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KNOWLEDGE ENTERPRISES, KNOWLEDGE ECONOMIES, KNOWLEDGE DIVIDE AND KNOWLEDGE SOCIETIES: A CONCEPTUAL FRAMEWORK

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ABSTRACT

The terms knowledge, knowledge enterprise and knowledge management have been in vogue for the last decade or so in the context of corporate sector as means for gaining competitive advantage. However, the term knowledge has a variety of interpretations and can mean different things to different people in different contexts. At a macro-level, knowledge economy and knowledge-based economy are widely used terms to signify economies in which the production, distribution and use of knowledge are the main drivers of growth, wealth creation and employment. The social sciences literature refers to knowledge societies as distinct from knowledge economies. Reference is also made in the economic and social science literature, particularly in the documentation generated by international development agencies, on issues such as knowledge divide among people and among nations.

A need has been felt to develop a conceptual framework in order to clarify various related concepts mentioned above and show their inter-relationships in a seamless micro- and macro- context. Using this framework, models of knowledge management at country level can be evaluated. However, before that, a prior step of validation of this framework is necessary by mapping the knowledge management model of a country internationally recognized as a successful knowledge economy. This will be the scope of a follow-up paper by this author.

Keywords: Knowledge, Knowledge Enterprise, Knowledge Management, Knowledge Economy, Knowledge Divide, Knowledge Society, Knowledge Human Resources, Knowledge Have Nots, Knowledge Consumers

Introduction

Extensive literature has been published over the last decade on knowledge enterprises, knowledge economies, knowledge divide and knowledge societies. This Paper aims at developing a conceptual framework which synthesizes these vital concepts. This is an intermittent step with a purpose to develop a coherent framework using which models of knowledge management at country level can be evaluated. The second phase of this academic effort (not covered in the present paper) would be to examine the case of Singapore as a country and assess the extent to which the framework of this paper can describe the evolution of Singapore as a Knowledge Economy.

Various Dimensions of Knowledge

The concepts of Knowledge Enterprises, Knowledge Economies and Knowledge Societies are

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founded on the basic concept of "Knowledge". However, the term knowledge has so many different interpretations in different contexts that very often the use of this term as well as the derived terms of knowledge enterprises, knowledge economies and knowledge societies degenerates into clichés or fashion statements.

Some of the interpretations of the term "knowledge" in various contexts are briefly summarized below. Figure 1 schematically shows these interpretations of knowledge.

Knowledge as "Actionable Information"

The Knowledge Management literature which has essentially developed in the context of corporate sector views knowledge as an entity related to the business strategy and objectives of the organization which if properly leveraged will provide a competitive advantage to the organization. A simple definition of knowledge as proposed by Tiwana (2002) for instance is that knowledge is "Actionable Information". This interpretation of knowledge, however, places this entity in the same cluster as data, information, databases, information systems etc.

Knowledge as Subject Matter Domain

Some definitions of knowledge view it as an entity related to a specific discipline. For example, any scientific subject such as physics or chemistry or any engineering subject such as telecommunication technology has its own body of knowledge. Different terms are used to describe this interpretation of knowledge. One such commonly used term is "Declarative Knowledge". Two other term used by OECD (1996), which can be collectively seen as belonging to this interpretation of knowledge are "Know-What" and "Know-Why".

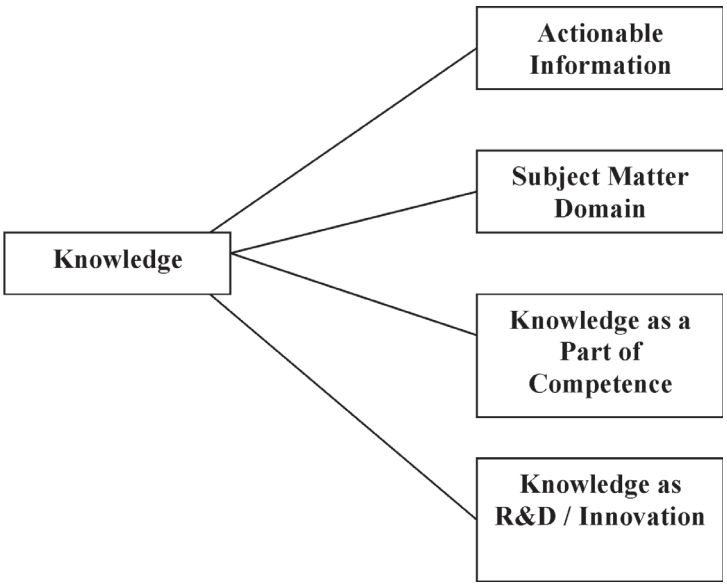

Figure 1: Interpretations of Knowledge

Knowledge as Part of Competence

The literature on training and development views knowledge, skills and attitudes as a triad defining the competence of an individual or the group of human resources in an organization. The first component of this triad essentially refers to the cognitive part of learning which

people acquire through education and thus relates to what one can elicit from study of subject matter domains. The second component of this triad, namely, skills, is also considered as a type of knowledge in the knowledge management literature. A common term used to describe this entity is "procedural knowledge". The OECD categorization of knowledge terms this as "Know-How". The third component of the triad, called, Attitudes, is also seen as some kind of skills. Some call it as soft skills, while some others call this as behavioural skills. The important thing about all skills (both "How-to" type and soft-skills) is that they can be acquired through training. Availability of guides, procedure manuals and instructional materials can help in acquiring these kinds of knowledge to some extent, but more importantly, these skills are learnt through observation, simulation and guided on-the-job learning.

Knowledge as R&D/ Innovation

Another interpretation of knowledge relates to creating its new forms, which enable the organizations to offer new products and services or some other differentiating factor for providing it a competitive advantage. The creation of new knowledge is of course dependent upon the competence of the persons engaged in R&D. It is also influenced by the enabling learning environment in the organization which fosters knowledge sharing amongst individuals.

Characteristics of a Knowledge Enterprise

A knowledge enterprise can be viewed as an enterprise which acquires knowledge inputs in various forms and delivers knowledge outputs for its customers and thereby derives economic value. Figure 2 schematically represents a "Knowledge Enterprise".

Knowledge Inputs

The inputs to a knowledge enterprise include, among others

a. Knowledge embedded in its Human Resources
b. Knowledge embedded in its Process Technology
c. Knowledge embedded in its Products Design
d. Knowledge Management Systems

Though these inputs are obvious, some explanation/ elaboration would be apt at this stage.

Knowledge Embedded in its Human Resources

The employees of the enterprise are endowed with certain qualifications and skills at the time of joining, which represents their initial knowledge stock. They progressively enhance their knowledge stock by acquiring new knowledge and skills through learning on-the-job and through specific training programmes or educational inputs. Much of the knowledge acquired by them is contextual knowledge about the affairs of the organization, its customers and its suppliers, which is vital for them to perform their day to day operations in the organization. Predominant form of new knowledge acquired by them is tacit knowledge. Generally speaking, the more number of years a person has been working in an organization, greater would be the value of this tacit knowledge to the organization. Additionally, some employees may acquire special skills or highly specialized domain knowledge in a particular field, which renders them unique value contributors to the organization because of their knowledge assets.

Knowledge Embedded in its Process Technology

Depending upon the nature of products and/or services offered by a company, it sets up elaborate processes for production and delivery of such products and services. These are

typically dominated by technology, which embodies the knowledge (of Know-How type) of production/ service creation. For example, the manufacturing plant of a chemical industry embodies the knowledge of its manufacturing process, optimized to produce the chemicals with high productivity, high quality, low wastage and low costs, and in accordance with the customers' delivery requirements. Further innovations may take

place in the process technology over time with experience gained, changes in customer requirements or new technologies being developed in the industry, which may necessitate replacement of the existing technology at some stage.

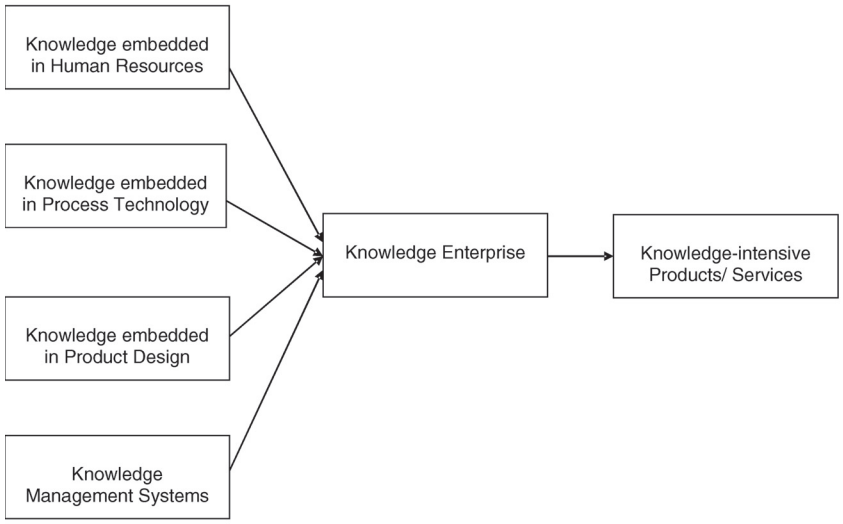

Figure 2:

Knowledge Embedded in Products Design

The products or services which are eventually delivered by a company are expected to satisfy customer needs through incorporation of desired product/ service features with the help of technology. Two types of knowledge are embedded in product design. One is obviously the technical knowledge of the conceptual design of the product which reflects the innovative thinking of the design personnel. The second is the customer-related knowledge, which is explicitly or implicitly made available to the design team by the marketing personnel, and which greatly influences the design decisions. The knowledge of competitor products and policies is another important ingredient of knowledge which is considered by the design team while designing new products/ services. Strategic considerations of aligning knowledge with business strategy so that the product related decisions serve to fulfill the strategic requirements of the enterprise are vital in this. The knowledge of strategy (and the related meta-systemic aspects such as policy planning, which fall into the domain of top management) are also important knowledge contributors.

Knowledge Management (KM) Systems

This refers to the systems specifically developed and instituted by an enterprise for acquiring, storing, distributing and sharing knowledge in the organization. A large part of the domain of KM systems is to explicate tacit knowledge, place it on knowledge repositories and portals, provide organization-wide (and often including customers and vendors) connectivity and

collaborative technology for sharing of this knowledge. These KM systems are directly concerned with making sure that the knowledge of individual employees is explicated to the extent possible and shared by all others in the organization. Various themes describing the philosophy behind the KM systems of companies make interesting reading and reflect the intent of such KM systems. For example, "Learn once, use anywhere" is a theme of KM systems at M/s Infosys Technologies Ltd., a leading global software development company headquartered in India.

Outputs of a Knowledge Enterprise

The direct output of a knowledge enterprise is obviously the products and services that it offers to its customers. The distinction between the products and services of the knowledge enterprise genre of enterprises (in contrast with a traditional enterprise) would be the knowledge-intensity of these products and services. Knowledge intensity essentially implies that a higher level of intellect is required on the part of the user/ consumer of knowledge products and services in satisfying his/her demand through the product/services being offered. For example, a Microsoft office product presupposes that the user has the basic knowledge of working with computer systems and is educated enough to grasp the instructions given through installation procedures and through the Help menus.

The rationale for a knowledge enterprise to offer knowledge-intensive products and services is that the knowledge economy increasingly generates more demand for such products and services. The new products/ services reflect the transformation of innovative and creative thinking of its R&D and other personnel into knowledge products which have current demand. The gradual and planned obsolescence of the older products so that the enterprise is continually attuned to the emerging customer needs is also reflective of the strategic knowledge within the company. Thus, higher percentage of new products/ services being offered by a company is an indicator of its being more knowledge-intensive.

Without yet defining a knowledge economy, it is argued here, for the sake of simplicity, that in a knowledge economy, various knowledge enterprises co-exist, with each one having a cascading effect on the other. Thus, one knowledge enterprise may need knowledgeable human resources, technology or products/services in a specific domain and thereby generate demand for such knowledge-based entities (human resources, technology or products/services). Another knowledge enterprise must produce such technology or product/services, and the economy must prepare human resources equipped with the knowledge in demand. Conversely, the output of a knowledge enterprise would fulfill such demand from other enterprises.

This cascading phenomenon of co-existing knowledge enterprises results in new forms of demand generation and fulfillment. These include: (a) high export demand for knowledge-intensive products/services; (b) process outsourcing of knowledge-intensive services; (c) emigration of skilled human resources; and (d) emergence of knowledge consumers. These are briefly discussed below.

High Export Demand for Knowledge-Intensive Products/Services

There may be high export demand for the knowledge-intensive products and services being produced by a knowledge enterprise. A higher volume of exports by a firm indicates that its products and services are endowed with attributes which have a global demand (or at least high demand in the global niche markets of that firm for a specified product or service).

Process Outsourcing of Knowledge-Intensive Services

Instead of the knowledge products being physically exported, the knowledge-intensive services may be offered through the process outsourcing route. The increasing incidence of knowledge

process outsourcing reflects this situation. This output of knowledge enterprises is specifically relevant to enterprise operations concerned with satisfying the needs of off-shore customers by providing remote services on the basis of direct skills of the enterprise personnel at other end. It is known that the traditional call centres relied on the voice skills as well as the contextual knowledge of specific geographical locations acquired through education and training by the call centre operators. However, in the upmarket KPO operations, higher level knowledge skills are critical. For example, a legal process outsourcing activity would require an elaborate knowledge of the legal system of the client organisation.

Emigration of Skilled Human Resources

There may be an off-shore demand for knowledge and skills embedded in human resources. Emigration of skilled professionals fulfills this kind of demand. Traditionally international migration has been related to both unskilled and low skilled labour as well as higher knowledge and skills. However, the demand for persons with higher levels of knowledge is increasing world-over, as this demand can't be fulfilled through local population alone due to a variety of factors. Higher knowledge intensity of products and services further reinforces demand for persons with higher knowledge and skills from overseas.

Emergence of Knowledge Consumers

As a consequence of the combination of knowledge-intensive products and services and increasingly knowledgeable and skilled human resources required in the economy, a new category of consumers called knowledge consumers has emerged. The knowledge consumers possess the basic qualification and skills to understand and gain proficiency with the features of the new knowledge products and services being offered. The knowledge consumers are not created out of vacuum. A symbiotic relationship exists between evolution of knowledge products and acquisition of new knowledge by the consumers to handle new features of such products. The increasing sophistication of Microsoft office products and operating systems provides a classical example of the steady evolution of knowledge consumers.

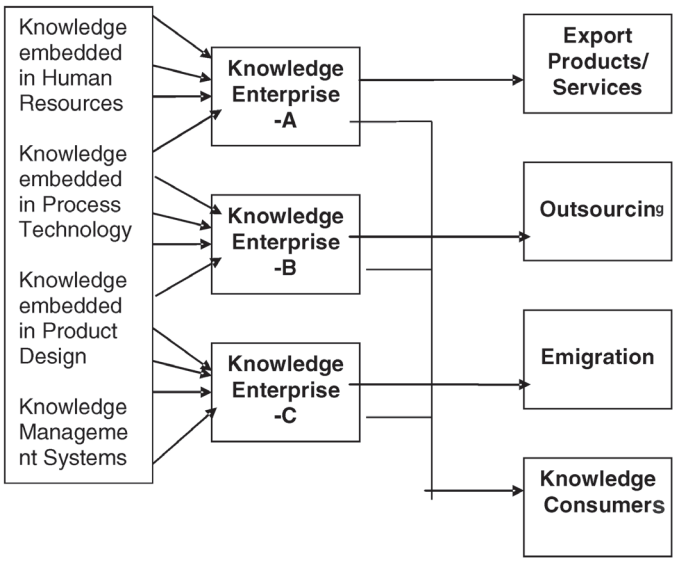

Figure 3: Cascading Effect of Co-existing Knowledge Enterprises

Characteristics of a Knowledge Economy

OECD Report (1996) defines knowledge-based economy[1] as one in which the production, distribution and use of knowledge are main drivers of growth, wealth creation and employment for all industries. Though this definition doesn't refer to the term, "knowledge enterprise", it is evident that the production, distribution and use of knowledge for growth and employment would require co-existence of multiple knowledge enterprises which fulfill demand for knowledge-intensive products and services as described above.

Figure 4 schematically depicts the concept of a knowledge economy. As can be seen, knowledge enterprises form a key component of knowledge economies because the creation of products and services by the enterprises and their procurement / utilization by the intended customers is crucial for a knowledge economy to survive. Additionally, a knowledge economy requires:

a. A network of educational and training institutions which serve to impart knowledge (both cognitive knowledge and skills) to the human resources of the economy.

b. R&D centres which generate new knowledge through creating new technologies and innovations, which can be commercially acquired and adapted by the knowledge enterprises. This is however not to say that knowledge creation is not in the in-house domain of knowledge enterprises; but creation of new knowledge as a commercial entity for public domain is a valuable output of the R&D centres in any knowledge economy.

c. Govt. policy environment which eventually decides whether the interface between knowledge enterprises, educational & training institutions and R&D centres is harmonious enough and conducive to the growth of the knowledge economy and its ability to meet the competitive challenges from other knowledge economies.

d. Connectivity and collaborative facilities which ensure that information & communication technology (ICT) is effectively utilized to promote dynamic interfaces among all the above said actors/ stakeholders of the knowledge economy.

This model of knowledge economy also presupposes that various knowledge enterprises within its boundaries are simultaneously competing and collaborating with each other. While competition amongst them is important to ensure that excellence is rewarded and those who best align their knowledge and business strategy gain the upper hand, collaboration in certain respects is equally essential to ensure that the economy as a whole has a greater knowledge leverage vis-à-vis the competing economies.

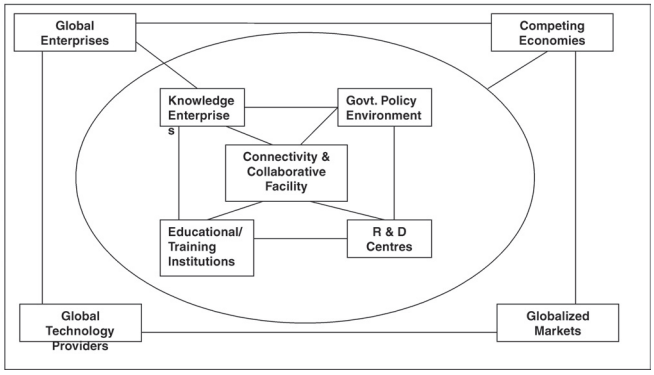

Figure 4: Concept of a Knowledge Economy

The competing economies in this context are obviously the economies of other countries, if a view is taken that a knowledge economy broadly superimposes itself on the national boundaries of any country. However, this is only a partial (though most predominant) view of a knowledge economy. Conceptually, the domain of a knowledge economy may be widened to cover a region (for e.g., SAARC or ASEAN countries) or conversely it may be narrowed down to smaller geographical but more modular domains such as cities. The concept of Knowledge City revolves around the assumption that the city rather than a country as a whole can be taken to represent a unit of analysis, as it may fulfill the criterion of having all the five components of a knowledge economy mentioned above. (Carrillo, 2006)

A particularly significant feature of knowledge economies is that they represent open systems, implying their having a dynamic interface with the external environment. The external environment of a knowledge economy also possesses newer characteristics, fueled by globalization and technology. Thus, globalized markets, global enterprises and global technology providers are essential components of the knowledge-intensive external environment of a knowledge economy.

Leaders and Laggards of Knowledge Economy

Having laid down the basic conceptual framework of a knowledge economy, it is easy to identify the characteristics of economies which can be considered leaders and those which can be considered laggards.

Knowledge Leaders

A leader amongst knowledge economies would be distinguished through the following unique features:

Focus on Competence Building

A leading knowledge economy has a focus on competence building. All the components of the economy are geared towards enriching the human resources with cognitive knowledge, skills and attitudes which are in demand. There is a strong emphasis on tertiary education because all progress in R&D is crucially dependent on the higher education levels, particularly scientific knowledge. Equally important is the emphasis on building basic literacy and primary education since that is the very foundation of higher education attainments. Both these are simultaneous targets for a knowledge economy, though both are targeted on different sections of the population. One doesn't view these demands for primary and tertiary education as competing candidates for resource allocation; both demands have to be satisfied and a critical mass of competencies attained for the economy to get into a self-sustaining mode.

Tight Linkages among Stakeholders

A leading knowledge economy has a focus on tight linkages or coupling between the Government, knowledge enterprises, knowledge creating systems (R&D) and knowledge imparting systems (education & training institutions). This tight linkage is crucial for the economy to respond to continuing changes in the external environment, necessitating continual infusion of new knowledge inputs in the knowledge enterprises.

Diversity of Human Resources

A leader among knowledge economies not only tolerates inter-mixing of nationalities and cultures, it actively encourages such inter-mixing. The intermixing is in itself an effective source of knowledge sharing and through that, creating new knowledge. Each member of a multi-cultural and multi-nationality team enriches the group perspective. Intermixing is also a barometer

of the gravitational pull of a knowledge enterprise and a knowledge economy to attract knowledge workers from different places across the world.

High Extent of Pervasion of ICT

A leader among knowledge economies has a high extent of pervasion of Information & Communication Technologies (ICT). The added value of pervasive ICT is that the connectivity among various constituents of the economy is greatly facilitated, thereby enabling dramatic reduction in response time, and smoothening the inefficiencies of the overall system.

Larger Export Markets and High Technology Products

Another characteristic of the leaders among knowledge economies is that they have a high percentage of export of products and services in their national income. This is reflective of the unique global positioning acquired by them through better leveraging of their knowledge assets. Yet another similar characteristic is that high technology products constitute a much higher percentage of the products and services made available by them to the global market.

Knowledge Laggards

Conversely, the laggards among knowledge economies exhibit opposite properties, or may not move forward to achieve the characteristics described above at the right pace. For example, they may have low literacy levels, low level of tertiary education, and may find more comfort in isolationist and protectionist policies. The human resources in a laggard economy may find that competence and merit is not rewarded, that internal conflicts resulting in friction and dissipation of energy are the order of the day and little incentive exists for collaboration. Connectivity may take a back seat on the reasoning that this is too expensive or that it is unlikely to make a significant dent.

Knowledge Divide: Fall-out of Knowledge Economies

In the conceptual description of knowledge economies given above, the ethos is that of developing and utilizing knowledge human resources (KHR) in economic activities of generating knowledge-intensive goods and services so that economic growth is achieved, and as a byproduct, knowledge consumers are developed. The knowledge consumers are also KHRs for the economy by virtue of their higher cognition and skills in specialized domains. However, a category of persons, who may be described as Knowledge Have-nots (KHN) may also co-exist which only marginally contribute to the knowledge economy, and may emerge out again as KHN only because of their marginal participation in the growth generating activities of the knowledge economy. Consequently, the gap in the knowledge content of KHRs and KHNs increases since the KHRs would have undergone significant increase in their knowledge content in the economy. This gap in the knowledge content of KHRs and KHNs, termed as “Knowledge Divide” is typically an adverse fall-out of knowledge economies, and is continually perpetuating. Figure 5 schematically depicts the knowledge divide.

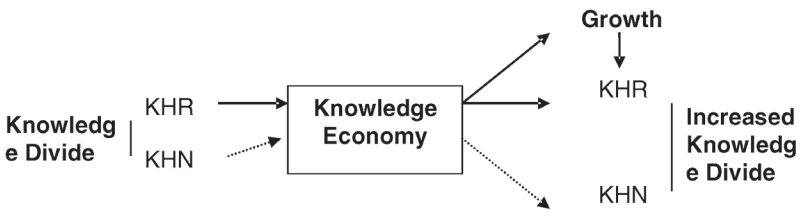

Figure 5: Widening Knowledge Divide

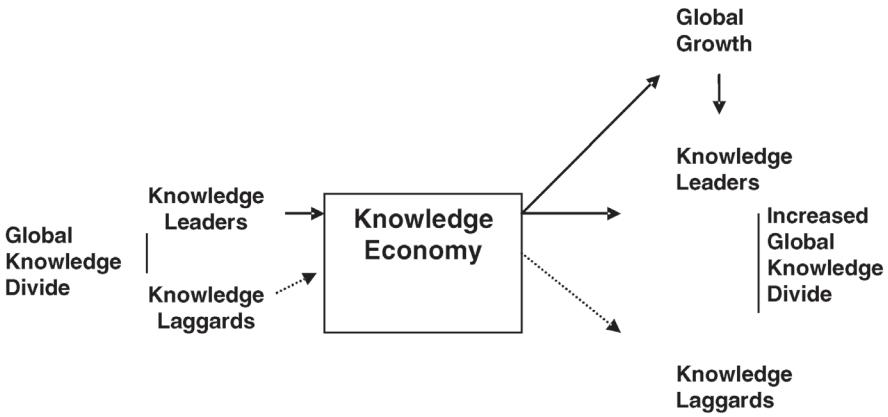

Figure 6: Knowledge Divide among

However, the knowledge divide is not confined to the boundaries of a knowledge economy. It can also be conceived as knowledge gap amongst economies. As seen in figure 6, the knowledge divide between knowledge leaders and knowledge laggards described earlier may also increase simultaneously with global economic growth, due to lesser extent of participation of knowledge laggard economies in global economic activities.

Knowledge Societies

While the concept of knowledge economy can be seen as leveraging knowledge for competitiveness, the concept of a knowledge society is "inclusive". A UNESCO Publication (2005) describing knowledge societies, observes that:

"… A knowledge society must foster knowledge-sharing among people. It should be able to integrate all its members and promote new forms of solidarity involving both present and future generations. Nobody should be excluded from knowledge societies, where knowledge is a public good, available to each and every individual. The cornerstone of true knowledge societies would be whether we now have the means to achieve equal and universal access to knowledge, and genuine sharing of knowledge."

Typical attributes of a knowledge society may be described as follows:

a. A knowledge society fosters collaboration rather than competition among economies.

b. It promotes sharing rather than shielding if knowledge.

c. It targets at the collective well-being of the society as a whole and not merely generating economic output.

d. The concept of knowledge society views educational attainment not only as a means of economic output, but also as an end result in its own right.

e. It values self-actualization as well as the ability of individuals to make their own choices based on informed decisions.

Figure 7 schematically describes the concept of a knowledge society. As can be seen, the two pivots of knowledge societies are existence of suitable knowledge sharing mechanisms at local and global level. Both the knowledge sharing mechanisms are fostered by a combination of Govt. policy initiatives and international development agency support. Availability of effective ICT facilitates these knowledge sharing mechanisms. Additionally, establishment of knowledge

management systems, both at local and global levels, are instrumental in strengthening these mechanisms. In this context, the World Bank has taken a pioneering role in installing and implementing knowledge management systems, which has been emulated by several international financial institutions and development agencies such as Asian Development Bank, UNESCO and UNDP, as well as bilateral agencies such as Swiss Agency for Development and Cooperation (SDC).

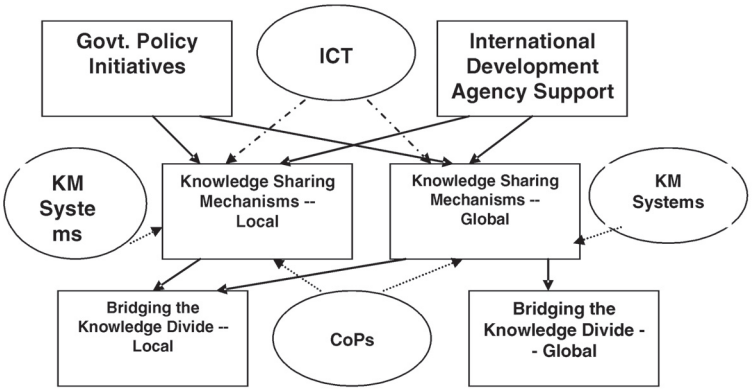

Figure 7: Concept of a Knowledge Society

The above said international development agencies have a crucial role to play in assimilating knowledge from different sources and disseminating it amongst the needy nations through collaborative developmental activities. Through the knowledge management systems established by these agencies, the prescriptive and descriptive expert knowledge contents, available in an explicit form, are shared. Additionally, even the tacit knowledge of local communities and the tacit contextual knowledge of the local environment where knowledge is to be applied are attempted to be captured (Batra: Dec. 2006). Several Communities of Practice (CoPs) on specific knowledge domains, geographical regions or problem clusters exist through cooperation among various international development agencies and other interested parties/ NGOs etc. which further strengthen these knowledge sharing mechanisms. The desired end result of all these initiatives is to bridge the knowledge divide, both at local level (within a knowledge economy) and global level (among knowledge economies) is bridged. This is, however, a continual endeavour – a never-ending exercise.

Co-existence of Knowledge Economies and Knowledge Societies

A knowledge economy can function in a perpetuating mode as long as the outputs of the knowledge enterprise can be geared to generate KHRs, which feed other economic enterprises. However, this process may not be self-perpetuating, and Govt. support and policy initiatives would be necessary to focus on KHR generation according to the changing knowledge needs of the economy. Additionally, Govt. support and policy initiatives have to invariably emphasize bridging the knowledge divide, and ensuring that the KHNs have greater opportunity of access to education & training and transforming into KHRs. Thus, in practice a Knowledge Economy requires support from the knowledge sharing philosophy of a knowledge society, and it is difficult to conceive of a knowledge economy without the values of a knowledge society to supplement.

Conversely, a knowledge society also can't exist without the embracing support provided

by the knowledge economy. The generation of economic surplus at the local level is the key driver of Government initiatives in building knowledge sharing mechanisms and investing into ICTs in the public domain. Similarly, the generation of economic surplus by various global knowledge economies/ nations is crucial for sourcing the funding requirement of international development agencies. Therefore, it is not possible to realize the vision of knowledge society to any satisfactory level in real terms without first realizing the vision of a knowledge economy.

However, the UNESCO Publication (2006) referred above also sounds a note of caution by observing:

The notion of knowledge societies holds out fresh possibilities for human and sustainable development. However, one important stumbling block in the growth of knowledge-societies is the risk of promoting a single model, based exclusively on the requirements of the knowledge economy. This model of knowledge economy would widen the existing divides and lead to the emergence of new forms of exclusion, not only between the most developed countries and the rest, but also within each country.

Conclusions

This Paper has aimed at developing a conceptual framework of knowledge, knowledge enterprises, knowledge economies and knowledge societies. It has illustrated the inter-linkages among these vital concepts. It also refers to the notion of knowledge consumers, which have an important role to play in a knowledge economy, and the notion of knowledge divide, both within and among knowledge economies.

The simultaneous emphasis on knowledge economies and knowledge societies reiterates the duality between competition and collaboration mentioned earlier in the context of knowledge enterprises. This duality of simultaneous competition and collaboration among human beings appears to be a fundamental trait of humanity and extends to the levels of economies and societies.

It is proposed to further elaborate this conceptual paper with real life examples of Knowledge Economies and Knowledge Societies. Singapore provides one ideal example, and considerable literature exists describing its evolution as a knowledge economy and a knowledge society and the developments resulting into that evolution. This would be the scope of a follow-up paper.

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