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Is it time for the Philosophy of ICT?

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ABSTRACT

Advances in Information and Communication Technology (ICT) and the accompanying impacts on socio-economic development have led researchers to consider a new ‘philosophical phenomenon’ known as Philosophy of ICT. In this article we argue that ICT has unique knowledge, questions, methodologies, explanatory models and ethical problems that are not easily addressed by the existing philosophies related to Computer Science, and hence there is a need to study the philosophy of ICT as a subject. Furthermore, ICT is a relatively a new discipline compared to the older subjects such as Computer Science, Engineering and Mathematics. The diversity and inter-disciplinary nature of ICT and the multiplicity of its uses in other sciences make it hard to define ICT and to prescribe how ICT research should be carried out. This article will attempt to address the need to study the philosophy of ICT as a subject, and discuss the main thematic areas that the study of ICT should entail.

Keywords: *Philosophy, Information and Communications Technology (ICT), Philosophy of ICT.*

PHILOSOPHY

[1] defines philosophy as all thought to the person with the right turn of mind. It is any damn thing you want [2]. Philosophy has also been defined as the personal search for truth in any field by rational means [3]. It is a theoretical activity aiming, like all theoretical activities, at discovering the truth. It has a subject-matter, and specific discipline methods, though it is unclear what exactly they are [3]. Philosophy raises pertinent questions about the world, the knowledge of it and what can be done about it [4]. Philosophical questions can be answered by three construed areas of philosophy; metaphysics, epistemology and ethics. Metaphysics includes part of philosophies of mind, language and science. The other part of these philosophies belongs to epistemology, which examines the cognitive contact with the world. Ethics is the normative branch of philosophy covering in part philosophies of law, social and aesthetics.

Philosophy of Science

Science has been defined as a class of activities which includes observation, description, and theoretical explanation; or knowledge that is gained through experience; or knowledge that has been logically arranged in the form of general laws [5]. Science can also be defined as structured knowledge derived from the facts [6]. It is the systematic way of studying the world we live in. The philosophy of science deals with issues such as the foundations of science, its assumptions and limitations, its implications, and what constitutes scientific progress. The basic questions that appear in the philosophy of science are ontological, epistemological, and methodological questions such as what is real? How do we get to know about the reality? And by which principles do we form knowledge?

Specific questions in philosophy of science are like “What is scientific knowledge and how is it different from other kinds of knowledge?”, “With what kinds of methods is science done?”, “What are the limits of scientific knowledge?”, “How does science develop?”, “What is the role of argumentation, logic, confirmations, concepts, and consensus in science?”, “Are

scientific results objective or subjective?”, “What can be proven?”, and “What is a law?” [2].

How is science different from other disciplines?

Mathematics is considered to be different from science because mathematicians do not observe phenomena, formulate hypotheses, and test those hypotheses. Mathematical knowledge is considered to be proven instead of observed and tested [7]. Though mathematics is considered different from science, it is often used as a tool for most scientific activities. In early 1900s, positivists were convinced that knowledge comes from experience and that scientific claims are only meaningful if verified. It has been stated that there could be no way to verify or prove universal truths but observations could be used in proving some claims to be wrong [8]. However it is argued that there exists consensus among scientists on explanations about the world [9]. Closely related to the philosophy of science is the philosophy of computer science [10].

Philosophy of Computer Science

Computer science has been defined as the study of the phenomena surrounding computers [11]. Computers, according to this definition mean the hardware, their programs or algorithms, and all that goes along with them. They argued that for any phenomena in the world there can be a science that describes and explain that phenomena. They continued by noting that there is indeed a phenomenon called computers[11]Computer science may not be a science (classic sense) as it doesn’t necessarily follow the scientific (or “experimental”) method. For example, often one experiment will suffice to answer a question in computer science, whereas in other sciences, numerous experiments have to be run [3]. After realizing that computer science is not necessarily a type of science its earlier categorization was updated [12]. Instead of saying that computer science is the science of computers and algorithms, it was now said that it is the “empirical” “study of the phenomena surrounding computers”, “not just the hardware, but the programmed, living machine” [12].



Computer Science is increasingly being drawn into other fields such as physics, chemistry, biology, psychology, and even sociology and anthropology. When computer scientists understand the assumptions, constraints, limitations, and premises of their own science, the easier it is to accommodate computer science for the uses of other disciplines. Researchers in the academic field of computing have brought together a variety of scientific disciplines and methodologies. The resulting science, computer science, offers a variety of unique ways of explaining phenomena, such as computational models and algorithms. Their increased investments in research efforts in computer science have led to the growth of a number of branches of computing such as computer engineering, electrical engineering, decision support systems, architectural designs and software engineering.

Philosophy of Information

The Philosophy of Information (PI) has been defined as a philosophical field that looks at critical investigation of conceptual nature and principles of information which includes its dynamics, uses and sciences [13]. The critical investigative nature provided by the philosophy of information should not be confused with mathematical theory of data communication referred to as information theory [14]. On the whole, its task is to develop an integrated family of theories that analyze, evaluate and explain the various principles and concepts of information, their dynamics and utilization, giving special attention to systemic issues arising from contexts of application and the interconnections with other key concepts in philosophy, such as knowledge, truth, meaning, reality and ethical values [13]. Though information is thought as an old concept, the technologies of computing and ICT has changed it to a primary phenomenon. The philosophical attention that computation has attracted in recent years has not affected the PI as it still prioritizes information over computation [14]. Philosophy of Information takes “computation” as one of the most important manufacturing processes in which information can be involved [15].

Philosophy of Technology (PT)

Philosophy of Technology is a philosophical field preoccupied by three main questions: what technology is; how to understand and evaluate consequences of this technology to the society and human state; and how human should react to the technology [16]. Further, engineering-oriented PT is the focus of the first question, society oriented PT covers the second question while technology ethics of PT is the concern of the third question. However, Philosophy of Technology does not sufficiently answer the three questions especially the second and third [16]. This therefore means there must be another philosophical technology to sufficiently cover all these concerns. Bunge came closer to a new philosophical technology through the title of his contribution of a technological model called Philosophical inputs and outputs of Technology [17]. Bunge differentiated

between what was later referred to as applied science and pure science. For Bunge actual technologies are those resulting from science and current technologies [17]. Heidegger takes the relationship between technology and science further than Bunge holding the view that current technology depends on science and that science also depends on technology [18].

Philosophy of ICT

In the footsteps of these criticisms, philosophers in the 1980s and 1990s started developing alternative approaches to technology that did not suffer from the problems of the classical approach [19]. The resulting approaches have been described as representing an empirical turn in the philosophy of technology [19]. This empirical turn aims to understand and evaluate implications of modern technology for the society and human condition. The engineering oriented empirical turn had its aim as to understand and evaluate the practices and products of engineering that happens beyond in the society. This empirical turn took place in 1990s and 2000s. Its proponents argued that the trouble with philosophy of technology was that it was not really about technology [20]. Its concern with social consequences made it forget about technology itself. Progress in the field, they argued, required a focus away from social consequences towards technology itself [20].

Philosophy of technology should endeavor to carefully describe and analyze the practices and products of engineering and in this way arrive at empirically informed, descriptively adequate philosophical theories of technology and engineering. The society-oriented philosophy of technology and technological ethics as they currently exist are not sufficiently equipped to provide full and answers to the empirical turn these philosophies took in 1900s and 2000s. Technology ethics focuses solely on a moral evaluation of technology, and on moral prescriptions. Philosophy of technology evaluates the consequences of technology relative to different standards of goodness and badness, rather than merely concentrating on moral goodness or badness.

Philosophy of ICT refers to the influence brought about by this new technology. The inclusiveness given to the name ICT indicates the significant shift in both the technology itself and our perception about it [21]. Majority of those who use name “Information and Communication Technology” for this new technology does so because it covers a wide range of spheres in which the technology plays a crucial role; the name also bridges the “hard” knowledge like mathematical and “soft” knowledge like social sciences. The “communication” component of the name ICT testifies of the change in character of the technology [21]. Accordingly, the word “communications” as prescribed in the name “ICT” reflects difference between technology and human sciences [22]. This makes ICT a universal global technology. Therefore the society under ICT era can be referred to as Global ICT Society; a society supported by ICT as a universal technology. ICT has transformed most of the physical



wealth creating opportunities to knowledge based opportunities [23].

The global nature of ICT has resulted in the knowledge society being understood as a society with capacity to create new knowledge and use information and ICTs effectively[24]. The knowledge economy resulting from knowledge society has been defined as one in which the creation and use of knowledge plays a pivotal role in generation of wealth[24]. The knowledge society could have philosophical propositional knowledge the “what”, and the prescriptive knowledge the “how”. ICT as a philosophy has given rise to new areas of knowledge such as ICT for development, global ICT and Internet.

Global Ethics

Philosophy of Technology has covered a lot in individual ethics. ICT like any other technology can be beneficial or harmful depending on its use. In global society, whether the technology is harmful or useful largely depends on the individual making assessment. What is beneficial to one individual may be harmful to the other. It is increasingly obvious that knowledge is becoming one of the precious resources in ICT global society and therefore becoming potential discipline for philosophical study [33]. ICT global ethics has to be alive to the fact that there are potential possibilities of using ICT for harmful purposes. In this aspect, global ethics is more of moral issues in regard to knowledge-society rather than technology itself. It tries to look at the kind of ethical problems arising as a result of knowledge society.

ICT for Development (ICT4D)

Development is creating technologies that have the potential to catalyze social change, and mapping human needs to technologies that directly respond to specific development problems. According to ICTD ICT can distribute wealth between the developing and developed countries by bridging the digital divide. The discipline of ICTD has dramatically grown in the past one decade [25][26]. The dimensions of growth identified are enhanced ICT access and standardization of work procedures which brings about accountability and transparency[27]. In their contribution “Computer Science isn’t enough” the influence of the current mode of ICT approaches for Development (ICTD) was critically looked at [28]. They argued that this discipline should emphasize on a perpetuation of a model, where technological knowledge is used in development interventions [28]. This has been supported by the argument that in pursuit of improving governance and resource production ICT is vital [29].

Internet

The internet is one of the most popular communication ways in the developed world today due to its strong and wide impact, and it also falls under the category of technologies about which users actually don't know much. Internet has been described as combination of several services with World Wide Web (WWW)

and Electronic Mail (E-Mail being the most commonly used by the internet users [30]. It plays crucial role in most areas of the society including and not limited to agricultural processes, health services, education, political processes, businesses / commerce and newsgroups. With connectivity to Internet, one can transact / execute business in the globe with no physical contact with the consumer / buyer or even the requiring intermediary [31]. There have been many philosophic studies of the web and the usage granted by the web for example finding the differences between the networked computation (web) and standard software computation, etc. The importance of the ‘Future of the Internet’ from a more practical than theoretical viewpoint has been discussed as the “Future of the Internet does not just involve technological problems but has implications for the economy, society and governance” [34]. As a sub themes in the philosophy of ICT, areas of knowledge that require philosophical study include evolution of internet, levels of communication, the World Wide Web and internet intelligence. Internet and specifically web is something embedded in the social societies and is something that not only creates opportunities for societal communication but also in which competitive interests prevail[32].

CONCLUSION

ICT is a universal technology raising philosophical questions which cannot be answered by any other discipline. For instance what knowledge economy is, what the difference between technology and communication is, what the global cyber security is, what the global ethics is, what relationship between technology, communication and internet exist, etc. in this paper we have looked at various philosophies in relation to the relatively new philosophy of ICT. We have also discussed possible thematic subjects in the philosophy of ICT.

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