Abstract: This paper presents the author’s view of the Information Society, emphasizing some basic concepts and definitions. Pointing out the significance of information, the paper provides a formal definition for “information”. The evolving concept of “global information society” is the major concern of the paper. Currently developing islands of information societies here and there are going to evolve, as the information age unfolds, into one Global Information Society. The paper outlines some of the basic characteristics of this society, presents a discussion of the associated issues, and concludes with some final remarks.

Key-Words: Information Society, Virtual Society, Virtual Organization, Virtual Enterprise.

1 Introduction

Virtual organizations are taking shape and expanding in all different aspects of our societies. Organizations are no longer limited by geographic borders. E-commerce and E-business enable companies operate globally on a limited physical resources. They no longer have to expand physical resources to expand business. E-learning enables universities operate virtually, turning the entire globe to a classroom. E-governments can now serve citizens on a 24-hour basis. This is how virtual societies are taking shape, making it possible to get the answer for any question, anywhere, anytime, provided that such an answer does exist. In other words, if the information we need does exist, it is available, anywhere, anytime. We are indeed living in information age, where all human societies are turning to one global Information Society.

2 Information

The most valuable commodity in this age is information. Information provides awareness, knowledge, and power! We live in a competitive world and in any area of competition, friendly or otherwise, the most informed party has the upper hand. An “informed” person generally makes the most appropriate decision. Information is the key word in our age.

Considering the role and significance of “information”, it is necessary that we give a proper definition for information.

2.1 What is Information?

Information is defined in different ways by different scholars [1]. Shannon [2], Pratt [3], Peters [4], Resnikoff [5], Dretske [6], and others [7, 8, 9] have their own definition of information. Robert Losee presents a comprehensive and critical discussion of the various definitions given for information [10]. He considers all other definitions as field-specific, and provides a discipline-independent definition of his own. For Losee, information is produced by all processes and it is the values of characteristics in the process’ output that are information [10].

I take an entity/representation approach to define information [1]. I say, any “representation” of an entity is information about the entity.

Formally, \( r \) is the \((\rho, t)\)-representation of \( e \), if there exists a function \( \rho \) and a point in time \( t \), such that \( \rho(e, t) = r \). Notice that different functions may produce different representations of a given entity; and a function may produce different representations of a given entity at different times. Using a convention that \( r \) refers to the current value of the function, we can eliminate \( t \), simplifying the definition. Thus, we can
say $r$ is the $\rho$-representation of $e$, if there exists a function $\rho$, such that $\rho(e) = r$. In this case, we can also simply refer to $r$ as a representation of $e$.

With this introduction, therefore, the notion of representation is defined by

$$ \rho(e, t) = r, \text{ where} $$

$$ \rho \text{ is the representation function,} $$

$$ t \text{ is the representation time,} $$

$$ e \text{ is the representandum, and} $$

$$ r \text{ is the representation.} $$

Having defined the notion of representation, we can now say $r$ is information about $e$ or $r$ provides some information about $e$, if $r$ is a representation of $e$. Any representation of an entity, therefore, provides some information about the entity. If the inverse of $\rho$ is also a function, then $\rho^{-1}(\rho(e)) = e$ and given $r$ we can reproduce $e$ ($\rho^{-1}(r) = e$), in which case $r$ is a perfect representation of $e$. A perfect representation of $e$ provides all the information about $e$. For example, on the set of positive integers, if $\rho(e) = e^2$, then $\rho(5) = 25$ and $\rho^{-1}(25) = 5$ and, therefore, 25 is a perfect representation of 5. As another example, in the Theory of Algorithms and Data Structures, a graph $G$ is routinely represented by its adjacency matrix $M$ [11]. If we define $\rho$ as $\rho(G) = M$, then $\rho^{-1}(M) = G$ and, therefore, $M$ is a perfect representation of $G$.

Most representations, however, are not perfect. For example, let us consider the function $\rho$ defined on positive integers as

$$ \rho(e) = \begin{cases} \text{odd,} & \text{if } e \text{ is an odd number} \\ \text{even,} & \text{otherwise} \end{cases} $$

The inverse of this function is not a function and, therefore, the corresponding representations are not perfect. By this definition, all odd numbers are represented as “odd”. The representation “odd” is not enough to reproduce the representandum. However, there are cases, where it can be useful just to know whether the number is odd or even. In general, there are cases, where we want only as much information about an entity as we need and not more. This is because, it serves no purpose to collect and carry around more information about the entity than we need; besides, not all the information on the entity is necessarily available. In other words, for many entities, imperfect representations of the entity are all that we have to work with. In addition, a representation of a representandum can be further represented, creating a hierarchy of representations. In fact, each layer of the

communication protocols is described by one level of the corresponding hierarchical representations.

Our notion of representation and the consequent definition of information are consistent with, and describe, most of the familiar concepts in information theory. For example:

- **Out-of-date and Up-to-date Information**: If the value of $t$, in the Equation (1), is equal to an old time, then the corresponding information is said to be out-of-date. For the up-to-date information $t$ must specify the current time.

- **Volume of Information**: In data communication, a message $m$ is represented as $\rho(m)$, transmitted to the destination, where the original message $m$ is reproduced by $m = \rho^{-1}(\rho(m))$. The volume of information contained in the message is $\log_2(n)$ bits, where $n$ is the size of domain of $\rho$. That is, the number of bits required to code a message out of $n$ possible messages is $\log_2(n)$ [12]. The logarithmic base 2 is for our choice of “bit”, as the unit of measuring information, considering that a bit consists of 2 states. If we choose a another mechanism, consisting of $b$ states, then the logarithmic base will be $b$.

- **Misinformation or Error**: A representation may not reflect the true state of the world, in which case it is misrepresentation, misinformation, or error.

  Formally, $r = \rho(e)$ is misinformation if $\rho^{-1}(r)$ is inconsistent with $e$. In particular, where perfect representations are required, $r = \rho(e)$ is misinformation if $\rho^{-1}(r) \neq e$.

- **Belief**: Given an entity $e$, belief is an idea one may choose to have on $\rho(e)$ being a representation (and not misrepresentation).

- **Knowledge**: Knowledge refers to justified true belief. Notice that there is no proof obligation for one’s belief, while knowledge must be justified and proved, otherwise it is not knowledge.

### 3 Information Society

*Information Society* is defined as a society based on information and knowledge. Information society is an evolving concept and it is now at its youth. At the
present, here and there, islands of information societies are taking shape. This is the early stage of information society. It will evolve, as the information age unfolds, and all these islands will join together, forming the Global Information Society. Currently, each country has its own action plan for developing the information society of its own; e.g., Finland [13], New South Wales of Australia [14]. Countries are also working together in several groups, where each group is trying to coordinate the efforts of the member countries in developing and integrating the information society of the group; e.g., South Eastern European countries [15]. Finally, worldwide organizations are working with the entire world on the development of the Global Information Society; e.g., World Information Technology and Services Alliance [16], World Summit on the Information Society [17].

Some of the very basic characteristics of information society are as follows:

- **Information society is global** in principle, for geographic borders are not recognized by the flow of information. It is, therefore, not our choice that the isolated information societies currently being developed in different parts of the world are going to join together, forming the Global Information Society. It is the natural trend in the evolution of information society.

- **Information society demands and promotes clarity, precision, honesty, and openness.** Dishonest politicians and officials cannot survive in this society. They can no longer fool citizens by false stories, for a wealth of information would be available for every citizen, who can simply look up and discover the facts. It is now clear for almost everyone, for example, that “the treat of terrorism or weapons of mass destruction” is nothing but a propaganda for the US invasion of Iraq.

As another example, which happened in a university around just recently, a computer science student asks a high official of the university for some facilities to complete his course project. The official trying to prevent him from working on the experimental and laboratory projects, states “You are wrong on doing course project; based on the ministerial approved program of your field, you don’t need it!”. The student politely goes back to his computer and does a simple search on the computer science curriculum of some prestigious universities and finds out who is really wrong! That is information society; one cannot get away with false statements in this society. Understanding the nature of information society, one has to think twice before making a statement.

- **Information society is governed by knowledge, competence, and only informed decisions and actions.** There will be no room for incompetence in this society. The wealth of information and knowledge available for the citizens of information society provide an environment, where only informed, knowledged, and competent individuals can survive as managers and leaders of the society.

In a university environment, for example, a department is normally chaired by the most knowledged, up-to-date, and academically competent member of the faculty. Actually there is an interesting case, again in a university around, where a department head, an associate professor with the M.S.E and Ph.D. degrees from some of the best universities, over ten years of experience in the most prestigious research center of the world, and over 40 publications, has been replaced by an instructor of no publication and having not even a basic Ph.D. or equivalent education! Although we are still in a very early stage of information society, I believe even in this stage, the society would not accept this change. Nothing personal, but such changes are simply not consistent with the nature of information society. Theoretically, the society must reject this instructor from heading the department, which was once headed by a much more competent associate professor. Theoretically, the society would demand the most competent person for the position. Practically, however, I intend to sit back, watch the game, and see how it goes... Maybe, in my next paper, I would return to this case and discuss the practical ending of the game.

- **Information society is a new environment, a new game, and a whole new set of rules.** We must learn the rules and play the game by the rules. Those who cannot adapt to the new environment or violate the rules will not survive. In the example above, replacing a perfectly qualified and competent department head by an unqualified and incompetent one is a clear violation of the
rules and, theoretically, must be rejected by the information society.

- **Information society** promotes equal opportunity. It has been a well known fact since long time ago that “information is power.” The free flow of information, in the information society, therefore, translates to equal distribution of power in this society. The availability of information to everyone without any restriction, control, or filtering, provides equal opportunity for all the citizens of information society.

### 4 Conclusion

This paper has presented the author’s view of the *Information Society*. *Information* and *knowledge* have been defined and discussed as the most significance and valuable commodities in our age. The paper demonstrated that the evolving concept of “global information society” which is taking shape on the basis of *Information* and *knowledge* provides a new environment with a new set of rules and regulations. *Information society* is governed by knowledge, competence, and only informed decisions and actions. It demands and promotes clarity, precision, honesty, and openness.

**References:**


