Data Management in Technical Institutions in India with Special Reference to Karnataka State, D.K. District

Shashidhar Kini K, Dr. Manjaiah D.H.

Associate Professor, Dept. of MCA, Srinivas Institute of Technology, Valachil, Mangalore, India

Professor, Dept. of Computer Science, Mangalore University, Mangalagangotri , India.

ABSTRACT: Information and communication technologies have a catalytic impact on productivity and innovation, by facilitating creativity and management, modernization of public service, such as health, education and transport, advances in science and technology by supporting cooperation and access to information. Institutions offering technical education are the heart of innovation and they play a vital role with their capacities to generate new ideas and transform these into educational assets.

KEYWORDS: *e*-CRM, CRM, Business Intelligence, Customer Data Integration, Technical Institutions.

I.   INTRODUCTION

Institutions offering technical education and their related departments are facing with the challenge of locating and recruiting students for their programs. In some cases, this situation is caused by potential students being unfamiliar with either technology in general and/or the specific programs that are available. One solution to this problem is to educate potential students about technology areas and programs through the use of effective technology through electronic customer relationship management (e-CRM) so that they can be educated towards the different courses and value- addition programs in the technical institutions. Each touch points of the students are recorded so that the institutions can find out the best means for their sustainability in the competitive global market.

The last two decades have also seen an influx of the use of computer-based technology into technical institutions in their day-to-day activities, increasing the institutions functionality and the subsequent adoption of technology. Advances in computational power have paved the way for harnessing complex algorithms for the analysis of operation and condition data. Research into database technology has allowed huge volumes of data to be collected and processed as well as spurring on the advent of the data warehouse. The internet has brought the benefits of information sharing and accessibility to the information provided through customer relationship management (CRM) is addressed in current research.

Now-a-days the focus is currently shifting from improving internal operations to concentrating more on customers. Technical education customers are demanding more attention and immediate service – that is "Internet time". Proactive institutions are now adjusting their practices by refocusing their efforts externally. Because of the need to concentrate more on customers, many institutions are once again turning to technology – customer relationship management. CRM goes several steps further than ERP by helping institutions to maximize their customer-centric resources.
Understanding the adoption and use of the technologies allows the IT industry to strategize on where to focus future research and development effort for technical institution management systems. However, with the availability of competing technologies compounded with a mixture of organization technology adoption strategies, it can be difficult to identify the current state of technological usage in technical institution management.

II. RESEARCH QUESTIONS & METHODOLOGY

This survey provides the current state of information systems and data warehousing in technical institutions by examining the use of information systems, the justifications behind their use, their integration, data warehousing and data retention. A questionnaire forms the primary tool of investigation and the survey methodology and the results analysis in this paper are exclusively devoted to the questionnaire. Interviews with different customers in technical institutions are used to confirm discoveries in the questionnaire results analysis. The results provide a rationalization for the research topics in this paper, and show the data management needs of the institutions offering technical education.

To understand the usage of data warehousing in technical institution the customers i.e. students, administrator's (office-staff), faculty members, advancement (donors), the institution and alumni are asked the different research questions in the survey design. They are:

- What is the composition of information systems in technical institution operations?
- Why some systems used while others are not, and what improvements can be made to current technical institution information system?
- How is the success of a technical institution information system measured?
- What is the level of integration between these information systems?
- What data are regularly discarded any why?
- What is the level of data warehousing activities in technical institutions?

Firstly, the research questions were addressed through the use of a structured questionnaire to form a general impression of the area. The questionnaire is hosted through a website. Here all possibility of e-CRM concept is used to get the maximum information from the customers. All the clicks are recorded and the data stored is downloaded through the website. Secondly, interviews were conducted in order to extract the institution and technical education specific knowledge in addition to providing a validation to the results of the questionnaire.

III. RESULT & DISCUSSION

The data collected from the website as well as offline are process through SPSS (Statistical Package for Social Science) software. The response rate for the web version of the questionnaire was considerably greater. Table 1 shows a breakdown of the targeted receipts into categories of applicability, responses and views. Despite the efforts we are able to get the minimum response because the emails sent are not seen, or the person has left the organization or he/she is not interested to give the response.

TABLE 1. ONLINE/MANUAL RESPONSE RATES

	Student	%	Office Staff	%	Faculty	%	Donors	%	Institution	%	Alumni	%
Total	30	100	25	100	25	100	05	100	05	100	10	100
Applicable	30	100	25	100	25	100	05	100	05	100	10	100
Responded	30	100	25	100	25	100	05	100	05	100	10	100
URL	28	93	20	80	23	92	02	40	04	80	07	70
Question-naire (offline)	02	7	05	20	02	08	03	60	01	20	03	30

As information systems form the source systems to a data warehouse, it is important to understand their composition within an organization. The results show that most organizations have operational excellence systems, while the adoption of day-to-day survival systems lags behind. The usage of information systems improved decision makes in the next position. It clearly shows that the maximum usage of information systems in operational excellence indicates that the institutions would like to work efficiently in every operation they carry out.

TABLE 2: USAGE OF INFORMATION SYSTEM IN DIFFERENT AREAS

Area	Yes	%	No	%	Unknown	%
Operational Excellence	84	84.0	09	09.0	07	07.0
New Products, Services and Business Models	35	35.0	45	45.0	20	20.0
Customer/Supplier Intimacy	38	38.0	45	45.0	17	17.0
Improved Decision Making	45	45.0	33	33.0	22	22.0
Competitive Advantage	39	39.0	40	40.0	21	21.0
Day to Day Survival	61	61.0	17	17.0	22	22.0

Technical institution should emphasize on desired improvements in information systems focusing on integration and reporting,

TABLE 3: DATA WAREHOUSE SITUATION IN TECHNICAL INSTITUTIONS

Situation	No. of Respondents	Percentage
Using Data Warehouse	44	44.0
Developing a Data Warehouse	24	24.0
Stopped using our Data Warehouse	06	6.0
Never had a Data warehouse	00	0.0
Unknown	24	24.0
Other	02	02.0

It is surprising to note that only 44% of respondents have data warehouse that is used in their data management. 24% of the organizations are developing a data warehouse. It is to note that 24% of the respondents are unaware of the data warehouse in their organizations/Institutions.

An important area for data warehousing is that of system integration. Integration involves making an information system accessible to another via an automated process. While data warehousing is an enabler of integration, it does not necessitate system integration, as it provides an indirect rather than a direct method. In addition, a direct method of integration does provide an easier upgrade path to data warehousing than those institutions without it, as it provides an existing infrastructure platform.

TABLE 4: LEVEL OF INFORMATION SYSTEM INTEGRATION

Level	No. of Respondents	Percentage
All systems are integrated	26	26.0
Some systems are integrated	51	51.0
No systems are integrated	07	07.0
Unknown	16	16.0

The majority of respondents had some type of information system integration within their organization as seen in table 4. As the "some systems are integrated" category includes various levels of data integration in their organization. Only seven percent respondents are in the category "no systems are integrated". The reason for this may be the small organizations that had a smaller number of areas covered by information systems. However, there was an anomalous observation that 16% of the respondents are unaware of the data integration system in their organization.

In data warehouse definition Macro [3] specifies four preconditions, the last of which states that "a data warehouse holds historical views of data". Transactional systems can store large amount of data; however, large amounts of data can lead to system performance degradation. The first solution to improving performance for most organizations is purging the system of superfluous data. This can pose a problem for data warehousing and data mining initiatives, as they can require a comprehensive set of historical data. As observed through the projects associated with this research, a good set of quality historical organizational data spanning years or decades is often difficult or impossible to obtain.

TABLE 5: ORGANIZATION POLICY IN DATA RETENTION/DISCARD IN DIFFERENT AREAS

Area	Yes		No		Unknown	
	No. of Respondents	%	No. of Respondents	%	No. of Respondents	%
Operational Excellence	38	38.0	52	52.0	10	10.0
New Products, Services and Business Models	23	23.0	63	63.0	14	14.0
Customer/Supplier Intimacy	23	23.0	64	64.0	13	13.0
Improved Decision making	32	32.0	57	64.0	11	11.0
Competitive Advantage	29	29.0	57	57.0	14	14.0
Day-to-Day Survival	25	25.0	58	58.0	17	17.0

From the above table the observation can be made that the data retention rate is very less compared to data discard. We can also observe that large percentages of respondents were uncertain about their organizational data retention policies. There is a lack of data lifecycle awareness within organizations with many individuals using corporate systems without knowing the procedures in data collection, maintenance and purging.

IV. CONCLUSION

This exploratory survey was conducted to provide a preliminary examination of the status of information systems and data warehousing within the institutions offering Technical education. The respondents were from different technical institutions of various sizes. The survey research questions addressed the composition and use of Information systems, as well as issues in data warehousing, integration and data retention.

The survey found that majority of institutions using information technology for their day to day work because information system architecture adoption increases the business processes effectiveness and the faster throughput.

One of the more striking revelations of this survey was that the primary justifications for using information systems was to both improve business procedures and data reporting. Streamlining business procedures through workflow automation decreases the overall time and resources required by each procedure and thus reducing costs. Data analysis and reporting also provides a method to detect inefficiencies within processes, and provides a platform for continuous improvement. Current information systems are largely based on relational data models, and the organisations using their information systems for data processing and reporting would be helpful for moving to multidimensional structure.

While most of the institutions have already integrated some of their information systems through in-house development, easier integration was cited as the most desired aspect for next generation systems. However, lack of knowledge on data integration standards was evident within the institutions. Standardizing on data transmission protocols allows a degree of forward compatibility and decreases the risk of adoption in long-term usage scenarios at the expense of an increased initial cost.

Data warehousing appears to be firmly established in the institutions offering technical education, with more than half the respondent's views is that either the warehouse is developed or it will be used in the institutions. Naturally, adoption has increased over the past half-decade and the primary reason for adoption is, again, the need for enhanced data analysis and reporting. With the significant uptake of data warehousing for the information in technical institutions, it appears that this methodology is a step in the right direction, although issues still remain on how to integrate data across different areas in technical institutions.

Customer data integration (CDI) is rapidly becoming a strategic initiative for technical institutions who want to successfully target, acquire, develop and retain customers. However, in order to benefit from CDI, an organization needs to create a unified and comprehensive customer view from all disparate data sources including CRM, financial, product and external data services Data integration flows are the back-end of a typical business intelligence (BI) architecture.

Overall, the major conclusion of this survey is that the use of data management in technical institutions will yield favourable results. Technology is being used to automate processes leading to greater efficiencies, and complex data analysis is now becoming mainstream after decades of simple data capture and reporting. These survey results are not meant to provide a definitive description of the field, but are instead a mechanism to provide an exploration into data management in technical institutions.

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