TEACHING INFORMATION QUALITY SKILLS IN A BUSINESS INFORMATICS PROGRAMME

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Abstract:

The increasing importance of information quality in practice and academia as well as the move towards a more applied and professionally-orientated computing education demand constant revision of education programmes. The following paper summarise some aspects of current study programmes in information systems and focuses on information quality skills taught in a business informatics programme. The success of this approach derives from the benefits that arise when management concepts are integrated with computer science technologies and software engineering principles to form a coherent methodological approach. The programme outlined in this paper addresses the need for an innovative and cross-disciplinary study model to equip computing graduates with information quality management skills.

Keywords: information quality, business informatics, curriculum development

1 Introduction

Over the last decade, the importance of information quality is ever more recognised among practitioners and academics. It has developed beyond the traditional view of information and data quality as a synonym for data accuracy. Wang and Strong (1996) note that in order to improve data quality in an organization, a multi-dimensional view of the concept must be taken.

Many researchers have examined ‘data quality’ and/or ‘information quality’. The result of the plethora of publications is a multiplicity of descriptions, definitions, criteria lists, case studies and frameworks for various areas of application (e.g. Wang, Storey & Firth 1995). In addition to these frameworks, literature on information quality indicates a number of technical, managerial, and organisation factors that are believed to improve information quality. However, at present there is no rigor empirical evidence on factors for successful or unsuccessful information quality management practice. Furthermore, there is no standard information quality management curriculum focusing on information quality skills or competences. In order to provide inside in competences and skills taught in information systems curriculum, we analyse one study programme and summarise some aspects of information quality competences.

We structure the article as following. First we summarise information quality management competencies. Then we outline the main characteristics of business informatics curricula and relate an example study programme to information quality competences. We conclude our article by outlining some future trends in information quality curriculum development.

2 Information Quality Management Competencies:

The primary concept of information quality management stems from total quality management (TQM), a concept commonly known in manufacturing (e.g. Wang et al. 1998, English 1999). However, what is emphasized here is that although Information Quality Management (IQM) has been accepted as embodying a set of principles, it has been widely disseminated in the form of descriptive cases or practices, tools, techniques, and systems.

TQM is a general management model that aims to meet customer needs and expectations within an organization through continuous improvement of the quality of goods and services and by integrating all functions and processes within an organization. Different sets of organizational requirements are prescribed by quality management experts and practitioners for the effective practice of TQM. Many authors, such as Deming (1986), Crosby (1979), Juran and Gryna (1993), Feigenbaum (1991) and Ishikawa (1986) providing a good understanding of general quality management. However, most of the earlier work is descriptive. Recent literature enhances the descriptive and method oriented work by proposing various comprehensive TQM models. Also, over the last decade there has been a shift of focus on studies in TQM from “hard” aspects, such as methods, tools, techniques, and systems, to “softer” behavioural and cultural aspects of TQM. These concepts have been widely used and accepted in recent TQM studies. Many empirical studies have investigated TQM practices of organizations, by analysing various components of TQM implementation (Ismail, 2005), typically classified as TQM constructs. For instance, Saraph et al. (1989) presented one of the first sets of empirically validated integrated quality management elements based on eight factors. Flynn et al. (1994) developed a more comprehensive set of TQM implementation constructs through a review of the past practitioner and empirical literature. Anderson et al. (1994), identified six constructs namely, leadership, process management, employee fulfilment, customer focus, learning, continuous improvement, and internal/ external cooperation.

The constructs or elements -either explicitly or implicitly- span almost the entire range of activities deemed critical to TQM. However, there is certainly not a clear agreement on the factors of TQM. Further, although to build on expertise and knowledge of TQM, a similar body of knowledge is not yet present for IQM. Since this research was not aimed at developing a validated IQM model of constructs, we decided to stay within common elements of TQM practices but to combine the elements to three main categories, which seemed most relevant to IQM. The IQM principles include:

Information produce and information system design

- Defining Information Product characteristics
- Defining Information Quality Requirements
- Defining an Information Manufacturing System

Operating procedures for continuous improvement

- Measuring the Information Product
- Analyzing the Information Product
- Improving the Information Product

Information Quality Culture

3 Information Systems and Business Informatics Degrees

Universities have offered various courses in Management, Information Technology (IT), Computer Science, Software Engineering and more recently Information Systems (IS), Information Management and Business Informatics. Courses have been established at many universities and the growth in particular of IT-related programmes is expected to continue. Recent changes, for instance the "Bologna Agreement" in Europe, globalisation and technological innovations, require established study programmes to be revised and new aspects to be introduced in curricula. The pressure to revise curricula rises as Universities are increasingly expected to offer attractive and profitable study programmes.

Traditionally universities focused on management and business studies as well as computing, software engineering and computer science. Computing and computer science (e.g. basic *informatics*) addresses technical and theoretical bases of information technology and software systems. *Business* and management provide knowledge of the principal functions of management and focus on business operations and decision-making (behavioural and organisational component). The combination of both disciplines, which includes technical and social components, is generally described as Information Systems. Terms such as Management Information Systems (MIS), Business Information Systems (BIS) or Information Systems and Management (ISM) are also common.

Management-orientated Information Systems programmes sometimes lack consideration of a *methodological* combination of the theoretical work of computer science with a practical orientation towards designing systems and applications. This methodological focus is the area of business informatics, which complements traditional areas of information systems that focus on *explaining* real world scenarios. Business informatics aims to engage constructively to develop solutions tailored to business problems. It takes an active role in aligning business strategy, corporate goals, business processes and information technology. The core element of business informatics is a methodological approach to describe, explain, predict and design information and communication systems. It involves the development of terminologies, models and architectures that are explicit and sharable.

We believe that in particular the methodological focus of business informatics is suitable to teach core competences required for Information Quality Management. The following Table 1 illustrates the matching between Information Quality Management competences and courses taught in a Business Informatics programme at Dublin City University (Helfert / Duncan 2006).

Table 1: Information quality skills and Business Informatics Courses

Module	Information produce and information system design	Operating procedures for IQM continuous improvement	Information Quality Culture
Research Skills/Seminar Topics	◖	◖	○
Information System Architecture	●	○	
Structural Science	◖		

Business Process Management	●		◖
Regulation in IS	◖	◖	◖
Business Studies			○
Strategic Management of Information Technology	○	◖	◖
Supply Chain Management	●		◖
Sectoral applications of Information Systems	◖	◖	◖
Project Management	○	○	●
Managing Change		◖	●
Managing and Working in an Intercultural Environment			◖
Practicum	●	●	◖

Legend:
- ● Considerable development
- ◖ Moderate development
- ○ Some development
- Negligible development

4 Summary and Conclusion

This article presented aspects of information quality skills and business informatics. It illustrated the matching between both in an example study programme. We summarised some key requirements of information quality competences for information systems graduates. In particular, graduates need a comprehensive understanding of behavioural aspects as well as software engineering, programming and information technology. Interpersonal and communication skills as well as problem solving and critical thinking capabilities are also essential for information quality skills. However, at present information quality curriculum development is still in its early stages. For instance, in Europe information quality study programmes are not common. It is expected that with the increasing importance of information quality aspects in practice the demand for such programmes will increase. Funding for curriculum development programmes, such as within the European Union, might be an opportunity to develop innovative and comprehensive study programmes in information quality.

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