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A New Generation of Information Scientists and Managers: MCA Promoting Digital Humanities via Interdisciplinary Specialization in the Social, Business, Health, and Mathematical Sciences

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Abstract— If any sort of company or institution is serious about constructing a solid information infrastructure, they should look to the field of information science for guidance. Data and its ever-increasing quantity are the driving forces behind the need for data and related domains. Data processing, information theory, and practice are all interconnected areas that make up the field of information science, which is really an interdisciplinary realm. When it comes to building and developing healthy, high-tech information systems, computer science is a crucial information science gradient. There is a dizzying array of computer-related academic programs, each with its own name and set of prerequisites and requirements, including Computer Science, Computer Application, Computer Science and Engineering, Information Technology, and many more. Similar to computer science, but with an emphasis on information, is information science. The Master of Computer Applications (MCA) programme is highly regarded in India and covers a wide range of topics related to the use of information technology (IT) to address societal and industrial issues. In order to improve the development of information infrastructure, this study discusses MCA in regard to the possibility of specialization in information science within such a program. It is herewith stated that the author's thesis (for the purpose of acquiring a research degree) incorporates certain parts of this article. The paper covers a lot of ground, touching on topics such as the necessity and features of information science, the educational situation in India and throughout the world, and how to incorporate this suggestion into modern Indian MCA programs.

Keywords— Information, Information Science, IST, Knowledge, Social Development, Digital Divide, Information Literacy, Information Divide, Information Development, Academics, Information Systems

I. INTRODUCTION

Among the many significant fields responsible for information operations including gathering, sorting, organizing, processing, managing, and disseminating is information science, an interdisciplinary branch of the scientific community. See Figure 2 for more details on how the field of information science is responsible for the construction of various types of information infrastructure, such as public information systems, chemical and bio-information infrastructure, medical information systems, and the traditional workplace of information scientists, the Information Foundation and related organizations. (10, 15). Educational opportunities in the field of information science are crucial for the growth of such endeavors in India. The number of schools offering an Information Science degree is still rather low, at just around ten [10, 13]. On the other hand, almost 2,400 schools of engineering and computer science offer an MCA program. The BCA and MCA curricula have room for growth in terms of the ways in which information science is included. The advancement of information systems, driven by cutting-edge IT and CS, will benefit in the long run from such an endeavor [16, 18].

II. OBJECTIVE

This paper deals with so many aim and objective; which including but not limited to:-

- To know basic about Information Science and its basic characteristics and features.
- To learn about the main component and field of Information Science and allied domain.
- To know about Information Science and relationship and integration with computing and allied domain.

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Vol 12, Issue 4, 2024

- To get a brief overview on Information Science and the institutions offering educational programmes in India.
- To prepare a model and proposed curriculum of MCA with focus or specialization in Information Science.
- To find out main challenges and issues in relation to MCA [Information Science] programme.

III. INFORMATION SCIENCE: BASICS

Information Science encompasses a wide range of disciplines, including but not limited to: Computer Science, Information Studies, Knowledge Management, Management Science, Mathematical Science, and Information Technology (for a visual representation, see Figure 1). The field of information science is in charge of developing both computational and manual methods for use in creating information systems and infrastructure [22].

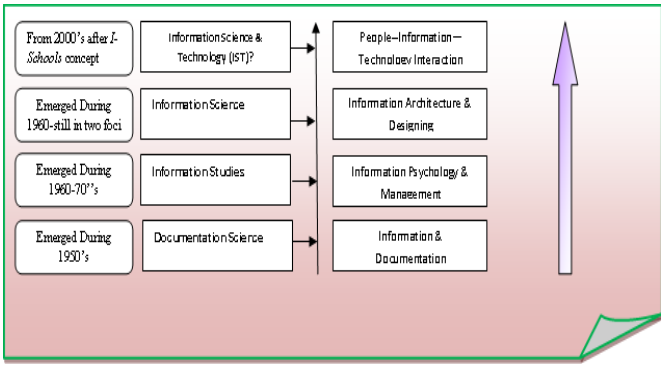

Fig: 1-Generation wise Information Field changes and changing nomenclature at a glance

Information Science has evolved from its roots in the information sector to become a sophisticated branch of applied science concerned with finding both technical and informational solutions. Information is essential to almost every modern institution and business, making information science a crucial field to study. Courses in information science nowadays are structured in a way that effectively shapes students' computing abilities and the foundations of information and society [23].

COMPUTER APPLICATION AND MCA DEGREE

Computer Application is one of the important domain and nomenclature in Indian academics. Computer Application mainly deals with computer related application and utilization.

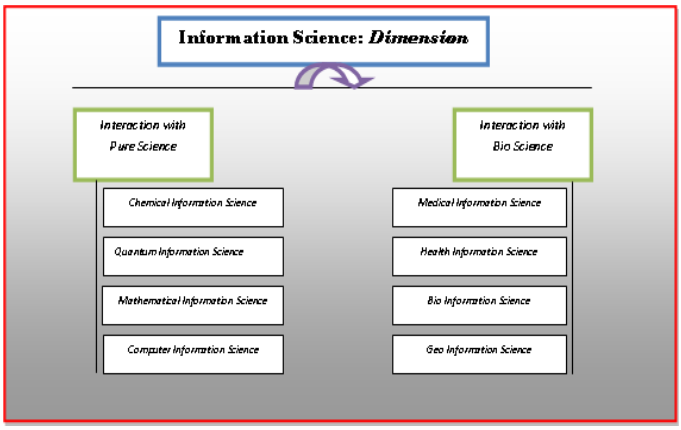

Fig: 2-Depicted Types of Information Science in respect to Domain focus

Instead of creating new hardware systems, tools, or embedded systems, this program is primarily concerned with applications and packages [12, 19]. While both the BCA and MCA are considered flagship programs in the field of computer applications, the MCA is often considered to be the more significant and worthwhile of the two.

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www.ijmece.com
Vol 12, Issue 4, 2024

Three years and a semester-based curriculum make up the planned MCA programme. If you want to get into the Master of Computer Applications program, you need to have a Bachelor's degree. This might be a BCA, BSc, BCom, or BA, and you need to have taken Mathematics or Computer Science in your 10+2 or undergraduate studies. An MCA degree is considered to be on par with a Bachelor of Engineering (BE) in computer science or engineering, or a Bachelor of Technology (BTech) in information technology. In India, the All India Council for Technical Education (AICTE) is in charge of ensuring that MCA programs are maintained consistently. Notably, AICTE has previously offered a model curriculum with a total of 25 theoretical examinations and 10 laboratory practice papers. Here are the main aspects of the curriculum:

According to AICTE guidelines, the core papers of IT for the MCA degree is listed as follows-

1. Introduction to Information Technology
2. Computer Organization and Architecture
3. Programming and Data Structures
4. Information Systems. Analysis, Design, and Implementation
5. Operating Systems
6. Data Base Management Systems
7. Computer Communication Networks
8. Object-oriented Analysis and Design
9. Network Programming
10. Software Engineering I
11. Software Engineering II
12. Artificial Intelligence and Applications

However, here total 12 papers had been proposed by the AICTE for MCA course as non-computer science core papers. Out of which 6 papers have deals with Management and 4 are as elective. The list of such specializations have depicted and mentioned in the Table: 1 and here out of six semesters, the last semester (VI Semester) a project work has been proposed.

Core Management Papers ***[5 Papers]***	**Elective Management Papers** ***[Any 4 Paper]***
1. Introduction of Management Functions 2. Oral and Written Communication 3. Accounting and Management Control 4. Management Support Systems 5. Organizational Behavior	1. Managerial Economics 2. Corporate Planning 3. Foundations of Decision Processes 4. Investment Technology 5. Business Finance 6. Taxation Practices 7. MIS Framework and Implementation 8. Management of Software Projects

Table 1 : List of non-computer science core papers.

IV. INFORMATION SCIENCE AND COMPUTER APPLICATION INTEGRATION

As previously mentioned, Information Science is an interdisciplinary field that integrates various scientific, technological, managerial, and even humanities (social science) areas that are either directly or indirectly linked to information processing and management [12, 18]. A new name, "Information Science and Technology," was coined by the IS as a result of its growing recognition in the professional sector. Crucially, the following elements and components are integrated within information science:

In Engineering- Computer Engineering, Mechanical Engineering, Electronics and Communication Engineering, Telecommunication
In Science- Bio-Science**,** Physics, Chemistry, Mathematics, Cognitive Science
In Humanities-Social Science, Library Science, Documentation

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www.ijmece.com
Vol 12, Issue 4, 2024

In Management Science- Administration and Leadership, Management Science.

The MCA curriculum designed and prepared by the All India Board of Computer Science, Engineering/ Technology and Applications (AIBCSA), which was set up by AICTE, New Delhi. It is important to note that the core of Information Science is positively possible to introduce in the MCA programme. It is a fact that the MCA curriculum already having components of computing/ IT/ Mathematics and Business and Management and thus by the inclusion of few information fundamentals and humanities gradients it is achievable to build Information Science/IST focused MCA programme. Here, in the proposed MCA, we have to include some important gradients of Information Science in such a way that a proper general balancing can be made without ignoring the computing gradients. Here three approaches have been proposed, in the first approach *[which is listed in Table: 2] the* MCA common papers kept as same provided by the committee of AICTE. Here just a few more papers have added related with the Information Science in Elective papers of MCA outline.

However, in second approach (i.e. here *listed in Table: 3)* the Information Science main/core gradients have included and distributed from the beginning of the programme and all the semesters have deals with AICTE's main gradients as well as the fundamentals of the Information Studies, Information and Knowledge Management including the Social Science gradients. Hence, the MCA programme looks like Information Science nature supported by the computing programme [05, 09, 12].

While in the third approach, *which is listed in Table: 4* we have proposed and depicted the same papers, as well as, outline of the main course (as MCA committee recommended) but here many gradients and specialized Information Science as elective programme have provided from the fifth (V) semester which is listed in fig. *Figure- 4/A/B/C*. The electives have proposed with the following flavors such as—

- *Medical Information Science.*
- *Geo Information Science.*
- *Chemical Information Science.*

Semester	**Papers**							
Semester -1	Introduction of IT	Computer Organization and Architecture	Programming and Data Structure	Introduction to Management Function	Mathematical Foundations	IT Lab	Programming Lab	
Semester -2	Information System Analysis Design and Implementation	Operating Systems	Oral and Wireless Communication	Accounting and Management Control	Probability and Combinatonics	Business Programming Lab	Linux and Windows	
Semester-3	Database Management Systems	Computer Communication and Networks	Object Oriented Analysis and Design	Management Support System	Statistical Computing	DBMS Lab	Statistical Lab	
Semester-4	Networking Programming	Software Engineering-I	Elective-1 Information Science and Services	Organizational Behavior	Elective-2 Knowledge Organization-Theory and Practice	Network Lab	CASE Tools Lab	
Semester-5	AI and Applications	Software Engineering-II	Elective-3 Digital Information Systems, and Knowledge Economy	Elective-4 Knowledge Organization-II	Optimization Technique	AI and Application Lab	Optimization Technique Lab	Industrial Lecture, Seminar, small project
Semester-6	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Seminar

Table: 2 MCA papers same as provided by the committee of AICTE but few IS/IST papers have added.

Semester	**Papers**							
Semester -1	Fundamentals of IST	Computer Organization and Architecture	Knowledge Organization	Introduction to Management Function	Information Services and System	IT Lab	Knowledge Organization Lab	
Semester -2	Information System Analysis Design and Implementation	Operating Systems	Oral and Wireless Communication and Information Networks	Information Systems-Trendz	Knowledge Management and Multimedia System	Business Programming Lab	Linux and Windows	

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www.ijmece.com
Vol 12, Issue 4, 2024

Semester-3	Database Management Systems	Computer Communication and Networks	Object Oriented Analysis and Design	Management Support System and Information Centres	Social Computing	DBMS Lab	Statistical Lab	
Semester-4	DBMS-2	Intelligent Information Systems and UE	CISCO Systems	Organizational Behavior	Virtual Lan	Network Lab	CASE Tools Lab	
Semester-5	AI and Applications	Software Engineering-II	Computing for People	IT For DSS	Optimization Technique	AI and Application Lab	KO-Lab-2	Industrial Lecture, Seminar, small project
Semester-6	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Project and seminar	Seminar

Table: 3 The IS/IST papers have added from the beginning of the semesters.

Semester	**Papers**							
Semester -1	Fundamentals of IST	Computer Organization and Architecture	Knowledge Organization	Introduction to Management Function	Information Services and System	IT Lab	Knowledge Organization Lab	
Semester -2	Information System Analysis Design and Implementation	Operating Systems	Oral and Wireless Communication and Information Networks	Information Systems-Trendz	Knowledge Management and Multimedia System	Business Programming Lab	Linux and Windows	
Semester-3	Database Management Systems	Computer Communication and Networks	Object Oriented Analysis and Design	Management Support System and Information Centres	Social Computing	DBMS Lab	Statistical Lab	
Semester-4	DBMS-2	Intelligent Information Systems and UE	CISCO Systems	Organizational Behavior	Virtual Lan	Network Lab	CASE Tools Lab	

Table: 4- Model approach where up to fourth semester the core MCA papers and IST papers have proposed with possibilities of domain based specialization at fifth and sixth semester.

Semester	**Papers**							
Semester -5 Specialization	Human Anatomy	Health Policies	Health IT and DSS	Health Informatics Software-1	Medical 2.0 and Web Designing	Health Informatics Software-1-Lab		
Semester -6 Specialization	Telemedicine and Network designing	Health Informatics Software-2	Knowledge Organization for Medical Literature	Medical Tourism and Computers	Knowledge Organization for Medical Literature-Practice	Health Informatics Software-2-Lab		

Table: 4/A- Specialization-1 of MCA with Medical Information Science

Semester	**Papers**							
Semester -5 Specialization	Chemical Informatics-Basics	Chemical Informatics Application	Chemo Informatics Software-Theory and Practice	Biology and IT	Systems and Computers	Textile Science and Informatics		
Semester -6 Specialization	MIS in Chemical Lab	Chemical Compounding	KM for Chemical Documents	Pharmaceutics and Chemo informatics	KM for Chemical Documents-Practice	MIS in Chemical Lab-Practical		

Table: 4/B-Specialization-2 of MCA with Geo Information Science

Semester	**Papers**

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www.ijmece.com
Vol 12, Issue 4, 2024

Semester -5 Specialization	Geo IS-Basics	GIS-Practice-1	GPRS and GPS	Topography and IT	Topographical and Geo Documentation	GIS-Practice-2		
Semester -6 Specialization	Space and IT	Oceanography and GIS	3D Modeling and GIS	Image Processing	Multimedia GIS	Cartographic technique and IT		

Table: 4/C-Specialization-3 of MCA with Chemo Information Science

Thus it is worthy to note that the proposed 3rd approach not only able and competent to produce skill of computing based information infrastructure system building as well as able to manage the growing need of sector wise (i.e. discipline wise) information and technologies. Thus, one degree holders shall be able in Health Information System, Geo Information System and classical information management which are in high demand in a contemporary context.

V. Challenges and Issues for Proposed MCA [Information Science]

Building MCA [Information Science] may come with so many possibilities and opportunities but it comes with so many challenges and issues; some of them are as follows-

- MCA [Information Science] needs the core of existing paper and subject prepared by AICTE committee.
- Training of such programme, interdisciplinary teachers are needed as they need to know IT and Computing to Information fundamentals for computational and manual Information System building
- Running such courses needs authorized permission of concerned authorities, body, and association.
- Government support and educational initiative is still a less important issue which is so essential to take care.
- Information Science is an interdisciplinary field and which is needed for Information System building in Information Foundation such as Information Centre, Documentation Centre, Libraries and organizational Information System building and hence Information Science is needed and during preparation of MCA- Information Science it is essential to take care the matter of manual knowledge organization and some aspects such as Information and Communication, Information Society, Information Management, Economic aspects of Information and similar facet inclusion in the perspective proposed programmes.
- Still, Information Science programmes are very much limited in India; only around 10 institutes are offers flagship programme of MSc- Information Science which listed in *Table: 5* and hence if full- fledged programme is not possible to introduce in Information Science then it may be offered as MCA [Information Science].

VI. Suggestion

- Information Foundations, Association and Computing and IT Association need to collaborate each other for building healthy Information Infrastructure with sophisticated IT support;
- AICTE, Ministry of IT, Education and similar departments are need to take proper initiative to start MCA- Information Science programme;
- During preparation of the programme, it is very much essential that the balancing of Information Fundamentals should be kept in mind;
- Apart from MCA programme such specialization may also be started in MCA- Information Science for producing skilled IT based Information Professionals;
- Initially if During MCA department wants to introduce MCA- Information Science specialization then appointing Adjunct Professor with Information Fundamentals specialization will be a better alternative.

VII. Conclusion

Information Science is one of the important and valuable domain as sophisticated Information Management backed by the Computing is possible with this domain. India is one of the largest educational hub in the world with near about 30000 higher educational institutions but still, the development of Information Science and the related domain is in very much limited in India [12, 19]. Hence, a better alternative may be introducing Information Science specialization at BCA/BCA or BSc/MSc-IT level. Proper planning, integration of computing and information related departments; associations may be an important alternative to manage Information explosion and future Information Solution.

VIII. References

Cohen, E. B. (2004) said as much. Implementing the Informing Science Framework in the Field of Higher Education: Building, Managing, and Sharing Knowledge. The Proceedings of the Knowledge Acquisition and Management Conference was held in Kule, Poland, from May 13th to the 15th, 2004.
[2] Eli B. Cohen and Malgorzata Nycz. (2006). A Science-Based View on Learning Objects and Online Education. Second Volume of the Multidisciplinary Journal of Knowledge and Learning Objects, 2006.
the thirdWith reference to Martin (1998). Trends in information employment from 1970 to 1995: an examination of information technology, employment, and the information industry. Publication: 49(12), 1053-1069, Journal of the American Society for Information Science.

[4] Ziming liu and Michael Buckland (1995).History of information science. Volume 30, Issue 4, Pages 385–416 of the Annual Review of Information Science and Technology.
Noted by Paul (2012). International Journal of Information Dissemination and Technology, Vol. 2, No. 4, October-December-2012, Page-245-248, ISSN-2229-5984, "The Role and Value of Information Scientists: An Examination of the Appropriate Academic Programme and Its Availability in India."
Umar Pricilda, Paul, P. K., Chaterjee, D., Bhatnagar, R. (2012). Academic Research Publication, New Delhi, Page-47-50, ISSN-2249-3689, "Information Scientist: Contemporary Innovative Techno Management Roles with Special Reference to Information Scientist Vs. Information Technologist: A Study" (IJISA, Vol. 2. No. 1, Jan-Jun-2012), (Information Scientist), APA style.
In 2013, Paul, Rajesh, Chatterjee, and Ghose published a paper. Article titled "Information Scientist: Technological and Managerial Skill requirement in 21st century" published in the journal "Information Studies" with the ISSN number 0971-6726 and pages 29–36.
Source: Paul, P. K. (2013). Overview of the Master of Science in Information Science (Geo Informatics) program with a focus on two suggested courses leading to advanced geospatial competence. Vol. 4, Issue 5, pages 218–227, International Journal of Pharmaceutical and Biological Research (IJPBR), ISSN: 0976–285X.
The source is Paul, P. K. (2013). "A Case Study on the Environment and Sustainable Development through Cloud-Based Green Computing" Published in the Scholars Academic Journal of Biosciences (SAJB), volume 1, issue 6, pages 337–341, with the ISSN number 1921–6883.
By Prantosh Kumar Paul (2013), we reach [10]. Nutrition Information Networks: Possible domain and Future Potentials. Publication: Scholars Academic Journal of Biosciences (SAJB), Volume 1, Issue 6, Pages 342-345, ISSN 2321-6883.
the eleventhDangwal, K.L., and Paul, P.K. (2014). Educational Systems Built on Cloud Computing and the Possibilities, Difficulties, and Threats It Presents The Turkish Online Journal of Distance Education (TOJDE), with the ISSN number 1302-6488 [page number], Issue 1, Page 89–98, Volume 15, Number 1.
[12]Karn, B., Paul, P.K., and Dangwal, K.L. (2013). Journal of Educational Research and Applied Social Sciences, Volume 4, Issue 2, Pages 141–146, Engineering Faculty, Departments, and the Community at Large: Highlighting a Few Educational Views on Information Science (IS).
Citation: Paul, P.K., K. L. Dangwal, and A. Kumar (2013). Modern Opportunities and Roles at the Intersection of Information Infrastructure with the World of Higher Learning. Articles 31–36 from the International Journal of Peace and Development Education, Volume 1, Issue 1.
[14] According to Reichman (1961). Cards with Notches. The status of the library (art04(01), pp. 11–55), edited by R. Shaw. Press of Rutgers University, Graduate School of Library and Information Science, New Brunswick, NJ.
Salatevic, T. (1996) states in [15]. Subjectivity reevaluated. Data science: Bringing different viewpoints together. The Royal School of Library and Information Science published the proceedings of the second conference on concepts of library and information science in Copenhagen, Denmark (pp. 201-218).
Salatevic, T. (1975) [16]. This study provides a framework for thinking about the idea in information science and provides an overview of related literature. Publication: Journal of the American Society of Information Science, Vol. 26, No. 6, Pages 321-343.

Referenced in Saracevic (1979a) [17]. This article will focus on the history and trajectory of computer science curricula. I. Historical overview. Publication: Information Processing & Management, Volume 15, Issue 1, Pages 1–15.
18. Saracevic, T. (1979b). This article will focus on the history and trajectory of computer science curricula. II. Education's unsolved "extemalities" Volume 15, Issue 4, Pages 291-301. Published in the journal Information Processing & Management.
Vakkari, S.P. (1996) said [19]. Information science and library science: Scope and content. Information science: From its inception to its impact on society, edited by J. Olaisen, E. Munch-Petersen, and P. Wilson, is available online. Scandinavian University Press, Oslo, Norway.
In 1987, Vickery and Vickery published a paper. Information science in theory and practice. Butterworths, London.
In 1975, Wersig and Neveling published a paper. Things the science of information finds interesting. Publication: Information Scientist, Volume 9, Pages 127–140.
"Visualization of literatures" [22] was written by White and McCain in 1997. Volume 32, Issue 1, pages 99–168, Annual Review of Information Science and Technology.