

COMMUNICATIONS AND IT ON THE LONG WAY OF THE INFORMATION SOCIETY TOWARDS KNOWLEDGE BASED SOCIETY

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Abstract

The paper is an approach of the complex problems involved in the process of evolution of the information society towards the knowledge based society, from the point of view of the communications and information technology contribution.

The main issue the author considered is the determinant role of the concept of “knowledge” in the way the communications and information technology could and must influence the stable and balanced evolution of the society when facing major challenges as the decline of Earth resources and the social incertitudes.

On this matter, the major features of the huge potential of the communications and information technology products and services are presented, along with some lessons the nature could offer to the “refined and updated knowledge” concept.

Keywords: *knowledge based society, information society, refined and updated knowledge, information age, communications and information technology, next generation networks.*

JEL classification: *D83, L86*

1. How to understand today when thinking at tomorrow?

Perhaps this is one of the most difficult and complex question the human kind have to answer, but one could say “This is not a new problem!” – and it is true.

The real problem is that we hardly get to watch (we should deeply understand!) “today” and the big challenge is that “The future is no more what it once was” – as said Yogi Berra [5].

In other words, the future is more and more difficult to imagine and to control, as our steps to it are changing with dynamic shapes and paces, in the information age.

What all these questions have to do with the communications and information technology (CIT), information society (IS) and further with knowledge based society (KBS)?

Of course, they have a lot to do, because the strategical policies and the tactical decisions, made by the companies and governments today for ***a better tomorrow***, in fact could no more be imagined without all that CIT means in all society fields and levels, with ***an increasing and complex influence***.

More than these, it is essential to understand that ***a better tomorrow*** is impossible to conceive and to reach without using and ***improving*** the potential, the means and benefits of CIT as provider of the IS services.

This understanding is very clear expressed at an European Union high level [3] as:

The EU and the knowledge-based society

The Internet is changing the world we live in. It is a change no less significant than the Industrial Revolution of the 18th and 19th centuries. Over the last two decades, information technologies and the Internet have been transforming the way companies do business, the way students learn, the way scientists carry out research and the way in which governments provide services to their citizens.

Now returning to the “question” – theme, it is clear why it is important to evaluate and fully understand the dimension and the complexity of the processes CIT generates in the IS, as it is the only way to manage the CIT potential to build **a better** future KBS and to face all challenges such a huge and fast evolution could bring for the humankind sooner or later (the “future” is not the “same”, its entropy is higher and higher).

Thinking with responsibility at the future means to deeply analyze the benefits and the vulnerabilities of the world actual progress (the recent crisis is an exemple), in order to increase chances to rise a world where not only to have an improved general good well, but more important is to avoid the risks of the decline generated by the fading of Earth resources, social incertitudes and other challenges.

All these fundamental issues justify the opinion that the actual IS has a “long way” to the KBS, even “knowing” that (and sometimes just because) **CIT is a huge and dynamic factor** of the society evolution, **but not the only one!**.

2. We have to learn to “know” what “knowledge” must be

The debate on KBS started in the 60-s and according to some political and scientific statements, we are already living in knowledge-based societies [2], considering that *KBS is a “modern society”*.

Of course it is a long discussion about where we exactly are (each and every country) and that is why, **very long is the way of IS towards KBS**. This does not mean that the question could be neglected, on the contrary, this is one of the main challenges to face when analyze the “present” and “design” the future.

Now is the time to observe how complex and complicate is the impact of CIT evolution in IS and KBT.

Better society requires best knowledge management practices and use of latest tools and technologies [1], but this issue does not mean that KBS could be reduced to what we already have in progress in the last decades: the knowledge based economy (KBE).

In a more general and traditional approach, the “knowledge” concept is based on measuring the world according to scientific methods and is focused on human rationality.

On the other hand, the creation of knowledge is more and more based on philosophical approaches, aiming the smooth dominance and transformation of nature.

Like usually in complex problems, we can guess that the solution is somewhere at the middle, in our case integrating both sides (progress - nature).

The evolution supported by CIT could generate in IS an optimal and balanced progress towards KBS, if we get to “know” all “knowledge” necessary for that. In order to do that, **we have to learn all the time and use the time with an appropriate (wisdom) “pace”**, inspite of the “too fast” pace that CIT is showing when providing the technological support and services for IS.

As the actual “knowledge” (including, for example, the software) increase in complexity, is more and more difficult (and time consuming!) to analyze all its implications on long term and especially to ***select the optimal solutions (which become new “knowledge”) for development***, irrespective the fields (scientific, technical, economic, social etc.)

So, we must manage the CIT development and services using policies, strategies, tactical decisions, algorithms and eventually soft programs that are based on ***very well refined and updated “knowledge”***, which must reflect both the rational creation of the humankind and the lessons learned from the nature (where all the bio-processes are in a harmony).

In this matter, a simpler form is expressed by the EU policy on KBS [3]:

The evolution towards an information and knowledge society influences the life of every citizen in the Community, inter alia, by enabling them to gain new ways of accessing and acquiring knowledge. Digital content plays an important role in this evolution. Content production has given rise to rapid job creation in recent years and continues to do so. Most of these jobs are created in small emerging companies. The public sector collects, produces, reproduces and disseminates a wide range of information in many areas of activity, such as social, economic, geographical, weather, tourist, business, patent and educational information.

3. Refining and updating knowledge with and for CIT, towards KBS – Trends and challenges

Learn from our progress and nature

CIT products and services bring in IS not only concrete progress elements, as their explosive evolution could offer lessons that would be appropriate to use in the main process of IS towards KBS, just because this process includes a lot of efficient “subroutines” that could match and lend the same kind of efficiency to a higher level of the organization (i.e. KBS), with adequate “filtering”.

One of the major “lessons” CIT showed is the logical “multiplication of truth”, using hard and soft structures as “bricks” (but with ***a huge potential of intrinsic changes!***), which further could be processed in a diversity of architectures and logics.

Maybe this first lesson would appear more impressive if we observe that it was the way the transistor led us to actual “tablet”, i-phone and other, on a “short” way (versus the Industrial Revolution!) where the PC and even the general concept of “computer” is on fading against a diversity of “devices” which include computing among other features.

It is important to notice that, in all this evolution the software has an increasing contribution, as its added value creating potential is huge and based on the “unlimited” resource of human brain. In spite of this, we have further to learn from nature (including our native brain), beyond genetic algorithms, neural networks, artificial intelligence and so on.

An other lesson from CIT processes is the way ***time*** and ***frequency*** (in general the electromagnetic spectrum) have been exploited, as apparently “immaterial” values.

Here is sufficiently to mention that the old expression “time is money” turned into “time sharing” or TDMA (time division multiple access) bringing *very much money* (for example in GSM etc).

About frequency it is relevant to see that, as national values, the frequency licences cost millions of EURO-s, but their technical applications in CIT products and services bring billions of EURO-s.

Nowadays the “knowledge” from these 2 lessons could be much important and complex than the above relatively “known” truths, just because CIT evolution based on these 2 lessons provided premises to leverage the level of understanding, approach new theory and achieve new state of the art technologies.

Examples could range from the wide concept of “context aware” technologies and services (with clear applications in NGN – next generation networks, sensors networks and cognitive systems), to the approach of “collective intelligence” and “network centric” oriented development (in a diversity of applications fields, including the “social networks”).

All these are aiming to exploit the “intelligence” and the “power” which are distributed in the “network”, either technical (as CIT use) or social (as we will see in the next future) networks.

Last but maybe the most important, it is now easy to observe the similitude of these CIT trends (as a new “knowledge” that is driving the steps to KBS) with the “lessons” learned from the “research” mother nature made for millions of years and resulted in the living world.

Starting from the “multiplication logic” present in the cell-based structures and the electromagnetic model of the nervous system, the new CIT approaches tend to lend models and achieve features similar with the brain – senses system (as the faculty through which the external world is apprehended) and other. Soon we will have devices/services that will help us to be aware (i.e. to have signals, data etc.) about processes we are interested in: for example when bus/train will come as we are walking in the nearby, or the existence of other things or events etc.

Designing “collective intelligence” and “network centric” strategies we have to learn from the “intelligence” collected in every part of the human body, which is able to react to changes (including catastrophic ones), as they could take over altered (or destroyed parts or functions). For example, this is a way “error tolerant” systems and services will have to follow.

But it is important to remember every day that ***the human body is only a part of the life on Earth*** and we have to invest in research, in order to discover useful “knowledge” from minus 11000 m (in the oceans) to plus 8000m (to the mountains) and more ... in the Universe.

Watch the shades of the progress

We have to consider the fact that the future challenges of a such explosive evolution (as CIT and IS have) are inherent, important and some times subliminal – anyway very difficult to forecast and evaluate.

Again it is essential to learn from the “wisdom” which the nature eventually sedimented in the humankind, as a culmination of its evolution. It is obvious that the

evolution achieved such a high level so any improvement is small, well refined and very slow (***assuming the general environment unchanged!***).

The lesson learned is obvious in economical/financial and especially in health studies (and many other fields): first and most important is to keep what we have and after that try to increase!

This way, the great challenge of the CIT progress towards KBS is to watch the steps and keep the pace ***enabling and using the proper “knowledge” everywhere in the IS.***

Among the other “shades” of this long way for CIT, we already have in front:

- ✓ the energy resources decline and “green CIT”;
- ✓ monitoring the security of critical infrastructures/resources (including CIT “assets”);
- ✓ the role of CIT as media for the dilemma: democracy-security;
- ✓ asymmetric environment (economic, politic and social) challenges for CIT development.

And more to come!

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