Science of ICT: Computer as a Qalam

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Abstract

The paper aims to discuss on how computer replacing the Qalam or in other word, pen as a medium of knowledge transferring. Pointed out from Surah (Al-Alaq, 96:1-5), "Proclaim! (Or read) in the name of thy Lord and Cherisher, who created, created man out 0f (mere) clot of congealed blood. Proclaim! And thy Lord is Most Bountiful — He who taught (the use of) the pen, Taught man that which he knew not.", clearly mentioning the word Qalam (pen) as a tool in seeking knowledge. In today's Muslim world, the word Qalam infers to the computer. The paper will look into both function of Qalam and computer and the relationship between both. Indeed, computer functioning as a Qalam is able to assist human beings in becoming an insan guided by the Quran and Sunnah. Nevertheless, another important aspect to be discussed in the paper is on the transition of knowledge captured from the ICT point of view. There are four (4) stages of the transition of knowledge that related to the science of ICT which is data, information, knowledge and wisdom. Each of the transition stages is related with the book of Allah which is Al-Quran. The subsection in the paper will further explain the connection between those transition and Ayah in the Holy Quran.

Keywords: *Philosophy of science; philosophy of ict; ict and qalam; heartware and peopleware.*

1.0 Introduction

Science of Information Communication Technology (ICT) focuses on the study of the hardware, software, programs and anything that goes together with it meanwhile the philosophy of ICT concerned with the philosophical problem that arises such as: What is a computer? How a computer operates? [1]. The following subsection will answer those questions and together with the question on how Qalam infers to the computer. The creation of human beings is extremely perfect and astonished for those who think of it in deep. Human is fully being equipped with the knowledge and technology that relevant to their time in which being assist by the Quran and Sunnah. This is proven in the Holy Quran, *Surah* (Hud, 11:37), *"And construct the ship under Our Eyes and with Our Inspiration and address Me not on behalf of those who did wrong; they are surely to be drowned*". In the time of Prophet Noah A.S, Allah has prepared and aspired Noah with the technology of building the ship or ark in order to avoid the believers from drowning in big flood [2]. By having faith in Allah and knowledge gifted from Allah, thus humans are able to move forward with new inventions. Based on the revelation of *Surah* Al-Alaq to Prophet Muhammad S.A.W, "*He who taught (the use of) the pen, Taught man that which he knew not"* shows that, the knowledge and technology that was gifted to Prophet Muhammad S.A.W and all of us is Qalam. Today as the technology is changing and moving fast, there are so many inventions that able to assist human in getting closer to our creator. One of the most successful inventions in this modern world is computer. Computer is a device that able to replace

the function of Qalam or known as pen. Computer was first invented with a big mainframe with limited functions. As time passes by, computer has become smaller and lighter with so many added functions that enable user to perform various of tasks. Among the major functions of computer is to key-in the data or known as input, store the data or information and get it back whenever it is needed. The next subsection will direct the reader to get a view of the functions of Qalam and computer and how it is related.

2.0 Computer as a Qalam

Qalam or pen is used to write down the information gathered from any resources, able to keep it as in a written form, can be read at any time and the written information can be disseminated around to other people. Another verse that mentioned the word Qalam is in *Surah* (Al-Qalam, 68:1) *"Nuun. By oath of the pen and by oath of what is written by it".* This clearly illustrates the importance of seeking knowledge by writing and reading it consistently. In this modern century, Qalam can be replaced with the use of computer [3]. Computer can be a medium of knowledge sharing and transferring. As being mentioned earlier, among the core functions of the computer is to get the information (input), analyze and store the information (process) and disseminate the information (output). The summary of the main functions of the computer is as follows [4]:

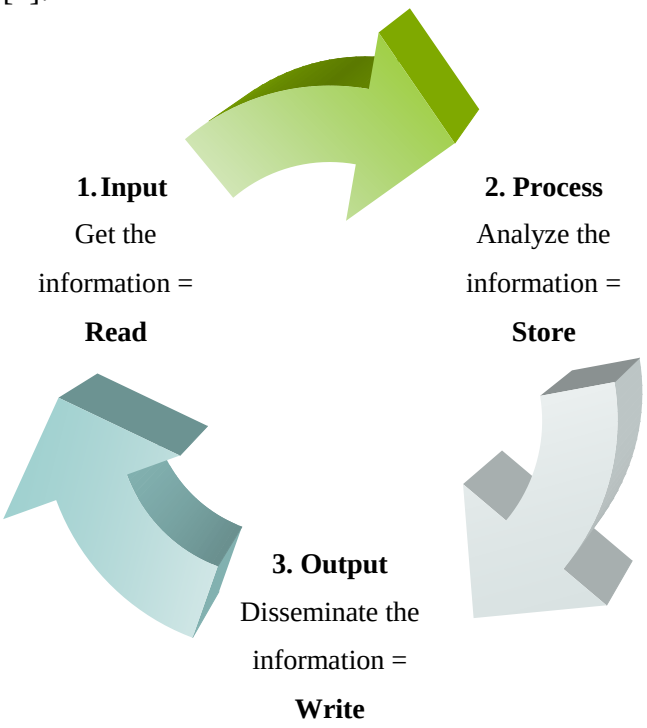
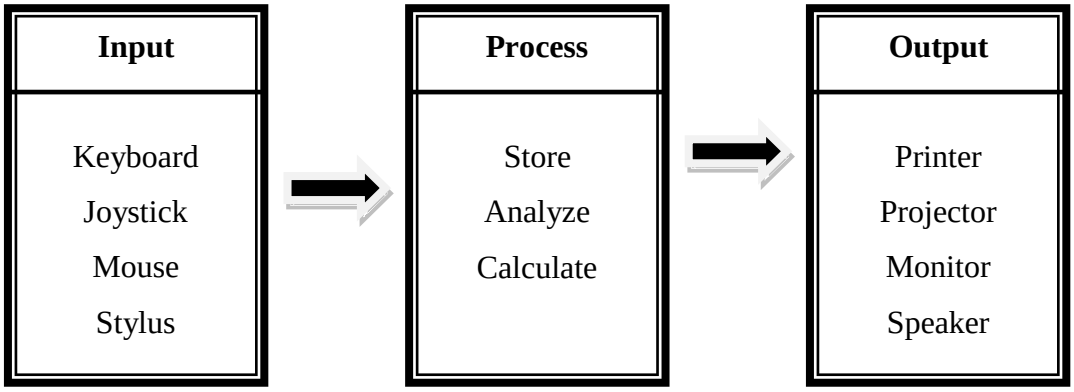


Figure 1: Core functions of a computer

Thus, undoubtedly Qalam can be replaced by the computer since both functions are the same whereby it can be a medium of knowledge transferring. In addition to the core functions of a computer, there are interconnected devices to perform such operations. The examples for devices that being used for the input function are keyboard, mouse, and joystick meanwhile for the process function are storing information and analyzing information. For output function, the

devices can be in a form of printer, projector and speaker. The figure below illustrate the example of the devices in a simplify manner.



Examples of devices and process for each function

Thus, the most important components among the three functions is input since the result of the output is being determine by the input and way of processing the input [5]. As a prove, in *Surah* (Al-Alaq, 96:1) it started with the word, *"Proclaim! (Or read)"* showing that the output is the most crucial part from all others. Moreover, to have a further view on this subtopic, there is another aspect of the components that is related which is the tacit knowledge and also the explicit knowledge. First, we need to know what is tacit knowledge and explicit knowledge. The following figure explains the tacit knowledge and explicit knowledge [6].

Tacit Knowledge	Explicit Knowledge
Knowledge that based on past experience and seldom being express freely. For instance: hands-on method or face-to-face to convey message.	Knowledge that being described in formal way such as printed documentation. For example, report or user manual.

Figure 3: Tacit Knowledge and Explicit Knowledge

Thus, let us look at the relationship of the input and output of tacit and explicit knowledge in a different perspective. Tacit knowledge is the technical skills or knowledge that can be gained by training, experience and ways people perceive the world meanwhile explicit knowledge can be easily shared and learned by passing down the documented procedures or ideas [7]. Input can be equivalent to the tacit knowledge since the knowledge or experience is there but does not freely being shared or disseminated around. The good example of tacit knowledge is the life time journey of Prophet Muhammad S.A.W which is based on his experience and what he has gone through. The revelation sent to him by Allah through Jibrail A.S is a tacit knowledge. The example of explicit knowledge that was sent to every human being is the Holy Quran. The book of Holy Quran was revealed with a complete story from the past, to the future and life in the hereafter. The Quran was documented according to its chapter and in a printed form for human to read as for a reminder of what happen in the past and what will happen in the future. Thus, the explicit knowledge can be the same as the output in a computer.

The figure 4 below illustrates an understandable form of the relationship between the Input and Output and Tacit Knowledge and Explicit Knowledge:

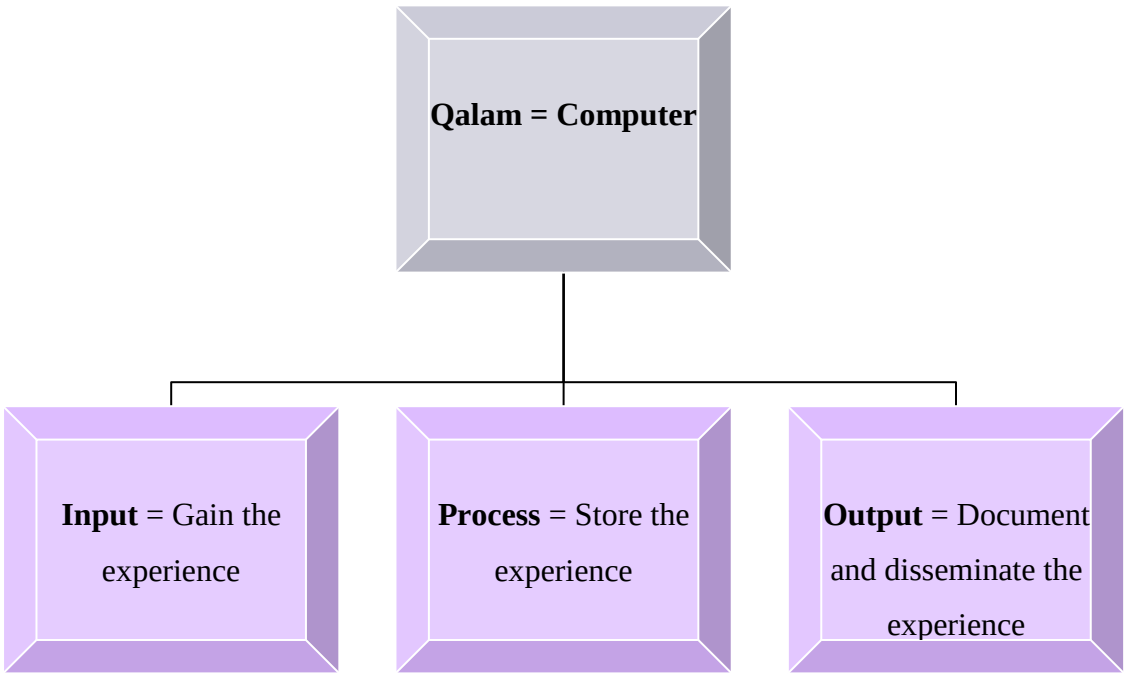


Figure 4: Summary of the relationship between Input and Output and Tacit Knowledge and Explicit Knowledge

3.0 The Relationship Between Qalam as Computer and Knowledge Transition

Both Qalam and computer have same function which is use to seek knowledge in order to attain wisdom as in *Surah* Al-Kahfi (18:109) *"If the sea were ink for (writing) the Words of my Lord, surely, the sea would be exhausted before the Words of my Lord would be finished, even if we brought (another sea) like it for its aid"*. It shows that the knowledge that human gained is too little and we still in process of seeking knowledge as people always said, the process of learning is from the cradle to the grave. As being highlighted in paper [8], ICT helps to assist human in making decision and act as a communication tools in fulfilling the relationships between God the creator and the servant of God. In the ICT point of view, there are four levels of the knowledge transition process which is data, information, knowledge and wisdom [9]. The lowest level of the knowledge transition is data meanwhile the highest level is wisdom. The diagram is as follows [10]:

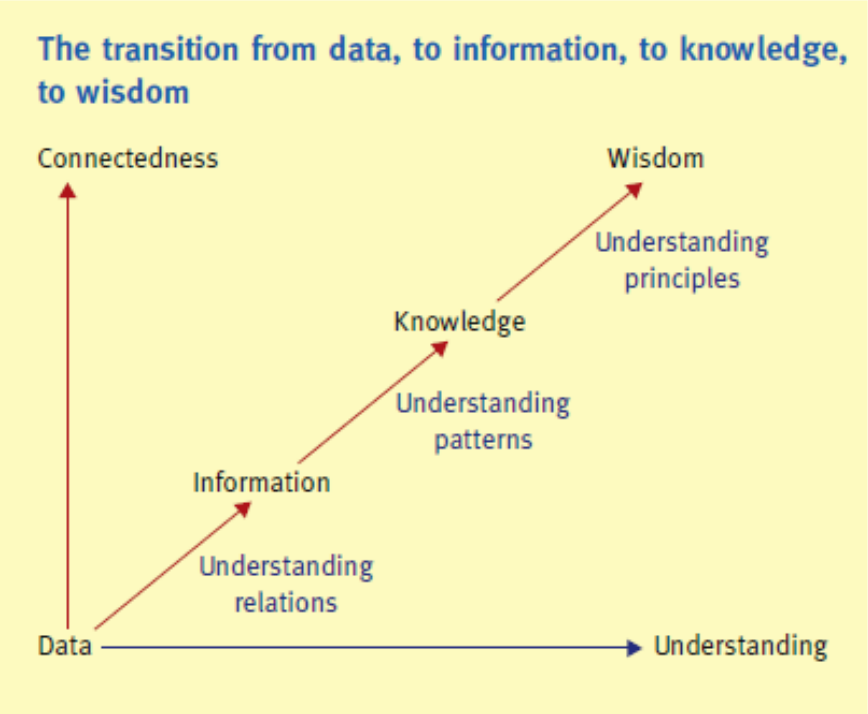


Figure 5: The transition from data, to information, to knowledge and to wisdom

The details explanation of those four level of knowledge transition are as follows [10, 11]:

i. **Data**: Data can be in any form and does not have meaning. It stands on its own. For instance, in the ICT perspective it can be in a form of symbols or abbreviation. Other example that is related to Islamic perspective is each of the *huruf* in Quran represents data.

ii. **Information**: Information is a collection of data that has been given meaning to it. It is structured and more organized. For instance, the meaning of the symbols in the database represents information. From the Islamic perspective, the sentence or *Ayah* in Quran and the translation of it represents the information.

iii. **Knowledge**: Knowledge answers the 'how's' question based on the information gathered. Knowledge can be tacit or explicit as mentioned earlier. The example of knowledge in the ICT perspective is the guideline or procedure to apply in creating databases. On the other hand, the example of knowledge application in Islamic perspective is the guideline on how to apply the teaching of Quran in daily life.

iv. **Wisdom**: Wisdom is process by which to differentiate right from wrong and good from bad. Wisdom is the highest level of knowledge transition whereby only human can achieve it. For instance, in the ICT perspective computer is a machine unlike human able to differentiate right from wrong and good from bad. But, it can be as an intelligent device that can assist human in achieving wisdom. The example from Islamic perspective

would be the consensus by *Ulama'* in deciding certain issues based on their evaluated understanding. The *Ulama*' has been granted with the wisdom in making decision.

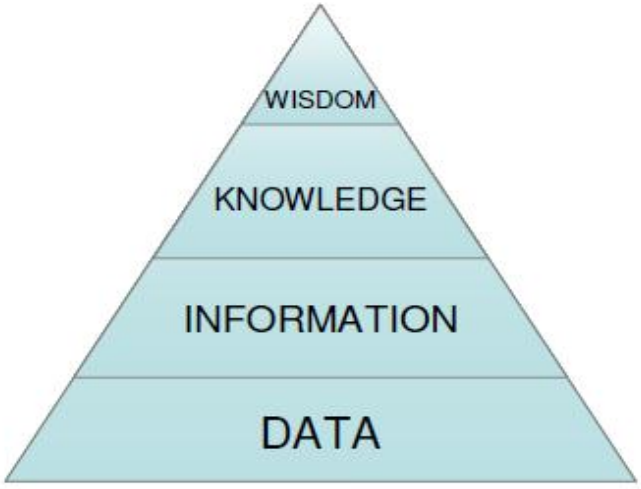


Figure 6: The knowledge pyramid

Figure 6, illustrate the knowledge pyramid in the context of knowledge transition [12]. The knowledge pyramid explains that data is the lowest level in the hierarchy and yet the largest entity since anything can be stored as a data. Next is information, the second largest entity as it is understandable and more structured. At the upper level is knowledge and finally wisdom. Since knowledge holds the useful and meaningful information, one of the outcomes would be decision making process [13]. Anyone can make a decision by having the knowledge but seldom people make a wise decision. In order to make a wise decision, ones need to have wisdom. Only small amount of people can achieve the highest level of knowledge which is wisdom. As being mentioned in paper [3], the society has too many information but not enough knowledge and too little wisdom. Hence, the increased of knowledge does not mean increased of wisdom. Table 1 proved that wisdom is construct based on data, information and knowledge [14].

Level	Definition	Learning process	Outcome
Data	Raw facts	Accumulating truths	Memorization (data bank)
Information	Meaningful, useful data	Giving form and functionality	Comprehension (information bank)
Knowledge	Clear understanding of information	Analysis and synthesis	Understanding (knowledge bank)
Wisdom	Using knowledge to establish and achieve goals	Discerning judgments and taking appropriate action	Better living/success (wisdom bank)

Table 1: Distinctions between data, information, knowledge and wisdom

4.0 Peopleware and Wisdom Workers

Peopleware is a new dimension of ICT element that needs to be considered in nowadays world. A part from the hardware and software, peopleware acting as a driver in ICT determining the right path in discovering new knowledge through the journey [15]. In other word, software and hardware is the device that used to operate a computer meanwhile people that manage the devices is known as peopleware. The peopleware need to have knowledge in inventing new devices and also making decisions. It is important to have knowledge that is aligned with the Quran and Sunnah so that peopleware can try to seek for the wisdom and always be in the right path. Again, by having knowledgeable workers does not assure to have the wisdom insight. The diagram below illustrates the relationship between peopleware, hardware and software derived from paper [9].

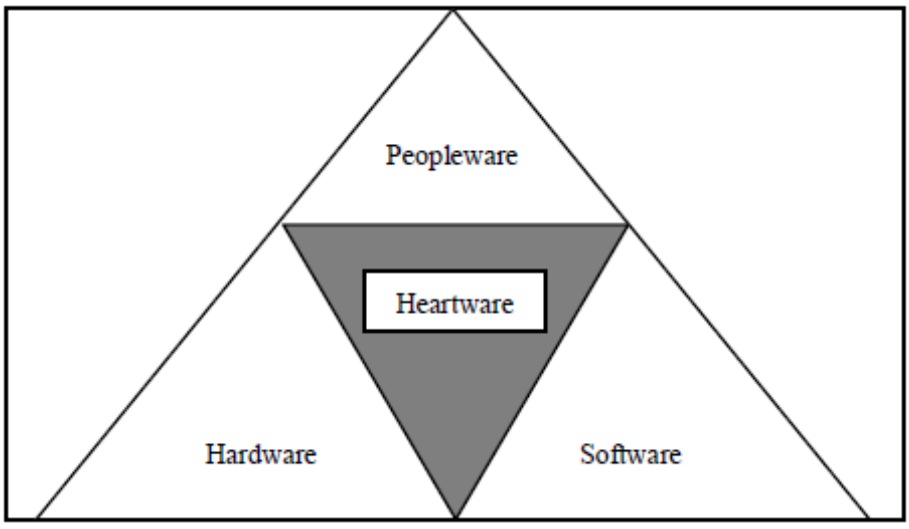


Figure 7: ICT Components

The peopleware has always to be in the upside position as the people or human will control all the devices including the hardware and software. Since the position of peopleware is on top of others, it is essential to have wisdom workers in the organization so that the right decision can be made and appropriate action can be taken. In the diagram, there is a heartware been placed in the center of all the three components to show the importance of having a good intention at making any decision in any circumstances that is related to ICT. The hardware and software will always be in a parallel side as they are supporting each other. It is always has to be whenever there is any software been produced, there need to have a hardware to operate the software.

5.0 Conclusion

In brief, computer can be used as a medium of knowledge transferring replacing the Qalam in seeking knowledge as the main function of a computer is by entering the input, it will able to process to produce such needed output in which is the same with Qalam able to read the given information (entering the input), store or keep the information gathered (store the input) and read back the information whenever needed (produce or print the output). We have also explained on the Qalam as a computer and the relationship between the knowledge transitions from data to wisdom. Finally, we have looked into the ICT components which are the peopleware, heartware, hardware and software and the relationship between those four components related to the wisdom workers.

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