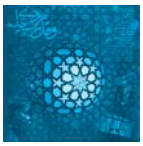
PART II

Section one: the concept of an Arab knowledge society

The Report starts, in Chapter 1, with a conceptual discussion of knowledge as it relates to Arab countries. It defines what is meant by knowledge and sets out an analytical framework for examining the current status and cultural, social, economic and political context of knowledge acquisition, the main subjects of this Report. The chapter contrasts the requirements of a knowledge society with the characteristics of Arab societies, historically and at the present time. The discussion identifies the key challenges that later chapters take up in detail.

CHAPTER 1



Conceptual framework: knowledge, human development and the knowledge society in Arab countries

This series of Arab Human Development Reports (AHDR) was designed so that the first issue, published in June 2002, offered a comprehensive treatment of human development in Arab countries according to the definition adopted by the series and recapitulated in Part I of this issue. Subsequent issues were to examine, in depth, specific challenges that are of essential importance to human development in those countries. This practice starts with this second issue of the series, dedicated to the topic of "knowledge".

This chapter lays out the conceptual basis for exploring issues of knowledge and defines what is meant by the "knowledge society". Subsequently, it discusses briefly some questions raised as a result of contrasting the characteristics of the "knowledge society" with those of present-day Arab societies. These questions, and the challenges they pose, will be further tackled in subsequent chapters of this Report. It ends by highlighting a major challenge to knowledge in Arab countries, namely the need to create strong, effective and increasing societal demand for knowledge supported by adequate purchasing power.

WHY FOCUS ON KNOWLEDGE?

Knowledge is recognised as a cornerstone of human development, a means of expanding people's capabilities and choices and a tool for overcoming human poverty. In the 21st century, knowledge is also increasingly a dynamic factor of production and a powerful driver of productivity and human capital. The first AHDR identified a serious shortfall in knowledge acquisition, absorption and use as one of three cardinal deficits undermining human development in Arab countries. This second Report starts where the first left off and takes an in-depth look at the causes and consequences of the relative backwardness of the Arab region in this vital arena.

The first AHDR highlighted how weak knowledge bases and stagnant knowledge development condemn many Arab countries to fragile productive power and reduced development opportunities. It is now a commonplace that the knowledge gap, rather than the income gap, determines the prospects of countries in today's world economy. In addition, a consensus is emerging that the gap between developing and developed countries in *the capacity to produce knowledge* is wider than the knowledge gap itself. This calls for serious efforts to regenerate knowledge production in the developing world.

The Report assumes that countries with deficient knowledge capabilities have much to gain by moving towards the "knowledge society" since the developmental returns on knowledge acquisition increase in societies suffering a knowledge deficit. Such societies can take advantage of the abundant stock of knowledge, experience and best practice available worldwide. They can learn from the mistakes and profit from the achievements of early knowledge leaders. In a comparative perspective, for Arab countries, the need to invest in knowledge is great and the dividends that can be realized are proportionately large.

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BOX 1.1

Edward W. Said - What knowledge?

It isn't knowledge as a product or commodity that we need; nor is it a matter of remedying the situation by having bigger libraries, a greater number of terminals, computers and so forth, but a qualitatively different knowledge based on understanding rather than on authority, uncritical repetition, mechanical reproduction. It is not facts, but how facts are connected to other facts, how they are constructed, whether they relate to hypothesis or theory, how one is to judge the relationship between truth and interest, how to understand reality as history. These are only some of the critical issues we face, which can be summed up in the phrase/question, how to think?

Knowledge is one of the few human resources that does not perish, but rather proliferates through consumption.

THE ACQUISITION OF KNOWLEDGE AND HUMAN DEVELOPMENT

KNOWLEDGE

Knowledge consists of data, information[1], instructions, and ideas, or the sum total of symbolic structures possessed by individual human beings or by society at large. These symbolic structures guide individual and institutional human behaviour in all walks of life and in all spheres of public and private activity.

Knowledge includes, for instance, the symbolic structures which are acquired through formal education and experiences learned from work and life. It also encompasses facts, stories, pictures and any mental construct informing human behaviour, whether documented, oral or implicit. The *institutional* knowledge of a society includes history, culture, strategic orientations and organisational forms.

Consequently, knowledge can be *explicit* (recorded in one form or another) or *implicit* (in the form of spontaneous behavioural prescriptions, for example). Moreover, the production of knowledge is not limited to the standard forms of science and scientific research, it also spans knowledge embodied in the various forms of artistic and literary expression and in both popular and formal cultures[2].

Knowledge transcends the mere acquisition of information. Indeed, information overload in the age of the Internet, media saturation and fast communication can sometimes smother true knowledge. The explosion of readily available data, opinions, articles, documents and other types of content triggered by the digital revolution can be overwhelming and requires a process of selection, extraction and judgment in order to retrieve useful and usable knowledge. Moreover, while knowledge ranks higher than information on the scale of human values, it is one step lower than wisdom, which entails a commitment to high human ideals such as freedom, justice and human dignity.

In all human systems, only a small amount of total organised knowledge is recorded. In human systems where the acquisition of knowledge is weak, the extent of *unrecorded* and implicit knowledge residing in individual and collective knowledge models, in the culture and in spontaneous prescriptions for human conduct, is still often substantial.

One of the quintessential, and seemingly contradictory, characteristics of knowledge is *that it grows with use*. Knowledge is one of the few human resources that does not perish, but rather proliferates through consumption.

It is useful to draw a distinction, on the

BOX 1.2

Collective learning: a means for developing knowledge capital or reinforcing the status quo?

In all societies there is a number, large or small, of people who possess some knowledge. The challenge of building knowledge capital within a human system, however, resides in converting individual knowledge to collective knowledge.

A large amount of knowledge exists in the minds of individuals in the form of answers to the questions: how and why? This constitutes a knowledge model on the individual level. A higher order type of knowledge is acquired through conceptual learning, which can change knowledge frameworks and thus the world-view of individuals. Conceptual learning can be distinguished from lower order procedural learning, which simply leads to changes in actions. A change in the knowledge model occurs when new actions, embedded in new knowledge frameworks, are established. Generally speaking, it can be said that individual knowledge models arise from a world-view (Weltenschaung) of the system embedded in the general knowledge model internalised by system members.

This discussion raises questions as to the content of the dominant knowledge model in the Arab world and whether it reinforces or hinders human development.

Most human systems possess common knowledge models that aim to protect the status quo and to entrench it in the form of conservative societal institutions, knowledge transmission mechanisms, and reward systems. Such models deter members of these societies from challenging the status quo and deprive them of opportunities for learning. From a developmental point of view, such learning is not useful and could be harmful. An example of this type of learning in Arab countries is the widespread culture of myths and the supernatural.

Controversy often springs up around what could be deemed useful versus harmful learning. The controversy, in fact, reflects the differing social interests behind these viewpoints. The only way out of this impasse is to adopt a decisive criterion.

In this case, it is suggested that the criterion be the extent of contribution to building human development, according to the definition adopted by this Report in Part I. This is the measure by which the elements of the Arab knowledge model must be judged, so that those features enhancing human development may be identified and fostered.

[1]The conversion of data to information requires processing such as evaluation and analysis.

[2]It is accepted that many technologies embedded in popular knowledge provide brilliant solutions to local problems. Consider, for example, the use of palm-tree stems in reinforcing buildings and roofs in Arab desert environments, which surpasses "modern" technologies in combating the harshness of the tough desert climate. This is also evident in the case of popular medicine in developing countries, especially in Latin America, where indigenous cures can have real commercial value. Several multinationals have rushed to possess this popular 'know-how', and convert it into monopolised knowledge through patents.

[3]The term "capital" is not limited to financial assets. The term in English means "man-made means of production" (Oxford Dictionary of Economic Terms, 1997).

level of society, between knowledge *wealth and knowledge capital*[3]. Knowledge wealth is the sum total of knowledge assets, or symbolic structures in society; knowledge capital is that part of knowledge wealth used in producing new knowledge, which in turn leads to the further growth of knowledge wealth.

The knowledge wealth of a given society extends, at least in principle, to the general, and ever-renewable, stock of human knowledge. However, two types of impediments hamper the free use of this stock. First, aspects of the institutional structure and the societal context of the knowledge system in the society itself can present internal obstacles. Second, features of the international context of knowledge acquisition can interpose barriers, as will be outlined in a later section.

Effective knowledge is knowledge that is widely disseminated, absorbed and used. The most fundamental driver of that process, on the individual or the societal levels, is *learning*. Individual and collective learning are two of the most important capabilities for building knowledge capital.

KNOWLEDGE AND HUMAN DEVELOPMENT

In the broad concept of human development, acquiring knowledge is a fundamental human *entitlement*. People, simply by virtue of being human, have a right to knowledge as a public good. At the same time, knowledge acquisition is also a *means* of achieving human development, since it enables people to enlarge their capabilities and widen their horizon of choice. Moreover, in the present phase of human progress, the acquisition, absorption and production of knowledge drive social and economic *transformation*. Knowledge can liberate individuals and societies from human poverty in a given cultural context and elevate them to higher planes of human existence. Thus, in human development terms, knowledge is multi-dimensional: an inherent human faculty and a basic human right, a human product and that which enhances what it means to be human in the first place.

In the developing world, knowledge acquired and expressed through education and learning, research and technological development, and literary and artistic forms in both popular and formal cultures -- together with the effective use of such knowledge in societal activities - will not only increasingly expand the frontiers of human potential. It will also be the means to enlarge the scope of human freedoms and to guarantee those freedoms through good governance and the promotion of equity and human fulfilment. Knowledge will thus serve the loftier goals of freedom, justice and human dignity.

As noted previously, knowledge has become an essential factor of production, and a basic determinant of productivity. There is a strong connection between knowledge acquisition and the productive capacity of a society. This connection figures prominently in high value-added production activities, which are increasingly based on knowledge intensity, and which lead to the rapid obsolescence of knowledge, technology and skills. Such activities are the mainstay of competitiveness worldwide, they will create the wealth of the future and they therefore constitute a major gateway to development for developing countries.

Yet in most developing countries, the knowledge system faces a dual crisis. On the one hand, the system itself suffers from the

Knowledge is multi-dimensional: an inherent human faculty, a human product and that which enhances what it means to be human.

BOX 1.3

Economic characteristics of knowledge

Knowledge has special features that determine its economic character.

Knowledge is non-spatial. It can traverse distances and borders at high speed, especially when digitised. Knowledge is also durable. It does not perish by being transferred from its owner to whoever demands it. This means that it can exist endlessly without any need for further production.

Some types of demand stimulate the reproduction of knowledge itself, at an additional cost to meet particular needs or preferences. Such preferences include reducing the cost of knowledge, or the time taken for its production, or its closer adaptation to the particular circumstances and resources of a society or its environmental requirements. Developing countries have a particular stake in expressing this latter preference, or taking adaptation into their own hands.

In practice, much knowledge is transferred to developing countries in forms originally developed for rich countries. This can reduce the value of knowledge transfers, and waste scarce resources. Such arrangements often burden poorer countries with additional and sometimes unjustified requirements, as in the case of conditions governing franchises. They can also impose requirements for expertise or capital assets not available locally. This reduces the benefits to developing countries of technology transfers owing to high transaction costs and the absence of domestic systems that would allow such countries to derive the maximum benefits from imported technology.

Hence the value of knowledge does not necessarily lie in its abstract content but rather in how much it can contribute to finding solutions to problems affecting a society at a particular time.

Source: Mohammed Mahmud Al-Imam, background paper for AHDR2.

In most developing countries, the knowledge system faces a dual crisis.

backwardness of the society of which it is an inseparable part, and its efficiency and impact are limited by restrictions emanating from its societal context. In some less developed societies, rooted constructs, concepts and precepts may actively hinder human development. Those symbolic structures need to be challenged by other knowledge structures that stimulate or enhance human development. Moreover, the elements of the knowledge system in developing countries are typically dispersed in various individual and non-formal forms. Dispersion makes it difficult to assess and manage knowledge wealth, let alone amalgamate scattered assets into an effective knowledge system built on firm knowledge capital.

On the other hand, the principal hope for overcoming underdevelopment and achieving competitiveness in developing countries is precisely a mobilised, well-organised and well functioning knowledge system. No other development investment promises greater exponential returns in an era of knowledge intensity and knowledge-driven competition. Cutting this Gordian knot is one of the most formidable challenges facing developing countries today.

SOCIAL DETERMINANTS OF KNOWLEDGE ACQUISITION

A society that does not clearly incentivise knowledge acquisition and use traps itself on the lowest rungs of learning.

The global stock of knowledge is renewable and grows ceaselessly. Yet its human, cultural and economic potential will not blossom in any country where the social climate does not actively encourage knowledge acquisition, dissemination, production and use. A system of knowledge can be sustained or stunted by the social soil in which it grows and by the surrounding regional and global environment. These conditions influence whether education, learning, R&D and literary and artistic expression flourish or fail and therefore whether productivity and human development prosper or not.

Regional issues take on special significance for Arab countries, whose small markets logically point towards greater regional integration. The dominance of the global economy poses different challenges. Experience suggests that attempts by each Arab country to belong to the world on its own usually result in that country assuming a marginal and dependent position.

A society that does not clearly incentivise knowledge acquisition and use through education, technical research and development and all kinds of literary and artistic expression traps itself on the lowest rungs of learning. A society that does not value knowledge highly does not provide for the knowledge acquisition system the necessary resources and social environment for its effective activity. The outcome is lower productivity and lagging human development.

The four most significant aspects of the societal context affecting Arab knowledge systems are: links with societal activities, especially production; the role of the state; the regional context; and the international environment. The first and second aspects are discussed next; the regional and international contexts are taken up in chapter 8.

Strong links between the knowledge acquisition system and societal activity

In a well functioning knowledge system, the enterprise sector (both public and private) and government and civil society organisations are dynamically connected. Such linkages energise the system and maximise its role in advancing productivity. For example, the modern conception of technological development demands a symbiotic link between societal activity sites and research institutions. This contrasts with the older, one-way view that technology is an *application* to society of scientific discoveries in research institutions. As a second example, the best education, especially in technical fields, cannot play a vigorous societal role without a strong connection to labour markets, firms, factories and enterprises.

A vigorous role for the state and all its institutions

This second aspect is particularly important in developing countries, where the "knowledge market" is traditionally notorious for failure. Knowledge, in the language of economics, is a public good whose producer does not necessarily capture all the returns on the initial investment. It is also non-rivalrous: its use by one party does not prevent others from using

it. As such, the returns to knowledge production accrue to society as a whole rather than exclusively to its producer.

Where knowledge is concerned, the relative weakness of the profit motive discourages profit-oriented enterprises from investing in knowledge production, especially in developing countries. Leaving knowledge acquisition entirely to the for-profit sector in less developed countries thereby risks reducing the supply of knowledge and depriving weaker social groups of its benefits. At the global level, this market failure can actively retard knowledge acquisition by developing countries and, as happens at the national level, leave the weaker social categories in those countries facing the greatest knowledge deprivation. The World Bank Report on Knowledge for Development (1998) emphasises these matters in more than one respect and concludes by stressing the decisive role of the state in developing countries in fostering efficient knowledge acquisition.

It is true that the for-profit sector plays a major role in the knowledge acquisition system in developed economies. However, the role played by the state remains pivotal, particularly in fostering basic research and education, areas that do not yield quick, tangible profits in developing countries yet which are indispensable to any vital knowledge acquisition system in the long run. In most developed countries, the role of the state was strongest during periods of nation building, a phase still in progress in most developing, particularly Arab, countries.

The role of the state is especially decisive in developing countries undergoing economic adjustments that excessively curtail the state's societal functions and services. At the same time, newer approaches to economic growth and development recognise that state activism does not stop at merely overcoming "market failure" but extends to taking initiatives in the public interest and becoming actively involved in knowledge acquisition and public innovation.

Ultimately, how dynamically a society participates in knowledge acquisition and how effectively such knowledge serves human development depends on societal structures: cultural, social, economic, and political. The presence and efficiency of key societal institutions are also key factors, as will be discussed later.

THE KNOWLEDGE SOCIETY

It is now understood that the cognitive assets of society -- knowledge and expertise -- and not its material assets -- raw materials or financial and physical capital -- increasingly determine its productivity and competitiveness.

State activism does not stop at merely overcoming "market failure" but extends to taking initiatives in the public interest .

The term "knowledge society" refers to this current phase in the evolution of human progress, as it is unfolding in advanced societies.

Specifically, the knowledge society is organised around the dissemination and production of knowledge and its efficient utilisation in all societal activities: the economy, civil society, politics, and private life, in a continuous quest to advance human development.

In such a society, knowledge plays a paramount role in shaping social structures; in influencing the performance of the economy, society and polity; and in changing the occupations and life-styles of its citizens as the knowledge content of their daily lives intensifies steadily. In a knowledge society, the number of workers in the knowledge system, as well as their share of the total work force, rises. In addition, the ratio of work time devoted to knowledge-intensive activities increases for all workers.

The cognitive assets of a society, and not its material assets, increasingly determine its productivity and competitiveness.

In economic terms, building the knowledge society in Arab countries means shifting towards a knowledge mode of production in place of the *rentier* mode of production[4] that currently dominates most parts of the region.

In a knowledge society, societal institutions belonging to the knowledge system, either as producers or disseminators, are many, varied and interconnected. The knowledge society guarantees a social context conducive to the vitality of the knowledge system. Eventually, a "knowledge culture" evolves, embodying values motivating the acquisition and use of knowledge. This culture is supported by effective societal incentives for disseminating and producing knowledge. In

[4]This applies to countries where economic value is basically derived from depleting raw materials, either directly in oil-producing countries, or indirectly in others through dependence on aid and expatriate workers' remittances from the former.

short, a virtuous circle develops between the effectiveness of the knowledge system and the extent of support it receives from the societal context.

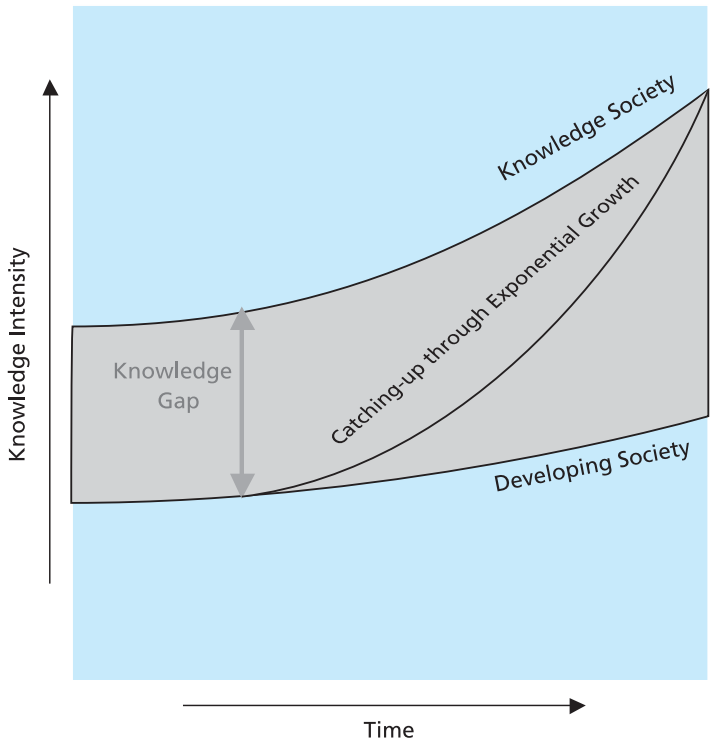
In other words, the challenge of knowledge acquisition consists of transforming society from a system that comprises some knowledgeable individuals to a societal system *fully* anchored in the production and dissemination of knowledge and its efficient utilisation in advancing human development

The knowledge society means instituting knowledge as the organising principle of human life.

As noted earlier, societies possess a huge amount of knowledge scattered in individual reservoirs in institutions, in people's minds and in a variety of media. Less formalised knowledge assets are implicit in the spontaneous activity of individuals and the popular culture of the society. Nevertheless, a rational societal leadership can mobilise uncoordinated institutions and dispersed knowledge through a deliberate societal programme. The potential dividends are handsome and will serve the strategic purpose of building human development.

To put this challenge in one sentence, the knowledge society means instituting knowledge as the organising principle of human life.

Figure 1.1
Bridging the knowledge gap through exponential growth in knowledge acquisition



To put it in a regional context, it can be said, without prevarication, that Arab countries are far removed from such a society.

Indeed, the divide between developing countries, including Arab countries, and knowledge societies is large and widening rapidly. Chapter 4, on the measurement of knowledge, reveals this gap clearly as reflected in the different performances of Arab countries and the East Asian "Tigers" in accumulating human capital.

Some analysts (e.g., Az-Zayyat, in Arabic, 2003) go so far as to maintain that if developing countries are to catch up with agile knowledge societies, they will have to pursue a path of *exponential* growth, (Figure 1-1). Adopting such a path is a tall order: it requires accelerating the dissemination, production and utilisation of knowledge in developing countries at rates faster than those which historically prevailed in today's knowledge societies. This steep gradient should be taken to indicate the seriousness of the challenges developing countries face if they seek to build the knowledge society starting from initial conditions today.

KNOWLEDGE ACQUISITION SYSTEMS

The conversion of knowledge wealth to knowledge capital and the efficient use of knowledge capital in producing new forms of knowledge requires two connected societal processes. The first is the dissemination of available knowledge, whereas the second is the production of new forms of knowledge in all fields: natural sciences, social sciences, the humanities, arts, literature, and all other societal activities. The efficiency of both activities rests on vigorous and efficient societal institutions and social processes.

These are complex systems reflecting the specificity of society, history, culture, and institutions. The success of these systems depends on the fluent exchange of knowledge among all units that produce and utilise knowledge such that the productivity of each unit, and of the societal system as a whole, is optimised.

The societal processes and institutions used in building and utilising knowledge capital in the dissemination and production of

knowledge vary and interact, especially in profit-seeking enterprises, which are expected to contribute effectively to knowledge acquisition, and in particular to technological development in a free market economy.

As a result of this multiplicity, the efficiency of knowledge dissemination and production depends on the organisational context that surrounds such processes and institutions and supports the relationships among them. The coherence of this *organisational context* is an important factor in building the knowledge society.

In less advanced societies, the organisational context surrounding the dissemination and production of knowledge is inefficient. Yet such organisation is the key to knowledge management, transfer, indigenisation and production. Both the state and the enterprise sector have a high stake in the efficiency of these organisational relationships.

Even so, the organisational context is only one component among the complex societal determinants of a successful knowledge system. It is the closest component to the functioning of the system itself. But it depends, in turn, on other important structures, which might seem farther away from the system but which have a stronger impact, positive or negative, on the formation of knowledge capital and knowledge wealth. The crucial structures governing the *societal* context of the knowledge system, particularly from the perspective of the Arab world, include the prevalent *culture, socio-economic structure,* and *political and legal context.* All of these exist in an influential *regional and global environment.*

Culture embraces several components, such as intellectual heritage, religion, and language. The socio-economic structure pertains to modes of production, growth and wealth distribution and to the societal incentive system associated with that structure. The political and legal context governs the processes and institutions of knowledge dissemination and production; especially important in this respect is the status of the key freedoms of speech, opinion and assembly.

All of these components are surrounded by, and subject to the *regional and global* environment of knowledge acquisition. This two-tier environment is especially relevant where Arab countries are concerned in light of escalating regional challenges and accelerating globalisation.

Figure (1-2) illustrates the elements of the knowledge system and the societal context that affects it as discussed in this Report. The numbered elements correspond to the Report's chapters.

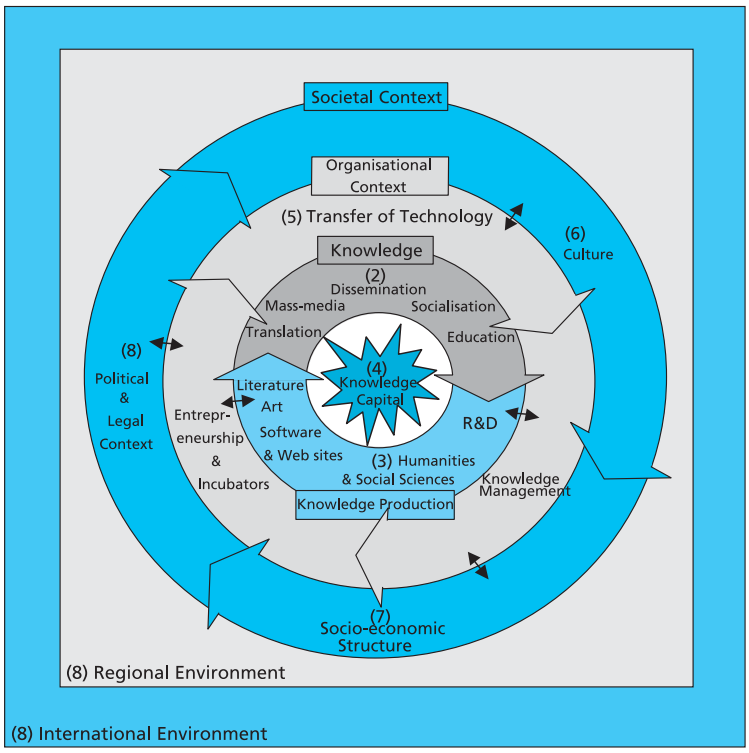
The diagram shows three rings that surround the heart of the knowledge system, knowledge capital, which is discussed in Chapter Four. All elements of the system are subject to two environments – the regional and the international – that influence them. Knowledge capital is circled by the two rings of knowledge acquisition - dissemination (Chapter Two) and production (Chapter Three). This knowledge acquisition subsystem is in turn surrounded by the organisational context for knowledge (Chapter Five). All the foregoing elements are surrounded by the cultural context (Chapter Six) and the socio-economic structure for knowledge (Chapter Seven). The last ring, the political context, and the regional and international environment, are discussed in Chapter Eight.

The establishment of a knowledge society in the Arab world, in the conceptual setting il-

Organisation is the key to knowledge management, transfer, indigenisation and production.

Figure 1.2:

The knowledge system: a schematic representation



lustrated here, poses considerable challenges, which are taken up in the Report.

ARABS AND KNOWLEDGE

A LONG, MIXED HISTORY LEADING TO CHALLENGES TODAY

Building the knowledge society in Arab countries reclaims one of the brightest treasures of Arab history.

The Arab world has a long and mixed history of knowledge acquisition. The first AHDR (2002) concluded that Arab countries have fallen far behind in acquiring knowledge, this now being one of the three main deficits impeding their human development at the beginning of the 21st century. Nevertheless, history tells us that Arabs, in previous epochs, contributed substantially to the production of knowledge and by extension to enriching the global stock of human knowledge. From this perspective, building the knowledge society in Arab countries reclaims one of the brightest treasures of Arab history.

This historical paradox raises an essential question: how can the Arab world truly internalize knowledge acquisition? How can the region move beyond merely importing scientific and technological products in the form of goods and services from companies and institutions abroad?

This question has preoccupied many scholars, intellectuals, politicians and others over the last two centuries. It represents the largest challenge facing the contemporary Arab world, which has not succeeded yet in indigenising knowledge as a social institution and an authentic cultural dimension.

The question is actually a cognitive challenge that concerns most developing countries. But in order to avoid over-generalisation it is useful to clarify some distinctive features of the Arab world, both inherited and acquired. Some of these features could help, while others could impede the successful indigenisation of modern knowledge.

THE ARAB KNOWLEDGE CIVILISATION: SOME SIGNIFICANT FEATURES

Islamic culture cannot be properly understood without investigating its scholarly character.

History shows that, with the beginning of the Abbasid state, a scholarly renaissance commenced, one hardly less important than that which transformed Europe during the 17th century. To understand this scholarly renaissance, some factors must be kept in mind.

The first is the role of the political and social authorities of the day in encouraging learning and providing the material requirements and the human capital for knowledge development. The reputations of the Abbasid Caliphs, who established libraries and observatories, were built precisely on this role. This state of affairs continued even after the disintegration of the caliphate and the division of the Islamic world into competing states, each with its own centres of scholarship. These new developments led to the creation of the "scholarly city" with its various and rival colleges. Looking at Baghdad during the mid-third century of the Islamic era reveals a city of thriving scholarship, with scholarly institutions representing various groups.

The second factor stemmed from the material and cultural needs of the new community. The vast new state, teeming with multiple cultures and systems, called out for development and unification. These two challenges prompted the resort to scientific scholarship. The extraction of groundwater, the digging of canals, the establishment of cities, the extension of roads, the organisation of ministries (*diwans*), the levying of taxes, the survey of lands and other activities led to the unification

BOX 1.4

A Cauldron of Cultures

"The rich legacy of Islamic civilizations, historians argue, is due in part to its exceptional absorptive quality and relative tolerance for different cultures and ethnic traditions of civilizations from southern Europe to Central Asia."

"Not merely translators, the Abbasids collected, synthesized and advanced knowledge, building their own civilization from intellectual gifts from many cultures, including the Chinese, Indian, Iranian, Egyptian, North African, Greek, Spanish, Sicilian and Byzantine. This Islamic period was indeed a cauldron of cultures, religions, learning and knowledge—one that created great civilizations and influenced others from Africa to China. This Golden Age has been hailed for its open embrace of a universal science, no matter the source—believing that there was not a "Christian science," "Jewish science," "Muslim science," "Zoroastrian science" or "Hindu science." There was just one science for the Abbasids, who were apparently influenced by numerous Qur'anic references to learning about the wonders of the universe as a way to honor God. Thus, reason and faith, both being God-given, were combined, mutually inclusive and supportive. Islam was anything but isolationist, and Abbasids connected to all cultural traditions, believing as they did that learning was universal, and not confined to their own domain."

Vartan Gregorian, Islam: A Mosaic Not a Monolith
President's Essay, 2001 Annual Report, Carnegie Corporation.

of calculation systems and the utilisation of algebra and geometry. *Sciences were applied to solving practical problems.* Moreover, religious duties, such as fasting, praying, and Hajj (the holy pilgrimage to Mecca) were accompanied by astrological research, which had a great impact on the progress of astronomy. The science of timing and the new social occupation of the "timer" led to the assimilation of scientific research in traditional culture. The development of mathematics and algebra was spurred by the appearance of new ministries and another new social occupation -- that of the scribe. Other examples of applied study can be cited in medicine, chemistry and mechanical engineering. Indeed, *science and its applications became a part of social practice*, through teaching and research. Scholarship was never marginal in the Islamic-Arab city, or in the popular culture. It was one of the main attributes of Arab culture even at the time of decline.

The third factor contributing to the scientific renaissance was that it was preceded by a renaissance in the humanities and the social sciences: specifically, in scholastic theology, linguistics, history, jurisprudence, religious exegesis and other disciplines. The rise of these scholarly fields paved the way for the development of mathematical and other sciences. To cite one example, *Kitab al-'Ain*, by al-Khalil bin-Ahmad, was the *first lexicographic work in history.* This work required scrupulous knowledge of phonetics as well as of the principles of combinatorial mathematics in order to draw up tables of words. In fact, several studies in the humanities raised questions that required drawing on or developing scientific answers. The rise of the humanities provided a large audience to those concerned with science and with language tools and it prepared the Arabic language to receive new forms of knowledge.

This *explosion of learning included all branches of knowledge at the time*; it did not favour some to the exclusion of others. Thus, it included theoretical branches and the applications related to the needs of the new community. *In this way, learning became an essential component of the popular culture*, and was not confined to matters of religion, language and literature. An appetite for knowledge became one of the hallmarks of Arab culture. It was evidenced by several anthologies exhaustively classifying old and new forms of scholarship, and it permeated popular culture as well.

The establishment of this new scholarly culture began with the transfer of the scholarship of the ancients, especially the Greeks. But on examining the scientific translation movement, particularly in astronomy and mathematics, another profound attribute becomes clear. *Translation is closely connected to scientific research and creativity.* The objective of the translation movement was not to establish a scientific library to enrich the palaces of caliphs and princes, but to *fulfil the needs of scientific research.* Without fully understanding this phenomenon, none of the outcomes of this movement, which undertook the most expansive translation of practical texts in history, can be appreciated.

Scholarship was never marginal in the Islamic-Arab city, or in the popular culture.

The translators themselves were leaders of the scholarly movement; indeed, some of them were among its universal authorities, such as al-Hajjaj bin-Mattar, Thabit bin Qurrah, and Qusta bin Luqa. Moreover, the choice of books and the timing of this choice were closely related to what was being researched. To take just one example, when Thabit bin Qurrah translated several books from Apollonius – the finest and most difficult writing in Greek geometry – he needed them in his new mathematical research, especially that related to calculating areas and sizes. The connection between scientific translation and advanced scientific research is not only an historical fact, but also explains why researchers active in astronomy and mathematics undertook so much translation in those fields. It also illustrates some of the attributes of linguistic translation.

Translation is closely connected to scientific research and creativity.

A far-reaching result of this meeting between two currents of study -- one in the humanities and languages, the other in scientific research -- was the rise of the scientific Arabic language. This new medium took two simultaneous paths, translation and creativity, reflected in the invention of new sciences unknown to the ancients. Perhaps the most important attributes of the new knowledge produced by Arab culture at this time were: 1) A new mathematical rationality; 2)

Experimentation as a pattern of proof.

The new rationality may be described in two words, algebraic and analytic, while the introduction of experimentation, by al-Hassan bin al-Haitham as a criterion of proof in physics research, profoundly influenced both the material and human sciences. Taken together, these historical currents illustrate that the Arab scientific renaissance produced, in its own time, a knowledge society in the full sense of the term.

The Arab scientific renaissance produced, in its own time, a knowledge society in the full sense.

Oddly, lessons learned from this history of indigenous and acquired knowledge during the early Arab scientific and linguistic renaissance were not enlisted when the modernization of science became a central question in the Arab world. Attempts at scientific modernisation by Muhamad Ali and Gamal Abdel Nasser during the 19th and 20th centuries respectively neither drew nor built upon this legacy. Instead, leaders turned to imitating what the West offered. Neglecting this heritage and settling for the pragmatic importation of science and technology from 19th century Europe – an approach that still dominates the minds of officials and reformist intellectuals today -- was a missed opportunity, historically, and likely created a significant *impediment to establishing a knowledge society in the modern Arab world*

THE ARAB KNOWLEDGE MODEL TODAY

The modern Arab world is the scene of myriad intellectual currents each with its own social, political and ideological direction and sources.

The modern Arab world is the scene of myriad intellectual currents each with its own social, political and ideological direction and sources. As in all other societies, these currents may meet intermittently without being subsumed into a single primordial frame of reference. There are Islamic fundamentalists and Islamic reformists. There are progressive, leftist, nationalist, liberal, technocratic and other intellectual movements. These movements are all variously reflected in writings on politics, history, society, economics, philosophy and science.

Such diversity of thought, though ostensibly a strength, also reflects a continuing crisis of identity and often results in conflict. This is the case despite the fact that Arab writers and intellectuals tackle common core issues -- backwardness and advancement, authenticity and modernity, the self and the other, the Arabs (Muslims) and the West. Such topics have persisted in writings and studies on Arab history, society and politics for more than a century. Indeed, to many, it appears that intellectual life in the Arab world has revolved around itself for several centuries without going beyond the self towards more productive and valuable fields of knowledge. When introspection succumbs to introversion, the wellsprings of creativity begin to run dry. A significant part of Arab intellectual endeavour seems to seek refuge in ideological headlines that either take the form of slogans to glorify and effect a nostalgic revival or that encourage self-pity, blame others for adversity and do not do justice to Arab societies.

These characteristics of intellectual output do not reflect any innate "inadequacy" in the "Arab mentality". Rather, they mirror a socio-political feature that is very common in contemporary Arab history, and which has a profound impact on culture, namely: – the dominance of the polity over intellectual products and their public reception.

The "self", the "other" and related concepts are deep structures requiring a close study of Arab sociology, history, and economics. Their depths are not easily fathomed amid a shifting reality. Yet it is clear that purveying general ideological statements, reducing complex reality and a rich past to a simple procession of glories and disgraces and venerating the heroic acts and struggles against humiliation of a few, do not yield accurate knowledge. One such (and all-too-common) example is simplifying the events of modern Arab history into a gallery of crude opposites: the authentic versus the inauthentic, local versus foreign, continuity versus rupture. Arab history in effect is narrated as though it had been solely one of alienation and corruption at a time when the Arab world had, in fact, witnessed valuable scientific, intellectual and cultural production, had experienced democracy, and had undergone momentous socio-political shifts. Failing to see history and heritage as living, ongoing and self-renewing human processes, where the march of progress is never complete, is misleading and therefore harmful to present and future generations.

It is worth noting the considerable intellectual contributions to social reform of the pioneers of the contemporary Arab renaissance through three schools in Egypt, Greater Syria and Arab North Africa. The Religious Reform school: Jamal ad-Din al Afghani, Mohammad Abdou, Abdelrahman Al Kawakibi, Abdelhamid Bin Badiss, Chakib Erslan, Allal Al Fasi; the Liberal school: Refa'a al Tahtawi, Ahmad Lutfi Essayed, Qassem Amin, Taha Hussein, Keireddin Al Tunisi, Al Yazigi and Al Bustani; and the Secular school: Shibli Shmayyel, Farah Antoun and Salama Moussa.

At this point in history, Arab countries face societal obstacles to knowledge production arising from ideological conflicts between different political currents. The conflict over the Islamicisation of knowledge is an example. This is because few Arab intellectuals are willing to focus on substantive issues relating to history and reality at the same time. Yet substantial gains would accrue to knowledge production from pursuing serious research on Sharia'a sciences, adopting a reformist scientific view. In fact, none of the characteristics or historical developments of Arab countries should be exempt from rational study.

Undoubtedly, there are certain structural impediments that constrict knowledge production in Arab countries. The cultural conflict between political currents over the Islamicisation of knowledge is one example. This conflict is tied to intellectual reluctance to discuss history and present-day reality together. Yet no essential characteristic or aspect of Arab society should be excluded from a scientific perspective. The question of research into history and heritage and the application of scientific and reformist approaches to that work, hold one of the keys to the production of knowledge and, therefore, to the knowledge society itself. Such questions should be the subject of collaborative thinking and study, not dissension or rancour.

In the final analysis, the Arab knowledge model, or the "Arab mentality", is a project, not a fixed construct. It is a model in the process of formation and, as such, it offers an historic opportunity that should not be missed. Arab countries will do well to indigenise science and knowledge as foundations of the Arab knowledge model in the continuing process of its formation.

BOX 1.5

Ahmad Kamal Aboulmagd: Towards a New Language of Faith

The current language of faith separates two worlds, both of which have been created by Allah, namely the World of the Texts (The Qur'an and the Sunnah) and the World of Life, with all human and non-human beings in it.

The first key of the new language of faith is that Muslims should know that belief in the metaphysical world does not negate the role of the mind; that the application of Islamic law is not enough to make one dispense with addressing human problems in all their social and economic dimensions; that Islam was not built on the ruins of the heritage of mankind; and does not strive to destroy and demolish the experience of peoples. Its basic function is to add to them the element of guidance and rationality and orient them towards what is good for mankind. In this new language of faith, new readings of the ancient teachings must emerge.

All the texts – at the top of which are the verses of the Holy Qur'an – are not another world to be added to this one. They are indeed witnesses to Allah's creation by Allah's own words. A Muslim is required to ponder on the Qur'an,, but he/she is also required to walk on the surface of the earth and ponder on the signs of Allah in mankind and in the furthest regions of the earth.

The law of Islam is not a system which is separate from people's ambitions and interests. It is – with all its sources – rather a means to realize those ambitions and protect those interests. All of it is justice and all of it is mercy. "Any question that goes out of justice into injustice, from fairness into inequity and from mercy to its opposite is not part of Islamic law, even if it was made part of it by interpretation".

Muslims are not separate from mankind at all. They are carriers of a message to mankind. As Muslims, they are witnesses to nations, but they remain on the same horizontal line with the rest of nations and peoples. Nobody owes them a favour, nor should they be haughty or conceited in dealing with others.

The comprehensive nature of Islam does not mean that the texts deal with every question of life, large or small. That is not only impossible, but also unacceptable, considering the freedom which Islam left to the human mind to move, interpret and decide.

The fact that Islam is eternal does not mean a "rigidity of its law". It means that it is able to renew itself and to innovate in response to the movement of life and its changing modes. The originality of Muslims and their excellence do not mean that they should be isolated from the rest of mankind, inward-looking in a closed circuit surrounded by a wall without doors. It means communication with people, living with them and, through that, conveying to them the loftier values and great principles upon which the doctrine of Islam, its law and ethical structure rest.

THE DEMAND FOR KNOWLEDGE

This chapter has previously considered some of the economic qualities of knowledge; this section analyses in more detail the issue of the demand for knowledge, the low level of which in Arab countries is one of the most serious restrictions on the production and diffusion of knowledge in society.

The "Arab mentality", is a project, not a fixed construct. It is a model in the process of formation.

Undeniably, knowledge supply can be a real constraint in developing countries, especially those where autocratic and absolute regimes restrict freedom of expression and the circulation of knowledge, ideas and information that are critical of authority. Yet there are good reasons to believe that the lack of demand for knowledge also curtails prospects

The price of knowledge rises with its transaction costs, which can be heavy.

for building knowledge societies in these countries

It may seem surprising that problems of demand are encountered in disseminating[5] a commodity whose main characteristics are that it is *non-rivalrous*[6] and *infinitely 'expansionable'*[7], as well as *aspatial -- weightless*[8]. A closer examination of the characteristics of knowledge demand in Arab countries reveals why such problems remain widespread.

SOURCES OF THE DEMAND FOR KNOWLEDGE

Sources of demand for knowledge vary in every community. Families demand knowledge as a way to invest in the human capital of their members, and to make social and economic decisions within the family. The state, civil society, and business sectors, public as well as private, demand knowledge in order to perform their respective functions. This demand grows stronger in proportion to the degree of rationalism in decision-making and the value placed on learning. In general, the major drivers of dissemination and demand are the institutional components of the knowledge system.

DETERMINANTS OF THE DEMAND FOR KNOWLEDGE

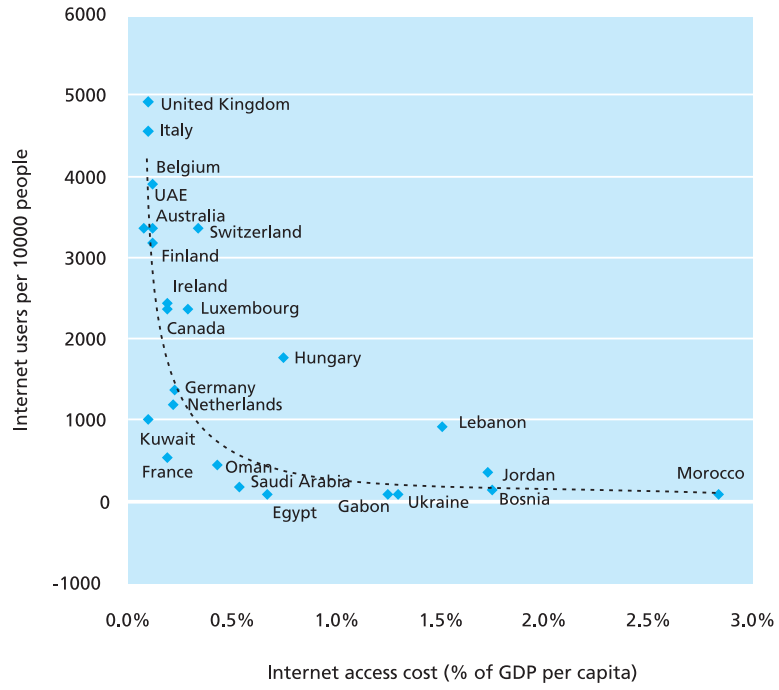
From a purely economic perspective, purchasing power substantially influences the demand for knowledge on the open market. Low incomes and the high price of knowledge, or the goods and services that embody knowledge, tend to curtail demand. In the Arab world, the majority of people have low incomes, while the cost of knowledge acquisition is high, especially if the commodity is directly imported or is produced locally using imported components. The price of knowledge rises with its transaction costs, which can be heavy. Rents paid to the producers of knowledge, to those who incorporate knowledge into commodities and services and to those who operate local monopolies[9] all bring up its cost.

Figure 1.3 shows the effect of cost on Internet penetration, which is a major means of spreading access to knowledge. It is quite clear that, in the Arab region, as in the world at large, the high cost of accessing the Internet is inversely linked to its diffusion.

The restrictive impact of high Internet access costs on the extent of its availability is illustrated in figure 1.4. High costs and the relatively limited availability of personal computers in the Arab world are reflected in low Internet usage compared to developed countries and South East Asia.

Generally speaking, demand for a commodity is shaped by the extent to which prevailing consumption patterns and their prices generate an appetite for particular goods and services. Some Arab countries are noted for their conspicuous consumption while basic needs often remain unsatisfied and costly to fulfil, because governments reduce the basic

Figure 1.3
Correlation between Internet penetration and Internet costs -- Arab countries and comparators



Source: International Telecommunication Union (ITU), 2002.

[5]Among the well-known examples is the limited dissemination of open-source software, such as "Linux", despite the fact that this operating system is free, effective and easily available. The impression that the software is difficult or unstable is not necessarily correct.

[6]Non-rivalrous means that the consumption of knowledge by one person does not reduce its availability to others.

[7]Infinitely 'expansionable' means that, no matter how high the cost of initial production, the cost of subsequent use is low.

[8]Aspatial or weightless refers to the ability of knowledge to cross borders, in particular if digitised.

[9] Consider, for example, the high costs of cellular phone services.

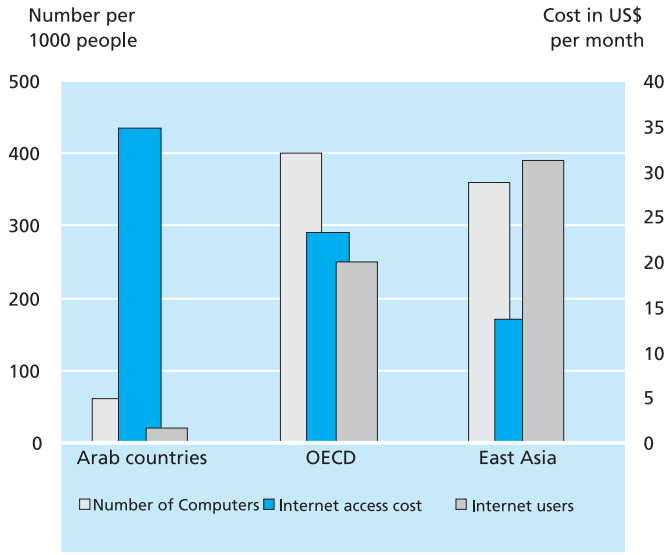
services they provide and the competition fails to provide better or more cost-effective alternatives. Not surprisingly, demand for knowledge, as embodied in goods and services, is declining. Imagine, for example, how public demand for Internet access competes with demand for health care.

In the case of knowledge, the characteristics and preferences of its potential users (decision-makers within families, the production sector, state and civil society institutions) largely determine the extent of demand. Arab families have always put great value on educating their children to the highest possible level in an attempt to raise their social status. Families have often been prepared to bear the high costs of education even if this severely strained their resources. This is evident when one considers the rising trend towards private tuition and private schooling in the region. On the other hand, in Arab countries, decision making within community institutions is often in the hands of older, authoritarian generations. In taking decisions, these generations mainly rely on traditional considerations that reflect their narrow affiliations and loyalties more than the broad scientific rationalism that requires decisions based on hard knowledge. In the last three decades, this problem has been compounded by the ascendance of money and power in the structure of societal incentives.

Reference has been made previously to how knowledge system institutions create demand for knowledge simply by playing their natural role. A vicious spiral of deteriorating knowledge supply is set in motion in communities with a poor knowledge system, curbing the direct demand for new knowledge. This is one of the most fundamental factors in the decline of knowledge in developing countries. The inadequacy of the knowledge system indirectly decreases the demand for it. Developing country decision-makers frequently complain, and rightly so, of the feeble support they receive from knowledge institutions when they turn to them for help.

Another shortcoming in the societal context in Arab countries that constrains knowledge demand is the widespread assumption that knowledge is not as effective as power or influence in solving social, economic and political problems -- or that it is simply beyond reach. Hence, decision-makers end up limiting themselves to deploying "traditional" methods and mechanisms. This is a further illustration of the weakness of developing country knowledge systems.

Figure 1.4
PC availability and Internet costs and penetration: Arab countries, OECD and East Asia, 2001



Source: World Economic Forum, 2002.

Coercion may succeed in suppressing or containing demand for knowledge more than any economic or social impediment. Certainly, when freedom is curtailed, knowledge is an early casualty and those who seek it apply it sparingly or learn to live without it.

Finally, another constraint is censorship of the Internet. This global media miracle, which originally arose to transcend borders and overcome distances, has fallen under the control of the censor in Arab countries. In Iraq for instance, it was not possible to access the Internet until mid-2000. Even after that, access remained limited. In one rich Arab country, the government closed 400,000 web sites after initially allowing access to the Internet in 1999. The increase in Arab Internet users in 2001 saw both restrictions on access and censorship of the Internet grow stronger once more (World Markets Research Centre, 2002).

The brakes on knowledge demand that have been cited here will be further discussed in Chapter 8, which addresses the political and legal contexts of knowledge.

There is a widespread assumption that knowledge is not as effective as power or influence in solving social, economic or political problems.

Coercion may succeed in suppressing or containing demand for knowledge more than any economic or social impediment.

About the journey towards the knowledge society

The following chapters of the report outline a cognitive journey that follows the contours of the conceptual framework briefly introduced in this chapter, a few of whose most important aspects were highlighted in their relationship to history and the Arab reality. The destination of this journey is a strategic vision for building the knowledge society in the region. This vision identifies the landmarks of societal reform, which precede the establishment of the knowledge society in Arab countries (Chapter Nine). The journey to this destination passes through two waypoints. The first (Chapters Two - Five) is an assessment of the present state of knowledge acquisition, dissemination and production, in Arab countries at the beginning of the 21st century. The second (Chapters Six - Eight) is an analysis of the features of the societal context affecting knowledge acquisition in the region at the present time, which considers culture, socio-economic structures and politics. Emphasis is placed on guaranteeing freedom under the rule of law, and the discussion culminates in a survey of the regional and international environment for knowledge acquisition.