Quantum Information Science and a Possible Domain for Future Information School

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INTRODUCTION

Quantum Information Science (QIS) is a combination of Quantum Science (which combines Radio Physics, Condensed Physics, and Electronics) and Information Science (which combines Computer Science, Information Technology, Mathematics, Information Studies, Documentation Studies). Quantum Information Science (QIS) is actually an extension of Quantum Computing. Quantum Information Science (QIS) is mistakenly taken as Quantum Information Theory but it has much differences with this. Quantum Information Science (QIS) is mainly responsible for improved and faster acquisition, transmission and processing of information. The 20th century is marked by three monumental achievements, namely, computer science, quantum physics and information theory, which have not only stunned the civilized world but also ushered into a new world – a new paradigm of science and technology. The information technology revolution of this century was directed towards the miniaturization of electrical circuitry on silicon chips on one side, enabling performance to double every 18 months (Moore's Law) and the deepening understanding of classical information in coding, cryptography and computational complexity on the other side. Thus a new era dawned with the promise of a new design strong enough to handle the ensuing new problems. Considerable planning has already been devoted to the challenges of designing and fabricating devices at the atomic scale using nanotechnology and quantum theory (Viola et al., 2001). Indeed quantum effects are being exploited to perform important, otherwise impossible information processing tasks, in addition to the creation of unbreakable codes and possibly a quantum computer to perform easily computations that would have taken millions of hours for its performance. Quantum Information Science (QIS) is actually an extension of Quantum Computing. Quantum Information Science (QIS) is mistakenly taken as Quantum Information Theory but it has several differences with this. Quantum Information Science (QIS) is mainly responsible for improved and faster acquisition, transmission and processing of information. Quantum Information Science (QIS) is actually nothing but an application and integration of Quantum Science and Information Science principles. Thus Quantum Science is mainly rooted by the Quantum Physics principles and then Quantum Computing and lastly Quantum Information Science. QIS is an existing field which needs intellectuality and mentality towards achievements. Quantum Information System is the ultimate result of healthy Quantum Information Science (QIS) practice. This article talks about Quantum Information Science (QIS); its background and origin. Possibilities of Quantum Information Science (QIS) as an academic domain and possible courses emphasizing challenges and opportunities to introduce it in I-School or Information Science departments with specialization are explored (Paul, 2012).

BACKGROUND AND EXISTING LITERATURE

Quantum Information Science (QIS) is a combination of Quantum Science (which combines Radio Physics, Condensed Physics, Electronics) and Information

Science (which combines Computer Science, Information Technology, Mathematics, Information Studies, Documentation Studies and so on (Paul, b, Kumar, 2012). , which has possibilities of healthy Information Infrastructure and speedy information access between information channels, information networks, information centre to information networks and so on. The wider benefit and possibilities of Quantum Information Science (QIS) attract thousands of scientists and technological experts in the field of physics and mathematics. . The Information Technology revolution of the past several decades has been driven by steady advances in the miniaturization of electronic circuits on silicon chips, allowing performance to double roughly every 18 months (Moore's law) (*Chen, 2002*). Quantum Computing differs from Information Science mainly in the perspective of different uses and scopes. Here physical form of information has a qualitative rather than merely quantitative bearing on how efficiently information can be processed *Gitts, 2007*. The economic impact of this quantum information science (QIS) is going to be no less profound. The complexity of the economic world with its colossal information will be resolved to generate a wholly new economic paradigm *(Paul, 2009).* So it is important that the necessary foundation of QIS be built to provide tools to solve those problems and enable progress move forward towards more specific technical and economic growth.

OBJECTIVE AND HYPOTHESIS

The main aim and objective of the study include:-

- To know about the Quantum Information Science (QIS) and its nature;

- To learn about Quantum Information Science (QIS) and its basic nature;
- To find out the main advantages and engineering applications of Quantum Information Sciences;
- To learn about I-School and its emerging nature;
- To find out possibilities of I-School based Quantum Information Science (QIS) programmes;
- To know about attributes and characteristics of modern Quantum Information Science (QIS) (see also Figure 1).

QUANTUM INFORMATION SCIENCE (QIS) AS A DOMAIN AND GROWING INTERDISCIPLINARY NATURE

Quantum Information Science (QIS) is a kind of science supported by several technologies responsible for information collection, selection, organization, processing, management and dissemination with super speed and dynamic movement from one place to another within a moment. Quantum Information Science (QIS) is mainly backed by optics and quantum physics; though it is now treated as a subject with far reaching implication for basic mathematical as well as physical science. Data and information are rapidly growing. Today it is very difficult to manage information thus emerging world wide both in professional practice and in academic researches. Fundamentally it is dedicated to both computer and physical science (Paul & Dangwal, 2012).

In general Quantum Information Science (QIS) may seem to be a combination of Quantum Science and

Figure 1. Road map of establishment of quantum information sciences
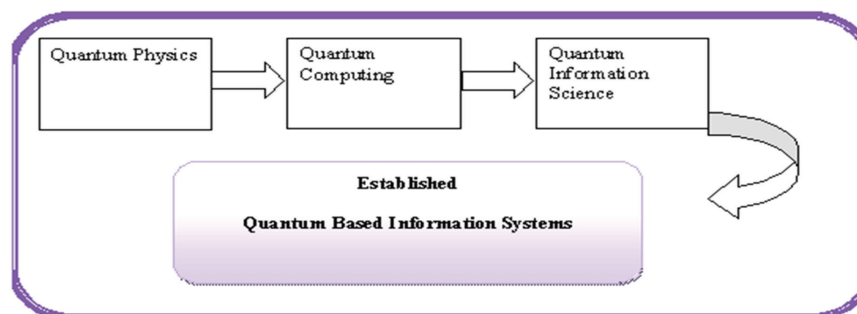
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