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How can IT enable economic growth in developing countries?

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Abstract

In this paper we review theories on the economic significance of IT, telecommunications, and information processing, and discuss the nature of economic effects that should be expected from the diffusion of IT and telecommunications and the increased emphasis on information activities. Economic and social theory converge to the suggestion that IT innovation and intensification of information activities do not lead deterministically to economic growth. Rather, organisations are faced with pressure to work out changes to the ways they do business or deliver their services, and policy makers must plan for a macro-economic environment that facilitates economic and social changes to the benefit of the country. A crucial question which emerges in this context is whether, under the current trends of globalisation, technical and organisational innovation implies homogenisation or diversity. We examine whether organisations acquiring IT and governments working out technology policy in developing countries should seek also to transfer 'best practice' for doing business and driving the economy. Finally, we put forward a critique of the homogenisation approach, and question the feasibility and desirability of efforts to accompany the development of technology infrastructure with the transfer of 'best practice' from industrialised countries.

Introduction

Intuitively most people believe that IT and telecommunications lead to economic growth. Undeniably information and telecommunication technologies have enormous potential to increase productivity of almost all economic sectors, to overcome problems of dysfunctional administration, to expand and improve the service. The impressive examples of newly industrialised countries - most notable of which is Singapore - which placed IT at the core of their economic development policies, are often quoted to confirm this widely held view. Yet, with all the plethora of IT products and telecommunications services already available in the market and in much more powerful and versatile forms than earlier generations of technology, in most developing countries it is difficult to find much evidence of IT induced economic growth.

It is well known that resources of computers, telecommunications, and relevant technical skills are very limited in large regions of the world, notably Africa, central Asia, and some regions of Latin America^{1,2}. Thus, at present, most developing countries are severely disadvantaged within a global economy which is increasingly more technology and information intensive. Unequal distribution of resources, such as telecommunications and technical skills, causes concern about the possibility of developing countries to participate in the emerging world economy³. There are fears that globalisation trends result in further marginalisation of poor countries or regions within the world economy, and lead to disruption of their social fabric⁴. Nevertheless, to the extent that efforts to secure investment on new technologies are made - and it has to be recognised that despite financial difficulties in most countries the pace of technology diffusion is significant - do they lead to economic development? what economic changes should be expected from the diffusion of information and communication technologies? what approach can achieve benefits of economic development?

The literature on IT in developing countries (see for example the proceedings of the IFIP WG 9.4 conferences ^{5, 6}) has not been particularly concerned with these questions and it is largely uninformed by theory⁷. Most of the reported empirical studies and recommendations are based on implicit assumptions about the economic value of IT developments. In the race to master technical skills and apply fast changing technologies little space has been allowed for the development of understanding of the changes enabled by the powerful new technologies. Discussion often exposes fundamental conflict between wildly optimistic views about the opportunities provided by new technologies (such as networking) for the cause of development, and deeply pessimistic perceptions about the possibilities developing

countries have to exploit these technologies to their benefit.

This paper examines the question of IT and economic development by reviewing theories on the economic significance of IT, telecommunications, and information processing. Our review of theory elaborates on the nature of economic effects that should be expected from the diffusion of IT and telecommunications and the increased emphasis on information activities. We find that economic and social theory converge to the suggestion that IT innovation and intensification of information activities do not lead deterministically to economic growth. Rather, they spur for change within organisations and economies. Organisations are faced with pressure to work out changes to the ways they do business or deliver their services, and policy makers must plan for a macro-economic environment that facilitates economic and social changes to the benefit of the country.

A crucial question which emerges in this context is whether, under the current trends of globalisation, technical and organisational innovation implies homogenisation or diversity. We examine whether organisations acquiring IT and governments working out technology policy in developing countries should seek also to transfer 'best practice' for doing business and driving the economy. In conclusion, we put forward a critique of the homogenisation approach, and question the feasibility and desirability of efforts to accompany the development of technology infrastructure with the transfer of 'best practice' from industrialised countries.

It must be pointed out that our study of the relationship between IT and economic growth does not address the fundamental development problem of providing for the basic needs of the rural of the marginalised urban poor. There is considerable skepticism, well justified from the declining economies and the social problems in many developing countries during the 1970's and 1980's, whether a development approach that is conceived primarily in terms of economic growth leads to trickle down effects that resolve gross social inequalities and poverty⁸. Nevertheless, the discussion of alternative development ideologies, although of prime importance, is beyond the scope of this paper. It suffices to note that the modernisation approach to development, which calls for the elimination of trade barriers, and welcomes investment and technological transfer from industrialised countries⁹, is at present pursued by most countries' governments and the most influential international development agencies.

Theories on the economic significance of technical innovation

Most contemporary theories on economic change acknowledge the significance of information and communication technologies (see, for example ^{10, 11}). Among efforts to understand technical innovation, economic development, and social and institutional change,

best known is the Noe-Schumpeterian theory, which builds on Kondratiev's perception of long waves of economic 'boom' and 'bust', and Schumpeter's work in the 1930s on the role of innovative entrepreneurs in creating new technical paradigms for future growth¹². This theory relates the pervasiveness of certain types of technologies with periods in economic development. Technologies are characterised as 'pervasive' if their applications affect almost all sectors of the economy. More specifically, a technology has pervasive economic effects and employment implications if it: generates a wide range of new products and services; reduces the costs and improves the performance of the processes, services and products of many sectors of the economy; gains widespread social acceptance; and generates strong industrial interest as means for profitability and competitive advantage.

On the basis of such analysis, IT is singled out as being the most pervasive technical innovation of the post World War II era¹³. It is considered to be at the centre of the present fifth wave of technological change in most industrialized countries. It has a wide range of applications that affect the conditions of production and distribution in almost all sectors of the economy. Moreover, it is the basis of the new industries of computers, software and telecommunications that produce a great range of new products and services^{14, 15, 16}.

Nevertheless, economists do not suggest direct cause and effect relations between IT innovation and economic growth. As with all major technologies associated with waves of economic change, it is understood that information and communication technologies bring about 'creative distraction' rather than directly resulting in economic benefits. While the potential of new information technology to lead to economic growth is widely acknowledged, it is understood that the economic effects of IT investment depend on the development of appropriate organisational and social structures capable of exploiting the technological potential^{16, 17}.

The productivity paradox

Macro-economic empirical studies have questioned the benefits of IT innovation and diffusion. The USA economy in the 1980's did not show gains of productivity, which is the most straightforward economic benefit expected from investment in information technology^{18, 19}.

Economists found that at a period of rapid increase in the use of IT, there was a slowing down of overall productivity growth. The problem has been particularly acute in the services sector, which had the highest investment in IT - representing about 85% of total US computer hardware investments - but its productivity remained stagnant. Specifically, the service industry made \$750 billion investment on information technology in the 1980's and had an average productivity growth of 0.7%, which is a rate significantly lower than that of

the 1970's, and much below that of the manufacturing sector, which did not invest that much in IT²⁰.

Even after accounting for other factors that affected the economy that period, such as increased oil prices, the negative correlation between productivity and diffusion of computers was surprising. Information systems researchers found the economists' claims that IT investment is not accompanied by productivity increases threatening to shaken executives' interest in applying IT, and set out to explain and disprove this 'productivity paradox'^{21, 22, 23}. It was suggested that the measures used to account for the economic effects of IT are inadequate, that there may be lags between investment in IT and the occurrence of productivity results, that IT contributes to the redistribution of wealth rather than the creation of new wealth, or that there is mismanagement and mis-use of IT.

More recent studies indicate positive productivity findings^{22, 23}. This may suggest that earlier data were inadequate, or that there is indeed a lag between introduction of new technology information systems and the achievement of productivity. But the causality between IT diffusion and economic growth is still inconclusive. Kraemer and Dedrick²⁴ used data from 1983 until 1990 for eleven Asia Pacific countries at different development levels and showed a significant positive correlation between investment in IT and growth in both GDP and productivity. Although the authors interpret their findings as evidence for IT-led growth they recognise that the existence of correlation does not suggest causality. In fact, their study also found that IT investment is positively related to a country's wealth, infrastructure and wage rates, which suggests a dynamic rather than an one way relationship between IT investment and economic growth.

While the cause and effect relationship between IT investment and productivity is inconclusive, efforts to explain the IT productivity paradox highlight other significant results. They find that the diffusion of IT is related with changes such as quality and variety of products and organisational re-structuring, rather than direct increase of output. With this recognition the productivity paradox loses its initial significance. Organisations may not produce more after investing in IT, but they may maintain or increase their competitiveness by improving the quality of their products or services, or by adopting more effective organisational forms²⁵. In other words, the explanation of the productivity paradox suggests qualitative socio-economic changes rather than direct efficiency improvement which are measurable as economic growth.

The Neo-Schumpeterian economic theory mentioned above, which suggests that IT investment represents a new paradigm in production and technology, corroborates this view. When such paradigm changes occur, previous explicit and tacit knowledge of production and doing business becomes obsolete. Organisations become efficient again only after a rather

long period of learning. Until then, new equipment and methods are not efficiently used, and the dynamism of innovation can coexist with a sluggish productivity growth²⁶.

At the level of the business firm it is well understood that most significant benefits from IT are achieved if the technology is utilised to support fundamental organisational changes²⁷. Since the late 1970's the socio-technical approach to information systems has maintained the argument that technology can bring benefits only if the systems' development process includes efforts to work out appropriate organisational changes^{28, 29}. In the eighties, organisational change was linked to the exploitation of IT by promoting such business practices as total quality management, and planning in order to align IT investment to business competitive strategies. More recently, ideas on radical organisational change through business process redesign have been widely influential^{30, 31}. While these writings differ in terms of emphasis and in terms of the approach of organisational change they suggest, they all converge on the same message: that development of IT systems does not deliver substantial benefits unless it is part of efforts to introduce wider changes in the organisations. Such changes may include the redesign of business processes, re-organisation of work procedures, restructuring of management, or changing the range of products and services offered by the business firm.

Measuring the increasing significance of information in the economy

Economists and social scientists have also paid attention to the increasing significance of information resources in contemporary economies. In business, policy making and public life in general, *information* has now acquired a role more prominent than ever before. Machlup's pioneering work³² identified the production of knowledge as a distinct economic activity and observed an increase in the ratio of knowledge-producing labour to physical labour in the United States. Since then, increasing trends in the proportion of information occupations in the economically active population have been observed in all other industrialised countries as well as in developing countries, and several efforts have been made to define and measure the 'information economy' of various countries^{33, 34, 35, 36}.

The production of information and relevant technologies is recognised as an industrial activity on its own right, spread across a very wide range of business firms. Two information sectors are identified in today's economies, depending on whether the information output that is produced by their industrial activities is sold in the market or is used internally in the process of producing what ever other products or services the business firm sells in the market³⁴:

- the primary information sector, which is defined as comprising the organisations which produce goods or services intrinsically conveying information or being directly relevant in

its production, processing and distribution, and transacted on established markets, and

- the secondary information sector, which is defined as comprising organisations which produce and consume information which is not transacted on established markets.

These definitions have been proposed for measuring the size of the information economy of a country and for assessing its significance. They have been applied in few cases only, because most countries do not keep the statistics required for such quantification. Nevertheless, without the accuracy and rigour of the economic analysis that measuring information sectors would allow, there is a great deal of evidence that the information sectors are growing in most countries.

But a trend of growth of the information sector in the statistics of a country is not an indicator of prosperity. Increasing numbers of information occupations may be due to bureaucratic inefficiencies rather than change of the structure of economic activities. This is often the case in developing countries where similar trends are observed³⁷. More detailed examination of the employment statistics of different countries reveal differences of patterns of types of occupations, in terms of routine clerical and skilled information jobs. An exercise by Engelbrecht³⁶ to measure the Japanese information sectors and compare findings with earlier measures of the USA economy concluded that of crucial importance are differences of effectiveness in information handling within organisations. If such differences - which are not captured in the 'information economy' measures - are ignored, investment in an inefficient secondary sector (for example dysfunctional private or public bureaucracies) may retard rather than enable economic growth.

Thus, critics of the information economy measures point out the limitations of quantifying the production, processing, and transmission of large amount of data. They emphasise the significance of understanding the substance of the data handled, the reasons for its demand, and the changes brought about by the content of the information that is communicated. Rather than introducing information workers and information products and services into economic analysis in a black box fashion that does not consider the type of work performed, we need to understand what are the significant changes in the way information impacts on economic activities. Such a different approach often refers to 'knowledge' rather than 'information'^{38, 39} and is related with a broader effort to understand changes that are happening in contemporary societies.

Theories on IT and socio-economic change

Indeed, the economists' efforts to conceptualise the economic impact of IT and to estimate the significance of information activities have been accompanied by efforts to explain such changes as a feature of contemporary societies. The most influential view is that the trend of

growing information activities that is observed in the industrialised economies in the post-war period signifies the arrival of the post-industrial economic stage. This idea of transformation of the economy from an industrial to a service-based post-industrial economy has been described lucidly by Daniel Bell⁴⁰. His model suggests a linear succession of pre-industrial, industrial and post-industrial phases.

In post-industrial economies human and information services, such as research and development, health, education, recreation, hold a prevalent position. Bell considers theoretical knowledge as the main driver of innovation and change which gives rise to new social relationships and new structures. It is the 'axial structure' of post-industrial societies. Knowledge and information are the most important resources for the transformation of the economy, and professional and technical groups are considered to be catalysts of change. Moreover, Bell argued that the post-industrial economy is a new economic system which does not preserve the socio-economic structures of industrial economies.

Many writers in the seventies and the eighties have disputed the logic of the post-industrial economy thesis as presented by Bell^{41, 42, 43}. The debate did not deny the idea that fundamental socio-economic changes are enabled by contemporary emphasis on knowledge and relevant technologies, but more elaborate explanations of the emerging new socio-economic conditions have been proposed. Rather than transcending the fundamental socio-economic structures of the industrial era, many analysts view the occurring structural changes as efforts intended to overcome the current crisis of the capitalist mode of production^{44, 45, 46, 47, 38}.

Thus, Castells in his study of the geography of contemporary socio-economic change⁴⁸, argues that in order to understand and explain current socio-economic trends we need to consider a complex set of changes happening simultaneously, namely capitalism as a social system, 'informationalism' as a mode of development, and the adoption of information technology as a powerful working instrument. He calls informationalism, or 'informational mode' of development, the state of the current advanced economies where information processing is the core, fundamental activity conditioning the effectiveness and productivity of the processes of production, distribution, consumption and management. Castells argues that the emergence of the informational mode has coincided with fundamental changes of the capitalist system since the 1970's in its efforts to overcome its structural crisis. Informationalism and capitalism have converged in a process of techno-economic restructuring of the society. His empirical research in the USA suggests a trend towards a growing dominance of the large corporations which, through network technology, run by decentralised management and by sub-contracting large parts of operations to small and medium-sized businesses.

Various other conceptions of the structural changes happening in the economies of advanced industrial countries have been suggested. In contrast to Castells' view about the dominant role of the large corporation, other authors emphasise the increasing potential of the small and flexible firms, particularly if they are provided with facilitating infrastructure of services¹⁰. Harvey⁴⁹ draws attention to the emergence of a new regime of small-batch production and sub-contracting that provide for quickly changing tastes and needs. He calls this phenomenon 'flexible accumulation', and argues that this follows the large-scale, Fordist production arrangements since the 1980's. He argues that with the compression of time and space that has been made possible with new information technology, new industrial patterns arise on the basis of some pre-existing mix of skills and resources. Similarly, Lash and Urry⁵⁰ suggest the term 'disorganised capitalism' to express the increasing fragmentation and flexibility of production they observe on an international scale.

The emerging global economy

The literature on economic globalisation provides further insights regarding the role of information and communication technologies in the observed economic changes. In general terms, globalisation has been defined as 'processes, operating on a global scale, which cut across national boundaries, integrating and connecting communities in new space-time combinations, making the world in reality and in experience more interconnected'⁵¹.

Among the various more specific meanings of the term globalisation the following are probably the most frequent⁵²:

- the trend towards increasingly more free trade, and the flow of finance, labour, and commodities among countries^{48, 50};
- the increasingly more significant role attributed to multinational corporations⁵³;
- the increasing partnership among companies around the world, irrespective of distance, which is enabled by new information, telecommunication, and transportation technologies¹;
- the cultural flows of signs, meanings and identities which result from global communications and international migration^{54, 55, 56}.

¹ Many cases of corporate webs can be found in the literature. For example, at the end of the 1980's the production of the car Golf by Volkswagen in Germany used parts from twenty one different countries in four different continents³⁸. Similarly, the production of televisions by the Japanese firm Hitachi for the USA market involves a manufacturing process shipping the television sets under production from Singapore, to Malaysia, to Taiwan, to Japan, to Mexico, and finally distribution to the USA⁷⁰.

The significance of information and communication technologies is a recurrent theme in the global economy literature. First, these technologies have an enabling role for the globalisation trends; they constitute the means for the compression and transgression of time and space barriers⁴⁹. Second, information and communication technologies are major determinants of competitiveness in global industries. This latter aspect is related to the increasing importance attributed to using information and ‘knowledge’ as a factor of production and competitiveness. In knowledge-based industries such as telecommunications, airlines, and financial services, IT applications have spread common operational standards. At the same time, breaking such standards with innovative uses of information and communication technologies is widely considered to be a weapon of competition, subsequently forcing all competitors to continuous technological change⁵⁷.

Furthermore, studies of the economic globalisation process raise two interrelated contrasts which are relevant to our question regarding the utilisation of IT for economic growth in developing countries. The first is the contrast between the local versus the global. Economic geographers argue that as space is increasingly compressed, the particular characteristics of localities acquire greater importance in the global economic activities. Particular locality matters more as distance and time become insignificant⁴⁹.

The second is the contrast between uniform organisational practices versus diversity of organisational forms and processes⁵⁷. This issue is discussed also in the business literature in relation to the management of the multinational corporation. Barlett and Ghoshal⁵⁸ distinguish among four different strategies pursued by multinational firms: multinational firms, operating their foreign subsidiaries as a loose federation or nearly autonomously in order to be able to respond to local needs and national opportunities; global firms, applying strict in order to co-ordinate world-wide activities and gain from standardised products manufacturing processes and operations; international firms, pursuing rapid diffusion of innovations from parent company to subsidiaries world-wide while allowing for local adaptation; and transnational firms, seeking to retain local flexibility as well as global integration and diffusion of innovations⁵⁸. They argue that global markets require firms to evolve from loose collections of relatively autonomous country units to integrated transnational forms which, nevertheless, are capable for local responsiveness.

Relevant conclusions for developing countries

In summary, the above brief review of efforts to conceptualise the relation between information and communication technologies and socio-economic change suggests the following:

- Investment in new technology does not lead directly to economic growth and increase in

information activities does not necessarily imply economic prosperity.

- Rather, the diffusion of information and communication technologies and the intensification of information activities are related with qualitative socio-economic change. Sociologists, economists, and geographers tend to agree that continuing IT and telecommunications diffusion and emphasis on knowledge development activities are enabling far reaching structural changes in the world economy.
- Without altering the prevalence of the capitalist mode of production, the spread of IT and telecommunication innovation opens new possibilities for value adding economic activities within a global rather than national context.
- Economic globalisation trends imply common pressures for competent technical and organisational innovation. In the race of innovation, technology, organisation of work, and business have to comply to universal standards and norms. At the same time they provide scope for competition through differentiation.

Although the theoretical perceptions outlined above are based mainly on observations in the context of industrialised countries, they are relevant to developing countries in so far as they put forward general conjectures regarding IT and economic change, and they elaborate on the global character of the contemporary economy. They suggest that: **IT and organisational innovation is a necessity in order to be part of the global economic activity, but it does not guarantee economic growth.**

Therefore, while managers and policy makers in developing countries are mobilising resources for the acquisition of technology - a formidable task on its own right - they have to address themselves to the organisational and economic changes that will accompany the technology innovation. The questions therefore that need to be addressed is what kind of economic structuring and what ways of organising work in business firms and public services should be pursued.

The literature does not provide adequate basis for normative suggestions either of macro-economic policy or business strategy. It reveals pressures for re-adjustment, and analyses observations of emerging economic structures, but there is no strong ground to suggest whether the implementation of particular changes will lead to desirable benefits of economic development.

Thus, for example, observations of the shift of labor to white collar industries does not suggest a decline of the significance of the manufacturing industry³⁸. There is no evidence that a large primary information sector comprising sub-contracted information services is

more effective than information services which are embedded in organisations¹, therefore it is part of the secondary information sector which is not easily reflected in macro-economic statistics. Arguments about the strengths and advantages of large corporations⁴⁹ co-exist with claims about the increasing significance of the small and flexible enterprises^{10, 59}. Analyses of the emerging organisational forms tend to be vague and inconclusive about the organisational characteristics best suited to exploit the potential of IT⁶⁰. There seems to be no unique economic policy and no proven business strategy that can guarantee developing countries successful exploitation of new information and communication technologies in the global information economy.

Homogenisation or diversity

Moreover, developing countries striving to secure a competitive place in the global economy are faced with fundamental dilemmas in organisational strategy and industrial policy. They have to address themselves to the contrasts regarding the significance of the locality in the global economy, and the significance of diversity in global business. They must participate in the international economy by adopting emergent common industrial patterns, institutional forms, and organisational structures, while they maintain adequate diversity from universal norms that will provide continuity of the local society's values and retain a distinct identity for their locality.

The dilemma between homogenisation and diversity has hardly been addressed in studies of information systems in developing countries. Although many authors explore indigenous requirements for the use of IT, they do not consider diversity of information systems as a potential source of competitive advantage. Most prevalent is the stream of literature suggesting technology transfer that is accompanied by the adoption of 'best practice'.

The argument on the imperative to integrate in the world economy by complying to standard practices is best exemplified by authors from the World Bank. Schware and Kimberley's 'guide to best practice' on IT and national trade facilitation⁶¹ suggests that developing countries have no option but to adopt 'best practice' organisational processes in order to be able to participate in EDI trade networks. Otherwise they will stay out of business. To that end, Schware and Kimberley urge developing countries to overcome obstacles from cultural and institutional factors.

In the same spirit Talero and Gaudette⁶² emphasise the opportunities that IT offer to developing countries² and argue for the necessity of the Bank's programme of economic

¹ This point is confirmed by the IS literature on outsourcing⁷¹ which discusses a number of potential problems confronting organisations which sub-contract their IS functions.

² Tolero and Gaudette's article convey a great enthusiasm about the 'information revolution', arguing that 'Information technology and telecommunications in developing countries can transform old challenges and

‘structural adjustment’ of liberalisation: ‘(i)t is easy to get excited about the opportunities, but the information revolution dictates new needs for developing countries that must be addressed, whether exciting or not. Fortunately, the information revolution also provides the means to address this urgent agenda of adjustments’. But they offer no guidance about how business organisations of the developing countries can compete within a global free market regime which is knowledge intensive, rather than labour intensive.

There are several problems with the suggestions that developing countries need to accompany IT and telecommunications innovation with the adoption of economic and organisational forms of the industrialised countries. First, as argued above, there is no proven ‘best practice’ or best policy. A variety of ways of organising a competitive industry⁶³ or a competitive business firm co-exist. Even business partnership mediated by IT, such as EDI, the resulting business processes seems to be more a matter of power relationship among partners and less technology driven best practice in terms of efficiency⁶⁴. Urging developing countries to transfer economic and organisational forms misdirects their effort from seeking schemes which can be locally effective to adopting unquestionably universal ‘imperatives’.

Second, it does not consider the feasibility of adopting successfully economic mechanisms and business practices from a very different socio-economic context. In many countries’ previous efforts to modernise, values which hold fundamental position in the ideology of modernity, such as independence and freedom, equality of individuals before the law, or economic self-improvement, were deformed and turned into their opposites⁶⁵. The ‘appropriate technology’ debate has highlighted the importance of matching technical innovation to the local society’s circumstances⁶⁶. In the business literature emphasis has shifted to the importance of using IT to sustain localised learning⁶⁷, while in economics attention to the cumulative nature of countries’ technological capacity led to the recognition of the significance of considering specific national conditions when devising industrial and technological policy⁶⁸.

Third, adopting economic mechanisms and organisational practices from the ‘post-industrial’ world may connect them with international business activities, but it does not guarantee a competitive position in the global economy. Summarising the findings of a three year debate within the OECD Technology Economy Programme, Freeman and Soete conclude that there is no automatic catching up with the world’s leading productivity performance. Convergence of objectives and solutions does not always lead to a ‘virtuous snowball’ circle, it might lead to vicious low-growth performance. Local managerial and technical skills, cultural proximity of producers to intended customers, institutionalised user-producer relationships, and

create unprecedented possibilities for sustainable economic development, just as it has for business in the industrial world’ (p 157) and that ‘(r)ural and poor urban communities can be integrated into economic life, and thereby raise income levels, through information services’ (p 161).

accumulated tacit knowledge are important sources of comparative advantage.

Such arguments from the economists are not unfamiliar to business experts. The information systems literature to be competitive requires not only to match the lowest cost of products or services, but also to be able to market new and better products or services. The latter requires truly innovative uses of technology and the development of organisational knowledge^{69, 67}.

Thus, to suggest that far-reaching institutional changes are needed in order to achieve the economic benefits that IT innovation promises is only the beginning. Organisational and social innovations will vary in different parts of the world. Experimentation and learning in organisational change are just as important as technical change. Pluralism, diversity and competition between alternative approaches. Learning to make value from technical innovation is a trial and error evolutionary process.

Summary

In brief, economic and social theory on the relationship between IT and socio-economic change suggests that efforts to spread information and communication technologies are necessary in order to participate in the emerging global economy, but not adequate to create economic growth. Consequently, developing countries are faced not only with the problem of mobilising investment for IT and telecommunications innovation, but also with the question of what economic policy and organisational interventions are needed in order to achieve economic development from investment in new technology.

Regarding the latter, policy makers and business managers in developing countries often seek to follow the patterns and 'best practice' emerging in industrialised countries. Influential international agencies, such as the World Bank, actively reinforce the approach of transferring policies and practices from industrialised countries to developing countries.

We argued that such an approach may be neither feasible nor sufficient to win a competitive position for a country's industry in the global economy. There is no unique path for changes that need to be implemented in order to facilitate and achievement of economic benefits from IT diffusion. While many industrialised countries are experimenting with reducing the range of state institutions and with introducing managerial practices that tend to prevail in the private sector, other countries, for example Singapore, Japan, and to some extent Germany, experience impressive economic results by continuing to rely heavily on government institutions, typically run in bureaucratic manner. While many authors relate the exploitation of IT with an increase of the significance of multinational corporations, others emphasise the empowerment of the SMEs, particularly when they are linked to form networked consortia.

In this paper we identified the contrast that homogenisation of economic structure and

business practice is required in order to participate in the global economy while diversity seems to be needed to achieve competitiveness.

In some industries, such as banking and airline services, IT and telecommunications are implemented in developing countries to implement industrial standards and international regulations. In such cases there is a homogenisation effect to be achieved, as a core of common services, delivered in more or less the same way, are expected all over the world. It would be wrong, however, to generalise and suggest that the introduction of information and communication technologies should be accompanied by the transfer of economic and organisational practices. There is no proven best way to structure and manage the 'post industrial' economy, and no optimal organisational form to pursue through IT use. Moreover, structures and practices which have been successfully implemented in a particular socio-economic context may not be feasible in another context. Finally, even if economic reform and organisational transformation by following a common pattern are feasible, homogenisation is not the source of competitive advantage, which is the logic currently driving the global economy.

Policy makers and business managers in developing countries will have to develop indigenous capacity to relate technical with organisational change. They need to combine efforts to adopt universal standards and regulations with a learning process for economic reform and organisational innovation appropriate to the local socio-economic context. In the emerging global economy, it seems to be significant to retain a distinguishable identity of organisational structure and culture. The economic growth potential of IT lies in its contradictory capacities to enable homogenisation as well as diversity. Using IT in its homogenising capacity is necessary to participate in the global economy. Competitiveness and economic growth require IT as an enabler of diversity.

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