

# MEASURING THE QUALITY OF DISTANCE EDUCATION BETWEEN TWO CONTINENTS

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Abstract: The purpose of the paper is to measure the quality of distance learning education between CDM Chicago and CDM Amman Jordan. To accomplish this task we used a Total Quality Management (TQM) Model developed by Mergen et al. (2000) and Widrick et al. (2002) which consists of three dimensions (Quality of Design, Quality of Conformance, and Quality of Performance). A case study approach was used to collect data in Amman, Jordan and Chicago, USA. One key finding is that distance learning systems (IT and business processes) in the US cannot be applied in Jordan without significant changes to the administrative process. Another is that, while technology is global in nature, local resources and cultural issues make distance learning difficult to adopt across continents.

## 1 INTRODUCTION

Quality has many definitions: Leavitt (1972) has defined it as *conformance to specifications*, Crosby (1979) defined it as *conformance to requirements*, Juran (1988) defined it as *fitness for use*, and Parasuraman, Zeithaml and Berry, (1985) have defined it as *meeting and/or exceeding customers' expectations*. Each definition has strengths and weaknesses with respect to measurement, generalization, managerial usefulness and consumer relevance, therefore each is appropriate under specific circumstances. Several authors have pointed out that what is needed is a framework that combines many of these dimensions (Wang and Strong, 1996; Grant et al., 1999; Adedokun, 1999 and Widrick, et al. 2002). In this paper the quality framework by Widrick et al. (2002) and Grant et al. (1999) is adopted. The application of quality measurement (QM) principles to solve industry-related problems has been institutionalized by institutions such as Xerox and Rochester Institute of Technology to gain competitive advantage (Widrick et al., 2002). Quality management plays an important role in the daily operations and management of these companies.

The College of Computing and Digital Media (CDM) has one of the largest graduate programs in computer science, telecommunications and

information systems in the US. It is part of DePaul University located in Chicago. Over the past few years CDM has expanded internationally to offer graduate degrees in Poland and Jordan. However, this study focuses exclusively on the CDM Jordan program. We believe that the formal application of a TQM framework will bring discipline to distance learning education between the two programs and will serve as means for continuous improvement. Therefore, the goal of this paper is to propose a set of measures and tools to evaluate each of the three dimensions of quality (Quality of Design, Quality of Conformance, and Quality of Performance) with respect to the delivery of distance learning education between CDM Chicago and CDM Amman Jordan.

The remainder of the paper is organized as follows. Section two discusses the quality framework adopted from Widrick et al. (2002). Section three explains the set of proposed measures, tools and techniques for measuring each of the three dimensions of quality. The next section presents a case study on distance education in Jordan. The paper ends with discussion and conclusion.

## 2 QUALITY FRAMEWORK

Juran (1951) takes a customer centric approach in defining quality as "fitness for use". Juran (1993)

later introduced planning, control and improvement (Juran's Trilogy) as part of the quality improvement process. Grant et al. (1999) and Widrick et al. (2002) build on Juran's quality trilogy as follows: plan (Quality of Design), control (Quality of Conformance) and improve (Quality of Performance).

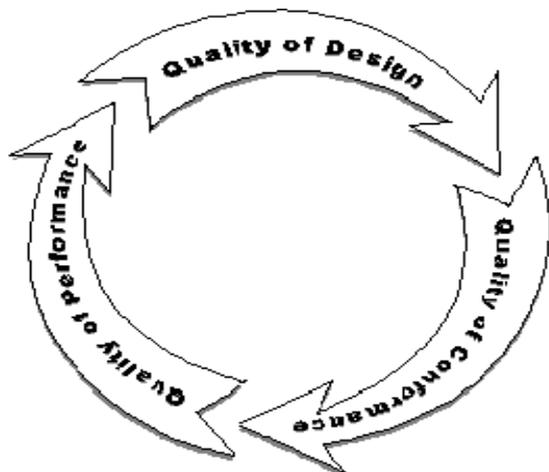


Figure 1: Relationship between components of the model (Grant et al., 1999).

Figure 1 suggests that the quality management framework (QMF) cycle begins with the design phase followed by a conformance stage and concludes with the performance stage. Theoretically the TQM process has no start or end point because of its continuous improvement notion. Like all processes there is a starting point which is assumed to be the design stage. Issues of conformance or performance may influence changes to the design stage.

## 2.1 Quality of Design

Grant et al. (1999) noted that design quality deals with determining the characteristics of a product or service at a given cost. Widrick et al. (2002) pointed out that the Quality of Design has to do with how well the design captures the intended requirements. The following three factors were used as a determinate for measuring design quality: (1) design insight and depth of requirements understanding; (2) the quality of the process used to translate the insights and requirements into valuable products or services for the end consumer; (3) the continuous improvement of the design process.

## 2.2 Quality of Conformance

Quality of Conformance describes how well firms and their suppliers conform to the design requirements. Conformance to requirements is one of the earlier measures of quality (Crosby, 1979). Quality of Conformance is relatively easier to measure compared to Quality of Design or Quality of Performance. While conformance quality is relatively easy to measure, in higher education distance learning it is difficult to measure partly due to the subjectivity of the product or service and the relatively long lead-time between delivery of service and the realization of the rewards or benefits.

## 2.3 Quality of Performance

Performance quality is often expressed as fitness for use, user satisfaction or meeting and/or exceeding customer's expectation (Juran, 1988; Grönroos, 1983). Widrick et al. (2002) explain that Quality of Performance deals with how well a service or product performs in the eyes of the consumer who could be internal or external. It is important to point out that each customer has a different assessment of quality. For example, executives tend to look at cost and return on investment as a measure of IT investment, while technical personnel measures things like IT downtime and system functionality. Performance quality is one area of assessment that is often not measured in distance learning.

## 3 APPLICATION OF THE FRAMEWORK: MEASUREMENT PARAMETERS AND TOOLS

Ensby, et al. (1997) proposed that the Baldrige quality criteria are appropriate for assessing functions of higher education institutions. Baldrige criteria emphasize identifying and satisfying customer needs. Ensby also suggested that students are the product of higher education institutions and the employers are the customer. Viewing students as products is different from other views taken by researchers such as Bailey et al. (1996) and Kanji et al.

(1998) who believe that university program artifacts such as curriculum, courses, projects, and so on are the products and students are the customers. Grant et al. (1999) suggest that university faculties and administrators should listen to

Table 1: Parameters and Tools.

Framework	Measurable parameters	Measurable tools
Quality of Design	Online education needs and Market potential Online resources and technical skill to deliver What program will be included in the distance education Admission requirements Continues training for technical staff Knowledge and skill requirements of the distance education locations Cultural and environment understanding of global delivery.	Survey of voice of customer Interview and meeting with stakeholders at offsite location Identify offsite stakeholders at various levels. Focus group on program requirements and technical requirements Identify and plan for administrative resources at the local site Survey and Plan of capable instructors for the distance program. Distance learning (DL) program committee
Quality of Conformance	List of degree programs in the online education program Available and fully functional technical resources Level of courses coverage in the onsite program and the distance learning program. Are courses offered in proper sequence in both program Involvement of qualified instructors in the online program	Confirmation of DL degree program Confirmation of tech resources Confirmation of level of coverage Confirmation of sequence of courses offered Confirmation of qualified instructors
Quality of Performance	Graduation level from the online education program Students satisfaction of the online education Employers satisfaction and continuous recruitments from the online program Alumni positions and compensation over their career cycle. Returning alumni for continues education and career development.	Graduation analysis Satisfaction survey and satisfaction trend analysis Industry feedback Alumni feedback New students from the employers

the concerns of employers who are the true customers and take them into consideration when designing courses for students who are the product. This view served as a guide to identify several measurement parameters and tools that could be applied to distance learning (see table 1).

#### 4 CASE STUDY

One of the co-authors spent six weeks in Jordan interviewing several stakeholders involved in the distance education partnership between CDM Chicago, and CDM Amman, Jordan. The co-author also taught classes in Jordan which allowed him to interact with students and ask them about their views of distance learning. Until the spring 2008, CDM was formally known as School of Computer

Science, Telecommunication and Information Systems (CTI). Since early 2000, CDM is the largest graduate school in the US. This is partly due to the breath and quality of the degree programs that are offered. Currently CDM offers twelve undergraduate degrees and fifteen graduate degrees in fields ranging from traditional Computer Science to Multidisciplinary Studies. Examples of nontraditional degree programs include Human-Computer Interaction, Digital Cinema, Project Management, and Interactive Media. CDM is one of the few computer science schools in US that offer a comprehensive degree program in Digital Media, Gaming, and Animation.

## 4.1 Design Quality

The dean of CDM in early 2000 was very aggressive in developing new programs and expanding the highly successful CDM brand internationally. One of the countries of interest was Amman Jordan. To start distance education in Jordan two visiting professors were hired from Jordan.

The design quality focused on planning and defining the key requirements of the Jordan program. One of the visiting faculty members from Jordan was instrumental in the design of the program which is physically hosted at the partner University in Jordan. The design team is made of personnel from CDM Chicago, one of the visiting professors, the dean, and members from the Jordanian Ministry of Education. The design team discussed the long term market needs of the program, the immediate programs

that could be delivered online, and those that could be added later, faculty members that would be involved with the program, and the technology requirements. The online program proposal was submitted to the university committee and it was approved for implementation. Based on feedback from the Jordanian Ministry of Education changes were made to the final online delivery proposal.

One key ingredient to the design was the home grown online software (DL-Web) that enables students in Jordan to login to DL-Web to play videos of the classes in Chicago. Lectures at the Chicago campus are available online to Jordanian students a few hours after classes end in Chicago. Jordanian students actually take the same classes as their Chicago counterparts via the DL-Web software. A local instructor in Jordan provides local tutorial support and helps with explanation of key course concepts.

The focus of the design phase is how the Chicago courses would be delivered in Jordan. Since Chicago has been providing distance education to students outside Chicago via DL-Web, it was expected that time and distance would not be a barrier. Faculty members teaching online courses in Jordan could interact with students through the DL-web discussion forum and email.

The last set of design issues was about the local activities and processes involved in setting up the Jordan campus, like buying tables, chairs, and setting up the computer network. The objective was to make the product available internationally where Jordan would be one of several international venues. Base on interviews with local administrators we

understood that input from potential employers were not significantly solicited at the design phase.

## 4.2 Conformance Quality

All of the design requirements were met by the end of the first year. However, issues that were not defined in the requirements came up later. For example, cultural issues and management were areas that needed to be addressed. Other unforeseen technical issues immersed so IT personnel and CDM administrators from Chicago visited Jordan campus frequently to ensure that the program would function technically and administratively. We observed that all the computers in the labs were functional and the course technology equipment worked. We were able to login to DL-Web and view course lectures, assignments, grades and so on. One change that was made from the original design was that students can pick up class lecture DVDs in addition to DL-Web because many Jordanian students don't have access to high speed internet at home. Exams are proctored locally and mailed to Chicago for grading. Take-home assignments can be submitted online and the instructors' comments on student assignments are submitted online. In addition, faculty members occasionally travel to Jordan to teach. Conformance was continuously monitored by soliciting feedback from students on the program, especially on course quality, teaching, and course usefulness. Consequently, conformance quality measurements have been focused on program elements including content delivery to ensure that it does not vary significantly from the Chicago program.

## 4.3 Performance Quality

Grant et al. (1999) and Ensby et al. (1997) agree that performance quality is one area that is seldom measured and unfortunately, the same is true in this case study. However, we are hoping to correct this limitation in the near future by measuring the performance of the program beyond student feedback. Most universities seldom considered the employer as the final customer hence they seldom measure the performance of their product (the students) in conjunction with the end customer (employer). The only ad-hoc assessment of performance quality was comments from the students. One student commented that having taking the capstone course he was able to understand what he needs to do to become the CIO of the company he works for. Several students completing the program are considering changing jobs and careers after

Table 2: Proposed Quality Assessment.

Method	Quality of Design	Quality of Conformance	Quality of Performance
Action Research	CDM should focus the design on customer expectations (i.e. IT needs within the Jordanian industrial environment). Such focus and understanding will be used to determine which CDM program will be adjusted and offered in Jordan. It will also determine which skill set is required for local instructors.	Conformance qualities would be assessed through continuous evaluation processes on classes, the instructors and the online technological fit.	Formal and informal feedback from the industry will be obtained as part of the quality process. Some of the industrial participants will include CDM alumni and board of directors. Comments from this group will feed into the design and conformance quality assessment.

acquiring new knowledge through the program. One student was considering starting an offshore outsourcing company. Efforts are on the way for the program to collaborate with industry partners. For example managers from IT companies including IBM Jordan were invited as guest speakers.

## 5 DISCUSSION/CONCLUSIONS

In this paper we identified a set of measurement parameters and tools to evaluate the three dimensions of quality with regards the distance learning between CDM Chicago and CDM Jordan. The proposed framework should prove useful for higher education institutions considering distance learning education implementation and assessment.

If we follow the TQM process proposed by Grant et al. (1999) and Ensby et al. (1997) we would conclude that the program is not the product but the students are. This view may force CDM Chicago to reevaluate the final product, is it curriculums and programs, students, or employers? In Chicago, CDM has a board of directors made up of industry IT executives. A similar approach should be introduced in Jordanian. Jordanian Board members could provide external review and valuable feedback of industry needs to design programs to better meet the need of customer (employers). They should establish a Jordanian alumni association to provide advice and aid the collection of Quality of Performance assessment. While the US-Jordan program has been very successful in its program delivery, several lessons were learned.

First, there is a difference between distance learning within the US (Chicago-New York) and distance learning across national boundaries or continents. Some of the assumptions that work in the US certainly do not work globally. For example, most students at DePaul have a PC with high speed

internet connection at home. This is not true for Jordanian students.

Second, IT system that works well in one cultural environment may not work in another (Ruohonen and Adalakun, 1997). This is true for all aspects of IT and other products. If CDM defines their product to be the programs, projects, curriculums and the DL-Web application it may present some challenges because research has shown that education has to be tailored to the needs of the society. While theories are global in nature the application is local, therefore, performance measurements have to address how the theories are applied locally. The current dean of CDM is taking steps to include industry partners in the improved design of the Jordanian program. He has approved to fund a career day event that would involve several Jordanian IT companies. Based on the findings of this research we propose a new view of quality for CDM (Table 2.).

Third, traditionally there seems to be a gap between industry and academia in terms of what subject matter and needed skills are important for student success. Many universities are involving industry experts in curriculum development. A good example of this partnership is the development of the MS degree in Manufacturing Management and Leadership at Rochester Institute of Technology in USA (Widrick et al., 2002). Such partnership fosters stronger ties between academia and industry. CDM could use such a relationship as another source for student recruitment into the program. This is extremely important due to the cultural and IT differences between the two countries. Cultural issues did not pose significant challenges because the theories discussed in the degree program were the same in Chicago and Jordan. The key differences were in the application of theory to practice, the resources available for implementation, and technology

Fourth, administration of distance learning across continent is more challenging than distance learning within the US. Time difference, language, religion, and social norms present administrative challenges to distance education in Jordan. In case of CDM, a permanent on site CDM director was available at the offsite location. The director in Jordanian has a strong US academic background and was an instructor in CDM for several years before assuming the position in Jordan. Such local and global knowledge was instrumental to the success of the joint program. If it were not for his local knowledge, the cultural issues would have derailed the successful implementation of the program.

Lastly, performance measurement is one area that is often problematic and seldom measured and this was confirmed in our study. In many universities performance quality is assessed by measuring the number of students in a program and revenue from the program. These are typical ways of evaluating the performance quality but they provide a limited assessment of performance quality. Future performance measurement should include customer evaluation of the product performance (CDM Jordanian graduate students). We believe this is the only way to maintain sustainable competitive advantage in the long run. Using TQM proposed by Widrick et al. (2002) performance issues could be used as a trigger for improving the design and conformance of the program. Future research may be used to survey Jordanian alumni and industry participants on their assessment of Jordanian graduates (i.e. the end products). Another study may be used to assess CDM distance learning students in US.

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