On the double meaning of 'information' and the work of knowledge

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Past few decades have seen the emergence of new information and communication technologies (ICTs) and the scale and nature of changes it has brought about has been described as 'information revolution'. At the most basic level, this technological development consists of the capacity of transforming texts, sounds and images into sets of ordered signals that can be recognized by computers and which can be transmitted over long distances and recombined again to reproduce original texts, sounds and images. This technology also facilitates easier manipulation and duplication of texts, sounds and images.

In late sixties and seventies, some theorists noted the changing occupational structure of advanced industrial society. More and more people were using their brains rather than muscles in their work. The economic changes of the time required a workforce with a larger component of people with linguistic, mathematical and technical competence as compared to the era of assembly lines. Some theorists saw these changes as harbingers of an 'information society' which will be more open, democratic, inclusive and less dependent on the drudgery of mindless repetitive work.

Then came globalization, with its flourishing financial markets and reorganization of the global economy. Cheap PCs became widely available. Internet developed as an unprecedented communication and information network. From being a preserve of academic institutions, activist sub-cultures and the like, Internet moved to become a means of commercial, media, and political activities. Organisations and institutions of all kinds reorganized their word processing, information management, and communication activities based on this new infrastructure, which had the added dimension of offering instant connectivity in global terms. These developments taken together heralded what was dubbed the 'Information Age' and the theory of 'information society' came of age in the form of a theory of 'network society'.

All these changes have finally led to the discourse of a knowledge-based society. Industrial society is seen to be undergoing a fundamental change resulting in the formation of knowledge society. The idea of 'information society' or 'knowledge society' often takes advantage of an implicit normative ideal of what may be termed as 'well-informed society' or 'knowledgeable society'.

While this serves as a convenient ideology for those riding the waves of current changes, serious questions have been raised about the implications of these changes for world society and its future. Sunil Sahasrabudhey in his note on "Dialogues on knowledge in society" sees a shift in the ground of knowledge associated with the increasing use of ICTs. The central position of science as the source of authoritative knowledge is being ceded and the emerging knowledge society is seen as bringing about a new regime of knowledge with ambiguous consequences for re-emergence of what is called 'lokavidya'. In this context, this seminar is a welcome move to begin examining the questions associated with knowledge in society.

In this note, I examine the two meanings of 'information'- one from the social context and another from the technological context – and try to show that a play on the ambiguity in the meanings of 'information' allows the building of an ideology of 'information society' or 'knowledge society' that seeks to draw our assent and to tie our hopes to the current global developments. Flowing from these two strands of 'information' we encounter two different spheres for our reflections on knowledge in society – one closely associated with the development of ICTs and the other associated with broader changes in the field of knowledge

and society. It is the latter, in my analysis, which holds greater importance for the future of lokavidya.

ICTs as infrastructure of global integrations

Globalisation is marked not only by integration of national economies to the global economic structures dominated by advanced industrial nations, but also by integration of different domains of society – business, government, NGOs (altruistic, voluntary initiatives), politics, media and knowledge (science, academy, information, policy). There is also an integration of these elite at the global level. ICTs provide a common infrastructure for these integrations. If you do not use ICT, you may be left out of this globally developing network society, which exists as part of the world society. The world society is marked by national boundaries. You risk a fortune or even your life if you want to transgress these boundaries. Not so for those who are part of the global network society. They, and their fortunes, move with ease across borders. If we look at the multi-tiered UN structure, the world society begins to reveal itself as a system of global apartheid. The world society with its inter-state and inter-national structures is absolutely essential for the current global structures to play on. If the world were truly globalized, balance of payments and national debts would not exist as meaningful categories. In fact, the most global of all global entities - the currency markets - wouldn't know how to exist but for the existence of multiple national economies. Moreover, the national governments have the task of managing the national societies.

If netizens and citizens are defined solely in terms of access to internet, it is not a very meaningful distinction. Is the army of call center workers part of the netizen world or not? Railway reservation clerks, occasional surfers etc. can hardly be called netizens. What matters is whether you are a part of the global network society.

Knowledge-institutions are finding their place in the network society. They are breaking stronger bonds – in some cases from governments – and establishing new ones to function in the larger network of business, NGOs, etc. In this task, it is essential for them to adopt the infrastructure of ICT and be networked in order to stay in circulation.

Paradoxes of knowledge-society

Creation of a knowledge-based society, learning society, information society (these are concepts from the same family) mainly by means of new ICTs forms an important part of national and global development goals. This has two components:

- The goal of adapting national economies to global dynamics of business
- A developmental or transformative goal of moving towards a better informed or more knowledgeable society.

World Bank has redefined itself as a knowledge bank. A few years ago the World Bank organized a Global Knowledge Conference in order to contribute to the task of building Global Knowledge Society. As a prelude to the conference, they had set up an electronic mailing list with more than a thousand participants contributing to a discussion on the theme of building knowledge societies. Most of the contributions described efforts to use new information and communication technologies (ICTs) in remote rural areas or among the poorer sections of urban populations – these efforts normally fall under the description 'ICT for Development'. When someone raised a question regarding the lack of any discussion on knowledge as such, a few interesting contributions came in response. Soon afterwards the discussion was back on the track of 'ICT for Development' thereby showing that adopting newer technology does not necessarily result in new knowledge practices.

The question is not about the need or use of ICTs in development efforts. Rather, it relates to the assumption that a society using more of ICT is by definition a better informed society. The U.S. is the society with highest spread and concentration of ICTs. Has it become a well-informed or knowledgeable society? Ignorance of American citizens about the rest of the world is evidenced in a variety of anecdotes and the nature of news media. The U.S. is a society in crisis in terms of crime, schooling, relationships. It is the greatest source of instruments and innovations in violence. Even in scientific literacy, the U.S. citizens fare poorly, as several studies have shown. Here, we begin to glimpse the paradox in the conception of 'information society' or 'knowledge society'.

The paradox can become even more glaring. E-learning is being promoted with great vigour and is considered a measure of development. The flesh-and-body teachers are being retrenched. No, it is not the same old story of technology taking away jobs. Society is undergoing a major reorganization. The Welfare state and social democratic ideals are supposed to obstruct the new dynamic of global circulation of capital, technology, people. But in promoting e-learning we are ignoring the knowledge gained over decades (may be centuries!) regarding the importance of teacher-student interaction in learning.

Great amounts of information are now flowing through networks at high speed. Then why is the knowledge, which has already been accumulated, being ignored? Is all the knowledge gained through research and experience being made use of to avoid the social and environmental catastrophes staring us in our face? How should this knowledge be organized and communicated? These are some of the questions that arise.

Two meanings of 'information'

How did the assumption that societies using more of ICTs are well-informed societies found a ground to grow? In some way or the other, all theories of information society, knowledge society, information revolution, information age incorporate this assumption which lends force to these theories by adding a transformative content to them.

There are two meanings of information:

One is the everyday meaning of information as a bit of knowledge. Right kind of information can enhance our understanding and bring clarity to our course of action. This is the meaning implied when we talk of an 'informed society' or having better information. This meaning has evolved since the advent of modern states in Europe. Information of this kind finds its meaning in the context of knowledge.

The other meaning of information is the one associated with technology and can be traced to the information theory propounded by Shannon and Weaver in late forties and fifties. Without going into precise definitions, we can say that information here means the ordered procession of signals in a transmission network. The information in this context is not meaningful information, and has been understood as syntactic rather than semantic. Information of this kind finds it's meaning in the technological context of translation, transmission, and reproduction of signals.

The two meanings will surely be intertwined if we explore the history of ideas. In fact, the category of 'information' plays important role not only in theories of information society, but in various fields like biology, linguistics, library science, education, and even physics.

I am proposing that a slippage from one meaning of information to the other makes possible the theories of information and knowledge societies. This slippage may be pervasive even in other fields of enquiry enumerated earlier.

Proliferation of representations

The latter, technological, meaning of information refers to the reducibility of all symbolic communication to 'ordered procession of signals' and their reproducibility. While text, sound, image can be thus broken down and reassembled; smell, touch, and taste among the senses are not reducible thus.

This leads first of all to a cultural environment dominated by text, sound and image. I speculate that effortless circulation of disembodied text, sound and image leads to a 'world of representation, structure and meaning', which can be read in many, even playful, ways. While the technology does an accurate job of reproducing the symbolic media according to physical parameters, meaning of messages thus transmitted is open to interpretation. Junk cars used by the poor people in Hollywood movies may evoke visions of prosperity in an Indian audience.

Is the world of things and forces being replaced by a world of representation, structure and meaning? Is imagination making a comeback? I doubt. Social knowledge has been relativised, natural knowledge remains separate and under the absolute authority of science. The division between cultural studies and natural sciences remains. This division is even reinforced by ICTs. We can work with the meaningful symbols without ever knowing about how computers work. Software constitutes the interface between the humans and the hardware. Open source programming, by insisting on blurring the distinction between users and producers of software knowledge, is a development that has to be examined in this context.

Virtual reality offers a space of play, creativity and easy manipulation and duplication of symbols and images. And dissent. At a deeper level, it attracts us by the possibility of choosing a reality to live in, at least seemingly so. After science was disciplined and institutionalized in the 19th century, scientists could play around with ideas and pursue 'knowledge for its own sake', while all knowledge they created was routinely used by the society or corporate body supporting research. Similarly, it seems to me, virtual reality offers a much larger space for much larger number of people to explore a world of meaning, structure and representation. Of course, it is only a secondary function of ICTs, primary one being to function as the infrastructure of network society.

Organization of meaningful information

For ICT to function as infrastructure or as a technology of information, it has to be embedded in information systems. Meaningful information has to be organized through information systems; mere technology is not enough. Now we are talking of information in the social context as a bit of knowledge. Information systems are ways of organizing, classifying and accessing information. The design of information systems depends on many factors but above all on the purpose and the potential users of that system. Any organization of information will reveal certain things and conceal other things, purposely or unwittingly. A company or a government department might organize information in such a way that one set of information is kept separate from another set to conceal the interconnections. An academic library will organize information according to academic disciplines, which will make it difficult for somebody to access or browse all information on topic that cuts across disciplines.

There is a tendency in the field of information organization to think that the complex text searches made possible by computers has made information systems redundant. This, to my mind, is not tenable.

An information system, then, has to be placed within an institution. Institutions have their own purposes, visions, cultures and objectives. An excellent information system in a closed institution is not useful to outsiders. To access information in government institutions you may need a right to information act. An academic institution may not be conducive for a non-academic person to access even in the absence of legal barriers.

Finally, there is a social dynamics of information. Different kinds of information circulate among different sets of people mediated by a number of institutions using diverse sets of technologies. We can notice a broad social division of information into technical and non-technical, which flow through different circuits. Movements like the Narmada Bachao Andolan had to struggle to break this separation of information in two spheres. Information technologies, information systems, institutions working within broader social structures of knowledge and information circulation determine how particular sets of information circulate.

Body of knowledge

Mere circulation of information is not enough. Information becomes meaningful only when assimilated into a body of knowledge. We have been talking about information in its social meaning as a bit of knowledge. But this definition does not bring out the specific character of information apart from being a bit of knowledge. We can start with a working definition:

Information as a bit of knowledge separated from the knower that circulates and for this necessarily requires a medium or a carrier. Data as a bit of knowledge admitted as such but sitting somewhere. So information detaches itself from a body of knowledge, circulates, and then again, is assimilated into a body of knowledge.

A body of knowledge can be the accumulated experience and knowledge of a person, an academic discipline, knowledge of a community, knowledge of an organization. A body of knowledge can grow or be modified when new information is assimilated.

A body of knowledge grows also through experience. A body of knowledge will have informational content and experiential content, though the proportion of the two may vary a lot. To take examples, let us take physics, pottery, and open source programming. In the high level of informational content, physics and open source programming are similar. If we take growth of knowledge, pottery and open source programming are similar in that their knowledge grows more through addition of new practitioners. Marxism or feminism can also be seen as bodies of knowledge. We can use this category for any social body of knowledge persisting through time in contrast to events of knowledge, which are episodic and localized. These events of knowledge are either perception or inference. Truly speaking, these latter are knowledge in real sense, since a body of knowledge is nothing, unless it is brought to bear upon reality in a specific instance.

The post-industrial regime of knowledge

It seems extremely difficult to assess whether the authority of science is diminishing in the wake of the emergence of knowledge societies, especially because challenges to science have come from many directions. There has definitely been an increasing incoherence in the enterprise of science when conceived as a whole. Various disciplines of science, the sciences, however, continue undeterred by the slowly crumbling structures of scientific legitimacy and superiority.

The question before us is whether in this 'information age', when the industrial society is reinventing itself as reflected in globalization and pervasive use of ICTs, the place of science within knowledge and the place of knowledge within society has also changed.

We must note at the beginning that the two emerging fields of information technology and biotechnology are based on modern physics and biology. The major change now is that the field of software has emerged as a vast and rewarding field of research and creativity, attracting talent from scientific fields as well. The more software is needed the more ICTs are implemented. When the infrastructure of business, state, science is being shifted to ICTs, naturally there is an explosion of software opportunities. On a given hardware platform a plethora of software opportunities is available. Within scientific research itself, role of simulation and computation has increased resulting in (or following from) increasing use of computers.

It is true that there is greater acceptance of knowledge produced by different methods and at a variety of sites. Within the system of scientific ideas itself, we notice a distinction between the context of discovery and the context of justification emerging in the first half of the twentieth century. As the idea of a common scientific method found it difficult to deal with the diverse and heuristic ways of reaching knowledge even within the sciences, this distinction between discovery and justification arose. It was claimed that scientificity of any knowledge lies in the method of its justification and not in how it has been discovered.

Whatever be the reasons, it seems clear that there is a growing recognition now that knowledge is produced at many sites. But this knowledge is then taken and processed at technical sites like research institutes and it acquires legitimacy only thereafter. Once it has been processed, in a simplified form it can be communicated to a broad section of people and organizations. This seems clear in the field of 'development knowledge', which covers the important area of 'traditional knowledge'. As such, this knowledge does not still have any authority. It has to be documented, and made a part of a different body of knowledge and then if it is not found to be in contradiction with scientific knowledge, it acquires legitimacy.

The society has moved from the conception where science was publicly produced authoritative knowledge available in the public sphere and business used technology to produce goods for consumption. Now knowledge itself has become a part of business.

Knowledge-based economy is what is often meant by knowledge-based society. How does this affect the sphere of knowledge? There is a tendency now that all knowledge should lead to or contribute to the development of certain products: goods, services, or more knowledge. If we talk in an old language, the current regime of knowledge privileges knowledge with a high exchange value.

To facilitate exchange, knowledge should have appropriate structure and communication infrastructure. The question we wish to pose is: whether we trace 'organisability' required today from knowledge to pervasive use of ICTs or to privileging of 'exchange value'.

Work of knowledge

There is so much knowledge in the world but how does this knowledge get organized at various levels: and then become a part of life. In societies dominated by knowledge-based economy, knowledge with high exchange value will float to the top. Moreover, the work of knowledge has two aspects: the work of knowledge that we do and the work that knowledge does on us. In contemporary times when we engage in knowledge work with the exchange value of knowledge uppermost in our minds, the knowledge we deal with is not allowed to work in us. We maintain a distance from that knowledge. The knowledge does not transform us, or our perceptions.

Whatever the future may be like, we can be pretty sure that the society will be complex enough to have a large number of people who do work of knowledge.

Science, research, teaching, literature etc. are all knowledge-work. This notion of knowledge-work is different from the one which goes with the conception of information society or knowledge-based society. From our perspective, that is merely brain-work or mental-labour. We do not look at society as divided between brawn workers and brain workers, or between physical labourers and mental labourers. Knowledge work is a domain of work, as agricultural work, industrial work, health care work, etc. Agricultural work, for example, involves a lot of knowledge and requires brains too.

Vidya lok can be a name for the world of knowledge work, norms and institutions of such work. The normative structure governing knowledge has to be evolved through practice. Philosophy can contribute to this. Source of all knowledge is perception (pratyaksa) or inference (anumana). Vidya lok has one specific character. As an individual we may be interested in understanding something; as a researcher we seek to produce some knowledge which is considered to be valid by other researchers. In the latter case, we are engaged in pararthanumana, i.e., inference for others. What is admissible and valid for the research community is governed by logic and / or certain prevailing norms. So in vidya lok knowledge becomes an interest beyond the context of its application.

We have to analyse the sphere of knowledge work as it exists and evolve alternative norms, philosophies, methodologies, institutions. This will be characterized by:

- A different relation with past knowledge,
- A different relation with one's own knowledge,
- A different relation with other's knowledge,
- A different organization of knowledge,
- A different conception of growth of knowledge, etc.

Lokavidya is the ground from which different specialized streams of knowledge-quest grow like trees. These trees shed their leaves periodically which go on to enrich the ground in the process of decomposition. They do so by becoming a part of our perceptions and therefore of our lives. But all trees have limited lives.

To recapitulate:

I suggest that we need to be skeptical of the notion of a knowledge-based society emerging on the back of ICTs. This notion derives its transformational character from a blurring of the social and technological meaning of information.

We need to examine the changes in the sphere of knowledge from a broader perspective.

The conception of a body of knowledge offers us a broad category to which we can easily relate to and at the same time it is general enough to accommodate the whole range of social knowledge. It also allows us to properly place the category of 'information', which is an important emerging category not only in the broader social context but also within various research traditions.

Apart from lokavidya, people's knowledge, we need to look at the sphere of knowledge work, vidya lok.

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