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Information Science and Technology (IST): The Nature and View from the Domain of Computing, Humanities, Management and Engineering A Conceptual Techno-Educational Study

P. K. Paul* Raiganj University (RGU), West Bengal, India

A. Bhuimali Vice Chancellor, Raiganj University (RGU), West Bengal, India

P. S. Aithal Vice Chancellor, Srinivas University, Karnataka, India

R. Rajesh Principal, Rohini College of Engineering, Tamilnadu, India

Abstract: Information Science is a Science of Sciences responsible for Information Solution besides its Technological Solution. Information Science [IS] is a broad field and combination of many fields of Science, Engineering, Management, Humanities and so on. Information Science during its origin developed as Information Field for Information activities such as collection, selection, organization, processing and management, and dissemination. Information Science sometimes treated as Information Studies or Library Science; however, there are many differences between Information Science and these two. Information Science is today emerging as an important name in Science and Technology and in several cases, the nomenclature of Information Science become popular as Information Science and Technology (IST). This paper talks about Information Science and its nature in the contemporary scenario with a brief discussion on earlier facets etc.

Keywords: Information; Information science; Information studies; IS; Computer science; IT; Computing; Information field; Technological field; Documentation science; Knowledge management; Academic programme.

1. Introduction

Information is becoming power and money in these days for several reasons. Information Science [IS] plays an important role for fulfillment of information availability to the organizations, institutions and personal uses. Information Science is actually a combination of many subjects such as Computer Science, Information Studies, Information Technology, Documentation Science, Management Science, Cognitive Science, Library Science, and Documentation Studies and so on [1-3]. Information Science in today's international academia though, an important Applied Science domain but closely connected with so many domains and disciplines such as Humanities, Social Science, Engineering, Technological Studies, and Management and so on. Initially during its development, Information Science [IS] mainly associated with humanities (domain such as) Documentation Science, Library Science and so on but the advancement of tools and technologies and computing changed the entire scenario of Information Science and makes it is an important socio-technical study with changing nomenclature in working and research areas [4-6]. The changing nomenclature depicted in Fig:1.

2. Objective

The main aim and objective of this study include but not limited to as follows:-

- To learn basic about Information Science and its characteristics.
- To learn basic about Information Science and its types.
- To know basic about Information Science and its importance in several fields.
- To know main difference in between Information Science, Information Studies, Computer Science and so on.
- To know future potentials of Information Science at a glance.
- To know about the transition of the Information Science to Information Science and Technology (IST) as a field of study, new nomenclature and research areas.

*Corresponding Author

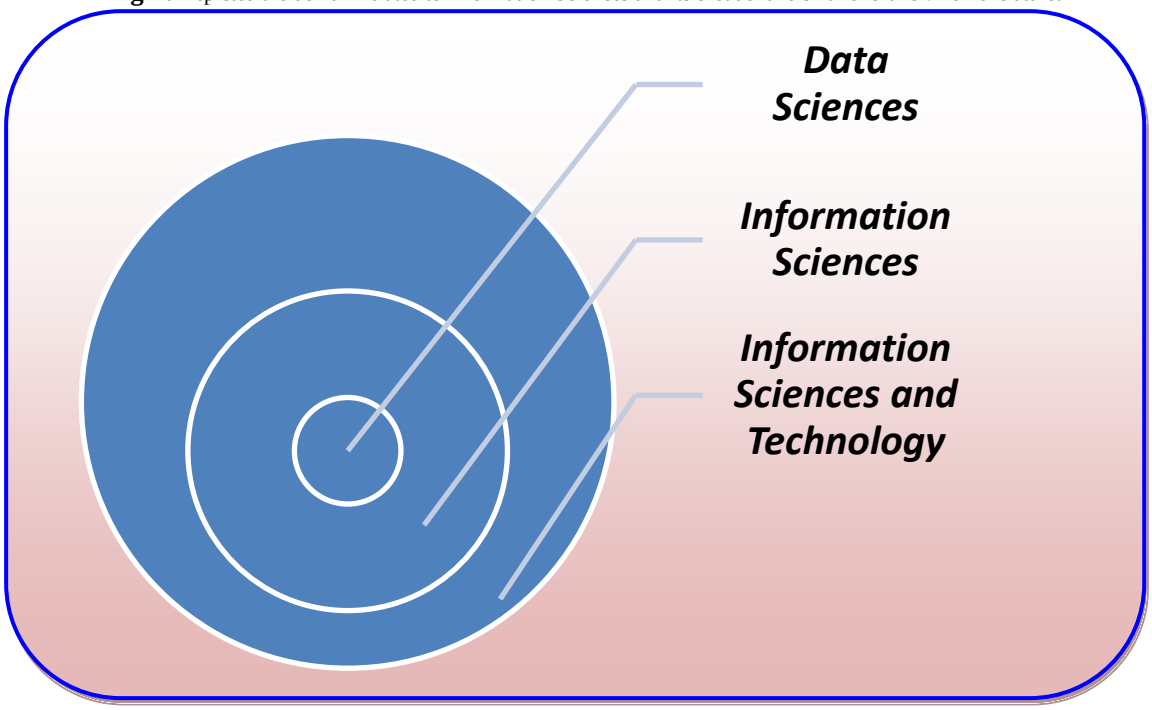
3. Methodology

This is a conceptual work and mainly derived out by healthy review of literature in the field of information which includes Information Science, IT, Computing, Cognitive Science (HCI), and Management Science (especially MIS) to learn about the healthy potential of Business Informatics in business promotion and Decision Support System. However, as a method of learning the Information Science and its contemporary educational scenario some of the web sources selected and analyzed for a potential discussion and future research directions. In the Indian context, the web sources are used from the DRTC (Documentation Research and Training Centre, Bengaluru, Karnataka), UGC for handling related areas and Model Curriculum of LIS, Management, Syllabuses of CBCS systems related to Computing and IT. Moreover, some IS related departmental sites have also evaluated to learn the SWOT of IS. In International context, the ASIST, United States, iSchools Organization, USA also played an important role for core areas of IS to reach the objective mentioned here [7]. Importantly the curricula of international iSchools have been studied and incorporated.

3.1. Information Science, Its View and Perception

Information Science [IS] has so many view and perception among the common mass and even academia. Many academicians think that, Information Science is actually another nomenclature of Information Technology or Computer Science, but it is a different field and broader than IT and computing field. It is a combination of some more fields which have direct and indirect concentration with information and technologies [8]. And thus technology affiliated nomenclatures are rising and few of them with concept depicted in Fig: 2.

Fig-1. Depicted the domain related to Information Sciences and its broader and smaller branch/ nomenclature.



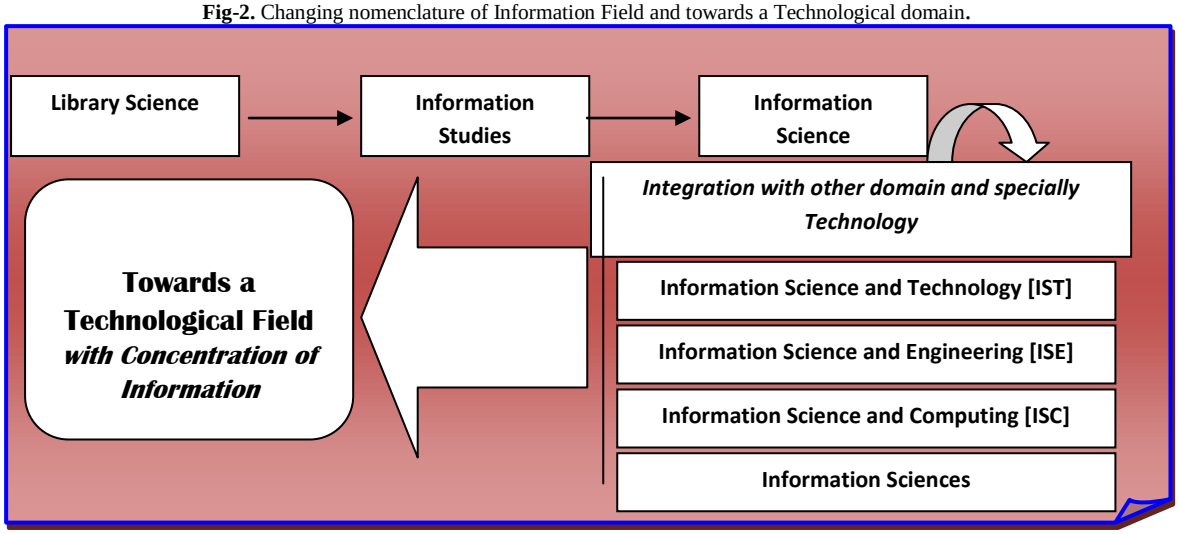
In Librarianship and Documentation field, Information Science treated as new nomenclature of theirs; however Information Science combines with so many others gradients and in today's context these gradients are highly treated as an Applied Science. Moreover in Library Science, some Information Science principles are employed for the better solution of information, content and documentation [9], [10], [11]. Though extensive research dig out that, the combination of Information Science and Library Science makes 'Library and Information Science' and only application of libraries and similar type of foundations [5, 12, 13].

As far as use of tools and techniques is concerned, Information Science may be classified two ways. Information Science which is biased with tools and techniques such as indexing, abstracting, cataloguing and classification and other knowledge organization tool; where as in another approach, Information Science deals with only computing aspects and uses DBMS, Networking Technologies, Web Technologies, Multimedia Technologies for Information Management and Dissemination [14]. Though, in recent academic evaluation, it is noticed that Information Science is accommodating both the approaches/ways for building information infrastructure depending upon need.

3.2. Information Science: Interdisciplinary, Social Science, Information Focused Domain

Information Science is an important domain of Social Science as it solves several information related aspects such as information society, information economy, information management, digital divide, information divide and so on. Thus, in this sense Information Science may be treated as domain of Social Science [11, 15].

Fig-2. Changing nomenclature of Information Field and towards a Technological domain.



Apart from aspects mentioned above, in Social Science point of view, Information Science also deals with some more aspects which are directly connected with Social Science and Humanities such as-

- Information Literacy.
- Information Development.
- Documentation.
- Community Information Services.
- Knowledge Economy.
- Agricultural Information Systems.
- Librarianship and so on.

However, the advancement of tools and technologies such as computing, IT changes entire dimension of Information Science and combined with so many domains (See Fig: 3) such as:-

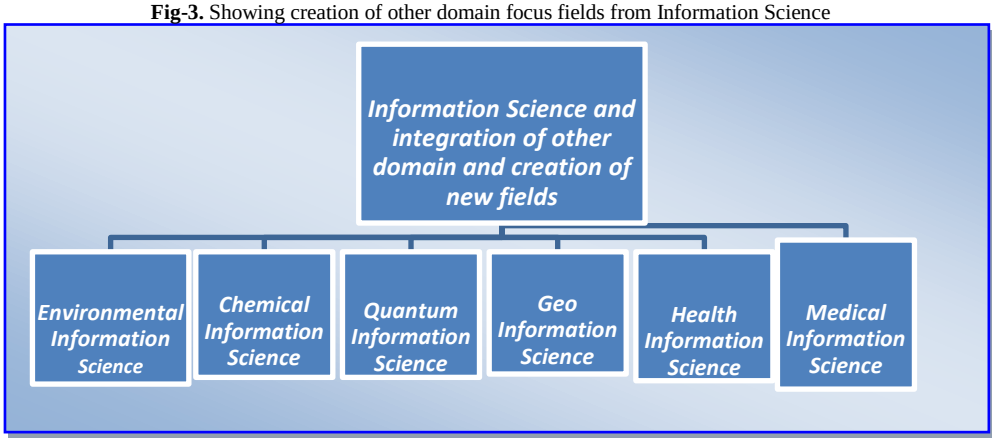
From Social Science domain-

- Information Studies.
- Librarianship.
- Documentation Science.

From Science and Technological domain-

- Computer Science/ CSE.
- Information Technology.
- Mechanical Engineering.
- Telecommunication Engineering.

Fig-3. Showing creation of other domain focus fields from Information Science



From Management and Commerce domain-

- Management Science.
- Business Administration.
- Policy Making and Strategic Management.

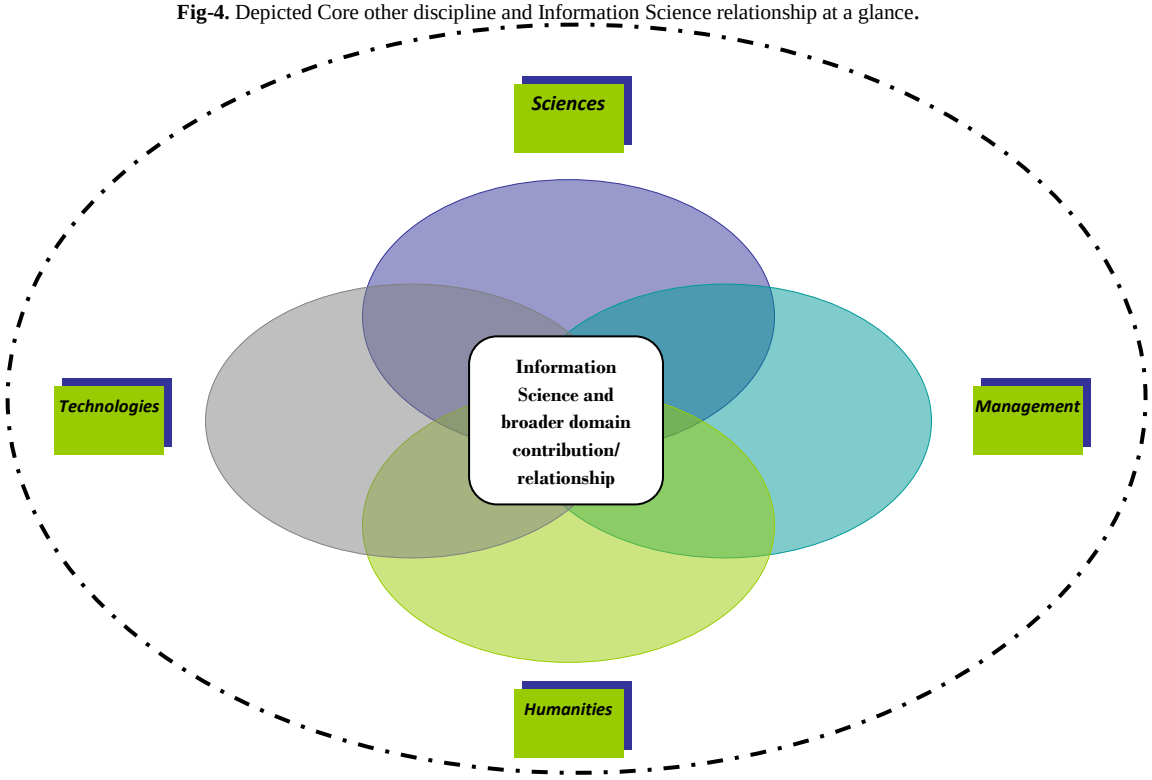
However, Information Science is always centered with information and information activities [16], [17]. Apart from Science and Engineering domain mentioned above some more may also interact with Information Science for development of new domain and dimension like [7, 18].

- Chemical Science *[for development of Chemical Information Science or Chemical Informatics]*.
- Medical Science *[for development of Medical Information Science or Medical Informatics]*.
- Quantum Science and Physics *[for development of Quantum Information Science or Quantum Informatics]*.
- Geography and Geological Science *[for development of Geo Information Science or Geo Informatics.*
- Food Science *[For Development of Food Information Systems or Food Informatics]*.

3.3. Information Science: A Science, Technology, And Computing Dependent Domain:-

Information Science, however, has so many affiliations with Science and Technology domain and makes Information Science as a field of Science and Technology [13, 14]. In Computing/ Information Technology following are closely related with information or in other sense related with Information Science.

Fig-4. Depicted Core other discipline and Information Science relationship at a glance.



Computer Engineering-

- Cloud Computing.
- Green Computing.
- Information Automation.
- Intelligent DBMS.
- ERP.
- Database Management Systems.
- Networking Technology.
- Communication Technology.
- Multimedia Technology.

And some other gradients make and integrate Information Science for intelligent Information and Documentation Solution [19], [17] [15].

Information Technology-

- Usability Engineering.
- Information Visualization.
- Human Computer Interaction.
- Green IT.

- Advance Informatics.
- SAP and so on.

Mechanical Engineering-

- AI Based Informatics.
- Decision Support Systems.
- Remote Information Administration.

Telecommunication Engineering-

- Networking Systems.
- Information Networks.
- Distributed Computing.
- E-Governance.
- E-Commerce.

3.4. IS or Information Science and Technology

Thus, from the above discussion, it may be designated that the Information Science is the domain of computing and Information Technology with social and Information basics touch [11]. However, Information Science has close connections with such gadgets but close with information fundamentals and social application may be on 'People, Organization, Institution, and Domain and thus many institutions worldwide are using the term IST in their programs, degrees, associations etc. [7, 15, 20]. See Fig: 4 for more clarification on this concept.

Table- 1. Depicted core gradients and stakeholders and features of Information Science.

People	Each and every one, because everybody need Information.
Institution	Educational, Technical, Health Care, Management and Organization and so on.
Domain	Science, Technology, Management, Medical Science and so on.
Special Domain	Which seek development of new domain like- development of Medical Information Science, Health Informatics and so on.

4. Findings

- Information Science is an interdisciplinary field and combination of Science, Arts, Engineering, and Technological gradients (listed in Table: 1).
- As far as the subject is concerned it is a combination of IT, Computing, Management Science, Cognitive Science, Library Science, Information Studies, and so on.
- Though Information Science is an Applied Science domain, it has a close connection with Community Science.
- Information Science has emerged as an interdisciplinary domain and gaining rapidly in traditional information management space and also digital information management.
- Information Science programme mistakenly treated as IT, Computer Science but it is broad than that and come with interaction with 'People, Information and Technology'.
- Internationally Information Science referring as 'Information Science and Technology' due to its hi-end technological inputs but importantly gaining a solid relationship with the traditional information studies to keep the slogan for all time- 'Information is for all'.

5. Conclusion

Information is one of the important names and responsible for information divide in many cases and thus it is one of the important domains for the community and societal development. Today everyone and organizations are aware of the need of the information and hence Information Science has great potential in the organization and other MNC's. So, it is better to introduce Information Science as a multi-disciplinary independent programme in the universities around the world. Initially, if introduction of IS (or IST whatever) become tough due to any reason, then specialization can be introduced in the related department such as Computer Science and Engineering, IT, LIS, Computer Applications, Management with the degree such as BTech/MTech-CSE (IS), BTech/MTech-IT (IS), BBA/MBA-IS, and so on for building healthy Information Infrastructure supported by traditional flavor of topics like knowledge organization, information retrieval, information society, information and community—and obviously other facets which deal by information studies. Ultimately, technology may be deemed as core but we can't ignore the values of humanities and social sciences. So let's welcome Information Science/IST for building a sustainable informatics practice and for the promotion of digital humanities.

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