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UNIT 1. WHAT IS KNOWLEDGE?

Knowledge has become perhaps the most important factor determining the standard of living - more than land, than tools, than labour. Today's most technologically advanced economies are truly knowledge-based.

Technology and knowledge are now the key factors of production

- Knowledge is the basic form of capital. Economic growth is driven by the accumulation of knowledge.
- While any given technological breakthrough may seem to be random, new technological developments can create technical platforms for further innovations, and that this technical platform effect is a key driver of economic growth.
- Technology can raise the return on investment, which explains why developed countries can attain sustain growth and why developing economies, even those with unlimited labour and ample capital, cannot attain growth.

What is the knowledge economy? "A knowledge-driven economy is one in which the generation and exploitation of knowledge play the predominant part in the creation of wealth". In the industrial era, wealth was created by using machines to replace human labour. Many people associate the knowledge economy with high-technology industries such as telecommunications and financial services.

More than 60% of US workers are knowledge workers!

Knowledge workers are defined as "symbolic analysts", workers who manipulate symbols rather than machines. They include architects and bank workers, fashion designers and pharmaceutical researchers, teachers and policy analysts. In advanced economies such as the US, more than 60 per cent of workers are knowledge workers.

Unlike capital and labour, knowledge strives to be a public good. Once knowledge is discovered and made public, it is shared with more users. The creator of knowledge finds it hard to prevent others from using it.

Know-why and know-who matters more than know-what

There are different kinds of knowledge that can usefully be distinguished. Know-what, or knowledge about facts, is nowadays diminishing in relevance. Know-why is knowledge about the natural world, society, and the human mind. Know-who refers to the world of social relations and is knowledge of who knows what and who can do what. Knowing key people is sometimes more important to innovation than knowing scientific principles. Know-where and know-when are becoming increasingly important in a flexible and dynamic economy. Know-how refers to skills, the ability to do things on a practical level.

A country's capacity to take advantage of the knowledge economy depends on how quickly it can become a "learning economy". Learning means not only using new technologies to access global knowledge, it also means using them to communicate with other people about innovation. In the "learning economy" individuals, firms, and countries will be able to create wealth in proportion to their capacity to learn and share innovation.

Intellectual capital is a firm's source of competitive advantage!

To become knowledge driven, companies must learn how to recognise changes in intellectual capital of their business. A firm's intellectual capital - employees' knowledge, brainpower, know-how, and processes, as well as their ability to continuously improve those processes - is a source of competitive advantage. But there is now considerable evidence that the intangible component of the value of high technology and service firms far outweighs the tangible values of its physical assets, such as buildings or equipment.

How do we measure a firm's intellectual capital? How can a firm tell whether its knowledge assets have increased or diminished over a certain period of time? According to Strassman, intellectual capital is what is left over after suppliers, employees, creditors or shareholders and the government have been paid, and obsolete assets replaced.

What about information and communication technologies (ICT)? ICT are the enablers of change. They do not by themselves create transformations in society. ICT are best regarded as the facilitators of knowledge creation in innovative societies. The new economics looks at ICT not as drivers of change but as tools for releasing the creative potential and knowledge embodied in people.

The rate of technological change has greatly increased over the past thirty years. There can be no doubt that the cycle of technology development and implementation is accelerating and that we are moving inexorably onward, out of the Industrial Age and into the Information Age.

With the advent of information and communication technologies, the vision of perfect competition is becoming a reality. Consumers can now find out the prices offered by all vendors for any product. New markets have opened up, and prices have dropped.

Competition is fostered by the increasing size of the market opened up by new technologies. Competition and innovation go hand in hand. Products and processes can be swiftly imitated and competitive advantage can be swiftly eroded. Knowledge spreads more quickly, but to compete a firm must be able to innovate more quickly than its competitors.

In a global marketplace where consumers are overwhelmed by choice, brand recognition assures their trust in both the tangibles and intangibles that a product will deliver. Like intellectual capital, brand equity can be hard to measure yet it may account for a significant proportion of a company's value. It is intangible in the sense that it often consists of customers' perceptions of the value they gain from using a product or service rather than any measurable benefit.

THE KNOWLEDGE ECONOMY

The knowledge economy, as Prime Minister Tony Blair of Great Britain has said three years ago, is really about one economy. There is, he says, "no new economy...there is one economy, all of it being transformed by information technology...it is a profound economic revolution."

What this means is that business must be in a constant process of change and adaptation to the new economic realities. In this new economy, it is evident that the key to success is "knowledge". For governments they are going to have to invest in, and develop, knowledge workers. This is going to mean that government budgets must allocate funds for skills development and education. What is important to realize, from the perspective of knowledge as a capital tool, is that the Internet has tipped the scales in favour of both businesses and governments. For example, for scientists in business and government, the Internet is a major tool to assist in the sharing of research and the findings. Scientists can now do this in an increasingly global environment. Exchange of research and ideas has accelerated innovation, inventions, and creation of new goods and products, at a rate never before known in human history.

The rapid development of the Internet has resulted in an escalation of the global economy. This globalisation has had a profound impact on both the economies of nations and the pressures on countries to compete effectively in this new global environment. Globalisation of the economy has also raised new issues of nationalism and protection of local culture. Yet, the pressures for change, brought by this new phenomenon, have also meant that countries can compete on a global scale. In this new environment two of the most important commodities of a nation are becoming information and knowledge.

Globalisation has been spurred on by the Internet, which operates 24 hours a day, 7 days a week. In this new environment, it will be important for governments to develop mechanisms to encourage the private sector, and public sector research organizations, to be innovative and able to deploy knowledge. Increasingly, as Prime Minister Blair has pointed out, more and more individuals and companies are engaged in businesses that are connected to the Internet. In 1999 it was estimated that Britain was the leader in e-Commerce in Europe, spending 2 billion online. But this is not just about the Internet, or e-commerce. The Knowledge economy is about how the new technologies have transformed the way we think and act, and the ways in which we use the Internet which is transforming our world economies.

Yet, despite the benefits of the transformed world economies, there are the deeper issues as to whether or not many of the developing nations can also benefit. The digital divide, economies of scale, trans-global organizations dominating the world markets, powerful economic engines of a few rich countries, and other concerns, can leave the impression that the gap in the world between the rich and the poor will widen over time. There is an argument to be made that the gap will widen over time if developed countries and international organizations do not move faster to narrow the gaps and bring in policies that will benefit all the peoples of the world. The evolving, powerful new technological tools, and the Internet are media that can be harnessed to

benefit developing countries. But this cannot happen in a vacuum. To succeed in the knowledge economy there are certain very basic policies that are needed. The first is to create a cultural change within the institutions of the country.

It is essential for any country, in developing structures for their knowledge-based economies, to develop their own best practices based on their history and cultural development. This is an important principle to understand as, for any country to succeed, it must, by necessity, rely on its own internal understanding and the wisdom of its culture. Many countries see globalisation as a threat to their cultures. To many in the world, globalisation benefits the rich and powerful nations and is perceived as another form of colonialization. Obviously, individual countries are the ones best suited to change their own culture. But, the lesson is the same, for any country to transform itself into a viable, knowledge-based economy, internal, institutional change will be crucial.

One of the prime tools a government needs, in order to embrace as much of their citizenry as possible, is wide access to both the Internet and Information and Communication Technologies (ICT). Thus, to achieve this, connectivity programs, funded by government, are necessary. In many countries, raising the overall literacy of the population is a primary goal.

This is essential for the development of knowledge workers at all levels of society. Importance is placed on computer literacy because it is now estimated that over 60% of production is created by knowledge workers. Technology pervades our lives, from the kitchen, to our means of transportation, to the workplace.

To thrive in the global knowledge economy it is going to be important to change the whole educational system to ensure a wide base of knowledge workers who understand and use these information technologies. Thus, education is a key, in order to ensure the skills for the knowledge economy exist in abundance. It is important that there be an army of skilled technical experts who understand and can apply technical knowledge. These workers are the underpinnings of the knowledge economy.

Part of the challenge in allowing wide access to the rich resources that exist through the Internet and other ICTs, is ensuring that there are sufficient opportunities for businesses to be online. There need to be programs to fund businesses to get them online. This is an important lesson many of the developed countries have had to learn. Getting businesses online is not just ensuring wide access to the Internet. It also requires extensive educational programs so business leaders understand the opportunities and benefits of having an online presence. This is important so that they can take advantage of the world as a potential customer.

DISCUSSION LEADER

The discussion leader's job is to ...

- read the text twice, and prepare at least five general questions about it;
- make sure that everyone has a chance to speak and joins in the discussion;
- guide the discussion and keep it going.

Usually the best discussion questions come from your own thoughts, feelings as you read.

MY QUESTIONS:

OTHER GENERAL IDEAS (Questions about the theme):

SUMMARIZER

The summarizer's job is to ...

- read the text and make notes about the ideas.
- find the key points that everyone must know to understand and remember the text.
- retell the text in a short summary in your own words.
- talk about your summary to the group, using your writing to help you.

MY KEY POINTS:

MY SUMMARY

WORD MASTER

The word master's job is to ...

- read the text, and look for words or short phrases that are new or difficult to understand, or that are important in the text;
- choose five words that you think are important for this text;
- explain the meanings of these five words in simple English to the group;
- tell the group why these words are important for understanding this text.

Your five words do not have to be new or unknown words. Look for words in the story that really stand out in some way. These may be words that are:

- repeated often;
- used in an unusual way;
- important to the meaning of the text.

MY WORD: 1. _____

MEANING OF THE WORD

REASON FOR CHOOSING THE WORD

MY WORD: 2. _____

MEANING OF THE WORD

REASON FOR CHOOSING THE WORD

MY WORD: 3. _____

MEANING OF THE WORD

--

REASON FOR CHOOSING THE WORD

--

MY WORD: 4. _____

MEANING OF THE WORD

--

REASON FOR CHOOSING THE WORD

--

PASSAGE PERSON

The passage person's job is to ...

- read the text, and find important, interesting, or difficult passages;
- make notes about at least two passages that are important for the text;
- read each passage to the group;
- ask the group one or two questions about each passage.

You might choose a passage to discuss because it is:

***important *informative *confusing *well-written**

MY PASSAGE: 1

REASONS FOR CHOOSING THE PASSAGE

MY PASSAGE: 2

REASONS FOR CHOOSING THE PASSAGE

QUESTIONS ABOUT THE PASSAGES

TRANSLATE THESE QUOTATIONS AND COMMENT ON THEM:

KNOWLEDGE

- You don't know how much you know until you know how much you don't know.-Anon.
- It is nothing for one to know something unless another knows you know it.-Proverb
- Men can acquire knowledge, but not wisdom. Some of the greatest fools ever known were learned men.-Proverb
- I find that a great part of the information I have, was acquired by looking up something and finding something else on the way.-Franklin Pierce Adams
- Man knows more than he understands.-Alfred Adler
- I think knowing what you cannot do is more important than knowing what you can.-Lucille Ball
- We have more information now than we can use, and less knowledge and understanding than we need. Indeed, we seem to collect information because we have the ability to do so, but we are so busy collecting it that we haven't devised a means of using it. The true measure of any society is not what it knows but what it does with what it knows. Warren Bennis
- It is what we think we know already that often prevents us from learning.-Claude Bernard

- Knowledge is the small part of ignorance that we arrange and classify.-Ambrose Bierce
- Knowledge is an unending adventure at the edge of uncertainty.-Jacob Bronowski
- To me the charm of an encyclopedia is that it knows and I needn't.-Francis Yeats Brown
- Never mistake knowledge for wisdom. One helps you make a living; the other helps you make a life.-Sandara Carey

IDIOMS RELATED TO INTELLIGENCE - UNDERSTANDING

- common knowledge

When information is well-known to everyone (particularly in a community or group), it is called common knowledge.

You didn't know the intern was Jack's son? It thought it was common knowledge.

- credibility gap

The extent of disbelief, of the difference between what you are asked to believe and what you are able to believe, is call a credibility gap.

The growing credibility gap may lead to a serious loss of votes in the next elections.

- at cross purposes

If two people are at cross purposes, there is a misunderstanding as to what each one is talking about.

Look, we seem to be at cross purposes. You're talking about 'sailing' boats, but I'm talking about 'selling' boats.

- crystal clear

A statement or expression that is easy to understand or has an obvious meaning is crystal clear or as clear as crystal.

There was no need to repeat the instructions. They were crystal clear.

- dumbing down

If something, such as a television program or a film production, is dumbed down, it is deliberately made less intelligent or less demanding in order to attract a larger audience.

Some TV channels are dumbing down their programs in an attempt to increase their audience ratings.

- enough said

This expression is used to indicate that you completely understand the situation and you do not need any further details.

Your mother-in-law arrived unexpectedly last night? Enough said!

- eyes (wide) open

If you do something with your eyes open, you are fully aware of what you are doing.

I took on the job with my eyes wide open so I'm not complaining.

- facts speak for themselves

When the facts of a situation are so clear that no further explanation or extra details are necessary, the facts speak for themselves.

No need to tell you that the situation is disastrous. The facts speak for themselves.

- get someone's drift

If you get someone's drift, you understand in a general way what they are trying to say.

I didn't understand every word but I got the drift.

- get the message

If you get the message, you understand what someone is trying to tell you, even if it is expressed in actions or gestures rather than words.

When Tony pointed to his watch, I got the message - it was time to leave for the airport.

- get the picture

A person who gets the picture understands what is being explained or described.

The alarm went off and people started running everywhere - you get the picture I'm sure!

- get wise to

If you get wise to something, you learn something that you were not aware of before.

He finally got wise to the fact that children were stealing apples from his garden.

- hammer something home

If you hammer home a point or an argument, you repeat it often to make sure that it is fully understood.

The police hammered home the dangers of drinking and driving.

- hit the nail on the head

When you hit the nail on the head, you are absolutely right about something or have guessed the exact nature of a problem or situation.

You hit the nail on the head when you said Mark had money problems. He's lost his job.

- horse sense

Someone who has horse sense is a practical thinker who has the ability to make sensible decisions.

Don't worry. Andrew has good horse sense. He'll do the right thing.

- ignorance is bliss

This means that if you don't know about a problem or unpleasant fact, you won't worry about it.

I didn't know our neighbor was an escaped prisoner until the police arrived - ignorance is bliss!

- jump to conclusions

A person who jumps to conclusions reaches a decision or makes a judgement too fast, before taking the time to check out all the facts.

We haven't got the full story yet so let's not jump to conclusions.

- know which side your bread is buttered

If you know which side your bread is buttered, you know where your interests lie or what will be to your advantage.

Jack never argues with his father-in-law. He knows which side his bread is buttered.

- learning curve

The length of time needed to learn something new is called the learning curve.

The new system has a long learning curve so we'll have to give the staff time to get used to it.

- light bulb moment

A light bulb moment is when you have a sudden moment of inspiration, comprehension or realization.

Harry had a light-bulb moment when he finally realized what was blocking the mechanism.

UNIT 2. SCIENTIFIC KNOWLEDGE

Science is a vast subject. Different scientific knowledge can be divided into two parts according to the nature of the origin of that particular knowledge:

- Laboratory Proven Scientific Knowledge:

Isaac Newton discovered the gravitational force and worked on to find out the nature of that force, he derived the three famous laws of force. These 3 laws can be practically proven at a well-equipped laboratory.

- Assumption Based Scientific Knowledge:

Albert Einstein is regarded as one of the most accomplished scientists in history; but the law of mass-energy for which he is so famous is based on pure assumption. $E=mc^2$, the famous formula derived by the great scientist cannot be proved at any laboratory as it is impossible to achieve the speed of the light.

When it comes to different forms of scientific knowledge, it means in how many forms the scientific knowledge can be described or imbibed. What people read in science textbooks is the result of the valiant effort of the scientist, who spent their whole life at laboratories to invent or derive something new or unknown. We are reading the result of their effort. The conclusions they derive or what we are reading in our text books are of two types; first one, what they proved in the laboratories and the other is what they assume.

There are many doubts that emerge during the search for personal knowledge. Doubt is one of the elements of personal knowledge. Let's admit that it is healthier to understand things than to learn them. But, of course, one has to place certain limits on personal knowledge as there are things that we don't understand but we accept them because they are generally accepted. To this extent our personal scientific knowledge is more limited than general scientific knowledge.

ARGUMENTS

The word "argument" has different meanings in different contexts. In philosophy, an argument is the set of reasons offered to get you to believe something. Sometimes "argument" refers to just the premises, as in "You think X? What's your argument for that?" Sometimes it refers to the premises plus the conclusion they're supposed to get you to believe. To understand philosophy you must find the arguments contained in what philosophers say and write. You must, in other words, find what it is they want you to believe, and what reasons they're giving you to believe it. It's not that hard to do. As you read, just keep asking yourself what the author is trying to persuade you of—what is the main point being made? And what reasons are being offered in favor of it? Once you find the arguments, you must then evaluate them; that is, check and see whether they're any good. To evaluate an argument, the first thing you need to notice is what type of argument it is. There are two main types of arguments: inductive and deductive.

Let's consider the basic structure of the most comprehensive and effective deployment of inductive reasoning in human history. Since its development during the Renaissance, modern science has contributed significantly to our ability to perceive, understand, and manipulate the natural world. Taken generally as a way of acquiring human knowledge, science is a procedure for the invention and evaluation of hypotheses that may be used to explain why things happen as they do. Unlike dogmatic appeals to the absolute, unchallengeable truth of unsupported assertions (as, for example, when a parent tells a child, "Because I say so, that's why."), scientific explanations are always tentative proposals, offered in hopes of capturing the best outlook on the matter but subject to evaluation, modification, or even overturn in light of further evidence.

The conclusion of the argument must be true if all of the premises are true. Those of its premises that state the antecedent circumstances will naturally be true so long as we have our facts straight. But the truth of the hypotheses, which try to capture the lawlike relationship between those circumstances and the event to be explained, will always remain open to question. So the quality of the explanation as a whole typically rests upon the extent to which these hypotheses are reliable. Although it always remains impossible in principle to prove the truth of a scientific hypothesis, it is possible to compare the distinct hypotheses involved in rival explanations of the same event.

The most productive model for the structure of a scientific explanation is that of a valid deductive argument. Some of the premises of this argument will be factual statements of the antecedent circumstances, while the others will be the scientific hypotheses offered as a way of linking those circumstances to the outcome stated by the conclusion. Scientific predictions have exactly the same structure; the only difference between the explanation and the prediction of an event is whether or not it has already occurred.

Deductive arguments try to prove their conclusions, that is, they try to show that the conclusion is absolutely true. This is a much higher standard of persuasion, and difficult to meet. If you can make a strong ("sound") deductive argument, you can set aside your doubts:

Premise 1: All men are mortal.

Premise 2: Socrates is a human.

Conclusion: Socrates is mortal.

Premise 1: If the moon is made of green cheese, then the sky will fall this year.

Premise 2: The moon is made of green cheese.

Conclusion: The sky will fall this year.

Keep in mind that an argument can be valid even if its premises and conclusion are false. Valid form isn't enough, by itself, to make an argument good! An argument should be sound, as in the following example:

Premise 1: In every Wes Craven horror movie, at least one character gets killed off.

Premise 2: Wes Craven has made at least five horror movies.

Conclusion: At least five characters have been killed off in Wes Craven's horror movies.

Inductive arguments try to give you reason to believe that something is probably true, or most likely true:

Premise 1: This crow is black.

Premise 2: That crow is black.

Premise 3: Every crow I've ever seen is black.

Conclusion: All crows are black.

The premises of this argument do not prove that its conclusion is true. We can strengthen the argument by adding more premises, like this:

Premise 1: This crow is black.

Premise 2: That crow is black.

Premise 3: Every crow I've ever seen is black.

Premise 4: I've traveled around the world examining crows and only found black ones.

Premise 5: I've asked everyone I've met, and they've all reported that all the crows they've seen are black.

Premise 6: I've read every book ever published about crows, and they all say crows are always black.

Conclusion: All crows are black.

But still the conclusion is not absolutely guaranteed to be true. We must admit that even if all the premises are true it's still possible that somewhere there was a white crow, or a red one, that nobody noticed.

Logic is a very effective tool for persuading an audience about the accuracy of an argument. However, people are not always persuaded by logic. Sometimes audiences are not persuaded because they have used values or emotions instead of logic to reach conclusions. But just as often, audiences have reached a different logical conclusion by using different premises. Therefore, arguments must often spend as much time convincing audiences of the legitimacy of the premises as the legitimacy of the conclusions.

For instance, assume a writer was using the following logic to convince an audience to adopt a smaller government: