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Focus : Corporate Governance

Productivity and Decent Work

Corporate Governance

Green Productivity and Corporate Planning

Audit Committees Requisite for Good Governance

Organisational Strategy in WTO Regime

JIT in Service Sector

Energy Efficiency in Barley Malt Plant

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Globalization, Productivity & Decent Work

Eddy Lee

The focus of this paper is on the inter-relationship between globalization and decent work. However, productivity is a key intervening variable. The ways in which globalization impacts on productivity is central to whether or not that process can be harnessed to provide decent work for all. It begins by defining the relatively new term 'decent work' and by setting out its policy implications. Then it argues that there is an important mutually reinforcing relationship between productivity and decent work and that strengthening this should be a key policy objective. Finally the literature on the impact of trade liberalization and of foreign direct investment, the two key drivers of the current process of globalization, on productivity and decent work has been reviewed. Conclusion has been drawn by discussing the implications of this for policies to enhance the productivity-augmenting benefits of globalization which, in turn, is central to achieving the objective of decent work for all.

Eddy Lee is Director (International Policy Group), ILO. Text of the Foundation Day Lecture delivered at the National Productivity Council, New Delhi, 10th February, 2003. Excerpts were published in Productivity News, March–April 2003.

Decent work

The ILO has a strong interest in ensuring that the process of globalization succeeds in promoting Decent Work for all. This is based on the view that this is, first, the best way for ensuring an equitable sharing of the benefits of globalization and hence ensuring its sustainability in the face of the real threat of a political and social backlash against the process. Secondly, as will be developed further below, the institutional framework and policies for achieving decent work are essential components of successful economic development strategies based on sustained increases in productivity.

What is Decent Work? Essentially it is a term intended to encapsulate the main elements affecting the welfare of working women and men and their families. These are: employment and earnings; social protection; fundamental worker rights to freedom of association, collective bargaining, and freedom from discrimination and forced labour; and social dialogue or voice for worker and employer organisations on issues affecting the world of work. Heuristically, one can think of 'Decent Work' as an end-state in which all these four elements of worker welfare are adequately provided for. Especially for the material components of this end-state (such as the earnings from employment and the level and extent of social protection), the notion of adequacy is defined in relation to levels of per capita income and the corresponding fiscal and capacity constraints. Shortfalls from these standards can be viewed as 'decent work deficits' that need to be eliminated through concerted action at both the international and national level.

Decent Work intended to encapsulate the main elements affecting the welfare of working women and men.

An underlying implication of this formulation is that action is necessary on all four elements of decent work

in order to achieve the ILO's overall objective of improving the welfare of workers. The normative dimension of this is that simply improving the economic situation of workers without the enjoyment of fundamental rights and voice is morally unacceptable. Thus a country where employment opportunities, earnings and economic security for workers are adequate but where workers are denied their fundamental rights still falls seriously short of the goal of Decent Work for all. It should be noted that this trumps any instrumentalist debate over the economic effects of fundamental rights or a possible trade-off between these and economic considerations. The universally recognised worker rights contained in the ILO's declaration on Fundamental Principle and Rights at Work must be respected unconditionally.

This normative stance is, moreover, buttressed by the notion that acting simultaneously on all four elements of Decent Work will also yield significant benefits in terms of policy complementarities. At the country level the framing of Decent Work programmes (always through a participatory process involving Government and the social partners) ensures policy coherence, with all the attendant benefits from complementarities. The adoption of a Decent Work programme implies that the objective function of the Government includes targets in terms of employment, social protection, fundamental worker rights and social dialogue. This commits governments and the social partners to act on all four fronts and to make the necessary allocations of financial and administrative resources to achieve all the targets set.

While the precise contents of a Decent Work programme will be country-specific, they will nevertheless have common core elements. The first is that the programme has to be embedded in the overall economic policy framework of a country. The reason for this is that the employment objective is largely determined by macroeconomic forces such as the rate and employment intensity of economic growth as well as by structural policies affecting the operation of labour, product, and capital markets. The general thrust of the ILO approach to macroeconomic and structural policies is to promote full employment through achieving the highest feasible rate of growth of productive jobs. The major concerns here are that the full productive job creation potential of liberalization is harnessed; that the employment loss and other social costs in the process of liberalization are minimised; and that the capacity of countries to provide income support and adjustment assistance to workers who are adversely affected is strengthened. In the case of capital account liberalization a key ILO concern is that this should not lead to increased vulnerability to financial crises or pre-empt the use of counter-cyclical macroeconomic policies.

Similarly, with respect to structural policies an overriding concern is that the regulation of markets and the pattern of taxes and subsidies should not impede productive employment creation. Distortions in relative factor-prices should be removed as far as possible in order to avoid disincentives to the creation of wage employment, while credit markets should provide fair access to small and medium enterprises and the self-employed. From this perspective, a thorny issue in many cases has been that of labour market regulation. Contrary to common misperceptions the ILO does not have a rigid, one-size-fits-all prescription on the issue nor does it automatically oppose labour market reform. What it does insist on are two basic requirements, namely, that fundamental worker rights are not compromised by labour market reforms and that the reform process is based on social dialogue. Far from being onerous conditions, these requirements have, in fact, several beneficial features. The elimination of forced labour, child labour, and discriminatory practices are not only moral imperatives but also improve the functioning of markets and enhance productivity. Similarly, a reform process based on social dialogue is likely to yield more equitable and efficient outcomes than one that is imposed unilaterally. This is because a participatory process brings to bear the insider knowledge of the main stakeholders in the labour market and makes explicit all the interests involved. This allows not only for a more informed design of new institutions but also for a more equitable and efficient resolution of competing interests. More importantly, it ensures the support that is essential for the reformed institutions to work well. Beyond these two basic conditions there are no preconceived models on what the precise configuration of labour market institutions should be. Countries are free to adopt systems that are best adapted to their particular circumstances and needs, provided that these are in keeping with underlying principles of social justice.

Elimination of forced labour, child labour, and discriminatory practices enhance productivity.

In the area of social protection a core concern is to strengthen and expand systems of social protection in the face of increasing risks that countries face in an era of increasing globalization. This requires action not only to extend existing systems of social protection that cover retirement, health care and disability beyond the formal sector but also to cope with the new risks associated with globalization such as increased redeploy-

ment and job churning, and the massive rise in unemployment and poverty during financial crises.

The issues addressed in the area of fundamental worker rights and social dialogues are of capital importance in their own right. But they are also central to achieving the goal of good political and economic governance. Freedom of Association, the right to collective bargaining, and social dialogue are key constituent elements of political democracy. At the same time, in terms of economic governance, they are powerful instruments for achieving greater equity, for empowering the disadvantaged and the poor, and for ensuring greater transparency in public policy and corporate governance. They also provide the enabling conditions for putting in place social pacts for ensuring macro-economic stability, broad support for economic adjustment programmes, and collaborative worker-management efforts to raise productivity and competitiveness.

Productivity and decent work: a two-way relationship

The achievement of the goal of decent work for all is fundamentally dependent on ensuring a high and sustained rate of economic growth. This is the ultimate basis for ensuring a steady expansion of employment opportunities, for raising living standards, and for increasing social expenditures, including for social protection. As is well known, a steady rise in labour productivity is essential not only for ensuring economic growth but also for an increase in real wages. As such policies to raise total factor productivity are a key foundational condition for attaining the decent work objective. Hence measures such as those directed at raising the international competitiveness of firms, to promote technological dynamism and to enhance the skills and productivity of the labour force are essential components of the decent work strategy. The same is also true of efforts to raise productivity in the agricultural and informal sectors since these make important contributions to reducing the proportion of the 'working poor' in the labour force.

Achievement of the goal of decent work for all is dependent on ensuring a high and sustained rate of economic growth.

But it is equally important to note that there is a 'virtuous circle' effect in the relationship between productivity and decent work. Rising productivity is essential for achieving decent work but progress in achieving decent work objectives also contributes sig-

nificantly to a rise in productivity. This is often insufficiently recognised by those who focus on the alleged productivity-reducing impact of protective labour legislation, of the 'insider' behaviour of trade unions, and of over-generous social protection. The extent of this problem is often exaggerated but even where true they can be fixed through sensible reforms of existing institutions and policies in order to reduce significantly, if not to eliminate entirely, the trade-off between productivity and the decent work objective. Indeed, such reforms are essential since malfunctioning labour institutions ultimately work against the decent work objective through their productivity-retarding effects. What is really important is the various ways in which the attainment of the decent work objective supports a rise in productivity. For example, the attainment of full employment raises productivity in the macro sense since it eliminates the wasteful under-utilisation of human resources. In addition the tight labour markets that result provide stronger incentives for firms to raise productivity. An appropriate framework for social dialogue based on fundamental labour rights would also confer productivity benefits through the industrial and social peace it brings about as well as through the cooperative effects it promotes between government and the social partners. Similarly an adequate level of social protection also helps to diffuse social tensions and to increase worker security and the willingness to accept structural changes at both the enterprise and economy-wide levels. Finally, as noted earlier, respect for fundamental labour rights and the practice of social dialogue makes a significant contribution to sound democratic governance that is an essential pre-condition for maintaining sustained increases in productivity.

Globalization and Productivity

Globalization should, in principle, offer expanded opportunities for raising productivity and the rate of economic growth in all countries. The extension of markets through international trade loosens the constraints to achieving economies of scale imposed by domestic markets. It also allows for greater specialization in line with comparative advantage while the spur of greater competition that greater openness brings should be productivity and growth enhancing. At the same time, expanded flows of foreign direct investment brings with it the promise of augmenting domestic investment, the transfer of technology, and spillover benefits that should also raise productivity and growth.

Yet the empirical record so far does not reveal that this potential has been even close to being achieved. In spite of widespread liberalization of trade and investment flows, only a small minority of developing countries can be said to have benefited significantly

from globalization. The reason for this lies both in the asymmetries in the current global economic system and in the failures of domestic governance. The upshot is that a majority of developing countries have failed to achieve a sustained increase in per capita incomes and unemployment, under-employment, and poverty remain endemic in many parts of the world. At the same time there is growing concern over a possible deterioration in labour standards, a rise in economic insecurity, and increasing dislocation in labour markets as a result of globalization.

To examine these issues further, the paper concentrates on a review of the impact of two of the main driving forces of globalization, namely trade liberalization and increased flows of foreign direct investment, on growth, productivity and decent work.

Trade Liberalization

According to standard theoretical models trade liberalization is unambiguously good for developing countries since they are labour-abundant. Freer trade will not only increase productivity and growth but will also simultaneously increase employment opportunities and wages for their most abundant resource, unskilled labour. This would also have the additional favourable effects of reducing wage and income inequality since the unskilled are among the lowest paid in the labour market. This view underlay the earlier literature on trade and employment in developing countries that had advocated a shift away from import-substitution policies towards more open trade policies.

Translated into policy terms this would mean that unilateral trade liberalization would always be a preferable policy option to import substitution or protection. There are, however, important theoretical reservations to this position. Most of these arise from the fact that the above propositions rest on the assumption that there is perfect competition and that there are only constant returns to scale in production. This is clearly at odds with the real world where, especially in developing countries, market imperfections are common and where many branches of industrial production are characterized by economies of scale. Therefore, "in the presence of certain market failures, such as positive production externalities in import-competing sectors, the long-run levels of GDP (measured at world prices) can be higher with trade restrictions than without" (Rodriguez & Rodrick, 1999). This was the underlying basis for the long-standing infant industry argument for the granting of initial protection to potentially competitive industries to enable them to overcome barriers to start up. More recent developments in growth and trade

theory have also provided additional arguments for protection. Endogenous growth theories suggest that "trade restrictions may also be associated with higher rate of growth of output whenever the restrictions promote technologically more dynamic sectors over others" (Rodriguez & Rodrick, 1999). Apart from reaping the benefits of economies of scale there may be also positive externalities generated by an increase in the stock of knowledge increased through these means. This is similar to the older arguments for import substitution based on the view that increasing returns and cross-firm externalities are ubiquitous in manufacturing and that protection to promote industrialization is justified on these grounds. This is often accompanied by the argument that prior industrialization is a necessary condition for later export success. From this perspective, trade liberalization is often deplored on the grounds that it sometimes leads to de-industrialization. "New trade theory" also makes the case that strategic trade policies can raise welfare under some circumstances. By supporting its firms to gain entry into sectors of production where world demand can support only a few oligopolistic firms (e.g., aircraft production) a country can capture significant benefits for the national economy.

It has also been pointed out that standard trade theory also assumes that resources (including labour) are always fully employed and that trade will always be balanced (Ocampo and Taylor, 1998). These assumptions rarely apply in the real world (*vide* the high levels of unemployment prevailing in many countries). In these circumstances, in contrast to the comfortable predictions of smooth and costless adjustment in standard theory, trade liberalization can impose heavy adjustment costs in the form of a contraction in output, high unemployment and wide trade deficits. Another strand of the literature also argues that adjustment costs may be high where there is monopolistic or imperfect competition, factor immobility and wage and price rigidity.

Adjustment costs may be high where there is monopolistic competition and wage and price rigidity.

The case against import-substitution policies in developing countries had been built up in the 1970s through a series of studies conducted by the OECD (Little, Scitovsky and Scott, 1970) and the National Bureau of Economic Research (NBER) (Kreuger, 1978). These studies documented the large inefficiencies associated with an import-substitution strategy with some heavily protected industries yielding negative value

added when output was measured at world prices. In contrast, following a more outward-oriented strategy, Asian NICs experienced rapid growth in both output and employment. The explanation offered for these contrasting outcomes consisted of both the static and dynamic losses associated with an import-substitution strategy. The former consisted of the higher costs of production in protected industries as well as the inefficiencies associated with the lack of competition in domestic markets, rent-seeking activities and delays caused by the system of quantitative restrictions on imports. The dynamic losses arose from the fact that import-substitution policies supported less competitive and more capital-intensive industries that grew more slowly. It was also claimed that by being less open to trade, the import-substitution strategies resulted in less access to foreign technology and knowledge, thereby benefiting less from an important source of growth. It has also been pointed out that import-substitution policies had appreciable negative macroeconomic effects that were insufficiently recognized at the time. Maintaining the import-substitution regime often required foreign exchange controls to support an over-valued exchange rate. In addition, limited growth of exports and heavy dependence on imported inputs often led to severe balance of payment problems that made it difficult to maintain macroeconomic stability. Consequently, it was difficult to achieve sustainable long-term growth under an import-substitution strategy. These studies established a presumption that outward-oriented strategies were superior to import-substitution but were relatively silent on the issue of *how* a shift from one strategy to another should be achieved. Yet, this is probably the most preoccupying question facing policy-makers in developing countries. The answer provided by the Bretton Woods institutions was that there should be substantial and swift trade liberalization, or "big bang" approach, as it is also known. This was the type of policy conditionality included in many structural adjustment programmes in the 1980s and in the programmes for the economies in transition in the early 1990s.

Assessing the impact of trade liberalization is inherently difficult because it is often accompanied by other liberalization measures. This characteristic of trade liberalization in this period is significant because it raises the important methodological problem that it is often difficult to disentangle the effects of trade policies *per se* from those of other measures of liberalization that occurred contemporaneously. It is also important to note that there were important differences among countries in the initial degree of protection from which liberalization occurred, in the macroeconomic circumstances that surrounded the initiation and the implementation of trade liberalization programmes, in the extent of liberalization that was undertaken, in the pace and sequencing of trade

liberalization measures, and in the relationship between trade and other liberalization measures. This makes it inherently difficult to arrive at general conclusions about the effects of trade liberalization.

Two studies, Dollar (1992) and Sachs and Warner, (1995) have been highly influential in forming the widely accepted view that countries with lower policy-induced barriers to trade experience faster growth, once other relevant country characteristics are controlled. Both these studies are based on a cross-section analysis for a large number of countries on the relationship between an index of "openness" of the economy and growth performance. The Dollar study claimed to show that for a sample of 95 countries over the period between 1976 and 1985, growth was negatively correlated with each of the two indices of openness used. The first index was a measure of real exchange rate distortion while the other was an index of real exchange rate variability. The rationale for the use of these indices was that the more open an economy the lower would be the extent of exchange rate distortion and the less the variability in the exchange rate. The Sachs and Warner study arrives at a similar conclusion on the relationship between the degree of openness and growth. The study is a cross-section analysis of a large sample, of 70 countries. Countries were classified as either "open" or "closed" based on five criteria—the level of average tariffs, the coverage of nontariff barriers, whether or not it had a socialist economic system, whether or not it had a state monopoly of major exports, and the level of the black market premium.

Countries were classified as "open" or "closed" based on the level of average tariffs, the coverage of nontariff barriers, whether or not it had a socialist economic system, a state monopoly of major exports, and the level of the black market premium.

The findings of both these studies have been seriously questioned by a detailed and convincing critique (Rodríguez and Rodrick 1999) which centres on the fact that the indicators of "openness" used are seriously flawed. They are not reliable measures of trade barriers and are also highly correlated with other sources of poor economic performance. As such the proposition that trade liberalization by itself leads to higher growth remains unproven.

Another recent attempt to revive the issue is the recent paper by Dollar and Kraay (2001). The paper

identifies a group of countries, the "post-1980 globalizers" that have seen large increases in trade and significant declines in tariffs over the past 20 years and claims that "their growth rates have accelerated from the 1970s to the 1980s to the 1990s, even as growth in the rich countries and the rest of the developing world has declined". The paper also claims that "since there is little systematic evidence of a relationship between changes in trade volumes (or any other globalization measure we consider) and changes in the income share of the poorest, the increase in growth rates that accompanies expanded trade leads to proportionate increases in incomes of the poor". The paper is, however, more convincing on the effects of trade *expansion* on growth than on the effects of trade *policy*. Although it tries to overcome some of the criticisms of earlier cross-section work on the relationship between trade and growth, it admits "that the available data on trade, growth and other policies may not be sufficiently informative to enable us to isolate the precise partial effect of trade on growth".

A recent review of the empirical evidence on the effects of trade liberalization concludes that trade liberalization has resulted in both an increase and a decline in the growth rate depending on country circumstances. Many countries were observed to have experienced an investment slump after trade liberalization, suggesting that a "J-curve" effect is at work. This suggests that there are at least short-run costs of adjustment after trade liberalization. Trade liberalization has also tended to be associated with an increase in current account deficits in spite of an increase in exports. These mixed results indicate that the impact of trade liberalization is not uniform but, on the contrary, is strongly influenced by factors such as the nature of the liberalization programme, the extent of pre-existing distortions in the trade regime, and the flexibility of markets. This view is supported by the divergent results that are revealed by recent country studies that examine the impact of trade liberalization.

However, nothing in the foregoing negates the fundamental truth that an open multilateral trading system is clearly preferable to a world economy with limited trading links. The gains from trade are undeniable as are the costs of protectionism, so the issue is not *whether* countries should try to benefit from freer trade but *how* this should be achieved. What the preceding discussion has tried to suggest is that there is no basis for a blanket prescription of "big bang" trade liberalization that is applicable to all countries. The relationship between trade liberalization and growth and employment is likely to be "a contingent one, dependent on a host of countries and external characteristics" (Rodriguez & Rodrik 1999).

Differences in country circumstances (such as the level of development, whether a country has comparative advantage in primary commodities or manufactures) are likely to warrant different strategies of trade liberalization.

Foreign Direct Investment

Cross-border investments have grown very rapidly. With respect to foreign direct investment it has been estimated that annual flows increased from US\$57 billion in 1982 to US\$1,271 billion in 2000. These flows declined sharply (by 51 per cent) in 2001 due to the slow down in the world economy. This decline was far more severe in the industrialized countries: inflows to developing countries decreased by only 14 per cent. Such short-term swings in investment flows are linked to the business cycle and stock market sentiment and have occurred during previous downswings in the global economy. They do not reflect a change in underlying trends. The book value of these investments, which gives an indication of the significance of international production in the global economy, increased six-fold from US\$0.7 trillion to US\$4.1 trillion between 1985 and 1995 (Graham, 2000).

The technological revolution has been a major driver of changes in investment flows.

It is also important to note the changing context within which these flows are occurring. A basic point is that the technological revolution has been a major driver of these changes in investment flows. In the case of FDI, the information technology revolution provided the enabling conditions for the growth of global production systems based on multi-country locations for different stages of production of a particular product. The new technology allowed greater and cheaper access to information on both input and output markets, reduced transaction costs and made management of a dispersed production network feasible (Narula and Dunning, 2000). This growth of a global production system, generating cross-border shipments of inputs and components, has been reflected in the increasing share of intrafirm trade in total world trade. As a consequence, the link between investment and trade patterns is now significantly stronger. Another important effect of the technological revolution on FDI is that it has changed the characteristics of the typical multinational enterprise. Increasingly, it is intensive in the use of knowledge capital and is an exporter of managerial, engineering, and

financial services. As such, in order to benefit from these "exports" it is essential that recipient countries invest in appropriate education and training to improve their capacity to absorb new technology and 'know-how'. Reputations and trademarks are also an important source of the competitive advantage of the multinational enterprise, as is its growing role in research and development, and product and process innovation (Markusen, 2000).

These technologically driven developments have been accompanied by a radical change in the policy environment for FDI. There has been a worldwide shift in policy attitudes towards foreign investment. "During the last two decades, many emerging economies have dramatically reduced barriers to FDI, and countries at all levels of development have created a policy infrastructure to attract multinational firms. Standard tactics to promote FDI include the extension of tax holidays, exemptions from import duties, and the offer of direct subsidies. Since 1998, 103 countries have offered tax concessions to foreign corporations" (Hanson 2001). In part, this could be explained by the disenchantment with import-substitution policies in the face of their evident failure. But it has also been driven by "optimism about the economic consequences of foreign investment, coupled with heightened awareness about the importance of new technologies for economic growth" (Hanson, 2001). On the latter point, it has also been pointed out that high technology exports have been by far the most dynamic area of export growth and access to this as well as to other "technology intensive and dynamic areas of activity" that were part of "integrated production networks under the aegis of TNCs necessarily meant that countries had to invite TNCs (transnational corporations)" (Lall, 2000).

Within the standard models of international economics, increasing cross-border investments are usually viewed positively. They represent a desirable reallocation of global investment funds based on the presumption that investors are rationally following market signals that direct funds to uses with the highest returns in the global economy. World output and productivity is thus maximized (Caves, 1996).

Increasing cross-border investments are usually viewed positively.

This benign view has, however, to be tempered by noting several obstacles in the real world that block its full realization. The flow of investment from rich to poor countries remains highly concentrated and most of the

least developed countries remain marginalized from the process. As a result, the contribution of cross-border investments to the reduction of the income gap between rich and poor countries as a whole has been weaker than predicted in the standard models of international economics.

One problem is the existence of policy obstacles to the free outflow of investments from developed countries. Many of these countries have in place policies such as locational incentives to attract foreign direct investment and anti-dumping measures that are sometimes misused for protective purposes. These constitute distortions to the free location of international investment. Domestic-content requirements within the European Union and NAFTA have also aggravated the problem (Moran, 2001).

Similarly, policy distortions in developing countries have resulted in the fact that inflows of investment have not always been directed to their most productive uses. High levels of tariffs have led to inflows of foreign direct investment that have been attracted to these protected domestic markets that were closed to their exports. This directs FDI into activities with a low social rate of return even though private rates of return are kept artificially high by protection. Similarly policies such as domestic-content requirements and joint venture stipulations have sometimes also reduced the efficiency of foreign investment without achieving the broader developmental objectives that inspired the adoption of such measures. Several studies have indeed shown that "a significant portion of the FDI that has gone to developing countries in the past has been invested in activities that were not internationally competitive" (Graham, 2000). But this problem has probably been reduced after the worldwide shift towards economic liberalization that has occurred in the past two decades.

Cross-border investment affects growth and productivity through several channels. First, it supplements domestic investment in receiving countries and hence should normally increase output and employment. This is an important consideration for developing countries with low savings rates and which face constraints on domestic resource mobilization. On the whole, the evidence suggests that foreign investment does increase growth. The explanation of the negative effect of FDI on growth in countries with low levels of human capital derives from the fact that FDI contributes to growth more through raising productivity than through increasing domestic investment. "Thus, FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy."

Another recent study of the effects of different components of private capital inflows on the growth of 44 developing countries concludes that "foreign direct investment and portfolio equity flows exhibit a robust positive correlation to growth" (Sotto, 2000). In principle, if the growth effect is positive, then so too should be the employment effect. For a dissenting view see Hausmann and Arias 2000. It is possible, however, that the net employment effect could be negative if there is a strong crowding-out effect on local firms and the number of jobs created by the foreign firms is lower than that of jobs lost. Employment creation by foreign firms could also be lowered if they introduce technology that is capital-intensive in relation to a country's factor-endowments. However, even where the employment effect is negative, this may still be economically justified from a longer-term perspective. This could be so if the displaced local firms were inefficient (and had no hope of eventually becoming fully competitive) or if the foreign firms generated strong linkage effects and productivity spillovers that raised the growth rate of output and employment over the longer term. The empirical evidence on this issue is, however, sparse and does not permit simple generalization.

Secondly, cross-border investments can potentially also raise the rate of growth if there are spillover benefits from the transfer of technology and skills to the local economy. In this case, it raises labour productivity and incomes. On this issue, a recent review concluded that "there is weak evidence that FDI generates positive spillovers for host economies. While multinationals are attracted to high productivity countries, and to high productivity industries within these countries, there is little evidence at the plant level that FDI raises the productivity of domestic enterprises" (Hanson, 2001). But this is based on only the very limited number of plant-level studies that are available. On the other hand, there have been countries, such as Singapore and Ireland that have been highly successful in generating strong spillover effects through the right policies and institutional development. A recent study based on the automotive and the computer/electronics sectors stresses the importance of being fully integrated into global production networks as an effective means of maximizing backward linkage and spillover benefits from foreign direct investment. "Foreign investors whose local operations comprise an integral part of the parent's global or regional sourcing network introduce state-of-the-art technology and business practices into the host economy both via the investment that the parent company makes in the performance of its own subsidiary and via the supervision that the parent and the subsidiary exercise over the performance of local suppliers ... As a by-product of their own efforts to strengthen their competitive posi-

tion in international markets, the foreign firms develop a major stake in the level of accomplishment of both the subsidiary and the suppliers upon which the subsidiary depends" (Moran, 2001). The main lesson learnt from the success stories is that the presence of local firms able to absorb the new technologies and respond to new demands is an essential precondition. In addition, policies to develop local education, training and technology systems and to build supplier networks and support institutions are also vital.

Cross-border investments can raise the rate of growth if there are spillover benefits from the transfer of technology and skills.

Enhancing the benefits of globalization on productivity and decent work

The foregoing suggests that the relationship between globalization and productivity and decent work is neither straightforward nor automatic. Adopting the policies and creating the institutional environment appropriate to a country's circumstances is vital for ensuring positive outcomes. Equally important, however, is the functioning of the global economy and its governance since this determines the extent to which developing countries can benefit from expanding flows of international trade and investment. Issues such as access to developed country markets, the multilateral rules governing trade and investment, and the functioning of the international monetary system are all important current concerns in international economic policy. I shall begin this concluding section by addressing these issues before going on to discuss the guidelines for national policies directed at maximising the benefits that can be derived from globalization.

(i) *International policies:* The fundamental requirement is better governance of the global economy that will generate higher and more stable economic growth. The development of institutions for managing the global economy has lagged far behind the accelerated globalization of the past two decades. Effective and equitable institutions for the coordination of macro-economic policies and for reducing instability in global financial markets are an obvious priority. This will reduce the risk of synchronised recessions and contagious financial crises that have taken a high toll in terms of lost jobs and social hardship.

A well-regulated and stable financial system is also required for boosting the rate of productive investment

in the global economy. This is the ultimate basis for maximising the rate of growth of productive jobs. This implies that destabilising, speculative capital flows have to be curbed through a combination of international and national policies. These flows have increased risk-aversion and raised the cost of capital, quite apart from the damage inflicted by financial crises. The new financial system must also allow sufficient room for counter-cyclical macroeconomic policies, especially in developing countries. In addition the problem of tax competition that has been weakening the capacity of the state to mobilize resources for productive public investment has to be solved.

Well-regulated and stable financial system is required for boosting the rate of productive investment.

The potential benefits from trade liberalization can be increased through making the multilateral trading environment more supportive of the efforts of developing countries. As we have seen earlier, a majority of developing countries still remain marginalized from the benefits of trade expansion in the global economy in spite of having, in many cases, undertaken significant trade liberalization. As such an important priority for the international community is to take measures to ensure greater market access for these countries. Progress in liberalizing trade in agriculture will be particularly important. Further, liberalization of trade barriers on labour-intensive manufactured products will also be helpful. But, as noted earlier, these measures will not be sufficient. They need to be complemented by effective programmes of external assistance to overcome supply-side constraints to export expansion in the least developed countries. Careful consideration should also be given to the capacity of these countries to bind themselves to the wide range of multilateral trading rules that have emerged and that are likely to be further expanded. A less demanding approach may be warranted in some cases in view of evident limitations in domestic capacity and special developmental needs.

International development assistance, especially to the least developed countries, can play a significant role in overcoming the current marginalization of the majority of developing countries from the benefits of foreign investment. By supporting the development of physical infrastructure and human resources as well as improvements in political and economic governance such assistance will contribute greatly to improving the attractiveness of these countries to foreign investment. In addition, the industrialized countries could consider

various promotional mechanisms to attract potential investors to least developed countries that offer good investment opportunities but are unable to market themselves effectively. More generally, the industrialized countries can facilitate private capital inflows to developing countries through improving information flows to investors, strengthening insurance schemes, and providing greater market access to exports from developing countries. This should be supported by an increased role of multilateral development banks in co-financing and providing guarantees to foreign direct investment.

(ii) *National policies:* In terms of national policy, an overarching priority is to manage more effectively the process of liberalization and integration into the global economy. Headlong liberalization should be avoided because of the many hazards it invariably exposes a developing country to. A case in point is financial liberalization, especially the removal of controls over capital flows. Hasty financial liberalization without prior development of a sound regulatory framework for the banking and corporate sectors greatly increases a country's vulnerability to financial crises with all its attendant social costs. These costs can be overwhelming, given the weakness of current social protection systems.

Economic liberalization programmes also need to be accompanied by measures to promote the efficient functioning of markets. From the standpoint of employment creation it will be particularly important to correct market failures that create biases against employment intensive growth. It will also be important to ensure that regulatory, credit market and other obstacles to the growth of enterprises, especially small and medium enterprises, are removed. In addition, measures to promote export opportunities for small farmers and rural non-farm enterprises can be effective in sharing the benefits of globalization more widely and in reducing poverty. The rapid growth of labour-intensive exports from Town and Village Enterprises (TVEs) in China is a good illustration of these possibilities. These are all critical requirements for ensuring that the full potential of the new opportunities for increasing output and employment growth created by globalization are realised.

More generally, the efforts of developing countries to benefit from the liberalization of world trade and foreign investment requires essential support from the right economic and social policies and institutions. The foundation for this is democratic, transparent and competent governance of a well-functioning market-based economic system. Without this the potential gains from trade liberalization and other economic reforms will be thwarted by obstacles such as barriers to entry into

newly competitive activities, market failures and other limitations on factor mobility. For example, the fundamentals of a well functioning market economy and good governance have to be in place before a country can even become attractive to foreign investment. An important part of these fundamentals is a sound investment climate that ensures property and other legal rights and that is free of unnecessary obstacles to enterprise creation, price distortions and macro-economic instability. Without this, even if foreign investments are attracted, the net benefits from this will be meagre.

In addition, without good governance, the gains that are realized are also likely to be unevenly distributed because of the lack of an even playing field for all economic agents. An essential component of good governance is respect for the fundamental rights at work defined in the ILO Declaration on Fundamental Principles and Rights at Work. Freedom of association is an indispensable element of the civil and political liberties that underpin a democratic and transparent political system. In tandem with the right to collective bargaining, it also constitutes a countervailing force to unequal economic power that can bring about a more equitable distribution of the benefits of economic growth. Full respect of these rights, as well as those relating to the elimination of forced labour, child labour and discrimination, are thus essential for defusing some of the most graphic contentions of the anti-globalization movement such as those relating to a rise in inequality and poverty and in exploitative labour practices. Moreover, as argued at the outset, these rights contribute to improved productivity in several ways.

Another obvious priority for national policy is in the area of education and training. Low levels of education and skills in the labour force are a basic barrier to industrial development, even in many labour-intensive industries. Moreover, creating a skilled and productive labour force, is especially important for attracting foreign investment and for increasing capacity to capture the spillover benefits from foreign firms.

In spite of the mixed outcomes in the past from the use of policy instruments to target, guide and bargain with foreign investors, these should not be totally abrogated. In many developing countries there are serious market failures with respect to the investment process that would justify the use of such instruments. Similarly, there are often divergences between the interests of multinational enterprises and those of host governments, as well as inequalities in bargaining power, that need to be narrowed. Hence the use of policy instruments such as rigorous project evaluation, regulation to correct anti-competitive behaviour,

control over mergers and acquisitions by foreigners, and measures to stimulate linkages with local enterprises may be justified by particular country circumstances.

The productivity-enhancing potential of the right social and labour policies also needs to be harnessed to the full. Active labour market policies to facilitate adjustment to changes in the structure of production brought about by trade and investment liberalization need to be emphasized. Measures to provide retraining for displaced workers, job search assistance and other measures to facilitate labour mobility will be important in this connection. As mentioned earlier, the effectiveness of such programmes is also likely to be greatly enhanced by the strengthening of social dialogue on economic reform programmes and of worker-management cooperation in handling restructuring at the enterprise level. Social dialogue aimed at reaching consensus on labour market reforms that improve the functioning of labour markets while preserving essential protection for workers will also be productivity-enhancing. All these measures are essential for preserving a stable environment that supports productivity-enhancing economic adjustments and for pre-empting harmful social and industrial conflict.

Productivity-enhancing potential of the right social and labour policies needs to be harnessed to the full.

Finally, the strengthening of social protection will also be essential for mobilizing broad popular support for economic reforms. Providing adequate income support for displaced workers is a necessary complement to active labour market and poverty-reduction policies. More generally, trade liberalization and other economic reform programmes must be sensitive to their likely social impact. Every effort needs to be made to minimize their social cost through measures such as an *ex ante* analysis of their social impact. In particular the impact of price changes on the poor, of the possible destruction of markets important to poor producers, and of changes in the demand for labour need to be given serious attention in policy design.

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No one would have remembered the Good Samaritan if he'd only had good intentions. He had money as well.

— Margaret Thatcher

Corporate Governance & Productivity in Korea

Young S. Park

Numerous researchers argue that key element in improving economic efficiency is corporate governance. In this study, we surveyed 38 Korean Sock Exchange listed firms and empirically tested how the corporate governance issues impact on productivity and growth in Korea. On the basis of the characteristics of good corporate governance, a framework was drawn up consisting of four key areas; ownership, management, social responsibility and institutional interface. The empirical findings support the fact that corporate governance is positively related with a firm's performance in Korea.

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Corporate governance in Korea was practically invisible until the East Asian financial crisis of 1997 drew attention to it and to the problems of "crony capitalism" in emerging-market economies.

According to the World Bank Report, clear evidence emerged of a rapid and unsustainable buildup of investment in fixed assets financed by excessive borrowings in Korea. This over-investment resulted in poor profitability, reflected in low and declining returns on equity and on capital employed. The findings of the World Bank report lead to several conclusions.

First, corporations in Korea tried to defy financial "laws of gravity" that can be ignored only at the risk of financial distress. Business practice in those countries reflect a lack of financial discipline. Second, Korean corporations have not adopted global standards on creating shareholder value. In an era of increasing capital mobility, disparities in underlying returns on equity and risk involved with capital employed are not sustainable in the long run. Third, the poor operating and financial performance in Korea suggests a need for systematic corporate restructuring.

Just a few years ago, it was fashionable to decry the short-sightedness of the American financial system, the tendency of U.S. financial markets to ignore longer-term corporate prospects while focusing heavily on quarterly earning reports. There were repeated calls for the U.S. to adopt new laws that would permit financiers to take a longer view of their investment, and to move toward the more relationship-based investing model that prevailed in Japan. Now the talk is all about the virtues of "the market" the importance of competition and disclosure, and the horrors of crony capitalism.

Why did these relationship-based financial systems, which have been credited with fueling the miraculous growth of East Asia implode suddenly? Based on previous academic researches, they have illustrated the

pros and cons of the relationship-based system and arm's length Anglo Saxon system. (Rajan and Zingales, 1998) The message from the existing research is that although relationships may increase or preserve value in some cases—particularly when contracts are hard to write or enforce they also have a downside when they do not rely on price signals. The consequence has been a widespread and costly misallocation of resources. Two dimensions seem important in determining whether a relationship works well in an environment relative to arm's length transactions. The first is the extent of adequacy of the contractual "infrastructure" ("contractability" for short) in that environment. The second is the availability of capital for investment. When there is little available capital relative to opportunities and contractability is low, relationship-based system is better than an arm's length system. On the other hand, when there is a high contractability and relatively abundant capital, the arm's length system works better. When the ratio of capital to opportunities is low but contractability is high, both systems work reasonably well, although in most developed economies arm's length system tends to supplant the relationship system over time. Finally neither system works well when capital is relatively abundant and contractability is low. The relationship system easily leads to over-investment while the arm's length system has limited ability to recover funds once they are invested.

Until the end of the 1980s, the East Asian economies were overwhelmingly relationship-based. At the outset of liberalization, the volume of profitable investment opportunities greatly exceeded the available capital. The capital shortage in turn prompted a momentous change in the environment: namely the opening up of the economies to capital flows—a development that coincided with the increased desire of western banks and fund managers for international diversification.

At the outset of liberalization, the volume of profitable investment opportunities greatly exceeded the available capital.

A flood of foreign capital poured into these countries at a time when the institutional infrastructure was not adequately developed to permit direct contracting between these sources of capital and borrowers. Not only did the foreign lenders not always know whether their funds were being deployed appropriately, they also did not have the institutional safeguard to protect their investment. Therefore they took the second best route—they kept their loans and invest-

ment short term so that they could pull out at any indication of trouble. Short-term financing was the cheapest way for the countries to obtain a large amount of capital. Both sides were happy provided the economies continued to go well. Then suddenly prospects changed. Once some foreign arm's length capital started to pull out, it did not make sense for any to stay in.

Therefore, we can say that the inconsistency between financial system and contractual environment lies at the core of the inevitability of the East Asian crisis. Once we have established the infrastructure of high contractability, we know that arm's length system works better than relationship system in the sense that it performs well regardless of the level of capital to investment opportunity ratio. Currently, East Asian countries are in the process of institutionalizing the contractability, for example, institutions such as exchanges and custodial services are set up, monitors such as rating agencies, auditors, and supervisory authorities are established or strengthened, accounting standards and disclosure laws are improved and bankruptcy and contract laws are made more effective. Under arm's length system with contractual infrastructure, there is much to be done by the investment bank as a provider of vehicle to allocate the funds with transparency. Next hurdle is overcoming the incompatibility of market mechanisms and the current corporate governance system.

We can define corporate governance in various ways depending on how the firm is viewed. Corporate governance is defined as "mechanism by which stakeholders of a corporation exercise control over insiders and management such that their interest is protected." (John and Senbet, 1998). Corporate governance is defined as rules, standards, and organization in an economy that govern the corporate owners, directors and managers (Prowse, 1998). In narrow definition corporate governance is defined as "ways in which suppliers of finance to corporations assure themselves of getting return on their investment" (Shleifer and Vishny, 1997).

In this research, we defined corporate governance as the system by which corporations are directed and managed. It specifies the relationship and distribution of rights and responsibilities among the providers of capital, the board, managers and other stakeholders (employees, consumer, the community and the state) of the corporation. The outcomes of the interplay of these actors are strategic decisions driving the corporation.

Much of the literature on corporate governance focuses on the "principal-agent" relationship between shareholders (the principals) and managers (the agents)

that stems from the separation of ownership and management in the publicly owned corporation of the kind that prevails in the US and the UK in which no single shareholder owns more than a small fraction of a corporation's stock. More important however is the fact that, outside the US and the UK, the corporation with widely dispersed ownership is not the rule but the exception. What prevails in Korea are corporations with concentrated ownership, i.e. large block-holders who directly control managers. Also widespread are cross-shareholdings among companies and the issuance of multiple classes of shares with different voting rights, all of which help dominant shareholders to control corporate assets considerably greater, even, than their direct stock ownership would justify. Therefore the key potential conflict of interest in Korea tends not to be between managers and shareholders *per se* but between the dominant owner-managers on one hand and minority shareholders and other investors (domestic and foreign) on the other. This conflict of interest is commonly referred to as the "expropriation problem", as opposed to the "agency problem" that applies to the principal-agent relationship between shareholders and managers.

What prevails in Korea are corporations with concentrated ownership, i.e. large block-holders who directly control managers.

Korean style of corporate governance tended in the direction of maximization of sales rather than what neoclassical economic theory argues as "manager should maximize the value of the firm." This was because manager/shareholder of Korean Chaebol could monopolize the private utility which is proportional to firm size or sales at the expense of minority shareholders.

Key element in improving economic efficiency is corporate governance. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining this objectives and monitoring performance are determined. Good corporate governance should provide proper incentives for the board and management to pursue objectives that are in the interests of the company and should facilitate effective monitoring, thereby encouraging firms to use resources more efficiently.

The purpose of this study is to understand how governance issues impact on productivity and growth in Korea, and develop policies, strategies and approaches

that can address these issues. Specifically, this study would identify the link between corporate governance and productivity and growth and policy implication would be recommended based on survey results.

The survey instrument

The underlying proposition of this research is that good corporate governance promotes improved productivity and competitive pressures. As suggested by OECD (1999), good corporate governance is indicated by the following:

Good corporate governance promotes improved productivity and competitive pressures.

- (1) It should protect shareholders' rights;
- (2) It should ensure equitable treatment of all shareholders, including minority and foreign shareholders;
- (3) It should recognize the rights of stakeholders as established by law, and encourage active co-operation between corporation and stakeholders in creating wealth, jobs and the sustainability of financially sound enterprises;
- (4) It should ensure that timely and accurate disclosure is made on all material matters regarding the corporation, including the financial situation, performance, ownership, and governance of the corporation; and
- (5) It should ensure the strategic guidance of the corporation, the effective monitoring of the management by the board, and the board's accountability to the corporation and the shareholders.

On the basis of the characteristics of good corporate governance, a framework was drawn up consisting of four key areas; ownership, management, social responsibility and institutional interface. It is these key elements of corporate governance that are presumed to affect the corporate performance in terms of corporate growth and productivity. The governing relationship can be described as:

$$\begin{aligned} & \text{Corporate performance (growth + productivity)} \\ & = f(\text{ownership, management, social responsibility,} \\ & \quad \text{institutional interface}) \end{aligned}$$

Here the dependent variables are company growth and productivity and the independent variables are ownership, management, social responsibility and institutional interface.

The following elements represent the range of issues that will be covered in this study and these issues are covered in the questionnaire.

Ownership

- Whether the company is publicly listed would impact on the performance. Generally it is believed that a publicly listed corporation has more diluted control because of minority shareholders and consequently higher monitoring costs, could lower productivity.
- Distribution of shares (provides information on ownership concentration) is related with performance. Many research findings claim that there is a U-shaped relationship between degree of concentration of ownership and corporate profitability.
- Ownership composition (who the shareholders are and who among them belong to the controlling group) would impact on corporate performance.
- Whether the company is government, local or foreign owned. It is believed that a multinational or foreign-owned corporation is more efficient and transparent.
- Whether the company offers stocks to employees affects firm performance. Labour productivity would be higher if there is an employee ownership scheme.
- Whether minority shareholders are represented in the board. Collective action problem inhibits assertion of rights of shareholders.
- Who are the creditors of the corporation? Bank or non-bank institutions? If creditors are part of the conglomerate (e.g. affiliated bank or financial institution), there is distortion of incentives to discipline the firm. Hence, there is less monitoring.
- Who guarantees loans made by the corporation? If the government guarantees them, then the creditors have few incentives to monitor.
- How strong are external creditor rights and their ability to enforce agreements? Arms length model vs. relationship model. In the Asian model (relationship), to offset poor enforcement

of governance rules because of trust, you have to rely on external creditor rights and their ability to enforce agreements.

Management

- Does management have independence in deciding (qualify types of decisions)? When there is high conflict between owners and managers, managers will invest less effort in managing the corporate resources. Hence, it would lower productivity.
- What types of decisions are made by the owners versus managers?
- How does executive compensation affect profitability and productivity? There is little evidence of a strong link between executive compensation and company performance e.g. profitability, growth.
- Transparency and information disclosure. The quality of transparency and information disclosure dependent on the use of internationally accepted auditing and accounting standards, independence of auditing, good financial reporting system. Foreign investors demand transparency and disclosure.
- What accounting standards are followed by the corporation?
- Does the corporation follow international accounting standard? Yes means more transparency. The more transparent, the more productive the corporation is.
- How many books does the corporation maintain? (separate for management, tax agency, corporate audit). Having several books means the corporation is less transparent.
- Does the corporation prepare financial reports and submit them to stockholders and the securities agency? Yes, means greater transparency.
- Does the corporation have a Code of Ethics that governs the behaviour of owners, managers and shareholders?
- Are there sanctions or penalties for violation? It is easier to deal with accountability questions in the privately owned corporations because of the profit motive. In public corporations there is no accountability standards. Hence, CEOs of government corporations are able to get away with poor performance.

- Does the firm have adequate arrangements to ensure legality of transactions that might have significant financial consequences? Yes, means higher accountability.
- Does the firm articulate and promote appropriate values and standards of behaviour across the organization? Yes means better deployment of accountability systems.
- Does the firm receive and investigate allegations of breaches of proper standards of financial conduct? Yes means better accountability systems.
- Does the firm ensure regularity of transactions by putting in place systems of internal control? Yes means less vulnerability to mismanagement.
- Does the firm have a corporate auditor who is not an owner of the board? Yes means the auditor is more independent. Hence, higher accountability.
- Is the external auditor independent from the company? Yes means better monitoring.
- For how many years have the corporation associated with the corporate auditor (auditor turn-over)? Long association means poor monitoring.

Public Responsibility

- Whether the corporation is conscious of consumer rights. Firm awareness of consumer rights means higher quality consciousness.
- Whether the corporation observes environmental regulations and standards. Green productivity means sustainable business, green bucks. It pays to offer environmentally friendly products to consumers.
- Whether the corporation is active in supporting its communities. Critics argue that social responsibility can lead to increased power, conflicts of interest, lack of accountability, decreased profits, and activities by business with no expertise. Proponents counter that social responsibility derives from its power and resources and its position as a citizen in partnership with government and the public. When there are no differences in price, quality and availability of products, sales and deals are often made on the basis of corporate practices. Consumers favour firms with solid corporate citizenship practices.

Interface with External Stakeholders

- What are the types of regulations imposed on firms? List rules of stock exchanges and company laws.
- What are the costs and benefits of regulations?
- What kinds of disciplining mechanisms are used by the government to enforce compliance with regulations? Repressive regulatory processes, statutory restrictions, low standard of transparency and disclosure, poorly trained regulatory personnel affect corporate performance negatively.
- Does the corporation follow international quality standards?
- Does the corporation observe core labour standards?

Survey implementation, methodology and distribution of respondent firms

In order to analyze the impact of corporate governance on productivity and growth, we conducted a detailed survey at the firm level. The survey was initiated in February 2002 and was completed in April 2002. We contacted top 300 largest KSE listed firms in terms of capitalization to arrange interviews with, preferably CFO, or any other executive in charge of investor relationship business. Out of 300 firms, we visited thirty-eight firms who permitted us to have an appointment to do interviews. We gathered publicly available financial data from the database of the Association of Listed Companies rather than asking individual companies while we interview. Using the public database would minimize the risk of reporting the number with heterogeneous perspectives.

A brief description of the characteristics of the sample is shown in Table 1. All surveyed firms are located in Seoul and all firms are listed in the Korea Stock Exchange and two of them are government controlled firms and others are private corporations listed in the Korea Stock Exchange. Twenty-three firms (60.5%) are from the manufacturing industry, five firms (13.1%) belong to construction industry, and four firms are engaged in trading and wholesale business. There are sixteen (43.24%) firms in which a foreign company has a financial stake and twenty-one firms (56.74%) in which no foreign company has a stake. The largest (smallest) company in terms of the total number of regular employee has 26,333 (200) employees.

Table 1 also tells us that 23 firms (63.89%) answered

Table 1: Characteristics of Sample Firms

		Frequency	%			
Industry distribution	Manufacture	23	60.53			
	Construction	5	13.16			
	Power generation	1	2.63			
	Business Service	1	2.63			
	Trading and wholesale	4	10.35			
	Retail	1	2.63			
	Others	3	7.89			
		yes	no			
Foreign firm has a financial stake		16 (43.24%)	21 (56.74%)			
Firm have holdings or operations in other court		23 (63.89%)	13 (36.11%)			
Exporting firm		32 (84.21%)	6 (15.79%)			
		Mean	Standard Deviation	Minimum	Median	Maximum
Proportion of export		0.3853	0.0525	0.003	0.3634	0.97
		Frequency		%		
Major shareholder	Government	2		5.26		
	Family	8		21.05		
	Domestic company	12		31.58		
	Foreign company	1		2.63		
	Individual	14		36.84		
Others		1		2.63		
		Mean	Standard Deviation	Minimum	Median	Maximum
Number of regular employees		3,863.21	5,701.60	200	1,999	26,333
Total compensation budget		140,336 million	241,697 million	5,622 million	64,130 million	1,246,39 million
Number of hours actually worked		2,453	250.25	2,160	2,448	2,868
Value of output		4,310 million	7,796 million	0	1,504 million	40,620 million
Value added		695 million	1,213 million	19 million	292 million	5,756 million
Book value of fixed assets		3,691 million	10,080 million	136 million	1,17 million	61,72 million
Gross Profit margin		0.2274	0.2274	0.0243	.1528	0.9993
Net profit margin		0.0283	0.06	-0.0969	0.0208	0.165
Return on equity		0.0245	0.2048	-1.1066	0.0423	0.2016
Return on assets		0.0112	0.0218	-0.0499	0.0097	0.0623

yes to the question does your firm have holdings or operation in other countries?? and 13 firms (36.11%) said no. According to Table 1, about 84% firms are exporting companies and the proportion of sales exported ranges between 0.3% and 97% and its average is 38%. In terms of internationalization, the sample is representing Korean firms considering the fact that the Korean economy is export oriented.

Seven firms answered that the majority ownership is held by one shareholder-owner (state or private) and seven firms answered that there are two to three shareholder-owners. Four firms responded that there are four to five shareholders who hold majority ownership and seven firms said that there are six to ten majority shareholders. Thirteen firms answered that they have more than ten majority shareholders.

Relationship between Corporate Governance and Productivity

In this section, we investigated how the key areas of corporate governance impact on growth and productivity. We have drawn scatter diagrams and applied regression analysis to find out any empirical relationship between corporate governance and productivity and growth of Korean firms. As a measure of productivity we used ROA, ROE, gross profit margin and net profit margin and sales growth rate and asset growth rate were employed as growth measures. Considering the fact that the survey was done in 2002, we used year 2000 financial numbers because year 2000 is what we can access in early 2002. We reported any significant result no matter whether it is consistent with research hypothesis or not.

According to Fig. 1, we can say that there is a positive relationship between foreign share ownership and revenue growth rate. It partially supports the hypothesis that a foreign owned firm is more efficient.

Figure 2 show how the gross profit margin changes according to the proportion of export out of total sales. There is a negative relationship. From the viewpoint of Korean firms, foreign product market is more competitive, thus the higher the proportion of export out of total sales the lower the gross profit margin is. When firms export more they are under severe competition which could be a positive factor for the firm in the long run but in the short run there is a squeezing effect.

We have the hypothesis that labour productivity is higher if there is employee ownership scheme. Figure 3 shows positive relationship between employee share ownership ratio and sales growth rate. Under the gover-

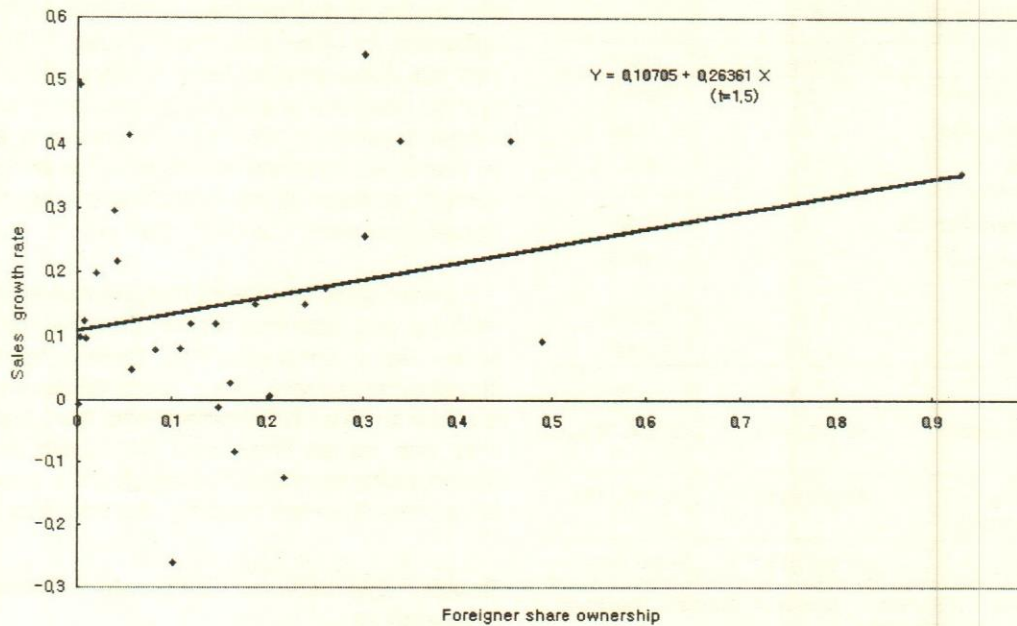


Fig. 1. The Relation between Foreign Share Ownership and Sales Growth Rate

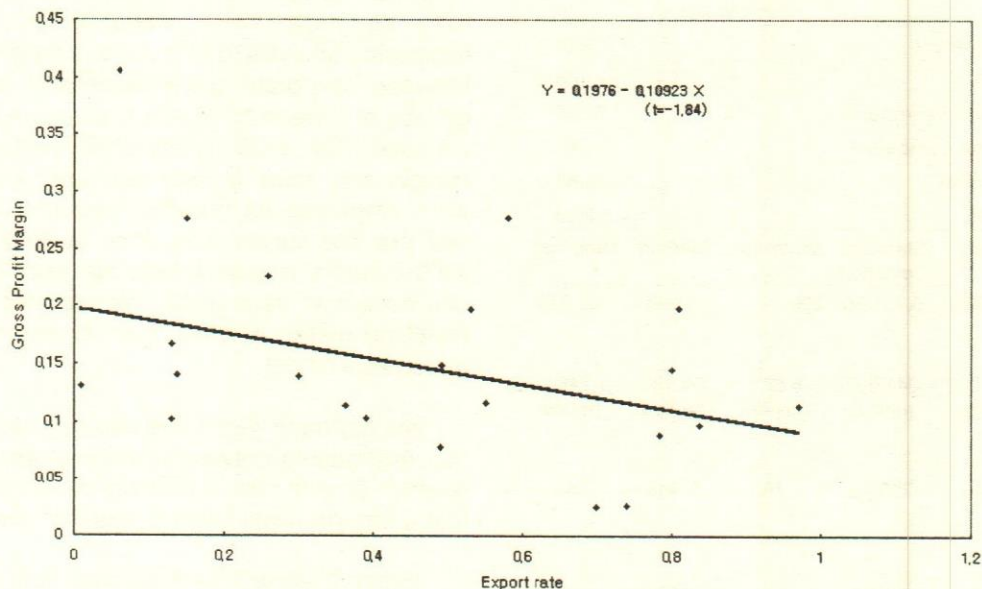


Fig. 2 The Relation between Ratio of Export and Gross Profit Margin

nance system where majority shareholders/managers prefers growth in firm size rather than maximization of profitability we can observe positive relationship as is shown in Fig. 3.

We have a similar relationship between managers share ownership and gross profit margin. When managers own shares of the company, there is incentive compatibility between shareholders and managers, so we can expect that there is a positive relationship. Figure 4 shows that the manager's share

ownership has positive impacts on the gross profit margin.

Figure 5 compares profitability and growth of two groups. For the question, Who are the creditors of the corporation?, we divided the sample into two groups, bank and non-bank. As is expected the group whose main creditor is a bank shows higher ROE, ROA, gross profit margin, net profit margin and sales growth rate. Only in asset growth rate the non-bank group is better than the bank group.

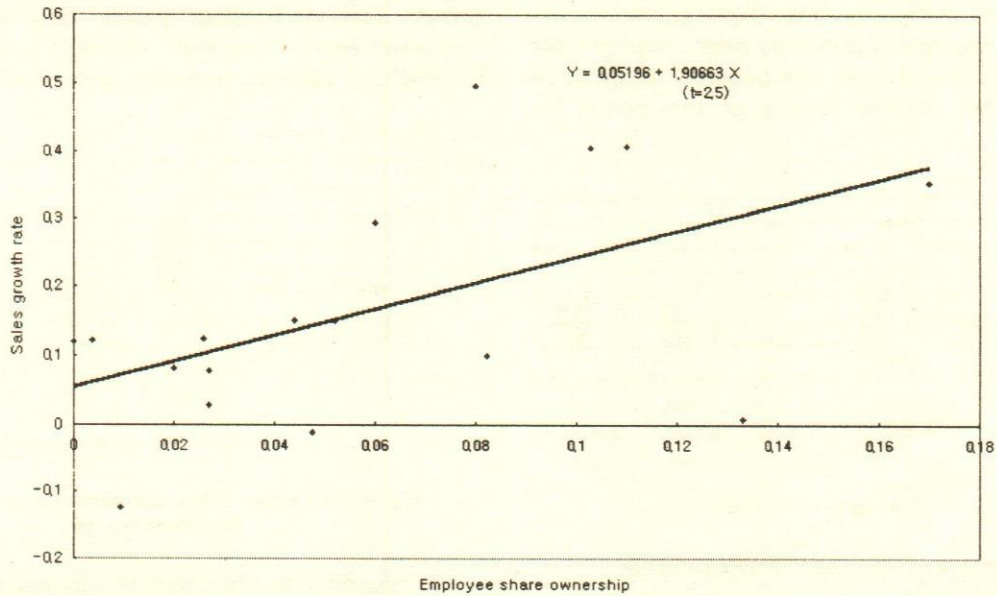


Fig. 3. The Relation between Employee Share Ownership and Sales Growth Rate

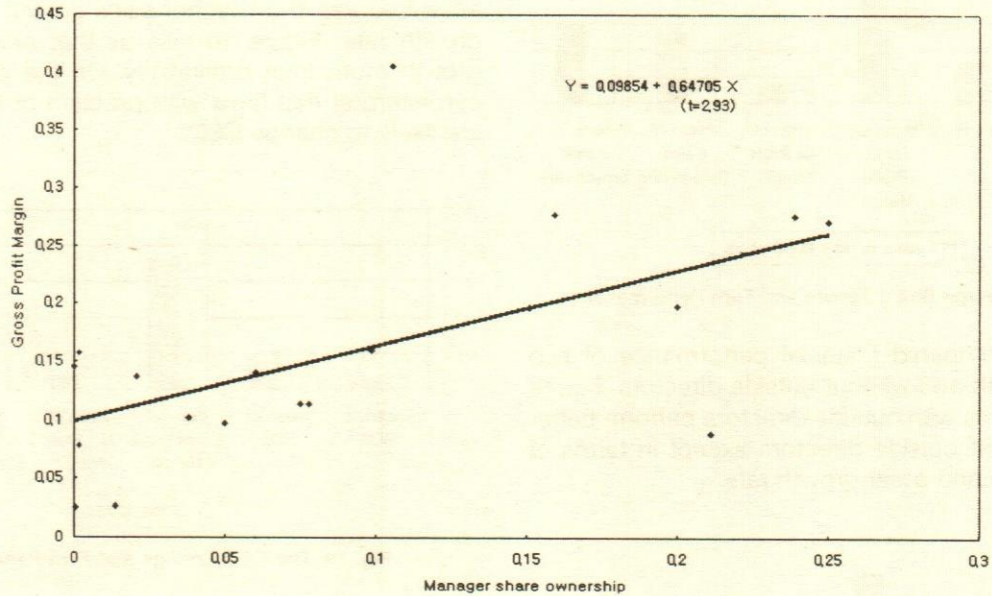


Fig. 4. The Relation between Manager Share Ownership and Gross Profit Margin

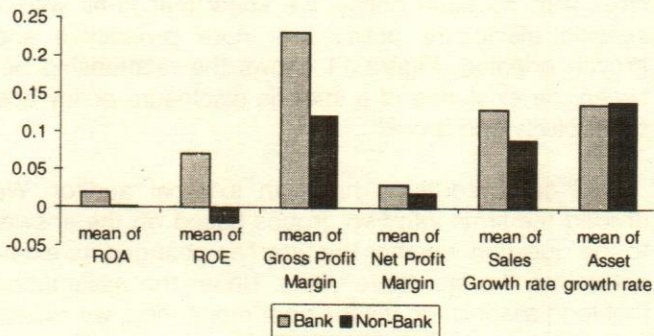


Fig. 5. Main Creditor and Firm Performance

We expect that when the creditors are part of the conglomerates, there is distortion of incentive to monitor. In Fig. 6, the survey shows that the above scenario can be applied to Korean firms. The group, where creditors are affiliated with the firm, has a problem of less productivity and less growth.

Firms were asked how long is the average tenure of the board and we compared whether the average tenure determines the productivity and growth. As is shown in Fig. 7, the group with 4-6 years average tenure of the board shows better productivity and growth than the group with less than 3 years average tenure of the

board. We cannot apply any clear explanation for why longer board tenure group performs better than shorter board tenure group. However, one possible explanation is that we expect shorter tenure of the board for troubled firms.

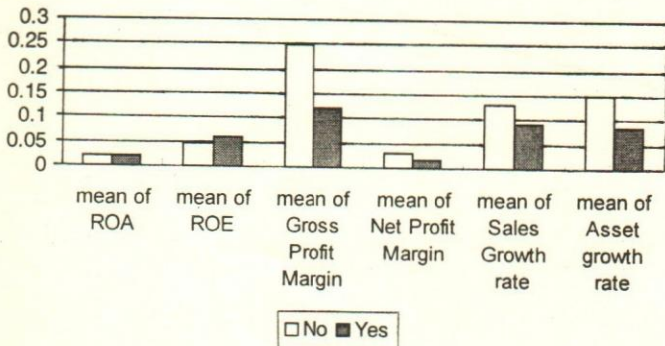


Fig. 6. Creditor's Affiliation and Firm Performance

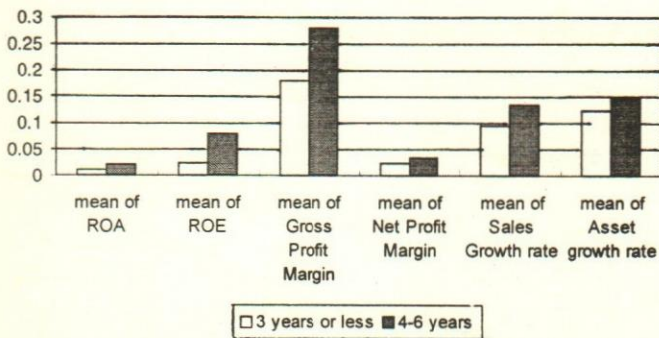


Fig. 7. The Average Board Tenure and Firm Performance

We also compared financial performance of two groups, firms with and without outside directors. Figure 8 reveals that firms with outside directors perform better than firms without outside directors except in terms of net profit margin and asset growth rate.

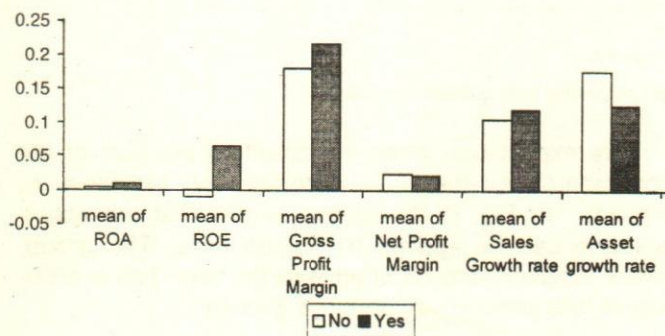


Fig. 8. Outside Director and Firm Performance

We also investigated whether the degree of independence of management in making operational decisions is a determinant factor in financial performance. In terms of ROA, gross profit margin, sales

growth rate and asset growth rate, the firms who answered either "very high" or "high" outperformed the firms who answered moderate as is shown in Fig. 9.

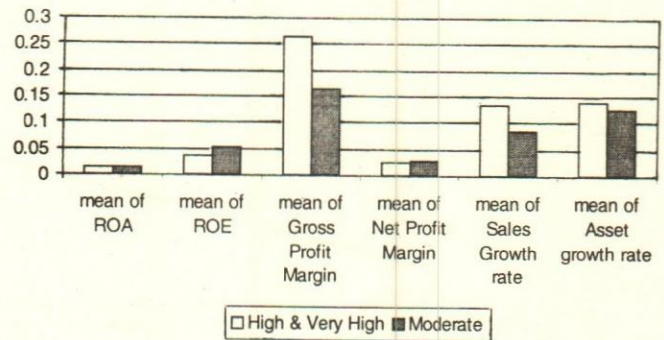


Fig. 9. The Degree of Management Independence and Firm Performance

In response to the question whether there has been change of CEO in the last 3 years, we compare financial performance. As is shown in Figure 10, firms which answered yes show higher sales growth rate and asset growth rate. Figure 10 tells us that new CEOs stress growth more than profitability. On the other hand, we can interpret that firms with problem of low profitability are likely to change CEOs.

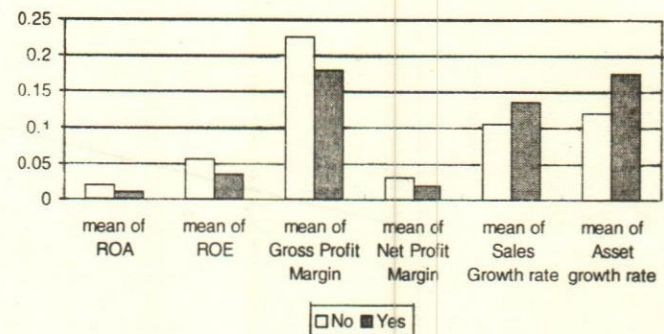


Fig. 10. The CEO Change and Firm Performance

When we compare the productivity and profitability of firms with a specific disclosure policy with that of firms with no such policy, we know that firms with a specific disclosure policy are more productive and growth oriented. Figure 11 shows the relationship between the existence of a specific disclosure policy and productivity and growth.

All surveyed firms have an external auditor. We divided the firms into two groups based on the answer to the question whether the firm has changed its external during the last three years. Under the assumption that long association means poor monitoring, we expect that firms answering no to this question would show lower productivity and growth. Figure 12 shows that

firms who changed an external auditor during the last 3 years do better due to better monitoring. Figure 13 compares financial performances of two groups which are based on the period of association with the current external auditor. Longer association period group show higher growth but low profitability.

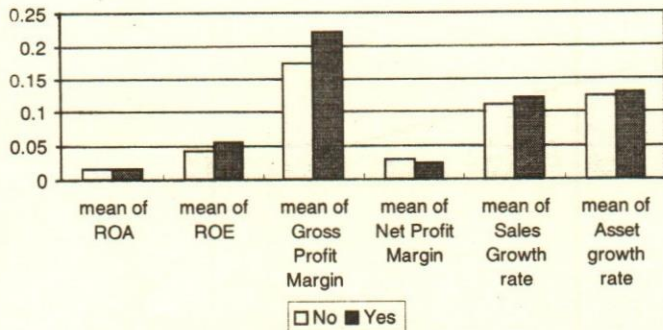


Fig. 11. The Existence of Disclosure Policy and Firm Performance

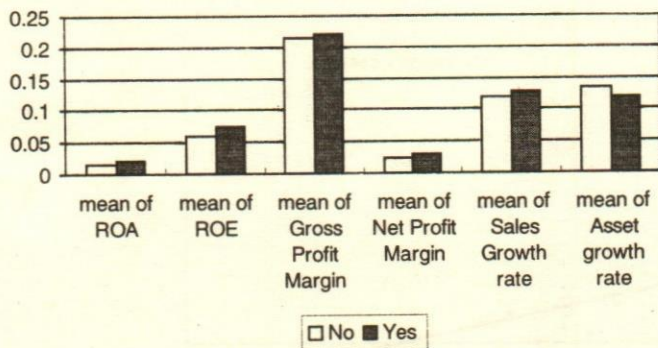


Fig. 12. The Change of External Auditor and Firm Performance

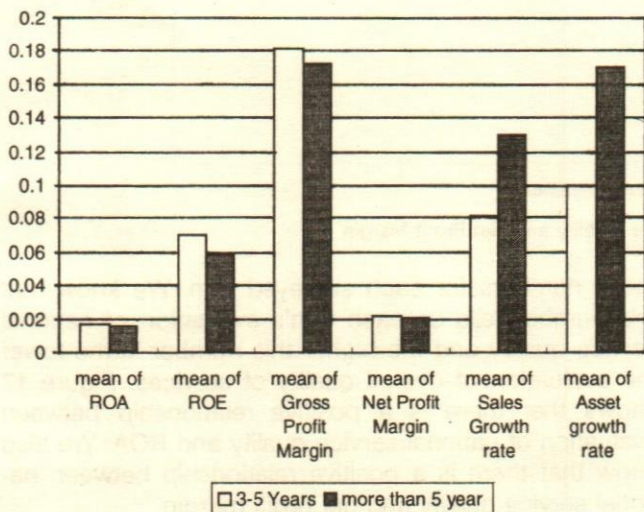


Fig. 13. The Tenure of Current External Auditor and Firm Performance

Figure 14 compares the productivity and growth of firms with an employees union or association within the

firm and firms with no employees union. Firms with employees union outperform in every measure, which tells us that the existence of a labour union is a critical factor for sound corporate governance in Korea. Figure 15 shows the comparison of financial performance between two groups categorized by the answer to the question, "During the last three years, have there been disputes between the management and employees?" Firms which experienced labour dispute in the last three years perform far better in profitability than firms with no labour dispute during the last three years. However the comparison of growth leads to reverse results.

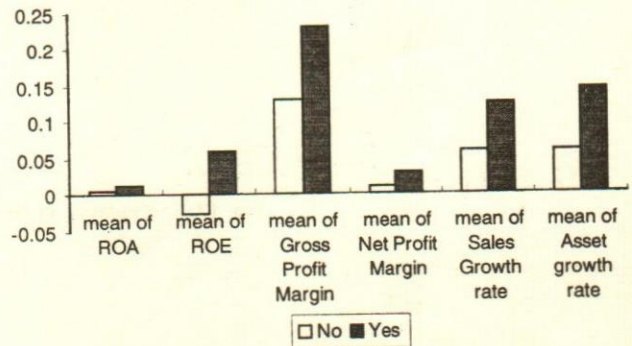


Fig. 14. The Existence of Employees Union and Firm Performance

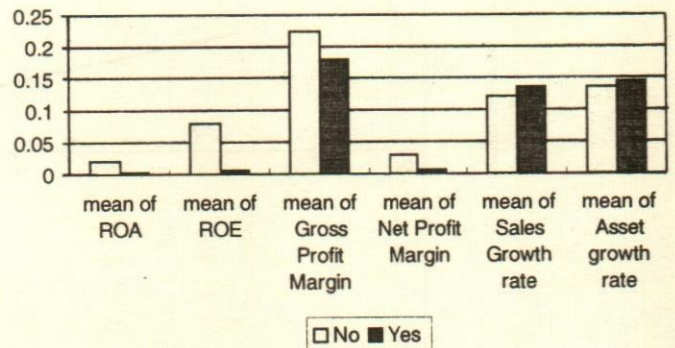


Fig. 15. The Existence of Disputes between Management and Employees and Firm Performance

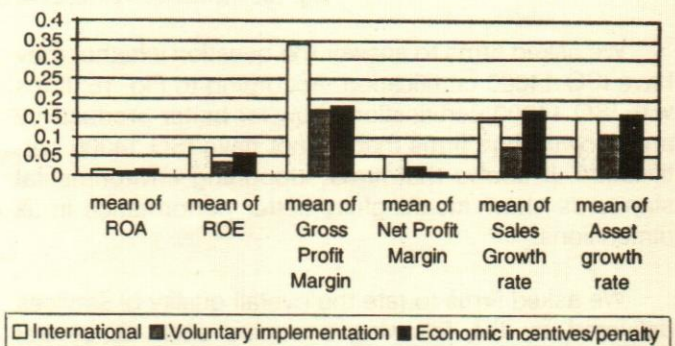


Fig. 16. The Existence of ISO 14000 Certification and Firm Performance

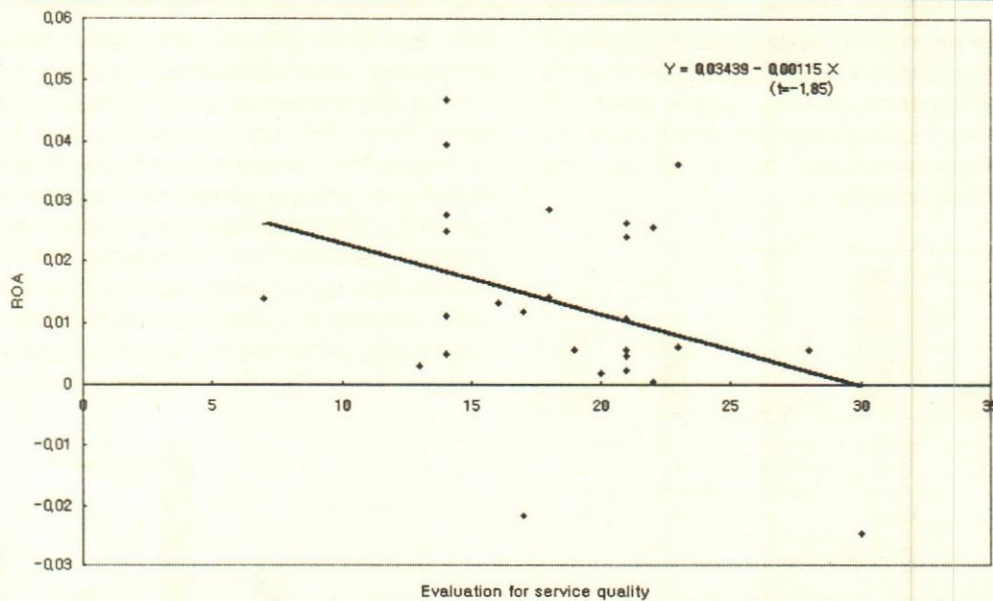


Fig. 17. The Relation of National Service Quality and ROA

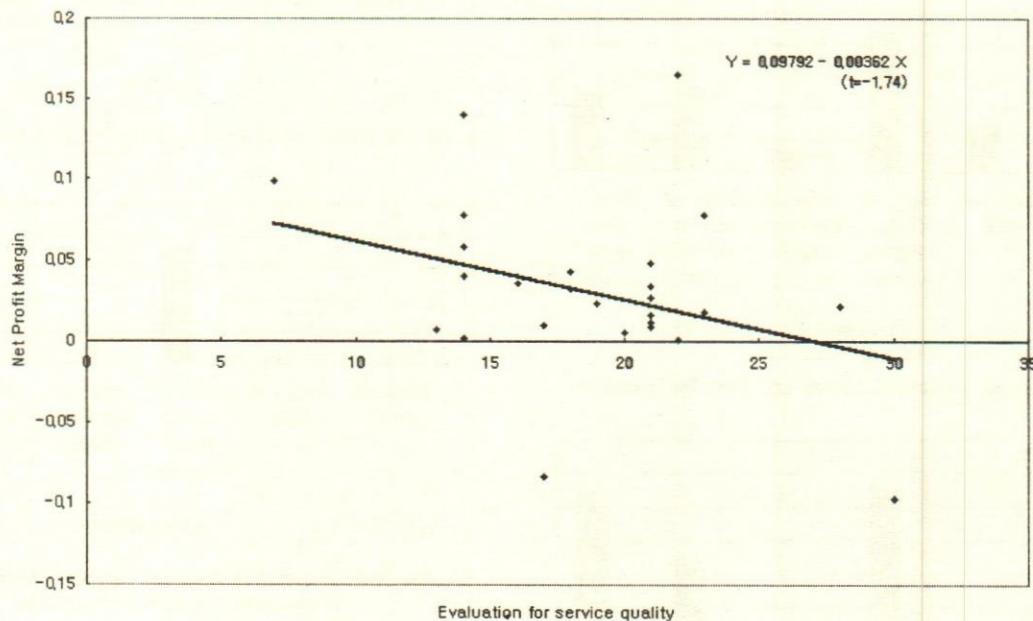


Fig. 18. The Relation of National Service Quality and Net Profit Margin

We asked firms to answer the question whether they have ISO 14000 certification. According to Fig. 16, firms with ISO 14000 certification show far better productivity and growth than firms that do not have ISO 14000 certification. It shows that firms supporting environmental standards show meaningfully better performance in all dimensions.

We asked firms to rate the overall quality of services delivered by the following agencies such as central government, parliament, central bank, customs, judiciary, police and internal revenue. We assigned 1 point to very good and 6 points to very poor then added

these numbers for each surveyed firm. We know that this number tells us each firm's evaluation of national service quality and the higher this number is the lower the evaluation of overall quality of services. Figure 17 shows that there is a positive relationship between evaluation of national service quality and ROA. We also know that there is a positive relationship between national service quality and net profit margin.

We asked what is your preferred approach to strengthening international safeguards, including codes of business conduct. Generally firms which chose international law show better performance than the groups

who checked voluntary implementation and economic incentive/penalties.

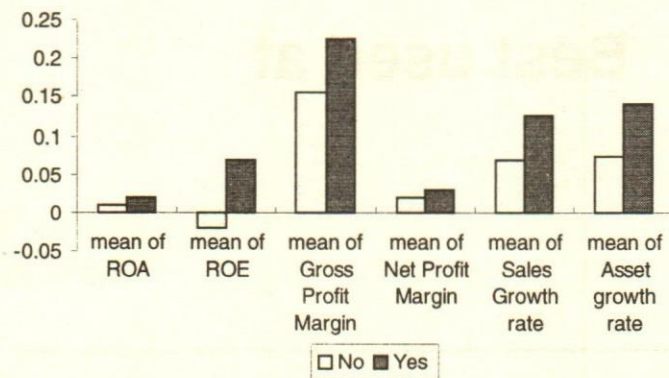


Fig. 19. The Preferred Approach of Strengthening International Safeguards and Firm Performance

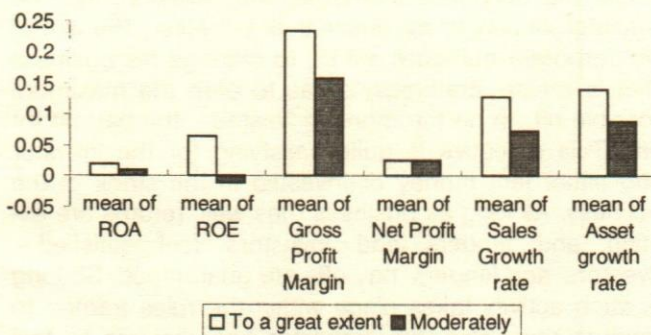


Fig. 20. Impact on Performance and Productivity by Corporate Governance and Firm Performance

Based on the answer to the last question, "To what extent do you think does the corporate governance of the firm affect its overall performance and productivity.?", we compared financial performance of two groups, who checked "To a great extent" and "Moderately." The group with "To a great extent" answer recorded better productivity and growth. This result make us believe that firms considering corporate governance issues seriously have better governance system which leads to better performance.

Conclusions

There is a clear evidence that unsustainable buildup of investment in fixed assets, financed by excessive borrowings in Korea is at the centre of the analysis of what lay in the occurrence of financial crisis in 1997. There are many researches arguing that key element in im-

proving economic efficiency is corporate governance. In this study, we empirically tested how the corporate governance issues impact on productivity and growth in Korea, and developed policies, strategies and approaches that can address these issues. On the basis of the characteristics of good corporate governance, a framework was drawn up consisting of four key areas; ownership, management, social responsibility and institutional interface. It is these key elements of corporate governance that are presumed to affect corporate performance in terms of corporate growth and productivity.

The empirical findings support that ownership, management, social responsibility and institutional interface are positively related with a firm's performance. Also, based on the empirical findings we propose various policy recommendations.

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Corporate Governance: Best used at Boom Time

Sugato Hazra

In this article the failures of corporate companies are described in the light of corporate governance norms. The measures that need to be implemented to ensure investor protection are analysed. The role of corporate governance in modern competitive markets is also discussed.

The concept of corporate governance may be summed up as a three-player game. A game of wits where the corporate manager, the investor and the regulator all play to maximize their benefits. The aim of the corporate manager will be to manage his business (that is create strategies) so as to earn the maximum possible return on the money invested – the pay off for him. This objective is quite satisfying for the investor who either lent money or invested in the stock of the business. As long as business runs well, returns are exciting and lenders and investors feel satisfied – investors' and lenders' pay offs are guaranteed. So long as such activity takes place within the rules framed to conduct the same, the regulator has reasons to feel happy. When everything goes as per expectations, it may be categorized as Nash Equilibrium, a condition where none of the participants can improve their pay offs given the strategies of other participants.

The only snag to this Nash Equilibrium condition, one of all around happiness, is that business cannot have an uninterrupted cycle of prosperity. Take World-Com for example. The largest carrier of international telephony suffered due to fierce competition that ensued world over with deregulation. Same fate befell Enron. Faced with adverse business conditions, the first reaction of a chief executive, normally, is that the bad times would blow over. He, therefore, takes little or no action. The other players of the game – investment analysts and banks, auditors, regulators, lenders, investors and even the media – initially wink at the warning signals. Thus, despite there being change in the conditions, which had set the earlier Nash Equilibrium, none of the players revise their strategies assuming that pay offs would remain unchanged as well. When finally the conditions go beyond control – as it did in a number of companies in the United States during 2002 – everybody rushes in with new strategies. In USA, the administration came up with the Sarbanes-Oxley act, to placate the investor community. The Chief Executives who had assumed the roles of infallible icons due to

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success of their companies, too, rush for new strategies – mostly to evade arrests and to fight prosecutions. Slowly the dust settles down giving the impression of another phase of uninterrupted Nash Equilibrium. But essentially the game remains a non-cooperative game with no apparent solution. The paper attempts to show how in a game of moneymaking things will continue to go wrong, but never so much that faith in the system gets irreconcilably interrupted. No participant in the game will like to shake public confidence beyond a point. The game must go on.

Failures of Corporate Governance

The present round of literature on corporate governance had its origin in the Enron debacle of 2001. Initially, the then US Treasury Secretary, Paul O' Neill, described the Enron collapse as "the genius of capitalism." Maybe he was right, economically speaking, but hopelessly suicidal politically. Subsequent events proved that Enron collapse was just the tip of the iceberg. Layers of manipulative accounting practices, proved much larger than anyone, including O'Neill, did ever imagine. In fact as alarmed regulators and investigators probed, the horror story of American capitalism did unfold. One by one some of the best-known American brands – Kmart, AOL Time Warner, Andersen – came under close scrutiny.

Enron removed its big liabilities from the balance sheet and clubbed these under "special purpose entities". But the same could not be carried on for perpetuity. At some point these needed to be accounted for. Thus Enron had to restate its profits for the years 1997 to 2000. This knocked off a whopping US\$ 1.2 billion from its book value. And it had to file for bankruptcy. When Enron had been creating innovative accounting heads, its auditor Arthur Andersen LLP – one of the big fives in USA – was merely adding up its fees. But it could do the same no longer as another big client of the firm, the WorldCom, followed Enron. By November 2002, the total accounting fraud unearthed at WorldCom added up to a massive US\$ 9 billion. India's Videsh Sanchar Nigam Ltd, now a Tata company, had carrier arrangements with WorldCom and lost money. But due to the privatization of VSNL before the scandal broke out, Indians did not have to hear much about the money lost.

After WorldCom, collapsed another telecom firm – Global Crossing. Both Enron and Global Crossing had indulged in capacity swaps with other telecom and energy firms – an innovative means of showing revenue where there was none. Others who were caught for overstating profits included giants like Xerox. The com-

pany had to pay fines for overstating its profits by US \$ 1.4 billion between 1997 and 2001.

Both Enron and Global Crossing had indulged in capacity swaps, an innovative means of showing revenue where there was none.

Death of US Supremacy?

The failures of companies hurt the corporate world primarily for two reasons:

- This had shown absolute lack of supervision on the part of the boards of these companies, auditors, regulators and stock markets. In other words, these instances proved that even in a supposedly open system like America's, frauds can continue to thrive under the guise of successful wealth creators. The rest of the world, particularly countries like India, which had been busy recasting their economies on the USA role model, were rudely shaken up.
- Second and more critical for USA was the fact that during the boom of the 90s more than 60 per cent of US households had been putting their hard-earned savings into shares. Many had pension funds – 401(k) pension plans – which sank. The employees of Enron for instance – not only did they lose jobs; their pension money also went under with the company. The US government could not have remained deaf to these incidents.

Paul Krugman, the noted economist, wrote the epitaph of the death of American supremacy.

Throughout much of the 1990s Washington had a standard – and somewhat preachy – message to the rest of the world: In an era when markets rule and military might is of limited use, a nation's influence rises and falls largely on its financial credibility. That was easy to say when the country's markets were rising, its biggest companies were trusted to report the facts each quarter and the rest of the World wanted to look like America. But now that a chunk of that 90s success has been exposed as mythical – and markets have staggered back to pre-boom levels – a sobering question is settling over Washington. If America's corporate prowess and clean markets were as much a source of its superpower status as its military might, could corporate

abuses erode a key element of national power? Is America going to pay a diplomatic price for crony capitalism, as so many other countries have?

Crony Capitalism

This does not mean that the USA or developed economies did not see the existence of crony capitalism before the unearthing of the recent spate of corporate scandals. Nor does it imply that crony capitalism has been successfully uprooted from these countries. In fact, the Mississippi Scheme in France or the South Sea Bubbles in England, both of the early 18th century, are two instances where greed was seen overtaking common sense. In both these cases there had been support from the Royalty for the schemes. Saner voices and warnings were dismissed and bubbles were allowed to run amok under the patronage of the rulers who were supposed to regulate.

Money has often been the cause for delusion of the multitudes. Sober nations have all at once become desperate gamblers. As France did in case of the Mississippi Scheme, England did around the same time for the South Sea riches, India did during the stock market boom in 1991-92, South-East Asia in the nineties and America most recently. The problem is that once the boom busts, the delusion assumes a different dimension—against the manner of running business. Thus we observe umpteen literature on corporate governance, committees set up everywhere—even in countries like India, not affected directly by the US corporate failures, new acts being enacted, for example, the Sarbanes-Oxley Bill of USA. The aim is to cool the nerves of investors so that business can continue as before.

Corporate Governance & Competitive Market

Some economists argue that competition in the product market is the best means of checking corporate governance abuses. Product market competition is arguably the most powerful tool to lead towards economic efficiency—which includes raising of capital at the cheapest possible cost to adopt well-defined practices of governing the corporate and thereby towards correct corporate governance practices. Imagine a situation where entrepreneurs rent labour and capital every minute in the market at a competitive price. In such a scenario there will be no resources left to divert. Therefore, it may be argued, competition itself will take care of corporate governance requirements. But in real life it is difficult to imagine such a scenario. Here production capital cannot be rented out every minute. People who sink capital will, therefore, require assurance of sorts that their money will be properly invested and not

diverted. And this assurance comes from corporate governance practices.

Some economists argue that competition in the product market is the best means of checking corporate governance abuses.

The need for corporate governance also arises because of the competition among firms to raise cheap resources from around the globe. And the assessment of what constitute correct corporate governance practice is highly subjective. Some held the US practice of corporate governance is the best, some feel that Anglo-Saxon corporate governance systems should be replaced with those patterned after Germany and Japan. Compare the system in USA, UK, Germany or Japan to those at Italy, Russia or the developing world. In Italy it has been observed that inadequate corporate governance mechanisms have caused a retarded flow of foreign capital to its firms. The newly emerging economies all suffer from similar mistrust in their systems. It is easier for these countries to adopt prudent corporate governance codes than creating a perfectly competitive product market which will eliminate the need for having such practices altogether.

Power to Investors

The most common approach to corporate governance practices is to give power to investors to protect their rights. In fact, there are two common approaches. The first is to give investors power through legal protection from expropriation by the managers. Second approach is ownership by large investors, matching significant control rights with significant cash flow rights.

Most corporate governance models used in the world—including large shareholdings, relationship banking and even takeovers—are essentially large investors exercising their powers. Large investors can rely largely on the legal system. But small investors cannot have this reach. Therefore, the world over only large investors manage to exercise rights arising out of corporate governance practices.

Corporations in developed economies like USA, UK; Germany etc. are governed through a combination of legal protection and concentrated ownership. These economies have the essential elements of good governance practices. In depth analysis of corporate governance practices in a paper published by NBER

concluded that "the principal practical question in designing a corporate governance system is not whether to emulate the United States, Germany or Japan but rather how to introduce significant legal protection of at least some investors so that mechanisms of extensive outside financing can develop."

Corporations in developed economies are governed through a combination of legal protection and concentrated ownership.

Investor Protection Mechanisms

Auditor

For an investor the first and a critical point for checking a company's operation is the auditor. It is for the audit firm to certify if all operations have been accounted for as per rules. The auditor's certificate will contain the elements, which will help an analyst or an investor to judge the strength or weaknesses of the business. Unfortunately our experience suggests that auditors are anything but objective in their analysis. In late 2002, Harvard Business Review carried an article by Bazerman, an experimental psychologist, George Loewenstein and Don Moore. The authors had conducted a controlled experiment where 139 auditors were given the task of auditing five firms. Half of the auditors were told that the companies had hired them, other half that they were handling accounts of rival firms. It was observed that those who were told that they had been hired by the firm as auditor were 30 per cent more likely to certify that the accounts of these companies had complied with the provisions of GAAP. If in a hypothetical situation the behaviour of the auditor gets biased, one does not require a fertile mind to guess what happens in real life.

This brings one to the auditing standards adopted by Arthur Andersen, the failed audit firm. It was seen that in year 2000, the firm had earned US \$ 27 million from Enron for providing consultancy services. This was more than what the firm earned as auditor of Enron (US \$ 25 million) during the year. Predictably the firm decided to wink at certain accounting aberrations of Enron in order to safeguard its income from other services.

Analysts

Analysts are another category on whom investors

tend to rely for signs of vigour or ailment in a company. Investment bankers argued that they had evolved a theory known as the Chinese wall which separate the various functions like broking, investment banking and research in their outfits. The recent events have illustrated how vulnerable these walls proved to be. Since the wake of the Corporate Governance Crisis in the USA, several banks—Merrill, CSFB, Morgan Stanley, Lehman Brothers, Deutsche Bank, Bear Stearns, UBS Warburg and JP Morgan Chase—have received a "record of findings" by the regulators. These detail the allegations against the banks of publishing overly rosy research to win lucrative investment banking business. The banks have agreed to pay a total of US \$ 1.48 billion which would fund independent equity research and investor education.

The modus operandi of market manipulators have not changed over time. In India, during the stock market boom of 1991-92 and again during the boom in the primary market in 1994-95, there was a regular nexus between merchant banks, brokerage firms, newspaper analysts and mutual fund managers which saw an issue getting sold and fetching premium immediately on listing. Often services of jobbers were used to prop up prices. And such nexus is still in existence as was evident in the arrest of a researcher from a leading financial newspaper on charges of extortion.

Regulators

The government and the regulator are supposed to supervise the market. This, they do very effectively—reflecting in all sorts of glory—during boom time. As SEBI did when IPOs had been ruling the Indian stock markets, or the technology shares had been pushing the US markets from one peak to another. It was an open secret that companies which had been entering the primary market in India in 1994-95, had been doing so with uneconomic projects, inflated project costs and close networking with market manipulators. Neither did the newly created regulator—SEBI—bother to put an end to the swindling nor did the media, supposed to be the sixth estate guarding public interest.

Neither did the newly created regulator—SEBI—bother to put an end to the swindling nor did the media.

Similarly both in India and in USA during the technology scrip boom, the regulators remained blissfully away from the market. In fact, if the top executives of Enron or WorldCom did resort to innovative accounting,

there was silent support from the regulators and authorities. Nobody ever questioned the superlatives used to announce the death of brick and mortar companies. Commonsense gave way to euphoria. And now the whole world is busy talking of corporate governance.

Conclusion

Participants in the game called market have only one objective—to make money. This is true for all—ordinary investor saving in a fund, fund manager investing in stocks, market intermediaries like brokers, bankers, those who earn their living from the market—analysts and media-persons, regulators and also government officials working in relevant departments. During boom time there is normally enough money for all—at least on paper. So there is no crisis of confidence. Whatever be the level it is a Nash Equilibrium where all feel satisfied and have no intention of changing strategy. Unfortunately, the market conditions can never remain static. Market dynamics turn some busi-

nesses less profitable in course of time. This is what happened recently in the USA, in the mid-90s in the Far East and in India twice in the 90s. In sum, the problems arise mainly due to the failure on the part of the participants to revise their strategies—when a crisis is in sight the corporate manager must build in the difficulties in his business decisions, analysts and media have to caution investors, auditors must bring this to book and regulators have to check company publications with a sharper eye. For investors—fund managers in particular—abundant caution is the need of the hour. They must know when to exit from an investment and how to shift to a safe option. If everybody revises his strategy well in time there can never be a crisis of corporate governance. It is the role of the government/regulator to educate investors on the market and publicize the same through mass media. At least in developed economies, where basic rules are well in place, a sharp eye of the regulator can force changes in strategies of players in the market, which is a good enough solution of the corporate governance problems. □

The heights great men reached and kept were not attained by sudden flight. But they while their companions slept were toiling upwards in the night.

— Longfellow

Green Productivity & Corporate Planning

A.K. Saxena & K.D. Bhardwaj

This article focusses on the need to integrate economic development with environmental protection in corporate governance by implementation of the concept of Green Productivity. The methodology for the implementation of GP is outlined as well as the measures that will ensure the long-term effectiveness of the concept in organisations.

A.K. Saxena, Director & K.D. Bhardwaj, Deputy Director, Environment Division, National Productivity Council, Lodhi Road, New Delhi.

Developing countries like India are characterized by a large number of small and medium enterprises supporting the activities of large-scale industries. In addition to providing employment, they generate waste resulting in lower overall productivity. These industries are resource intensive. Many approaches have been developed and adopted in various countries to minimise the generation of waste and protect the environment. The approaches like Waste Minimization and Cleaner Production emphasize on pollution reduction at source along with improving the efficiency of the production process. "By considering pollution prevention separately from other manufacturing needs such as productivity and quality improvements, most pollution prevention programmes fail to develop the vital synergies and working relationships with manufacturers that are essential to drive both pollution prevention and manufacturing competitiveness." (US Office of Technology Report 1994).

In the recent past, the emphasis has been laid on resource conservation and pollution control in order to sustain development. In view of fast depleting natural resources, world scientists and environmentalists gathered at Rio de Janeiro in 1992 under the auspices of the United Nations to discuss sustainable development. Since the Earth Summit in Rio de Janeiro in 1992, sustainable development has been a key term for overall socio-economic development without creating negative impacts on the environment. The need for resource conservation, efficient use of resources and environment friendly corporate policies and behaviour has now been recognized the world-over. Asian Productivity Organization (APO), a premier organization of productivity in the Asia-Pacific region based at Tokyo, linked productivity improvements with environmental protection and developed the concept of Green Productivity.

Green Productivity: Concept & Philosophy

Green Productivity is a concept of integrating socio-economic aspirations and a means to harmonize en-

Environmental protection and economic development. It is the key for enhancing the quality of life of the people through sustainable development. Improvement in quality of life is often associated with an increase in demand for goods and services. Production of these goods and services often depletes the natural resource base and generates wastes/pollution, which if dumped/discharged into natural bodies causes environmental damage. The socio-economic development, therefore, seems to defeat its own basic purpose, as there cannot be a better quality of life in a polluted and degraded environment. The natural resources will become extinct, if uncontrolled exploitation continues. Indiscriminate dumping of wastes and pollutants in the atmosphere or water bodies, or even land, has already degraded them in many parts of the country. In several cases, these have been rendered unfit for human use and are beyond regeneration levels. In some cases, production of goods and services has involved techniques, which either use and/or discharge toxic and hazardous substances, thus, posing great risks to society. Such techniques may sometimes be economically attractive but are not sustainable on grounds of potential threats to the environment and society.

Conventional productivity improvement techniques have not paid due attention to such environmental aspects. The environmental cost has been conspicuous by absence in the generally accepted production-cost accounting systems. Wastes have been considered as valueless with, at best, a nuisance value for getting rid of.

GP looks at these wastes as potential resources. Wastes are manifestation of lost resources. However, the performance of an enterprise can no longer be evaluated on the basis of the economic parameter alone. It needs to be integrated along with environmental performance. Poor environmental performance means adverse impact on the environment due to higher levels of wastes and pollution generation. Such a situation cannot be sustainable since a manufacturing enterprise, which does not tighten its belt and strive for continuous improvement of environmental performance, cannot be allowed to operate in the long run. Apart from economic competitiveness due to loss of resources, poor environmental performance also causes loss of social acceptability. Such a situation can only be tackled

Apart from economic competitiveness due to loss of resources, poor environmental performance also causes loss of social acceptability.

by application of GP techniques. GP aims at simultaneous improvement in economic and environmental performance of a company.

Green Productivity – An Overview

Green Productivity (GP) is a strategy for enhancing productivity and environmental performance for overall socio-economic development. It is the application of appropriate productivity and environmental management tools, techniques and technologies to reduce the environmental impacts of an organisation's activities, goods and services.

In its formal definition GP uses three key terms (I) strategy, (II) productivity and environmental performance (III) socio-economic development.

GP leads to gains in profitability through continuous improvements in productivity and environmental performance. Excessive use of resources or generation of pollution is indicative of low productivity as well as poor environmental performance. In fact, pollution is the result of inefficiency of the production process which has to be improved. To improve the situation, GP pursues a strategy based on technical and managerial interventions. It is a process of continuous improvement.

GP leads to gains in profitability through continuous improvements in productivity and environmental performance.

The practice of GP is characterised by the following distinguishing characteristics.

Environmental Compliance: The heart of GP is environmental protection, the first step for which is compliance. It can be achieved through the practice of GP by pollution prevention and source reduction. The residues should be viewed as a resource, which can be a raw material in another process, or valuable products can be recovered. Whatever the remainder, it will be required to be managed using end-of-pipe treatment measures. While achieving environmental compliance productivity will also improve. These practices ultimately may lead to a situation beyond compliance with the ultimate aim of ensuring quality of life.

Productivity Improvement: The other side of the GP coin is productivity improvement. The Kaizen approach

of continuous improvement forms the basis. This approach goes hand in hand with environmental protection. The concept of continuous improvement achieved by adopting the tenets of the PDCA (Plan, Do, Check and Act) cycle is aimed at ensuring not only productivity improvement, unlike in classical productivity improvement programmes but also environmental improvement. This is a dynamic and iterative process. Along with productivity improvement, this also improves the bottom line of the industries.

Integrated people-based approach: One of the strengths of GP is its worker involvement and team based approach. Its people based approach extends to improve the working environment, non-discrimination and related social welfare issues. The improvement in workers' health and safety enhances the workers' productivity. The approach adopted is methodology based and involves multi-stakeholder participation. This enables a step by step approach, systematic generation of options and solutions, contribution by all the members in an organisation to the GP process. The people involvement also ensures transparency and accountability. (Green Productivity Manual, APO)

In other words, GP can yield many benefits, which includes:

- Increased profitability due to: reduced operation and waste management costs, greater competitive advantage, reduced liability risks – enhanced worker's productivity
- Protection of public health and the environment
- Enhancement of the public image of an enterprise
- Resultant compliance with regulations
- Improvement of the employee's morale, his participation, and the quality of his work life.
- Improve the quality of the product.

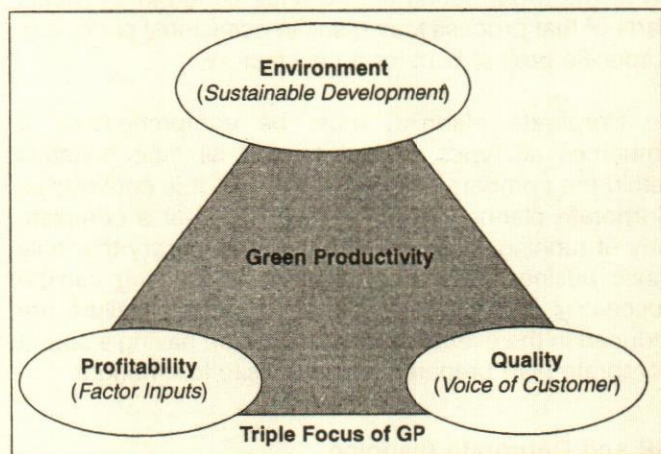
To some extent, the productivity practices like Total Quality Management (TQM), Total Productivity Management (TPM), preventive maintenance, 5-S based housekeeping, etc. reduces the environmental burden. In any case, the productivity practices and pollution prevention programmes alone can not take care of the environment in totality and sustain the development. However, for total environment management, there is a need to integrate productivity improvement along with pollution prevention and control programme.

The need to fundamentally change the approach of business by moving towards resource efficiency and

taking a holistic life-cycle view of products and services was recognized in the 1990s. Resource efficiency not only leads to conservation of natural resources but also results in improvement in productivity and environmental performance. Therefore, if development is to be sustainable, there is a need to move beyond the preventive approach and ensure that both productivity improvement and environment protection is achieved simultaneously.

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GP recognizes that Environment and Development are two sides of the same coin, and for any developmental strategy to be sustainable it needs to have a focus on environment, quality and productivity, which form the triple focus of GP.



In order to apply the concept of GP one has to adopt a systematic and structured methodology, in addition to the commitment and willingness of the management (Green Productivity Manual, APO).

GP Methodology Revolves around the PDCA Cycle

The central element of the GP methodology is the examination and re-evaluation of both production processes and products to reduce their environmental impacts and highlight ways to improve productivity and product quality. Implementation of these options leads to another cycle of review and so promotes continuous improvement. GP methodology revolves around the PDCA cycle.

In a nut-shell, Green Productivity is a way of life. It is not simply a business strategy but a philosophy, an end-less process and the more one gets into it, the higher returns one gets. A successful Green Productivity Programme can be accomplished only by continuous involvement of all the stake-holders at all levels in an enterprise. Green Productivity is the surer and long sustaining way of carrying out economic activities be it agricultural, manufacturing or services. The implementation of Green Productivity approach would lead towards sustainable development in the long run.

Corporate Planning

Corporate planning is an analytical process, which encompasses an assessment of the future; the determination of desired objectives—the context of that future, the development of alternative courses of action to achieve such objectives and the selection of a course of action from among these alternatives. When a corporate planner talks of "planning", or say "corporate planning", he means all the things that run through this management process to the final action. He also thinks of continuous management processes, something that goes on in the organisation all the time, although individual parts of that process may result in occasional plans, e.g. a specific project plan for a new factory.

Corporate planning must be comprehensive. It embraces all types of activity and all time horizons within the company. As it is a process, it is continuous. Corporate planning is not a technique but a complete way of running a business. It is not necessary that only those business which use corporate planning can be successful but it is certain that chances of failure are reduced in the event of any organisation having a sound corporate plan prepared after requisite forethought.

GP and Corporate Planning

The concept of GP can be stretched as wide as the organization desires, to cover an array of activities that can be applied from the smallest to the largest scale. This simply means, the organization may prefer to apply GP concept to only one area of it's activities, for example, production to start with, and can subsequently enlarge it

This kind of in-built flexibility in GP makes it amenable to all kinds of organizations, be it industry, service, agriculture or community.

to cover other activities. Similarly, beginning with one small department, the organization can scale up GP concept to corporate level. This kind of in-built flexibility in GP makes it amenable to all kinds of organizations, be it industry, service, agriculture or community.

NPC has already implemented GP concept in various sectors of industries viz. dyes and dye intermediates, tanneries, pulp and paper, textiles, edible oil etc. In all these sectors, the concept was implemented at production plant level with the help of the concerned industry. All the concerned industries have derived tremendous benefits in terms of reduction in consumption of resources, cut in energy expenditure, minimization of wastes, compliance with environmental norms and stipulations and increased overall productivity. Some of these industries, located in states where environmental concerns are quite serious and public awareness is higher, have been able to survive just because of adoption of GP. Industries with experience with GP are confident enough to declare that they can survive against multi-nationals. Looking at their success, other industries have also adopted the concept and benefited.

However, NPC's experience is at variance. Despite recognizing that GP is beneficial, the GP concept has not grown into a movement in industry. It remains limited to the shop floor level and gradually loses its shine. This can be overcome by adopting GP as an integral part of the whole system of organization. It needs to be linked to the management system of the organization. It needs to be encompassed in overall planning. It needs to be strategized for running business. GP needs to be included in corporate planning.

GP needs to be included in corporate planning.

The aim of corporate planning can be the planning of resources to ensure their optimum utilization, to achieve an optimum rate of return on the capital employed whilst optimizing the extent of customer satisfaction, but also ensuring the future survival of the business and the highest level of job enrichment possible for the personnel employed.

The adoption of GP in corporate planning can lead to various benefits as delineated below. In addition to institutionalize the GP concept:

- It will change the way of doing business resulting in higher efficiency.

- It will sustain the concept of continuous improvement.
- It will bring attitudinal change in the employees.
- It will improve the working environment.
- It will improve the environmental performance of the organization.
- It will reduce consumption of resources, enhance production and lower wastage and increase profitability.

And the biggest advantage of incorporating GP concept in corporate planning is that all the above benefits will continue to occur throughout the life span of an organization in one form or the other.

How GP can be Incorporated in Corporate Planning?

Introduction of GP in corporate planning

The first and foremost step towards adopting GP in corporate planning is meant for the top level management inclusive of the board of directors, their will and commitment.

The top level management should understand the concept of GP and once they are convinced, they should allow one-time-demonstration of this concept in their industry. Upon successful demonstration, the process of incorporation of GP starts. The live demonstration of application of GP concept will make the employees aware and make them amenable to adopt this concept. The purpose of demonstration is only to win the confidence of employees and the top management.

Further steps include recognition of GP concept in the corporate policy, formulate long-term, medium-term and short-term plans emanating from the policy and include designation of GP officer (one of the senior managers can be identified and trained to understand the concept of GP) to play the role of facilitator/moderator under the Chief Executive Officer (CEO). A facilitator is a person in the organisation responsible for planning and monitoring the activities and use of resources within specified functions of the business. In addition, facilitator also has the responsibility for providing information to operating managers and supervisors. In this case, GP facilitator will also act as a moderator and help in GP implementation and planning.

Responsibilities of GP Facilitator

The broad responsibilities of GP facilitator may include the following:

- GP facilitator will be responsible for all activities relating to GP implementation and planning.
- He would help top management in formulating corporate policy addressing GP adequately.
- He would formulate long term, medium term and short term plans for implementation of GP in accordance with the corporate policy in consultation with the CEO. The executive responsibility lies with the CEO.
- He would assist Senior Managers and departmental heads to formulate objectives and targets in order to meet long, medium and short term plans.
- He would also represent GP activities in the budget committee and prepare, with the help of Senior Manager and Departmental heads, feasibility reports for GP activities. This would consist of investment and gain aspects.
- He would also identify training needs and organize the same for various level of management as and when required.
- He would prepare annual reports on GP activities and submit to top management.
- He would provide requisite information to Sr. Managers and departmental heads for implementation of GP.

GP Plans

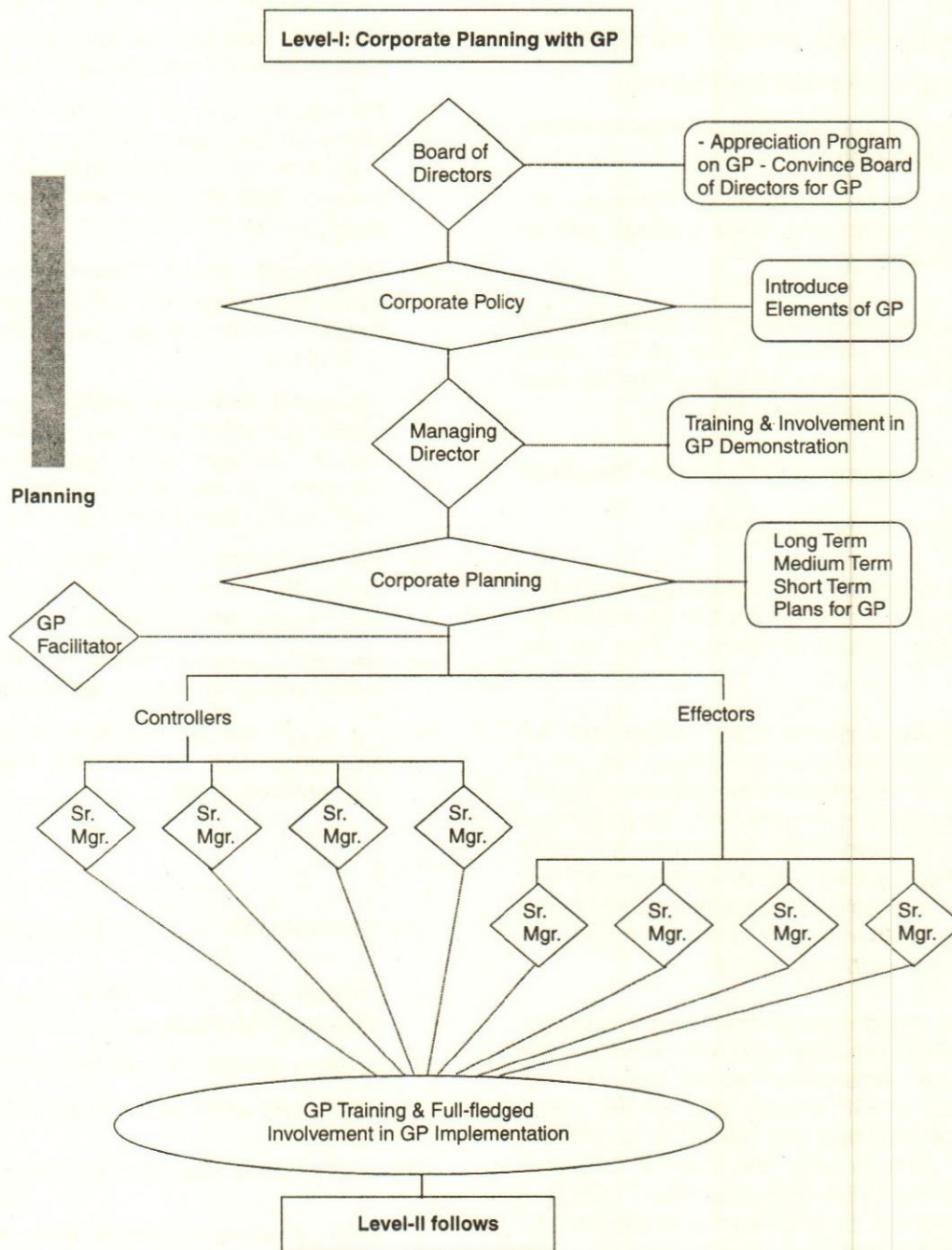
The GP related to long-term plan may include:

- Change over to efficient and environment friendly technology
- Develop eco-friendly pollution free product
- Give green image to the organisation

The medium-term plan may include:

- Take up waste utilisation study and establish waste recycling/reduce facility
- Change in lay out of particular section/department
- Reduce energy consumption
- Increase the output of certain selected departments with little investment, etc.
- Achieving ISO 14001 certificate
- Change of machines

Chart-I



The short-term plan may include:

- Minimisation of waste
- Compliance with environmental laws
- Improved working conditions
- Good House-keeping

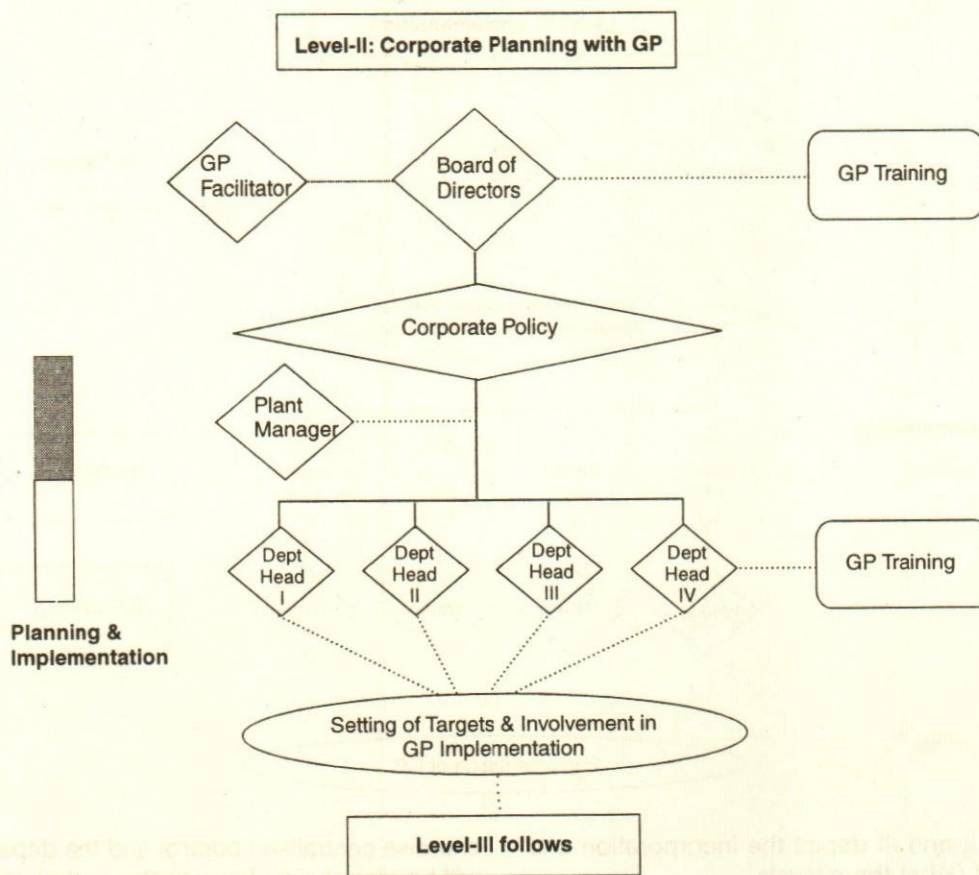
Objectives and targets should be set in order to

meet above objectives under long, medium and short-term plans.

GP & Corporate Management

While adopting GP, care has to be exercised to ascertain that GP should not be seen as an additional function of an organization but it should be considered as a tool to carry out other functions more efficiently. These functions may be production, marketing, sale,

Chart-II



product diversification, research and development, overseas market penetration etc. Also, the GP concept can not be placed in the category of other available resources i.e manpower, machines, finance etc., because it is a connecting resource/tool.

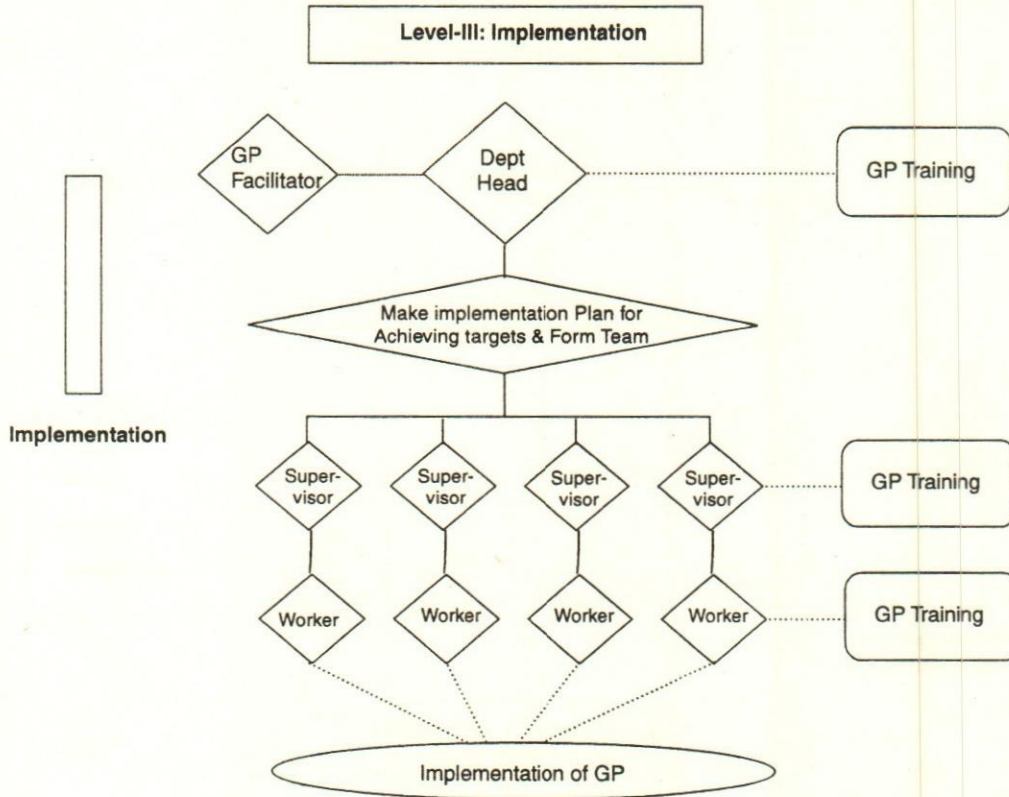
In general, the levels of management in many organisations include the board of directors, managing director, senior managers, middle management, supervisory, etc. The managing director or Chief Executive Officer, together with the senior managers, forms the management team of a business. The GP manager can be one of the senior managers and can work in association with managers looking after line and service functions. The GP manager (who may be from Environment/Utility sections) will act as facilitator and all other line and service function managers and workers i.e. production manager, works engineer, plant supervisor, maintenance manager, quality controller, foreman, workers etc. will act as "effectors". The effectors are the managers/workers who are executing organisation policy and effecting changes to the activities being performed and the resources being used on the basis of information provided by the facilitator.

The GP manager can be one of the senior managers and can work in association with managers looking after line and service functions.

The incorporation of GP does not end with the deputation of GP manager. The top management has to be committed to GP concept and choose the options, which are in accordance with the concept of GP. A core team needs to be formed including various departments and the GP manager under the managing director. The core team while taking any decision with regard to organizational activities will study it with regard to GP principles and should be empowered to make recommendations with necessary changes.

GP will be adopted as a self-organizing system which should be dynamic in nature to begin with, and which can respond to changing circumstances by adjusting their behaviour to achieve and maintain optimum performance.

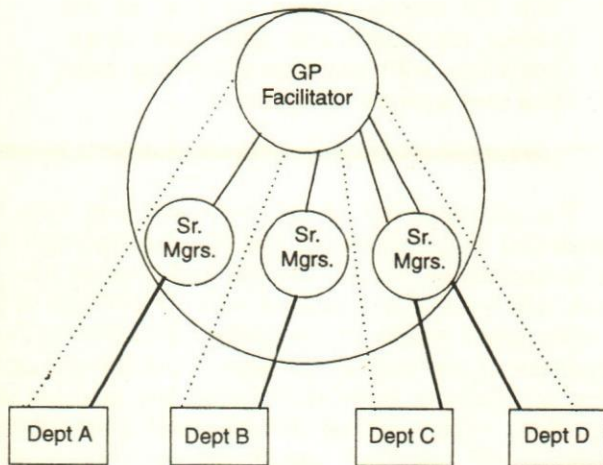
Chart-III



The charts I, II and III depict the incorporation and implementation of GP at three levels.

exercise centralised control and the departmental heads will be responsible for activities in their department. This has been depicted in chart - IV.

Chart-IV



Centralised control with de-centralised activity

In order to institutionalize concept of GP at corporate level, "the centralised control combined with decentralised activity" approach can be adopted to begin with. As per this approach, the GP facilitator will

GP audit

As a part of internal audit, GP audit has to be carried out which would be executed by GP facilitator. It would cover various aspects such as adequacy of GP activities with regard to objectives and targets and progress made thereof. As a part of GP audit, other areas will also be identified for GP implementation.

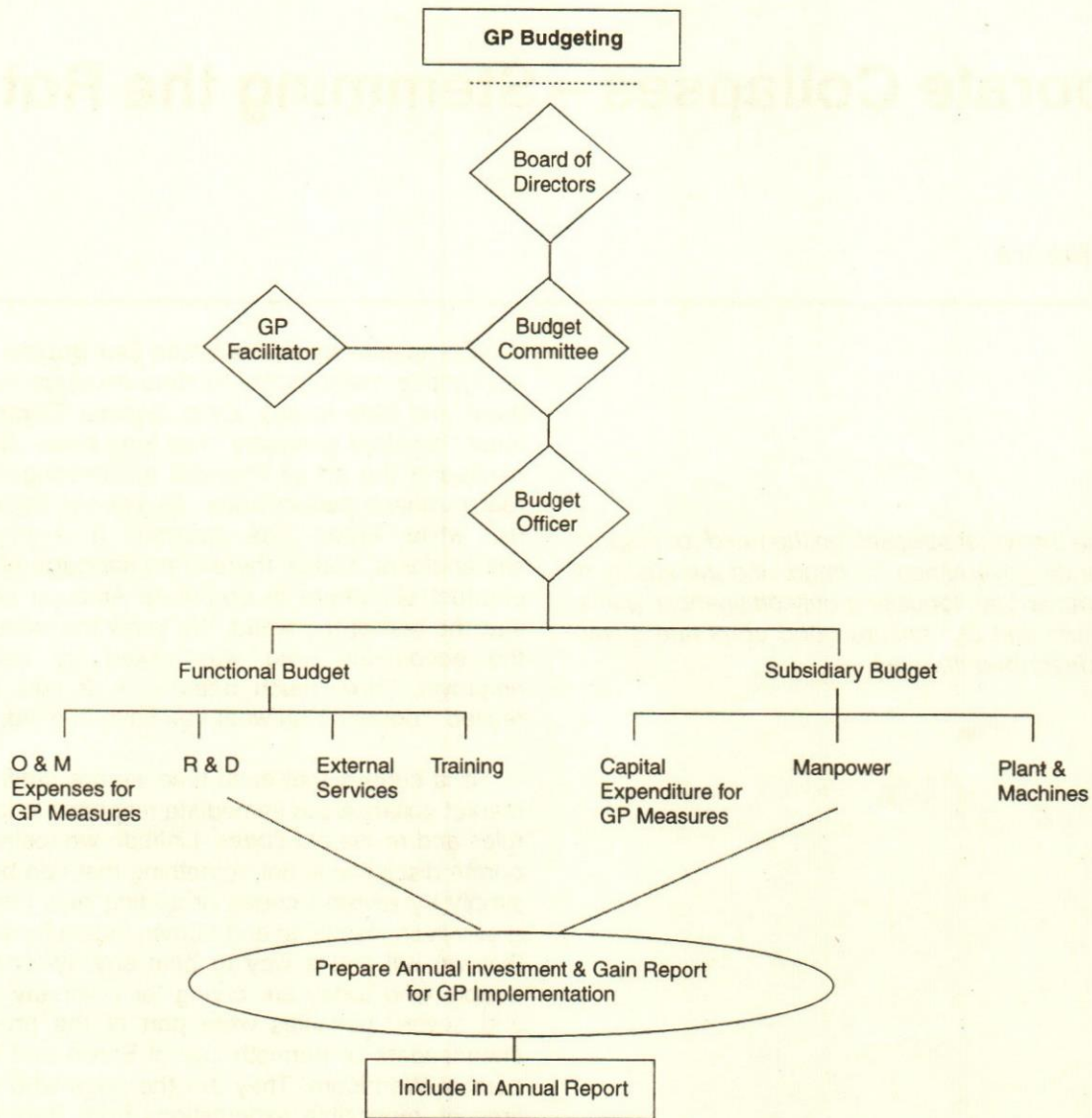
GP budgeting

In order to implement GP measures, separate budgetary arrangements have to be made. This can be made while preparing the annual budget of an organization. Also separate investment and gain budget can be maintained for GP measures. This would be important to study the feasibility of GP measures implemented for the top management. The chart - V outlines GP budgeting procedure. (R. G. Anderson, 1975)

Inclusion of GP activities in Annual Report

The organization should keep a separate section

Chart-V



highlighting GP activities, and progress made in it's annual report. It should also clearly indicate the financial gains due to implementation of GP measures. By doing this, the organization will involve all the stake holders in the process and will definitely improve it's image.

Case of GP incorporation in Corporate Policy

M/s Jindal Steel & Power Pvt. Ltd., Raigarh, Chattisgarh, has incorporated a policy on GP in their general company policy. GP team has been formed with the help of various departments to work out GP options. NPC has provided training to different levels of officers on GP.

M/s Rama Phosphate Limited (Oil Division), Indore, Madhya Pradesh has also implemented GP in association with NPC as a part of Green Productivity Demonstration

Programme in the year 2001 and received tremendous benefits in terms of reduction of oil wastages and conservation of resources (National Productivity Council, 2002).

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Corporate Collapses – Stemming the Rot

Madhav Mehra

In this article the writer stresses on the need for responsible corporate governance for improving the quality of human life rather than focussing only on financial gains. Various factors that can ensure good corporate governance are described in detail.

Madhav Mehra is President, World Council for Corporate Governance and Chairman of the World Quality Council.

Companies since the South Sea Bubble have used accounting methods not to state earnings but to inflate them and hide losses. Even General Electric, world's most "admired company" has long been suspected of mastering the art of financial engineering rather than real business performance. As Warren Buffet reminds us, while Enron has become a symbol of the shareholders' abuse, there is no shortage of egregious conduct elsewhere in corporate America or, shall we say, the rest of the world. We know the classic story of the accountant who was asked by his potential employer, "how much does 2 + 2 add upto"? He replied, "depends on what you have in mind, sir".

It is curious that each time we are confronted with market collapse our immediate response is to seek new rules and revise old codes. Little do we realise that corporate discipline is not something that can be achieved simply by revising codes or adding new ones. Human greed is so insatiable and human ingenuity so profound that we will find a way to beat any system. The very people who today are crying for company law reform and severe penalties were part of the procession of cheerleaders of Kenneth Lay of Enron and Bernie Ebbers of Worldcom. They are the ones who stoked the fires of impossible expectations from their new found heroes and lured them to make commitments they knew could not be sustained. Even the investors were so inebriated with the "irrational exuberance" of the 1990s that they almost willed the companies to tell lies.

The public outcry following the accounting frauds in US led to the passing of the Sarbanes-Oxley Act which creates an accounting oversight board, strengthens auditor independence, requires CEOs to certify accounts, enlarges rules governing conflicts of interest and increases criminal penalties. President Bush signed the Act into law on 30 July 2002 and called the legislation "the most far reaching reforms of American business practices since the time of Franklin Delano Roosevelt". In the UK, the Department of Trade and Industry has appointed Derek Higgs, Chairman, Partnerships UK Plc, to review the issues of conflict of interest.

He has already been criticised as he is also the non executive director of Allied Irish Bank which was in the news recently for detection of a massive fraud. The key issues on which Derek Higgs is inviting views are: What role should non-executive directors perform and how does this compare to the present position?

- What knowledge, skills and attributes are needed and what can be done to attract, recruit and appoint the best people to non-executive roles?
- Do existing structures and procedures facilitate effective performance by non-executive directors?
- Do existing relationships with shareholders or others need to be strengthened?
- How can non-executive directors best be supported to perform their role?

India too has appointed a Committee under Naresh Chandra, its former Cabinet Secretary and an illustrious Indian Ambassador to US, to examine the entire gamut of issues pertaining to the Auditor-Company relationship, professional regulatory bodies and the role of independent directors.

As the Enron debacle indicates, good corporate governance code is no guarantee of good corporate governance. There needs to be stricter monitoring and enforcement of laws on punishment for corporate scams. Along with a requirement of disclosures and accountability, laws should be amended to mete out swift and deterrent punishment to the offenders.

Corporate Boards

The cornerstone of an effective board is the institution of independent directors. Our first question should be to find out why it is not working. Indeed why a person like Lord Young, the then President of UK's Institute of Directors called for its abolition? The key to all this is the manner of their selection. In a survey conducted in the UK it was found that as many as 75% of non-executive directors are recruited as a result of an informal networking by an existing director. A classic example is of a system called Golden Triangle whereby a director of company A sits on the board of company B while the director of company B sits on the Board of company C and the director of company C sits on the board of company A. The triangle is called Golden because the non-executive director appointed by this arrangement invariably ends up on the remuneration committee as well. It is no wonder, therefore, that Lord Young has lambasted the institution of independent directors. He

argued that relying on part time outsiders who barely spend 15 hours a year to police boardrooms was naive and "dangerous nonsense". Non-executive directors appointed this way become a greater liability and more harmful than executive directors who at least know the business.

Non executive directors are outside directors who have no previous connection with the board nor have any management ties. It is the non-executives and not the CEOs who are the eyes and ears of the shareholders. Theirs is the job to bring objectivity and impartiality to the board's decision making. They also widen the horizon of the board in formulating strategy, applying both a wider general experience and any relevant skill and knowledge that the board may otherwise lack. Cronyism in the appointment of non-executives and in the supervision of board room pay can spell disaster. Non-executive directors are crucial to maximising effectiveness of the board and it is time that the process of recruiting independent directors is given as much importance as appointment of a CEO. Ideally, appointment of both auditors and non-executive directors needs to be made by a group or a vehicle, which is independent of the board. The process needs to be made as transparent as possible which is possible only if each appointment is made through an appointment committee. This committee should develop criteria for the appointment and engage an independent search firm for recruitment.

Auditor Independence

Auditor independence is another area of concern. Their judgement becomes questionable when auditors perform a significant consultancy role. As Mike Rake, International Chairman of KPMG says, auditors accepting consulting services in the same company is simply unacceptable. Forbidding auditors from offering other services to clients must become an article of faith for ensuring good corporate governance. Worldcom paid Arthur Andersen \$12.4 million last year for such services compared to \$4.4 million for audit fees. Sarbanes-Oxley Act's requirement of rotation of auditors to prevent cosy relationships undermining the integrity of the audit is also worth emulation. Andersen had been Worldcom's auditor since 1989. Periodic change of the auditor might have led to more probing and indepth examination of accounts.

Auditor independence is another area of concern.

The most important task is to establish common international accounting standards. For far too long the accounting standards have been emphasising form over substance. We need to move away from the prescriptive rule to the ground realities of business. This poses one of the biggest challenges for the International Accounting Standards Board. We also need to settle the controversy over accounting for share options which according to John McFall, chairman of the Treasury select committee, whose report on the financial regulation of public limited companies, post-Enron, has been recently published, allows rich executives to retire to a life time of luxury. It is strange why stock options have not been treated as an expense so far and why it was left for Warren Buffet of Coca-Cola to take the lead in this respect.

Executive Compensation

There is also a need to rein in excessive executive compensation. Prudential shareholders had set a good example in scrapping a new pay scheme that could have netted its Chief Executive, Jonathan Bloomer a £4.6 million bonus on top of his basic salary of £660,000 if certain targets were met. It has now been generally admitted that corporate governance principles in the US have been used to advance corporate greed of CEOs. In the 1990s while CEO salaries increased by 30 per cent a year the employee wages remained static. In his recent address commemorating 9/11, Bill McDonough, President New York Federal Reserve, denounced the excessive increase awarded by CEOs to themselves during the past decade. He said "the policy of vastly increasing executive compensation was ...terrible bad social policy and perhaps even bad morals". He pointed out that studies now indicated the average chief executive made 400 times more than the average production worker, compared with the ratio of 42:1 two decades ago. Mr McDonough urged chief executives and directors to adjust pay levels "to more reasonable and justifiable levels".

In fact, independent auditors, non-executive directors and audit committees are also not enough. What is needed is greater overall accountability from everyone in the company from a clerk to a CEO. They need to be educated to detect a fraud at an early stage and report any suspicious transactions and activities. If they do not they could face prison sentences and financial ruin. What we need is a culture change within companies to fight the financial fraud, which in the UK alone, according to City fraud litigation specialist Philippsohn Crawfords Berwald, has registered an alarming increase of 200 per cent during the last six months. Lot of this fraud is also a byproduct of new technology. Organisations must use every opportunity for exposing staff to training

in new technologies. Highly motivated, continuously developed and trained staff are the best insurance against fraud.

Sarbanes-Oxley Act has done a commendable job in introducing an Oversight Board which will have five members appointed by SEC to oversee accounting firms that conduct audit of public companies. This board will set standards to uphold the integrity of public audit and will have the authority to investigate abuse and discipline offenders. There are in the UK 23 regulatory bodies which make the task of supervision of auditing standards extremely difficult. There is an urgent need for a single independent body to oversee all accounting aspects on the lines of US's Oversight Board.

The requirement of personal certification of accounts by CEOs with deterrent penalties for "wrong doers" is another step in the right direction. It is necessary for each CEO to get their financial directors to check whether the financial reports give you and your shareholders a truthful account of the state of the company or uses accounting discipline to hide behind the figures. Remember the phrase "profit is an opinion whereas cash is a fact". Annual report should contain a section written by the audit committee summing up issues and explaining them in simple language with special regard to any items of creative accounting such as accelerated revenue recognition of balance sheet vehicles and other complex transactions to hide company losses.

Role of IT

IT can have an important role in improving the effectiveness of the board. Businesses are becoming increasingly complex and problems such as Enron occur when business becomes global. Failures of Enron, in fact, are not of accounting but management. Accounting was used to hide management failures. Important thing, therefore, is to prevent such management failures through better governance structures and creating real time systems like digital dash-boards that help you access constantly fresh data about different streams of operation.

Failures of Enron in fact are not of accounting but management.

Market realities themselves have changed vastly during the last few years. According to Elliot and Schroth the forces driving the slide include:

Complexity: In business, particularly in global business, complexity is becoming deeper and wider and is providing hiding places for new forms of business deception.

Technology: Advancements are proving speed for business manoeuvres, both the good and the legal and the bad and illegal.

Inability to Grasp Reality: Corporations are losing touch with the performance reality states of their business operations, finance and accounting, deal making consequences, and the value of their intellectual capital.

The Need for Precision: Managerial tasks require more rigor, more precision, and complete accountability in the boardroom and from the leadership teams.

Unless corporations understand the new requirements for business performance and the importance of innovation, budgetary controls and closer monitoring, legislations will be merely firing grenades to stop a tornado. Corporate directors need to be more radical and revolutionaries constantly spurring their companies towards creating new competitive spaces through innovation.

National Quality Programme

The corner stone of the absolute minimum standards for the constantly gyrating new economy for corporate managers will be a new form of scientific management based on performance reality and accuracy in reporting on corporate capabilities. There needs to be a National Quality Programme for "accuracy" in corporate information and all forms of company disclosures. We should make quality assurance part of the corporate reform movement. This will be the foundation for real performance quality programme based on precision of information and reporting of corporate data. Quality Awards need to be restructured and applied to corporate information problems. Currently Six Sigma is applied for developing and delivering "near perfect product and services". This can be used to improve the management capability for advancing the best companies and checking the fraudulent.

Good corporate governance is required not only to prevent frauds but to maximise value for all stakeholders. The role of non-executives in the Boards is not only of watch dog but also, and more so, of creating wealth. Shareholders are at far greater risk from a mismanaged and under performing business than an errant individual. Companies have to bear in mind the

The role of non-executives in the Boards is not only of watch dog but also of creating wealth.

potential trade-off between polishing corporate reputation and delivering growth, says a survey report by the Economist Intelligence Unit. "Tight governance can protect firms and investors from fraud, error and undue risk, but it can also threaten agility and innovation".

Executives of the top ten firms of market capitalisation in the US, the UK, France, Japan and Germany have expressed concern that tougher corporate governance rules would negatively affect merger and acquisition deals because of lengthening diligence procedures. A majority of company bosses also believe that the ability of their firm to make effective decisions would be compromised by closer scrutiny and tighter legislation. And while corporate governance is seen as a leading issue by the vast majority of those polled in this survey, it ranked relatively low on the list of dangers executives saw threatening their firms' share price. Adverse markets, a shortage of top quality management, reputational risk and a lack of innovation all beat out concerns over poor financial reporting and lack of transparency. The report also calls into question the ability of the regulators to set more than a broad framework for good corporate governance. "Ultimately rules are no substitute for ethics or how trust operates in business", says the report's author, Victor Smart. "There is no one set of regulations which is going to stop Enron".

Voluntary Action

There is a strong need for voluntary action. This comes from personal commitment to ethics, social values, equity, fairness, transparency, rule of law, legitimacy, respect for individual and recognition of diversity and gender balance as value enhancers. We must know that knowledge economy has changed the world. Earlier companies made money by not informing people. Today you make money by informing people. The problem comes of informing people when you have failed. In the innovative economy of today when you have to constantly design new models you cannot have a winner all the time. When you are hitting at a constantly moving target you are bound to miss some shots. The answer is to have courage to own your failures and share them with shareholders. Transparency cannot be achieved without courage.

Corporate scandals and the consequent collapses

have a lethal effect on the poor and the old. Not only these destroy their life saving and reduces them to penury and desperation they take away their confidence in the markets. It is a great national loss. But revising codes of corporate governance is certainly not the answer. We have a great capacity to beat the codes. Andersen has asserted all along that whatever they did at ENRON or WORLDCOM was within the law and thousands of firms do the same. Again, nothing that President Bush has said in the aftermath of so many accounting scandals is new. Plastering capitalism's cracks simply won't work. It needs a systemic change which will come only by looking inside and not from outside. It is we who have to change our paradigm from individualism to integration, from tangibles to intangibles, from capital to knowledge, from objects to relationship, from parts to the whole, from domination to partnership, from structures to process, from short termism to long termism, from growth to sustainability, from confrontation to collaboration and from covering up failures to owning up.

Scientists have recently discovered that the small, brave act of cooperating with one another, of choosing trust over cynicism, generosity over meanness, altruism

over selfishness makes the brain light up with joy. Experiments conducted on young women engaged in cooperative effort showed the longer they are engaged in cooperative strategies, stronger were the blood flows to the pathways of pleasure. Obviously our effort should be to increase opportunities of cooperation and down play unbridled competition.

As we move into the 21st century there is a growing recognition that the ultimate goal of economic effort ought to be to improve the quality of life. Money is not a measure of all things that make us happy and markets are not the best mechanism to enhance human happiness. Indeed, if completely unfettered, they can do the opposite by encouraging selfish behaviour. Our focus should not be only on financial capital but also human capital, intellectual capital and environmental capital. Good Corporate Governance must aim at maximising the value of all capital.

We need to think of business designs that go beyond the externalities of quarterly profits and provide intrinsic sustainable value to all shareholders. With its belief in equity, fairness, transparency, legitimacy, integrity and responsibility, corporate governance is the best vehicle to improve the quality of life. □

Some men see things as they are and say why. I dream of things that never were and say why not.

— John F. Kennedy

Audit Committees for Good Governance: Indian Scenario

Nand Dhameja

This article focusses on the growing need for corporate governance and its various definitions and components. It reverses on the critical role that audit committees play in ensuring the integrity of the company in financial reports. The legal requirements of audit committees are discussed at length and a survey conducted to examine the reporting of corporate governance practices by companies.

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Corporate Governance—Meaning and Significance

Corporate governance, for a growing global economic entity, entails accountability and transparent financial performance. A study of 188 companies from six emerging markets, India, Malaysia, Mexico, South Korea, Taiwan and Turkey for the year 2001 has shown that companies with better corporate governance did have higher price-to-book ratios, indicating that investors will pay a premium for shares in a well-governed company. In fact corporate governance gained prominence with the Cadbury Committee Report in 1992 after the business failure due to financial crisis in the UK and thereafter, a number of committee Reports focused on the salient features of corporate governance. These Committees are listed in Annexure I.

Cadbury Committee defined corporate governance as a system by which companies are directed and controlled; boards of directors are responsible for the governance of their companies; the shareholders' role in governance is to appoint the directors and the auditors and to satisfy themselves that an appropriate structure is in place. The responsibilities of the board include setting the company's strategic aims, helping the leadership put them into effect, supervising the management of the business and reporting to shareholders on their stewardship. The board's actions are subject to laws, regulations and the shareholders in the general meeting. In the words of Kumar Mangalam Birla Committee, "a system of good corporate governance promotes relationships of accountability between the actors of sound financial reporting—the board, the management and the auditors. It holds the management accountable to the board and the board accountable to the shareholders"

Hampel Committee, successor to the Cadbury Committee, gave a word of caution that:

Good corporate governance is not just a matter of

prescribing particular corporate structures and complying with a number of hard and fast rules. There is a need for broad principles. All concerned should then apply these flexibly and with common sense to the varying circumstances of individual companies. This is how the Cadbury and Greenbury committees intended their recommendations to be implemented. It implies that on the one hand companies should be prepared to review and explain their governance policies, including any special circumstances which in their view justify departure from generally accepted best practice, and on the other hand, that shareholders and others should show flexibility in the interpretation of code and should listen to directors' explanations and judge them on their merits.

While the Cadbury Committee laid corporate governance focus 'largely on accountability' the Hampel Committee put focus on 'enterprise initiative as well as on accountability'.

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Berle and Means (1932) in their pioneering work on the Modern Corporation and Private Property suggested that the modern corporation was run by professional managers who were accountable to dispersed shareholders. This pointed to a narrow view of corporate governance and fits into principal (share-holders) – agent paradigm. In broader terms, corporate governance refers to the fact that the firms have many stockholders other than its shareholders and managers have to manage the organisation for the welfare of the stakeholder (Xavier Vives, 2000). Since the late 1980s onward, there has been a stimulated interest in corporate governance on the emergence of a series of frauds and scandals in the corporate sector allied to a growing culture of greed and aggressive takeovers and restructuring. The concept of good governance is important in every sphere of the environment, whether social, political and economic. The concept has been gaining popularity among governments, non-incorporated bodies, among nations with the objective to improve the effectiveness of governance of nations; the fundamental principles being transparency, performance and accountability.

Preamble to the OECD Principles of Corporate

Governance (1999), while referring to the importance of corporate governance for the well being of the stakeholders, emphasised the relevance of macro-economic and environmental factors. To quote from the Preamble to the OECD Principles,

One key element in improving economic efficiency is corporate governance which involves a set of relationships between a company's management, its board, its shareholders and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined. Good corporate governance should provide proper incentives for the board and management to pursue objectives that are in the interest of the company and shareholders and should facilitate effective monitoring, thereby encouraging firms to use resources more efficiently.

While corporate governance is an important element affecting the long-term financial health of companies, it is only part of the larger economic context in which firms operate which includes, for example, macroeconomic policies and degree of competition in product and factor markets. The corporate governance framework also depends on the legal, regulatory, and institutional environment. Business ethics and corporate awareness of the environmental and societal interests of the communities in which it operates can also have an impact on the reputation and long-term success of a company.

There is no single model of good corporate governance. In the light of individual firms and the variety of national institutional frameworks, it would be useful to seek to establish a global standard of corporate governance.

There is no single model of good corporate governance.

Common elements that underlie good corporate governance and Principles build on these common elements are formulated to embrace the different models that exist. The Principles are evolutionary in nature and should be reviewed in the light of significant changes in circumstances. To remain competitive in a changing world, corporations must innovate and adopt their corporate governance practices so that they can meet new demands and grasp new opportunities.

The Institute of Chartered Accountants in England & Wales (1996) in their response to the consultative document published by the Hampel Committee to seek views on a broad range of corporate governance issues expressed that:

- Good corporate governance rests firmly with the boards of companies: strong balanced boards are needed with effective independent non-executive directors. The prime responsibility for effective governance lies with the board of the company; shareholders and auditors can necessarily only play a secondary role.
- The Cadbury Code should be amended to require that the roles of chairman and chief executive be split and that directors be re-elected at intervals not exceeding three years;
- Consideration should be given to requiring that all directors of listed companies should pass a 'fit and proper' test.

Corporate governance has been enforced in most of the countries through Listing Agreements by Stock Exchanges, under which the listed companies are required to follow corporate governance rules. There are broadly two systems of corporate governance as regards beneficiaries of corporate governance. The Anglo-American system tends to focus on shareholders and various classes of creditors, while continental Europe, Japan and South Korea believe that companies should also have obligations towards employees, suppliers and so on. The Confederation of Indian Industry (CII) in its *Desirable Corporate Governance: A Code* recommended the first model on the ground that Indian labour laws are strong to protect the interest of workers. Good corporate practices must - at the very least - satisfy two sets of claimants: creditors and shareholders.

Corporate governance has been enforced in most of the countries through Listing Agreements by Stock Exchanges.

Sound periodical financial reporting and review system; adequate disclosure and transparency in such reporting, and independent audits are essential to ensure accountability not only to the board but also to the shareholders.

With the recent corporate financial debacles in the United States and European countries, like Enron,

World Com, Marconi points to the fact that "too many boards are stuffed with yes men who question little that their chief executives suggest" (The Economist, Jan 11th-17th, 2003). As a result there have been a spate of recent proposals to revamp and transform corporate governance practices. For example, in Germany, Canada, France and Malaysia, corporate governance codes have been issued. This is besides the changes in the US including the Sarbanes-Oxley Act which provides for greater responsibility for boards and auditors, or the reforms including the "executive session" of the board, where members would reflect on whether the chief executive has really answered all their questions, whether he is involving them in the development of strategy, whether the agenda he sets covers the right points. In India, the Naresh Chandra Committee Report lays down various measures, like, including independent directors on the board, to streamline corporate governance code and it is proposed to bring in certain legislative changes in this direction. The World Bank is sponsoring regional round-tables on corporate governance in Latin America and Russia.

Audit Committee – Origin

The New York Stock Exchange requires, since 1978, that all listed companies have audit committees composed solely of independent directors and the 1987 report of the American Treadway Commission concluded that audit committees had a critical role to play in ensuring the integrity of US company financial reports.

Experience in the United States has shown that, even where audit committees might have been set up mainly to meet listing requirements, they have proved their worth and developed into essential committees of the board. Similarly, a published research in the United Kingdom concluded that the majority of companies with audit committees offered added assurance to the shareholders that the auditors, who acted on their behalf, were in a position to safeguard their interests.

Highlighting the importance of audit committees the Cadbury Committee Report stated that the Committee

Regards the appointment of properly constituted audit committees as an important step in raising standards of corporate governance. Their effectiveness depends on their having a strong chairman who has the confidence of the board and of the auditors, and on the quality of non-executive directors. Membership of an audit committee is a demanding task requiring commitment, training and skill. The directors concerned need to have suffi-

cient understanding of the issues to be dealt with by the committee to take an active part in its proceedings.

Appendix 4 to the Cadbury Committee Report stated that many UK companies had an audit committee and 53% of the top 250 industrial firms in the Times 1000 had audit committees; and the figure rose to 66% if unlisted companies and foreign subsidiaries were excluded from the calculation.

Audit committees are well established in the United States, as stated earlier, since the listing requirement of the New York Stock Exchange in 1978; and a 1989 study revealed that 97% of major corporations had them. In Canada, they are a legal requirement.

The audit committees operating effectively would bring in significant benefits, which include:

- Improve the quality of financial reporting, by reviewing the financial statements on behalf of the board;
- Create a climate of discipline and control which will reduce the opportunity for fraud;
- Enable the non-executive directors to contribute an independent judgement and play a positive role;
- Help the finance director, by providing a forum in which he can raise issues of concern, and which he can use to get things done which might otherwise be difficult;
- Strengthen the position of external auditor, by providing a channel of communication and forum for issues of concern;
- Provide a forum within which the external auditor can assert his independence in the event of a dispute with the management.

The Combined Code by the London Stock Exchange issued in June, 1998, lays down that "The duties of the audit committee should include keeping under review the scope and results of the audit and its cost effectiveness and the independence and objectivity of the auditors. Where the auditors also supply a substantial volume of non-audit services to the company, the committee should keep the nature and extent of such services under review, seeking to balance the maintenance of objectivity and value for money".

The Blue Ribbon Committee in the US has the distinction of pioneering in the field of corporate audit committees. According to Blue Ribbon Committee on

Improving the Effectiveness of Corporate Audit Committees, "Good governance promotes relationship of accountability among the primary corporate participants to enhance corporate performance. A key element of board oversight is working with management to achieve corporate legal and ethical compliance. Such oversight includes ensuring that quality accounting policies, internal controls, and independent and objective outside auditors are in place to deter frauds, anticipate financial risks and promote accurate, high quality and timely disclosure of financial and other material information to the board, to the public markets, and to shareholders". The recommendations were addressed to size, composition, role, powers, and duties.

The Blue Ribbon Committee in the US, has the distinction of pioneering in the field of corporate audit committees.

In short, the functions of the audit committee largely relate to the finance department of the organisation, that is, review of external audit findings, review of independence and objectivity of external auditors, review of internal control, findings of investigations, and to improve the financial reporting by reviewing the accounts that are prepared by following sound accounting principles, in particular the stipulated accounting standards.

However, on the contrary, as reported in (The Economist Jan 11th-17th, 2003), companies do not have independent directors, rather they have "interlocking relationships". They generally look for "consensual" candidates; the board level committees are not independent. For example, Compensation committee which determines CEO's pay, includes relatives either to the boss or to the company or "audit committee meets after the figures that it was supposed to scrutinise had already been released"; or an excessively powerful chairman of the board keeps the board in the dark as important decisions or negotiations are informed to the board a day before it is announced.

Companies do not have independent directors, rather they have interlocking relationships.

Audit Committees in India – Legal Requirements

In India companies are required to have audit com-

mittee of the board under the Listing Agreement with the Stock Exchange or under the Companies Act (with effect from December 13, 2000), though conditions stipulated vary. The basic difference being that under the Listing Agreement all the three members of the audit committee would be non-executive and independent directors, and one of them must have knowledge of accounting and finance, while there is no such requirement under the Companies Act. It may be mentioned that CII in its *Desirable Corporate Governance: A Code* (1988) recommended that listed companies with either a turnover of over Rs. 100 crore or a paid-up capital of Rs. 20 crore should set up audit committees within two years. However, the Report of the Working Group on the Companies Act as referred to by the CII Code, recommended that the audit committees be set up voluntarily "with the industry associations playing a catalytic role"; the Working Group felt that legislation in favour of audit committees would be counter-productive, and could lead to a situation where such committees would often meet the letter—and not the spirit—of the law.

However, Kumar Mangalam Birla Committee recommended that "a qualified and independent audit committee should be set up by the board of a company. This would go a long way in enhancing the credibility of the financial disclosure of a company and promote transparency". The audit committee, as recommended by Kumar Mangalam Birla Committee, should have minimum three non-executive directors, majority being independent with at least one director having financial and accounting knowledge. The need for audit committee was emphasised from the recognition of the audit committee's position in the larger mosaic of the governing process.

Similarly, under Clause 49 of the listing agreement, every listed company has to constitute an Audit Committee of directors which has the powers to investigate any activity within its terms of reference, to seek outside legal advice, to review the financial and operational policies of the company, to focus on the accounting/auditing aspects. The committee has to oversee Financial Reporting Process/Disclosure of Financial information to ensure it is correct, sufficient, and credible; to review financial statements before submission to the board, focussing on changes in accounting policies, qualifications in auditors report, compliance with accounting standards, and with the stock exchange requirements; to review the management/internal audit and control system and have discussions with external and internal auditors; to review the company's financial and risk management policies, to look into the default of payments to suppliers, depositors, dividends.

Companies Amendment Act 2000 (w.e.f. December,

2000) requires that every public company having a paid-up capital of not less than Rs. 5 crore shall constitute a Committee of the Board of Directors known as 'Audit Committee' which shall consist of not less than three directors and such number of other directors as the Board may determine of which two-third of the total number of members shall be directors, other than managing or whole-time directors. The committee shall act in accordance with the terms of reference specified in writing by the board. It shall elect a chairman from amongst its members.

The recommendations of the Audit committee on any matter relating to financial management, including audit report, shall be binding on the board. If the board does not accept the recommendations of the audit committee, it shall record the reasons thereof and shall communicate such reasons to shareholders. The chairman of the Audit Committee shall attend the annual general meetings of the company to provide any clarification on matters relating to audit. The Annual report of the company shall disclose the composition of the audit committee.

The auditors, the internal auditor, if any, and the director-in-charge of finance shall attend and participate at meetings of the Audit Committee but shall not have the right to vote.

The Audit Committee should have discussions with the auditors periodically about internal control systems, the scope of audit including the observations of the auditors and review the half-yearly and annual financial statements before submission to the Board and also ensure compliance of internal control systems. A comparative statement showing the requirements for the audit committee under Clause 49 and section 292A of the Companies Act is given in Annexure II.

On comparison of requirements regarding audit committees under the Companies Act and under the Listing Agreement, one finds that the Companies Act stipulates the following additional requirements which are silent in Clause 49 of the Listing Agreement:

- i. The audit committee constituted shall act in accordance with terms of reference to be specified in writing by the board.
- ii. The recommendations of the audit committee on any matter relating to financial management, including the audit report, shall be binding on the board.
- iii. If the board does not accept the recommendations of the audit committee, it shall record the

reasons thereof and communicate such reasons to the shareholders.

Similarly, Clause 49 of the Listing Agreement stipulates the following which are not requirements under the Companies Act

- i. Minimum three members of the audit committee shall be non-executive directors with the majority of them being independent and with at least one director having financial and accounting knowledge;
- ii. The audit committee should invite such executives, as it considers appropriate (and particularly head of the finance) to be present at the meeting of the committee, but on occasions, it may meet without the presence of any executive of the company;
- iii. The company secretary shall act as secretary to the committee;
- iv. The audit committee shall meet at least thrice a year. One meeting shall be held before the finalisation of annual accounts and once every six months,
- v. The quorum of the audit committee shall be two members or one-third of the members of the audit committee whichever is higher and a minimum of two independent directors.

As mentioned earlier the Institute of Chartered Accountants of India issued a Guidance Note on Certification of Corporate Governance in June, 2001. The Guidance Note was intended to

- i. provide guidance to auditors for issuance of certificate of compliance of conditions of Corporate Governance as stipulated in clause 49 of the Listing Agreement between the Stock Exchange and the auditee entity
- ii. assist in classifying the respective responsibilities of the management and the auditor
- iii. suggest inquiries the auditor is required to make from the management
- iv. provide guidance on the verification procedure to the compliance of conditions of corporate governance
- v. outline circumstances where the auditor may issue an adverse or qualified certificate

Corporate governance practices are being subjected to rating. In this regard, SEBI has recently mandated CRISIL and ICRA with the job of developing a

model for rating companies on the basis of their compliance with corporate governance norms. In this respect, ICRA is the second credit rating agency in the world to launch the services of Corporate Governance Rating. ICRA's Corporate Governance Ratings (CGR) provides current opinion on the level to which an organization accepts and agrees to codes and guidance of Corporate Governance practices that serve the interests of the stakeholders, employees, government and society at large. ICRA's corporate governance rating is based on a scale of '1' to '6', with CGR '1' denoting the *highest rating* and CGR '6' the *lowest* (indicating poor corporate governance). However, according to ICRA, the rating is not a certificate of statutory compliance or comment on the company's future financial performance, credit rating or stock prices. ITC corporate governance has been rated by ICRA, the first ever rating of corporate governance practice in the country. ITC has been assigned a 'CGR2' rating, implying a 'high level of corporate governance' which reflects ITC's transparent shareholding structure, well structured management decision making process with adequate delegation of powers and sound board structure and process. Further 'the composition of ITC's board as well as the board's committee's frequency of meetings, quality of agenda papers and the board's involvement in the decision making process satisfy the requirement of good corporate governance'. ITC's corporate strategy aims at creating multiple drivers of growth anchored on its core competence. ITC's current focus is on FMCG, hotels, paperboards, paper and packaging and agrobusiness. ITC's FMCG business constitutes cigarettes and new areas like lifestyle and retailing. Despite gestation cost of some of its recent investments and restructuring cost on account of exit from edible oil and financial services business, the company has been consistently earning a high level of return on capital employed. The rating also reflects conformity with the provisions of Clause 49 of Listing Agreement, even though the rating is not to be interpreted as an indicator for statutory compliance.

SEBI has mandated CRISIL and ICRA with the job of developing a model for rating companies on the basis of their compliance with corporate governance norms.

Audit Committees and Boards among Indian Companies – A Survey

- How are the board level audit committees doing their job?

- How far are the members committed to the Committee's work?
- How far the audit committees are effective?

In this respect, we quote Omkar Goswami, a noted economist, a member on the boards of well known companies, who has referred to the case of a company (Business World, April 8, 2002) which adopted in the first half of the year 2000, corporate governance practices and inducted some new independent directors—people who were aware of their fiduciary duties towards shareholders. The meetings of the audit committee, the compensation committee and the board, and the Annual General Meeting were fixed for the next 24 months, with an intention to make it incumbent upon the directors to attend the meetings.

In the first substantive audit committee meeting, the external auditors were grilled by the committee on various aspects of their audit functions and their findings. A detailed list was prepared for follow up with timelines and those who were responsible for taking action. At the next meeting of the audit committee, the first item on the agenda was the action taken report, and the management was quizzed about slippages. The new internal auditor was asked to present a brief and timelines of what the person would do under different heads. Internal audit procedures, audit traits and legal compliance process were examined in detail. On an average, each audit committee meeting takes over three hours. Often the chairman of the committee spends a day sitting with the auditors and following up on details. The management has gone out of its ways to facilitate processes, and complies with some of the toughest standards ever seen in any Indian board.

Similarly, compensation committee meetings were not less intense. The company under reference was involved in knowledge-driven business with net sales of Rs 195 crore and a return on net worth (RONW) of little under 20% in 1996; the corresponding figures for the year 2001 were Rs. 917 crore and 26.8% and it had become one of the three key Indian players in the industry. The company did it perhaps to be listed at the New York Stock Exchange as it got listed in 2001, or it wanted to be measured with the best. It raises a question, do companies observe corporate governance code purely for legal compliance, or for better management in the interest of stakeholders?

The recent cases of Enron, WorldCom, Global-Crossing, Qwest, Tyco AOL-Time Warner involving tempering of accounts for billions of dollars and adver-

sely affecting the interests of investors; or a number of companies in India resorting to accounting gimmickery to rig their accounts (as reported by the analysis of results of 639 companies by the CRISIL) raise a question towards the effectiveness of audit committees and corporate governance. In this regards, Kevin and Mike (1997) write 'While there may be widespread compliance with Cadbury, there is a danger that actions become simply *box-ticking exercises* and/or impose a cost burden on firms which outweighs any benefits'.

A study of Audit Committees in smaller listed companies in U.K by Paul Collier (1997) showed that the audit committees were formed in accordance with the Cadbury recommendations and in a number of cases the audit committee was composed exclusively of non-executive directors, but regular meetings between non-executive directors and the auditors without the presence of executive directors did not take place.

A survey of 56 companies in India (including five companies from the public sector) was carried out by analysing their annual reports for the year 2000-01 to examine the reporting of corporate governance practices and the composition of audit committees. The Companies under survey comprised two companies that had a paid up capital below Rs. 5 crore, 22 companies had a paid-up above Rs. 100 crore, while companies having paid up capital between Rs.5-20 crore, Rs.20-100 crore were 10 and 22 respectively. The analysis indicates that,

- corporate governance code had been adopted by companies and the annual reports contained a brief statement on the company's philosophy on code of governance, Board of Directors composition and their other particulars; audit committee - its brief terms of reference, composition, names of members and chairperson, number of meetings, attendance therein and business transacted during the year. In addition, a certificate from the auditors regarding compliance of conditions of corporate governance was enclosed in the Directors Report.
- Members of audit committees in many cases also included executive directors; the chairman and managing directors and some executive directors were the permanent invitees in many cases. There was no such requirement that at least one member should have knowledge of finance and accounts. These though were as per the requirements of the Companies Act, not in compliance with the Listing Agreement.
- As regards directorships of other companies

and membership/chairmanship of committees and boards, the Companies Act (w.e.f. Dec. 2000) stipulates a limit of 15 directorships, excluding directorships of private companies, or unlimited companies. It may be mentioned that the Kumar Managalam Birla Committee recommended a ceiling on the maximum number of committees across all companies in which a director should be a member to 10, or act as a chairman of not more than 5 committees. Our analysis indicates that though number of directorships, was within the prescribed limit, in about 26% cases the number of total directorship reported across all companies exceeded 20. As regards membership of audit and other committees of the board, while in 19 percent cases the membership was between 10-20, only in 5 percent cases the membership exceeded 20.

As a member of the board, and its Committees, one has to attend their meetings during the year. Taking one meeting per day, one may ask how many days in a year one is busy attending the meetings? Looking at the total number of membership of audit committees for the companies under study, the analysis shows that in 41 percentage cases they were engaged in attending more than 60 meetings in a year; the corresponding percentage for more than 120 meetings was 10. This reflects the importance and commitment towards board and committee meetings by the members of the audit committees.

Conclusion

The corporate governance rules are well documented and are being observed, the accounting standards have been framed and of late have been made mandatory. Critics of audit committees also question their effectiveness on the ground:

- How far members of the audit committee are prepared to perform the role assigned to them as regards the knowledge inputs and time required?
- How far the Chairman of the committee is effective and strong as he is to choose the agenda, to conduct the meeting, to steer the proceedings of the meeting with the members having diverse opinions, to have consultations with external auditors, internal auditors and director finance; this is particularly so as 'agenda setting and steering the flow of information determines corporation control'.

- Considering that a large number of directorships or membership/chairmanship of committees for certain directors, including non-executive and independent directors, exert pressure on their time, how effectively are they able to do justice with the agenda of a committee's meetings? To report from *The Economist* (Jan 11th-17th, 2003), the demands on the time of a director of a large company have increased by about 25%; meetings are now often longer than the typical two to four hours and held perhaps eight or nine times a year, this is besides the travel time and one to two days of research and thinking that the National Association of Corporate Directors has recommended to prepare for each board meeting.
- Lastly, improvement in corporate governance with the ammended rules and accounting standards would depend on both boards and investors.

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Annexure I

Annexure II

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Comparative statement showing the requirements under Clause 49 and section 292A

Clause 49 of the Listing Agreement	Section 292A of the Companies Act, 1956
1. a) All entities seeking listing first time are required to set up an audit committee at the time of listing. (b) All existing listed entities with a paid-up capital of Rs. 3 crores and above are required to set up an audit committee in a phased manner	1. Every public company having paid-up capital not less than five crore of rupees shall constitute an audit committee immediately on the enactment of Companies (Amendment) Act, 2000 i.e. with effect from 13 th December 2000
2. The audit committee shall have minimum three members, all being non-executive directors, with the majority of them being independent, and with at least one director having financial and accounting knowledge.	2. The audit committee shall have minimum three directors of which two-third shall be directors other than managing or whole-time directors.
3. The chairman of the audit committee shall be an "independent" director.	3. The members of the audit committee shall elect a Chairman from amongst themselves.
4. A representative of the external auditor, when required shall be present as an invitee for the meetings of the audit committee	4. The Auditors shall attend and participate at meetings of the audit committee.

Source: Guidance Note on Certification of Corporate Governance (The Chartered Accountant, June, 2001). □

E-government – Initiatives & Challenges

Ram Lal & Abid Haleem

E-government enhances user satisfaction by providing round the clock access to government information and services. E-governance seeks to develop processes and structures for harnessing the potentialities of ICTs at various levels of government. In India, the transformation of the government into E-Government is a challenging task. This is an exploratory paper where old and new services delivery models have been compared to assess the effect of E-government. A brief SWOT has been presented. E-readiness of India has been discussed. Technology is important but equally important is the customisation, standardisation, industry participation, cost effectiveness, legal framework, and scope for integration of higher levels of services.

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Information and Communication Technology (ICT) has provided extensive opportunity for individuals, communities, countries and regions to interact effectively. Today ICT is being seen as an important instrument for improving efficiency in public administration, but it is being used mainly within existing structures and organisations. The Internet revolution has changed this perspective radically. Everyone realizes its enormous potential for fundamental re-thinking in public management and public service delivery. Another trend in public management is a shift of focus from different management techniques to a broader concept of governance. E-government is the use of Internet technology to improve the delivery of services and change processes and procedures of government. It enables governments to provide round the clock service to their citizens at home/office. Governments can also use the Internet to rationalize their ways of business. Thus E-government can effectively strengthen the governance process and demonstrate transparency and efficiency (NLC Congress of Cities, 2000).

Governance

Governance has been defined by various agencies globally. Some of them are as follows:

- It is the process by which diverse elements in a society wield power and authority and, thereby, influence and enact policies and decisions concerning public life and economic and social development.
- It is a system of directing and controlling the actions, affairs, policies and functions of a political unit, organization, or nation. "As a great social leveler, Information Technology ranks second only to death. It can raze culture barriers, overwhelm economic inequalities, and even compensate for intellectual disparities. High technology can put unequal human beings on an equal footing, and that makes it the most potent democratizing tool ever

devised" (World Bank Group Proposal).

- It refers to the systems by which organisations are run and the laws, regulations and best practice with which they are required to comply (The Institute of Chartered Secretaries and Administrators).

Characteristics of Governance

Governance is characterised by the following five major attributes,

- *Participatory*: all men and women should have a voice in decision-making directly or through legitimate intermediaries built on freedom of association and capacity constructively.
- *Transparency*: free flow of information and accessibility to information to those requiring them.
- *Accountability*: the responsibility for their actions as decision makers in government, private sector and civil society, to the public and institutional stakeholders
- *Equity*: all men and women have equal opportunities to improve or maintain their well-being.
- *Promotes the rule of law*: legal frameworks should be fair and enforced impartially, particularly the laws on human rights.

E-government

Government is the process by which groups of people get their authority to make decisions and serve and protect the interest of all (<http://www.myflorida.com>). Thus, it is a means of bringing the government closer to the common citizen through the provision of on-line public services. It is a technological exercise, integrating individual database and websites of government departments. Nowadays it is becoming a tool to modernize government and hence enhance the economic competitiveness of business and citizen empowerment. E-government is a way for governments to use the new technologies to provide people with convenient access to government information and services, to improve the quality of the services to provide greater opportunities to participate in government institutions and processes. However, it must be made clear that government online is not E-government. It opens up a new paradigm of governance, ultimately creating a new form of government.

"E" in E-Government stands for much more than electronic and digital, here E denotes:

- E for EFFICIENT – do it the right way
- E for EFFECTIVE –do the right thing
- E for EMPOWERMENT –greater participation in governance process
- E for ENTERPRISE – initiative and innovation.
- E for ENHANCED user interface by providing 24/7/365 access to government information and services
- E for ONLINE ENVIRONMENT

This will provide online government solutions that businesses and citizens can see and use, thus enhancing the user satisfaction.

E-government is integration of Government and IT and refers to the use by government organisations of information technologies (such as Wide Area Networks). These technologies can serve a variety of different ends: better delivery of government services to citizens, citizen empowerment through access to information, or more efficient government management, improved interaction with business and industry.

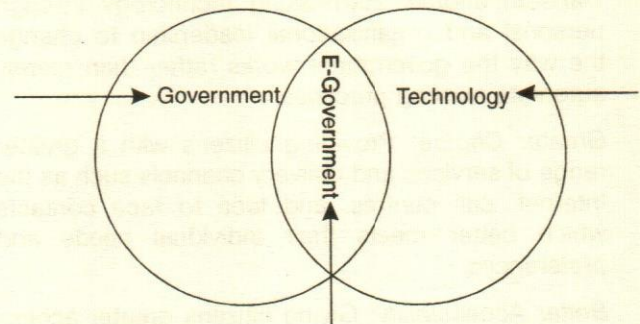


Fig. 1. E-Government Concept

E-Government makes the full range of services which departments and their agencies provide for citizens and businesses accessible electronically. It is also about departments harnessing new technology such as the Internet and Intranets to improve their operational efficiency in delivering services and carrying out their core activities (Ram Lal, Abid Haleem, 2002).

Why E-government

- E-government provides an opportunity to enhance user satisfaction by providing round the clock access to government information and services. It is a rapidly evolving space where static information is being replaced by online transaction and integrated

government solutions. Following are some of the reasons, why E-Government is proposed.

- *Easy to use:* Connecting people at Center, State, Districts, Blocks and local centres, according to preferences and need.
- *Social inclusion:* Available to everyone, at home, at work, in schools, in libraries and other convenient community locations. Equal access and equal treatment to the rich and poor. Information Empowerment of the citizens through information.
- *Private and secure:* Provide with appropriate standards for privacy, security, and authentication.
- *Generating trust:* It can generate trust in the government and serve the public.
- *Innovative and results-oriented:* Emphasizing speed and harnessing the latest advances in technology.
- *Collaborative:* With solutions developed collectively and openly among public, private, nonprofit, and research partners, on the basis of their experience and expertise.
- *Cost-effective:* Through strategic investments that produce significant long-term cost savings.
- *Transformational:* Harnessing technology through personal and organisational leadership to change the way the government works rather than merely automate existing practices.
- *Greater Choice:* Providing citizens with a greater range of services and delivery channels such as the Internet, call centres, and face to face contacts which better meets their individual needs and preferences.
- *Better Accessibility:* Giving citizens greater access to the range of services delivered by departments by providing better, easier to use information on-line and joining up services at the point of delivery.
- *More Transparency:* Providing better accountability, responsiveness and transparency on the part of government employees.
- *More Convenience:* Providing services in a way which suits citizens' and businesses' needs, for example, by providing on-line, 24 hours service enabling people to obtain information and carry out transactions with departments when it is convenient for them to do so.
- *Faster Delivery:* Providing faster, more accurate services, for example, on-line services which enable citizens to obtain information more quickly than by post or by visiting a government office; and by electronic data interchange which enables busi-

nesses to transmit large amounts of data quickly and easily to departments. It saves cost of travel and stay at the place of services.

- *Improved Efficiency:* Replacing manual processing of routine high volume work by IT systems to reduce staff requirements and deliver financial savings or allow staff to be re-deployed to other priorities. It can also be used to make the purchasing of goods and services more efficient. This may improve the efficiency of the government machinery and systems.
- *Effective System:* The proposed definition system can handle a large volume of work with connectivity and accessibility at all levels. The very purpose of good governance can be effectively conceptualized, modeled and achieved.

Benefits for The Government

Government may also derive advantages from E-Government. Some of the benefits are given below:

- Information that Government departments require will be available at the click of a button, as opposed to filing in forms. Better information management.
- Reduce time consuming searches through filling cabinets.
- Information will be transparent and any constituent can access the information.
- Access rights to information will halt misuse of information and data.
- Helping to provide better customer services and easy mechanisms to solve the problem.

Electronic government has many dimensions, it includes changing internal government processes through Government administration, policymaking, planning, learning, using a variety of electronic channels for direct service delivery. This may transform the government's relationships with its partners in the areas of health, education, justice, social services, transportation, resources management etc. IT drives fundamental shifts in management and delivery across systems facilitating two-way citizen engagement, digital democracy, citizen feedback, electronic referendums, electronic voting etc.

There are four pillars of e-government through which the government can provide services to citizens effectively.

Standards: It refers to the comprehensive set of

technical and non-technical guidance and standards together with a supportive legal framework and regulation of electronically transmitted messages. Also it will guide exchange data, information and knowledge including messaging standards and transfer standards for files. This will remove barriers such as transparency obstacles, legal recognition and intra-government information sharing and database integration. It ensures the credibility, transparency, and privacy of the transactions through a comprehensive policy framework.

National Infrastructure: It refers to the use of the infrastructure components to be developed and procured for compatibility of the systems communications, which will help in connecting the government offices.

Partnership: The benefits of e-Government cannot be realized by the government while working in isolation. Partnerships between government, private industries and NGOs are a key means of joining up services, sharing skills, dispersing risk and making better use of resources.

Support: This refers to the need of support in delivering the information and are the core pillars of e-government—management skill and leadership, organizational development, change management, and national conference, regional workshops, sharing experiences to provide better services to citizens' need.

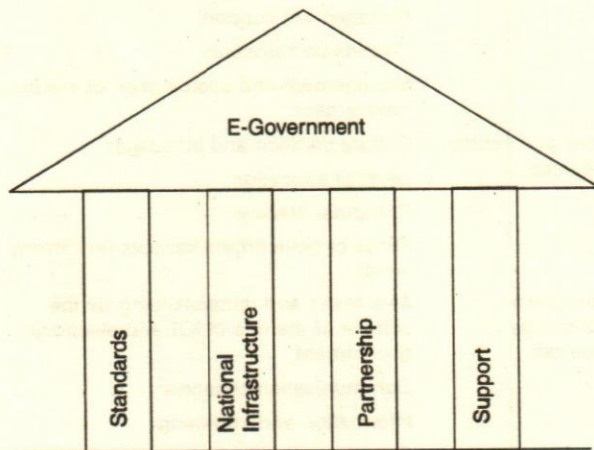


Fig. 2. Pillars of E-Government

Drivers for E-Government

Drivers are key factors to accelerate the speed of e-government. These are responsible for improvement in government and technology itself by providing the services as needed by citizens

- Government as services provider
- Citizens expect quality performance
- Information and communication technology tools offer transformational value
- Legislation
- Potential cost saving
- Competition
- Technology improvement

Components of e-government are Integration of Services, Focus on the needs of citizens, partnership with private sector and improvement of the internal efficiency of departments.

Four major components of e-government are being envisaged below.

Openness and Integration of services: Government services should be widely available and accessible to all citizens at any time. The government services should operate as one-shop-one-stop services with an integrated system that provide access to all government departments and branches.

Focus on the needs of citizens: For quick and easy access to government services and simplicity of use, there should be interaction between government and citizens. Government services should increasingly focus on the needs of the citizens and government should analyse feed back from citizens to improve the quality of services. A large number of services and two-way communication will encourage more citizens to use these services.

Focus on partnerships with private sectors: To reduce expenses of government through effective use of technologies and open transparent system of government purchases, there should be an interaction between government and industries. Government should cooperate with the private sector to ensure skilled and experienced staff and management skills to supervise the big projects on the automation of the government's workflow.

Focus on improvement of the internal efficiency of departments: To cut expenses and improve the quality of services, there should be interaction between and across departments. This ensures rational use of technologies that leads to reduced cost and improved

operation of government. Government departments can improve their operating efficiency by avoiding delays in the workflow and by motivating staff. Re-engineering internal processes using technologies and tools will improve the internal efficiency.

Services Delivery Model

Government is responsible for providing citizens with services, namely, education, health, transport and electricity, water, judiciary, administrative and local services. Quality of services varies from state to state. In this section a comparison is made of old services delivery and new services delivery model.

Table 1: Comparison of Old and New Services Delivery Model with Different Attributes

Attributes	Old Service Deliveries with reasons		New Services Deliveries with reasons	
Speed Delivery	Slow	Manual system	Very good	Through IT
Trust	No	No transparency	Very good	Transparency
Paper flow	Slow	Manual	Fast	Through IT
Information flow	Slow	Paper work	Fast	No paper; IT flow
Participation of citizens	Marginal	No awareness	Digital divide	Marginal
Transparency	Marginal	Hiding relevant information	Very good	Reengineering & IT
Efficiency	Slow	Staff dedicated for own personal interest	Very good	Reengineering & IT
Accountability	Slow	Favouritism	Very good	Maintained; IT
Corruption	More chances	Poor record keeping	Less chances	Transparency through IT
Empowerment of the Poor	Marginal	No information to encourage the citizens to participate in decision making	Very good	Encouraged for participation through IT
Performance criteria	No fixed criteria	Providing mis-information	Objectives established	Transparency through IT

The old services delivery model seems to be based on documents which were not citizen-centric. This model could not provide proper services needed by citizens. It was a slow, non accountable and non transparent system. It opened the doors for organizations to utilize the services of the department for their use and not for citizens. The staff of the organization could not provide information to citizens without personal favour.

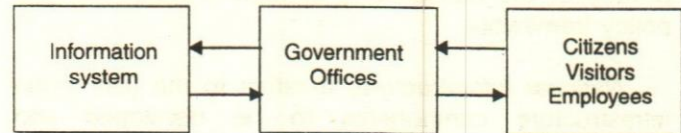


Fig. 3. Old Services Delivery Model

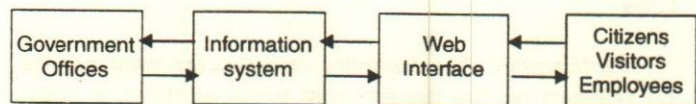


Fig. 4. New Services Delivery Model

This new model is a web-based interface model through which citizens can access the information of the organization and the delivery of the services is very fast and efficient. This model is able to maintain the transparency and efficiency of the organisations.

Table 2: Activities and Key Factors

Areas of activities	Key factors
Political	<ul style="list-style-type: none"> Awareness of the political importance of electronic government Management support Citizens participation Management and coordination of electronic government
Social and Human resources	<ul style="list-style-type: none"> Culture tradition and languages Level of education Computer literacy Focus of government services on citizens needs
Information Technology resources	<ul style="list-style-type: none"> Awareness and understanding by the citizens of the role of ICT and electronic government Communication channels Information and knowledge Software technology Telecommunication infrastructure and Technology management Use of telecommunication Accessibility of data and information Data security Ability to manage information flow in the process of decision-making/Standardized methods and storage of information

Comparison of services delivery model has been undertaken based on interaction with a number of middle level officers and literature review. This model has not been tested exhaustively for validation thus natural biases may have come up.

Assessment of E-government

When creating and implementing e-government, it is essential to analyze the major areas of the activity and

Table 3: SWOT Analysis from Political, Social and IT Aspects

(A) Political Aspects	
Strengths	Weaknesses
Strengthening of the democratization process and state administration reform	Insufficient funding of ICT Lack of coordination of ICT development
Internet boom	Slow decision-making process
Timely completion	Hierarchical structure Reluctance to implement reforms
Opportunities	Threats
Reinvent government Increase transparency Attraction of external funding	Unwillingness on the part of the top managers Corruption Piracy Resistance to change Political instability
(B) Social and Human Resources Aspects	
Strengths	Weaknesses
People are striving to learn ICT ICT utilization may boost software exports	Weakness of the basic elementary education Low computer literacy Multilingual environment Lack of knowledge in comparison with private sector
Opportunities	Threats
Creating new jobs / new skills Improvement of education system Internet promotion Skilled manpower available Health care, transport, tourism Law and order Parliament and assemblies Supreme court and High courts/	Possibility of brain drain after skilled training Digital divide Internal resistance Ensuring of personal information
(C) Information Technology Resources Aspects	
Strengths	Weaknesses
Starting from scratch (no past burdens to bear) Opportunity to leapfrog Internet as a determining factor	Lack of ICT training High cost of internet connection Heterogeneous data Lack of ICT standards Software licensing
Opportunities	Threats
Use of common standards Use of equipments	Dependency on technology Piracy and security, cyber attack

Indian Specialized Organizer

Table 4: Indian Specialized Organisations

Organizations	Responsibility	Role in e-government
C-DAC (Center for Development of Advanced Computing)	For development of advance computing	It can help in developing high end technology and providing advanced computing to government
NCST (National Centre for Software Technology)	High end software development and training	Software development and IT manpower
SCL (Semiconductor Complex Ltd)	Design and Manufacture of Very Large Scale Integrated Circuit	It can help in making hardware
STQC (Institution dedicated to Standardization, Testing and Quality Certification)	Dedicated to Standardisation and Quality Certification of IT products	It can help in testing of software and standardization, building guidelines
CMC (Computer Maintenance Corporation)	Premier Government organization for Software Products and Services	Software development and software courses preparation and training
CEDTI (Centre for Electronic Design and Technology of India)	Caters to training and product development needs of electronics Industry	Boosting electronic products
NIC (National Informatics Centre)	Provides infrastructure and content for all Governmental activities. Connects all the administrative regions of the country up to micro-level	True representative for e-governance at national level and providing e-governance software development, and training to all government staff, supporting state governments for e-governance and also providing basic information through its website
STPI (Software Technology Parks of India)	17 Specialised Zones for dedicated export of Software from the country - 1204 Exporting Units established - High Speed Data Communication Facilities upto 2 GBPS with 17 International Gateways	Helping in creating the new E-governance software for Government and providing high speed communication channels
ERNET (Education and Research Network)	Provides Network Services to Indian academic and research community	Providing research network and education to education institutes to share their views through education websites
ERDCI (Electronics Research and Development Centre of India)	Research organisation for development of new products and technologies in electronics	Helping in new electronics products and technologies

its key factors. This is shown in Table 2. These activities are further required to evaluate the risks and problems of E-Government. It needs to be noted that an explanatory study of these activities and corresponding key factors are based on our understanding of e-government in India.

SWOT Analysis

Political aspects are related to e-governance vision, strategy and policy, laws and legislation, decision making processes. Social and human resource aspects are related to social issues, cultural and computer education. Information Technology aspects are related to software and hardware technology and data privacy, systems security, awareness of Information Technology among the citizens. The following SWOT analysis is made on the above key aspects and factors are given below.

E-readiness of India

Major Government and non-Government organizations are actively involved in promoting technology and required education for e-government. They are helping the government in transforming its processes and deliver information by providing specialized technology and training, equipping the staff with IT skills.

Industry Associations

The following associations are responsible for promoting e-government by providing software technology and telecommunication

Table 5: Industry Associations and their Responsibilities

Industries Associations	Responsibilities
ESC (Electronics & Software Export Promotion Company)	Promote trade of Information Technology and Electronics between India and the rest of the world.
NASSCOM (National Association of Software and Service Companies)	An association of companies in India operating primarily in the computer software and service sector
MAIT (Manufacturers Association of Information Technology)	Providing IT hardware guide lines and sharing the IT activities
TEMA (Telecom Manufacture's Associations)	Responsible for Telecom equipment and technology development

Indian Government has some advantages that can help in implementing e-governance modules. Extensive work is being undertaken in developing the support infrastructure, amending the laws and undertaking sup-

port exercises. Some of the major works are being summarized below.

- National Task Force on IT
- Government support and E-Governance Vision
- Set up Ministry of Information and Communication Technology
- Telecom Liberalization
- IT Bill and IT Professional power
- High quality HR
- Language Advantage
- IT Infrastructure

Indian Cyber Law

Some of the major initiatives taken by the policy planners in this area are summarized below:

Cyber Framework

- The Information Act, 2000
- Legal framework to facilitate electronics commerce and electronics transaction.
- Aims to recognize electronic contracts, prevention of computer crimes, electronic filing/ documentation, digital signature, etc

Integrated Circuits Lay out Design Act

- Boost for Indian Industry on IPR front

Convergence Bill - in Parliament

Institutions and Private Software Development and Training Industries

Table 6: Professional Institutes and Private Software Development and Training Industries

Institutes	Univer- sities	Engg. Colleges	IITs	IIMs	Polytechnics
Nos.	284	1046	7	6	1210
IT GIANTS – INDIA					
VSNL	TCS	SATYAM	WIPRO	HCL	NIIT INFOSYS

Major Initiatives by Indian States

There are some Indian states that have adopted Information technology in re-engineering their processes and transforming government relationships with citizens and industries.

Andhra Pradesh is one of the Indian states which has employed Information Technology as a tool to improve services for citizens.

The e-seva programme is to provide integrated services to citizens of the state. The e-seva centre is a one-stop-shop for payment of electricity, water and telephone bills to the issue of birth and death certificates, permits and licenses, reservation of bus tickets and receipt of passport. Internet services like Internet-enabled electronic payments, downloading of forms and government orders and filing of applications on the Web are also offered.

CARD: Computer-Aided Administration of Registration Department provides end-to-end solution for the automation of registration processes.

FAST: Fully Automated System for Transport, whereby offices of the Regional Transport Officers are providing services like issue of learner's licenses, driving licenses and registration of vehicles which are in use. All these citizen services have significant, reduced processing times.

Gujarat Government introduced the smart card-based driving license project. The government has also implemented a state-wide Wide Area Network (WAN) project that connects its various office complexes and corporations and supports services like voice, data and video traffic, e.g. Gujarat's State Road Transport Department's computerised check posts' project.

Bhoomi Project has computerized all land records of the Karnataka Government. It helps the farmer to get a copy of the record of the rights and crops documents. This project made changes in the system of governance and administration.

In Kuala Friends Project is an integrated electronic interface where citizens can access government services, pay bills and taxes, obtain information from the government.

Friend's centres have been set up in 14 districts of Kerala. The objective of Project FRIENDS is to induct a philosophy of services delivery to the Government, and treat the citizen as a valuable customer who pays for services. FRIENDS mean 'Fast, Reliable, Instant, Efficient, and Network for Disbursement of Services'.

The Gyandoot Project is an intranet in the tribal district of Dhar (Madhya Pradesh). It is a community-based, highly cost-effective and financially self-reliant approach for bringing the benefits of Information Technology to the doorsteps of tribal villagers. This has

enabled rural tribal citizens affordable access to various government and market related needs through Information technology.

The Gyandoot Project has increased awareness of the empowering ability of information in Dhar District and the possibilities for increasing transparency and accountability in governance.

236 mandis connected online in Rajasthan for daily rates have improved the efficiency and transparency in transaction.

Bhagidari (Partnership) in Delhi was started in the area of vocational training, electricity distribution, transportation and solid waste management by using Information technology with citizen's contact.

Conclusion

India has cost and quality advantages and technically trained professionals along with government support and IT vision. The government should think what the citizens want and need and create universal access, choice of channels. There are potential benefits of e-government which will enable the government to provide more efficient, affordable and convenient "citizen-centred" service; greater access to information regarding government services and programmes; the horizontally integrated "seamless" access to all branches and levels of government via "single-window" access points will be less confusing and more transparent, accountable, and responsive. E-government will contribute to economic growth and enhanced service, accountability, effectiveness and relevance.

E-Government is also a social change programme and the center of vision of e-government should be focused on the citizens and other key stakeholders should be considered. E-Government alone cannot transform the government, so there should be partnerships with the private sectors. E-government requires strong political leadership, which is essential to create the momentum to drive forward the vision for e-government. The Internet access to citizens must be seen as a human right, as it will elevate the life of common citizens and bridge the digital divide by giving them more opportunities. A national infrastructure needs to be developed to ensure high-speed connectivity for rural and remote communities. It is leadership, which can transform the government rather than automation of existing practices, and technology. E-government will be government for the people where all citizens and private organisations and government will be online at any place or time they wish.

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Yesterday is a dream, tomorrow but a vision. But today well lived makes every yesterday a dream of happiness, and every tomorrow a vision of hope. Look well, therefore to this day.

— Sanskrit Proverb

Corporate Governance in India – Issues & Challenges

Durga Prasad Samantaray, Ashok Kumar Patnaik & Karunakar Patra

Corporate Governance as a working tool for improving the overall effectiveness of corporate enterprises has found wide acceptability in the corporate world in India. Corporate Governance as practiced in India has as its primary goal the optimization of the performance of corporate entities within the limitations placed on the corporate work environment by the intensity of investor aspirations on the one hand and the compulsions of public interest and situational constraints on the other. Corporate Governance tries to enunciate the responsibility of the Board of Directors and Managers, whether defined by the law or not, to ensure good performance.

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In the era of liberalisation, privatisation and globalisation, corporate governance is playing an important role. Although many people tend to think about Corporate Governance from a regulatory compliance perspective, we prefer to view it from an economic framework. This is because, in a real world, although many companies may manage to comply with the regulatory requirements for good corporate governance, their stakeholders are continuing to get a raw deal. Good Corporate Governance is ensuring managers run the business in the long term interest of the stakeholders and in doing so, ensure that all the other stakeholders are also taken care of. To do this we need to take corporate governance more seriously and find ways to get the wealth destroying companies to, first, improve their capital efficiency and, second, to harvest capital out of these areas so that it can be re-deployed in more productive sectors of the economy. The Indian companies that create wealth (in other words, have positive MVA), on an average, earn higher MVA/Capital than their comparable peer set (wealth creators) in other economies. The leading Indian MVA companies such as WIPRO, INFOSYS, HLL, RELIANCE, ITC and others can justifiably take a bow!

Corporate Governance is the system by which organisations are directed and controlled. The Corporate Governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as board, managers, shareholders and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. By doing this, it also provides the structure through which the company objectives are set and the means of attaining those objectives and monitoring performance. Organisation for Economic Co-operation and Development (OECD, April 1999)

Corporate Governance Concept

Managers generating large cash flows with limited opportunities for value creating (positive NPV) investment projects, tend to destroy share owner wealth by investing too much capital back into their existing business and/or making ill-conceived and over-priced acquisition forays into unrelated areas. The managers tend to 'fix' the game for their own benefit rather than think of the long-term interest of shareowners. Many private sector organisations around the world have found the implementation of the EVA framework a far more effective internally driven initiative to improve governance as compared to compliance mechanisms or transaction driven alternatives such as Leveraged Buy-outs and change in corporate control.

Many private sector organisations around the world have found the, implementation of the EVA framework, an effective internally driven initiative to improve governance.

Corporate Governance represents the three important things on which a beginner's decisions are based – value framework, the ethical framework and the moral framework. Decision-making is a crucial aspect for every business organisation, where the decisions are based not only taking into consideration the illegal or moral hazard but also on the government. Improving corporate governance and stakeholders' wealth creation performance is especially relevant in the Indian context for the following key reasons:

- The stakeholders' wealth creation track record of Indian companies is poor, when compared with companies in other economies. This is driving investors and boards to become increasingly active and demanding performance improvements from corporate India.
- Maximising stakeholders' wealth is no longer an academic or esoteric issue. It increasingly affects the common man as the proportion of the population that owns shares (directly or indirectly) continues to grow.
- The distinction between owners and managers is increasing. Family controlled companies are increasingly moving to delegate managerial responsibility to professionals rather than to family members, thus driving the need for more formal corporate governance mechanisms to better align owners' and managers' interests.

- Improvements to the take-over code and other regulatory policies are slowly but surely making it easier for shareowners to boot out inefficient management.

The increasing efficiency of capital markets and global mobility of funds across the world means that opportunity cost of shareowners' funds is increasingly real. If Indian corporates do not perform investors, especially Foreign Institutional Investors, will look elsewhere.

Indian companies have a poor stakeholders wealth creation track record. Our best performers are truly world class compared to other economies. However, our capital allocation, consumption and utilization put us way behind the others.

Our analysis shows that, on an average, the Indian companies create only 50 paise of Market Value Added (MVA) for every rupee of capital invested, whereas Pan-Asian, US and European companies are at least twice as productive; in other words, their MVA/Capital ratios are greater than one.

Need for Corporate Governance

Due to the separation of ownership from management, the primary responsibility for running a business with integrity and honesty lies with the managers who are accountable to the shareholders and investors. A vast majority of Indian corporates are controlled by promoters' families which while owning a negligible proportion of share capital in their companies rule them as if they are their personal kingdoms. This minority misgoverns the majority. In view of this misgovernance, corporate concepts like democratic management, professional management, transparent operations, etc., have become myths.

Corporates now have access to opportunities worldwide but at the same time they are also faced with the threat of the entry of global players in India. Due to scarcity of resources, attention is being given to development of greater and greater skills. There is an increasing awareness that the customers are the most important entity in any business. Also there is a growing realization that good corporate governance is a must not only to gain credibility and trust but also as a part of strategic management for survival, growth and consolidation.

The committee on corporate governance was set up in 1991 by the London Stock Exchange to look into the financial aspects of corporate governance. The committee led by Sir Adrian Cadbury had submitted its report on Corporate Governance in December 1992.

The report of the committee has activated Corporate Governance movements also in India. The recent needs in corporate governance in India has been owing to the following factors:

- Assertion of rights by a new breed of shareholders who are more discerning and objective.
- Significant presence of Foreign Institutional Investors who expect international standards in corporate governance, demanding greater professionalism in the management of Indian corporates.
- Concern on the part of lending institutions like banks and Financial Institutions about the functioning of companies financed by them.
- Integration of India with the world economy, which demands that Indian industry conforms to the standard set of international rules.

Corporate Governance in India

Good Corporate Governance has become the maha vakya in the boardrooms across the country, and as usual, many years after it became an accepted practice in the West, especially in the U.S., GCG received official blessings through amendments in 2000 to the Companies Act, 1956 (the Act), additional stipulations in the listing agreement and the institution of an annual award on excellence in corporate governance. Plans are also on the anvil to set up a Central Institute for Excellence in Corporate Governance, intended to tune up GCG mechanisms in tune with emerging globalisation.

It will not be out of place to recapitulate the compelling factors for the acceptance and adoption of GCG in India, which are: (i) compulsions for Indian companies to raise GDRs/ADRs abroad, and also getting their shares enlisted in foreign bourses, particularly at NASDAQ and New York stock exchanges; (ii) significant presence of a large number of Foreign Institutional Investors, who demand greater professionalism in India companies; (iii) integration of India with the world economy which entails following a standard set of international norms and standards; (iv) realisation by lending institutions which are now subject to rigorous accounting norms, particularly with regard to income recognition and provision against NPAs; and (v) assertion by shareholders of their rights.

Kumarmangalam Report

The objective of the committee was "enhancement

of the long-term shareholders' value while at the same time protecting the interests of other stakeholders". The key recommendations of the report were:

Board of Directors

It provides leadership, strategic guidance and objective judgment independent of the management to the company and exercises control over the company, while remaining at all times accountable to the shareholders. The Board has five basic responsibilities:

- Overseeing Strategic Development and Planning
- Management Selection, Supervision and Upgrading
- Maintenance of Good Member Relations
- Protecting and optimizing the Organisations' Assets
- Fulfilling Legal Requirements

Audit Committee

- Brief description of terms of reference
- Composition, name of members and Chairperson
- Meetings and attendance during the year

Remuneration Committee

- Brief description of terms of reference
- Composition, name of members and Chairperson
- Attendance during the year
- Remuneration policy
- Details of remuneration to all the directors, as per format in main report

Shareholders Committee

- Name of non-executive director heading the committee
- Name and designation of compliance officer
- Number of shareholders complaints received so far
- Number not solved to the satisfaction of shareholders

- Number of pending share transfers

General Body meetings

- Location and time, where last three AGMs held
- Whether special resolutions were put through postal ballot last year, details of voting pattern
- Person who conducted the postal ballot exercise
- Procedure for postal ballot

Disclosures

- Disclosures on materially significant related party transactions i.e. transactions of the company of material nature, with its promoters, the directors or the management, their subsidiaries or relatives etc. that may have potential conflict with the interests of the company at large.
- Details of non-compliance by the company, penalties, strictures imposed on the company by the Stock Exchange or SEBI or any statutory authority, on any matter related to capital markets, during the last three years.

Means of communication

- Half-yearly report sent to each shareholder
- Quarterly results
- Which newspapers normally published in
- Any website, where displayed
- Whether it also displays official news releases
- The presentations made to institutional investors or to the analysts.
- Whether MD&A is a part of annual report or not.

General Shareholder information

- AGM: Date, time and venue
- Financial Calendar
- Date of Book closure
- Dividend Payment Date
- Listing on Stock Exchanges
- Stock Code
- Market Price Data: High, Low, during each

month of the last financial year

- Performance in comparison to broad-based indices such as BSE Sensex, CRISIL index etc.
- Registrar and Transfer Agents
- Share Transfer System
- Distribution of Shareholding
- Dematerialization of shares and liquidity
- Outstanding GDRs/ADRs/Warrants or any Convertible instruments
- Plant Locations
- Address for correspondence

Corporate Governance and Finance

To many observers the significance of corporate governance to the transformations process is of fairly recent origin. As the need for governance has become increasingly urgent, a heated discussion has evolved. In a broader sense, good corporate governance is important for market confidence, the efficiency of international capital allocation, the renewal of industrial bases and ultimately the nation's overall wealth and welfare.

Corporate governance has become much wider than disclosures and compliance and calls for a paradigm change in the role of the Board and corporate directors. They need to be evolutionary and revolutionary, constantly moving the companies towards higher levels of creativity. Mr. N.R. Narayanmurthy, of Infosys, was of the view that it was not possible to run business by short changing shareholders; but only through following corporate governance.

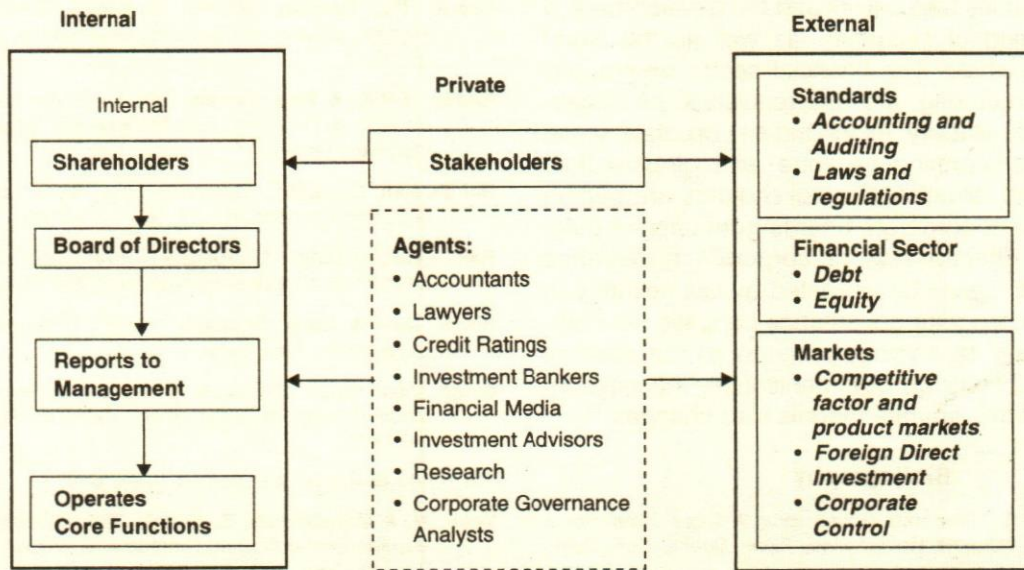
Today, it is clear that good corporate governance has moved from safeguarding the interest only of the shareholders or owners to promoting the interest of all its stakeholders, which include local government, societies, creditors, bankers, employees as well as direct consumers.

Good corporate governance has moved from safeguarding the interest only of the shareholders or owners to promoting the interest of all its stakeholders.

Scope of Corporate Governance

Corporate governance is generally viewed from the

Corporate Governance framework



(The Internal and External Architecture)

standpoint of shareholders interests. Though this perspective is legitimate and important, another perspective that deserves attention is that of economic development, especially in the context of the East Asian Economic crisis. From the development perspective, good governance is key to effective management of scarce capital resources, more so in developing countries. In India, the level of transparency and standards of disclosures observed by the corporate sector leave much to be desired. Corporate governance is a means of overcoming this problem as it seeks to minimize the malpractices by companies by establishing a system where more information about the transactions of the companies or decisions taken by the management are available to shareholders and public. In response to the Asian crisis, the World Bank is assisting countries in structural reforms that include measures to strengthen corporate governance. The World Bank as a member of the OECD's task force on corporate governance is bringing out voluntary guidelines and principles for improving corporate governance. The preliminary draft report comprises five principles on which corporate governance should be based. They are:

- Protect shareholders rights
- Equitable treatment of all shareholders
- Recognition of rights of stakeholders in creating wealth and jobs
- Disclosure of timely and accurate information on matters regarding the financial situations and performance; and

- Strategic guidance and effective monitoring of the company by the Board, and Board's accountability to the company and shareholders.

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Reasons for Failure inspite of these norms:

- Ineffective leadership
- Incompetence of the Board Members
- Lack of mutual trust
- Time deficit
- Constant change
- Less predictability in decision making
- Need for quicker decisions
- Superficial commitment to vision, mission and values.

Conclusion

To conclude, corporate governance is not only an

effective means of investor protection, but also carries wide implications for the operations and fund raising ability of companies themselves and the development of globalised trading of securities, as well as the world economy as a whole. The financial sector reform and corporate restructuring are pre-requisites for establishing economic stability. As the Indian corporate scene is gradually transforming to cope with globalisation, liberalisation and privatisation, stakeholders are getting restless to prevent corporate boards from offering them inferior deals. Effectiveness of corporate governance systems cannot merely be legislated by law neither can any system of corporate governance be static. As competition increases, technology pronounces the death of distance and speeds up communication, the environment in which firms operate in India also changes.

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A failure is not always a mistake; it may simply be the best one can do under the circumstances. The real mistake is to stop trying.

— B.F. Skinner

Corporate Governance in Selected Organisations

R. Satya Raju

Corporate governance plays a prominent role for creating confidence and trust among the people concerned. It helps improve organisational respect and excellence. This article discusses issues relating to the concept; its importance; recent trends; committees on corporate governance; corporate experiences with reference to three successful private sector organisations, in particular, and several other organisations, in general, for understanding the concept and content of corporate governance.

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The concept of Corporate Governance has gained considerable currency in recent years all over the world. Several organisations, including the World Bank, are focussing their attention on this subject, which is included in several management courses, executive development programmes and some other educational programmes. In Australia, the Royal Melbourne Institute of Technology has introduced a M.B.A. Corporate Governance course.

Corporate America is facing an intense crisis. The last two years have been particularly difficult. First it was the bust of the dotcoms that led to the erosion of billions of dollars of personal wealth. Then followed the slide in the stock markets that began in April 2001, the US dollar began its descent (against Euro and Yen) causing quite an uproar in several emerging economies (BSE - 2002). In USA, Europe, Asia, including India, several universities are offering this subject in the management curriculum. National Productivity Council of India and some other organisations are also focussing their attention on this important theme.

The World Bank concentrates its efforts on modernising the legal framework and strengthening the judicial system to promote economic and social development. The broad objectives of assistance are to help bring about legal and judicial reform, improve governance and physical infrastructure, and increase access to justice. Key elements of reform include promoting judicial independence through improved appointment systems, planning, and financing, as well as disciplinary procedures; modernising judicial administration and case management; and training judges and court personnel. Governance improvements encompass strengthening anticorruption programmes, building capacity in public agencies and civil society organisations, and supporting bar associations and legal education.

Research studies reveal lack of corporate gover-

nance in several organisations in India and abroad. In India, about 1,400 companies disappeared between 1991-96. Over one hundred dot.com companies have vanished from the Indian business scenario. Several non-banking companies have also closed down. Because of huge investments, institutional investors can effectively use ownership rights and make a worthwhile contribution to the governance of companies. The growth of institutional investors is very significant in the UK and USA. In 1963, individuals held 54 per cent of corporate equity and institutional investors 29 per cent. By 1994, the proportions were changed drastically to 20 per cent and 60 per cent, respectively (Vasudha Joshi 2002). Corporate democracy and better behaviour will go a long way to improve the current business culture in the eyes of the public, but unless these changes are accompanied by a new vision of the purpose of business, they will be seen as mere palliatives (Charles Handy 2002).

The Concept and Importance

Corporate Governance refers to corporate discipline. There are several views on the concept of corporate governance. It means, a structural framework to make a healthy and competitive company with self cleaning and competitiveness by following strategies, transparency, innovation and social orientation. According to the Confederation of Indian Industry (CII), corporate governance deals with the laws, procedures, practices that determine a company's ability to take informed managerial decisions vis-à-vis its claimants, the shareholders, creditors, employees and the State.

Corporate governance deals with the laws, procedures, practices that determine a company's ability to take informed managerial decisions vis-à-vis its claimants.

The Cadbury Committee defines this concept as, "the system by which companies are directed and controlled, thus, placing the Board of Directors of a company in the centre of the governance system". Maximising the shareholders' value in a legal and ethical manner is the symbol of good corporate governance. According to the Cadbury Committee in the UK, the three pillars of corporate governance are—nomination committee, remuneration committee and audit committee. These committees have to perform various functions as directed. In Germany, the corporate governance system has a two-tier Board structure—the

supervisory board (SB) and the executive board (EB). In Japan, corporate governance emphasises growth and market share of the organisation.

The US corporate governance structure is stipulated by the legal system. The contents of the established corporate laws in each state are the same, containing a general committee of stockholders and a board of directors. The stakeholders are the supreme rulers of corporate governance because they have the power to appoint and dismiss members of the board of directors.

As per the citizen's charter for good governance, the fundamental objective of corporate governance is the "enhancement of long term shareholder value while at the same time, protecting the interest of the stakeholders". Corporate governance is needed for the following reasons: to practice ethics and values; to create confidence among the stakeholders; to improve operational efficiency of the business; to protect the rights of the shareholders; to provide protection to financial and other lending institutions; to strengthen the Board of Directors; to provide protection to financial and other lending institutions; to strengthen the Board of Directors; to provide autonomy and responsibility to the Board of Directors; to create wealth and economic value.

Constitution of Committees, Boards and Associations

All over the world, several committees have been constituted on corporate governance. Some of them are: The Cadbury Committee (1991) of UK; The King Committee (1994) of South Africa; The Toronto Stock Exchange Report of Canadas (1994); Australian Association of Investment Managers (1995); Global Corporate Governance Advisory Board; The OECD Principles of Corporate Governance (1999); International Corporate Governance Network (1995); Centre for European policy Studies—Brussels (1995); The Vienot Committee (1995); Davis Global Advisors Inc. (1996); The Blue Ribbon Committee of the USA; The Hampel Committee of UK (1997); The Kumar Mangalam Birla Committee of India (1999); Confederation of Indian Industry (1998).

All these committees and associations studied the functioning of corporate governance in various countries and companies and submitted reports with recommendations. They emphasised the importance of corporate governance in creating trust and confidence among shareholders. The rights of shareholders; equitable treatment of shareholders; the need for disclosure

and transparency; the role and responsibilities of the Board of Directors; are also highlighted.

Recent Trends

The recent trends in corporate governance in the United States and the United Kingdom are the following: Boards are getting more involved not only in reviewing and evaluating company strategy but also in shaping it; institutional investors such as pension funds, mutual funds and insurance companies are becoming active on boards and are increasing pressure on the top management to improve corporate performance; shareholders are demanding that directors and top managers own more than token amounts of stock in the corporation. Stock is increasingly being used as part of a director's compensation; non affiliated outside directors are increasing their numbers and power in publicly held corporations as CEOs are losing their grip on boards. Outside members are taking charge of annual CEO evaluations; boards are getting smaller, partially because of the reduction in the number of insiders but also because boards desire new directors who have specialised knowledge and expertise instead of general experience; boards continue to take more control of board functions by either splitting the combined Chair/CEO into two separate positions. As corporations become more global, they are increasingly looking for international experience in their board members; the combined Chair/CEO position is being increasingly criticised because of the potential for conflict of interest. The CEO is supposed to concentrate on strategy, planning external relations and responsibility to the board. The Chairman's responsibility is to ensure that the board and its committees perform their functions as stated in the board's charter. The Chairman conducts meetings and also presides over the annual shareholders' meetings. Some critics say that the board can properly oversee top management if the chairman is also in the top management. In view of this, the chairman and CEO roles are separated by law in Germany, The Netherlands, Finland, Britain, Australia (Yogesh and Singh 2002).

Organisational Experiences

Several organisations in the USA., including Bank America, Eastman Kodak, Phillips Petroleum, Chase Manhattan, etc., have been implementing the practices of corporate governance effectively. In Europe, Australia and Asia several companies have introduced corporate governance practices for organisational transparency and effectiveness.

Companies have introduced corporate governance practices for organisational transparency and effectiveness.

The following information provides some shortcomings in American Corporate Conduct (Business Week in BSE, 2002).

Adelphia Communications	Failure to disclose loan guarantees
Arthur Andersen	Shortcomings in audit and destruction of audit documents (Enron, Global Crossing, Qwest, and WorldCom)
CMS Energy	Roundtrip trades that overstated revenues
Computer Associates	Overstating revenues
Credit Suisse First Boston	Irregularities in IPO allocation; agreed to pay US\$100 million to NASD
Deloitte & Touche	Shortcomings in audits (Adelphia)
Dynegy	Round-trip trades that allegedly inflated revenues
Edison Schools	Failure of internal audit
Enron	Abuse of accounting and disclosure rules to inflate profits
Ernst & Young	Breach of auditor independence rules (marketing agreement to sell software with Peoplesoft, an auditing client)
Global Crossing	Inflating revenues
Halliburton	Accounting policies that treated cost overruns as revenue
Hedge Funds	Conflicts of interest
ICapital Markets	Alleged irregularities in trades
KMart	Underreporting of losses
KPMG	Failure to catch alleged revenue inflating maneuvers (Xerox)
Lucent Technologies	Booking revenue before realisation
Merrill Lynch	Conflicts of interests: agreed to pay US\$100 million
Network Associates	Overstating revenues
PNC Financial services	Accounting practices
Qwest Communications	Inflating revenues
Reliant Resources	Accounting inadequacies
Trump Hotels	Accounting inadequacies
Waste Management	Accounting inadequacies
WorldCom	Accounting inadequacies
Xerox	Inflating inadequacies

In India, as per the study conducted by Business Today, the top companies following corporate governance practices are: Hindustan Lever Limited; Telecom; Bajaj Auto; HDFC; L&T; TISCO; ACC; Colgate; Indian Hotels; IDBI; Infosys; Wipro; Satyam; Dr Reddy's Laboratories; Reliance Industries Ltd; Asian Paints, etc.

Infosys Technologies Ltd., Asian Paints Ltd., and Reliance Industries Limited are professionally managed companies in India. These companies have been showing excellent performance and contributing a lot to the nation either in terms of employment or in increasing income and value of the assets. They have been following effective corporate governance practices. The practices of these organisations have been outlined below.

Infosys Technologies Ltd., Asian Paints Ltd., and Reliance Industries Limited have been following effective corporate governance practices.

Infosys Technologies Ltd.

The policy of the company is to have a Chairman and Chief Mentor—Mr. N.R. Narayana Murthy; a Chief Operating officer (COO) and Deputy Managing Director—Mr. S. Gopalakrishnan. There are clear demarcations of responsibility and authority. The Chairman and Chief Mentor is responsible for mentoring Infosys core management team in transforming the company into a world-class, next-generation organisation that provides state-of-the-art technology-leveraged business solutions to corporations across the world. He also interacts with global thought-leaders to enhance the leadership position of Infosys. In addition, he continues to interact with various institutions to highlight and help bring about the benefits of IT to every section of society. As chairman of the board, he is also responsible for all board matters (Annual Report 2002). The CEO, President and Managing Director is responsible for corporate strategy, brand equity, planning, external contracts, new initiatives, and other management matters. He is also responsible for achieving the annual business plan. The COO and Deputy Managing Director is responsible for all customer service operations. He is also responsible for technology, acquisitions and investments. The Chairman, CEO, COO, the other executive directors and the senior management make periodic presentations to the board on their responsibilities, performance and targets.

Board members are expected to possess the expertise, skills and experience required to manage and guide a high-growth, hi-tech, software company deriving revenue primarily for G-7 countries. Expertise in strategy, technology, finance, quality and human resources is essential. Generally, they will be between 40 and 60 years of age. They will not be relatives of an executive director or of an independent director. They are generally not expected to serve in any executive or independent position in any company in direct competi-

tion with Infosys. Board members are expected to rigorously prepare for, attend, and participate in all board and relevant committee meetings. Each board member is expected to ensure that their other current and planned future commitments do not materially interfere with the member's responsibility as a director of Infosys.

The board is responsible for the selection of any new director. The board delegates the screening and selection process involved in selecting the new directors to the nominations committee, which consists exclusively of independent directors. The nominations committee makes recommendations to the board on the induction of any new member.

The board constantly evaluates the contribution of its members, and recommends to shareholders their re-appointment periodically as per statute. The current law in India mandates the retirement of one-third of the board members (who are liable to retire by rotation) every year, and qualifies the retiring members for re-appointment. Executive directors are appointed by the shareholders for a maximum period of five years at a time, but are eligible for re-appointment upon completion of their term. Non-executive directors do not have a specified term, but retire by rotation as per law. The nominations committee of the board recommends such appointments and/or re-appointments. However, the membership term is limited by the retirement age for the members. Under this policy, the maximum age of retirement of all executive directors is 60 years, which is the age of superannuation for the employees of the company. Their continuation as members of the board upon superannuation/retirement is determined by the nominations committee. The age limit for serving on the board is 65 years.

The compensation committee determines and recommends to the board the compensation payable to the directors. All board-level compensations are approved by shareholders, and separately disclosed in the financial statements. Remuneration of the executive directors consists of a fixed component and a performance incentive. The compensation committee makes a quarterly appraisal of the performance of the executive directors based on a detailed performance-related matrix. The annual compensation of the executive directors is approved by the compensation committee, within the parameters set by the shareholders at the shareholders meetings. Compensation payable to each of the independent directors is limited to a fixed amount per year as determined and approved by the board—the sum of which is within the limit of 0.5 per cent of the net profits of the company for the year calculated as per the provisions of the Companies Act, 1956. The com-

pensation payable to independent directors and the method of calculation are disclosed separately in the financial statements. Those executive directors who are founders of the company have voluntarily excluded themselves from the 1994 Stock Offer Plan, the 1998 Stock Option Plan and the 1999 Stock Option Plan. Independent directors are also not eligible for stock options under these plans, except for the latest 1999 Stock Option Plan. The board has complete access to any information within the company, and to any employee of the company. At meetings of the board, it welcomes the presence of managers who can provide additional insights into the items being discussed.

The information regularly supplied to the board includes: annual operating plans and budgets, capital budgets, updates; quarterly results of the company and its operating divisions or business segments; minutes of meetings of audit, compensation, nomination, investors grievance and investment committees, as well as abstracts of circular resolutions passed; general notices of interest; declaration of dividend; information on recruitment and remuneration of senior officers just below the board level including appointment or removal of CFO and company secretary; materially important litigations, show cause, demand, prosecution and penalty notices; fatal or serious accidents or dangerous occurrences, any material effluent or pollution problems; any materially relevant default in financial obligations to and by the company or substantial non-payment for goods sold by the company; any issue which involves possible public or product liability claims of a substantial nature; details of any joint venture or collaboration agreement; transactions that involve substantial payment towards goodwill, brand equity or intellectual property; significant development on the human resources front; sale of material nature, of investments, subsidiaries, assets, which is not in the normal course of business; details of foreign exchange exposure and the steps taken by management to limit the risks of adverse exchange rate movement; and non-compliance of any regulatory, statutory nature or listing requirements as well as shareholder services such as non-payment of dividend and delays in share transfer.

The board's policy is to have, regularly, separate meetings with independent directors to update them on all business-related issues and new initiatives. In such meetings the executive directors and other senior management personnel make presentations on relevant issues. The board has five committees—the audit committee, the compensation committee, the nominations committee, the investors grievance committee and the investment committee. The first three consist entirely of independent directors. The investors grievance committee is composed of an independent, non-executive

chairman and some executive and non-executive directors. The investment committee consists of all executive directors.

The board is responsible for the constituting, assigning, co-opting and fixing of terms of service for committee members to various committees, and it delegates these powers to the nominations committee. The chairman of the board, in consultation with the company secretary of the company and the committee chairman, determines the frequency and duration of the committee meetings. Normally, all the committees meet four times a year except the investment committee which meets as and when the need arises. Typically, the meetings of the audit, compensation and nominations committees last for the better part of a working day. Recommendations of the committee are submitted to the full board for approval. The quorum for meetings is either two members or one-third of the members of the committees, whichever is higher.

The primary objective of the audit committee is to monitor and provide effective supervision of the management's financial reporting process with a view to ensure accurate, timely and proper disclosures and the transparency, integrity and quality of financial reporting. The committee oversees the work carried out in the financial reporting process—by the management, including the internal auditors and the independent auditor—and notes processes and safeguards employed by each. It provides an open avenue of communication between the independent auditor, internal auditor, and the board of directors ("BoD"). It meets at least four times every year. The audit committee may ask members of the management or others to attend meetings and provide pertinent information as necessary. It confirms the independence of the external auditor and objectivity of the internal auditor. It reviews with the independent auditor the co-ordination of audit efforts to assure completeness of coverage, reduction of redundant efforts, and the effective use of all audit resources.

The primary objective of the audit committee is to monitor and provide effective supervision of the management's financial reporting process.

It reviews with the independent auditor the adequacy of internal controls including computerised information system controls and security, and related findings. It considers and reviews the management, internal auditor and the independent auditor; significant

findings during the year, including the status of previous audit recommendations; any difficulties encountered in the course of audit work including any restrictions on the scope of activities or access to required information; and any changes required in the planned scope of the internal audit plan. It reports periodically to the BoD significant results of the foregoing activities.

The committee shall consist solely of 'independent' directors of the company and shall be comprised of a minimum of three directors, each of whom is 'financially literate' or shall become 'financially literate' within a reasonable period of time after his or her appointment. They should be diligent, knowledgeable, dedicated, interested in the job and willing to devote a substantial amount of time and energy to the responsibilities of the committee, in addition to BoD responsibilities. At least one of the members shall have accounting or related 'financial management expertise'. The members of the committee shall be elected by the BoD and shall continue until their successors are duly elected. The duties and responsibilities of a member are in addition to those applicable to a member of the BoD. In recognition of the time burden associated with the service and, with a view to bringing fresh insight, the committee may consider limiting the term of audit committee service, by automatic rotation or by other means. One of the members shall be elected as the chairman either by the full BoD or by the members themselves, by majority vote.

The internal auditors of the company are in the best position to evaluate and report on the adequacy and effectiveness of internal control. Keeping in view the need for the internal auditors' independence from management a formal mechanism is created to facilitate confidential exchanges between the internal auditors and the committee, regardless of irregularities or problems. The work carried out by each of these auditors needs to be assessed and reviewed with the independent auditors.

As a result of the transparency, autonomy, accountability and commitment towards high professionalism, the organisation has been considered number one among the most respected companies in 2002.

The organisation has been considered number one among the most respected companies in 2002.

Asian Paints

Asian Paints (India) Limited believes that best board

practices, transparent disclosures and empowerment of shareholders are necessary for creating shareholder value. An industry-wide corporate governance initiative in India was pioneered by the Confederation of Indian Industry (CII) in 1997-98. Subsequently, the Securities and Exchange Board of India (SEBI) set up a committee on corporate governance and based on the recommendations of this committee, a new Clause 49 has been inserted into the listing agreements of all the stock exchanges in the country. Clause 49 specifies the standards that Indian companies have to meet and the disclosures they have to make with regard to corporate governance (Annual Report 2002).

The company's commitment to corporate governance precedes this statutory requirement. Asian Paints had set up an audit committee as far back as 1990 under the chairmanship of an independent director. Appropriate disclosures are made to the shareholders, thereby ensuring greater transparency and better financial reporting.

As on 31 March 2002, the Board comprised of 14 Directors, out of whom, six are promoter-Directors. Three of the six promoter-Directors, including the Executive Chairman, are whole-time Executive Directors, while the other three are Non-Executive. Of the remaining eight Directors, seven are Non-Executive and independent and one is Non-executive but not independent.

The Asian Paints Board met nine times during the year 2001-2002. The maximum gap between any two Board Meetings was 84 days.

Inter-alia, the following is provided to the Board as part of the agenda papers well in advance of the Board meetings or is tabled at the Board meetings: annual budgets; quarterly results of the company and its operating divisions or business segments; minutes of meetings of the audit committee and other committees; information on recruitment and remuneration of senior officers just below the Board level; fatal or serious accidents or dangerous occurrences; any materially significant effluent or pollution problems; any materially relevant default in financial obligations to and by the company or substantial non-payment for goods sold by the company; any issue which involves possible public or product liability claims of a substantial nature; details of any joint venture or collaboration agreement; transactions that involve substantial payment towards goodwill, brand equity or intellectual property, significant labour problems and their proposed solutions; significant development in the human resources and industrial fronts; sale of material nature, of investments, subsidiaries, assets, which is not in the normal course

of business; the steps taken by the management to limit the risks of adverse exchange rate movement; and non-compliance of any regulatory, statutory nature or listing requirements as well as shareholder services such as non-payment of dividend and delays in share transfer.

The company does not have a remuneration committee. The Executive Chairman and other Executive Directors are paid remuneration as per their agreements with the company. These agreements are placed for approval before the board, shareholders and such other authorities as may be necessary. The remuneration structure of the Executive Chairman and other Executive Directors comprises salary, house allowance, commission, perquisites, contribution to provident fund/superannuation, gratuity and leave salary.

The Company has an independent audit committee. The composition, procedures, powers and role/functions of the audit committee constituted by the company comply with requirements of the Companies Act, 1956, as well as those of Clause 49 of the listing agreement.

The terms of reference of the Audit Committee include the following: overseeing the company's financial reporting process and the disclosure of its financial information; recommending appointment and removal of the external auditor, fixing of audit fees and approving payments for any other service; reviewing with management the half-yearly and annual financial statements with primary focus on accounting policies and practices, compliance with accounting standards and stock exchange and legal requirements concerning financial statements; reviewing adequacy of internal control systems and the internal audit function and ensuring compliance of internal control systems and reviewing the company's financial and risk management policies; reviewing reports furnished by the internal auditors and statutory auditors and ensuring suitable follow up thereon.

As on 31 March 2002, the audit committee comprised four Non-executive Directors, of whom three are independent. The members of the committee are Mr. Manubhai G. Patel (Chairman of the Committee and Independent Director), Mr. Mahendra C. Choksi (Non-Executive Director), Ms. Tarjani Vakil (Independent Director) and Mr. Mahendra M. Shah (Independent Director). The members of the committee have financial and accounting knowledge.

The Company has constituted a Shareholders/Investors Grievance Committee of the Board of Directors to specifically look into complaints received from the

shareholders of the company. The members of the company's Shareholders/Investors Grievance Committee are Mr. K. Rajagopalachari (Non-Executive Director) who is the Chairman, Mr. Abhay A. Vakil (Managing Director), Mr. Mahendra C. Choksi (Non-Executive Director) and Mr. Mahendra M. Shah (Independent Director).

Reliance Industries Ltd. (RIL)

Reliance Industries Ltd., is one of the world's largest integrated organisations. It has a vast reservoir of intellectual capital with young, dynamic, committed and skilled human resources. Global benchmarking practices are the mantra of the organisations.

The RIL is committed to achieving the highest international standards of corporate governance—including shareholders, employees, the government and creditors (Annual Report 2000).

The board of Directors comprises of 11 directors, including five external directors. The external directors include two nominees from leading investment and financial institutions. The important committees are: audit committee; compensation committee; finance committee; and share transfer committee.

Except for the Finance Committee, all other committees comprise of external directors only. The organisation has set in place a policy framework for ethical business conduct by its human resources. The policy contains their values and commitments; code of ethics, business policies, the insider trading policy and a detailed programme for ethics management.

The organisation believes that increased transparency and enhanced disclosure promote better corporate governance. It has set new benchmarks in adequate and timely corporate disclosure. It regularly maintains a very high degree of interaction with its institutional debt and equity investors. Reliance endowed a chair for Corporate Law and Governance at the National Law School of India University to coordinate and manage studies, academic courses, training, curriculum development and publication and dissemination of information and documentation pertaining to Corporate Law and Governance.

The accounts are audited by statutorily appointed Indian auditors, and a firm of international accountants. In the interests of its wide base of international debt and equity investors, Reliance also provides, as a matter of regular practice, a reconciliation of its quarterly and annual accounts with US GAAP and International Accounting Standards (IAS).

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Reliance became the first Indian company to voluntarily initiate the process of regularly making detailed presentations on current financial performance, to the leading government controlled investment institutions in the country in 2000. This was viewed as a pioneering step in promoting corporate governance, given the substantial shareholding enjoyed by such institutions in most Indian corporates.

Reliance regularly maintains a very high degree of inter-action with its institutional debt and equity investors, in India and abroad, to keep them abreast of current developments in the company, and to address their ongoing need for information. During the year, Reliance became the first Indian company to publish an Intellectual Capital Report, providing insights into the value-creation processes within the company.

This was aimed at redressing the imbalance between non-financial and financial data, and in recognition of the belief that the value of organisations will, in times to come, increasingly reside in their intangible assets. The Intellectual Capital Report will now be published ever year. Reliance makes full use of the power of technology, for communicating online corporate, financial and product information, on its website, www.ril.com.

Other Corporate Groups

The House of Tatas; the Birla Group; the Kirloskar Group; the Dalmia Group; the Bajaj Group; the Oswal Group; the Mafatlal Group; the Oberoi Group; the Munjal Group; the Khaitan Group showed high performance in terms of net profits and total assets during 1992-93 to 1996-97 as a result of good corporate culture and governance practices (Vijay Sharma 2001).

Conclusion

As per the research studies and literature available in India and abroad, it is evident, that, some companies are the most respected and some are least respected, based on the parties of corporate governance.

Autonomy and accountability are to be fixed and implemented for effective governance. Internal audit system is to be strengthened in every organisation. The positions of CEO and chair are to be separated.

All the organisations have to provide the true picture of the financial statements and all other information required for the stakeholders. The organisations have to create trust and confidence among the shareholders and general public. The members of the board have to possess the required qualifications and qualities to perform their functions effectively. The CEOs of the organisations should be visionaries, wise and value based. The government has to encourage transparency, values and ethical practices by creating, and encouraging congenial environment for sound governance practices. The most successful and valued companies like Infosys, Asian Paints, RIL, HLL, Satyam, etc., are to be taken as model companies to implement corporate governance in the organisations where it is not satisfactory. With the will to follow effective governance practices from the boards, top managements, executives employees and society, Indian companies will reach the top position in the global business scenario in the years to come.

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Organisational Strategy in WTO Regime

M.P. Gupta

This paper reviews the World Trade Organisation (WTO) in general, concerns of Intellectual Property Rights (IPR) in particular and its influences on organisational strategy. The current literature on the WTO in relation to India attention is on regulations of the WTO, Regional Trade Arrangements and country level concerns. There is hardly any discussion on organisational level influences of the WTO regime. Here the attempt is to describe the significance of organisation level strategy in the WTO regime by citing some examples.

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Introduction

With the commencement of a regular organisational set up in the name of WTO in 1995 which has a large number of nations agreeing to comply with regulations to remove trade barriers, there are several levels of concerns that individual nations as well as regional unions of nations are engaged to resolve. Uruguay, Seattle, Doha rounds have not yet been able to bring out a consensus and conclusions to many issues such as subsidies in some critical sectors, misuse of IPR regime, and e-commerce. It is important to understand some basic facts to be able to make a value judgement on these issues. These facts relate to the available planet resources vis-a-vis our knowledge to exploit these resources to be able to feed the increasing world population on a sustainable basis. It is predicted that by 2020, the world population would reach 7.3 billion thereby leading to an exponential increase in the demand in priority areas such as food, shelter and health, straining the planet resources. The challenge before us in this century would be to evolve not only knowledge and technologies that ensure conservation of natural resources, optimisation on manpower and energy with a simultaneous maximisation of productivity, but they have to be environment-friendly and cost effective. As stated by Ganguli (2000), a concerted global real-time teamwork will be required in the creation of new knowledge, exploitation of the cumulated human learning over the centuries and frameworks for sharing expertise, infrastructure and know how in a scale the world has not so far experienced. There will be newer ways of working and benefit sharing among nations, corporates and individuals, all designed to enrich the quality of life under the most demanding societal dynamics.

Our predecessors have been very wise to have conceived an International agency i.e. United Nations (UN) which has the mandate of countries the world over to guide the management of scarce planet resources and spearhead human development. An idea was floated at the end of World War II to create the international system of economic organisations, that would help to

reconstruct all the destroyed countries when the war was over and would provide efficient economic ties among the member countries. Three institutions were considered:

- currency task organisation – IMF created in 1944 in Bretton Woods
- credit organisation – IBRD created in 1944 in Bretton Woods
- trade organisation – International Trade Organisation – was never created!

General Agreement on Tariffs and Trade (GATT) – signed on 30.10.1947 in Geneva, Switzerland – was to be a forum for multilateral negotiations on a variety of international trade issues, including tariff and quota policy and trading practices. When the idea of creating ITO died, GATT became the major arbiter of world trade for almost fifty years.

The World Trade Organisation (WTO) came into being in January 1995 in Geneva and succeeded the GATT. The GATT was a set of rules, a multilateral agreement, with no institutional foundation. The WTO is a permanent institution with its own secretariat. The multilateral trading system was developed through a series of trade negotiations while GATT existed. The first rounds dealt mainly with tariff reductions but later negotiations included other areas such as anti-dumping and non-tariff measures. The latest round, the 1986-94 Uruguay Round, led to the WTO's creation. Present membership is 140 countries (up to 30.10.2000). New members China and Taiwan (10.11.2001) have raised a lot of hopes and curiosity among other member countries. Total budget in the year 2000 was 127 million Swiss francs. The structure of WTO is briefly described as:

- i. Ministerial Conference – head of WTO (the meetings take place biennially) is a one country/one vote body (Tuvalu has the same influence on policy as Germany).
- ii. General Council – composed of representatives of each member state manages the following councils:
 - ✦ Council for Trade in Goods
 - ✦ Council for Trade in Services
 - ✦ Council for Trade-Related Aspects of Intellectual Property Rights (TRIPS)
- iii. Dispute Settlement Body (DSP)
- iv. Trade Policy Review Body

- v. Secretariat, headed by Director-General (Michael Moore from New Zealand) nominated by Ministerial Conference

The Gatt rules applied to trade in merchandise goods. The WTO covers trade in services and trade-related aspects of intellectual property. Objective is to promote the rising standards of living and to develop the resources of the world. The WTO seeks a substantial reduction of tariffs and other barriers to trade and the elimination of discriminatory treatment in international commerce. WTO seeks to achieve trade liberalisation and the elimination of geographic discrimination.

Supranationalism refers to a level of political authority above the nation state. It implies a shift in sovereignty away from states and toward an international institution. The European Union (EU) is the best example of a supranational authority: the European Commission, is, for instance, able to make and, ultimately enforce laws on EU member states. This includes the removal of all government-induced border tariff and non-tariff barriers to the movement across national borders of all goods and services leading to full economic integration. This integration leads to a Single Market. The WTO is nowhere near as strong as the European Commission.

WTO has been criticised for moving too slowly and leaving too many issues unresolved. These shortcomings are widely seen as one of the reasons for the popularity of regional and preferential trade arrangements such as EU and NAFTA, which are perceived as more flexible and more amenable to “deeper” integration.

Future of WTO

There have been substantial changes in the world economy in the 1990s. Capital is much more mobile internationally and exchange rates are more flexible. Many of the transition economies of East Europe and Central Asia have suffered declining incomes and their economies are not integrated with the rest of the world. Electronic commerce is recognised as the new mode of transacting business. Regional trading arrangements have proliferated. In these circumstances, there is a need for a clear view as to the direction in which the WTO should move. The opportunities therefore available now are:

- Integration of the former Soviet states and the countries of Eastern Europe into the framework of open international trade
- Expansion of the telecommunications sector and electronic trade

- Opportunity to bring international industrial espionage to an end

WTO should provide a set of rules that lead to the efficient organisation of world production and consumption in a world economy with much higher levels of cross-border flows in goods, services, assets and intellectual property. It would face threats from the following:

- Radical organisations in various countries
- Regionalism in the form of trade blocks – groups such as NAFTA or EU have regulations that conflict with those of the WTO
- Intellectual property regime favouring MNC and rich nations

Some of the weaknesses, which WTO needs to address, are:

- Absence of any mechanism for weighting the influence of a member proportionally to the size of the member's economy
- Apprehension of many member nations regarding the loss of national sovereignty under the WTO
- Some countries such as Russia, though willing to join the WTO, is unable to meet the requirements for membership
- Insufficient liberalisation of foreign direct investment

Concerns of Intellectual Property Rights (IPR)

Successes of US and some of the European economies establish the fact that the information and knowledge industry plays a very critical role in national economic growth. Developing countries need to realize that trade in knowledge-related goods and services can have profound consequences for societies. The real challenge being faced now is the creation of a knowledge regime—Trade Related Intellectual Property Rights (TRIPS) under the aegis of the WTO has led to the world wide commodification of knowledge.

It is a common belief that IP laws are going to benefit primarily those countries whose domestic economies and exports are tied to the servicing of the 'life sciences' and 'Information economy'. For instance, the largest US trade export item in 1996 was software and entertainment that had a combined worth of US\$ 60.2 billion. Given such volumes of trade in information, market consolidation has become a key objective of the

dominant players, and every perceived barrier from piracy and protectionism, have become matters of concern at multilateral trade negotiations. The threat posed by intellectual piracy has, for instance, become the basis for global anti-piracy alliances. Other countries, whose GDPs progressively reflect service-sector based incomes, such as Japan and some of the countries belonging to the European Community, are also key promoters of the global IP regime.

It is thus a forgone conclusion that TRIPS would reinforce the competitive advantages and the global economic power of developed countries, the USA in particular. The present knowledge regime is skewed towards reinforcing the interests of the developed world. It is the product of a peculiarly parochial worldview that unfortunately has attained currency today. Coombe (1998), in *The Cultural Life of Intellectual Properties*, alludes to the particularity of this worldview

Non-Native people must begin to recognise the contingency and peculiarity of their own concepts of property and the colonial foundations on which they are built. The abstraction, commodification, and separation of land from people's social lives and from the cultural forms in which we express meaning and value as human beings living in communities represent only a peculiar, partial and limited way of dividing up the world. The range of Western beliefs that define intellectual and cultural property laws – that ideas can be easily separated from expressions, that expressions are the singular products of the individual minds of Romantic authors... are not universal values that express the full range of human possibility, but particular, interested fictions emergent from a history of colonialism that has disempowered many of the world's people.

TRIPS would reinforce the competitive advantages and the global economic power of developed countries, the USA in particular.

In December 2002, United States blocked agreement on a global pact to allow poor countries to buy cheap drugs to tackle epidemics such as AIDS, malaria and tuberculosis (The Economic Times, December 21, 2002). US took a stand to work with other WTO members to try to find a solution that would not challenge any country that broke WTO rules to export generic versions of patented drugs to poor countries that needed them. Poorer countries wanted the drug deal to allow

them to order copies of drugs developed by major pharmaceutical firms based in richer states from manufacturers in countries like India, Thailand and Brazil. An outline drugs accord was first approved at a WTO ministerial conference in Doha 13 months ago, clearing the way for an agreement to launch the new round aimed at lowering barriers to trade in goods and services. When countries are at different levels of development, it's prudent to have a deferential, rather than (an) uniform, international regime for the protection of intellectual property rights (Nayyar, 1992).

The scope for protecting public interests is as a result of the supranational trade regime. The shift is towards a restrictive understanding of proprietorship in IP. MNCs are filing patent applications that are deemed to be anti-national, for instance on products such as 'basmati' rice, 'turmeric' and 'neem'. Recently RiceTec Inc. was granted patent on three varieties of 'basumati'. Further, US patents [having numbers 6,051,235; 6,242,012; 6,063,381; 6,224,871; 6,054,585; 5,072,383; 6,171,683; 6,159,474] have been awarded for a variety of uses of spices such as ginger, piperine, coffee substitute and aswagandha. So also a broad based patent in US for spices derived from Amla to Natreon Inc., a New Jersey based company. Russians have recently filed six patents on 'vacha', a semi-aquatic herb found in India, out of a total of 26 global patents. It is essential that wherever scientifically possible, Indian S & T institutions and companies must initiate serious R & D programme leading to good quality patents, failing which the Indian Basumati story may happen for this sector as well.

The US patent Office has just granted a patent for "both hand hair cutting methods". Network Associates had been granted a patent for "Method and System for Providing Automated Updating and Upgrading of Antivirus Applications Using a Computer Network" – something that companies have been doing for years. There is excessive protection of IP and how it is accorded trumping power over other values and social priorities such as access to medicines, to education, and to the sharing of ideas and information. This pity situation is expressed as:

"I can't purchase anti-HIV drugs because of patent law?" or

"As a farmer, I can't get access to patent-protected seeds for planting?" or

"As a teacher, I can't distribute materials to my students due to copyright restrictions?"

Noam Chomsky once said, "this harsh regime [of Intellectual Property Rights] is designed to grant multi-

national corporations control over the technology of the future. These would let them control essentials of life, guarantee huge profits on drugs that are priced far beyond the reach of taxpayers who fund research, let alone the bulk of the world population. It really is a scandal". Here, it is worth quoting Jagdish Bahgvti, the celebrated Professor of economics and consultant to Arther Dunkel of GATT, "how we turn the WTO into a royalty-collecting agency for multinational companies by introducing TRIPS into the Uruguay Round!"

CSIR, IARI, IITs, IISs are some of the leading Indian institutions responsible for the development of contextually relevant technologies. But at present, these institutions are under-funded and on the margins. Keniston (1998, p. 106) highlighted the neglect of national interests on the indigenisation of software in India. He refers to the anomaly illustrated by the fact that while the Windows NT platform has been localised in the major Latin languages and 'enabled' for Catalan, Rhaeto-Roman, Bahasa and Icelandic, and the Macintosh operating system has been localised for the language spoken in the Faeroe Islands, in Kazakh and Uzbek, neither companies offer programmes in Hindi, one of the largest spoken languages in the world. For a country of India's size, such minimal requirements could have become the basis for Microsoft and Apple Macintosh trading in India. While it has been confirmed in a recent report (Staff Reporter, 1999, p. 13) that Windows 2000 will be a multilingual platform capable of processing languages in the Devanagri script, this example is still illustrative of the politics of prioritising. Early inductions of such software could have led to transfers of technology and to the development of language software for India's 18 other official languages.

CSIR, IARI, IITs, IISs are some of the leading Indian institutions responsible for the development of contextually relevant technologies.

Some active NGOs [such as the Research Foundation for Science, Technology and Ecology and the Karnataka-based farmer's association, the Karnataka Rajya Raita Sangha (KRRS)], have led to significant increases in national awareness on issues related to international trade and IP in particular, and its consequences for local livelihoods. There have also been innovative expressions of local sovereignty, for example, the cataloguing of all genetic resources by villagers in Pattuvam, a village in North Kerala, leading to a "declaration placing controls over identified genetic resources available and utilised within the jurisdiction of the village" (Alavares,

1997, p. 11). Furthermore there have been numerous, context-specific struggles against dams and MNC factories that could have had serious environmental consequences. While such expressions of struggle need to be supported, there is a need for the intensification of such actions, for larger, inclusive understandings of IP, and its communication to diverse publics in India.

Perceived Suspicion

It is interesting to look into history that indicates a trend of conscious design on the part of actors having a hegemony in the international arena, be it the Roman Empire, or later British or, German or American or Russian or a cluster of nation that reaches to abysmally low levels to protect its hegemony of the world order. Both world wars were fought for controlling the global economy. In an interview given by Emperor Wilhelm II of Germany (which was instrumental in the First World war), he said.

But you will say, what of the German navy? Surely, that is a menace to England! Against whom but England are my squadrons being prepared? If England is not in the minds of those Germans who are bent on creating a powerful fleet, why is Germany asked to consent to such new and heavy burdens of taxation? My answer is clear. Germany is a young and growing empire. She has a worldwide commerce which is rapidly expanding, and to which the legitimate ambition of patriotic Germans refuses to assign any bounds. Germany must have a powerful fleet to protect that commerce and her manifold interests in even the most distant seas. She expects those interests to go on growing, and she must be able to champion them manfully in any quarter of the globe. Her horizons stretch far away.

(The interview of the Emperor Wilhelm II on October 28, 1908, London Daily Telegraph.)"

Influences on Organisational Strategy

At the outset, it might appear that as an international organisation, the WTO has no effect on organisation strategy or operations. However, a close examination will reveal there are many structural influences in many sectors of business. Service corporations are able to decentralise production regionally or globally, often by subcontracting particular components of work. Fragmentation of the labour market also takes place along demographic fault lines with disfavoured groups—including immigrants and young people—often relegated to non-standard, occasionally illegal, conditions of employment. In the long term, stratification and fragmentation might represent either a potential rallying

point or a formidable barrier for labor unions and other social movements, in their efforts to influence the shape of the new techno-economic paradigm. To date, it has been very much the latter. The results have become part of our everyday experience; static or diminishing wage rates; high levels of unemployment reaching across all categories of employment; downsizing, closures, and relocations leading to disruption of family and community life; and, predictably, social and political tensions. Whether, in the long run, a prosperous new economy will emerge from the travails of the old remains to be seen.

The subsidisation of firms by their governments is one of the most controversial issues in international trade. Corporate strategy involves not only market activities like product development, finance and marketing, but also non-market issues like government aid, regulatory policy and trade policy. It is in this context important to understand how WTO disciplines affect firms. The key institutional innovation of the WTO is the binding disputes process. States must comply with the WTO recommendations or face trade sanctions. Since compliance with WTO decisions may require changes in domestic law, firms can be affected.

The subsidisation of firms by their governments is one of the most controversial issues in international trade

On December 5, 1997 the US lost its first major trade dispute in the WTO. The high-profile case pitted photographic paper and film giants. Kodak and Fuji, against one another along with their respective governments, the US and Japan. The Kodak-Fuji dispute centred on the question of fair access for Kodak to Japan's retail film market. There was considerable anger in the US Congress when the American government — and hence Kodak — lost the case.

In February 2000, the WTO announced that US tax legislation concerning the treatment of export-earned income constituted an illegal subsidy and ordered its withdrawal (WTO, 1999e). This ruling may force firms such as Boeing, Microsoft and Caterpillar to restructure their exporting procedures. It may well also result in their paying more tax.

In 2000, an Australian company, Howe and Co., was forced to pay back some of the export subsidies it received from the Australian government. Aside from the punitive aspect of the case — requiring repayment of subsidies was unprecedented — one Australian official

observed that Australia would have to rethink its entire industry support programmes (Taylor & Pearson, 2000).

Another interesting case study is of the commercial rivalry between two aircraft manufacturers, Embraer of Brazil and Canada's Bombardier. Bombardier has always been a private company; Embraer, in contrast, was state-owned from its creation in 1969 until privatisation in 1994. Embraer stunned its Canadian competitor in 1996 by announcing large orders (200 jets) from two American regional airlines. Bombardier began to complain that Embraer's success was the result of Brazilian government support. The Brazilian government has developed an exchange rate subsidy scheme, Proex, to assist exporters. Trade press reports suggested that Embraer aircraft were enjoying a US\$ 2 million price advantage in bidding contests due to this. However, Bombardier itself had secured government support for its product development programmes. In 1992, the Canadian government offered the company a C\$ 38 million loan to support development costs of the first CRJ model. The rivalry became increasingly bitter through 1997. Both countries essentially counter-sued each other in the WTO after failing to agree on a bilateral negotiated compromise. On 14 April 1999, a WTO disputes panel found that some Canadian subsidy programmes supporting Bombardier violated the agreement on subsidies and countervailing measures (WTO, 1999b). These were the debt-financing schemes the "Canada Account" and the Technology Partnerships Canada programme designed to support regional aircraft production. For its part, Brazil was found to have afforded Embraer an illegal subsidy with its Proex scheme of interest rate subsidies to purchasers of Brazilian aircraft. WTO subsidy regulations have forced Canada, Brazil, and their firms to reassess their funding plans and strategies. This case provides an insight into emerging international disciplines on subsidisation that may affect other firms and industries in future. A subsidy is legal unless it confers a market advantage – a benefit in WTO parlance – on the firm or industry receiving it.

These cases in the WTO are good examples to serve as a warning to managers that the Geneva-based institution can have an important role in shaping corporate strategy by affecting the economic regulatory environment where firms operate so its operations deserve closer study by management scholars.

It is now important for firms and managers to ensure that they are aware of WTO structures and procedures and familiar with how the WTO operation might affect their business. The task facing international business scholarship is to catch up with these firms and trace the tangible impact of WTO decisions on specific companies. There is a rich literature on the "input" side

of trade policymaking and strategy; that is, the role of companies in lobbying for specific policies to be adopted by their governments, or inserted into WTO treaties. What we currently lack at the international level are "output" side studies that examine what the WTO decided and how it decided it (Hocking & McGuire, 2000). Further down that line, we also lack studies of the actual adjustments made by firms and states to WTO rulings (Capling, 2000).

State level initiatives such as the following would provide a framework to organisations to strategize handling the concerns arising out of the WTO regime:

- Implement a formal national IPR literacy mission;
- Set-up IPR training institutes to prepare technically qualified attorneys;
- Integrate national technology planning with IPR
- Introduce an enabling national taxation policy to encourage innovation, building of IPR portfolio and its utilisation in technology transfer and trade;
- Re-structure the judiciary and enforcement machinery for professional and speedy response to IPR issues.

Conclusions

WTO has created both opportunities and threats before nations while striving to achieve what has driven its creation i.e. promote rising standards of living and developing full use of the resources of the world. In pursuit of these the WTO seeks a substantial reduction of tariffs and other barriers to trade and the elimination of discriminatory treatment in international commerce. In other words, it seeks to achieve trade liberalisation and the elimination of geographic discrimination. There are several concerns emerging out this, one of which is the commodification of knowledge under the IPR regime. This paper cites some glaring examples of IPR depicting these concerns and advocates a set of initiatives, which includes institution building, creating a legal framework and awareness campaign to be taken up by states in order to handle the problem. These have a direct bearing on enabling organisations to develop strategies to address WTO influences on a long-term basis. Organisations should ensure that they are aware of WTO structures and procedures and familiar with how the WTOs operation might affect their business.

The paper draws from the inaugural address of Professor R.S. Sirohi (Director, IIT Delhi) at the seminar on WTO organised on 9 November 2002 at Institute of Management studies, Ghaziabad.

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The three law of thermodynamics: The First Law: You can't get anything without working for it. The Second Law: The most you can accomplish by working is to break even. The Third Law: You can only break even at absolute zero.

*Always and never are the two words you should **always** remember **never** to use.*

– Wendel Johnson

JIT in Service Sector

Anil Gupta, Sultan Singh, Raj Kumar & Dixit Garg

Just in Time (JIT) can be summarised as a systems approach to achieve excellence through continuous improvement and elimination of all kinds of waste. It can be applied to all organisations in the manufacturing and service sector. The issues faced in the service organisation are, however, vastly different from those in manufacturing. This is highlighted by the intangible nature of services and difficulty in measuring quality. The study conducted here is of the admission process (AP) in various polytechnics of Haryana. This study was primarily motivated by the nature of activities involved in AP and perception among the service sectors about the potential benefits of JIT. A detailed study of the existing admission process was carried out and analyzed for possible improvements with the application of JIT principles. The findings formed the basis for suggestions for implementing JIT principles in all such applications.

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Increasing domestic and international competition has forced the Indian service sector to look for some innovative ways or techniques to meet the challenges/problems posed by the growing service sector. JIT is one such globally accepted and used technique which can play a major role in making services operate more efficiently and effectively. The paradigm of JIT applies to all organisations, both manufacturing and service. Some of the benefits that can be achieved by following the JIT philosophy are: more flexibility to meet competition, greater customer focus, reduced service calls, greater productivity, reduced wastage, and improved work culture, coupled with continuous improvement. The customer is becoming more and more demanding as regards the quality apart from tangibles offered. Thus, there is a need to look at the details of operation management problems in the Indian service sector and then suggest some effective and economical approach that can face the new challenge posed by the growing service sector. It is natural that principles of JIT be extended to service sectors such as educational institutes in order to achieve excellency in their objectives. The admission process studied here is an exercise for admitting students from all over Haryana to various polytechnics of the state. The taking up of AP as a case study of JIT was motivated by the following factors: nature of activities involved and the perception among service industries about the potential of JIT.

The broad objectives of this study are to recommend measures to:

- Improve the service
- Improve transparency
- Maintain economy of time
- Improve information system
- Improve visibility of operations
- Improve processes
- Focus on continuous improvement
- Eliminate long queue system

JIT in service and administrative systems

Service sector of Indian economy, including service part of manufacturing line, is expanding very fast. People have become increasingly dependent on services but have frustrating experiences because of inadequate standards attained. There is a need to focus attention on challenges of effective management of service organisations and operations, which are vastly different from the challenges of a manufacturing environment. Applications of JIT in service systems are beginning to appear in literature (Lee, 1990; Conant, 1998). It is essential to understand how JIT can be integrated in diverse industries that use service systems. Weiters (1984) listed some important attributes of JIT as continuous improvement, attention to any barrier to smooth production, commitment to reduce change over time, to eliminate breakdowns and defects, to abolish stock outs and lost material, to minimise material handling, to establish high morale, cooperative teamwork etc that provide the opportunities for improving service operations. Improved service is a major competitive strategy for service industries. System wide approach of JIT has a greater role to play in service than in manufacturing. Productivity of service sector has become even more critical as it occupies a larger segment of our economy.

One special case of service system is the administrative services. Administrative services are required in all business operations and contribute greatly to the cost of product. Many administrative activities while necessarily having to be performed are viewed by JIT management principles as wasteful. The integration of JIT principles to administrative areas can cause reduction in required administrative activities. Many JIT principles and implementation strategies applied in a manufacturing set up can be applied in administrative systems. Administrative systems have the inventory (orders that need filing), highly repetitive production processes (order processing procedures), product flow (flow of customers orders through departments) like those of manufacturing systems. Target areas like proofing routing, mailing, filing are similar to inspection, scheduling, moving, and storing in manufacturing. Wasteful activities in these areas can be reduced by JIT. JIT administrative systems require workers involvement on quality aspect, restructuring of facility layouts, flexible workers, scheduling work at less than full capacity and standardised work activities to increase worker efficiency. JIT principles motivate workers to seek out new problems that inhibit efficiency in production processes. To help managers and workers identify problems and then prioritise them for solution, methods of cause and effect diagram and pareto principle may be used.

The integration of JIT principles to administrative areas can cause reduction in required administrative activities.

Literature Review

Literature can be reviewed under the following two categories:

Related to the issues in service sector

Prior studies (Chase, 1981; Ross, 1994) indicate that there are significant issues of service operations which have to be addressed in order to meet the serious challenges facing the service firms. These are:

- How to utilise the resources most effectively.
- Monitoring and measuring quality of services.
- Predicting future events, conditions, customer demand, price/cost levels etc.
- Intangibility and inability to store output makes the service process more challenging.
- Service-system process requires a high degree of human element contact.
- Production and consumption occur simultaneously.
- Customer is the participant in the production process.
- Heterogeneity of services in consequence of explicit and implicit service elements relying on individual preferences and perceptions.

Above-mentioned issues make customer satisfaction more pronounced in service sector than in manufacturing sector. Managing customer satisfaction holds the key in service operations. Customer perceptions, customer delight and outrage, importance of contact personnel, employees attitude etc. play an important role in dealing with customer expectations. Parsuraman et al, (1991) identified reliability, tangibles, response time, assurance, empathy as some important dimensions of customer satisfaction in service.

JIT in service sector

Inman and Mehra (1991) stressed upon the applicability of JIT in service environments, including service part of manufacturing line. Some benefits of JIT were reported as improved communication, elimination

of warehouses, reduced supplier base, improved vendor performance, improved quality, improved service, lower price levels, quick response time etc. Alanso and Frasier (1991) emphasised that management should apply and encourage JIT in planning and managerial activities in addition to manufacturing. They have also shown how the performance parameters are improved when the company reduces management delays. According to some researchers purchasing is one of the main departments in manufacturing as well as non manufacturing environment as it has a large potential for quality improvement and cost savings. Important attributes of JIT purchasing have been identified and a survey of the attributes has been carried out in the Indian context.

Benson (1986) reported that diverse service organisations from bank cheque processing centres to hospital operating rooms are now applying JIT philosophy to the special problems of service production. It was hoped that service industries will continue to investigate the potential advantages of JIT and soon the list of successful case histories will include hotels, educational facilities and leisure establishments.

Health care industry

Whitson (1997) identified areas such as central supply, materials management, pharmacy, nursing, physician practices etc. of health industry where JIT can be applied. Costing system and quality under JIT was also discussed.

Hotel industry

Shinohara (1988) applied JIT as a strategy for renewed growth in skylark restaurant chain. Inventory reduction, customer response time, switching over to custom production in a highly cost effective manner were some of the benefits reported.

Banks

Lee (1990) stated that much of the in house work performed in a bank in processing bank loans, paper work on customer accounts, preparing financial statements etc. can be planned by bringing together groups of highly flexible bank officers to work in cell type lay out.

Warehousing

Carlson (1995) investigated JIT applications to ware housing operations. As a result, benefits of reduction in errors and complaints leading to higher productivity, saving in pick route distance, storage

space, cost and improved quality and response time were reported.

Customer Service Centre

Moore (1988) applied JIT principles of quality, involvement of employees, communication, use of flexible work force etc. to a customer service centre. The immediate results were quite remarkable with an increase in customer service level, improved quality, reduction in work in process and repair cycle time etc.

Mail order operation

Conant (1998) applied JIT in mail order operation of a company in USA. As a result, order processing time, backlog, complaints etc. reduced significantly and customer delivery time improved.

Administrative systems

There are many reasons for applying JIT principles to administrative systems. One reason for their application is the potential for improvement in reducing the overhead costs. In the manufacturing area a study revealed that direct administrative services account for at least 20 per cent of the total overhead costs and may represent as much as 35 per cent of the total cost of a product to a customer. All these considerations provide an opportunity for cost reduction under JIT principles. In the corresponding target areas of proofing, mailing, routing and filing, the wasteful activities in administrative systems might be reduced by applying JIT principles. While the need for JIT in administrative systems was presented in the early 1980s, only recently have specific applications in administrative areas started appearing in the literature (Manske, 1988; Alanso and Frasier, 1991; Conant, 1998; Lee, 1990). JIT improved efficiency, costs, customer service etc. by reducing administrative lead time, order filling time, set up times on all types of administrative activities, reducing backlogs, space requirements, management delays, providing fast information flows and stress on quality etc.

Case analysis

Admission Process is required in all educational institutions for admitting the students every year. To improve the institution's image in this competitive scenario, this process has to be improved so that everyone involved may feel satisfied and comfortable. This paper is an attempt in this direction and is looking for the application of JIT in improving the admission process.

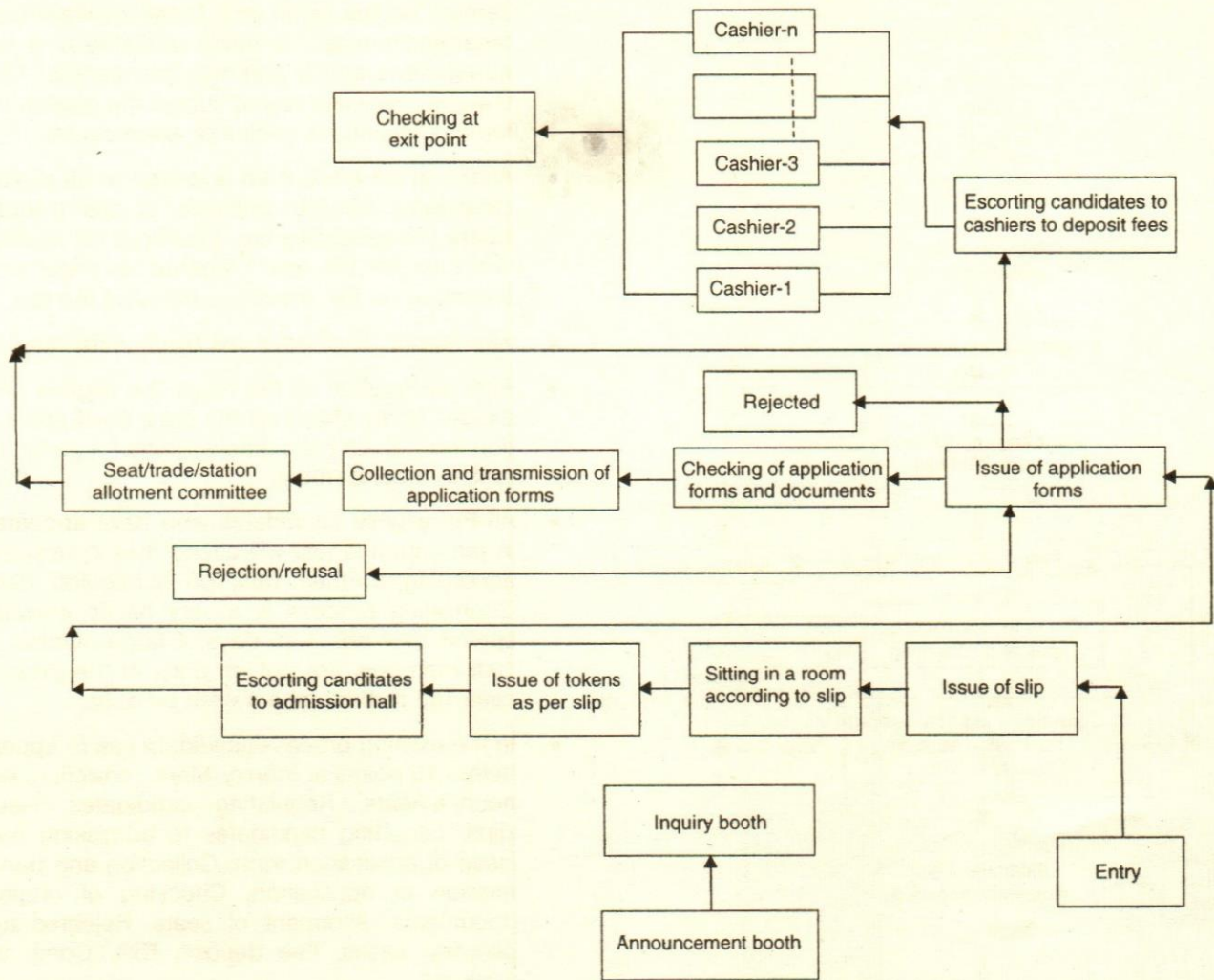


Fig. 1. Candidate movement diagram for Existing System

The preliminary information of the case under study is stated in Table 1.

Table 1: Preliminary information of the case

Total number of employees	130
Total number of institutes	25
Courses offered	20
Time taken in the entire admission process	11 days
Total number of students appeared in test	30000
Total applications received for admission	10000
Total candidates admitted	300

To encounter the difficulty in the existing system, an effective procedure for good performance and prestige may be adopted in the JIT context. With a view to provide a transparent admission process with maximum convenience to students, parents and staff, an effective procedure is adopted under the JIT context. Emanating

from this broad objective, the specific objectives are to:

- Improve quality of such services
- Increase transparency in the system
- Reduce the waiting time and queue time
- Improve information system
- Improve lay out
- Improve visibility of operations
- Increase employee's involvement
- Increase flexibility in operations

Methodology

Before the proposed implementation of JIT, existing admission process is studied thoroughly to identify the various problems. A survey was conducted among the

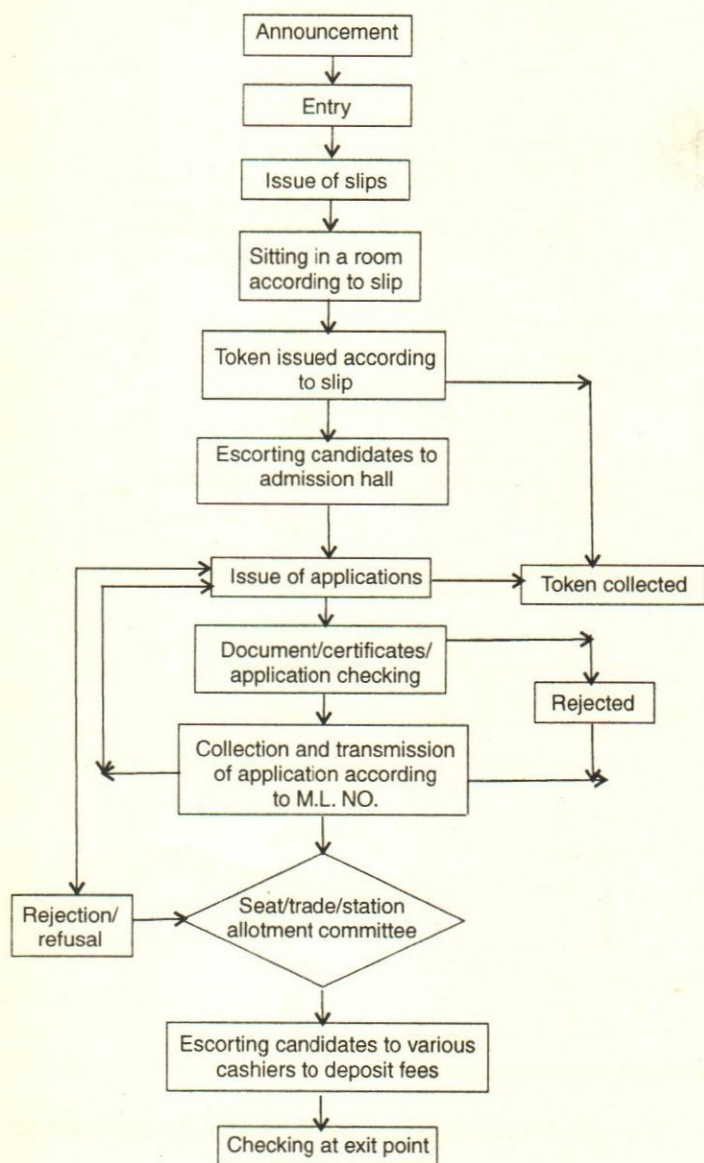


Fig. 2. Flow chart for existing admission process

newly admitted students with the help of a questionnaire. They were asked many questions regarding transparency in the system, time consumed, information system, satisfaction, attitude and behaviour of the staff involved in the process etc. Their suggestions were incorporated. Discussions with the staff/principal were made to get useful insights of the existing admission process. The responses of the students and opinions of the staff were analysed for JIT implementation.

Existing admission process

In the existing centralised admission process, the candidates willing to seek admission have to appear in:

- An entrance test which is held at different

centres on the same day. Detailed information regarding the test is made available in a few newspapers and a common prospectus. After that the candidate has to submit the application form indicating his choice of exam centre.

- After that an admit card is issued to all eligible candidates by the principal of the institute where the candidate has submitted his application form for the test. Elaborate arrangements are made for the smooth conduct of the test.
- After about 10-15 days, the result is declared.
- After declaration of the result the eligible candidates apply afresh on the prescribed application form. Each candidate is allotted a particular rank in order of merit.
- All the eligible candidates who have appeared in the entrance test will attend their counseling according to their rank on scheduled date. Counseling process is a very hectic exercise spread over about 15 days. A large number of staff members are put on duty. In the present case 130 staff members were on duty.
- In the existing process candidate has to appear before 15 points at Inquiry, Merit correction, Announcements, Regulating candidates, Issue slips, Escorting candidates to admission hall, Issue of application form, Collection and transmission of application, Checking of original documents, Allotment of seats, Rejected application cases, Fee deposit, Exit, Computer work etc.
- In addition to above there are other arrangements to be made in the form of Sound arrangement, Electricity arrangement, Seating arrangement inside hall, Seating arrangement outside hall, Water arrangement, Cleaning, Dusting, Discipline etc.

Flow charts, candidate movement diagrams and lay out for the existing admission process is shown in Fig. 1, Fig. 2 and Fig. 3.

Based upon student's survey and staff feedbacks the following points are observed;

- Long waiting time for students and their parents.
- Long duty hours for staff.
- Admission charts not properly designed.
- Frustration and irritation among all human beings involved. Delay and confusion in work.
- Boring etc.

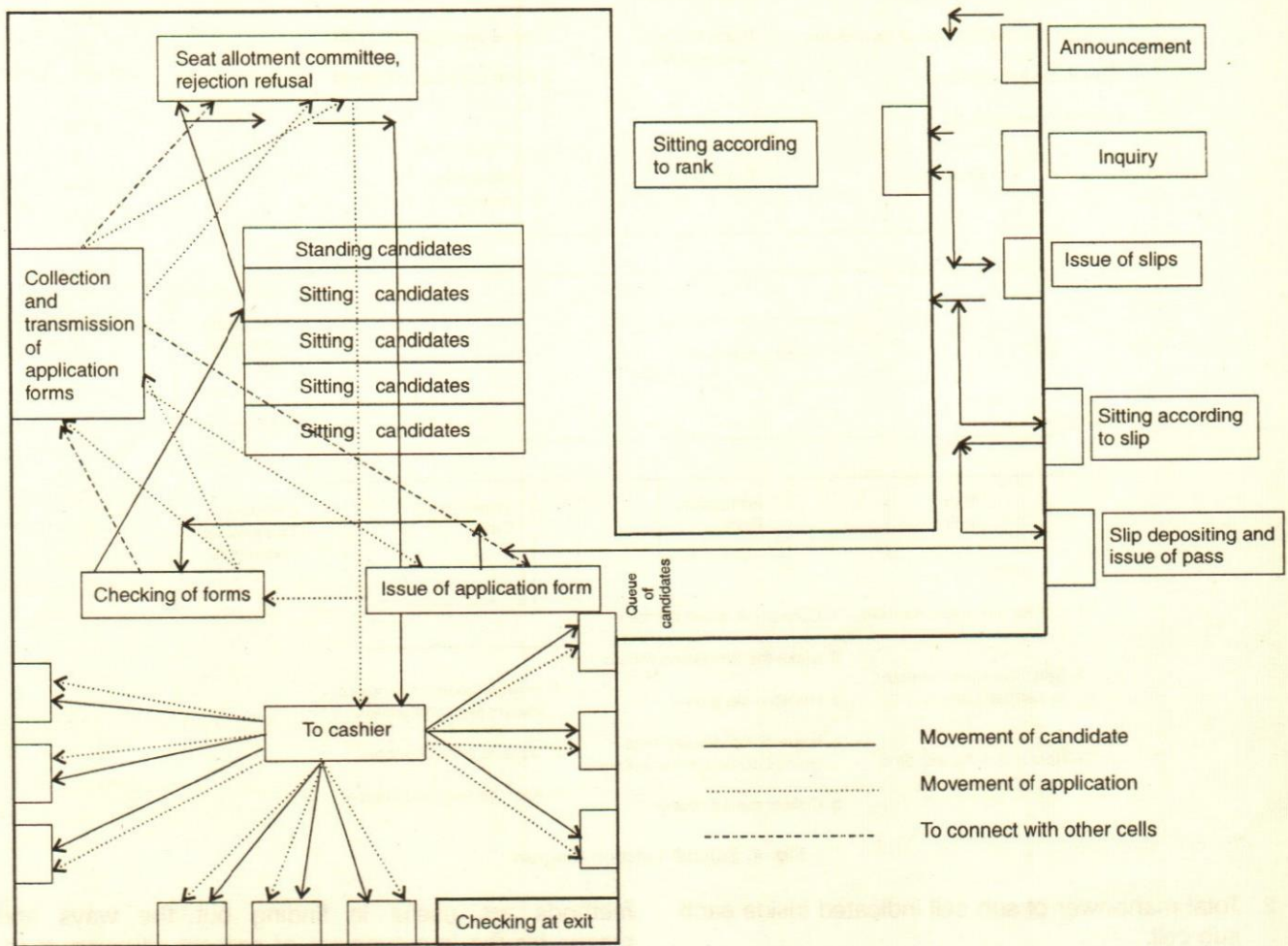


Fig. 3. Lay out of existing admission system

Proposed admission process

On analyzing the existing system deeply a focus is made on its disadvantages and then some improvements suggested by the application of JIT technique.

In the admission process inventory is in the form of candidates, which can be minimised by making lots and less file movement providing U-cell lay out in the admission hall. Also an effort is made to minimise manpower by providing computers and entry kanban to candidates. Sub cells are created. In each sub cell, 10 candidates will come in one lot. After they are entertained in a sub cell, only then will they be shifted to the next sub cell and the next waiting lot will come. Each subcell is allotted different functions. The related diagrams are shown in Fig. 4 and Fig. 5.

The objective here is to convert the functional layout to a flexible group layout. In this regard the following guidelines are useful;

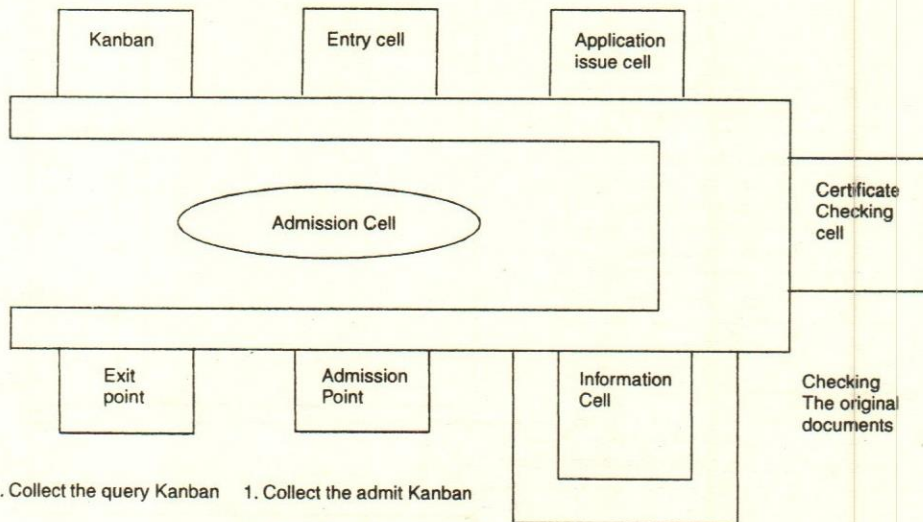
- There should be sufficient volume of work in the sub cell.
- The number of students and nature of work determine the capacity of the cell.
- The objective of the sub cell is to improve the utilisation of manpower.
- The needed capacity of the admission cell must be determined from
- The candidate interview schedule.

Result of the Proposed System

The proposed admission process have different sub cells performing their functions differently as the name of the cell indicates. Now the time taken by one candidate in getting admission is calculated according to figure 6, which shows the admission cell indicating;

1. Time taken by a lot in minutes at the top of each cell.

- | | | |
|---|-------------------------------|-------------------------------|
| 1. Make a lot of 10 candidates | 1. Enter the time | 1. Collect the entry slip |
| 2. Check the identification of candidates | 2. Issue M.L NO. And rank NO. | 2. Issue the application form |
| 3. Issue the entry Kanban | | 3. Keep entry slip for record |
| 4. Announce to next lot. | | |



- | | | |
|---|--|--|
| 1. Collect the query Kanban | 1. Collect the admit Kanban | |
| 2. Send the entry Kanban to Kanban Cell | 2. Make the admission record | |
| 3. Note down the exit time | 3. Receive the fees | 1. Provide information about vacant seat and station |
| | 4. Issue computerised fees receipt about the vacant seat | 2. Issue to admit Kanban |
| | 5. Collect the admission | 3. Allot the seat and station |

Fig. 4. Subcell function diagram

- Total manpower of sub cell indicated inside each sub cell.
- Movement of candidate is shown by arrow mark inside cellular type admission hall.

The results expected are;

Total manpower required = 23

Total candidates = 70

Total time taken = 27 minutes

Time taken per candidate = $27/70 = 385$

Time taken for 1100 candidates = $385 * 1100 = 423.5$ minutes = 7.05 hours for whole admission process per day

These results have also been illustrated in Fig. 6 and Table 2.

Concluding remarks and directions for future research

The result of the study has shown that JIT

methods are useful in finding out the ways and means for the improvement of present situation of Indian service industries and operations. Despite the fact the results may not be as spectacular as those achieved in manufacturing industries, the utilisation of JIT in service is more than justified. Some of the observations of the study are:

- It is expected that improved service will enhance the public image of the process and students, parents' etc. will feel comfortable with the process
- Applications of JIT will lead to optimal utilization of resources and increased productivity
- System in the service sector is likely to become more transparent.
- Initiatives suggested will help in monitoring its progress in the eyes of everyone involved.
- In the era of competition, the support of some effective approach like JIT is needed in order to improve its operations.
- The study represents only a broad view of the application of JIT. In this context, it is recom-

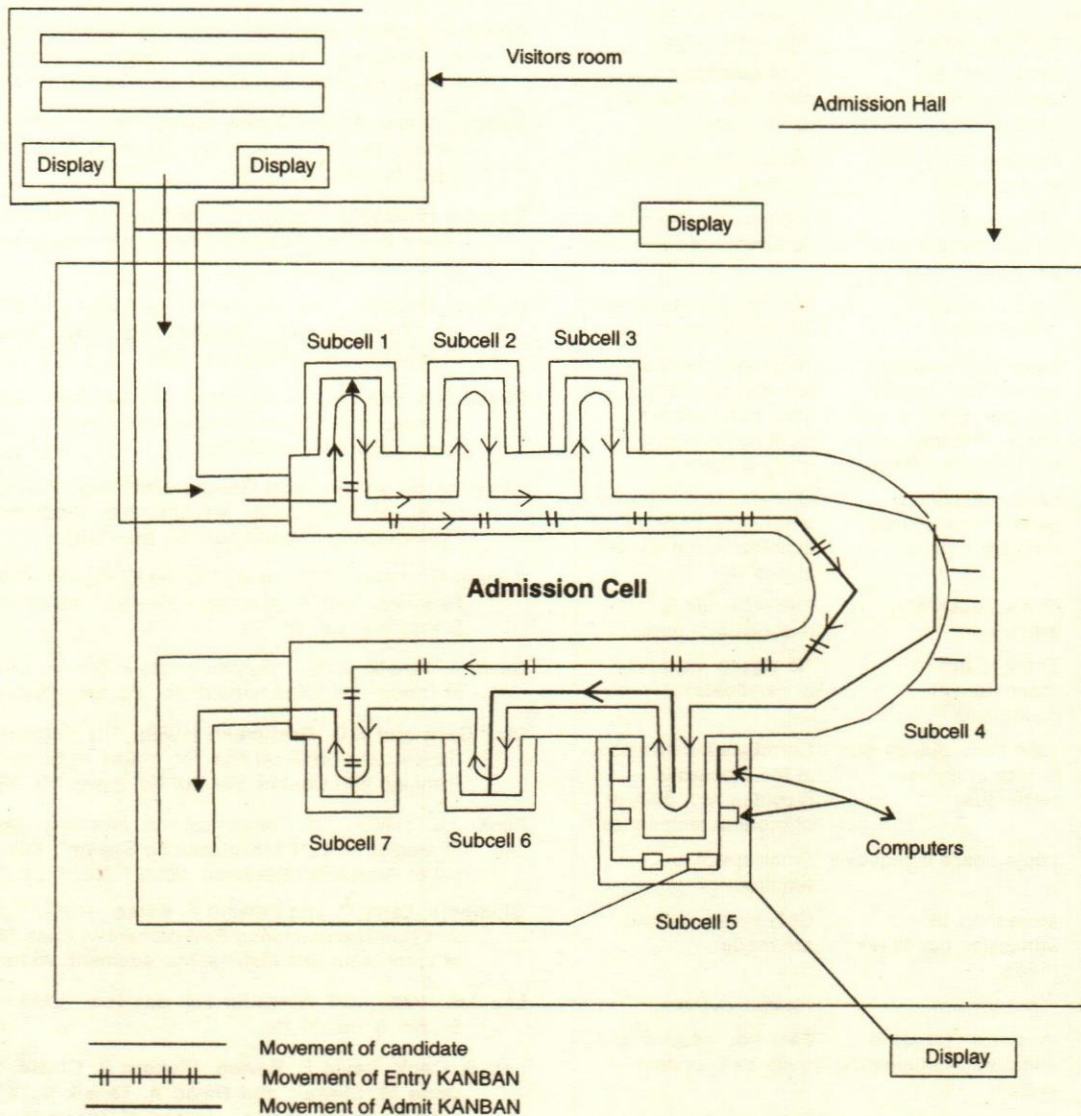


Fig. 5. Forming U-cell and Subcell diagrams

mended that micro case studies in different types of Indian service sectors must be carried out and computerised empirical models developed to feed the requirements of the Indian service sector.

7. Perfect JIT implementation may not be feasible due to the lack of resources, technology, non-availability of multiskill workers and cultural/attitudinal differences etc. However, to make it a success, the following suggestions are given.
8. Some elements of JIT are easy to implement. Therefore maximum weightage must be given to these elements to reap maximum benefits. Also identify areas of the organisation where JIT can be applied.

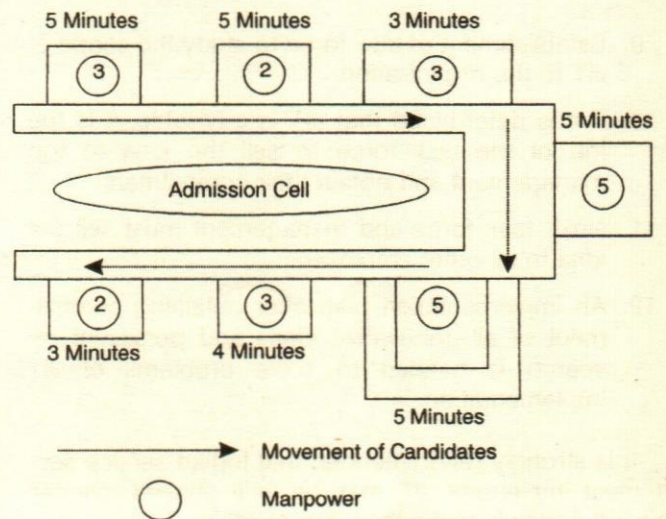


Fig. 6. Manpower and time

Table 2: Comparison of existing and proposed system

	Existing system	Proposed system
Time	Time taken per candidate is difficult to calculate	Time taken per candidate is very easy to calculate
Working hours	Average 12-14 hours long process	Nearly 7 hours long process
No of candidates	Average 800 candidates are called per day	1100 candidates can be entertained per day
Techniques	Lack of modern techniques	Modern techniques are effectively used
Manpower	More staff members are working. Nearly 130 staff members are performing their duty for 12 hours a day	Less staff members are working. Only 23 staff members are working for only 7 hours a day
Queues	Long queues are usually seen at each admission point	Queues are eliminated and only a lot of 10 candidates are allowed at one cell
Working	The scheduled admission	The schedule is reduced to 9 days
Movement	There is zigzag movement of candidates	No zigzag movement of candidates
Transparency	Less transparency due to lack of modern techniques	Complete transparency in the process is provided with the use of modern techniques
Space	Large space is required	Small space is required
Admission points	More than 16 admission points are made	Only seven subcells are made
System	Rigid system	Flexible system
Process	Very slow, tiresome and confusion creating system	Fast, not tiresome and quite clear system
Satisfaction	Less satisfaction to public and staff	More satisfaction to public and staff

9. Establishment of task force to study the scope of JIT to the organisation.
10. If it is determined that JIT is advisable, it is the job of the task force to sell the idea to top management and obtain their commitment.
11. Next, task force and management must sell the idea to all other employees.
12. An implementation plan after obtaining commitment of all. Innovative ideas and persistent research is needed to solve problems of JIT implementation.

It is strongly recommended that Indian service sector must implement JIT, may be in a phased manner. This will certainly make them competitive.

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Impact of House of Quality on Buyer Satisfaction

Bhimaraya A. Metri

Quality has become one of the critical competitive strategies in today's global market. To achieve quality, building firms must understand customers' needs and develop products/facilities and services appropriately. A powerful tool to understand the customers' needs is House of Quality (HOQ). In this paper, first, a brief review of the need for house of quality, its concept, methodology and benefits within the context of building construction industry are presented. Second, a case study based on the customer requirements for residential buildings in a housing society at one of the largest municipal corporation cities of southern Maharashtra is presented to illustrate the use of HOQ in enhancing the buyer satisfaction in building industry.

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In the past, the main concern of the building firms had been on meeting requirements, whereas the current trend is on quality for survival, competition and globalization. Quality has become one of the critical competitive strategies in today's global market (Park & Kim, 1998). It is defined in terms of (1) conformance to the agreed requirements of the customer and (2) a product or service free of deficiencies (Juran, 1988). The American Society for Quality and Crosby support this definition (Arditi & Gunayadin, 1999). In building industry, quality can be defined as meeting the requirements of the designer, contractor and owner, while abiding by the standards and building bylaws of concerned authorities. Meeting the requirements of the designer and contractor (internal customers) is an essential part of the process of supplying quality-constructed facility to the owner (external customer). To remain competitive, building firms must have a strong commitment to customer satisfaction and focus more closely on real customer needs and expectations, instead of working towards goals that are internally generated—like work efficiency. Further, the firm must operate according to a set of standards defined by their customers: quality, innovation, responsiveness, convenience and ability to offer variety.

Constructed facilities are usually made-to-order products that are based on the specific requirements of customers. These requirements are related to the ultimate needs that a facility is intended to fulfill (Kamara et al., 1999). For example, need of a family for staying is satisfied by a house. Thus, the requirements for such a house must reflect the requirements of the ultimate need of the family, if it is to fully satisfy the customer. The realization of the customer's vision of a proposed facility depends on how the requirements for that facility are defined and communicated to the design team (Kamara et al., 1999). It also depends on how the requirements are converted into design and how the design is converted into an actual facility. If the customer requirements are systematically analyzed, prioritized and translated into design and con-

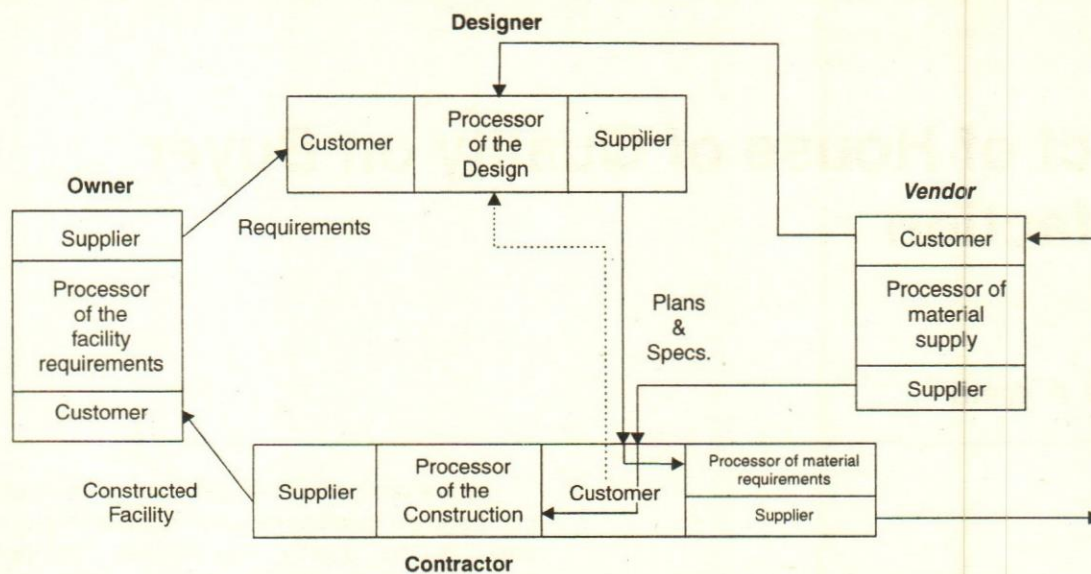


Fig. 1. Juran's triple role concept applied to construction process (adapted from Burati et al. 1992)

struction processes, then it allows the designer the flexibility to select the best solution to meet the customer's needs. This can be done exactly with house of quality. It helps the engineers and contractors to fully understand customer requirements, to develop priorities for these requirements that are technically correct and finally satisfy the customer (Metri, 1998). Also, as the scale and complexity of building projects grow, the need for "getting right the first time" becomes much greater, which necessitates HOQ again.

In the building industry, some deficiencies that have led to call for its improvement through house of quality are:

- The absence of structured procedure for the evaluation of customer requirements.
- Ineffective communication between the project participants within each stage of the construction process.
- Disunity in design and construction process. This creates quality problems like design deficiencies, rework and schedule and cost overruns which adversely affects reliability, economy and customer satisfaction (Srividya et al., 1998).

Thus, there is a need to explore the potential of HOQ in building industry, which has benefited immensely through applications in manufacturing and service industries. Principles of HOQ, methodology and benefits are described here and a case study is presented to illustrate the practical implementation of HOQ in the building industry.

Customer-Supplier Chain

To undertake HOQ, it is necessary to determine the customer-supplier relationships within each work process (Gopalkrishan et al., 1992). This is made possible using Juran's "triple role" concept. In building construction industry, the whole work process can be broadly divided into three stages: Planning process, Design process and Construction process. The main parties involved in these processes are Owner, Designer and Contractor. Every party in a process has three roles: supplier, processor and customer (Burati et al., 1992). Among the main parties, the contractor has to play an additional triple role for procurement process with the vendor and the designer has to modify his plans and specifications to satisfy the contractor and vendor(s). This triple role concept is shown in Fig. 1, which shows distinct separations between the owners of a process and also identifies the customer and supplier for each process. The thick dotted lines in Fig. 1 indicate the feedback of the contractor and vendor. During each process stage, it is necessary to obtain customer feedback to determine what changes should be made to meet the requirements of the customers. Table 1 clearly indicates the supplier and the customer in each process stage.

House of Quality

The 'House of Quality', the basic tool of the management (also known as quality function development) originated in 1972 at Mitsubishi's Kobe shipyard site and then Toyota and its suppliers developed it in numerous ways (Hauser & Clausing, 1998). It has been used successfully by various Japanese manufacturers

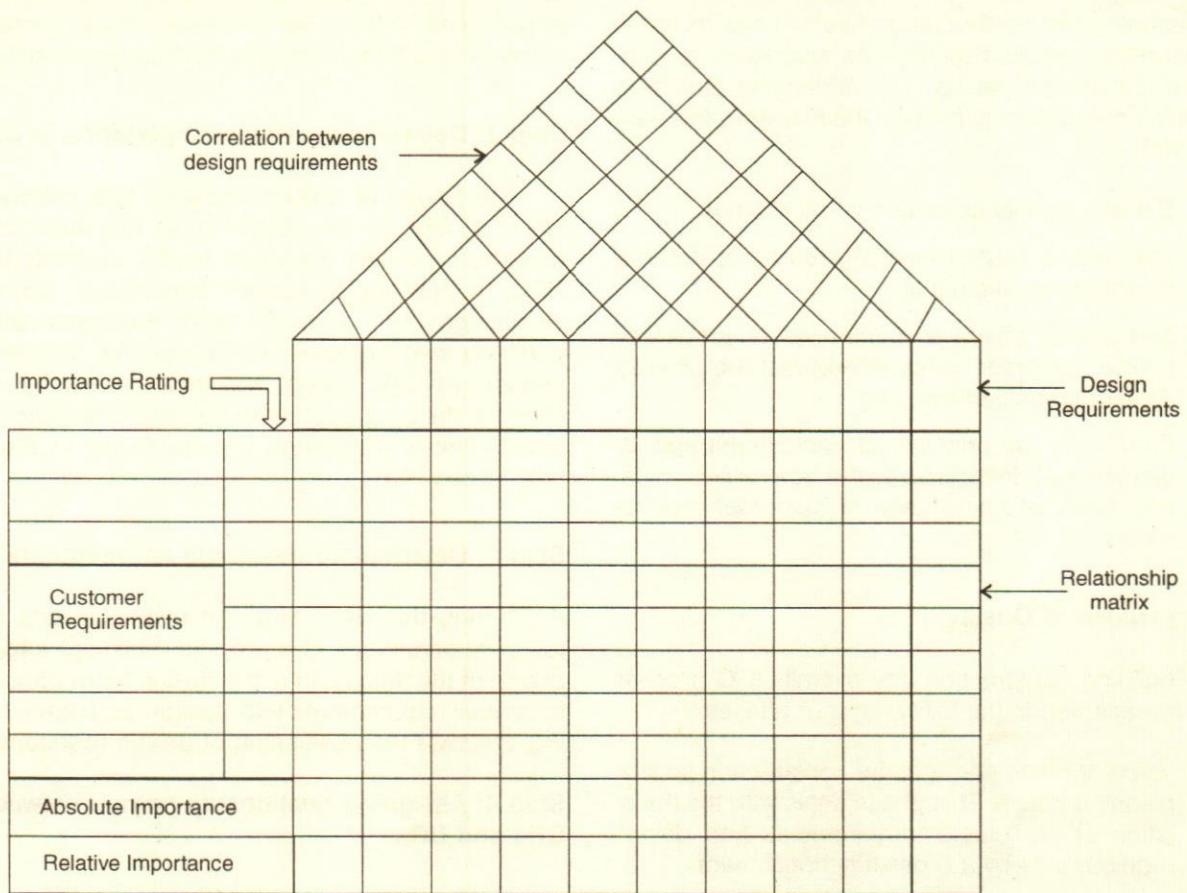


Fig. 2. Basic structure of House of Quality matrix

(Hauser & Clausing, 1998). After the concept of HOQ was introduced in 1983 in United States through auto manufacturers and part suppliers, many US firms, such as Proctor & Gamble, Raychem, Digital Equipment, Hewlett Packard, AT & T, ITT, GM and Ford applied HOQ to improve communication, product development and measurement of processes and systems (Park & Kim, 1998). At Ford alone there are more than 50 applications of HOQ (Hauser & Clausing, 1998). In spite of its 'success stories' in other industries during the last decade, HOQ has not been well recognized in construction.

'House of Quality', the basic tool of the management originated in 1972 at Mitsubishi's Kobe shipyard site.

HOQ is a technique of converting customer demands into quality characteristics and developing a design quality for the finished product by systematically deploying the relationships between the demands and the characteristics, starting with the quality of each part and process (Akao, 1990). In the construction industry,

Table 1: Customer-supplier relationship in building construction process stages

Process stages	Process owner	Supplier	Customer
Planning process: Facility requirements	Owner (client)	Owner (client)	Designer (who receives requirements from owner)
Design process: Plans & Specifications	Designer	Designer	Contractor (who receives plans & specifications from designer)
Construction process:			
i. Material requirements	Contractor	Contractor	Vendor (who receives requirements from contractor)
ii. Material supply	Vendor	Vendor	Contractor (who receives materials from the vendor)
iii. Facility construction	Contractor	Contractor	Owner (who receives the constructed facility from contractor)

it is a matrix-based methodology that is used to translate customers' required quality characteristics into appropriate constructed facility. The underlying principles of the HOQ methodology include the following (Kamara et al., 1999):

- Defining quality as customer satisfaction
- The use of multidisciplinary teams in defining customer requirements
- The use of charts and matrices to propagate critical customer wants throughout the product development life cycle and
- Employing the principle of deployment and attaching numeric values to the otherwise qualitative levels of importance of customer requirements.

Building House of Quality

For building construction, the overall HOQ process can be represented in the following four phases:

- *Voice of customer*: It is the construction facility-planning phase. This phase deals with the translation of customers' requirements into design requirements by a cross-functional team.
- *Voice of designer*: In this phase, design requirements are translated into construction drawings.
- *Process planning*: This phase deals with the translation of drawings into construction process requirements.
- *Construction planning*: This is the final phase of HOQ. In this phase the construction process requirements are translated into construction phases.

The first phase of the HOQ process deals with facility planning. The House of Quality matrix is used to understand the voice of the customer and to translate it into the voice of the designer. Fig. 2 shows the basic structure of the house of quality matrix for the first phase. It consists of six steps.

Step 1: Determining customer requirements (CRs)

The first step in the HOQ is to define the facility being offered. This begins with the customer, who in conjunction with their supplier, defines construction facility characteristics thoroughly. These characteristics represent what the customer wants (the voice of customer) and these characteristics are called as customer

requirements (CRs). Fig. 2 shows where customer requirements will be located in the house of quality matrix.

Step 2: Determining relative importance of CRs

The house of quality measures the relative importance of CRs to the customer. In this step, customer provides a weight for each facility characteristic (i.e. CRs) to indicate its relative importance. Some times weightings are based on team members' direct experience with customer or on surveys. Pairwise comparison of CRs using Analytical Hierarchy Process (AHP) is the best solution to determine degree of importance. These weightings are displayed in the house, next to each CR.

Step 3: Determining designing requirements (DRs)

During this step, a design team converts the customer requirements of a product (building) into the language of the designer i.e. the design team translates the customer requirements into design requirements (DRs). Fig. 2 shows the positioning of design requirements.

Step 4: Assigning relationship ratings between CRs and DRs

At this stage, the inter-functional team fills in the body of house, the "relationship matrix", indicating how much each DR affects each CR (Fig. 2). The strength of relationship between CRs and DRs is expressed by a rating scale 1 - 3 - 9 to indicate weak - medium - strong relationships, respectively. The team can also use symbols (e.g., D) to establish the strength of these relationships. The team seeks consensus on these evaluations, based on experts' solicitations and customer responses.

Step 5: Determining correlation between DRs

During this stage, the team determines any relationships between the DRs. If changing of one DR alters the effect of any other DR, then, roof is added on the house. This will show how changing one DR affects another. The roof allows a two-way comparison between all the DRs. The nature and strength of these relations (positive or negative, weak or strong) are described at this stage. The top of the HOQ matrix shows the positioning and the form of display. Many times this step is not required.

Step 6: Computing the absolute and relative importance of DRs

The absolute and relative importance of DRs is computed using the relative importance of CRs and the

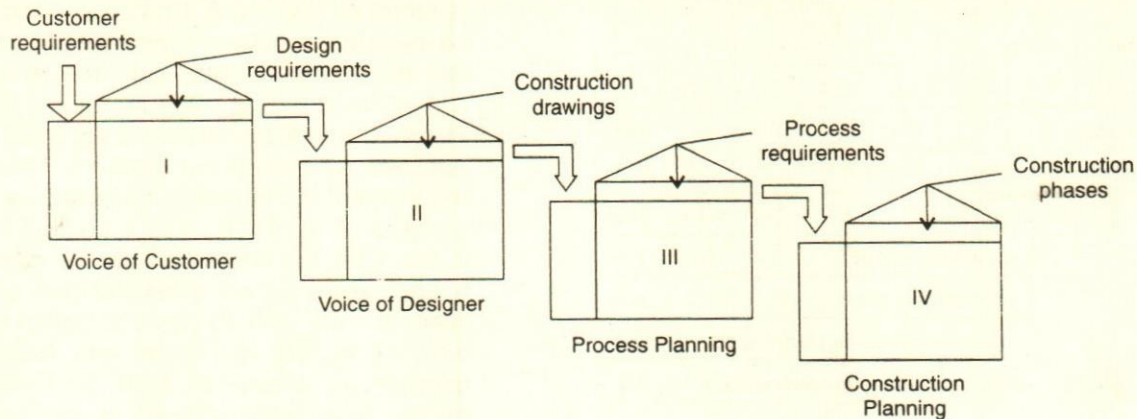


Fig. 3. Phases of House of Quality in building construction process

relationship ratings (i.e., 1 - 3 - 9). For each DR, the absolute importance rating is computed as:

$$AI_j = \sum_{i=1}^m l_i R_{ij} \quad \dots(1)$$

Where,

AI_j = Absolute Importance of DR_j , $j = 1, 2, \dots, n$

l_i = Degree of importance of CR_i , $i = 1, 2, \dots, m$

R_{ij} = Relationship rating representing the strength of relationship between CR_i and DR_j

The absolute importance rating can then be transformed into the relative importance rating. The relative importance of DR_j is derived by adjusting the AI_j to a scale of 1-9, by setting the highest value as 9 and proportionally computing the value of others, using the formula:

$$RI_j = (AI_j / AI_{\max}) \cdot 9 \quad \dots(2)$$

Step 7: Prioritization of DRs

During this stage, all the DRs are ranked on the basis of their relative importance (RI) as computed in step number 6 for their prioritization. The larger the RI, the more important is DR. The aim is to determine targets for the DRs that satisfy the customer requirements.

Step 8: Design process

All the information needed to begin the design process is now available. In this stage, the design team gives top priority for the DRs having higher relative weightings. These relative weightings can be related to

the level of customer satisfaction because DRs with higher ratings are likely to give more satisfaction to customers than with lower ratings. Thus, without consideration of any other constraints, DRs should be incorporated into the facility of interest in the order of their relative importance rating to achieve more customer satisfaction.

Similar steps are involved in other phases of HOQ process. Fig. 3 represents all the four phases of HOQ process. Each phase is represented by a house and each house processes two characteristics. The four linked houses represent the whole HOQ process in construction. These linked houses implicitly convey the voice of the customer to construction facility.

Benefits of HOQ

Six benefits of HOQ are identified for building industry. The use of HOQ enhances:

- The provision of a structured methodology to capture and bring the voice of customer into the construction organisation.
- Communication and horizontal integration through the use of procedures and processes that focus on the language of the customer.
- The provision of a traceable path from the customer down to the most detailed processes, throughout each stage of the building construction process.
- A deeper understanding of facility requirements.
- The provision of a simple strategic method for assessing the impact of changes to requirements.
- To focus the customer on his/her future situation and the related demands.

Customer → Requirements ↓	B	C	D	E	F	G	H
Easy access [A]	A-4	A-2	A-D	E-4	A-3	A-G	A-3
Noise control [B]		C-3	D-3	E-4	F-3	G-4	B-3
Natural lighting [C]			C-D	E-C	C-3	C-G	C-3
Fresh air supply [D]				E-D	D-3	G-3	D-3
Low operating cost [E]					E-4	E-G	E-3
Aesthetically pleasing [F]						G-2	H-3
Individual room planning [G]							G-4
Common spaces-stairs, etc. [H]							

Fig. 4. Criteria weighing matrix

Case Study of Residential Buildings

In this case study, the actual key requirements of MIG (Middle-Income Group) customers (house buyers) for residential buildings in a housing society at one of the largest municipal corporation cities of southern Maharashtra are used to demonstrate the first phase of house of quality. The builder is providing constructed houses to the customers. Due to close association of author with the housing project, HOQ has been used in the planning process by interacting customers (house-buyers) and design engineer.

The following step by step procedure has been adopted for the application of house of quality methodology to transfer customer requirements into design requirements:

1. The customer requirements have been determined by conducting interviews with customers. The important requirements identified in this case are: individual room space planning, easy access, natural lighting, noise control, low operating cost, aesthetically pleasing, fresh air supply and common spaces.
2. Importance of each of these CRs to the customers has been determined using criteria weighting matrix in association with the customers as shown in Fig. 4. Firstly, all the CRs have been listed in tabular form and each has been assigned a letter of alphabet as shown in Table 2. Secondly, these assigned letters have been used to compare each CR with every other CR. The degrees of importance of one CR over another have been chosen using four preferences: major, medium, minor and no preference. These have assigned scores of 4, 3, 2 and 1, respectively. For example, 'A' has been found to have major preference over 'B', hence the comparison between 'A' and 'B' in the criteria matrix

is recorded with an A-4 notation. When there is no preference between the two CRs, the score has been written using both the letters in the scoring matrix. (e.g., A-D in column D, Fig. 4). Thirdly, the total raw score for each CR has been obtained by adding the numbers following that requirement in the matrix. For example total raw score for A is 14 (i.e., 4 + 2 + 1 + 3 + 1 + 3). Next, in this step, the relative weight for each CR has been derived by adjusting the raw score to a scale of 1-10, with 10 being assigned to the CR with the highest raw score and using proportionality, as shown in Table 2. Finally, these ratings have been entered in the 'importance rating' column in the house of quality matrix (Fig. 5).

3. Voice of customer is converted into voice of designer. On the basis of customer requirements, corresponding design requirements have been generated with the help of the design engineer and entered into the matrix (Fig. 5). These are: function of spaces, relationship between spaces, number of access points, soundproofing, ventilation, indoor lighting and Architecture/interior decoration.

Customer Requirements (CRs)	Importance Rating	Design requirements (DRs)						
		DR 1	DR 2	DR 3	DR 4	DR 5	DR 6	DR 7
CR 1	08	09	09	09	-	03	01	03
CR 2	02	09	09	09	-	03	-	-
CR 3	07	09	09	01	-	09	01	03
CR 4	07	09	09	01	-	09	03	-
CR 5	10	09	09	03	-	03	-	03
CR 6	02	09	09	03	-	09	09	09
CR 7	09	09	03	09	03	09	09	03
CR 8	02	03	03	03	03	03	01	03
Absolute Importance →		411	357	227	33	291	137	126
Relative Importance →		9.00	7.82	4.97	0.72	6.37	3.00	2.76
Customer satisfaction (%) →		26	23	14	02	18	09	08

Note: CR1 : Easy access
 CR2 : Noise control
 CR3 : Natural lighting
 CR4 : Fresh air supply
 CR5 : Low operating cost
 CR6 : Aesthetically pleasing
 CR7 : Individual room planning
 CR8 : Common spaces like stairs, etc.

DR1 : Function of spaces
 DR2 : Relation between spaces
 DR3 : Number of access points
 DR4 : Sound proofing
 DR5 : Ventilation
 DR6 : Indoor lighting
 DR7 : Architecture/int. decoration

Fig. 5. House of Quality matrix for requirements of residential buildings

4. The relationship between CRs and DRs have been determined in consultation with the design engineer using 9-3-1 scale to denote strong, medium and weak relationships, respectively. These ratings have been entered into the main body of HOQ matrix. Roof matrix has not been taken into account for the study, since there is no conflict relations between DRs.

Table 2: Relative importance values of customer requirements

Sr. No.	Customer Requirements (CRs)	Notations	Raw score	Relative Importance
1	Easy access	A	14	08
2	Noise control	B	03	02
3	Natural lighting	C	12	07
4	Fresh air supply	D	12	07
5	Low operating cost	E	18	10
6	Aesthetically pleasing	F	03	02
7	Individual room planning	G	16	09
8	Common spaces like stairs etc.	H	03	02

5. Absolute and relative importance values have been calculated using the equation (1) and (2) as given in step 6 of the previous section. They have been entered at the bottom of the HOQ matrix.

6. On the basis of relative importance values, design requirements (DRs) have been prioritized as shown in Table 3. Design requirements (DRs) with higher relative importance values will give more satisfaction to customers therefore, these relative importance values have been related to the level of customer satisfaction (CS_j) as shown in Table 3, using the formula:

$$CS_j = \frac{RI_j}{\sum_{k=1}^n RI_k} \cdot 100 \quad \dots(3)$$

Table 3: Prioritizing of Design Requirements to satisfy customers

Notation	Design requirements (DRs)	Relative Importance	Customer Satisfaction
DR1	Function of spaces	9.00	26
DR2	Relation between spaces	7.82	23
DR5	Ventilation	6.37	18
DR3	Number of access points	4.97	14
DR6	Indoor lighting	3.00	09
DR7	Architecture/int. decoration	2.76	08
DR4	Sound proofing	0.72	02

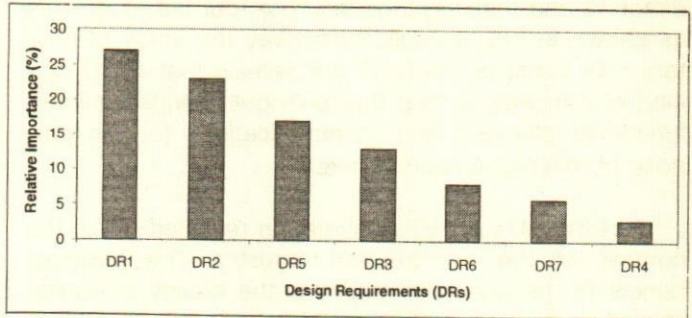


Fig. 6. Relative importance of Design requirements

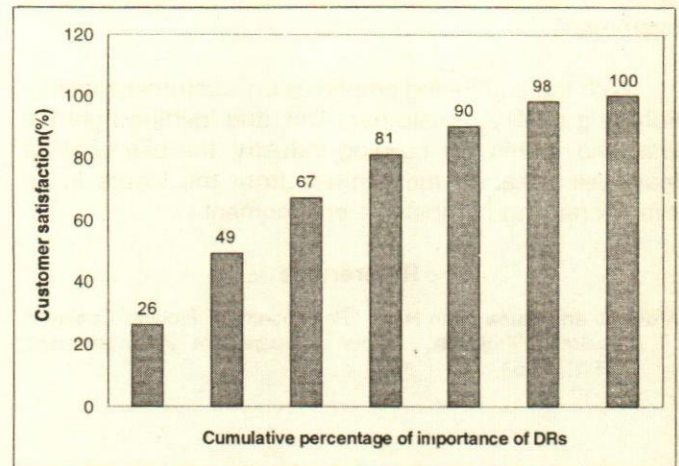


Fig. 7. Pareto diagram

Therefore, relative importance values of the DR_j guide the design process. From Fig. 6 and Fig. 7, it is clear that, in the design process, DR1, DR2 and DR5 should be given top priority over the others and special attention should be paid to them so that customer satisfaction can be improved up to 67 per cent. This study helped the builder to pay attention to DRs, as per the prioritization in preparing plans, detailed design and specifications for residential buildings in the housing society.

Conclusion

This study has resulted in new insights regarding HOQ and house-buyer satisfaction. Applicability of HOQ methodology that has been successfully practiced in manufacturing sector has been described and tested for design of residential buildings in a housing society. The HOQ establishes clear relations between construction processes and customer satisfaction that are not easy to visualize. It is a structured approach, giving increased focus and resolution to understanding customer requirements. Hence clients, designers and contractors must work closely together from the time a facility is

conceived. In general, it gets people thinking in the right direction and thinking together. The four linked houses as shown in Fig. 3 implicitly convey the voice of customer to construction facility. It reveals that, HOQ is a kind of conceptual map that provides means for inter-functional planning and communications for the purpose of meeting customer needs.

The benefits of HOQ have been revealed within the context of the construction industry. The principal benefit of the house of quality is the quality in house. The case study described in this paper provides an illustration of the use of HOQ in transferring the voice of customer into voice of designer and prioritizing those design requirements that improve the satisfaction of customers.

With the continuing emphasis on 'customer satisfaction as a quality', 'customers first' and 'getting right the first time' within the building industry, the use of HOQ may well separate the winners from the losers in an ever-increasing competitive environment.

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□

When nothing seems to help, I go and look at a stonecutter hammering away at his rock;

Perhaps a hundred times without as much as a crack showing in it.

Yet, at the hundred and first blow it will split in two and I know it was not the hundred and first blow that broke it.

Be not afraid of growing slowly,

Be afraid only of standing still.

- Sanskrit Proverb

Organisational Climate of Non-Profit Organisations

Mary Philip Sebastian & S. Bhargava

This study was done on non-profit organisations engaged in changing/supporting human behaviour. Non-profit organisations lack the guidance and competition the market provides. Organisational climate of two types in two regions and perception by two types of staff were studied using the three way Analysis of Variance (ANOVA). One way ANOVA was also used to test the hypothesis. It was seen that the main effect of type of staff was significant. Region and nature of organisation did not show significant variance in the climate perception. Variance was noticed across demographic variables. Factors of climate like goal setting process and decision-making process were seen to exert strong influence on overall organisational climate. The implication of these findings for non-profit organisations is discussed.

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Terms like voluntary organisations, non-government organisations (NGO), non-profit organisations and the like are used for organisations involved in social work. However all these terms also include other organisations which are not involved in social work and so the term human service organisations are being more and more used to refer to non-profit organisations engaged in social service. The work of non-profit being qualitative in nature, it lacks the guidance the market provides for profit organisations. This study was done to understand the kind of climate existing in non-profit organisations, more specifically, human service organisations, and what changes are required for more effective working of these organisations.

Organisational Climate

People are affected by the culture in which they live. Values, beliefs, attitudes, and behaviour are shaped by the social culture. It is not surprising that this social culture finds its way into organisations. All the same, organisation culture of different organisations can be as varied as the culture differences we find in society.

Climate and culture are very similar concepts. Climate focuses on members' perceptions of the way things are (Reichers & Schneider, 1990). Climate can most accurately be understood as a manifestation of culture (Schein, 1984). Culture is a deeper, less consciously held set of meanings than climate. There is also conceptual overlap. For example, the reward policies of an organisation (factor of climate) is also manifestation of culture (assumption about worker motivation) (James, James & Ashe, 1990).

Climate is assessed with a questionnaire while a culture researcher depends on qualitative methods. So culture researchers lack the objectivity and comparability of the quantitative methods of climate research. The focus of climate research and even the definition of

climate has evolved over the past 25 years (Rentsch, 1990). In the beginning the focus was on organisational or situational characteristics (Forehand & Gilmer, 1964; Schneider & Bartlett, 1968). In the following years more attention was given to the individuals' perception (James & Jones, 1974; Jones & James, 1979; Schneider & Hall, 1972).

Reichers and Scheinder (1990) talk of three stages that is part of the evolution of constructs. In the first stage a construct is invented or borrowed with elaboration, discussion, and operationalization. During the second stage, critical reviews of the concept like faulty conceptualisation or inadequate operationalization appear in the Literature. During the third and final stage there is consolidation and accommodation. The construct becomes accepted, its antecedents and consequences are well known and boundary conditions are specified.

Although the world climate appeared in earlier articles, Litwin & Stringer (1968) is considered the beginning of the concept of climate (Reichers & Scheinder, 1990). There have been special issues of Administrative Science Quarterly (1983), Journal of Management Studies (1986) and Productivity (1994) devoted to culture. Climate is an indigenous concept while culture is a borrowed concept from anthropology (Reichers & Scheinder, 1990).

Verbeke, Volgering, Hessels (1998) explored the conceptual variation of the concepts of organisational climate and culture. They used two overview articles to discuss the conceptual variations—overview about organisational climate by Moran and Volkwein (1992) and by Sachman (1991) on organisational culture. Moran and Volkwein (1992) mention four conceptual variations or perspectives on organisational climate. They are structural perspective, perceptual perspective, interactive perspective and cultural perspective. Organisational culture had three perspectives. They are holistic perspective, variable perspective, and cognitive perspective. Using PRINCALS analysis the authors found that organisational climate is a reflection of the way people perceive and come to describe the characteristics of their environment and organisational culture, it reflects the way things are done in an organisation. Thus these scientific concepts expand around a core concept (Verbeke et. al, 1998). Rentsch (1990) feels that Climate theorists have discussed climate at three levels. Organisational (eg. Forehand & Gilmer, 1964), group or subsystem (eg. Joyce & Slocum, 1982) and psychological or individual (e.g. James & Jones, 1974).

One question which had been raised by many researchers and academicians is about the unit of

analysis in the case of organisational climate. The question is whether organisational climate remains a perceptual perspective (psychological climate) or it is something members should share (an interactive perspective, which is usually referred as organisational climate) (e.g. Glick, 1985; Hellriegel & Slocum, 1974; Reichers & Schneider, 1990; Dennison, 1996). Sharma (1989) conducted an all India survey of organisational climate and found that controversy exists over whether individual or organisation should be the unit of analysis. However, Sharma (1984) found that in the Indian context, whether the unit of analysis was the individual or the organisation did not account for different measures of climate. Comparison of the two ways of measurement showed that the two sets were identical. They were similar in terms of their relative rank as well as magnitude.

In this study the staff was asked about their perception of climate. Sharma (1984) noticed that whether the unit of analysis was the individual or the organisation, it did not account for different measures of climate. Hence, using individual perception to measure organisational climate was considered adequate in this study. The detailed description of the design and scales are given below.

Using individual perception to measure organisational climate was considered adequate in this study.

Hypotheses

The objective of this study was to find out if there is variation in the climate across different regions and if the kind of work helped to enhance climate. Work of non-profits being qualitative in nature, there is difficulty in measuring performance of the staff or the organisation. Hence it is important to find out the factors that affect climate in NGOs.

Based on resource dependence perspective, Tsui (1990) predicted that executives will be more satisfied than managers and employees with the unit studied. Based on the strategic contingency perspective it was also predicted that managers and employees are more satisfied than executives with the unit.

Hypothesis 1

Following from the above study; it is predicted that field staff will give more favourable organisational climate ratings than office staff.

Variations in age, caste, gender, education are seen to have an impact on organisational climate (Tsui, 1990).

Hypothesis II

Respondents at different levels of age, experience, tenure, and education will show variance in the perception of climate of the organisation.

Hypothesis III

The climate of the organisation will show significant variation across the two regions and the two types of NGOs studied.

Climate is often seen as an individual or group level variable and so studies have tried to demonstrate its impact on satisfaction, performance and such individual level variables (Litwin & Stringer, 1968, Dieterly & Schneider, 1974; Lawler, Hall & Oldham, 1974). Sinaga (1993) stressed the importance of decentralised decision making in NGOs. It was found that climate greatly influences the performance of NGOs.

Hypothesis IV

More decentralised the decision making, better will be the perception of organisational climate.

Sample

The sample for this study was staff of NGOs engaged in community work. These were NGOs which work around the needs of the community, like a slum, a village or such units. They are involved in promoting the community's welfare by enabling the people to meet their basic needs, particularly to solve the problems of poverty and underdevelopment. They could be engaged in adult education programmes, non formal education, health education, nutrition programmes, preventive health care, family counselling, alcoholism information, implementing government schemes like IRDP, training in income generation activities, help with needs of families like getting a ration card, construction of a shop, and so on.

Six NGOs were studied at Trivandrum. The response rate was 100 per cent in an NGO of training and an NGO in grass root level work. 93 per cent staff participated in the study from two other NGOs in grass root level work. Of the six NGOs studied at Mumbai, two were large NGOs. Around 50 per cent of the field-staff and all the office staff was included. Since many of the large NGOs were not willing to be part of this study, smaller NGOs were approached. The response rate at

these NGOs varied from 85 to 100 per cent.

Design of the Study

A $2 \times 2 \times 2$ (Region \times Nature of the organisation \times Type of staff) factorial design was used in this study. Region had two levels—Southern and Western. Trivandrum from the South and Mumbai from the West were the two regions chosen. Nature of the organisation had two levels—Grass-root work (GW) and Training (TRG). Grass-root work NGOs are those non-profit organisations whose focus of work is grass-root work. They are engaged in providing services in the community where they are working. Training NGOs are those non-profit organisations whose focus of work is training. They are engaged in training the staff of other NGOs or give skills training to beneficiaries. The two types of staff were Office-staff (OS) and Field-staff (FS). The impact of the above factors on organisational climate was examined.

Reliability Testing

The measure of organisational climate was based on the total score of twenty-two items, in the scale developed by Rao and Chattopadhyay (1996). The scale of organisational climate included in this study, followed a 5-points response pattern. The questions had options very little extent (1), little extent (2), some extent (3), great extent (4) and very great extent (5). The alpha co-efficient for the composite organisational climate measure was 0.88 in this study. The items required respondents to describe conditions and procedures in their organisations. A high score indicates more favourable conditions and procedures or a better organisational climate. The lowest possible score of a respondent is 22 and the highest is 110. The lowest score obtained in this study was 51 and the highest score was 102.

Demographic Profile of Respondents

The total number of respondents was 439. Of this 205 were from Trivandrum and 221 from Mumbai. Of the respondents 250 belonged to non-profits whose focus of work was grass-root level activities and 176 belonged to non-profits whose focus of work was training. There were 128 office staff and 298 field staff. 18.5 per cent were below 21 years old. 40 per cent belonged to 21-30 age group and 20.5 per cent in the 30-40 age group. 20.9 per cent were above 40 years old.

35.3 per cent of the respondents were graduates and 30.8 per cent were postgraduates while 34 per cent

were higher secondary or lower. 30 per cent were born and brought up in the city of Mumbai. 34.2 per cent spent their childhood in rural areas while 35.8 per cent lived in towns. 32.3 per cent were Hindus and 64 per cent Christians. 73.3 per cent did their schooling in vernacular medium schools but 26.7 per cent studied in English medium schools.

Analysis

Analysis was done to understand the impact of region, nature of non-profit organisation and type of staff on the dependent variable, viz., Organisational Climate (OC). The findings are discussed taking into account the impact of the independent variables separately. The impact of demographic variables on organisational climate was also found. Some of the factors of climate were analysed separately to find out how far decentralised decision-making augments better climate perception.

Table 1: One way ANOVA of Demographic Variables on OC

Demographic Variable	Levels of Variable (Mean)		df	F
	1	2		
Organisation Age (young/old)	59.4459	57.5668	1/438	4.1918*
Age of respondent (young/old)	59.2879	58.0333	1/438	2.3419
Living till 18 years (urban/rural)	57.0267	59.2907	1/438	5.4915**
Medium at school (Vernacular/English)	58.8851	57.5043	1/438	1.7603
Religion (Hindu/Christian)	63.1972	56.2028	1/422	55.493***
Tenure (<5/>5 years)	58.211	59.410	1/438	1.2904
Experience (<5/>5 years)	59.4832	57.3731	1/438	5.2613*
Profession Status (changed/not changed)	54.9487	59.8137	1/438	22.9042***
Gender (Male/female)	59.5548	56.5419	1/438	9.9791**

N = 439

* p < .05, ** p < .01, *** p < .001

Table 1 gives a description of the effect of various demographic variables studied on the perception of climate. Age of the organisation was significant (p < .05), younger organisations accounting for better climate (Table 1). Younger staff as well as undergraduates had given higher rating of climate. One reason is that majority of the younger staff also tend to fall in the undergraduate

category. Post-graduates have given the lowest rating of organisational climate. Although those who spent their childhood in urban area accounted for higher mean, it is those who studied in vernacular medium who considered the climate to be better. However, the impact of medium of instruction in school was not significant. Tenure did not have significant impact, but those with less than five years experience (p < .05) had given higher ratings. Those who did not change their profession as well as male staff accounted for a higher mean rating of climate.

This gives an idea of the influence these demographic factors have on the perception of climate. Thus Hindus, males and those from rural area are seen to have better perception of climate than their counterparts. It is evident from Table 1 that there was significant variance in the perception of climate across the different demographic variables except age of respondent, medium of school, and Tenure. The results are in the hypothesised direction, thus supporting hypothesis II.

Three way analysis of variance was carried out with region, nature of organisation and type of staff as independent variables and climate as the dependent variable. The main effect of type of staff was highly significant for climate. However, climate did not show significant variation across the other independent variables viz., two regions or two types of non-profit organisations. The interaction effect of region and nature of non-profit organisation was also significant for organisational climate. These findings are discussed below.

Table 2: Summary of ANOVA on OC Scores

Source of Variation	Sum of Squares	DF	Mean Square	F
Region (A)	251.824	1	251.824	2.778
Nature of organisation (B)	123.245	1	123.245	1.359
Type of Staff (C)	1397.758	1	1397.758	15.418***
A × B	384.906	1	384.906	4.246*
A × C	64.232	1	64.232	0.709
B × C	49.754	1	49.754	0.549
A × B × C	0.011	1	0.011	0.000
Residual	37894.847	418	90.658	
Total	40178.350	425	94.537	

N = 426

* p < .05, ** p < .01, *** p < .001

Impact of Region and Nature of Organisation on Organisational Climate

The main effect of Region on organisational climate

was not significant (Table 2). Thus hypothesis III was not supported. However, the presence of interaction effect gives partial support to the hypothesis which is discussed in a latter section. Mumbai showed a mean of 59.22 and Trivandrum 57.68. This means that the perception of staff on climate did not vary significantly across the two regions studied. Osborn and Hunt (1974) felt that organisational climate of non-profit organisations were different because they did not work in an environment of competition. Sayeed (1980) found significant variation on organisational health dimensions across various locations. The main effect of nature of organisation on climate was not significant. Thus there was no significant variation in the perception of the staff from NGOs in grass-root work or training. This showed that the nature of work of the non-profit organisation had very little to do with the climate of the non-profit organisation. Field staff gave higher rating than office staff because their involvement in the non-profit organisation was higher. However, the type of work the non-profit organisation was involved in did not have any impact on the perception of climate. Studies showed that climate which was bureaucratic inhibits the normal development of personality but a favourable climate where individual needs were satisfied, led to better performance and satisfaction (Strauss 197). Hence the role of decision making and employees involvement in determining climate was looked into separately.

Field staff gave higher rating than office staff because their involvement in the non-profit organisation was higher.

Impact of Factors of Climate

Goal clarity, goal setting process, decision making process, motivation of the staff, feedback given to staff, grievance handling procedure, and policies of the organisation were the different dimensions of climate which were analysed separately. Only a few of the significant variations are discussed here. It was seen that goal clarity and feedback given to staff were higher at Trivandrum ($\bar{X} = 3.78$ & 3.83 respectively) compared to Mumbai ($\bar{X} = 3.46$ & 3.6 respectively). Goal setting process as well as decision making process were better appreciated at Mumbai ($\bar{X} = 3.79$ & 15.09 respectively) than Trivandrum ($\bar{X} = 3.28$ & 14.19 respectively). This meant that Mumbai had more decentralised decision-making compared to Trivandrum. It was seen that non-profit organisations in grass-root work at Trivandrum had the lowest mean rating on involvement of the staff in goal setting process as well as decision-

making process. Similarly the training NGOs at Mumbai also had low mean rating of decision-making and goal setting process. Sinaga (1993) felt that non-profit organisations have centralised decision-making due to their dependence on funding organisations as a result of which, sometimes non-profits have to follow the goals set by the funding organisations.

Goal setting process and decision-making process are more crucial in the case of grass-root work than for training. Although there are weekly meetings of the field staff with the co-ordinator to plan, discuss problems faced by them, the staff gave low rating on goal setting process and decision-making process. This implied that the objective with which staff meetings were held did not have the impact intended by them. Thus the Non-profit organisations need to review the process and modify their methods to implement effective programmes at the grass-root level. Azma and Mansfield (1981) found that centralisation had positive associations with climate dimensions of task orientation and employee involvement only in highly competitive contexts. However, it is evident that employee's involvement as well as orientation of grass-root work at Trivandrum needs to be reviewed and alternate strategies adopted regarding the kind of programmes, and involvement of beneficiaries in its planning and implementation.

The motivation of the staff to work hard was higher at Mumbai ($\bar{X} = 3.94$) compared to Trivandrum ($\bar{X} = 3.61$). Also field staff ($\bar{X} = 3.87$) had given higher rating than office staff ($\bar{X} = 3.58$). Sanghi (2001) noticed that motivation varied across the different levels of the staff in the hierarchy. In the case of motivation too, a similar trend was visible. Trying to understand this better the impact of policies of the non-profit organisation was analysed. During the pilot and case studies, it was observed that staff had complaints regarding the policies and practices about client referral and the kind of cases handled by the non-profit organisation. It was seen that there was significant main effect only for nature of non-profit organisation (GW $\bar{X} = 3.66$, TRG $\bar{X} = 3.91$) and type of staff (OS $\bar{X} = 3.57$, FS $\bar{X} = 3.85$) in the case of policies. The response to the item in the questionnaire referring to the same showed that as expected, non-profit organisations in grass-root work were given a lower rating. It was grass-root work non-profit organisations who faced problems in sticking to the policies of the organisation. At the same time some sort of control mechanism was necessary for its smooth functioning. Orientation given to the staff about the policies and practices of the non-profit organisation, should be more clear and precise, so that staff will know where to be flexible.

Interaction Effects on Organisational Climate

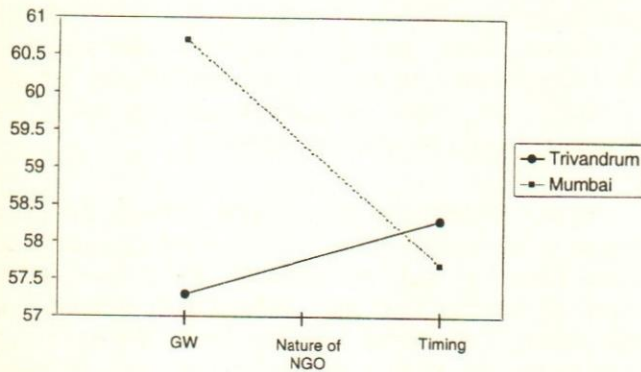


Fig. 1. Two Way Interaction of Region and Nature of NGO on 'OC'

Two way interaction of region and nature of Non-profit organisation (Fig. 1) was significant. At Trivandrum, staff of non-profit organisations in training had a very high rating of climate whereas at Mumbai, non-profit organisations in grass-root work perceived climate to be better. As seen from the earlier section, grass-root work NGOs at Trivandrum and Training NGOs at Mumbai are having low mean rating on decision-making process and goal setting process indicating a more centralised style of functioning than their counterparts. This is in the hypothesised direction. As expected, the more decentralised the decision-making process, the better the perception of climate.

The findings of Sinaga (1993) indicate that managerial cadre tends to be involved only in bureaucratic procedures such as meetings, formulating project proposals, project evaluations and negotiations with donor agencies. The younger employees get low incentives but project implementation depends on them. The decision making process is centralized in the hands of the leaders and the board of trustees. This leads to dissatisfaction amongst the lower level staff. Another area of frustration is the limited promotional avenues for staff in non-profits.

Impact of Type of Staff on Organisational Climate

The main effect of type of staff was significant. A look at the mean values showed that field staff had higher mean ($\bar{X} = 59.7$) compared to office staff ($\bar{X} = 55.7$) on organisational climate. This supports hypothesis I that field staff will give higher rating of organisational climate than office staff. It may be observed that field staff experienced greater autonomy, greater involvement in goal setting and decision making process, and also had higher motivation to work hard. It was the field staff because of whom the cause of existence of the non-profit organisation was served. Thus

their job involvement was higher. Field staff gain great personal satisfaction from their achievements. Office staff indulge in routine activities, which did not have any direct implication on climate. On the other hand, the activities of field staff influenced climate because job autonomy, freedom to make decisions and the like rest or rather become a necessary aspect of the work of field staff.

Main effect of type of staff was significant in the case of motivation to work and impact of policies. The fact that field staff aspire to do many things but accomplish very little is a known fact.

Hansenfeld (1992) tried to express this difficulty concretely—

To the human service workers these organisations reflect their own commitment and dedication to improve the quality of life of people in need, and offer them the opportunity to practice their professional and occupational skills. They provide them not only with extrinsic benefits but also with the intrinsic rewards that come from helping people. But these organisations are also a source of great frustration, by constraining them from serving their clients in accordance with their professional norms and values, by denying them the resources they need to serve their clients, by burdening them with too many rules and regulations, and by discounting their own views on the best ways to serve clients (p. 4).

Field staff are mostly females but the administrative and authoritative positions are held by males.

This incongruity is further exacerbated by the fact that field staff are mostly females but the administrative and authoritative positions are held by males. This situation is a universal phenomenon (Ferguson, 1984; Butter, et al., 1985). As a result of this dependent role, women tend to follow masculine orientation, although trying to uphold feminine values. This is made complex by the fact that majority of the clients approaching these non-profit organisations are also women.

Proper information flow, involvement in decision making, are very important in grass root level work. The group leader should be able to balance these activities with time management and creating a climate of satisfaction. The members should find him or her approach-

able and available. This enhances the morale and commitment of the workers. Non-profits with its qualitative nature of work, facing lot of hurdles on the way to goal attainment clearly indicates how the morale of workers can be low very often, and this also strongly points to the role of the leader. Mental time differs from physical time. Both these have to be strong for the leader and hence he or she should know good time management.

Alder and Mathews (1994) found that staff who felt that they were under tremendous pressure from work, reported sick as well as were unhappy with their supervisors. The staff of non-profit organisations looked upon their supervisors for support and guidance. Although field staff complained that they were not given adequate direction by the supervisors and director, they had to relate their problems to the supervisor, because on their own they were not able to solve the problems arising from their work. Hence supervisors were expected to support them, appreciate their work as well as empathise in their disappointments and struggles. Jackson and Schuler (1985) found that low job satisfaction was related to non-participation in decision-making, inability to provide feedback to supervisors and lack of recognition for good performance. Poor mental health was linked to close supervision and no autonomy at work (Beehr & Newman, 1978). Close supervision was not a threat in non-profit organisations; it was the absence of supervision and guidance that was plaguing the employees.

Close supervision was not a threat in non-profit organisations; it was the absence of supervision and guidance that was plaguing the employees.

Although office staff were not directly involved in sorting the problems of clients, field staff shared their experiences with them. This gave them an understanding of what was happening as well as made them feel involved in the work of the non-profit organisation. Beehr and Newman (1978) highlighted the importance of participation and involvement by suggesting that mental health was to a large extent a function of the degree to which output was under the control of the individual worker. In that context, overload of work or output did not lead to stress in a non-profit organisation. Very often the kind of problems of the clients that the field staff were handling stressed them out because they did not have the knowledge and ability to handle them. Sometimes they felt miserable about a client's problem for days. Nursten (1997) has written in detail about the

problems of the worker-client relationship and the lack of research and efforts to help the mental health aspects of field staff.

Conclusion

The hypotheses in the study were fully supported except hypothesis III which received partial support. Interaction effect indicates that decision-making style influences the climate to such an extent that the total rating of climate changes across the two regions and two types of NGOs. This shows that factors of climate can have strong impact on the overall organisational climate. The interaction effects are clearly pointing to the need of improvement in different aspects of climate in the different organisations studied. Conducting an organisation audit to understand the level of the various indicators of climate will help non-profit organisations to decide on a strategy to improve organisational climate. If the weak areas in the indicators of organisational climate is focussed on and improved, climate can be improved.

Non-profit organisations are directly accountable to their board of directors or to their funding organisations. Hence non-profits lack the guidance the market provides corporations. In the business world, customer satisfaction is very important. If enough customers are dissatisfied, the business will be affected. In non-profit organisations where there is no indicators like customer satisfaction and sales, it is important to have a good climate to raise the morale of the staff.

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Scale & Scope Economies in the Mobile Wireless Value Chain

Hemant K. Sabat

In order to build sustainable businesses in the mobile wireless industry, its stakeholders endeavour to earn higher margins by driving scale and scope economies in the industry's value chain. This paper describes the emerging business models and how these models improve operational efficiencies in the value chain. Specifically, this paper describes how the value chain evolves, identifies the value chain's sweet spots whose potential are being increasingly harnessed by the stakeholders to build sustainable businesses, and provides a roadmap into the future of the industry. As the value chain realizes these scale and scope economies, the industry is stabilizing.

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A confluence of technological leaps in omnipresent mobile wireless devices, networks, applications and services is setting the stage for the mobile wireless to transform itself from mobile voice to the ultimate communication media by ushering in radical new applications and business models. However, to capitalize on the opportunity, mobile wireless stakeholders must understand the key components of the mobile wireless industry: the evolving value chain and market structure, capital investment economics and business economics of the industry, emerging business models and trends driving scale and scope economies in the chain, and a roadmap into the industry's future. This overview, which is illustrated in Fig. 1, is briefly discussed here.

Delivering mobile wireless value through the evolving mobile wireless value chain and market structure

The mobile wireless subscribers expect a convenient, secure, reliable, personalized service at a value-based price. To enable these value propositions, the value chain has been evolving. However, the mobile wireless industry, like other industries, can be fundamentally split into two business models: retailer and wholesaler segments, or more specifically, customer-facing and support services, and the underlying communications networks and ownership of spectrum rights needed to offer wireless services through these networks (Fig. 2).

Traditionally, the network operator has bought rights to spectrum (spectrum owner role) to offer wireless service in a market, own and manage the network (network operator role), and provisioned customer-facing wireless services (service provider role). Fast forward to the present. New players have entered the industry turning it competitive and hostile. The complexity of interactions among them has increased. The technologies have become complex, and customer expectations have surged. Therefore, the value chain is confronted with

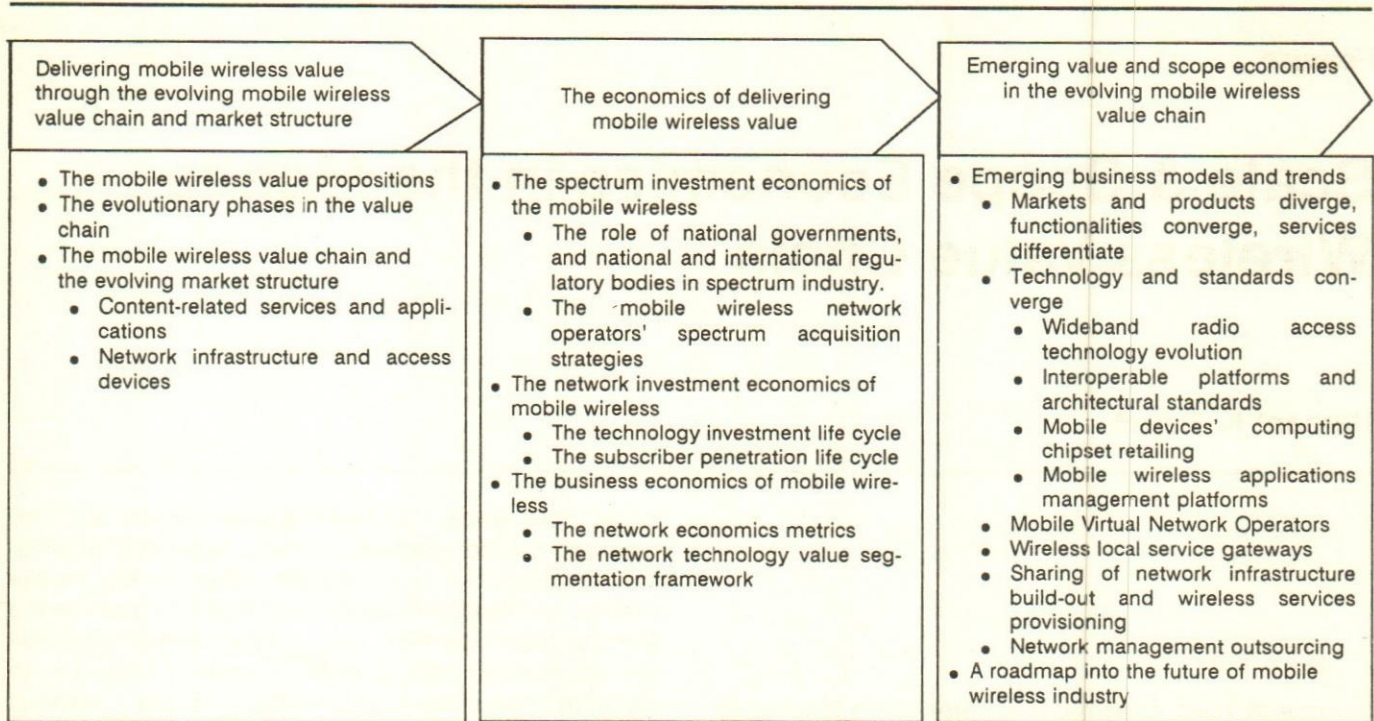


Fig. 1. The structure

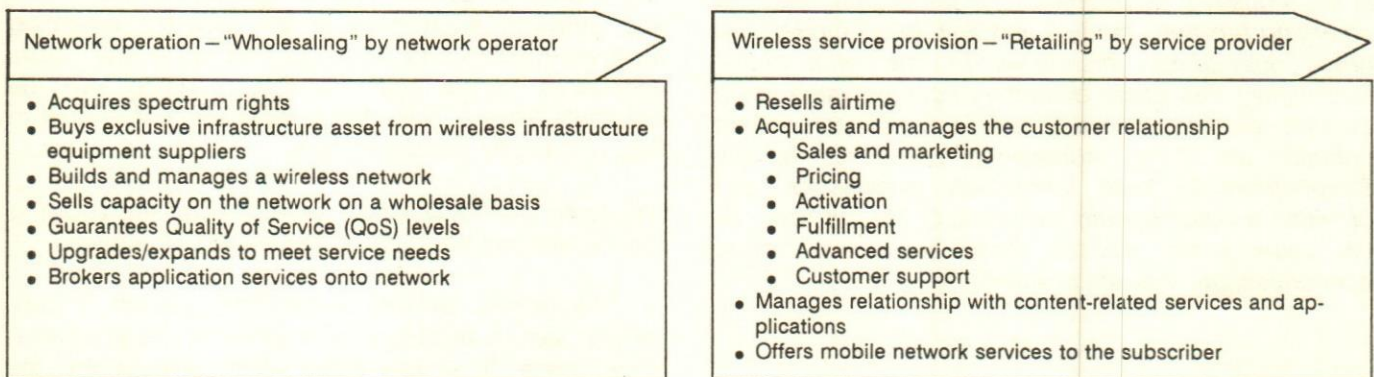


Fig. 2. The wholesaling and retailing functions in mobile wireless value chain

several challenges, both technological and business-related. Notable among these are listed in Table 1. The industry has been endeavouring to manage these challenges by flushing out the economics of delivering the mobile wireless value.

The economics of mobile wireless value

Attempting to overcome these challenges, the industry has been evolving through three chronological phases: the birth through the land-grab to the emerging mobile wireless (Sabat, 2002c & d; 2003b). Each of these phases has distinct economic characteristics that fall into various categories: spectrum investment economics (Sabat, 2003c), network investment economics (Sabat, 2002d), and business economics

Table 1: Challenges faced by the mobile wireless value chain

- The complexity of Third Generation (3G) technology
- High barriers to entry into the capital-intensive network infrastructure and access devices segment of the value chain coupled with low barriers in content-related applications and services segment
- Emergence of competitive threats as companies vie to earn a greater market share and endeavour to drive higher margins
- Shift from vertically-oriented business models to customer-facing horizontally-focused ones in order to realize greater scope economies
- Interoperability and compatibility issues across multiple grade networks owned by different operators, applications and services to earn customer loyalty and reduce churn thereby driving higher margins
- Identification of killer applications, and development of devices that will increase usability

(Sabat, 2003b). Moreover, the economics of each phase has driven the emergence of the subsequent phase, as described in earlier papers (Sabat, 2002c & d; 2003b).

Emerging scale and scope economies of the mobile wireless value chain

As the industry transitions from the bygone land-grab phase to the emerging mobile wireless phase, the value chain segments have been dynamically responding to the architectural challenges and the industry's competitiveness. These noteworthy changes, which are concluded from the right-most column in Figure 1 and described in the rest of the paper, are:

- The mobile wireless industry has been evolving architecturally to provide the content suitable to mobile wireless devices through scalable, reliable and interoperable networks using limited airwave spectrum bandwidth, and on to access devices constrained by form factors and resolution capabilities.
- New players are entering the market with new business models and new offerings to gain a foothold in the young industry, and to secure revenue streams from untapped opportunities in the value chain.
- Through partnerships, expansions, and mergers and acquisitions (M&As), creative, new services and applications are being offered in real-time with reduced risk.

Accordingly, a new regime has been evolving, wherein the wireless network operator no longer owns and manages the entire value chain. In the current evolutionary state, whereas the traditional value chain functions (Fig. 2) are still being performed by a combination of the existing and new players, the players are

more readily identifiable into two new broad segments, content-related services and applications, and network infrastructure and access devices (Fig. 3).

Due to enormous impact on the mobile wireless industry's evolution, these emerging trends and models demand an incisive discussion. Whereas the literature offers many a treatise on a few of the aspects of emerging trends in a disjointed fashion, the trends have out-paced the research. This paper:

- Explains how segments of the industry's value chain are evolving to stabilize the chain;
- Identifies the value chain's sweet spots, describes six emerging business models that are harnessing the potential of these sweet spots and explains how these models are improving operational efficiencies in businesses thereby driving scale and scope economies in the value chain; and
- Provides a roadmap into the future of the mobile wireless industry by rationalizing the unfolding competitive dynamics in the value chain.

Equipped with this understanding, the stakeholders can develop strategies to drive operational efficiencies in their businesses, and can build sustainable businesses; frame regulations and technological standards that are interoperable, secure and reliable; and focus their research efforts on emerging technologies to develop interoperable, secure and reliable commercial solutions that work seamlessly to offer the mobile wireless value to subscribers.

Driving scale and scope economies

The potential to capture a greater share of what will

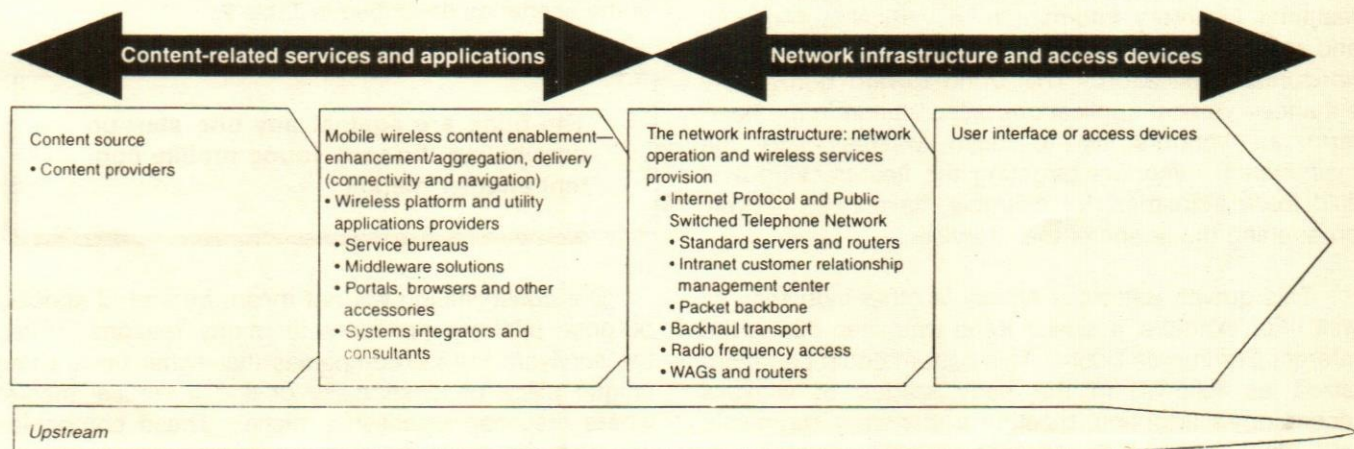


Fig. 3. The mobile wireless value chain

become a very service-rich subscriber utility, beginning with 2.5G, is attracting companies to move beyond their traditional area of market participation. This trend is best understood by describing the market dynamics in the value chain's segments and then by integrating the dynamics in these segments to draw their evolutionary path.

Content-related applications and services

Lower barriers to entry in the content-related services and applications segment have been attracting many companies. With many companies crowding the segment, the subscribers have been exposed to multitudes of offerings, but mostly of undifferentiated services. However, whereas the adoption of packaged wireless content enablement applications, a sub-segment of the content segment of the value chain, has grown over the years, only about 15% of Fortune 1000 firms currently use them (Yokomizo, 2001a). Availability of multitudes of undifferentiated services and their slow adoption has made the market competitive.

Lower barriers to entry in the content-related services and applications segment have been attracting many companies.

Most of the current wireless content enablement deployments are vertical applications for specific industries or corporate departments (Yokomizo, 2001a). Whereas wireless applications and services targeting specific vertical industries have proved to be more popular, over the past one year, horizontal functions have begun to appear in those vertical applications (Yokomizo, 2001a). The addition of messaging features would let, for example, a salesperson in the field access real-time inventory information, a vertical application, and receive an alert when particular items run short, a horizontal application. This trend toward horizontally enhanced vertical applications will continue in the near-term as vendors try to push wireless into the mainstream. Vendors targeting the fleet-tracking and field force industries, for example, have been actively broadening the scope of their services.

This growth pattern is typical in other industries as well. For example, a similar trend was seen during the Internet Commerce boom. This pattern could be rationalized as follows. In the early stages of wireless technology's adoption, meeting a customer segment's high-priority needs by offering vertically-focused applications will provide a clear return on investment. But

as the market matures, as new players populate the segment, and as enterprises expect a broader set of fundamental options, ultimately moving to a one-stop shop enterprise, vendors will have to broaden the capabilities of their applications. This broadening of portfolio helps the players not only to benefit from scope economies, but also to avoid ending up as niche players.

Another notable trend in this segment is the growth of pieced-together platforms. Whereas the individual content enablement platforms have the potential to succeed individually, the value chain can derive scope economies by bringing multiple applications into one combined platform. For example, Mforma's strategy is to sidestep the time-consuming development phase by simply buying the separate applications needed to create a platform for developing mobile applications and integrating them into a mobile content delivery platform.

Eventually, to further realize the benefits from scale economies the value chain will promote a change in the nature of the content enablement platforms. Content enablers could unite around mutually beneficial standards, not the technology approaches of individual companies. Though carriers would prefer a single development tool that performs multiple functions, the odds are against any one start-up dominating the very young mobile content enabler market. This is more probable especially when carriers have yet to deploy the technology needed to gather location information. In fact, even as a plethora of middleware companies have been establishing themselves in the value chain, Gartner predicts that up to 75% of the 100 or so wireless platform and middleware companies will be gone by the end of 2002, either dead or acquired. The reason is that those vendors need a US\$3 billion market to survive. But Gartner estimates the 2002 market to be about US\$500 million and growing at just 10% per year (Kuchinskas, 2001). The industry could see one or more of the scenarios described in Table 2.

The odds are against any one start-up dominating the very young mobile content enabler market.

But consolidation will not mean the end of special-purpose platform providers for many reasons. First, the survivors will be companies that either have some unique piece of functionality or find a vertical market where they can establish a niche. These companies will then be following one of Porter's three generic strategies for achieving above-average performance in

the industry segment, and hence, can sustain themselves (Porter, 1985). Second, big companies have their own Achilles heel. The more new and numerous devices and applications a subscriber wants to connect, the more helpful a platform or middleware product becomes. Companies such as IBM, Oracle, and SAP may connect mobile users to their specific systems, but they may not be so good at providing a unified connection scheme to all the various systems on the network, which will come from a variety of vendors. And even if they may, smaller middleware startups will have a competitive advantage due to shorter time-to-market arising out of nimbleness and less structured hierarchical organizations.

Table 2: The evolution of content-enablement platforms

1.	A factor driving the predicted middleware market dynamics could be the traditional software companies such as Lotus, IBM, Siebel Systems, Computer Associates. With critical mass of customer base, cash flow and track records, these companies can offer mobile extensions to their applications that claim to obviate the need for middleware.
2.	Or, over time, these middleware services may migrate from the carriers to the secondary service providers and ultimately to large enterprises that decide to make the wireless part of their overall network management.
3.	Another possibility is Mforma being bought out by a stronger player. Even if platforms such as Mforma's platform progress after an acquisition, it will still be a stopgap technology that will be superseded by more standards-based platforms or even by the carriers themselves. A similar trend is seen in the evolution of Internet commerce where only major platforms such as Ariba and i2 Technologies have survived the bust cycle that followed the hype, the Internet boom.

Another notable trend that will most likely drive industry growth in the future is the emergence of new mobile services such as Multi-Media Services (MMS) and imaging applications. This will help value chain players earn a greater mindshare of the customer, and thereby realize scale economies. To capitalize on this opportunity, industry players will need to deliver end-to-end solutions based on open architectures and standards. The degree to which the industry is successful in creating ubiquitous interoperability will ultimately determine the size of the market and the pace of adoption. Therefore, the industry will focus on interoperability issues to plug holes at the interfaces.

Network infrastructure

This segment of the value chain has been evolving architecturally to manage airwave spectrum bandwidth bottlenecks while endeavouring to meet the service demands of mobile wireless subscribers. As wireless data services flourish, and volume of Internet Protocol (IP)-based traffic grows, the industry will see a true con-

fluence of wireless and Internet. With this technological leap, to harness the full potential of mobile wireless, the network-related segment of the value chain is maturing and migrating to a new kind of architecture called wireless Internet packet-based network.

Optimized for an IP applications architecture.

This involves an evolution to a common- packet architecture for voice and data traffic with distributed access, transport, routing/switching, and control functions. Services, including voice, data, mobility management, and new IP services, are migrating to server platforms. Voice traffic will be carried in packet format from end-to-end. By doing so, voice and data will be consolidated into a single network. As network data traffic increases to offer scale economies to the network operators, these changes will drive a reduction in the number of physical network elements and links, as well as a reduction in warehousing facilities. The net effect will be a reduction in network operator's costs for voice traffic and quicker time-to-market for new services and applications even while optimizing the network for data end-to-end. The industry will then realize the benefits of scope economies.

For this architecture to be implemented in the industry, however, five key value chain elements are necessary to be in place: a packet-based network backbone, an IP-based Intranet, an Intranet customer relationship management center, Wireless Access Gateways (WAGs) and routers, and wideband radio interface.

Access devices

The mobile wireless handset devices segment of the value chain is endeavouring to integrate existing and new functionalities offered by the service providers into one convenient, easy-to-use device. In the year 2001, the handset segment of the value chain has seen the first wave of data-enabled wireless devices. Whereas the number and variety of these devices continue to grow, a true 'killer device' has yet to emerge that can offer multiple benefits. Further, the current end-user's experience with wireless services largely revolves around the features, functions and performance of their handsets and its software. As a result, the source of 2G mobile telephone differentiation and much of the emphasis over the past ten years has been on the user interface devices themselves. The near-term will probably see another wave of wireless devices, which is discussed in the emerging business models section following this.

Thus, the value chain has developed content

Industry		Functionalities/ benefits	Device category	Devices		Companies		
Mobile wireless	Data services	Information Computing	Personal computers	Notebooks		Dell, Compaq, IBM, Toshiba, Apple, Sony		
				Handheld PCs		Hewlett-Packard Palm, Research In Motion (BlackBerry), Handspring (Visor), Compaq (iPAQ)		
				Personal Information Managers				
	Mobile telephony	Communication	Telephones (broadband)	Analog		Sony Ericsson Mobile Communications, Nokia, Motorola, Samsung, Neopoint, Matsushita, NEC, Alcatel, Fujitsu, Hitachi, Sagem, Sendo, Sanyo, HTC, Kyocera, LG, Mitsubishi, Panasonic, Sharp, Siemens, Toshiba		
				Digital	Voice-enabled digital Cellular Phones			
					Smartphones (Voice + Internet-enabled)		Kyocera, Motorola, Nokia, Sony Ericsson Mobile Communications, Qualcomm, Samsung	
				Paging systems (narrowband)	Pagers	FLEX		Arch Wireless, SkyTel (WorldCom), PageNet, PageMart, Metrocall, WebLink
						ReFLEX		
				Dedicated Packet Data Networks (e.g., Cellular Digital Packet Data)		BellSouth Wireless Data's Mobitex (Ericsson) American Mobile's ARDIS (Motorola)		
	Media and entertainment	Entertainment	Handheld games	Video game players			Nintendo (Gameboy), SNK (NeoGeo), Bandai, Microsoft (Xbox), Sony (PlayStation), Sega	
Video				Photography	Film-based			Canon, Nikon, Pentax, Kodak, Sony, Sharp
			Digital camcorder					
			Digital still camera					
Personal DVD			Sony, Panasonic					
Audio (Personal Hi-Fi)			Mini Disc	Sony, Panasonic				
	Solid state (Flash memory) / HDD			MP3, Samsung, Sony				

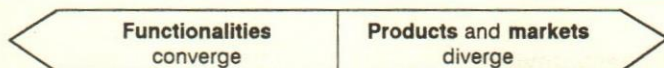


Fig. 4. Trends in Mobile devices

enablers to generate wireless content, which is increasingly being transmitted through an IP-based core network, and on to an access device, which is integrating more and more functionalities. This architecture is made more efficient by emerging business models and trends. In order to understand how the new business models and trends are targeting the sweet spots and harnessing the potential of the value chain, the most notable models are discussed below.

Business model/trend 1

Today's consumers demand a wide range of benefits, which can be segmented broadly into four categories: information (personal, business), computing (commercial transactions such as purchases and sales), communications (voice, messaging), and enter-

tainment (video, audio) (Figure 4). To meet these needs of subscribers, businesses offer consumers a wide range of digital devices, including mobile phones, digital music players, digital cameras and camcorders, handheld gaming devices and portable and handheld Personal Computers (PCs). This trend is supported by the emergence of new products and the digitization of older, analog devices.

Further, increasingly, these devices are competing across traditional divergent product lines in terms of their functionalities (Strategy Analytics, 2001; Shostech et al, 2000). As device manufacturers pull together the telephony capabilities of the mobile phone with the data features and functionality of a handheld, many products are appearing in the market that provide multiple functionalities integrated into the

same device (Figure 4). Functionalities' convergence is among the hottest trends. The converged handheld market opportunity is positioned directly at the intersection of these two industries.

Functionalities' convergence is among the hottest trends.

Even with this functionalities' convergence trend among divergent products, the offerings are increasingly personalized, and hence, differentiated, to earn a larger mindshare of the targeted customer. As mentioned earlier, in the handset industry, much of the emphasis so far has been on developing a product that can primarily deliver voice communication services. There has been little emphasis on wireless data connectivity. The next-generation solutions are all about data capability, which will open a potentially larger utility to users. Therefore, when moving over to 3G, it will to a much larger extent be the service provider who determines the device utility. This will be primarily achieved through downloadable applets, localized services, and electronic security.

In line with this, handset manufacturers will have to increasingly leave development of the basic handset technologies to component suppliers, focusing on two aspects:

- *Capturing a portion of the service/application value available with 2.5G/3G services*

This shift towards higher value-add services/applications for 2.5G/3G will offer the opportunity for terminal manufacturers to shift the source of differentiation from product to function. With regard to their business model, the top-tier terminal manufacturers have to shift from a box technology focus to an application focus.

- *Identify the "killer form" factors to deliver these services/applications*

The possible applications run on mobile terminals will be very closely related to terminal form factors. Terminal characteristics such as data entry (keyboard, keypad, and handwriting recognition), displays (color, black-and-white) and the processing elements inside will all be determined by which services/applications are to be provided. With no clear vision of future killer applications for 2.5G/3G, terminal suppliers will have to launch a wide array of form factors in the market,

hoping that one will hit the mark. As a result, they may leave the development of the basic technology elements for the terminals to the component suppliers.

In sum, the source of differentiation will shift from product to function, and the focus will shift from box technology to application/services ('services differentiate'). Differentiated services will enable service providers to earn a higher ARPU. Given that applications will drive the form factor of the access devices, and that subscribers are demanding a variety of applications and services, the market will see a spate of products rolling out ('markets and products diverge') that will increasingly include new functionalities offering data services, mobile telephony and media and entertainment, all integrated into the same device ('functionalities converge').

Table 3: Examples of functionalities' convergence

- In 2002, the U.S.-based Handspring launched its new Treo model that combines the functions of a handheld computer, a PDA and a Global System for Mobile Communications (GSM) phone (Young, 2001a; Table 4); and
- Microsoft's Pocket PC 2002 promises to offer a wider range of connectivity interfaces including 802.11b wireless LAN, Bluetooth, Cellular Digital Packet Data (CDPD), CDMA and GSM networks, as well as digital-audio playback and enhanced security.
- The use of Java operating environment and Qualcomm's Binary Runtime Environment for Wireless (BREW) application development and management platforms by Motorola, Nextel, and others in enterprise-oriented devices also presages the shift from standalone PIMs to truly mobile wireless devices.
- Compaq, acquired by Hewlett-Packard in 2002, is incorporating Java into its iPaq H3800 series, using Insignia's Jeode PDA edition. This opens the door to running enterprise applications such as sales force automation, commerce or database queries (Total Telecom, 2001a).

Accordingly, as described earlier, the year 2001 saw the first wave of data-enabled wireless devices and the near-term will probably see another wave of wireless devices. Mobile phones are expected to evolve into personal information and communication devices, and even serve as a new content distribution platform (see example in Fig. 5). At the same time, PCs and PDAs are adding communications and audio-visual functions.

Mobile phones are expected to evolve into personal information and communication devices, and even serve as a new content distribution platform.

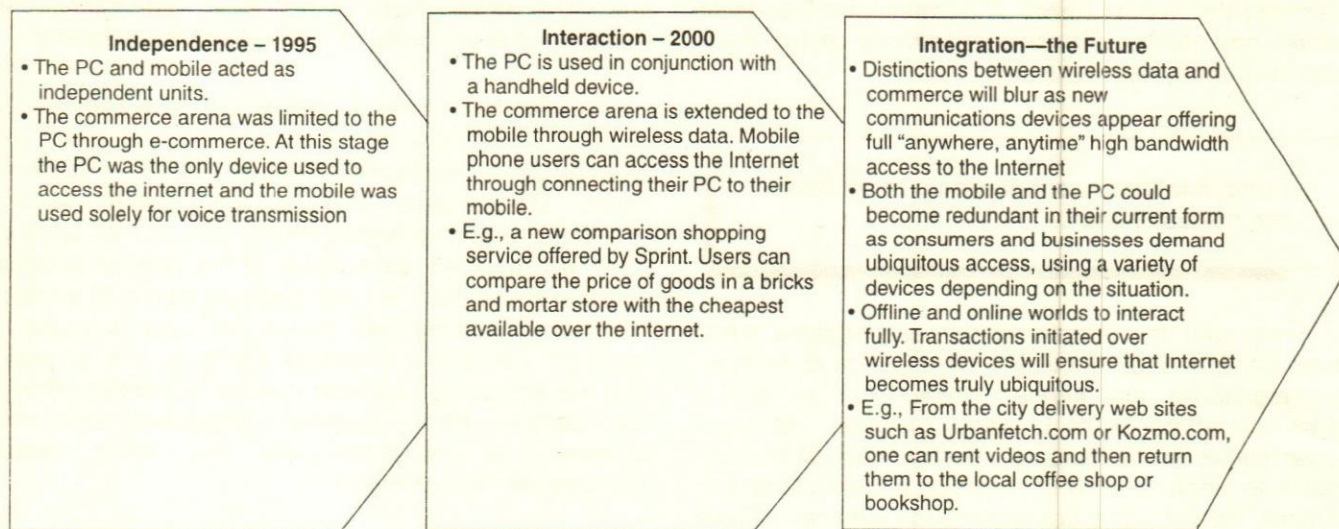


Fig. 5. Integration of communication functionality with information and computing: historical trends

Standalone audio and video devices will add Internet functionalities.

Table 4: Integration of communication functionality with information and computing: Handspring's Treo

Targeted at and customized for high-end users, who would buy devices such as the Nokia's Communicator, Compaq's Accompli or Kyocera's QCP, the device comes with either a keyboard or the familiar stylus-based Graffiti system. It can be used as a phone without the need for attachments, though it supports GSM only. Based on the Palm operating system, the novel feature is the level of integration. The Treo also comes with its own browser, called Blazer, which supports HTML (Hyper Text Mark-up Language), c-HTML (compact HTML, the mark-up language used by i-mode), WML (Wireless Mark-up Language) and xHTML (supported by WAP 2.0). The Blazer is designed to allow faster browsing by ensuring that text comes up first, with images following later. This is achieved as all traffic goes through a server that grabs a Web page and pushes the text through to the device. By doing this, it is possible to gain faster Internet access using GSM speeds.

The market effects of functionalities' convergence are many. One of them is as mobile phones increasingly integrate multimedia functions and services, new demand drivers in the digital world will require mobile handset vendors to strengthen or acquire core competencies related to digital media and consumer electronics. Most players will be forced to find an attractive partner or exit the business. A joint venture between mobile equipment-maker Ericsson and consumer electronics giant Sony in 2001 to form Sony Ericsson Mobile Communications is such an example (Tissot, 2001). These partnerships let the players generate scope economies by helping them gain foothold in new domains.

There are challenges to this integration trend that

may come from many quarters, as described in latter sections.

Business model/trend 2

The content and functionalities are enabled by the network and access devices (Fig. 3). Therefore, the economics of functionalities' convergence has necessitated

- A convergence of wideband radio access technologies and of the architectural standards supporting the technological evolution; and
- Emergence of interoperable platforms, and of architectural standards in the access devices segment.

The functionalities' convergence trend has also enabled:

- Retailing of mobile wireless devices' computing chipset; and
- Emergence of mobile wireless applications development and management platforms.

How these trends are generating scale and scope economies in the value chain is described below.

Wideband radio access technology evolution

It is a given that technology has a significant impact on the fundamentals of the wireless business. In particular, the choice of digital air interface used to deploy wireless service determines and also affects Quality of

Service (QoS) and Return On Investment (ROI). Network capacity, which impacts QoS of functionalities, increases only through additional spectrum, or technological improvements in the radio interface, which allow more bits to be transmitted over the same amount of spectrum. The average user is consuming more voice minutes per month (Deutsche Bank, 2001). What compounds the scenario is that the amount of data traffic will grow very quickly from the use of more and numerous applications and services focused on communications, information, entertainment, and commerce. Given this increase that the industry has forecast for voice and data traffic as well as subscribers, it is clear that as time goes by operators need to add capacity. Further, the number of wireless subscribers continues to increase at around 20% per year (Global Mobile, 2002). But radio interface technologies have different geographical coverage at a given capacity. Therefore, operators deploy new technologies that allow them to increase coverage.

To add capacity and increase coverage, the mobile wireless industry went through its first major technology upheaval in the 1990s when operators chose the digital upgrade path from analog to cellular. To offer wireless data content, now the industry is undergoing its second major technology upheaval in the digital domain itself. The introduction of mobile wireless data has thrown new spanners into the well-oiled traffic engineering and economics that the industry has developed for voice. The industry is now investing in technologies and standards that would enable higher data transmission rates and higher QoS to a broader geographical coverage.

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As technology has a significant impact on the fundamentals of the wireless business, deciding this next-generation technology migration path involves considering a number of factors. The operator has to consider not only how well the technologies perform relative to each other and how much each migration path costs (upgrade costs plus subscriber conversion costs), but also evaluate market-specific factors. A case in point is the developmental challenges faced by the U.S. mobile wireless market described in Table 5.

The choice of digital technology to date has affected spectrum allocation due to different channelization and frequency reuse of the various technologies, as well as a host of other issues. Limited spectrum bandwidth and yet-to-be-developed efficient, user-friendly interfaces or devices constrain the user experience promised by mobile wireless value chains. The evolution and deployment of wideband radio technologies will relieve the current access bottleneck and open the door to a richer wireless Internet experience. The evolutionary path of wireless access or air interface technologies is depicted in Figure 6.

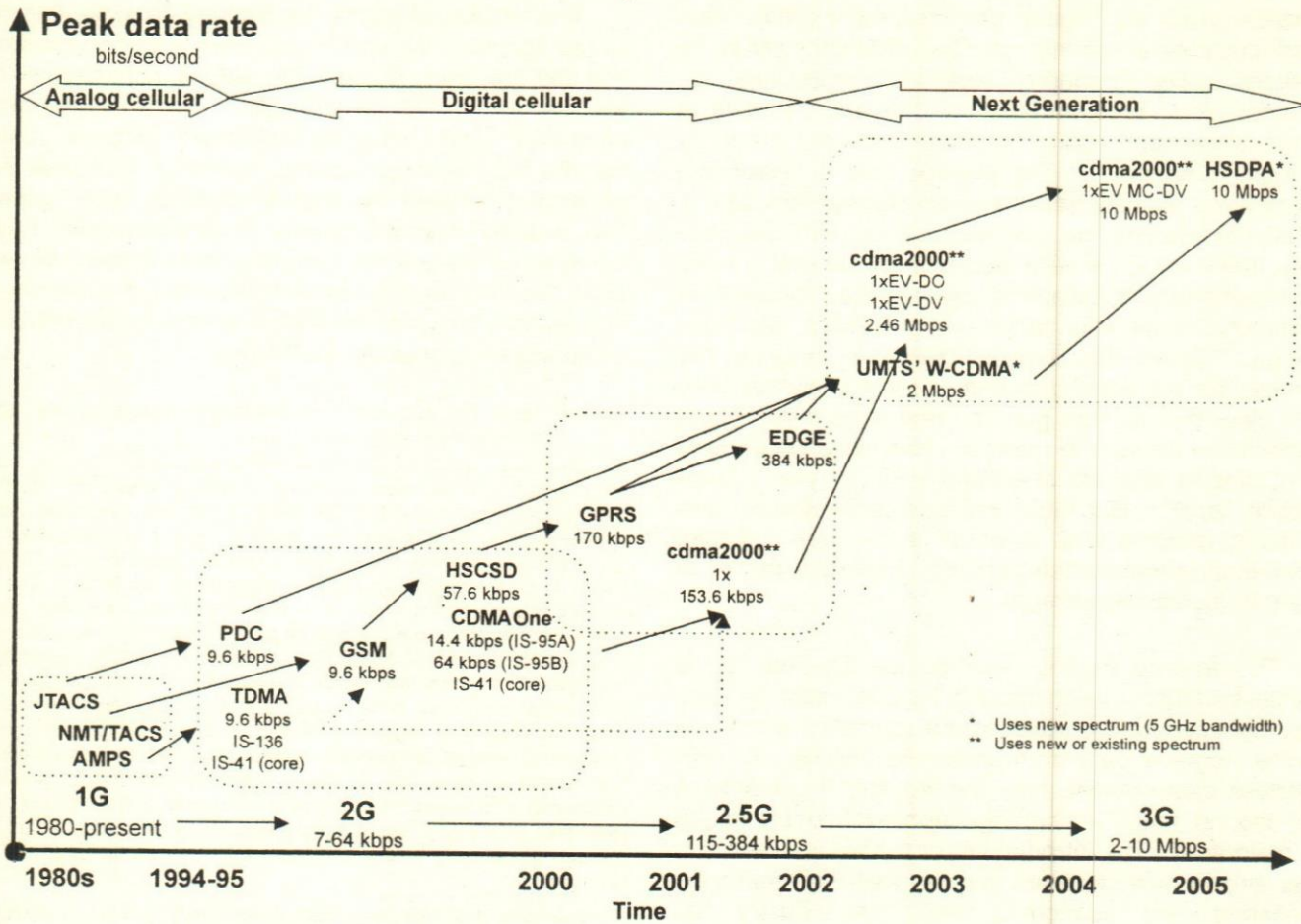
Table 5: Radio access evolution challenges faced by the U.S. mobile wireless industry

In the U.S., rather than mandate a single standard like the European Union did with GSM, the U.S. let competition decide. Consequently, as the industry moved from one technological generation to the next, the carrier's made decisions to go to TDMA, GSM, or CDMA depending on business and market drivers. These decisions have had an impact on carrier's businesses since, and will have a much more material impact on their business as they migrate to the next technological generation. Mainly due to the multiple, competing technology standards in the U.S., relative to the rest of the world, the development of U.S. wireless voice and data services has lagged behind. Poorer quality and more expensive wireline telephone services have resulted in wireless penetration of only 39% in the U.S. versus penetration rates in Europe of 67% at year-end 2000 (Carvalho et al, 2001). Further, 3G networks in the U.S. are going to operate in a spectrum that is already being used for 2G services, and not a new spectrum as in Europe.

Furthermore, if all operators were using GSM, such as in Europe, the migration and upgrade cost would be the same for all operators, independent of the technology chosen. As multiple 2G technologies are being used in the U.S., upgrade costs are different among operators.

As the carriers migrate to 3G through 2.5G along one of these paths, they are exposed to multitude of factors on which to base their decisions. These factors are ease of migration from an operator's current technology to the next, network capital expenditure (capex) required for migration, radio frequency needs, competitive data throughput availability from the technology, and services differentiation capability for revenue generation from subscribers.

By integrating multiple technologies into fewer more efficient, and standard technologies, the industry will support a larger volume of subscribers and offer bandwidth-heavy applications per technology. As a result, it will realize scale economies. Further, service providers can venture into untapped regions with region-specific applications to earn scope economies with minutely-varying multiple businesses. In other words, strategic and well-timed technology migration path decisions can help operators and service providers:



NMT: Nordic Mobile Telephone
HSCSD: High-Speed Circuit Switched Data
EDGE: Enhanced Data Rates for GSM Evolution
EV: Evolution
DO: Data Optimized
DV: Data-Voice
MC: Multi-Carrier
HSDPA: High-Speed Downlink Packet Access
IS: Interim Standard

Fig. 6. Evolution of wireless access technologies: from 2G through 2.5G to 3G

- Lower operating costs by increasing network capacity and making more efficient use of spectrum;
- Increase ARPUs by allowing operators to provide new types of services and to earn a greater mindshare of the subscribers thereby realizing scope economies at the subscriber-level; and
- Reduce churn by improving QoS and achieving scale economies quicker than otherwise.

Emergence of interoperable platforms and open architectural standards

A concurrent pre-requisite to the deployment of the converged radio access network architecture is the creation of a global and open mobile software and services market. A number of handset vendors and wire-

less service providers have formed an interoperability group to develop interoperability standards, and to ensure that future generations of wireless devices work together more seamlessly. The group includes Nokia, Ericsson, Sony, NEC, Mitsubishi, Samsung and Siemens (Hold, 2001).

The initiative marks an important milestone as industry stakeholders come together to boost the early introduction of new, interoperable mobile Internet access and visual contents downloading services worldwide, utilizing the 2.5G evolution and the coming 3G networks. Furthermore, because members of this alliance include not just handset vendors (i.e., Nokia), but also consumer electronic vendors such as Sony, the venture is clearly looking beyond just the current handset vendor domain. It will provide a more consistent solution for wireless users by offering an interoperable

solution between handsets and other consumer electronic devices. These open architecture initiatives will also benefit developers because it will include application programming interfaces available from their Web sites that will free developers to concentrate resources on innovation rather than getting to market. As the underlying software is the same, subscribers will eventually be able to use new applications to communicate among a greater number of different smartphones. As a result, operators may benefit as well.

At the same time, one should be wary about the market seeming to lurch from interoperability alliance to alliance, with many failing to gain traction. Whereas the goals of this alliance are good, the success of the venture is far from assured. Most vendors join interoperability groups such as this with less focus on ensuring that all players can work well together, and more focus on ensuring that their own particular needs are taken into account. As a result, somewhere along the line most of these groups fail to deliver, causing a splintering of the factions into several competing relationships.

Another typical problem occurs when each vendor takes the end results of the group as a base level of interoperability and seeks differentiation through added value. This is necessary to an extent, but these vendors will have to agree to play by certain guidelines to ensure that the value-added functionality does not lead to future interoperability issues. Also, Microsoft is noticeably absent from the list of alliance members. Therefore, there is a risk that the software giant will continue to push forward with its own handset operating system attempting to create a de facto standard that does not interoperate.

Last, to succeed, this venture needs to expand beyond its current limitation of GSM interoperability for many reasons. One, such a stance works well in Europe, but the goal should be global interoperability, and as such, must include CDMA and TDMA. Two, without the inclusion of these technologies, the benefits of this interoperability will be very limited.

Mobile devices' computing chipset retailing

Mobile semiconductor companies are bundling the chipset, software, development tools and reference design in the 2.5G and 3G platforms. The companies plan to offer platforms including component specifications, printed circuit board layouts and software, plus support for customization. An analogous case in point is retailing of 'industry's professional knowledge' in professional services industry.

This emerging business model can have three economic impacts on the value chain. One, by sourcing chipsets and platforms ('technology enablers') from leading handset Research and Development (R&D) houses, and producing locally at a fraction of the labour costs of Europe and North America, any company can today enter the mobile handset industry. Two, the platforms will allow equipment manufacturers to launch 2.5G and 3G handsets without having to spend huge sums on R&D. Three, by retailing chipset technology, the chipset makers will bring down barriers to entry into the chipset market and create a commodity out of a proprietary high-margin portfolio-reminiscent of PC manufacturing industry in the 1980s. This will create two segments in the mobile handset industry: there will be very few companies that will deliver the technology, but many companies that will deliver the handsets (products).

This emerging business model can have three economic impacts on the value chain.

Mobile wireless applications

As the industry lurches towards data services, mobile wireless applications management platforms solve a problem that has hobbled the industry for long: Handset manufacturers must load each phone's applications onto the handset at the factory. Further, each application must be custom-built for each individual handset. There is no way to install new applications on existing phones. Therefore, carriers faced a difficult, time-consuming, and expensive proposition when rolling out new services to users. Users have had to replace the handset with a new one that has new applications loaded on it.

Mobile wireless applications management platforms allow users to download new applications to mobile wireless devices, save them, and delete old ones. Subscribers can upgrade the functionality or usefulness of their mobile device after purchase. These platforms are creating not only a way to write applications, but also a way to distribute these applications. Carriers get a large pool of mobile wireless applications from which to run their networks. Developers do not have to develop a different application for each handset variation. Readymade marketplace run by these platforms bring developers and carriers together and speed the appearance of mobile wireless applications.

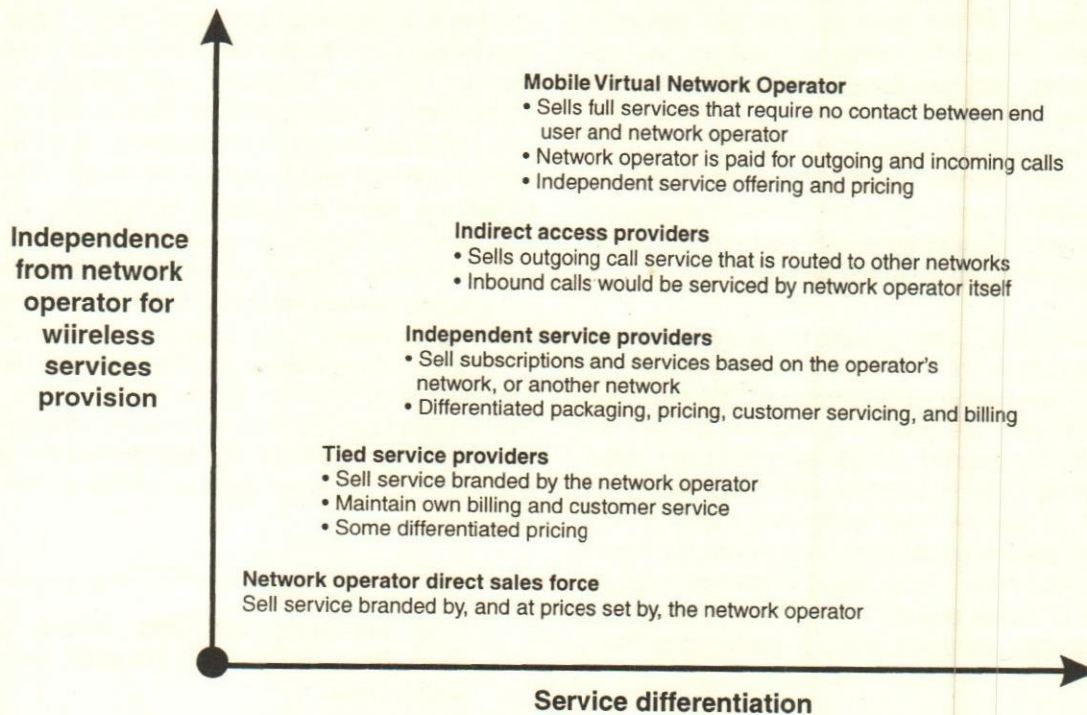


Fig. 7. Levels of wireless services provision

Table 6: A comparative evaluation of J2ME and BREW

J2ME	BREW
<ul style="list-style-type: none"> • The addition of Sun's Java to mobile handsets through J2MEa miniaturized version of its flagship programming language opens Java-enabled devices' applications to initially be similar to the wealth of applications developed for the Palm Operating System (OS), including games, personal information management, and portfolio/ asset tracking tools. • Generally regarded as a more programmer- friendly environment than the C/C++ required to program BREW applications. • Not limited to CDMA phones. The fact that 75% of the world uses GSM handsets (Total Telecom, 2001b) may allow it to realize scale economies quicker. 	<ul style="list-style-type: none"> • Aims to simplify mobile application development on CDMA handsets. • Offers a native development environment that allows faster program execution, and tighter integration with hardware.
<ul style="list-style-type: none"> • The 2.5G packet capability allows these applications to be network aware so that they can continuously refresh real-time content such as airline schedules, weather alerts, currency prices or stock quotes. Both these platforms let a single mobile application run on a number of computing platforms, from Windows to Linux to the Mac operating system. 	

Two competing commercial solutions, namely, Sun Microsystems' Java 2 Micro Edition (J2ME) and Qualcomm's BREW, offer consumers the ability to download and save applications to the handset. In the longer-term though, as evident from the comparative evaluation of the two technologies in Table 6, Java ap-

pears to have the opportunity to stimulate handset replacements as people upgrade handsets (similar to PCs in the 1990s) for better memory and processing power and access-improved applications.

Table 7: The MVNOs

Virgin Mobile	The U.K.-based Virgin Mobile, a VNO in the mobile wireless world, sells a unique version of a service already running on a single underlying asset: wireless voice and data service on a mobile phone on a third-party's network. Virgin Mobile will also offer Virgin-branded services on Sprint PCS' network in the U.S.
NorthPoint Communications	AT&T's NorthPoint Communications provides the backbone for more than 200 broadband ISPs, including Excite@Home and MegaPath.
Working Assets	Working Assets resells MCI's long-distance service under its name.
Quam	Group 3G's Quam has recently signed a 'national roaming agreement' with E-Plus so that Quam can launch an MVNO-type of service in Germany (Telefonica's Press release, 2001). The now-defunct company, Group 3G, was a partnership between Sonera (42.8%) and TEM (57.2%) that targets the new 'Generation M' for private and corporate customers in Germany.
Universal Music Mobile (UMM)	Vivendi's MVNO, UMM, has set its revenue model on marketing music to the youth market. UMM offers voice, Short Message Service (SMS) capabilities and other features such as previews of new releases, music news, music events, invitations and CD purchases (New Media Age, 2001).

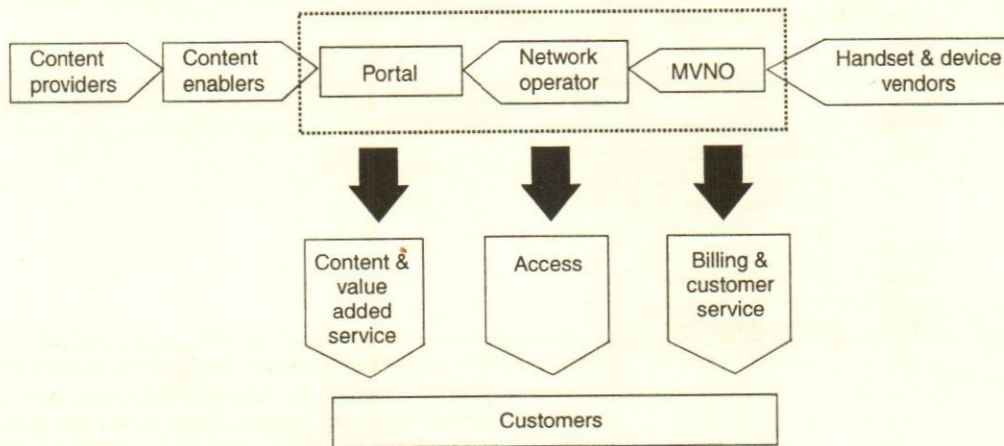


Fig. 8. An MVNO value chain

Business model/trend 3

To provision wireless services that are listed in Figure 2, the wireless industry could adopt one of several models. These variations are an outcome of how the wireless services are obtained by a subscriber, as defined by the U.K.'s Office of Telecommunications (OFTEL, 1999). The two defining dimensions are: level of differentiation of wireless services and dependence of wireless service provider on network operator for wireless service provision (Fig. 7).

Of particular importance is the wireless Virtual Network Operator (VNO) model. A VNO is a service provider that extends its existing brand into an existing service of a third-party communications network operator. The VNO model is being extended to the mobile wireless industry by Mobile Virtual Network Operators (MVNOs). MVNOs do not own the underlying spectrum or radio network; they use the wireless communications network of a third-party carrier to offer their own private label branded versions of licensed carriers' existing wireless services. Thus, these companies act as sales and distribution channels for licensed wireless carriers, buying airtime wholesale and reselling it to consumers. Table 7 gives examples of a few of the operating MVNOs.

The MVNO business model is an outcome of economies of scale efficiencies arising from the core competence of a company in specific business operations of the mobile wireless value chain. Due to complexities of the evolving industry, the network operator should let the 'retailing' function of the value chain be performed by the MVNOs, who have the core competence in 'retailing' telecommunications business. Figure 8 describes how MVNO business model combines a few existing sub-segments of the value chain (Figure 3) to create a new virtual segment.

As the mobile wireless era unfolds and wireless data traffic increases, the economics of MVNO model will adapt and transform the value chain. Wireless data is radically different from undifferentiated voice services that have become a carrier's commodity offering. Mobile wireless data services demand the service provider to feel the pulse of the demands, preferences, and habits of the customers. Combined with this marketing paradigm, the classic economics of "prisoner's dilemma" will be too tempting for someone not to move out of the box and turn the 'retailing' over to a better positioned or more creative entity. The carrier will do the voice aspect, but the data and media can migrate to the most creative entity in tune with the demands, preferences, and habits of consumers. Success at this could make other carriers in the market clamour for this channel on their networks.

Further, MVNOs brand their service with special home pages, colour faceplates for phones (team jersey and logo, or Goofy), and then link users to their outside voice or data destination. This type of brand extension generates significant new business opportunities for content aggregators and portal infrastructure companies such as InfoSpace and i3 Mobile. It also allows companies such as Virgin to venture into mobile business (Virgin Mobile) while offering products from its existing portfolio. This lets such companies not only to earn scale economies from a larger subscriber base, but also earn scope economies by venturing into new businesses such as mobile wireless.

Furthermore, one of the business value propositions of mobile wireless is personalized content. Therefore, meeting customers' demand for location-specific personalized content will be one of the critical success factors of mobile wireless. But, in many countries, subscriber-pays model is based on the number of minutes used, and not on per download. This is not

Table 8: Wireless LAN technologies and standards

Wireless LAN standard	Data transmission rate (Mbps)	Radio Frequency (RF) band (GHz)	Comments
802.11	1-2	2.4 <i>Region Allocated Spectrum</i> US 2.4000 - 2.4835 GHz (unlicensed by FCC) [Industrial, Science & Medical (ISM) band] Europe 2.4000 - 2.4835 GHz Japan 2.471 - 2.497 GHz France 2.4465 - 2.4835 GHz Spain 2.445 - 2.475 GHz	<ul style="list-style-type: none"> Institute of Electrical and Electronics Engineers (IEEE) instituted a working group called IEEE 802.11 to create this wireless LAN standard
802.11b	11	2.4	Named as Wi-Fi by Wireless Ethernet Compatibility Alliance (WECA) <ul style="list-style-type: none"> Wireless Ethernet Compatibility Alliance (WECA) was founded by 3Com, Aironet (acquired by Cisco), Intersil, Lucent, Nokia and Symbol to certify 802.11b products and to promote Wi-Fi as a wireless standard 802.11b products are generally backward compatible with 802.11 products
802.11a	54	5-6 [Unlicensed National Information Infrastructure (U-NII) band] in the U.S.	<ul style="list-style-type: none"> Currently expensive Has high power consumption 802.11a products are not compatible with 802.11b devices, as the two standards operate on different radio frequencies
802.11i			Adds stronger security and encryption technology to 802.11, 802.11b, and 802.11a
802.11e			Makes 802.11, 802.11b, and 802.11 multi-media environment-friendly
802.11g	54	2.4	<ul style="list-style-type: none"> Will work with older wireless networking technology, 802.11b, allowing companies and consumers to keep existing equipment and possibly boosting the number of wireless connections in homes and businesses (Reuters, 2001a) Texas Instruments and Intersil are backing competing technologies for 802.11g standard
HomeRF	2 10 (Proxim's Symphony supporting HomeRF 2.0 standard; Arar, 2001)		<ul style="list-style-type: none"> Targeted at home market segment Designed for low cost and simplicity rather than high-speed performance Backed by HomeRF Working Group, which includes many major computer and consumer electronics manufacturers such as Intel, IBM, Compaq, Motorola, Samsung, Siemens, 3Com, Fujitsu, Hewlett-Packard, LG Electronics, Matsushita, Nortel, Proxim, National Semiconductor, Philips, Sharp, Texas Instruments, and Xerox Based on older Digital Enhanced Cordless Telephone (DECT) standard, which itself was based on TDMA Includes a protocol called Shared Wireless Access Protocol (SWAP) for device-to-device communications, which is designed to enable interoperability (Shostech et al, 2000)
HiperLAN2 Global Forum (H2GF)	54	5	<ul style="list-style-type: none"> Founded by Bosch, Dell, Ericsson, Nokia, Telia and Texas Instruments, Lucent, Nortel and Xilinx Advantages are its very broad bandwidth (up to 54 mbps, enough for numerous simultaneous television channels, making it suitable for multimedia applications), relatively low interference (the technology uses less-crowded spectrum), promised interoperability with UMTS, a 3G standard, and built-in 'ad hoc' networking protocols Supports higher data rates, but are currently expensive, and have high power consumption

Sources: Newsbytes (Cellular Telecommunications & Internet Association, Total Telecom, ZD Net.com, CBS MarketWatch.com, Wireless NewsFactor); Sabat, 2000; company/organization Web sites.

economical for surfing. Since the primary purpose of mobile wireless will be utility (hunting, not surfing), the content has to be highly targeted to a customer to enable hunting. By drawing upon their experience with customers from cross-selling opportunities, MVNOs are better placed than network operators to offer such content and generate scope economies in the value chain.

Meeting customers' demand for location-specific personalized content will be one of the critical success factors of mobile wireless.

Table 9: Comparison of wireless networking options

Factors	Wireless WAN	Wireless area networks		
		Wireless LAN		Wireless PAN
		802.11(a, b, i, e, g)	HomeRF	
Coverage	Wide	Local	Personal	Personal
Speed	384 kbps	1-11 Mbps	1.2 Mbps - 10 Mbps	
Distance	10 miles	100 meters	50 meters	10 meters
Content	Voice + Data	Voice + Data	Voice + Data	Voice + Data
Power consumption	High	High	Medium	Low
Primary market	Mobile wireless	Corporate LAN	Home LAN	Home LAN
Frequency band	800 MHz, 1900 MHz Licensed spectrum	2.5 GHz - 5.2 GHz Unlicensed spectrum	2.4 GHz Unlicensed spectrum	2.4 GHz Unlicensed spectrum
Technology	CDMA, TDMA, GSM, WCDMA	Wi-Fi	HomeRF	Bluetooth
Devices	Cellular phones	PCs, laptops, printers, Internet gateways, automobiles (Telematics)	Laptops, home appliances, cable/DSL/satellite, PCs, Home entertainment centers, printers, set-top box, cordless phones, Home gateways	Cellular phones, PDA, laptops, peripherals, desktop PCs, digital cameras, mouse/keyboard, automobiles (Telematics), consumer appliances
Companies	Nokia, Ericsson, Samsung, Kyocera, Denso, Siemens, Motorola, NEC, Sony	MobileStar	Proxim	

Sources: Carvalho et al, 2001; Crawford & Aftahi, 2001; Lundberg & Carvalho, 2001; Sabat, 2000.

Business model/trend 4

Local service gateways such as wireless LANs and wireless PANs have applications in the office, home, and public areas like airports, hotels, and shopping areas. How these gateways generate scope economies in the value chain is described here.

Wireless Local Area Networks

The main limitation to the success of wireless data stems from the fact that today there is no wireless network that can satisfy the needs of all wireless data users. Whereas two-way paging ReFLEX networks and the dedicated packet data networks of American Mobile ARDIS and BellSouth Wireless Data's Mobitex are well suited for messaging applications, remote access to the Internet is limited by the device and spectrum. While the cellular carriers struggle to bring 2.5G and 3G high-speed data to their national networks, the alternative, high-speed, wireless data network based on wireless LAN technology using wireless Ethernet, also known as Wi-Fi or 802.11b, has been appearing in a remarkably organic fashion.

As shown in Table 8 that describes the current and evolving wireless LAN technologies, wireless LAN

providing data speeds up to 11Mbps (Wi-Fi) on par with the average wired Ethernet network's 10Mbps and up to 54 Mbps is gaining significant momentum in the business, home, and education markets as replacements for wired Ethernet networks (Young, 2001b). In doing so, wireless LANs are creating a critical subscriber base for wireless data to take off. A comparative evaluation of performance parameters of cellular networks and wireless LANs (see Table 9) shows that 2.5G and 3G technologies, which are in early stages of implementation, target a mindshare of data subscribers that is complementary to that of wireless LANs. By targeting a complementary mindshare of the customer, the next-generation technologies can use this wireless LAN's data subscriber base to gain traction and accelerate.

Data subscribers who get used to Wi-Fi's high data throughput will expect an equally high QoS from CDMA2000 and WCDMA. Thus, wireless LAN is creating an expectation that 3G cellular networks must meet.

Wireless LAN has its own share of troubles, including security weaknesses and vulnerability to signal interference. Yet, it may serve as Wi-Fi's hot spots serving hospitality business (airports, hotels, restaurants, cafes, executive lounges, etc.) and educational institutions. Further, whereas, in the future, a possible 3G roll out

may restrict wireless Ethernet to niches, 3G licensing costs, technology delays, spectrum drought (wireless LAN operates in unlicensed 2.4 GHz) have swung the current tide in favor of wireless LANs.

Wireless Personal Area Networks

Whereas Bluetooth and Wi-Fi overlap in their value offerings, they are pitched at different industry segments, as described in the comparative evaluation of performance parameters of the two technologies in Table 9. The power requirements and the sheer volumes of mobile phones in circulation will make Bluetooth much more popular in general use. But 802.11b will capture hot spots mainly because of its higher throughput. Therefore, both wireless systems will coexist in the marketplace and will allow service providers to derive economies of scope benefits.

Business model/trend 5

When sharing a network, an operator essentially joins another operator to build the network and operate it. These partners could reduce their network infrastructure build-out costs by offering services via the same network, as well as their wireless services provisioning costs through roaming and resale agreements. Through sharing maintenance, rent and power bills, savings could be generated from optimal capacity utilization, network operators can reduce network-operating expenses in the range of 10-30% (Modoff et al, 2002).

It is technically feasible for two operators using two different frequency ranges to share the same network, ranging from base stations down to switching and applications layer. Consequently, network operators could adopt one or more options to share the network build-out costs. An operator may team up with another license holder to share network-build in certain areas, even while retaining full ownership and responsibility for build-out in others. Alternatively, the operator may strike a network-sharing agreement covering the whole network. Thus, operators could share facilities, expand roaming agreements, share network, share radio access network, among other things. Table 10 lists the current network sharing agreements.

Network operators could adopt one or more options to share the network build-out costs.

Table 10: Network infrastructure build-out sharing arrangements

Countries	Network sharing operators
Austria	Telefonica Msviles
Brazil	Telefonica Msviles - Portugal Telecom
Canada	Bell Mobility - TELUS Mobility
Germany	T-Mobile International's T-Mobil (Deutsche Telekom) - Viag Interkom (mnmO2 was formerly part of British Telecom) Group 3G or Quam (Telefonica Msviles-Sonera)-E-Plus (KPN)
India	Airtel (Bharti) - Escotel (Escorts)
Italy	Telefonica Msviles
Netherlands	Telfort (mnmO2) - KPN Mobile (KPN NV) Dutchtone (Orange/France Telecom) - Ben Nederland (Belgacom-Deutsche Telekom) 3G Blue - Dutchtone (Orange/France Telecom)
Portugal	Telecel - Optimus
Spain	Xfera, Telefonica Msviles, Vodafone Espaa (formerly known as Airtel)
Sweden	Europolitan (Vodafone) - Hi3G (Hutchison) - Orange (France Telecom) Comviq (Tele2) - Telia
Switzerland	Telefonica Msviles
U.K.	T-Mobile International's One2One (Deutsche Telekom) - OO2 (mnmO2)
U.S.	Cingular Wireless - T-Mobile USA33

Sources: AFX News, 2001a; Bourne, 2001a; BWCS, 2002; Modoff & Thelander, 2001; Mouawad, 2001; Noguchi, 2002; Ransom, 2001a & b; Reuters, 2001b; Roberts, 2001a, b & c; Stillit et al, 2001a; Stillit et al, 2001b; Taaffe, 2001; The Economic Times, 2002; Total Telecom, 2001c, 2002a & 2003; van der Pas, 2001; Young, 2001c.

Network sharing has its risks as well. These issues and operators' network sharing strategies constitute network sharing economics of the mobile wireless industry.

Business model/trend 6

The trend of equipment manufacturers taking over the management of operators' wireless network is gaining currency. This trend is an outcome of many operators preferring to concentrate on developing services, such as video clips and full Internet access, to run on the third-generation networks rather than managing the physical infrastructure. Further, the technical challenges of the next generation of mobile technology also drive the offload of network management to an equipment supplier. For example, in December 2002, Swedish mobile-equipment maker Telefon AB LM Ericsson

agreed to take over the management of Hutchison Telecommunications (Australia) Limited's mobile wireless network for seven years.

A roadmap into the future of the mobile wireless industry

These business models have been dynamically evolving in response to architectural demands, customers' expectations and competitive environment. This evolution is helping the industry generate scale and scope economies and drive operational efficiencies in the value chain. In this evolutionary stage, the value chain is in transition to a stable state. During this transition, new players are entering the market, new business models are emerging, and new trends are taking root. The breakup of traditional monopoly in the industry is helping the new-born older players to entrench untapped markets.

Making the market more competitive is the fact that the network infrastructure and access devices markets are saturated with established players operating in an already-hostile environment. This environment is barely sustaining positive margins for the established players; new entrants are, therefore, left in the lurch.

After the excess infrastructure spending in 1999-2000 the industry is going through a deep and protracted correction resulting in slower overall growth. All these developments have created a chaotic and unsustainable market structure at the macro-level, and have led to unprofitable business operations in the companies, at the micro-level.

After the excess infrastructure spending in 1999-2000 the industry is going through a deep and protracted correction resulting in slower overall growth.

As a result, some of the competitors in the market are undertaking cost-reduction programmes. At this stage in the given market, these programmes will reduce costs at the expense of their customers, and further weaken the companies' ability to succeed. Therefore, these cost-containment measures, in place of measures driving operational efficiencies, will be self-defeating.

In fact, increase in both traditional landline and wireless subscribers will force network operators to resume construction of their networks and reverse the slow-

down. As demand continues to increase, the management of now-reticent companies will tend to drive policies to grow faster than the market. To grow faster than the market, these companies may pursue one of these strategies: acquire market share from competitors through aggressive pricing and differentiation, divest non-core assets to generate higher operating profits, merge and/or acquire units to derive synergy, among others.

Acquire market share through aggressive pricing and differentiation

Acquiring market share in a slow-growth phase is a Herculean task. Therefore, the companies will resort to predatory pricing to win market share. This will lower margins in the respective segments. To increase margins as well as to retain market positions, these companies may differentiate their services by offering better content enhancement and delivery offerings at an acceptable QoS and at a value-based price. As market share begins to shift to companies with differentiated offerings, there will be a proliferation of differentiated services and applications in search of life-sustaining niches in the value chain.

The companies will resort to predatory pricing to win market share.

Divest non-core assets to generate higher operating profits

In an attempt to secure profits, the companies will try to refocus their meager resources on core businesses. In this effort to improve their cash position, the companies will focus on non-strategic divestitures, process simplification, inventory reductions and the elimination of discretionary spending to improve their cash position.

Merge and acquire units to derive synergy

Companies are resorting to this strategy for one or more reasons: complexity and high costs of 3G networks; increased scale and lower costs; reduce competitive pressures; synergies from complementary portfolios (including improved spectrum position to offer wireless services in a region, and increased strength in specific regions or market segments such as business users or lower-end consumers); and rationalized digital coverage if/when analog channels are permanently shut down.

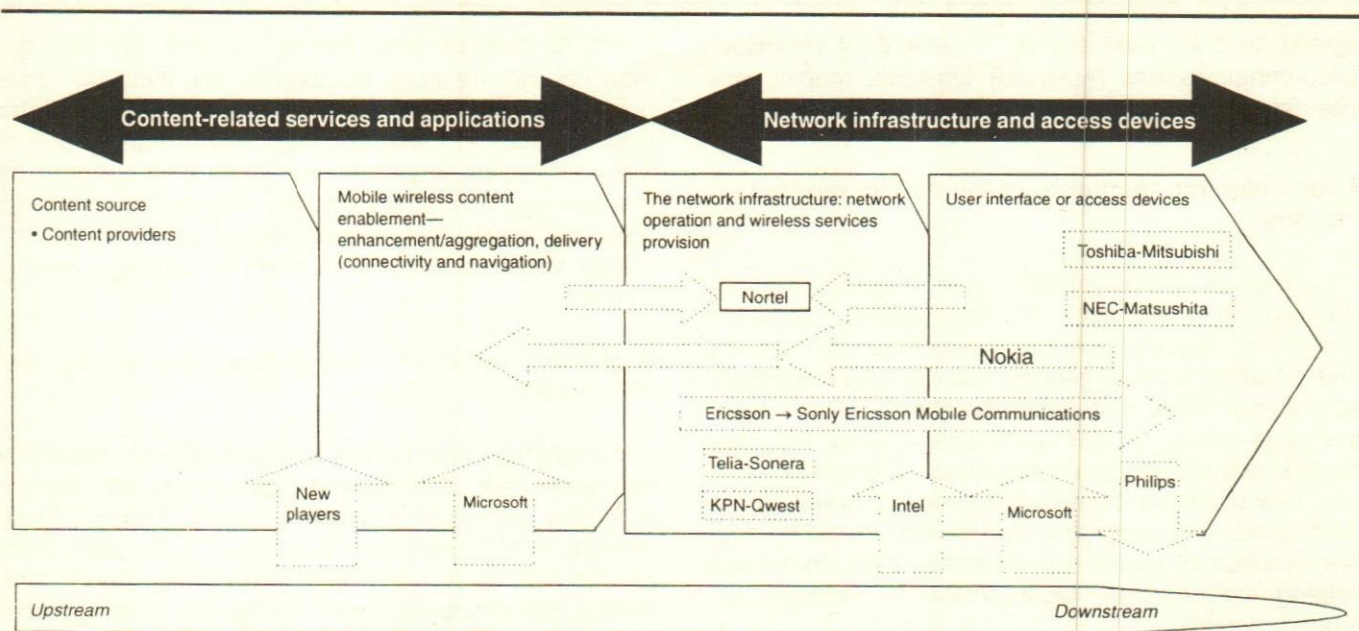


Fig. 9. The competitive dynamics in the mobile wireless value chain

Table 11: Partnerships in the mobile wireless devices segment

Sony Ericsson Mobile Communications	This development agreement between mobile equipment manufacturer Ericsson and consumer electronics giant Sony underscores how electronics companies are entering the increasingly competitive mobile game. By teaming up, they challenge industry leaders Nokia and Motorola, which control about half of the world's market share.
Toshiba-Mitsubishi	Electronics giants Toshiba Corporation and Mitsubishi Electric Corporation became the latest Japanese mobile phone makers to tie-up after Sony and Ericsson (Stevenson, 2002).
NEC-Matsushita	NEC Corporation and Matsushita Electric Communication Industrial Company Limited have also announced a venture to jointly manufacture 3G handsets (Stevenson, 2002).
Motorola-Siemens	In October 2001, Motorola, the world's second-biggest mobile cell phone-maker, and Siemens initiated talks to link their cellular network unit, their cell phone division or both and create a business worth between US\$20 billion and US\$25 billion (Bulkeley, 2001).

The complexity of 3G is likely to force a greater variety of players to work together, to collectively overcome the various technological and business model challenges, and to reduce company-specific risk. Combined with high costs of next-generation technologies, the 3G technological challenge has forced mobile phone makers around the world to seek alliances to compete against the global leaders. Failing to establish itself in the handset market, Ericsson has replaced its solo venture with a joint venture with Sony, as described earlier (CBS MarketWatch.com, 2001; Tissot, 2001).

Figure 9 gives a visual description of such dynamics. Table 11 lists other examples.

The wireless network operators are also turning to M&As as a way to increase the size of their business and generate scale and scope economies. Many companies have product line holes that need to be filled while others are struggling to focus their resources on existing strengths. Competitive threats could also lead to forming synergistic partnerships in the value chain. Through M&As, larger companies will tend to benefit by generating scale economies that are simply not possible for smaller players. Shared marketing and operational expenses among contiguous footprints, equipment, and long distance purchasing power, and the ability to bring roaming "on network," are key drivers. In addition, larger companies that leverage these efficiencies tend to have better access to capital with which to improve service.

Whereas clearly the dearth of capital owing to the current market conditions has prohibited a major M&A "feeding frenzy" over the last several months, telecom equipment companies have continued to evaluate their own identity and the telecom industry will go through a rigorous consolidation phase over the next few months.

Telecom carrier consolidation has already begun in the form of bankrupt smaller operators' assets being acquired by larger telecom operators.

Telecom carrier consolidation has already begun in the form of bankrupt smaller operators' assets being acquired by larger telecom operators.

However, there are many barriers to consolidation as well. Viability of integration between high-profile companies may call off many mergers. Historically, alliances in the mobile market have proved difficult; failed attempts at consolidation and shakeouts have been common as well. Another barrier to consolidation could be the technology used by the operators. However, prospective consolidation gets easier on the technology front because the evolutionary path to 3G is limited to essentially two choices, and work is being done on a new interoperability standard between GSM and TDMA. Further, branding could cause further difficulties if the joint venture opts for a new identity that could leave the customer struggling. The final challenge to integration comes from the issue of cultural compatibility.

All the above-stated competitive market dynamics are balancing specialization and consolidation of services in those niche companies that are better positioned and that have core competence in specific business operations in the value chain. Specifically,

- (i) Players that are strongly positioned in a segment are exploring newer niches to expand their base in the value chain.
- (ii) Players that are not strongly positioned enough to drive operational efficiencies are being driven out.
- (iii) The dominant equipment providers may shift during the turnaround and may even provide opportunities for smaller start-up companies to enter the field. Start-up companies such as Monet Mobile Networks and ProQuent Systems will likely be able to provide peripheral equipment and services that major telecommunications companies had previously planned to handle themselves. Major equipment firms no longer have the money to support marginally relevant R&D projects in light of losses and negative cash flows.
- (iv) New players may enter the market. But only those players with business models that benefit from economies of scope will survive the hostile conditions as new entrants.

Conclusions

As the market endures the hostile phase, scale and scope economies are the drivers of the emerging trends. The forces behind these drivers are customer

demands, hostile industry environment and operator's business drivers. Customer demands for mobile business value has led to convergence of functionality in products. This, in turn, has necessitated a convergence of technology and standards and divergence of products coupled with differentiation of services along the value chain.

Further, the competitive industry and business drivers are forcing the players to adopt business models based on their core competencies. Relying on core competencies will help the players generate economies of scale benefits. A focus on core competencies, consolidation and shakeouts, and adoption of more efficient business models will help the industry achieve operational efficiencies in the value chain. By adjusting quickly to changing conditions and by focusing on doing what they do best, niche players will derive higher margins.

These emerging trends will force wireless services to grow faster than the cumulative company growth rate in respective segments. Also, the current glut in demand will force a natural upswing in demand for offerings. When this trend spreads to other pockets of the value chain to form a critical mass in the overall industry, it will feed as fodder the demand to grow even faster to complete the virtuous cycle of fostering the market growth rate. The telecommunications equipment vendors, which secure a sufficient supply of components, will gain a competitive advantage when demand returns.

While experiencing the dynamics typical of any hostile market the value chain is strengthening and the industry is maturing by driving economies of scale and scope efficiencies. In the longer term, mobile wireless services may transcend the boundaries from being only mobile or being only wirelessly connected to offering truly mobile wireless services.

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The longer I live the more I see that I am never wrong about anything, and that all the pains that I have so humbly taken to verify my notions have only wasted my time.

— George Bernard Shaw

Energy Efficiency in Drying Kiln of Barley Malt Plant

Debashish Pramanik

This paper discusses the result of the diagnostic energy efficiency study conducted in the barley drying malt plant. It helps in monitoring, minimising energy losses and enhancing energy efficiency/productivity in the plant. The diagnostic study reveals the areas/systems where energy losses can be minimised. It also reveals the energy intensive systems/components where retrofitting/modifications can be done efficiently and in a cost-effective manner using selective measures/techniques for energy conservation. Control of energy related parameters enable the systems/components operation at the highest efficiency. Recommendations and conclusions are given for the rapid implementation of all energy saving measures (techniques/components).

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The steps of various process operations involved in the production of malt, as adopted by the barley malt industrial processing plant are given below.

- i. Screening of barley
- ii. Steeping
- iii. Germination
- iv. Drying
- v. Screening and bagging

The barley malt plant has four basic types of equipments/systems: refrigeration system, germinating box, drying kiln and dryer using hot air. The kiln used for the hot air generation is the most energy intensive system in the plant. Almost all barley malt plants use two forms of energy, viz. thermal (heat) energy and electrical energy. The heat to power ratio varies from 3:1 to 10:1 and its magnitude depends upon the type of process and equipment used. It indicates that the barley malt plants are thermal energy intensive. Therefore, the conservation of thermal energy is more important than electrical energy in barley malt plants. The area of generation, distribution, consumption of hot air and cold air can be taken at the first and second priority for implementation of thermal and electrical energy saving measures. Energy saving in distribution of hot air, cold air can be obtained by using proper insulation (on hot and cold pipes/ducts) and by plugging leakage at different locations. Energy saving in cold air generation can also be obtained by using appropriate controls and thermostats. However, the magnitude of saving or productivity improvement obtained is not as attractive as it is in hot air generation. In the present paper a diagnostic approach of energy efficiency/productivity improvement is done.

The number of similar type drying systems used for barley drying in a typical plant is 1-3. Each system is equipped with one fuel (preferably coke) fired combustion chamber, one chamber for mixing cold air with the

products of combustion and one induced draft (ID) fan. The production, discharge capacity of one drying system and one ID fan in a typical plant is 212 quintal per batch and 50000 cubic feet per minute. About 4-5 kg of sulphur is also burnt in the kiln during each batch to maintain the colour of the malt.

Process variables

The time requirement for different processes followed in the plant is given in Table 1. As can be seen from the table, the total time required for production of one batch of malt is about 178 hours.

Table 1: Time for Various Process Steps

Process centre	Time (hrs)
Screening of barley	10
Steeping	6-8
Germination	120
Drying of malt	30
Screening of malt	10
Total batch time	176-178

Normally at the end of germination, the product (i.e. malt) at 25°C with 42-47 per cent moisture content is sent to the drying section. The moisture content of the malt is reduced to about 3.5-4.0 per cent in the kiln operated drying section. The time required for completion of drying is 30 hours. Malt is gradually heated to 75°C then cooled to about 35°C before being shifted to the malt screening section.

Fuel and Associated Systems

Hard coke is used as the fuel in the kilns of a typical plant. Coke is the low volatile (or lean) fuel, which does not produce smoke. Coke is stored on the ground close to the kiln area. A small quantity (10-15 kg) of wood is used for initial firing during each batch. Minor losses occur, when recovering the coke from the stock as the manual loading system churns up the ground and cause a carpet of coke particles to become embedded in the ground. Carpet losses of up to 3-4 per cent may occur in this way.

The coke is supplied on a grate (of 2 sets) from one side of the kiln through feeding sections, at a gap of two hours. Feeding is done in two sets at an interval of about 20-25 minutes. The coke is manually fed keeping the door(s) in open position. The size distribution of the coke particles on the fuel bed is not uniform. The grate bars are slightly inclined and longitudinally spaced with uniform gaps.

The actual coke consumption in the kiln is monitored and the figure is used for the energy balance calculation of kiln. Generally, the record of coke consumption per batch of malt in individual drying systems in many plants is not maintained. Personnel in most of the plants maintain the consumption (monthwise and gross) of coke and the total barley production in the individual drying system. Every operating kiln offers scope for improvement in specific energy consumption and energy efficiency/productivity.

Every operating kiln offers scope for improvement in specific energy consumption and energy efficiency/productivity.

Approach for designed/existing streams

In one batch, about 250 bags of barley are processed in summer whereas 300 bags are processed in winter in the typical plant. Each bag of barley weighs about 85 kg. The total time required for the processing of barley in the screening section is 6-8 hours. The designed heating capacity (kcal/hr) of drying systems in the typical plant is not available. It is observed that the front of the duct and fan is well insulated with aluminium cladding.

Observed streams and measured parameters

Atmospheric air is heated in the combustion chamber. Hot exhaust gases in the combustion chamber is allowed to mix with the cold air in the mixing chamber, which passes through the duct to the bottom of the barley drying chamber at the first floor level. The kilns are of very crude type and do not have any control over the combustion air. Some parts of the coke bed, offering less resistance to the flow of air, burn out sooner than others leaving empty spaces on the grate through which combustion air rushes uncontrolled. Air (cold and hot) is regulated through two separate manually operated dampers and obtain the desired temperature of hot air (after mixing) within the duct. Cold air is drawn vertically and horizontally through a damper at roof level and at the right side. The incoming cold air temperature to the mixing chamber is at 31.6°C. The air-fuel (A/F) ratio is not maintained in the typical kiln. There is no air-fuel mixing characteristics designed to provide a stable flame holding. The three vital process parameters which are monitored and controlled closely in the plant are (i) time, (ii) temperature and (iii) moisture content during each operation.

The average moisture content level in germinated

barley grains is reduced from 42 per cent upto 4 per cent in dryers. There are two drying chambers in each system, at the 1st floor and 2nd floor level respectively. The chamber at 2nd floor level and 1st floor level is used for the reduction of moisture content from 42-20 per cent and 20-4 per cent with a drying time of about 18-20 hours and 10 hours, respectively. Temperature measurement is done while the kiln is operating at the stage of about 10 per cent moisture content in the barley grains at 1st floor level. The temperature of hot air charge at the dryer inlet is measured to be 55.3°C. The indicator installed for the measurement of hot air temperature at the exit of the mixing chamber is not working.

Measurements are also carried out for the air-flow at inlet, coke consumption and O₂ content in hot (exhaust gas and its mixture with cold air) air at the inlet/exit of the mixing chamber of the drying system. O₂ percentage and temperature of hot air are measured through gaps around the kiln doors and the hole provided for thermocouple at the mixing chamber exit of the system.

Performance of the kiln

Two air supplies required to burn coke on a grate efficiently are as follows. (a) Primary air—It is introduced under the grate and required to burn the fixed carbon of coke. (b) Secondary air—It is introduced over the grate and required to burn the volatile matter. The performance of the kiln, i.e.; thermal efficiency of the kiln, (primary generator) for hot air generation is determined by direct method. The actual A/F ratio for coke burning and the heat absorbed by the incoming air is calculated. The energy balance is worked out on the basis of various losses occurring in the kiln. The parameter measured/collected from the plant for evaluating the energy balance/thermal efficiency of kiln are given below.

- Combustion air velocity at the first, second, third and fourth section of kiln
- Oxygen percentage in hot (before the mixing chamber) air
- Temperature of hot air (before and after mixing chamber)
- Ambient/Cold air temperature at the side and top of the mixing chamber
- Cold air velocity at the side and top of the mixing chamber

The air velocity is not constant at different points in the vertical plane of the suction ports/sections.

Energy related parameters and A/F ratio

An attempt has been made to calculate the actual A/F ratio under which the combustion system is operating. This is done based on the oxygen (O₂) balance of the infiltrated air plus combustion air stream at one end and the hot (mixture of cold air and exhaust gas) air on the other. It may be kept in mind that the level of O₂ at the measuring point is on the higher side on account of high percentage of infiltrated air, which is not taking part in actual combustion. The estimated value of A/F ratio for kiln (based on the calculation) is given in Table 2. The combustion taking place with lower A/F ratio than the optimum range indicate the fuel (coke) is burning. Therefore, the generated heat is consumed by the remaining quantity of the unreacted portion of the drawn air. The combustion with the optimum level of A/F ratio will reduce the extra air being heated up, which will reduce the fuel consumption to obtain the desired temperature.

Table 2: Estimated value of air-fuel ration

Air at 4 inlets (m ³ /hr)	Fuel consumed (kg/hr)	O ₂ in hot exh. gas* (%)	A/F ratio
1037	130	8.7	5.0

* at the entrance of the mixing chamber

Large quantity of atmospheric air is drawn at high velocity into the drying system. About 62 per cent of the total quantity of the supplied combustion air is used for the combustion of coke. Significant quantity of air does not take part in combustion but carries away heat to the mixing chamber from the combustion chamber. Ambient air through other two sections lower the temperature of air in the mixing chamber. The heat absorbed by the incoming air is calculated as given in Table 3, which goes to the bottom of the wire mesh at 1st floor level of the dryer.

Table 3: Estimated heat absorbed by the incoming air

Parameter	Unit	Level
Airflow (through front) involved in combustion	m ³ /hr	746
Remaining air (through front) in combustion chamber	m ³ /hr	454
Total amount of cold air being heated	m ³ /hr	59710
Mass of airflow at 31.6°C	kg/hr	69145
Hot air temperature	°C	55.3
Ambient temperature	°C	31.6
Heat input	kcal/hr	455000
Heat gained by the cold air or heat in hot air	kcal/hr	393298
	%	86.44

Table 4: Operating parameters

Parameter	Unit	Level
Carbon monoxide (CO) content in exhaust Gas	ppm	1250
CO ₂ content in hot exhaust gas*	%	5.19
Relative humidity	%	75.0
Temp. of clinker on the coke bed	°C	240
Temp. of bottom ash	°C	146

*at the entrance of the mixing chamber

The operating parameters required to evaluate the efficiency of the kiln are measured. Average level of other parameters at each location is considered based on 2-3 trials of testing. Other operating parameters and the measured temperature of clinker on the grate, bottom ash and the hot air at the exit of the mixing chamber (or inlet to dryers) are given in Table 4.

Heat balance of the kiln

The summary of results of detailed heat balance of the kiln is shown in Table 5. The calculation is based on the data available and actual coke consumption figure for the kiln.

Table 5: Heat balance of kiln

Type of heat distribution (%)	Level
Heat in hot air	86.44
Loss due to CO	1.98
Loss due to hydrogen & moisture in coke	3.44
Loss due to moisture in air	0.05
Loss due to unburnt carbon in bottom ash	1.58
Loss due to heat carried away in bottom ash	0.52
Structural loss	5.78
Total heat distributed	99.79
Unaccounted loss	0.21

The efficiency or the heat in the hot (before mix of kiln exhaust gas and cold air) air of the kiln is 86.44 per cent, which can be improved proportionately by the reduction in the following major heat loss components.

Major heat distributions in the kiln

Heat in hot air

The heat in hot air of kiln is calculated to be 86.44 per cent, which is highest among all the heat distributed, calculated and tabulated above. The heat in hot air depends on maintaining the proper A/F ratio and reducing the structural loss.

The estimated A/F ratio based on the measurement taken, during the energy study, is found to be low at 5.0, as indicated in Table 2. In the present case, the amount of CO is found at the combustion chamber and the sampling port. The measured level is slightly lower than the actual due to minor dilution of the combustion generated CO by the infiltrated air, which is not taking part in combustion.

Structural loss

Prolonged usage of the kiln could also have resulted in deterioration of insulating/structuring materials on the surface of the combustion chamber, mixing chamber. This would also lead to lower hot air temperature because of high heat transfer between hot air and atmosphere.

The hot surfaces of kiln are bare and almost black. In order to assess the heat loss due to radiation and convection, the surface temperatures are measured. The outermost bend surface temperature on the aluminium clad is measured to be within 40-45°C, which is within the acceptable limit. The heat loss from the bare surfaces is significant. It should be noted that the heat loss from hot surfaces can lead to significant reduction in the hot air temperature.

The energy performance of the kiln will be improved by maintaining the kiln parameter at the optimum level. Following suggestions can be implemented to improve efficiency, which will simultaneously improve the kiln productivity.

Optimum parameters/specific recommendations

The optimum and operating level of parameter for the kiln is given in Table 6.

Table 6: Optimum and operating level of parameter

Parameter	Unit	Optimum	Measured
CO ₂ content in the hot air (products of combustion) at the exit of combustion chamber	%	9-10	5.19
Surface temperature (average) of			
- Wall	°C	40- 45	40-78
- Doors		60-65	148
Structural loss	%	2.7	5.78

The optimum CO₂ in the products of combustion at the exit of the combustion chamber is an indicator of better combustion of fuel/coke. Therefore, the required amount of heat could be obtained from the reduced

quantity of coke burning with higher CO₂ at the exit. To determine the end-use energy efficiency/productivity improvement, the techniques are evaluated on the basis of two criteria: (1) technical feasibility (2) economic feasibility. Based on an assessment of the situation, the following recommendations are given below for energy productivity enhancement.

1. Two factors, proper A/F ratio and reduced structural loss, if taken care of, can improve the heat in the hot air component substantially. The fuel consumption is expected to come down due to optimisation in A/F ratio level.
2. Ensure the calibration of temperature indicator. One portable O₂ analyser should be procured and the regular practice should be made to check O₂ level in hot air at the exit of the combustion chamber, once in a day or whenever fuel firing in the kiln is changed. Hot air sample should be tested at the nearest possible point before the mixing chamber.
3. A sliding (adjustable) manually operated door made of insulating material should be installed to cover four openings for combustion air. It would help to keep control over combustion air (primary) by maintaining the excess air at different levels. The reduced quantity of primary air could be supplied as secondary air above the fuel bed. It could be admitted through either a very small port in the door or slightly larger gap around doors. This technique will have control on the A/F ratio. Combustion of coke could be improved by use of primary and secondary air in right proportions.
The heat protecting insulating cover at the feeding doors will be useful to achieve the desired temperature of air at the chamber before combustion.
4. In order to avail the benefit of higher hot air temperature and minimum structural heat loss, following recommendations are made for repair work.
 - a. Cracks on the concrete on wall during shut down,
 - b. Damaged portion on the front wall

It is recommended to do whitewashing of the concrete walls and roof. The heat loss will also be reduced because of the low emissivity of the white coloured walls. It is also recommended to reduce the radiation and convection loss (or sur-

The annual savings because of 3 per cent structural loss reduction would be about 14.5 tonnes of coke, which will significantly reduce the overall energy input.

face temperature of the wall and doors) by insulating the surfaces with suitable material. The annual savings because of 3 per cent structural loss reduction would be about 14.5 tonnes of coke, which will significantly reduce the overall energy input and increase/enhance the energy efficiency/productivity of kiln. The investment and payback period for a suitable insulating material would be nominal and attractive.

5. The uniform size distribution of coke particles in the fuel bed should be maintained to ensure even distribution of combustion air in and around the fuel. It would always give an optimum air distribution pattern throughout the bed of fuel and a stable flame pattern while requiring less overall excess air than in the existing system.
6. Coke should be stored on a concrete base with a slight slope for drainage purposes. Utilisation of the storage area could be improved by subdividing the total area into bays (by a low retaining wall). It would significantly reduce the carpet loss.

Conclusion

From the above, it can be observed that the diagnostic energy efficiency study helps in monitoring, minimising energy losses and enhancing energy efficiency/productivity. The pay back period for implementation of energy saving measure becomes more attractive with the increase in annual operating hours also. The study with implementation focus also reduces energy input or improves energy consumption per batch or year by:

- (i) highlighting the areas of energy loss and ways of utilisation;
- (ii) identifying the reasons for higher energy consumption;
- (iii) indicating the monetary benefits because of energy saved per year;
- (iv) showing design deficiency in the kiln and plant.

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Strategic Energy Futures – A Mix Optimisation Study

Anitha S. Ramachandran

This article describes the mix optimum study carried out in Kerala to estimate strategic energy policies which would ensure energy management in the future.

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Energy is the prime mover of economic growth and development. The oil crunch of 1973 and 1979 had a profound impact on energy demand and has led to a considerable change in energy thinking. A number of technologies of the earlier cheap oil era have been replaced. With the successful harnessing of various forms of energy in an economical manner, many nations have now gone for a policy of energy supply based on a prudent mix of various forms of electricity generating systems. They have to choose between the different options of energy based not only on the cost of production but largely on the overall cost benefit aspects of all factors like environment etc. This calls for sustainable technological development strategies. As a result strategic energy planning has become the order of the day. Here an attempt has been made to estimate source wise (strategic), energy futures by using mix optimum model in the context of Kerala.

Kerala with its industrial backwardness, was known for its unique position of having some margin of electricity over demand. But the situation has changed during the past decade. Even though Kerala is industrially backward, the persistent increase in households' demand has converted the energy 'surplus' state into an energy deficit one. Kerala has been much acclaimed for its attainment of higher standards of life reflected by indicators like high quality of life index, high literacy rate, better political awareness etc., but the per capita energy consumption is one of the lowest in the country and is a major hindrance in her industrialisation process. Had we formulated a scientific and realistic energy policy and made available energy in required quantities, the state would have been characterised by significant all round growth. To meet the ever growing increase in the demand for energy and also to meet the future demand, other modes of energy have to be developed in a strategic frame work. An energy crisis is imminent in the state if there is any further negligence of planning in the energy sector. Strategic energy planning for the state is the only key to the solution. In order to

achieve this, a mix optimum study has been carried out using the Linear programming method to make an optimum mix of different energy sources over different time spans.

This paper details the mix optimum study carried out and the results thereof. The data used for the study correspond to the year 1997-98.

The present scenario

The present installed capacity of the state is 2472.6 MW with a generation capacity of 10690.5 MU. From 1985 onwards, Kerala has been importing power from the national grid and at present 25 per cent of our demand is met through the national grid. From 1969-70 to 1982-83, Kerala had been exporting power. But since then the exports were almost negligible. The stagnancy of capacity generation, on one hand, and ever-increasing demand for power, on the other, has created a significant gap in the supply and demand for power in Kerala.

The maximum demand of the state reached 2316 MW during 2001 under load restrictions and low voltage conditions. If the prevailing low voltage problems experienced in most of the localities in Kerala had been solved, the above figure would have been much higher.

The reasons for poor voltage are mainly due to the inadequacy of installed capacity, lesser availability of central share during peak load hours due to the constraints in inter state and intra-state transmission system and the present fragile transmission and distribution system.

Table 1: Sectoral power consumption in Kerala

in million kWh (percentage in brackets)

Year	Industrial	Domestic	Commercial	Agricultural	Others	Total
1970-71	1225 (65.90)	81 (4.36)	66 (3.55)	41 (2.20)	446 (23.99)	1859 (100)
1980-81	1913 (42.51)	443 (9.84)	185 (4.11)	80 (1.78)	1879 (41.76)	4500 (100)
1990-91	2697 (51.07)	1621 (30.69)	449 (8.50)	206 (3.91)	308 (5.83)	5281 (100)
1993-94	2764 (43.98)	2068 (32.90)	836 (13.30)	261 (4.16)	356 (5.66)	285 (100)
1997-98	2515 (32.59)	3777 (48.94)	652 (8.45)	341 (4.44)	431 (5.59)	716 (100)

Source: Power System Statistics, Kerala State Electricity Board.

The power consumption in Kerala is dominated by industrial and domestic sectors. Sectoral consumption of power is given in Table 1; in fact, there has been a

phenomenal increase in the domestic consumption of electricity.

It can be observed that agricultural sector consumes only a very low percent of total power in Kerala. Of the total power produced in 1970-71, the industrial sector accounted for 65.89 per cent, domestic sector 4.35 per cent, commercial sector 3.55 per cent and agricultural sector 2.2 per cent. The share of domestic sector has been increasing and that of the industrial sector and others have been declining. By 1997-98 the share of the industrial sector declined to 32.59 per cent, whereas the domestic sector share increased to 48.94 per cent and the commercial sector to 8.45 per cent. Therefore the consumption pattern of power in the state is found to be in favour of the domestic sector at the cost of industrial and other sectors.

The electricity consumption pattern of Kerala shows that over the years the share of the domestic sector is increasing and this has resulted in a peculiar problem, namely, managing the peak demand. Hence any mix-optimisation study has to take into account the peak demand and not the average demand. In order to forecast the peak demand for electricity, auto regressive moving average model has been used.

Any mix-optimisation study has to take into account the peak demand and not the average demand.

Surplus demand

Since for the past few years power cut has been introduced off and on it is not possible to estimate the exact demand. Any future demand projections should take into account this surplus demand. The present peak generating capacity is 2060 MW (the present installed capacity is 2472.6 MW); accounting for the availability from the central grid also which is on an average 400 MW.

Table 2: Peak Demand for Electricity

Year	Forecast (peak demand)	Peak Demand to be met accounting for surplus demand (rounded off)	Additional Capacity requirement
2010	2775.78	3500	1500
2020	3493.50	4000	2000
2030	4245.04	5000	3000
2040	5030.27	6000	4000

Taking into account the surplus demand the additional generating capacity to be planned has been worked out in Table 2.

Based on Table 2, the additional capacity to be planned during different times is as follows:

By year 2010	medium term	1500 to 2000 MW
By year 2030	long term	3000 to 4000 MW
By year 2040	very long term	4000 to 5000 MW

Mix Optimum Analysis

As is known, in a region, the prominence of different energy sources vary over time. Accordingly, it would be preferable in energy planning to opt for an appropriate mixing of different energy sources, spatially and temporally. The mix optimisation solution can be worked out by linear programming we can optimise the total combined energy output from the different possible energy sources of the state in the medium/long/very long term.

The above optimisation is subjected to different constraints as well as upper bounds of the various energy sources based on the time horizon.

The different sources of energy accounted in the model are Major hydel, Small hydel, Coal, Naphtha, Diesel, Liquefied nitrogen gas, Nuclear.

Also the different constraints are Capital cost, Minimum total energy requirement, Operations and maintenance cost (including fuel cost), Foreign exchange, Environmental cost.

Linear Programming Model

We have estimated the optimum energy mix corresponding to different time spans—medium, long, and very long. Also corresponding to each time span, we have estimated an energy mix assuming different scenarios. For each time period we have attempted two solutions; one corresponding to the energy demand forecast and the other by assuming an upper bound for energy demand for the period.

In fact, we have estimated the optimum energy mix for different scenarios (scenario 1, scenario 2) assuming different cost constraints. The cost constraints that depict the first scenario are:

Capital cost - Rs 3 crore/MW

Operations and maintenance cost - Rs 0.8 crores/MW

Foreign exchange cost - Rs 0.7 crores/MW

Environmental cost - Rs 0.2 crores/MW

In the second scenario, we have tried a different cost criterion where operations and maintenance cost reduced to Rs 0.3 crores/MW instead of Rs 0.8 crores/MW in the first scenario; also, foreign exchange cost got reduced to Rs 0.25 crores/MW instead of Rs 0.7 crores/MW under scenario 1.

Assumptions

The study has been based on the following assumptions:

The capital cost per MW varies from 1.23 crores (major hydel) to 4.87 crores (coal). Hence an average value of 3 crores/MW can be used as capital cost constraint.

Except for major hydel, the environmental cost varies between Rs .01 crores to Rs 0.30 crores per MW (in the case of major hydel the environmental cost is Rs 4.8 crores/MW). Here a value of .2 crore/MW can be used as environmental cost constraint to limit the expenditure on this account.

Operations and maintenance cost variation is from Rs .01 to Rs .94 cr/MW. Here the upper limit has been varied from Rs .3 cr/MW to Rs .8 cr/MW for different scenarios.

Foreign exchange cost varies from 0 to Rs .83 crores/MW for different sources. Here this limit got varied from .25 crores/MW to .7 cr/MW (as the optimum solution requires a minimum of 0.25 crores/MW).

By the year 2010, up to 1000 MW capacity is feasible for major hydel, small hydel and nuclear; capacity of 1500 MW is feasible for coal, naphtha, diesel and LNG.

For the long run, that is by year 2030 and beyond, the maximum potential that can be harnessed from major hydel is 3000 MW and small hydel 2000 MW. For all other forms of energy, 3000 MW feasibility is assumed.

Inflation effects on costs are not taken into account as their effect is uniform for all the sources. The exchange rate variation of rupee is not considered. However different scenarios are developed by varying the upper limit for foreign exchange cost. Presently most forms of energy are following the administered price mechanism. Of late there is a move to decontrol the

prices. The impact of this decontrol is not considered as data as it is yet to emerge. Another aspect which is not taken into consideration is the effect of dual pricing for peak hour demand which is yet to be implemented. The cost of transportation does not vary much from the ongoing trend. The cost estimates are based on constant available technology only. It is also assumed that the total of different costs is the budget constraint.

Mix Optimum Solutions Corresponding to Different Periods

The linear programming solutions of mix optimum corresponding to medium, long, and very long periods are given below.

Medium Term

The requirement for medium term i.e. for 2010 is 1500 MW minimum and 2000 MW maximum. The solutions to these cases are based on scenario 1 and scenario 2.. Fig. 1 gives the mix maximisation result for medium term.

Case 1 – Additional Energy Requirement 1500 MW

Scenario 1

The linear programming solution of mix optimum for an additional energy requirement of 1500 MW based on scenario 1 is composed of Small hydel 1000 MW, Naphtha 440.50 MW and Major hydel 59.50 MW.

Scenario 2

In scenario 2, the mix optimum solution obtained is Small hydel 1000 MW, Naphtha 440.50 MW and Major hydel 59.50 MW.

In both cases, the solution obtained is found to be the same in major hydel, small hydel and naphtha.

Case 2 – Additional Energy Requirement 2000 MW

Scenario 1

Based on the linear programming solution, the mix optimum for an additional energy requirement of 2000 MW is composed of Small hydel 1000 MW, Naphtha 920.67 MW and Major hydel 79.33 MW (in case 2, scenario 1).

Scenario 2

The results of mix optimisation shows that a require-

ment of 2000 MW can be met by a mix of 1000 MW of Small hydel, 584.38 MW of Naphtha, 339.12 MW of Nuclear and 76.50 MW of Major hydel.

In scenario 1, the solution obtained is for major hydel, small hydel and naphtha whereas in scenario 2, nuclear also finds a place in the solution. There is also a marginal decline in the share of major hydel and naphtha.

Long Term

The requirement for long term i.e. for year 2030 is 3000 MW minimum and 4000 MW maximum. Solutions have been developed for both these cases.

Case 1 – Additional Energy Requirement 3000 MW

Scenario 1

The linear programming solution of mix optimum for an additional energy requirement of 3000 MW based on case 1, scenario 1 is composed of 2000 MW of Small hydel, 881 MW of Naphtha and 119 MW of Major hydel.

Mix optimisation Results, Medium Run - Summary Year 2010

Scenario 2

The mix optimum solution obtained of scenario 2 is composed of 2000 MW of Small hydel, 881 MW of Naphtha and 119 MW of Major hydel. The solutions for scenario 1 and 2 are the same.

Case 2 – Additional Energy Requirement 4000 MW

Scenario 1

The linear programming solution of mix optimum for an additional energy requirement of 4000 MW based on case 2, scenario 1 is composed of 2000 MW of small hydel, 1841.34 MW of Naphtha and 158.66 MW of Major hydel.

Scenario 2

The results of mix optimisation shows that an additional requirement of 4000 MW can be met by a mix of 2000 MW of Small hydel, 1168.77 MW of Naphtha, 678.23 MW of Nuclear and 153 MW of Major hydel.

In both the scenarios, the contribution of small hydel remains the same at 2000 MW. In scenario 2, the

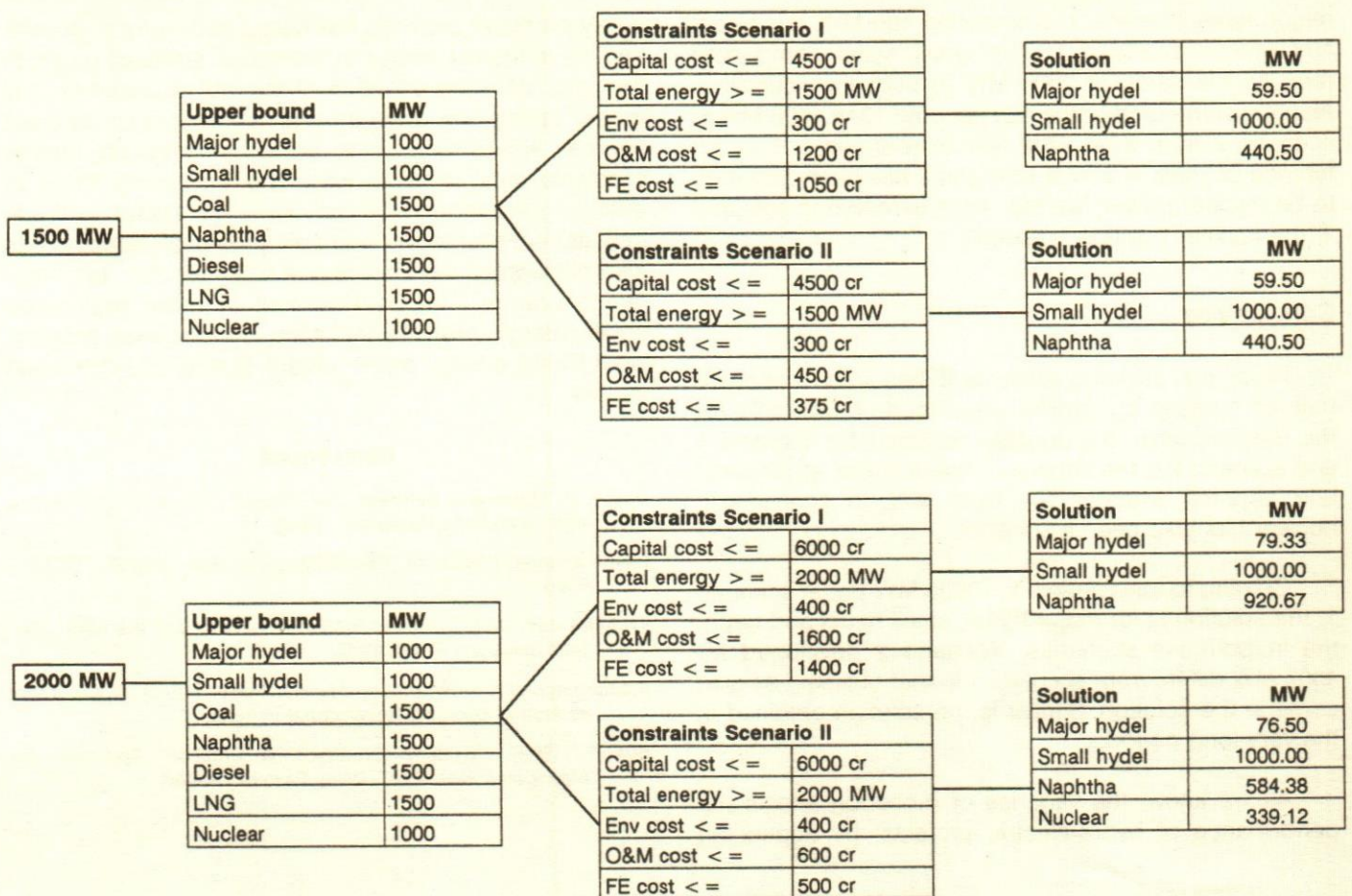


Fig 1. Mix Optimisation Results Medium Run-Summary year 2010

share of major hydel and naphtha declines marginally giving way to nuclear with 678.23 MW.

scenarios (Table 3) show that while the allocation for

Very Long Term

Case-Additional Energy Requirement of 5000 MW

Scenario 1

The linear programming solution of mix optimum for an additional energy of 5000 MW based on scenario 1 is composed of Naphtha 2801.67 MW, Small hydel 2000 MW and Major hydel 198.33 MW.

Scenario 2

Based on the linear programming solution, the mix optimum for an additional energy requirement of 5000 MW in scenario 2 is composed of Small hydel of 2000 MW, Nuclear 1469.54 MW, Naphtha 1344.40 MW and 186.06 of Major hydel.

The solutions obtained for 5000 MW in different

Table 3: Summary Results of Mix Optimization

Year	Additional demand	Scenario I	Scenario II
Medium Term 2010	1500 MW	Major hydel 59.5	Major hydel 59.5
		Small hydel 1000	Small hydel 1000
	2000 MW	Naphtha 440.5	Naphtha 440.5
		Major hydel 79.33	Major hydel 76.5
Long Term 2030	3000 MW	Small hydel 1000	Small hydel 1000
		Naphtha 920.67	Naphtha 584.38
		Nuclear 339.12	Nuclear 339.12
	4000 MW	Major hydel 119	Major hydel 119
		Small hydel 2000	Small hydel 2000
		Naphtha 881.0	Naphtha 881
Very long term 2040	5000 MW	Major hydel 158.66	Major hydel 153
		Small hydel 2000	Small hydel 2000
		Naphtha 1841.34	Naphtha 1168.77
		Nuclear	Nuclear
Very long term 2040	5000 MW	Major hydel 198.33	Major hydel 186.06
		Small hydel 2000	Small hydel 2000
		Naphtha 2801.67	Naphtha 1344.40
		Nuclear 1469.54	Nuclear 1469.54

major hydel in scenario 2 is around 186 MW, it is about 198 MW in scenario 1. The small hydel component remains the same at 2000 MW in both the scenarios. Also the share of naphtha has become 1344.4006 MW in scenario 2 from 2801.6702 MW in scenario 1. The difference of 1469.54 MW in scenario 2 has been assumed to be nuclear power (we may note here that in scenario 1, the nuclear solution is absent).

Conclusions

From the ongoing analysis it has been observed that for meeting an additional demand of 1500 MW for the medium term, the solution obtained for scenario 1 and scenario 2 is the same with major hydel, small hydel and naphtha whereas for 2000 MW, in scenario 2, nuclear has also been a solution.

Coming to long period, for 3000 MW under scenario 1, the solution is for major hydel, small hydel and naphtha in both the scenarios. Scenario 2 developed for 4000 MW differs from scenario 1 in that nuclear has also come in the solution. Similar is the solution obtained in the very long period.

As we know, the vagaries of monsoon affects the performance of hydro-electric projects; by depending

solely on hydel projects, the Kerala economy in general and its industrial sector in particular suffered much in the past. Here the adoption of the mix optimum energy model taking into account the risk factors of different sources would help us to solve our pressing energy problems in a strategic way. The increasing share of energy consumption of the domestic sector and the consequent problem of managing the peak demand has also highlighted the importance of a mix optimum energy generation. The development of more regionwise small energy projects including small diesel projects would help energy management during peak demand simple.

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*If you have built castles in the air, your work need not be lost.
That is where they should be. Now put the foundation under
them.*

— Henry David Thoreau

Creating & Capitalizing on Opportunities: The IC Imperative

P.N. Rastogi

Opportunities are here defined as contrived contexts of value creation that enhance existing and/or create new revenue streams. Their identification and exploitation are conjointly based on a firm's knowledge of its business environment, and its synergistic spectrum of knowledge resources. The latter include skills, capabilities, creativity, innovation, process redesign, and expertise. Various methods and ideas for identifying opportunities are seen as plural modes of developing knowledge of customers and markets. A firm's creation, development and leveraging i.e., management of knowledge, is inextricably bound up with its social and human capital in a dense dynamic nexus. Intellectual capital (IC) is the resultant of this nexus, and denotes a firm's holistic capability to address its challenges and opportunities. Plural revenue streams that can be generated by IC, are outlined briefly. Approaches towards developing an opportunity creation system are delineated synoptically, and the importance of IC is highlighted.

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Opportunities as Revenue Streams

Opportunities provide contexts of value creation and enterprise growth. Their effective exploitation is manifested in a firm's enhancement of its existing and/or creation of new revenue streams. Consider, for example, the plural revenue streams generated by GE's Aircraft Engines division:

- (i) Sale of engines on the basis of the product's price and performance competitiveness and standard service support.
- (ii) Sale of engines facilitated by the firm's financing facility and service support during a standard or specified warranty period.
- (iii) Sale of maintenance and repair service for its engines through contracts guaranteeing uptime over an extended negotiated period.
- (iv) Sale of maintenance and repair service for the aircraft engines produced by other companies in the same manner as in (iii)
- (v) Sale of engines supported by financing and extended maintenance and repair service contracts for its own engines, and
- (vi) Sale of maintenance and repair services for its own engines, as well as, for engines produced by other companies in the same manner as in (iii).

The foregoing six distinct and parallel revenue streams generated by GE's Aircraft Engines division exemplify the company's effective creation and exploitation of opportunities in its highly competitive business arena. But a deeper and more important issue to consider here is: How could the company create and capitalise on these opportunities?

The Ubiquitous Importance of Knowledge

GE Aircraft Engines or any company's ability to cre-

ate and exploit opportunities depends on its rich base of knowledge and leveraging of that knowledge. Visualization and identification of foregoing opportunities required an in-depth knowledge and insightful understanding of market and customers. The company's grid of sensors had to process and integrate a wide variety of data and information regarding market saturation; competitors' customer-value-propositions, positioning and market offerings; the problems faced by customers and their changing business priorities; and the course and direction of the industrial sector concerned. The knowledge so produced by processing and integration of environmental information, had to be further juxtaposed against the knowledge of what the company could do to produce customer-valued outcomes in a competitively superior manner. To achieve requisite depth and breadth in its service offering, GE systematically built up its pool of knowledge resources through sustained investments in service technologies and proactive acquisitions of aviation service companies in USA, UK, and Brazil. The essence of opportunity creation lay in inputs of knowledge and ideas to create revenue generating demand patterns.

Visualisation and identification of opportunities by themselves however, cannot create demand, or generate revenue streams. The company had to crystallise its concepts of creating and delivering superior customer value. It had to identify, develop, assemble, and organize a portfolio of requisite skills, best practices, expertise, innovation, competencies, stream-lined processes, and bundling of capabilities; to be able to create and deliver superior customer-valued outcomes. Knowledge resources comprising such a portfolio further need to be inter-related in terms of their complementarity and potential synergy. Together, they constitute a firm's knowledge spectrum which needs to be continually enriched and expanded. It is such a pool and creative configuration of a firm's knowledge resources that enables it to enhance and/or engender its revenue streams through creation and exploitation of opportunities.

Visualisation and identification of opportunities by themselves, however, cannot create demand.

Without an adequate knowledge of its dynamic business environment, i.e., market shifts and changing customer priorities; an enterprise cannot identify any opportunity. And without a synergistic spectrum of requisite knowledge resources, the enterprise cannot

create, crystallize, and exploit any opportunity toward enhancing or creating any revenue stream. The junction point of both environmental knowledge, and the knowledge spectrum base of an enterprise, lies in its crafting of a distinctive customer-value proposition. The latter reflects the firm's knowledge i.e., its understanding and interpretation of the nature and dimensions of competitively superior customer-valued outcomes. The firms need to engage in systematic learning efforts toward acquiring knowledge about customers' needs and wants, preferences and priorities, in this context.

Knowledge Acquisition/Creation

A number of useful methods and techniques of research have been proposed toward acquiring or creating knowledge about customers in order to improve or devise better customer-value propositions. A few such recent techniques/methods may be briefly outlined as follows:

- *Customer Visits:* It is a useful method of acquiring knowledge about customers' needs, wants, problems, and requirements. Customer visits are conducted by a cross-functional team and involve a clear specification of objectives, a careful selection of customers, a discussion guide for eliciting relevant information in support of specified objectives, and a format for organizing the knowledge acquired in a systematic manner. Customer visits provide a useful tool for identifying unmet or non-obvious customer needs, gaining insights about new or potential market opportunities, learning about the role a given product or service plays in meeting customers' requirements, and building or revitalizing customer relationships.
- *Creating Customer Scenarios:* These refer to the broad context in which customers select, buy, and use product/services; the role these play in their lives; the inconveniences or difficulties they face in their purchase or usage experience; and the relative adequacy or otherwise of the product/service toward meeting their real needs.
- *Constructing a Buyer Utility Matrix:* Rows of this matrix specify a customer's six utility levers—customer productivity, simplicity, convenience, risk, fun and image, and environmental image. Columns of the matrix list six stages of the 'buyer experience cycle'—purchase, delivery, use, supplements, maintenance, and disposal. By locating a product/service on any one of the

thirty six spaces in the matrix, managers can see how a given or proposed product/service creates a different utility proposition from other existing products/services.

- *Value Innovation:* This method focuses on creating new products/services of high growth potential. A 'value curve' is created for comparing the level of value provided along the salient elements of the proposed product/service with the corresponding levels of value provided along those elements by the competing products/services. The 'value curve' for a proposed new product/ service should be crafted in the light of four core considerations as follows;
 - Eliminating some factors commonly accepted in the prevailing industry practice,
 - Reducing some factors well below the industry's standard,
 - Raising some factors well above the industry's standard, and
 - Creating and providing some factors that the industry has never offered.

A systematic consideration of the above four issues may help managers discover new sources of value for a mass market of consumers.

- *Mapping the Consumption Chain:* A mapping of customers' entire experience with a product/service can help a company identify new points of differentiation, and develop its ability to generate successful differentiation strategies for profitable growth. The customers' total experience with a product/service needs to be captured along the entire set of stages that constitute the consumption chain of that product/service. A consumption chain consists of the following fourteen sequential stages: awareness of need, search, selection, order and purchase, delivery, payment, financing, receipt, installation and assembly, storage and transport, use, service, repair and returns, and final disposal. Directed brainstorming about each step in the consumption chain can elicit numerous ways to differentiate even the most mundane product or service. The mapping experience needs to be performed for each important customer segment.
- *Turning Customer Input into innovation:* This method focuses on seeking customer inputs regarding what they want a new product or service to do for them. Asking customers to focus on desired outcomes, enables a company to

identify and understand better difficult-to-articulate needs of its customers. Elicited outcomes are further sought to be crystallised or refined in terms of specifying clearly both the type of improvement required (minimize, increase), and a unit of measure (time, number, frequency). Customer articulated outcomes are then ranked according to their perceived importance, or priority. They serve to identify opportunity areas for product development and market segmentation on the one hand; and a more informed competitive analysis and evaluation of the potential alternative product/service concepts on the other. Opportunities emerge from the outcomes that are highly valued by customers, but are not provided by existing products/services.

Opportunities emerge from the outcomes that are highly valued by customers.

An Inventory of Ideas and Themes

Foregoing methods illustrated plural modes of knowledge acquisition for identifying the possibilities for opportunities. Marketing management literature however, highlights a number of interesting ideas and themes which specify the nature and direction of creating opportunities. They may be viewed as relatively weak general insights based on inductively processed knowledge. Each idea or theme is based on real world case studies and empirical examples which are however, necessarily limited in their number, scope, coverage of events and situations, and bounds of time and space. They cannot as such be deemed to be of universal import. They however, need to be viewed as valuable insights that may complement and supplement each other in their indicated contexts; and elucidate the nature, richness and dimensions of opportunity creation.

In what follows some major ideas and themes in the present context are listed very briefly. The listing is neither exhaustive, nor based on any order or sequence.

- Repositioning a product/service in terms of one or more of the following: novelty, cost competitiveness, utility, quality, customization, or variety. Repositioning involves redefining the nature and basis of value addition.
- Creating 'market space' or providing for total customer experience for a well-defined cus-

tomer segment. Examples of market space include 'document management' by Xerox, 'global networking capability' by IBM, 'extended life management' by Baxter, 'global financial management' by Citibank; or hospitals guaranteeing to provide full range of health services. Market space concept requires thinking in terms of missions which redirect resources and energy to provide high-value inclusive results for customers. Such results bring customers back again and again and lock them in by getting them deeply involved. Market space theme runs counter to the idea of gaining market-share for separate categories of products/services.

- Providing the 'total solution' customers seek and being responsive to their underlying concerns and requirements.
- Tracing a product's path from raw materials to waste disposal, and identifying value-adding opportunities at different points in the path, or eliminating or combining some of the sequential points.
- Doing more with less i.e., stretching resources through a high level of tactical creativity like Japan's 'bullet train thinking'. This opportunity creation mode aims at heavy cost reduction through radical redesign and simplification of products and/or processes.
- Providing improved or new solution to a known need, a new solution to an unexpressed or anticipated need, or an evolving solution to an uncertain need.
- Creating radically new and superior value for customers by reconceiving products/services. Rethinking of packet delivery by FedEx, direct selling model of Dell Computers, fifteen minutes delivering window for supplying ready concrete mix by Cemex; are relevant examples in this context.
- Providing joy of use to customers for a product/service. Ice cream by Hagen Daaz and premium coffee by Starbucks, are relevant examples here,
- Conceiving of total imaginable market for a product/service and expanding through large economies of scale and replication. Disposable cameras, watches, and syringes are relevant examples of this mode of opportunity/creation.
- Thinking in terms of enhancing customers' convenience in terms of time, ease of access and high reliability of performance.
- Reducing customers' costs by collaborating with them to help solve their problems, and helping them become more competitive by addressing the problems of customers' customers.
- Identifying and exploiting potential opportunities through collaboration or partnering with suppliers, complementors, competitors, or firms in other industries; for mutual benefit.
- Offering products with superior performance functionalities based on technological innovation.
- Combining product and service elements to create more powerful customer-value propositions.
- Identifying where and how profits are being made, or can be made in an industry, or its value chain; and capitalizing on the opportunities at those points. For example, in PC computing, profits are concentrated in microprocessors (Intel) and software (Microsoft); not in hardware which has become a commodity. In chemicals, profit is concentrated in manufacturing, not in distribution. Reverse is the case in general merchandise. In automotive industry, profit is in downstream activities such as financial services and extended warranty, not in assembly or distribution.
- Exploiting opportunities through leveraging of core competencies. Honda's core competence is in engines and power-trains. Sony's core competencies are in miniaturization and microelectronics. GE capital's distinctive competence in risk management and deal structuring is based on its cumulative learning.
- Learning from and outperforming pioneering firms by being a fast follower. Successes of Samsung in microwave ovens, Japanese firms in optics and electronics, and Microsoft in software, are relevant examples in this context.
- Leveraging a set of values around a brand that can be applied broadly as in the case of Virgin and Disney; and thereby reaping economies of scope.
- Identifying a common set of important customers that is best and profitably served in a co-ordinated way. At Cisco, IBM, and various GEC divisions; it is account management that integrates together products, processes, and technological capabilities into customer solutions.

- Finding avenues of growth in customer and product adjacencies. An example is Gillette moving from shaving blades to shaving cream and other toiletries for men.
- Creating conditions for exploiting a growth opportunity. Intel's investments in Net and multi-media businesses to create a market for its more powerful chips, is an example.
- Radiating opportunities from a core business to new geographies, new value chain steps, new customer segments, new channels of marketing and distribution, new products and/or services, and new businesses.
- Creating value by changing industry structure through well thought-out, well-planned, and effective mergers, acquisitions, or alliances.
- Creating opportunities through selling of expertise or know-how (i.e., 'economies of skills') in the form of coaching, training, and consultancy services.
- Identifying and exploiting opportunities outside existing firm and industry boundaries. GE Capital Services, for example, originated as a company that helped finance the purchase of GE products. It has grown from consumer and retail credit to rail-car, aircraft, truck and trailer leasing; corporate finance; credit cards; information technology management services, and outsourcing; and expanded across the globe.
- Eliminating or relieving customer stress through 'simplicity marketing'. Four 'Rs' of simplicity marketing are:
 - (a) developing products that replace multiple or more complicated products,
 - (b) repackaging or bundling products that were previously available only separately,
 - (c) repositioning a brand to emphasize its potential to simplify customers' lives, and
 - (d) replenishing or making continuously available, a customer's supply of a particular product or service so that the customer has to make only one purchase decision.

The core insight here is to demonstrate empathy for customers, save them time, and alleviate their stress engendered by 'overchoice', or a clutter of options.

Knowledge as the Common Denominator

The foregoing list of ideas and themes provides a pool of insights based on a distillation of knowledge

from a wide variety of case studies, empirical observations and managerial experience. All the insights directly and indirectly imply that creation of opportunities is based on creation and delivery of customer-valued outcomes. Sophisticated products, services, processes, and technologies by themselves do not create any competitive advantage(s). Customer perceived unique and valuable outcomes do. A firm's ability to create marketplace opportunity(ies) depends on its knowledge of how to create and deliver such outcomes in a competitively superior manner.

Sophisticated products, services, processes, and technologies by themselves do not create any competitive advantage(s).

The list of ideas and insights is useful in that it highlights the richness and variety of modes through which knowledge can be leveraged creatively to generate opportunities for value creation. It however, needs to be supplemented with three other flows of knowledge. They relate to (i) business domains of enterprises, (ii) pace of change in their business environments, and (iii) the competitive reality faced by them.

(i) Firms differ a great deal from each other in their domains and scope of business. Firms in diverse areas like turn-key projects, heavy equipment and machinery, industrial commodities, retail merchandise, financial and professional services, semiconductors, microelectronics, software, aero space, fashion goods, entertainment, and so on; differ widely in respect of their individual characteristics, competitive compulsions, business strategies, and critical success factors. Each firm in any field of business is a unique entity and a historic individual. Envisionment, conceptualisation, and creation of opportunity by and for a firm, therefore, have to be based on an in-depth knowledge of its specific business domain, scope, ecology, and environment.

(ii) Enterprises also differ in respect of the pace of change in their business environments. The nature of opportunities for enterprises in relatively slow-paced business environments is markedly different from those available to firms operating in fast-paced and volatile environments. The intensity of competition may indeed be high in both cases. The need for creativity, innovation, and distinctive capabilities is also high in both types of enterprises. But for firms in slow-paced environments, such as retail, fast food, consumer durables, and commodity businesses; the primary drivers of growth lie in process efficiencies,

economies of scale, and replication. On the other hand, for firms functioning in fast-paced business conditions, such as software, semiconductor, telecommunications, biotechnology, and microelectronics businesses; the primary drivers of growth lie in rapid development of new products, non-linear technological innovation, and creation of industry standards through networking.

Wal-Mart and Microsoft represent two highly dissimilar types of highly successful enterprises in the present context. The nature and requirements of creating and exploiting growth opportunities differ widely in their cases. Both the firms have however, successfully created and exploited a succession of opportunities to excel in their respective arenas of business. Their respective knowledge spectrums and knowledge management practices are also vastly different.

(iii) In their respective domains of business, enterprises also continually face the hard reality of competition from other firms in the same or related business domains. A firm cannot create a promising opportunity, if it cannot excel in creating and delivering customer-valued outcomes. For this purpose, the firm must continually monitor, understand, and assess the products/services, or market offerings, of its competitors; and appraise its actual and potential performance relative to them. More specifically, the firm must continually acquire, develop, and organize its knowledge of competitive reality along the following dimensions:

- What is/are competing with what?
- Who is/are competing where and how?
- Which is/are gaining mindshare and market-share and why?

The first query relates to the nature of competing customer-value-propositions. The second is concerned with understanding the geography of competition and competing modes of delivering customer value. The third query focuses on appraising the basis of competitive edge displayed by particular products/services or market offerings. Only on the basis of an incisive and insightful knowledge of its competitive reality, may a firm be able to proceed meaningfully toward envisioning and creating any new opportunity(ies).

Knowledge is the common denominator in the firms' visualization and creation of opportunities. But knowledge does not by itself provide the full or complete capability to realize or execute effectively the actual exploitation of opportunities. What then is the nature, source, and significance of such an inclusive and crucial capability? This issue is taken up next.

A Firm's Holistic Capability

A firm's ability to envision, create, and develop opportunities depends on its in-depth knowledge of its dynamic business environment; and the synergistic richness of its environmentally relevant knowledge spectrum (KS). Continuous development, richness, mutual reinforcement and leveraging of its KS resources generates a firm's sustained capacity for creation of value in two complementary ways. In the first instance, they drive the firm's growth by expanding the orbit of what the firm can do. In the second case, they expand the firm's orbit of envisioned possibilities, or, of what might be possible for the firm to do. A firm's success in creating and developing growth opportunities thence depends on its knowledge-based strength. But the actual exploitation or realization of opportunities depends on a firm's people. It is people who create, develop and leverage knowledge for value creation.

A firm's KS is not a stand-alone entity. It is based on people's ability to generate creative ideas and concepts and innovate; to organize, develop, combine, and cross-fertilize different domains of knowledge and expertise; and to develop and deepen unique competencies and leading-edge capabilities. A firm's KS is created and leveraged by its human capital (HC) and serves to enrich the latter. Human capital represents the motivation, talents, skills, creativity, commitment and knowledge of the members of an organisation. It is powerfully shaped by the social capital (SC) of an enterprise. Social capital denotes a firm's ethos of trust and co-operation, help and care, shared values and vision. In the absence of such an ethos, HC of a firm cannot develop; and in the absence of HC, KS of the firm cannot come into being.

HC, SC, and KS together form a mutually amplifying dense dynamic nexus; such that if any of them is poor or weak, a firm would be devoid of its capacity for sustained creation of value. Intellectual capital (IC) of a firm is the resultant of its dense dynamic nexus of SC, HC, and KS, and transcends its constituents. It represents a firm's overall, holistic or super-ordinate capability to meet its challenges and capitalize on opportunities through a creative and flexible synergistic orchestration and deployment of its KS resources. Such an orchestration and its effectiveness, in turn, are based on the rich-

Intellectual capital (IC) of a firm is the resultant of its dense dynamic nexus of SC, HC, and KS, and transcends its constituents.

ness and mutually amplifying interplay of the firm's SC, HC, and KS.

IC is a firm's meta-level capability emerging from the continuous and mutually reinforcing development of its crucial social, human, and knowledge resources. It forms the foundation of a firm's competitiveness under complex, uncertain, and continually changing business conditions. Development of IC does not require a plan. It is the cumulative outcome of an iterative or organisation wide developmental process. The latter involves dense webs of participation, involvement, and collaboration for creation of value through relentless development and deployment of knowledge.

IC as the Source-Spring of Plural Revenue Streams

A firm's success is ultimately reflected in its sustained profitable growth. The latter is manifested in the form of revenue streams. Revenue streams are enhanced or generated as the outcomes of successfully exploited opportunities. IC is a firm's super-ordinate capability to exploit opportunities. Through its creative and synergistic orchestration or choreography of a firm's rich KS resources, IC can potentially generate plural revenue streams. The nature and classes of revenue streams, and the leveraging of knowledge underlying them, may be briefly outlined as follows:

- (1) Streamlining of its core business processes by a firm for economy and speed in a continuing manner can generate high gains in the form of cumulative cost savings. Radical redesign of processes, incremental process innovations, adoption of best practices, supply chain optimization, use of ERP systems, six sigma methods, lean manufacturing, outsourcing, and other analogous knowledge-intensive productivity measures come within this category. The revenue stream here takes the form of releasing huge economic value trapped in inefficient and obsolete business processes.
- (2) Another class of revenue streams can be generated through an imaginative leveraging of innovation and/or competencies. This may take the form of offering substantially improved products and services on the one hand, and/or new products and services, on the other. Improved and/or new products and services offer superior value to customers in terms of price, quality, performance, convenience and benefits; and increase the firm's market share. The latter not only increases sales revenue, but also provides the firm increased opportunities for learning from customers and markets. Such a

continuing impact of new knowledge helps the firm further toward expanding its market share. The firm may not only increase the size of its revenue stream from improvements in current products and/or services; but also create new revenue streams from new products and/or services.

- (3) Development and deployment of new technological competencies, and/or new unique and inimitable capabilities including a creative bundling of competencies and capabilities; may enable the firm to introduce such radically new and different products and/or services of high functionality which disrupt the existing markets. They may enable the firm to generate monopoly rents from its unique knowledge assets for varying lengths of time.
- (4) A firm's high level of innovativeness, competencies and capabilities, expertise and efficient processes make it a very attractive alliance partner. The firm may thence be able to engender new streams of revenue through its joint ventures and strategic alliances with other firms. Such ventures and alliances may also provide the firm with new valuable opportunities for learning from its partners to expand its knowledge base.
- (5) A KS-IC rich firm may create another stream of revenue through the licensing and/or sale of its patents, intellectual property assets, and know-how. The firm may also generate revenues by providing consultancy and training services based on its unique know-how and capabilities.
- (6) Another large and powerful class of revenue streams is generated by a firm through the growth and expansion of its business(es). A firm can leverage its distinctive competencies and capabilities and know-how to expand across products and markets on the one hand, and geography, on the other. The firm may also adopt a strategy of appropriate acquisitions, and synergistic diversification in this context.
- (7) Another and perhaps the most powerful class of new revenue streams stems from the creation of new business(es). Creation of a new business is apt to be based on one or more non-linear innovations in products, services, technology or business systems design, (i.e., e-business). It may be an outcome of a firm's development of new competencies, combinatory capabilities, or knowledge-based powerful information technology assets. Such new business in their turn may trigger new spirals of growth, revenues and profits.

The foregoing classes of revenue streams though analytically distinct, are not mutually exclusive. Change-master firms display sustained profitable growth by generating plural revenue streams in tandem and in parallel. Their IC enables them to both anticipate and respond to challenges and opportunities in a timely manner. They relentlessly amplify the potential of their IC in terms of enhancing their number and range of options, speed of response, flexibility and resilience. Their IC provides the propulsive power of their profit engines.

Efficacy of IC

From a cybernetic perspective, the IC of a firm may be deemed to reflect its macro level regulatory capability. The firm must be able to emit a matching variety of responses corresponding to each and every type of challenge that may confront it. The number and variety of responses may be more than the variety of challenges or problem situations; but they must not be less. If, for any challenge or problem situation, the firm cannot emit a matching response; the necessary condition for the efficacy of the firm's IC would remain unmet. The firm's responses, individually or in combination, must also be effective and executed in a timely manner. These are the conditions for control. Thus, the power and potency of a firm's IC may be appraised in terms of the state of its ever-evolving capability to meet the extant, emerging and potential challenges facing it, in a timely, effective, and continuing manner.

IC is a high order meta-level concept with a broad and inclusive scope. For this reason, it is also rather amorphous, fuzzy and ill-defined; and its measurement and evaluation are fraught with difficulties. The importance of, and the interest in, the concept stem from the recognition of a wide and widening gap between the market and book values of firms. The concept is, however, also pragmatically useful in terms of changing managerial perceptions on the valuation of companies, on the centrality of knowledge as the quintessential competitive resource, on the justification of investments in strategic options and a prod-and-learn process, and on the role of high market capitalization to capture global growth opportunities.

IC is a high order meta-level concept with a broad and inclusive scope.

IC fosters, and is fostered through an unceasing process of building and expanding skills, competencies,

expertise, and innovation; that feed on each other to engender inimitable synergies and the capability to be better than the best. Its focus is on amplifying and orchestrating the outputs of a firm's knowledge management toward continuous crafting and renewal of competitive advantage. IC rich enterprises continuously explore and exploit knowledge to create and leverage unique capabilities, unique assets, unique customer-value-propositions, and unique market positioning to create wealth ceaselessly.

Creating an Opportunity Development System

Although creation and exploitation of opportunities depend on KS and IC, they have to be visualised and recognised first. Recognition of promising opportunities is not a random process. Creation of value and pursuit of growth are too important to be left to chance. All leading firms across the globe have instituted mechanisms, procedures, and practices for timely recognition and proactive development of opportunities. Their objective is to minimize the lag between visualization and recognition of opportunities, and generating revenue streams from their effective exploitation.

A formal or semi-formal system for creating or identifying opportunities is also necessary for overcoming the perceptual constraints imposed by prior knowledge (work roles, experience, education, and professional background) of a firm's key decision-makers. Prior knowledge creates a 'knowledge corridor' which allows entrepreneurs to recognize certain opportunities but not others. Prior knowledge of markets, of ways to serve markets, and of customer problems, engenders a perceptual barrier toward sensing and appreciating novel and unconventional possibilities unrelated to their experience. Such a perceptual constraint also highlights the need for extensive participation and involvement of a firm's HC in opportunity creation. The perceptual constraint may be overcome by leveraging people's diversity of talents, experiences, knowledge and backgrounds.

A systematic and organized effort toward creation/recognition of opportunities can assume different structural forms and modes. Some of them may be outlined briefly as follows:

Creating an Ideas Bank

Companies as part of their knowledge management practices may create an inventory of promising ideas regarding salient aspects of their competitive performance. Pooling of ideas may cover a wide range: technology and product development, reconfiguration of

market space, new sources of product/service differentiation, new competencies, integration of skills and capabilities, redesign of business processes, areas of business expansion, dynamic options for future profits; and so on. These ideas may be expanded, combined, discarded, and replenished from time to time in an ongoing manner.

Some firms like Honda, Toyota, Canon, and Schlumberger also maintain a database of pretested technological ideas. This helps them speed up their product development projects on the one hand, and solve unforeseen technical or customer problems on the other. An ideas bank may also generate opportunities in terms of copying or extending a known idea into new geographic locations, or taking up an idea from one industry and applying it to another. The concept of JIT system, for example, was triggered by the observation of shelf replenishment of food items in supermarkets. The concept of hub-and-spoke system for package delivery by air, was similarly sparked off by observing the procedure of clearance of cheques by banks. The idea of branding in a similar manner has been extended to unbranded fields like computer chips, pens, washing powder, flour and salt.

An idea bank calls for a new type of role – knowledge brokers – who are charged with seeking interesting ideas from a wide variety of internal and external sources, and bringing together ideas from disparate contexts. This role and approach engenders a 'knowledge brokering cycle'. The latter consists of four highly interrelated work practices: (i) capturing good ideas, (ii) keeping ideas alive, (iii) imagining new uses for old ideas, and (iv) testing promising concepts. Old ideas may sometimes provide creative solutions to new problems. Testing promising ideas shows whether a possible opportunity has significant commercial potential.

An idea bank calls for a new type of role – knowledge brokers – who are charged with seeking interesting ideas from a wide variety of internal and external sources.

Building an Opportunity Register

An opportunity register houses an inventory of specific opportunities that appear promising. The opportunities, whether perceived or imagined, may span a wide area ranging from new or redifferentiated products and/or services, to new customer segments or new markets, and new businesses. Best opportunities from

the register are targeted for focused initiatives, or exploratory assessment through real options reasoning. Uncertainty in capitalizing on high potential opportunities is embraced through adoptive execution. The latter operates on the basis of learning through market probes and small-scale experiments for testing assumptions. Learning is focused toward progressively reducing the ratio of assumptions to knowledge. It is essential for reviewing the nature and potential of an opportunity as a clearer picture unfolds.

One important purpose underlying an opportunities register is to enable an enterprise to distinguish between and assess possible opportunities on the basis of their upside potential. The criteria in this context include:

- Duration and amplitude of the revenue streams from the proposed market offering.
- Duration of growth in demand for the offering.
- Solutions to critical problems provided by an effective exploitation of the opportunity.
- Leverage provided by the opportunity to tap many adjacent market subspaces.
- Market offering's potential to evolve into an expanding mass-market.

The primacy of focus in this context is to assess how high the upside potential of an opportunity can be. Some venture capital firms follow this style of opportunity assessment.

Establishing Opportunity-based Units

Most leading firms have established such units. They usually take the form of customer teams, project teams, or solutions teams. Executives in such units are judged on their ability to spot opportunities, develop their subordinates, and provide help and resources for other key projects. The nature and managerial practices of such units however, differ from firm to firm.

At Shell Oil, a business-development unit helps geographically dispersed operating units identify, crystallise, and exploit opportunities around the world. Promising opportunities receive a global ranking and resource allocation in the context of the interests of the company as a whole. At IBM, all employees have the right to register anything they regard as an opportunity into the company's opportunity management system. Account managers of the firm's thousand largest customers play an important role in spotting and exploiting opportunities. They keep track of the customers' current requirements and carefully project their emerging

needs. When a high-ranking customer launches a big project and invites IBM to bid, managers in charge of that customer's account post the new opportunity on the company's opportunity management system, notify all relevant resource owners, and co-ordinate the company's efforts toward exploiting the opportunity. ABB ranks prospective projects to ensure that resources go to the most important ones. ABB gives open access to all the key information about projects to its opportunity managers and resource owners, that are apt to be geographically dispersed.

Honeywell provides another important example in this context. This firm has created dedicated "strategic Account Alliance Teams". These teams are composed of an executive and several technical experts who partner with an executive and several experts from the customer company. The teams focus on ways to enhance value to the customer, eliminate unnecessary costs, and strengthen the relationship between the two companies. They also explore and engage in joint development to create new technologies or services for the customer. GEC, in a similar context, has formed boundaryless customer productivity teams (BCPTs) i.e., teams of individuals from diverse GE businesses who work together to cross-sell GE products.

Creating Solutions Surplus Systematically

Providing solutions to customers' problems, instead of selling them discrete products and services, has emerged as an attractive growth opportunity. Declining margins for manufactured products and standard services on the one hand, and attractive profit margins and growth potential on the other; have increasingly led many major companies like GEC, IBM, Citibank, Nokia, and Charles Schwab, to create and exploit opportunities in term of providing solutions for their most important customers.

While providing high value solutions for the problems of customers represents a significant area of growth in saturated markets; capitalizing on such opportunities is not easy. Three basic and relatively difficult requirements for success need to be met by enterprises in this context:

- The companies need to create a profitable 'solutions surplus' by leveraging distinctive capabilities to provide outcomes that would otherwise be unavailable to their important customers/clients.
- The companies need to sustain that surplus by managing and overcoming the gaps between customer-valued-outcomes, and their repertoire of skills and capabilities. The companies need

to be customer-centric while continually building new, and expanding existing capabilities.

- The companies need to overcome or significantly reduce, the gaps between requirements of their customers, and their stock of capabilities through an appropriate organisation design. The latter should comprise the following segments:
 - (i) Comprehensive and empowered front-end units capable of understanding the problems and issues faced by customers, and for which they need solutions.
 - (ii) Back-end units that can effectively respond to customers' concerns through their exploitation and development of the necessary capabilities, and
 - (iii) Strong leadership and infrastructure at the central level to foster and facilitate continuous collaboration between the front- end and back-end units.

Without an effective organisation design, a company would not be able to integrate, complement, or combine its capabilities to deliver solutions to customers.

Developing a Radical Innovation Hub

A radical innovation hub is a structural unit and device to organize competencies for idea generation, recognition of opportunities, and their evaluation. A large company may need a network of such hubs. A radical innovation hub is meant to link people with ideas, opportunity recognisers and evaluators, hunters and gatherers of radical innovation ideas.

The role and functions of a radical innovation hub may be visualised as follows.

- Aligning a firm's strategic intent with its management of radical innovation.
- Implementing techniques and supportive processes to foster generation of innovative ideas, initiatives, and approaches.
- Serving as a homebase for radical innovation proposals, and as receiver of breakthrough ideas and developments from internal and external sources.
- Helping potential innovators and entrepreneurs articulate the opportunities envisioned by them.
- Undertaking initial evaluation and organizing further more detailed evaluation of proposals.

- Serving as a repository of promising but unripe ideas.

The role of the manager of such a hub is crucial.

He/she must have access to informal networks of scientists, engineers, technologists, sales personnel and business unit managers. Such an access is vital for his/her being regularly posted with news and important developments. The manager serves as a central information node and a link between emerging technologies and commercial markets. To create wide awareness of technologies and markets, the manager may publicly display the following types of information:

- An inventory of key development projects within the company.
- All markets in which the company has a presence, and the potential needs in those markets.
- Business concepts currently being pursued within the company and the requirements of knowledge and information for continuing funding.

Building an Innovation Portfolio and Electronic Market for Ideas

In order to institutionalise the process of opportunity creation, a company needs an innovation portfolio supported by an in-house electronic market for ideas, talent, and capital. Innovation portfolio for a large firm may consist of thousands of ideas, hundreds of experiments, double digit number of ventures, and single digit number of new businesses. Such a portfolio is a 'portfolio of possibilities' which are under various stages of review, experimental testing, full-fledged trials, and exploitation.

A corporate wide IT system is necessary to support the innovation portfolio. Any employee with a promising new idea could 'toss' his/her idea to an on-line market for radical ideas. An 'innovation editor' would group similar ideas together and post them on the company's intranet. This would, in turn, enable real time online discussions for ideas that attract attention and thoughtful inputs. Individuals across the company may highlight their interest in working on those particular ideas. Top management could monitor this process and make necessary resources available for highly promising ideas. A company needs to build efficient electronic markets for ideas, capital, and talent in order to institutionalise and accelerate pay off from creation of opportunities based on non-linear innovation.

A corporate wide IT system is necessary to support the innovation portfolio.

Hatching the Company's Future

Many leading companies have established in-house incubators, and/or venture capital units, for exploring and recognising possible future opportunities. Their primary objective is to enable the enterprises keep ahead of changes being wrought by the Internet, and not to miss out on opportunities that may unfold in the near future.

One such unit is LabMorgan, JP Morgan's incubator for new e-finance businesses. The bank ploughed \$1 billion into new ventures in 2000 toward reinventing the bank. Lab Morgan is focused on generating promising new ideas, testing and validating them, and then accelerating the development of viable business concepts. Viable new business concepts are developed through building prototypes, experimental demonstrations, and creating a basic company infrastructure around them. The decision about whether to invest or not comes next based on the prototype and experiments. The whole process is compressed within a period of three months only.

The LabMorgan evokes an image of a honeycomb to convey its idea of a collection of self-contained e-finance businesses. These businesses stand alone, yet also fit closely together in a greater whole.

Conclusion

Opportunities are the pathways to enterprise growth through creation of value. Knowledge is the quintessential resource for creating value. It however, does not exist alone. It's acquisition, creation, development, diffusion, leveraging and co-ordinated development are collaborative social processes involving people as carriers of knowledge. Ethos and processes of collaboration (social capital), abilities and motivation of people (human capital), and a firm's dynamic pool of knowledge resources (knowledge spectrum), are inextricably bound up with one another in a dense dynamic nexus of mutually supportive interaction. Intellectual capital (IC) as the holistic capability of an enterprise to meet challenges and exploit opportunities, is the emergent from that nexus. However, without values and vision that inspire people to be and do their best together, social and human capitals cannot develop and grow. And without the latter, there can be no leading edge development and deployment of knowledge, and

no IC. The roots of opportunity creation and exploitation thence lie in the vision and values, the meaning and purpose of people in an enterprise.

An organisation with poor IC cannot enable and motivate new possibilities of value creation and growth. It will witness its decline from within and without. Other enterprises with richer IC to embrace value-generating possibilities will ensure and hasten its decay and decline. In a turbulent and highly competitive business environment, an enterprise cannot settle on just one best way to compete. It has to constantly search for, create, and exploit opportunities with narrow and shrinking windows of time; if it is to survive, develop and grow. It cannot remain static. The foremost requirement in volatile business conditions is a firm's ability to proactively develop, and rapidly assemble, orchestrate and synergistically deploy its knowledge spectrum. The firm may also need to change its direction and course with little or no lags in its real-time information-decision-action cycle. It is in such demanding and dynamic business situations, that a firm's social, human, and knowledge capitals need to work in tandem; and in a fast, fluid and focused manner. And this is what a firm's IC imperative is about.

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A successful person is one who can lay a firm foundation with the bricks that others throw at him or her.

— David Brinkley

Small-Scale Paper Mills & Economic Reforms

Prabhakara Sharma

This article discusses the viability and advantages of small scale paper mills vis-a-vis the government's economic policies which have adversely affected the paper industry. Measures need to be urgently taken to help the industry face global competition.

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The idea of setting up a number of small paper mills has attracted many Indian entrepreneurs. Firstly, this is to bridge the gap in demand and supply of paper in the shortest possible time. Secondly, in view of a large amount of capital required for establishing an integrated pulp and paper plant, the planning commission of India favoured small units during the Third Plan (1961-66) so that they can use the locally available raw material. Finally, this is due to stagnant production and depleting forest raw materials on the one hand and rising demand for paper on the other. As a result, from the mid seventies small paper mills emerged using straw and agricultural residues as raw material.

Structure based on the Size of the Unit

The structure of the Indian paper industry is based on the production which ranges from 2 tonnes per day (TPD) to 300 TPD using diverse raw materials, technologies and making different varieties of paper products. Mills based on forest raw materials set up in the early years of the industry were relatively small. The average size of a paper unit in 1955 was about 9,000 TPA. With the establishment of few large integrated pulp and paper units from 1955 to '60, the average size of a paper unit increased to 16,000 TPD in 1960.

From 1960 to '70 additional capacity was attained through expansion and commissioning of small-scale paper units. The paper industry is divided into three groups based on the size of the unit and installed capacity.

Table 1 exhibits the category-wise growth of paper industry and its installed capacity from 1970 to 2000. The first variety 'A' comprises of large paper mills, manufacturing above 20,000 TPA. The second 'B' is consistent with medium paper mills manufacturing between 10,000 TPA and 20,000 TPA. The third 'C' category comprises small units, producing less than

Table 1: Category-wise Growth of Paper Mills From 1970 to 2000

Capacity (TPA)	Category	1970	1975	1980	1985	1990	1995	1996	2000
Above 20,000	A	13	16	21	23	30	47	47	52
From 10,000 to 20,000	B	5	7	10	17	24	38	42	45
Below 10,000	C	39	51	92	211	252	295	291	309
Total		57	74	123	251	306	380	380	406

Source: Paper Maker July 2000, and compiled from the various records of Indian Pulp and Paper Technical Association (IPPTA) Sharanpur, UP.

Table 2: Installed capacity of the units from 1970-2000

Category	1970	1975	1980	1985	1990	1995	1996	2000
A	5.71 (75.6)	7.75 (74.4)	10.44 (67.9)	11.46 (48.5)	14.57 (48.3)	21.36 (56.2)	23.71 (56.5)	25.62 (41.3)
B	0.71 (9.4)	0.98 (9.4)	1.44 (9.4)	2.74 (11.6)	3.79 (12.6)	4.72 (12.44)	6.24 (14.85)	8.94 (14.4)
C	1.13 (15.0)	1.69 (16.2)	3.50 (22.7)	9.41 (39.9)	11.79 (31.1)	11.92 (31.36)	12.05 (28.7)	27.45 (44.3)
Total	8	10	16	24	30	38	42	62

(Lakh Tonnes)

Source: Paper Maker July 2000, and compiled from the various records of Indian Pulp and Paper Technical Association (IPPTA) Sharanpur, UP.

10,000 TPA. It reveals that the total number of paper units increased from 57 in 1970 to 74 in 1975, 123 in 1980, 251 in 1985, 306 in 1990, 380 in 1995, 1996 and in 2000 the total units crossed 400. In numerical terms, the small paper mills outnumbered the large and medium mills. Most of these small units have an installed capacity of less than 10,000 TPA. In 1985 the number increased by more than 100 percent as compared to 1980. The number of mills more than doubled and crossed the 200 mark with further addition of 121 new units. By 1990 the number of paper mills had gone up to 306, out of which 252 were in the category of small units.

Table 2 indicates that the small units formed a large proportion of paper making capacity in the country. In the years 1995 and '96 though the total units are the same some small units were changed into medium units by expansion programmes. The capacity has been increased from 8 lakh tonnes in 1970 to 62 lakh tonnes in 2000. The increase is nearly 8 fold.

Structure based on Category, Size and Capacity

The Indian paper industry is comprised of three segments based on the raw material they use. They are Wood-based mills, Agro-based mills, and Waste Paper mills. The number of mills in each segment along with the distribution of raw materials and the

approximate percentage usage of raw materials is presented in Table 3.

The Indian paper industry is comprised of three segments based on the raw material they use.

The Ministry of Industries, Government of India, and 'Report Energy Audit and Conservation in Pulp and Paper Industry in India' published by All India Small Paper Mills Association, categorized paper mills into three types. Large mills having capacity more than 50,000 TPA. These mills are permitted to use raw materials such as bamboo, hardwood, soft wood, conventional materials etc.

In the medium type of paper mills the installed capacity is in between 20001 to 33000 TPA and 33001 to 50000 TPA. These units use the raw material of agricultural residues, waste paper and are restricted to the use of conventional raw materials.

Thus the large-scale units were given some protection by the Government. Table 3 also describes the distribution of paper mills on the basis of installed capacity. Fairly high capacity utilization is a healthy signal for the growth of paper industry.

Table 3: Structure of Paper industry based on Capacity and size

Classification (TPA)	No. of units	Installed capacity	Category	Utilization capacity %	Raw material	Approx. usage %
Small						
Below - 5000	140	78874	V	50 to 60	Agriculture Residues	40
5001 - 10000	112	564435	IV	51 to 60		
10001 - 20000	88	473800	III	52 to 60	Waste paper	60
Medium						
20001 - 33000	32	426331	II	70 to 80	Agriculture Residues	80
33001 - 50000	19	400627	II	71 to 80		
Large						
Above 50001	15	4258260	I	80 to 85	Bamboo hardwood soft wood Others	75 22 01 02
Total	406	6202327				

Source: Compiled from Report Energy Audit and Conservation in Pulp and Paper Industry in India.

Total capacity = 62.0 lakh tonnes

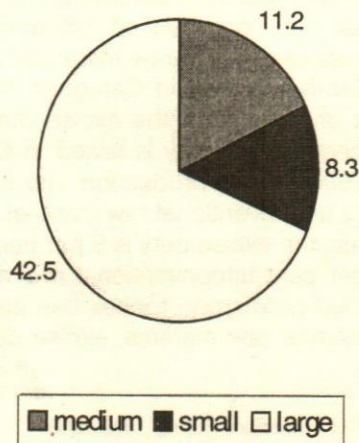


Fig. 1. Structure based on installed capacity

Most of the large-scale mills are situated in close proximity of forest resources such as bamboo and hard woods. Forest raw material forms the main source contributing nearly 75 per cent of the total production of paper and board. The increase in population created demand of land for cultivation and requirements such as hydro electrical projects resulted in the shrinkage of forest areas. Similarly, the demand for wood has increased for paper industry and constructional purposes.

The Small Paper Mill

In terms of installed capacity, the mills with a capacity of less than 30 TPD/10,000 TPA are defined as small paper mills and are eligible for concessions and fiscal incentives from the Government and financial in-

Total units : 406

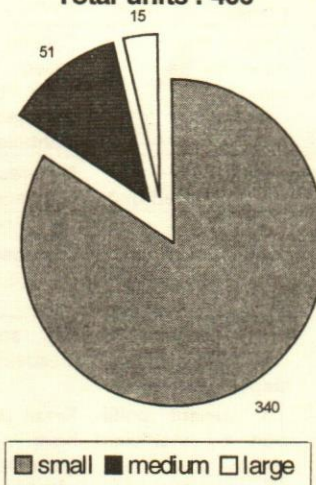


Fig. 2. Structure of paper industry on the basis of size

stitutions. From 1983 this limit has been raised to a capacity of 50 TPD/16,500 TPA. But from 1984 onwards mills up to a capacity of 80 TPD/26,400 TPA were considered as small paper mills. Currently, paper mills with an installed capacity of less than 33,000 TPA are considered as small mills by the government for the purpose of granting various concessions in excise duty.

The mills with a capacity of less than 30 TPD/10,000 TPA are defined as small paper mills and are eligible for concessions and fiscal incentives.

According to the All India Small Paper Mills Associa-

tion (AISPMA), the primary factor to be called a small paper unit is that it does not use primary raw materials like bamboo or hard wood. It basically depends on secondary raw materials such as non-wood plant fibres like cereal straw, grass, sugar cane bagasse, waste paper.

Chart 1: Government Policies and their Impact

Policy	Objective	Impact
Large public sector creation	Ensure adequate paper availability	Strong PSU pressure
Promoting small units	Promote use of non-forest base raw material	Fragmentation of the industry Large scale sickness Increased capacity in the mid eighties
Excise structure & board class	Improve economies of scale	No impact since excise structure favours smaller units Product mix of companies widened considerably
Paper control order	Ensure availability of paper to educational sector at reasonable prices	Affected the profitability adversely rescinded in 1987
National forest policy	Ensure forest cover for the country	Caused shortage of forest based raw material for large paper mills and lessened viability of plantation projects
Coal exchange/licensing	Promote agro-residue based units	Agro-residue based capacity benefited
Low import duties on wood pulp and chip 5%	Ensure easy availability of low cost raw material	High import bill Larger units benefited
Higher import duty on waste paper	Curtail indiscriminate waste paper imports	Put small units at a disadvantage
Pollution control norms	To prevent pollution by inefficient mills	Small units, which do not have efficient treating technology, threatened with closure.
Liberalisation, privatisation, & globalisation dismantling of trade barriers	Improve the quality of products to provide a strong competition to promote the products in global markets	A trade policy has thrown an open challenge to paper makers of India to acquire desired capabilities to stand in competition at global level. Liberalisation trade policies have had an adverse effect and most mills fared badly in terms of economic performance. The financial aspect indicates that the steep increase in material cost, labour and other costs cause constant problems. Resource constraints affect employment, earnings and production, particularly shortage of right quality raw material.

Economic Policies

Despite the improving economic climate, the country suffered a severe balance of payments crisis in 190-91 that was compounded by the effects of the Gulf war, Kargil War etc. The crisis prompted the Indian government to initiate an economic reform programme that combined immediate stabilization measures with more far-reaching structural reform.

Although the Indian Government has generally followed prudent macro economic policies, the country's long-term growth record has been lower than those of most Asian countries. The government of India followed various policies. It decontrolled the paper sector, discouraged forest based mills, and encouraged unconventional raw material based mills. Chart 1 shows the details.

Excise Duty

Table 4 reveals that the Government is levying differential excise duty on mills of different capacities based on the use of different raw materials viz., 100 per cent Wood, Bamboo based in Category 'A' Class-I > 33,000 tonnes of production the excise duty is 20 per cent. 15 per cent excise duty is levied in Category 'A' Class II > 33,000 tonnes production and they have to use 50 per cent unconventional raw material. In the case of Semi 'A' Class the excise duty is 5 per cent and these mills use 75 per cent unconventional raw material and Class B < 33,000 production tonnes use atleast 50 per cent unconventional raw material, excise duty is levied at 10 per cent.

Table 4: Excise Duty Structure During 1999-2000

Type of mill	Production in tonnes	Excise Duty (%)	Raw material used
A Class I	> 33,000	20	100% wood bamboo based
A Class II	> 33,000	15	At least 50% unconventional raw material
Semi A Class	NA	5	At least 75% unconventional raw material
B Class	< 33,000	10	At least 50% unconventional raw material

Source: IPPTA Convention Issue, Dec, 2000.

Government regulation is also considered in price determination. Recently, the reduction of customs duty of imported goods of EXIM policy from 60 to 25 per cent lead to new paper products and high quality paper

being available in the Indian market. Resultant entry led to decrease in demand of paper products of Indian mills. So, this led to decrease in prices. By this it can be said that government policy intervention is to be considered in price determination.

Concessions and Incentives

The Government of India has extended many incentives to the small paper mills. The factors responsible for increasing number of small mills and their contribution are attributed to excise duty concessions and several incentives and encouragement provided by the Government from time to time. Permission for importing second-hand machinery, exemption from the purview of price and production controls and excise duty rebate are some of the concessions provided to small paper mills. For mills using not less than 75 per cent raw materials in the shape of bagasse, 100 per cent excise duty concession is granted for the first three years.

Problems of Small Paper Mills

Small paper mills have their own peculiar problems that affect their production. The operational figures of small paper mills have generally fallen short of expectation despite numerous facilities and fiscal concessions being provided to them. Most of the imported machinery was suited for the use of wood pulp as raw material. Hence the same machinery could not be effectively adapted to other agro-based materials like bagasse and straw.

It is believed that an old imported machine costs about one-tenth of a new indigenous machine. But the cost of rebuilding, import duty, increased cost of inputs and lower yield makes old imported machinery a costlier proposition. Such units are incapable of utilizing standard process equipment and are based on outdated and crude technological concepts, involving high cost of production and low productivity.

Small paper mills have to depend mainly upon agricultural residues and secondary fibrous raw materials like waste paper and waste gunny. Larger quantities of straw are used as animal fodder, also for roofing, packaging, fuel, and manure. Agricultural residues being seasonal, their collection, handling, transportation, and storage (due to bulkiness) pose difficulties. The non-availability of straw in large quantities at centrally located places is yet another disadvantage to small paper mills. Hence, considerable amount of labour as well as money have to be diverted in the collection of raw material.

Small paper mills have to depend mainly upon agricultural residues and secondary fibrous raw materials like waste paper and waste gunny.

Increased consumption of agricultural residues and consequent competition among small paper mills some times have led to uncertain availability as well as unhealthy price competition. Competition made way for exorbitant price rise. Regarding waste paper, it is estimated that hardly 15 per cent (against international standard of 30 per cent) of total paper produced in India is available for recycling as a bulk of it is used for packing. In advanced countries collection of waste paper is done on an organized basis but not so in India. Cost of imported raw materials such as market pulp and waste paper escalated due to import restrictions. The secondary fibrous raw materials are becoming costlier and more irregular in supplies than bamboo and hard wood.

The paper industry discharges a lot of effluents, which are toxic. It is estimated that effluents discharged from 30 TPD agro-residue-based mills without chemical recovery is equivalent to an integrated mill with 100 TPD. It is also noticed that the chemicals discharged as black liquor from 30 TPD mills may be equivalent to about Rs. 2 crores annually. The effluent is also a major source of pollution in inland surface water streams. It has not yet been possible to develop a technically feasible and economically viable process for recovery of chemicals in small paper mills. This has resulted in wasteful consumption of chemicals and consequent high cost of production as well as widespread pollution.

The lack of standardized equipment has led to operational inefficiency in small paper mills. Some of the shortcomings in this regard are: imbalance in different sections of the plant, low thermal efficiency of boilers, inferior quality and poorly designed machinery and equipment and performance of second-hand imported machinery well below the anticipated level in many cases.

Entrepreneurs have promoted most of the small paper mills with little exposure to major industrial ventures. They are located in backward areas and are faced with the difficulty of securing the services of trained, competent, skilled, and technical man power both at floor and executive levels.

In view of small-scale production and the inherent nature of the agriculture residues being poor in quality compared to virgin straw materials, there is a risk of small paper mills not being competitive with the existing

large paper mills based on forest raw materials, both in quality as well as prices.

In spite of numerous problems and bottlenecks these mills have made rapid strides in the past one and a half decades increasing their contribution to national paper production from 45 per cent to above 50 per cent.

Advantages

The establishment of a chain of agro-based small paper mills has once again supported the theme that "developing state is one, which creates wealth out of its waste, while a under-developed state is one which wastes its wealth". Small paper mills sub-serve the following important social, economic and national objectives.

- The greatest advantage of a small paper mill is that it is not highly capital intensive and the gestation period is not long. So they are within the reach of new entrepreneurs whereas large mills have to remain restricted to a few big industrial houses. The low investment, lesser interest burdens and low gestation period is the main attractions of these mills.
- They utilize agricultural residues and other raw materials, which would go waste and thus augment the production of paper. The major revolution in the paper industry comes from small paper mills, which use inexpensive raw materials and which, in other words, creates wealth out of waste.
- They are relieving pressure on forest raw materials and help to conserve fast depleting forest reserves. Ecologically as well as economically, the use of this kind of raw material is a major advantage.
- Waste paper has always been used as one of the principal raw materials by small paper mills. Recycling of waste paper contributes to the reduction in the consumption of chemicals as well as environmental pollution.
- Small paper mills, which are designed to utilize the locally available raw materials, will have less transport costs because of their close proximity to raw materials.
- The mills are of considerable socio-economic importance also because they can prevent the concentration of ownership and dispersal of industry, leading to balanced regional development.
- Because of nearness to the centres of raw

material availability, most of the small papers units are located in rural areas, providing employment avenues to rural folk round the year and giving additional income to farmers as their agricultural wastes are taken up by the mills. In a way these mills play a significant role in rural development.

Economic Scenario

As government commensurately began to free industry and external trade from control and regulation in the early 1980s, output and productivity grew. Between 1980-81 and 1990-91, GDP grew at an average annual rate of 5.5 per cent. In terms of gross value added, agriculture recorded an average annual growth rate of 3.6 per cent while the manufacturing and services sectors grew at around 7.0 per cent per year. Gross domestic investment averaged 23 per cent of GDP over this period and recorded real increases of 7 per cent per year. Between 1990-91 exports grew at an average annual rate of 8 per cent from US \$ 8.5 billion to US \$ 18 billion, while imports rose from US \$ 16 billion to US \$ 24 billion.

As per the economic survey, the growth in real GDP was 5.4 per cent as compared to low growth of 4 per cent in the year 2000-01. However, industrial growth suffered by declining to 2.7 per cent as against 5 per cent recorded in the previous year. The impressive growth rate of 5.71 per cent in 2001-02 as against negative growth rate of 0.2 per cent in 2000-01 in agriculture and allied sectors contributed to the GDP. However, it is gratifying to note that the fundamentals of the economy continue to remain strong. In fact, inflation had fallen to 1.4 per cent, the foreign exchange reserves crossed US \$ 58 billion, and food stocks increased to about 60 million tonnes.

The thrust of the union budget for 2002-03 was to consolidate the economic reforms put into motion in the earlier years. The budget also sought to improve the fiscal management of the States by linking the financial assistance to States to the quality and level of reform initiatives that they undertake. In order to encourage State reforms, the Finance Minister set aside Rs. 148 billion as performance based incentives in the areas of power generation, urban infrastructure creation, provision of rural credit and irrigation for agriculture. The budget reflected a fiscal deficit which was attributed mainly to adverse economic conditions and security environment.

In order to tackle the issue of fiscal deficit, both the Centre and the States should join hands by focusing on

revenue enhancement by enforcing better compliance in direct taxes, extending service tax, and establishing a better tax collection system. This can also be done by controlling the expenditure by reducing the interest rates and subsidies and levying appropriate user charges on public utility services.

Indian Paper Industry to-day

The demand recession, cheaper imports, supply-demand imbalances and the resultant price cuts adversely affected the performance of paper industry during the year 2001-02. The per capita consumption of paper in India continues to be at a woefully low figure of 5 kgs., as compared to the global average of 52 kgs. This offers very good scope for growth of domestic paper industry, provided fibrous raw material at competitive prices is made available.

The per capita consumption of paper in India continues to be at 5 kgs, as compared to the global average of 52 kgs.

Most of the domestic paper mills are not in a position to produce quality paper at competitive costs. This present situation calls for enhancement of manufacturing capacities by achieving economies of scale which undoubtedly requires a high level of investment. While the average capacity of a paper mill in India is about 11,500 tpa, the corresponding figure in the USA is 1,84,000 tpa, in Canada, it is 2,13,000 tpa.

Conclusion

With recent economic reforms in the country, the paper industry has been exposed to severe competition from global players. With the globalization of the Indian economy, the Indian paper industry is in pursuit of its modernization and upgradation to improve quality and productivity. There is need for inducting a cost effective manufacturing process in the Indian paper industry to make it competitive in the international market. The paper industry is passing through bad times due to market recession. Steep hike in the cost of almost all the

inputs of paper industry is posing a serious threat to the very existence of paper mills. Restructuring of finances has to be taken up to streamline the functioning of the paper industry. The Indian Paper Manufacturer's Association informed the governmental authorities that the raw material problem of the domestic paper industry could be solved if 10 per cent of the total 67 million hectares of degraded forest land is made available for development and afforestation. It is suggested that it is desirable to provide massive plantations on marginal and degraded farm lands to achieve raw material self-sufficiency and sustained availability for the bright future of the Indian paper industry. This also creates an eco-friendly environment and improves the socio-economic status of the farmers. Clone propagations of pulpable tree species by selecting elite parental trees with desirable characters like, fast and uniform growth, high yielding, disease and pest resistant and drought tolerant varieties, low cost and effective planting techniques by the way of treated bare rooted 'Casuarinas' seedling and 'Subabul' stumps provides maximum returns. Low cost planting technique helps in reducing planting expenditure to the tune of Rs. 3,000 per hectare.

The small-scale mills had to go for expansion and modernisation to widen their base and strengthen profitability. It is also suggested to modernize the small-scale units by introducing scientific expertise in production as well as innovative technology of marketing in order to compete with large-scale units of domestic as well as imported paper products.

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Diversification of Agriculture in Punjab

Gurpreet Kaur, A.S. Joshi & J.S. Sidhu

Keeping in view the problems created by paddy-wheat monoculture, diversification of agriculture in Punjab has become the need of the hour. Different optimum plans of diversified farms developed at given and relaxed level of resources may enhance the income and employment of different farm categories to a considerable extent. But, at the same time various diversification strategies, by shifting some of the area from wheat-paddy farming system to other alternative enterprises, may not be possible unless the existing techno-economic policy environment is changed in favour of the suggested alternative enterprises for agriculture in Punjab.

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Agriculture being the mainstay of the rural population plays a vital role in the Indian economy. More than 70 per cent of the people are dependent on agriculture. Majority of them belong to small and marginal categories. To meet the food requirements of a growing population, the research and technology development and extension efforts had been directed towards the development and adoption of high yielding varieties of wheat and rice. High yielding varieties coupled with high doses of inputs and better output prices have tilted the agricultural production pattern in favour of paddy and wheat. Over time, particularly since the ninties, the profitability of paddy-wheat has started stagnating and declining. The paddy-wheat monoculture has also led to a number of ecological and economic problems such as declining water table, deficiency of micronutrients, increase in area under saline/alkaline soils, increasing incidence of pests and diseases etc. At the same time, the costs of the inputs are rising, resulting in decline in the profitability in Punjab agriculture. It may not be possible to sustain the existing cereal oriented production pattern in the long run. Thus, diversification of Punjab agriculture is the need of the hour. Many efforts have been made to analyse the problems related to diversification and suggest measures to divert some of the area under wheat-paddy rotation to other crops and enterprises.

Farm diversification may be adopted as a strategy for profit maximisation by reaping the gains of complementary and supplementary relationships. Farm diversification also acts as a powerful tool in minimisation of risk in the farming business. Under weather and market induced risk and capital constraints, diversification helps in stabilizing farm income.

Various studies conducted earlier have shown that the introduction of one or the other enterprise in the existing production pattern can increase the income of the farming community. But at the same time, it increases the capital requirements as a shift in the

cropping pattern is only possible by either adoption of new technology or raising the price of output.

An attempt has been made in this paper to analyse diversified farms of different categories with more income generating enterprises in Ludhiana district and to optimize their income and employment.

For this purpose, primary data was collected from the four villages of district Ludhiana during the year 1999-2000. Multistage random sampling technique was used to select farmers who were raising general crops, fruits, vegetables and dairy animals. By using cumulative cube root frequency method, the farmers were classified as small farmers operating 1-5 acres of land, medium farmers with 5-10 acres of land and large farmers operating more than 10 acres of land. From each category, a sample of 25 farmers were selected, making a total sample of 75 farmers. To achieve the desired goal of income maximisation, the following linear programming model was used to develop the optimum plans:

$$\text{Maxi } Z = \sum_{j=1}^n P_j X_j$$

$$\text{Subject to } \sum_{i=1}^m a_{ij} X_j \geq b_i$$

$$i = 1, 2 \dots m$$

$$j = 1, 2 \dots n$$

$$X_j \geq 0$$

Where Z = Total returns to fixed farm resources

P_j = Returns to fixed farm resources per unit of an activity

b_i = Availability of i th resource

a_{ij} = Input requirement of the i th resource per unit of j th activity.

n = Number of real activities

m = Number of resource constraints

$X_j \geq 0$ = Non-negativity constraint

The annual returns from fruit crops were discounted at 12.5 per cent per annum. The optimum plans were developed both at existing level of resources and at relaxed level of resources. In relaxing the resources, it was assumed that labour can be hired and capital can be borrowed to any extent.

Table 1: Existing production pattern in three categories of farms in Ludhiana district of Punjab, 1999-2000

(area in acres)

Enterprises	Unit	Size categories		
		I	II	III
Wheat	Acre	1.00 (12.98)	2.00 (13.79)	2.00 (9.15)
Sarson	Acre	-	-	3.00 (13.73)
Paddy	Acre	1.85 (24.02)	1.00	(6.89)
Maize	Acre	-	2.00 (13.79)	2.50 (11.44)
Total area under crops	Acre	2.85 (37.00)	5.00 (34.47)	10.00 (45.76)
Potato	Acre	0.50 (6.49)	0.50 (3.45)	-
Cauliflower	Acre	0.50 (6.49)	0.50 (3.45)	1.00 (4.57)
Brinjal	Acre	-	0.50 (3.45)	-
Tomato	Acre	-	-	1.00 (4.57)
Cillies	Acre	-	-	1.00 (4.57)
Total area under vegetables	Acre	1.00 (12.98)	1.50 (10.35)	3.00 (13.71)
Guava	Acre	2.00 (25.97)	2.50 (17.24)	3.85 (17.62)
Grapes	Acre	-	2.50 (17.24)	3.00 (13.73)
Total area under fruits	Acre	2.00 (25.97)	5.00 (34.48)	6.85 (31.35)
Barseem	Acre	1.35 (17.53)	2.00 (13.79)	1.00 (4.57)
Sorghum	Acre	0.50 (6.49)	1.00 (6.89)	1.00 (4.57)
Total area under fodder	Acre	1.85 (24.02)	3.00 (20.68)	2.00 (9.14)
Dairying animals	No.	1	3	5
Total cropped area	Acre	7.70	14.50	21.85
Total returns	Rupee	51674	103774	145133
Returns/acre	Rupee	10672.98	10923.58	10113.79
Cropping intensity	%	158.76	152.63	152.26

Figures in parentheses are the percentage of total cropped area.

Existing production pattern

The existing cropping pattern and the returns on all the three farm size categories in Ludhiana district are presented in Table 1. The table shows that paddy-wheat rotation accounts for 37 per cent of the total cropped area on category-1 whereas category-II had 14 per cent maize along with 14 per cent wheat and 7 per cent

Table 2: Optimum product-mix at existing resource levels on all the three farm categories in Ludhiana district of Punjab, 1999- 2000

Enterprises	Unit	Size categories					
		I		II		III	
		Area under enterprises	Total return (Rupees)	Area under enterprises	Total return (Rupees)	Area under enterprises	Total return (Rupees)
Wheat	Acre	0.97 (14.76)	10350.05 (19.04)	3.80 (28.76)	41533.40 (34.52)	2.5 (13.43)	27349.80 (14.93)
Sarson	Acre	0	0	0	0	10.85 (58.27)	94499.99 (51.60)
Paddy	Acre	0.72 (10.96)	4122 (7.58)	2.70 (20.44)	15565.30 (12.94)	2.00 (10.74)	11570.16 (6.32)
Potato	Acre	0.52 (7.91)	7506.24 (13.80)	2.26 (17.26)	29663.90 (24.65)	0	0
Brinjal	Acre	0	0	0.19	2800.58 (2.33)	0	0
Chillies	Acre	0	0	0	0	1.77 (9.50)	31037.09 (16.95)
Guava	Acre	3.36 (51.14)	17270.13 (31.76)	0	0	0	0
Grapes	Acre	0	0	4.24 (32.09)	30740 (25.55)	0	0
Berseem	Acre	0.50 (7.61)	3995.16 (7.35)	0	0	0.50 (2.68)	3946.37 (2.15)
Sorghum	Acre	0.50 (7.61)	3316.9 (6.10)	0	0	1.00 (5.37)	6704.75 (3.71)
Dairying	No.	2.00	15620 (14.36)	0	0	1.00	7930 (4.33)
Total cropped area	Acre	6.57	-	13.21	-	18.62	-
Total returns	Rupee		62180.48		120303.18		183128.16
% increase in return over the existing plan's returns	%		20.33		15.92		26.18

Figures in parentheses indicate percentage of gross cropped area and percentage of total returns.

paddy. The category-III had 14 per cent sarson along with 9 per cent wheat in rabi and about 11 per cent each of paddy and maize in kharif. The vegetable crops occupied 12.98 per cent, 10.35 per cent and 13.71 per cent of the gross cropped area in categories I, II and III respectively. The area under orchards was 25.97 per cent on category-I while it was 34.48 per cent and 31.35 per cent in categories II and III respectively. The area under fodder crops had an inverse relationship with the size of holding, with 24.02 per cent, 20.68 per cent and 9.14 per cent in categories I, II and III respectively. The size of dairying herd was five on category-III followed by three animals on category II and one on category-I.

The area under fodder crops had an inverse relationship with the size of holding.

Returns over variable costs were maximum on category-II followed by categories I and III. It was Rs 10923.58, Rs 10672.98 and Rs 10113.79 per acre on

categories II, I and III respectively. Intensity of cropping was relatively more on category-I indicating more intensive use of area by smaller farmers, than medium and large farmers. It was 158.76, 152.63 and 152.26 per cent on categories I, II and III respectively.

Optimum product-mix at existing level of resources

The optimum product mix at existing level of resources was developed for Ludhiana district and is given in Table 2. In category-I, guava accounted for 51.14 per cent of the gross cropped area contributing Rs 17270.13 to the gross returns. Among the other crops, wheat and paddy commanded 14.76 per cent and 10.96 per cent of the gross cropped area contributing Rs 10350.05 and Rs 4122 of the gross returns respectively, while in category- II, grapes among the fruit crops has appeared in the optimum plan commanding 32.09 per cent of the gross cropped area. The corresponding area under wheat and paddy accounted for 28.76 per cent and 20.44 per cent of the gross cropped area contributing to the extent of Rs 41533.40 and Rs 15565.5 to the gross returns. In case of large farmers, sarson turned out to be the major crop accounting for 58.27 per cent

of the total cropped area with Rs 94499.99 as gross returns whereas wheat and paddy accounted for 13.43 per cent and 10.74 per cent of the gross cropped area. Among the vegetable crops, potato for small farmers, potato and brinjal for medium farmers, has entered in the cropping pattern in the optimum plan commanding 7.91 per cent, 17.26 per cent and 1.44 per cent of the gross cropped area, respectively. While in large farmers, chillies has entered the optimum plan commanding 16.95 per cent of the gross cropped area. Among the fodder crops, both berseem and sorghum disappeared in the case of medium farmers whereas the area under sorghum remained almost the same as in the existing plan in case of small as well as large farmers. There is a little increase in milch animals in the optimum plan to the extent of two on small farms and sharply declined from five animals to one on large farms. The dairy enterprise almost disappeared in case of medium farmers. Per cent increase in returns in optimum plan over the existing plan was 20.33, 15.92 and 26.18 per cent on small, medium and large farmers categories, respectively.

Income and employment pattern in various plans

Improvement in income and employment through optimization of product-mix was calculated for all the

selected farm categories and are presented in Tables 4 to 6.

Table 3: Optimum product-mix at relaxed-resource constraints on all three farm categories in Ludhiana district of Punjab, 1999

Enterprises	Unit	Size categories		
		I	II	III
Wheat	Acre	3.85 (39.69)	5.50 (28.45)	14.35 (50.00)
Paddy	Acre	3.85 (39.69)	7.38 (38.83)	8.66 (30.17)
Potato	Acre	1.00 (10.31)	2.00 (10.5)	0
Cauliflower	Acre	0.50 (5.15)	1.17 (6.15)	1.69 (5.88)
Brinjal	Acre	0	2.00 (10.5)	0
Chillies	Acre	0	0	3.00 (10.45)
Sorghum	Acre	0.50 (5.15)	1.00 (5.26)	1.00 (3.48)
Dairy	No.	1.00	1.00	1.00
Total cropped area	Acre	9.70	19.00	28.70
Total returns	Rupee	87292.77	161825.10	244464.10
% increase in return over the existing plan	%	68.93	55.93	68.44

Figures in parentheses indicate percentage of total cropped area.

Table 4: Employment level in various plans at varying resource levels on category-I in Ludhiana district of Punjab, 1999-2000

Months	Availability (Man hrs)	Existing plan		Optimal plan at given resources		Optimal plan at relaxed resources	
		Resource used	% of resource used	Resource used	% of resource used	Resource used	% of resource used
January	430	608	141.39	608	141.39	699.93	162.77
February	430	234	54.41	234	54.41	234	54.41
March	430	223	51.86	223	51.86	223	51.86
April	430	343	79.76	430	100	732.73	170.40
May	430	246	57.20	430	100	443.33	103.1
June	430	237	55.1	237	55.11	237	55.11
July	430	357	83.02	357	83.02	357	83.02
August	430	339	78.83	430	100	444.57	103.38
September	430	397	92.32	397	92.32	397	92.32
October	430	591	137.44	591	137.44	591	137.44
November	430	383	89.06	430	100	462.68	107.6
December	430	506	117.67	506	117.67	590.33	137.28
Total	5160	4464	86.51	4873	94.43	5412.57	104.89
Total returns	Rupees	51674		62180.48		62180.48	
Returns/acre	Rupees	10685.27		12857.83		18050.61	
% increase in return over the existing plan	%			20.33		68.93	

Table 5: Employment level in various plans at varying resource levels in category-II in Ludhiana district of Punjab, 1999-2000

Months	Availability (Man hrs)	Existing plan		Optimal plan at given resources		Optimal plan at relaxed resources	
		Resource used	% of resource used	Resource used	% of resource used	Resource used	% of resource used
January	540	445	82.40	540	100	563.50	104.35
February	540	318	58.88	318	58.88	318	58.88
March	540	312	57.77	312	57.77	312	57.77
April	540	451	83.52	540	100	742	137.40
May	540	388	71.85	540	100	578.97	107.22
June	540	439	81.29	540	100	598.22	110.78
July	540	456	84.44	456	84.44	456	84.44
August	540	470	87.04	540	100	540.31	100.18
September	540	534	98.88	540	100	652.22	120.78
October	540	575	106.48	575	106.48	575	106.48
November	540	321	59.44	321	59.44	321	59.44
December	540	457	84.63	457	84.63	457	84.63
Total	6480	5166	79.72	5679	87.64	6114.22	94.35
Total returns	Rupees	103,774		120303.18		161825.10	
Returns/acre	Rupees	10925.42		12665.62		17037.09	
% in crease in return over the existing plan	%	-		15.92		55.93	

Table 4 shows that income levels would increase by 20.33 and 68.93 per cent by the adoption of optimal plan at given resources and optimal plan with relaxed resources, respectively, over the existing plan on small farms. The scenario of human labour employment on the small farms in the existing plan was that the farmers used to hire additional labour in the months of January, October and December to the extent of 41.39, 37.44 and 17.67 per cent of the available labour force. For all the other months there was 50 to 90 per cent surplus labour. In the optimal plan developed at given resources, the farmers would have to hire casual labour to the same extent as in the existing plan. Additionally, the available labour force was fully employed in April, May, August and November whereas in February, March, June, July and September, labour was still not fully utilized. For the adoption of optimal plan developed by relaxing resources, the farmers will have to hire casual labour by 62.77, 70.40, 3.10, 3.38, 37.44, 7.60 and 37.28 per cent of the available labour in January, April, May, August, October, November and December, respectively. Even with the relaxed resources, these optimal plans could not absorb the surplus labour during some months on the farms. Thus, efforts should be made to search for new enterprises which can fit in the cropping pattern to absorb the available labour on the farms or the government should create avenues in the non-farming sector to supplement the income of these small farmers during the lean seasons.

Table 5 reveals the comparative income and utilization of labour with optimum plans over existing plan in case of medium farmers. The income of the farmers increased by 15.92 and 55.93 per cent by the adoption of optimum plan at given resources and at relaxed resources, respectively. In the existing plan on medium farms, the labour utilization indicated that during all the months, labour was surplus except for October where an additional labour of 6.48 per cent of the available labour was hired. Labour use was varied from 60 to 100 per cent over the other months. Optimal plan with given resources created a demand for additional labour to the tune of 6.48 per cent of available labour in October whereas in January, April, May, June August and September, the available labour was fully utilized. For the optimal plan with relaxed resources, the farmers would have to hire an additional labour force in January, April, May, June, August, September and October to the extent of 4.35, 37.40, 7.22, 10.78, 0.18, 120.78 and 6.48 per cent of the available labour force.

The income of the farmers increased by 15.92 and 55.93 per cent by the adoption of optimum plan at given resources and at relaxed resources, respectively.

Table 6: Employment level in various plans at varying resource levels in category-III in Ludhiana district of Punjab, 1999-2000

Months	Availability (Man hrs)	Existing plan		Optimal plan at given resources		Optimal plan at relaxed resources	
		Requirement	% of resource used	Requirement	% of resource used	Requirement	% of resource used
January	572	508	88.81	508	88.81	508	88.81
February	572	329	57.52	329	57.52	329	57.52
March	572	325	56.82	325	56.82	325	56.82
April	572	482	84.26	572	100	2114	369.58
May	572	426	74.47	426	74.47	426	74.47
June	572	418	73.07	572	100	577.45	100.95
July	572	668	116.78	668	116.78	1238.71	216.55
August	572	521	91.08	521	91.05	521	91.08
September	572	588	102.79	588	102.79	588	102.79
October	572	585	102.27	585	102.27	585	102.27
November	572	379	66.26	572	100	631.4	110.38
December	572	529	92.48	572	100	789.25	137.98
Total	6864	5758	83.88	6238	90.88	8632.81	125.77
Total returns	Rupees	145133		183128.16		244464.10	
Returns/acre	Rupees	10124.80		12775.43		17054.36	
% increase in return over the existing plan	%	-		26.18		68.44	

The income and employment pattern for large farmers is shown in Table 6. A glance at this table shows the increase in income by 26.18 and 68.44 per cent by the adoption of optimal plan at given resources and optimal plan with relaxed resources, respectively, over the income in the existing plan. In case of employment of human labour in the existing plan, the farmers used to hire additional labour to the tune of 16.78, 12.79 and 2.27 per cent of available labour force in the months of July, September and October, while in the rest of the months, there was surplus labour available with the farmers.

The available labour was used to the tune of 88.81, 57.52, 56.82, 84.26, 74.47, 73.07, 91.08, 66.26 and 92.48 per cent of the available labour in the months of January, February, March, April, May, June, August, November and December, respectively. In the optimal plan with existing resources, the farmer will have to hire additional labour to the same extent as in the case of existing plan. In addition to this, the labour force was fully utilized in the months of April, June, November and December, while in the rest of the months, labour remained unused. In the optimal plan with relaxed resources availability, the farmers will have to hire additional labour to the tune of 269.58, 0.95, 116.55, 2.79, 2.27, 10.38 and 37.98 per

cent of the available labour force in the months of April, June, July, September, October, November and December, while in the rest of the months, surplus labour was available with the farmers.

Conclusions

The foregone analysis of income and labour use on the diversified farms of all the categories at the existing level of resources indicated that there is further scope for increasing the income and employment on these farms by optimizing the existing resources. But by removing the resource constraints, income of the farmers can be increased from 55 to 70 per cent, along with fully utilizing the available resources. The optimization of diversified farms clearly pointed out that in the existing economic environment wheat and paddy turned out to be dominant crops for all the categories of farmers with vegetable crops like potato, cauliflower and brinjal as minor crops. Fruits and dairy enterprises did not find favour under the optimum plans when resources constraints were relaxed. It is important that any diversification attempt to solve the problem created by wheat-paddy monoculture may not be successful unless existing techno-economic policy environment is changed in favour of suggested alternative enterprises for agriculture in Punjab.

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Look at a day when you are supremely satisfied at the end. It's not a day when you lounge around doing nothing; it's when you've had everything to do, and you've done it.

— Margaret Thatcher

Notes & News

Unlisted Companies and Corporate Governance

The general concern about corporate governance has always been centered around large companies and more specifically on listed companies. A large chunk of Indian business has been ignored primarily because they are not listed in any of the stock exchanges. These are those companies which are either family run companies or companies with joint ventures who feel that they do not require public money/capital for running their businesses.

It is not expected that good corporate governance is not required of unlisted companies because they are not accountable to the capital markets and thus the people. However all the rules, regulations, debates on corporate governance are concerning private and public sector listed companies. Practically, unlisted companies have been spared and kept away from observing the code of corporate governance. There are large, family-run, multinational, public sector unlisted companies which are very well known and have large other stake holders. The table below lists some of these companies:

Major Unlisted Companies

Companies	Total Income (Rs. Crores)	Profit after Tax (Rs. Crores)
Hyundai Motors	2,353	59
Jet airways	2,004	10
LG Electronics	1,766	47
Nirma Consumer Care	1,552	0
Bennet Coleman	1,216	206
BALCO	967	28
Cargill	961	(-) 15

Source: Compiled from Business World various issues

In a survey conducted by Business World—CMIE in 2001 it was observed that the unlisted companies:

- Report poor profit margins
- Pay lower salaries and wages
- Pay lower dividends

It is being argued that due to considerably higher levels of corporate governance, listed companies are better performers and hence have greater access to additional capital. There is a necessity to have good corporate governance in sizeable unlisted companies for the protection of the stakeholders, if not the shareholders. The debate continues whether listing of the firms with the stock exchanges is synonymous with greater transparency. This however is not always true. Given below are two examples of businesses, which are not drawing their capital from the public, i.e. the stock markets but are adhering to the principles of good corporate governance.

Dilmah New Zealand Pvt. Ltd a well-known tea company, with their production base in Sri Lanka, mentions on the tea packets "Dilmah is a family owned and managed company, a family that has successfully reflected its values in the cost, quality and integrity of the brand". This is but a reflection of the practice of good corporate governance by a closely held company.

The other example is that of the Chennai based over Rs. 4000 crores Murugappa group that was awarded the "Distinguished Family Business Award" by IMD, Switzerland. The award has acknowledged the success of the family promoted business organisation that has demonstrated continuity, value creation, social contribution and change management. In addition to achieving superior business performance, the company has taken the responsibility for development of neglected areas of Tamil Nadu. A portion of the profit is—contributed to run educational institutions, research centers and health care activities. The group has transformed the business from family run to a professionally managed one. A corporate

board has been formed with seven family members and three independent directors. The groups' commitment is towards excellent corporate governance through high quality of disclosure norms of international standards. The management has identified seven most important factors responsible for excellent corporate governance and these are:

- Willingness to take risks
- Anticipating change and showing willingness to adopt change
- Display of humanity
- Combining hard work & sacrifice
- Abundance of trust
- Dealing with affection
- Operating with pride

Thus in these cases we can say that the enterprise value is more sensible than shareholder value and the firm value of a family controlled company may be dependent on the nature and extent of family influence under various conditions.

Thus it can be said that corporate governance goes beyond laws. Good corporate governance is a state of the mind of the management in control of the company. It cascades a set of core values that need to be instilled at all levels of the organisation.

Source: Various issues of Business Standard

D. Jagannath Rao
Assistant Director (Economic Services)



Anyone can do any amount of work provided it isn't the work he is supposed to be doing at that moment.

– Robert Benchley

Book Reviews

Management Control and Reporting Systems, by Mohinder N. Kaura, Pub. Response Books, New Delhi: 2002, pp. 267; Price Rs. 250.

Measurement of performance is fundamental to the management of any organisation. Organisational decision making is inter-linked with measurement of performance. The quality of decision making in allocation, deployment and utilization of resources often rests on the quality of the measurements made. It is considered that measurement is the process of obtaining symbols to represent the properties of objects, events or states. Performance evaluation should lead to courses of action to resolve problems and to a focus on issues which concern growth, improvement and planning. Measurement also becomes an important tool for score board keeping, that is to know how well the company is performing. In simpler terms the measurement process must concern itself with such dimensions as the purpose of the measurement process, the context of its need and as to who would use the measurement.

Financial returns are not the only performance objectives of an organisation. Similarly, investors are not the alone stakeholders who look forward to satisfaction in performance. Management controls and reporting systems have to consider the emerging new facets of performance objectives and satisfaction expectations of other stakeholders.

Mohinder N. Kaura's excellent book 'Management Control and Reporting Systems', deals with the measurement, review and performance of an organisation as well as its business units. The author explains that a control system is a monitoring and review instrument that measures the performance of an organisation and its business units, divisions, departments, operations and tasks. Management control systems have been considered to involve, broadly, actions as defining the scope and objectives of control efforts; ascertaining key factors which have impact on performance: measurement of deviations from planned course and their significance, evolving, testing and evaluation of alternate

control actions; determining most appropriate tools, techniques and systems, implementing the same, compiling a performance monitoring and review report and deciding on corrective actions.

The book has been organised into five parts. The first part comprising of five chapters (Introduction to Chapter-4) deals with issues concerning the structure of management control systems. In Chapter-1, the author points out that control systems have to be exclusively designed to suit the organisational requirements. A number of factors influence the design of control and reporting systems and these include size, spread, organisational philosophy, nature of operations and divisibility, responsibility centres and perceptions of people. The effective implementation of these systems requires requisites and these include creation of responsibility centres, spelling out multiple goals, identification of inputs and outputs, an environment of participation, a feedback mechanism and top management commitment. In Chapter 2 the author recommends that organisational segmentation by responsibility and decentralisation is necessary for proper direction and control. A number of types of responsibility centres have been proposed. These are related to expense, revenue, profit, investment, financial performance, besides an Strategic Business Unit and Business Group. Selection of appropriate measures of performance is necessary. These should be easy to assess and enable evaluation of performance on both a short term and long term basis. Both financial and non-financial measures are to be taken into consideration. These aspects are discussed in Chapter 3. The author has proposed three sub-systems of Management Control Systems. Strategic Control is concerned with the holistic performance (e.g. market share, sales growth, return on capital employed, economic value added) and comparing the same with strategic plans. The second sub-system of Business Unit divisional control deals with measurement and review of performance of business units and its subdivisions. The third sub-system, Operational Control, is a process of control that ensures tasks and operations are executed efficiently and effectively. A rational trans-

fer pricing system is helpful for a review of the performance of business units. It helps in identification of the units' contribution to total profits and facilitates improvement through cost consciousness and management controls. A sound transfer pricing system should be simple, easy to understand and the transfer pricing prices should be perceived as fair by both the transferer division as well as the transferee division. It is indeed a difficult proposition. The author has an extensive exposure in this field and brings in his experience of eight companies that use this system. A number of bases of transfer pricing systems have been listed such as cost price, market price, landed price, shadow price etc. Transfer pricing systems form the core discussion in Chapter 4.

Part One of the book lays the foundations for the succeeding parts and provides a strong theoretical background to provide shape to the control systems. It is an extremely useful part for a practicing manager who is either interested in establishing a control and reporting system or wants to verify the soundness or foundations of the existing systems in the organisation. The narrative is simple, logical in explanation and convincing even for the uninitiated. Part Two (Chapters 5-9) focuses on the process of control systems and highlights different steps for effective and robust methods for formulation of controls. The author has emphasized the role of strategic planning explaining its difference from perspective planning and operational planning. Chapter-5 provides a useful outline of various process steps to formulated strategic planning. Chapter 6 is devoted to performance measurement of operating business units. Prof. Kaura has detailed the concept of a profit centre, its requisites and ground rules of its success. Performance of an Investment Centre has been brought out in depth. The author recommends use of ROCE as the right blend of all major ingredients of an operating management's responsibility. Use of EVA and its rationale against MVA has been explained. Inclusion of three case studies has made this Chapter interesting and easy to comprehend.

Chapter 7 is devoted to performance measurement of service departments and co-ordinating units. The author refers to the operational activities as prevalent in departments of research and development, human resources, marketing support services, production support services, finance and control department etc. The conventional approaches are not adequate as it is difficult to determine the amount of expenditure for achieving a given level of activity. Zero base review approach has been recommended for budget formulation. The author has demonstrated the use of this approach in the case of building maintenance. Chapter 8 explores controls and reporting systems for construction projects

and working capital for multi-plant, multi-product and multi-sales outlet organisations. These types of organisations have various stages of implementation and therefore require modified approaches. The last of the chapters in this part deals with budgeting processes, budget formulation and performance monitoring.

Part Three (Chapters 10, 11) of the book deals with reporting systems. An effective management reporting system should help in identification of what is wrong, in diagnosing causes of losses and in determining accountability for wrongs. The author points out that a good reporting system should be linked with corporate objectives, should have strong orientation towards operations and provide information according to areas of responsibility. Chapter 10 provides useful formats for management reports in several areas of applications.

Benchmarking has been recognised as a highly useful tool in management control systems. It helps to know the performance in relation to other firms so that steps are initiated for improvement. Chapter 11 provides interesting reading on this subject and outlines a methodology for linkage with control systems.

Part Four (Chapters 12, 13, 14) is devoted to control and reporting systems in special types of organisations. The author has taken up banks in Chapter 12. Banks have peculiar characteristics and require focused control on non-performing assets. Besides, these have to deal with specialised functions such as resource mobilisation and credit dispensation. In the context of these requirements, the author has proposed systems to comprise of long range plan and strategic control, performance budgeting and operational controls. Chapter 13 is on a monitoring system for Research and Development planning, funding and monitoring of programmes/projects with relation to budgets and plans. Chapter 14 deals with control systems for Export oriented organisations. Data on foreign markets, customers and competitors is neither fully reliable nor fully adequate as compared to domestic markets. EOUs are therefore more exposed to risk and uncertainties of business as contrasted to their domestic counterparts. These aspects have to be therefore incorporated in management controls.

Part Five (Chapter 15) explores the application of Balanced Scoreboard System at operating levels. The author has explained how BSS can be used in a typical bank. The concluding Chapter 16 deals with the process for conducting an audit of the control and reporting system. The author recommends that the audit should be carried out of functional reporting systems, corporate objectives and strategies and corporate resources.

The measurement on business processes is not entirely new. Companies have always attempted to evaluate performance. However, there is a paradigm shift in key performance indicators. The performance measurement systems have out-grown financial reporting. The quality of the product or service, customer service, improvements achieved in the business processes, quality of corporate governance, values and ethics, customer satisfaction, employee satisfaction and several other indicators are not merely drivers but constitute measures of performance in the changed business scenario. The author has not covered these aspects adequately: only a nominal reference has been made to the non-financial measures in Chapter 3. The financial measures otherwise dominate throughout the publication.

Service chapter has begun to dominate economy. The characteristics of the service sector differ from manufacturing sector. Besides, the service sector is hugely diverse that it is indeed difficult to develop a common framework of control systems and performance evaluation for all the sub-sectors of the service sector. The usefulness of the book would have increased manifold if the author would have examined these issues in depth and proposed suitable structural changes in approaches to evaluate performance in at least the prominent sections of the service sector. Discussion on performance as in Chapter 12 is highly limited and not an in-depth analysis.

Inclusion of more life case studies in the book as illustrations of application of approaches would have been welcome additions and made the subject easier to understand.

Written in a lucid style, the publication provides a strong conceptual foundation to understand the rationale of management controls. Theoretical perspectives form the core of the book.

The book promises to make for an interesting and thought provoking reading. The focus on importance of measurement of performance is retained throughout. It should prove to be a reference book to research scholars and those interested in in-depth study of the science of management. It should also be helpful to practicing managers in facilitating knowledge sharing on the subject and taking up its implementation in organisations. Books of calibre on this subject are indeed scarce. The publication, resultant of a long rich experience of academics and exposure to industry, as possessed by Prof. Kaura, should prove to be a good addition to the existing literature on the subject.

G.D. Sardana
Director, Ujala Pumps
New Delhi

Unleashing India on World Markets by Raghu Nandan, Response Books (Sage Publications), Paperback edition, pp 413, Price: Rs. 350.

'Unleashing India on World Markets' is an exceptional book, which is an eye opener to every Indian businessman, bureaucrat, manager as well as a commoner. The author has sincerely tried to bare the realities of Indian business/economy vis-à-vis its exports; quite often with justifiable emotional outbursts. — It's a wake up call.

The author tries to use this book to pass on the vast experience he has gained in understanding twenty four foreign cultures to his countrymen, so that someone may pick up cue from the same and place Indian business/products appropriately in the World Market.

This book tries to address the problem of our declining exports through the managerial approach.

The Book is divided into two parts. (Part One is more of introspection into the Indian business culture/attitude; while Part Two is more of a guidebook on exports) The Part One is divided into three chapters while Part Two into four chapters. The Part One is more of an introspection of Indian managerial attitudes—looking into what makes our potential clients/customers run away from us. Further, it analyses the actual contribution of exports earnings to our economy. This part also reveals some glaring realities/anomalies in Indian economic policies like Protectionism that has terribly lowered the competitiveness of our industry; while the competitiveness of Japanese and Korean industry improved in spite of the same.

The last chapter of this part analyses the various bottlenecks that were and continues to be the stumbling blocks for Indian exports; which includes the typical attitude of the Indian Diaspora vis-à-vis the Chinese Diaspora. The author reminds the fact that we Indians are not good at working with each other. Hence, tend not to build strong commercial, professional, political or cultural institutions; rather split them as each of us wants to be the boss.

The examples, cases highlighted, statistics, ..etc are very apt and quite a few of them do rack many a preconceived notions. The general tone in Part one is that of woe, with the author prodding and beckoning the Indian businessman/manager quite often to get out of the wreck and meet the World Market Challenges or perish. Infact, the author also tries to call the bluff regarding our forex status and the euphoria over our software strengths. The presentation is simply wonderful and makes reading interesting.

The Second Part is more of the author's advice as to what, where and how a potential Indian exporter may go about—particularly focused on Japan, Korea, Thailand and Malaysia. The author has gone very much into the nitty gritty (may seem superfluous); which are often taken for granted—like the basic understanding of the buyer, their cultures, etc—but may turn out to be the finer points that could aid the businessman/manager in delighting one's overseas clients. This portion covers a lot of practical inputs to the Indian exporter on his business tour to the above countries.

The final chapter is more on the practical hints on selling to the aspects to be considered while selling to the Japanese and East Asians, with specific reference to the finer points to be kept in mind while dealing with clients of different nationalities/cultural groups.

The cover page design is a wooden crate (with its shoddy finish); perhaps an indicator of the care we give for packaging our products. The only negative point, I wish to highlight is that few of the paragraphs are being repeated verbatim in different chapters. The price quoted

for the same is Rs. 350/- while I feel that the same may be priced anywhere between Rs. 390/- to Rs. 425/-.

This book is ideally recommended to be read by every Indian businessman, Corporate managers, Management student and officials/executives promoting Indian exports. This book would also be an interesting reading for any Indian who has been blaming everything on Government, politician, corruption and if not the British; to understand that there is an urgent need to change our attitude; to unleash India on world Markets.

The underlying message to the reader is as follows:

"It is only if the people of a nation have a tendency to work together and build strong business, political and social institutions that the nation progresses. It is merely a question of attitude."

John Thomas
Deputy Director
National Productivity Council of India



You only live once. But if you work it right, once is enough.
— Fred Allen

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The book has been prepared to include all the relevant aspects of production management, giving particular attention to new trends in management techniques which can help to improve the performance and controlling of costs. Areas of project planning, quality control and management, workstudy, value engineering, operations and human resource development have been given elaborate coverage. New concepts like business process re-engineering, terotechnology, ergonomics and zero defect analysis have been briefly introduced.

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ISBN: 81-239-0807-5

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Khandare, SS

The book contains basic concepts of management information system and electronic data processing. The current information technology used in management information system is also discussed. The concept of database management and information technology used for MIS operation has been presented. The book provides the system analysis approach for solving problems in MIS. The use of various graphic and analytical tools have been discussed. The book also covers the packages used for RDBMS system and SQL in foxpro. The book throws light on artificial intelligence and expert system. The new emerging area of e-commerce is also covered in the book.

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Bansil, PC

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HB, Rs. 995.00

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Basra, Amarjit S (Ed)

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Khan, Iqbal H & Ahsan, Naved

It is a comprehensive text providing detailed information about management strategies to be adopted as per the national and international guidelines. Field problems and design features have been discussed in this as per regulatory requirements. It includes numerous worked out numerical examples. The subject-matter has been

organized logically to make it easy and interesting for students as well as field engineers. It also includes several case studies and discusses the use of IT pools for environmental monitoring.

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Naidu, BSK

The book contains 21 articles submitted at two National Conferences in the millennium year, viz "Hydro Power India 2000" and "Life Assessment". These articles have been grouped into four sections". Hydro-Power Policy and Vision, Environmental Issues, Renovation & Modernization, and Small Hydro. The Hydro Policy of the Government of India, announced in 1998, forms part of the book. All those issues have been discussed to sustain hydro development and environmental protection.

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HB, Rs. 1,000.00

Seed Storage of Horticultural Crops

Doijode, SD

This comprehensive valuable book contains methods and strategies to help farmers and breeders store seeds and maintain seen quality to produce the best possible plants. This informative volume examines topics such as germination, plant anatomy, and types of seeds, making it ideal for students and educators.

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Mathur, Ramesh, et al

The volume includes 19 papers on agriculture microbiology, radioactive waste, forestry, mining, pest management, toxicity, wild life and rural upgradation.

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ISBN: 81-239-0786-9

HB, Rs. 1295.00

Handbook of Industrial Pollution and Control, 2 Vols.

Bhatia, S C

In four sections, these volumes provide a fairly comprehensive coverage of the multi-disciplinary nature of pollution and environmental aspects. Section I is devoted to basic concepts of pollution. Section II deals with chemical process and allied industries, which, like other industries, releases pollutants to the environments. Section III focuses on pollution prevention aspects of food processing and allied industries such as dairy, meat, poultry and seafood and edible oil industry. Various methods of recovery and reuse of milk by-products and prevention of dairy wastes are also discussed. Section IV explains the role of textile, man-made fibre, jute processing industry and measures to discharge these effluents.

2002, LXI+1184 pp
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HB, Rs. 1995 Rs. 1995

Mineral Nutrition of Crops: Fundamental Mechanisms and Implications

Rengel, Zdenko (Ed)

It is the first book to grasp the complexity of the soil water plant microbe interactions governing nutrient uptake and utilization by crops. It establishes a base at the single plant level, takes into account cells as well as plasma membranes of these cells, and then builds from there to include issues related to plant-pathology, soil microbiology, soil chemistry, hydrology, breeding and modeling.

2002, (Reprint), XIV+400 pp
ISBN: 81-239-0816-4

HB, Rs. 995.00

Plant Viruses as Molecular Pathogens

Khan, Jawaid A & Dykstra, Jeanne (Eds)

37 specialists in various fields and from various countries make this a unique single volume. The book provides very interesting concepts regarding the use of molecular techniques to gain new insight into long-standing pathological issues, such as virus evolution, host adaptation, and epidemiology. It contains a good deal of information on plant viruses of importance in the tropics such as potyviruses, begomoviruses and some emerging plant viruses transmitted by fungal vectors. In all, it is a valuable collection of themes on the new art and science of plant virology.

2002, XVIII+537 pp
ISBN: 81-239-0820-2

HB, Rs. 1495.00

Modern Trends in Environmental Biology

Tripathi, G

The book embodies all kinds of recent information in different aspects of pollution problems. The impact of environmental pollution on human health has been described. Ecohydrological features of the Holy Ganga river microbial contamination of water resources, conservation of coastal and island areas and effect of acid rain have been nicely elucidated. Environmental problems related to coal mines, and zone, pesticides, fossils, past biodiversity crisis have been vividly discussed. Effects of various toxicants on biological systems, metal poisoning, atmospheric reactions, chemical toxicity and health hazards, use of antidotes, biochemical monitoring and toxicity assessment have been thoroughly presented. Environmental sustainability, wetland management and role of vermitech in pollution abatement have also been given.

2002, X+411 pp
ISBN: 81-239-0798-2

HB, Rs. 1495.00

Bioresource Technology

Tripathy G. (Ed.)

Bioresource genes are the product of 3000 million years of evolution. But it is only recently that their importance as the basis of livelihood and ecological safety have been realized by scientists.

Due to an unchecked population growth and rapid industrialization the bioresources are continuously under threat of fast depletion. There is an urgent need, hence, to create a general awareness of this aspect and introduce, when there is still time, future planning for the management of these life-supporting natural bioresources.

There has been a general dearth of literature in this specialised area. The Editor, seized of the problem and realising his limitation to handle such a vast range of application of these resources independently, has attempted this multi-authored work.

2002, X+378 pp
ISBN: 81-239-0849-0

HB, Rs. 1195.00

Chemistry of Pesticides

Roy N.K.

In spite of constraints of natural resources such as land and water, the future demand of food, feed and fibre in the next two decades can be met only by ensuring higher productivity for which crop protection more than crop improvement holds the key.

During the last decade or so, many universities have introduced new techniques in crop protection like application of recombinant DNA technology, plant breeding for durable resistance to pests and disease and harnessing of biocontrol agents to ensure effective and ecofriendly crop protection. In spite of all these efforts, chemical pesticides continue to be the kingpin of crop protection. This situation is unlikely to change for at least another two decades.

Pesticide chemistry is being taught in agricultural universities and several traditional universities both at UG and PG levels. But unfortunately in India no books suitable to syllabi are available. The present book attempts to give a holistic account of pesticide chemistry.

2002, XII+336 pp
ISBN: 81-239-0854-7

HB, Rs. 1195.00

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