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**A Framework  
for Exploring Information Systems  
Quality Perspectives**

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**A Framework for Exploring  
Information Systems Quality Perspectives**

Rámcem pro posouzení  
kvalitativních hledisek informačních systémů

Short version of Ph.D. Thesis

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Information Systems, Quality, Information systems Quality, Information Systems Stakeholders, Multiple Perspective Framework, Technical Perspectives, Organizational Perspectives, Personal Perspectives, Hard Approach, Soft Approach, SSM, Soft System Methodology, CATWOE Analysis, Structuration Theory, Root Definitions.

## **Klíčová slova**

Informační systém, kvalita, kvalita informačního systému, IS, investor, rámec vícenásobného ohledu, technické pohledy, organizační pohledy, individuální pohledy, striktní přístup, měkký přístup, SSM, metodologie měkkých systémů, analýza CATWOE, teorie strukturace, kořenové definice.

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# **1 INTRODUCTION**

## **1.1 INTRODUCTION**

Information systems technology is the backbone of the development of the developed countries. Some researchers have also recognized it as the most important factor separating the developing countries from the developed ones [7]. Countries are being encouraged to attract economic growth by entering the ‘information age’ and being able to supply or compete at the global level. Therefore, there is no wonder that many developing countries are trying to bridge the development gap by means of technology acquisition and quality improvement. The rapid diffusion of IS in developing countries has not been accompanied by substantial developmental benefits[30].

This research is not concerned with measurability of Information Systems (IS) quality or translating quality into numerical terms. Instead, the study emphasizes the meanings that members of an organization give to an IS and to its cultural context. IS quality is viewed as relative to an individual’s estimation or group consensus [4], as a representation of a user’s perceptions of how an IS meets their needs [16], and as dependent upon a user’s actions or possibility to act [42].

The backdrop of this research is IS provision in a Libyan public sector organizational context. As a developing country with rapidly changing economies, the Libyan context has unique characteristics that are ideal for understanding the socially constructed notion of IS quality. The researcher selected two public-sector organizations as the setting of the fieldwork for the research.

## **1.2 RESEARCH OBJECTIVES**

The eventual aim of this explorative research was to build an understanding of the socially constructed notion of the IS quality concept. The general objectives were:

- Understanding the views of IS stakeholders in a particular organizational context about IS quality and identifying the different perspectives of quality in IS.
- Understanding the issues that shaped the stakeholders’ constructions of IS quality.
- Understanding more about the contexts and processes of IS development, usage, and provision.

## **1.3 RESEARCH QUESTIONS**

Research methods literature urges researchers intending to pursue a qualitative research to design a research question before immersing themselves into the research [6][29]. The following three research questions represents the main issues discovered and pursued by this study:

- Q1. What is IS quality when viewed from a multiplicity (technical, organizational, and personal) of perspectives?
- Q2. What is the context of IS provision?
- Q3. What is the relationship between the multiple TOP (technical, organizational, and personal) perspectives of IS quality and the IS context?

## 2 QUALITY APPROACHES FOR INFORMATION SYSTEMS

This study concerns an exploration of the socially constructed notion of IS quality within the cultural context of public sector organizations. A review of approaches and frameworks that examine the IS quality concept because it allows this study to be positioned within other investigations of IS quality.

### 2.1 INFORMATION SYSTEMS

Information systems (IS) and information technology (IT) are not same. IT is part of IS, but the opposite statement is not true. IS could be acknowledged by people, technologies, and machines used to capture, generate, collect, record, store, retrieve, process, display and transfer or communicate information to multiple users at appropriate levels of an organization to accomplish a specified set of functions [32].

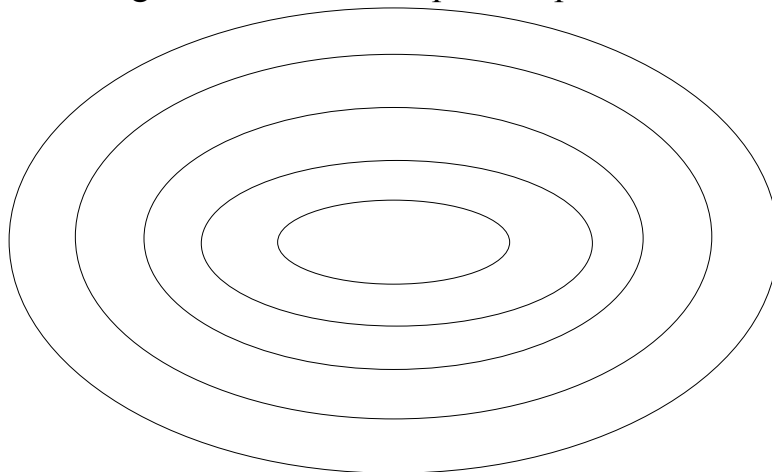


Figure 2.1: Information Systems as Social Systems

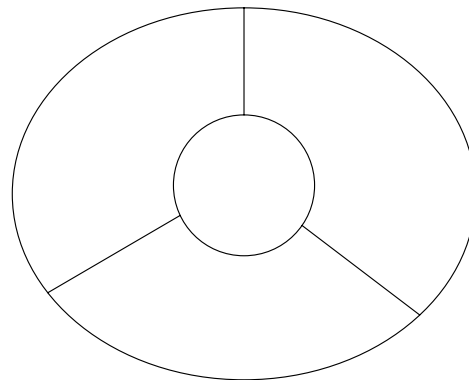


Figure 2.2: Dimensions of Information systems

### 2.2 QUALITY APPROACHES IN IS

Approaches in research on IS quality are dominated by the scientific paradigm. This reflects the approach used in most of the literature on quality. Any possible distinction in paradigms is manifested in three areas[14]:

- Assumptions about the nature of IS quality (ontological difference).
- The stances adopted in inquiring about IS quality (epistemological difference).
- The methods used in carrying out those inquiries (methodological difference)

All information systems require people to construct and work with artifacts pencil and paper, forms, ledgers, computers, and communication networks within a particular organizational setting, which exists within a wider environmental context. The information system is influenced by both the organizational context in terms of its strategies, structures, politics, and culture, and by the wider political socioeconomic, cultural, political, and technological environment within which the organization exists [28].

### **2.2.1 Hard Approach to IS Quality**

The following assumptions underlie IS quality research categorized as using a hard approach [8].:

- It assumes that the meaning of IS quality is not problematical as long as an objective stance is employed.
- It assumes that IS quality can be identified and defined in terms of its characteristics, factors, and attributes.
- The identification of the above involves the process of making a selection of a few from a set of many.
- IS quality can be implemented and monitored through quality systems, quality control and quality assurance.
- IS quality has a physical reality with characteristics which can be measured.
- IS has a physical reality whereby quality can be engineered into the process of IS development.

### **2.2.2 Soft Approach to IS Quality**

An IS is not seen as a physical artifact, but as conceptions in the stakeholders' minds which are shaped by their experience of the computer systems. IS quality conceptions are social constructions based on their assumptions about, and perspectives on the world [18]. These constructions are then altered through the learning which occurs when the stakeholders experience change, and are confronted by other perspectives.

Many of the ideas expand upon Garvin's identification of five perspective points of viewing quality, based upon the academic disciplines of its inquirers. Garvin's five perspective of viewing quality are:

- Transcendental view - quality is recognizable but not definable.
- User view - quality means fitness-for-purpose.
- Manufacturing view - quality means conformance to specification.
- Product view - quality is tied to inherent characteristics of product.
- Value-based - quality is dependent on how much customer is willing to pay.

There have been several suggestions in the IS literature for using a soft approach to IS quality. Each suggestion provides a set of proposed methodologies or frameworks. Such as the use of either Soft Systems Methodology (SSM) [10], participative systems design, or prototyping to address the problems of quality in IS [19], the use of a dialectical systems approach, which addressed the weaknesses of both the hard and soft approach to IS quality.



### 3 RESEARCH METHODOLOGY

The researcher intends to discover how IS quality is described and perceived by the stakeholders themselves. Thus, a Multiple Perspective Framework that blends the ideas from both the ‘hard’ and the ‘soft’ approach is proposed to make sense of data gathered from that natural setting. However, the objectives of the fieldwork can only be attained through a critical examination of feasible research approaches. This leads to the formulation of an appropriate research methodology for conducting the fieldwork.

#### 3.1 RESEARCH DESIGN

A research design is the logic that links the data to be collected to the initial questions of a study [48]. A questionnaire survey was used in the preliminary study preceding the determination of the research design. The preliminary study guides the selection of organizations for the case study. The textual analysis complements the findings from the case study. Figure 3.1 shows the research design.

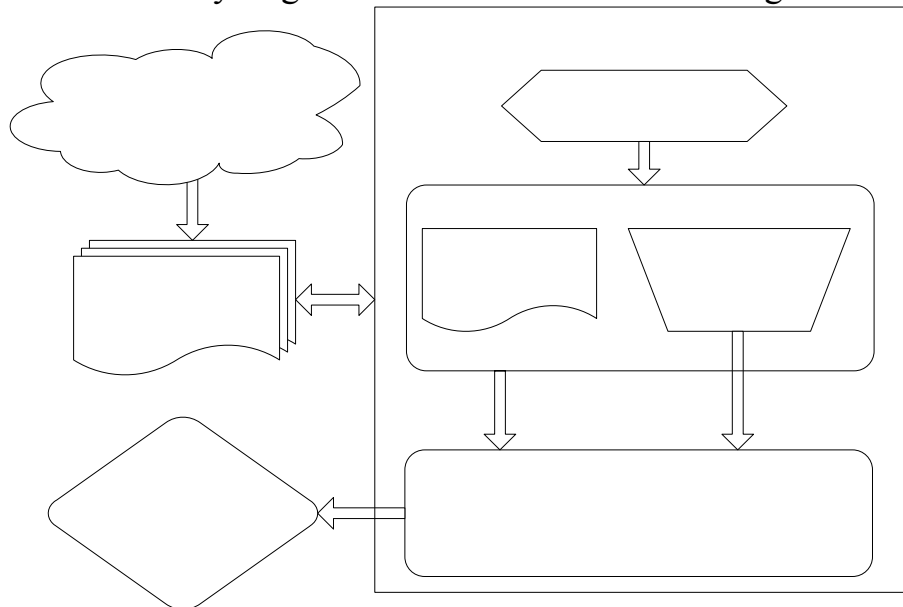


Figure 3.1: Research Design

#### 3.1.1 Case Study Approach

This section discusses important issues considered by the researcher in employing the case study approach during the empirical work. These are the issues of gaining access to the sources of data, use of case study protocol, the methods utilized, and the interviews conducted.

##### 3.1.1.1 Case Study Protocol

Due to the limited time allocated for the case studies, a data gathering plan in the form of a Case Study Protocol was prepared. A Case Study Protocol is more than an instrument as it also contains the procedures and general rules that will be followed in using the instrument [48]. The general Case Study Protocol report formally prepared for the organizations, which was actually of greater benefit for the

researcher. The protocol report was enclosed with the letter applying for permission to access the organization. The report provides background information of the research. It allows the gatekeeper and its reader to have an idea of what to expect during the case study.

### 3.1.1.2 Methods Employed

The case study employed the following methods: unstructured interviews, reviews of documentation, and informal observations.

### 3.1.2 Multiple Perspectives Framework

The Multiple Perspective Framework (MPF) for exploring IS quality, which is depicted in Figure 3.2 consists of two streams of inquiry of SSM used in this study. The two streams of inquiry that interact with each other for classifying the different perspectives of IS quality among the stakeholders in the situation [9].

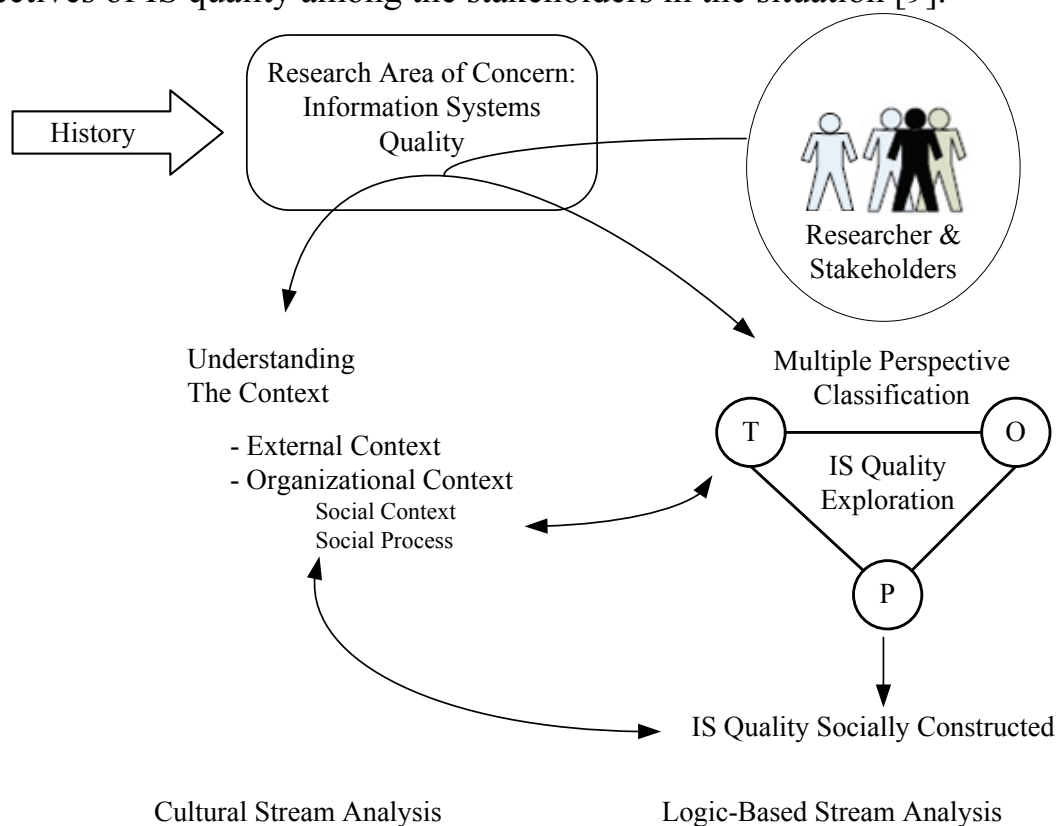


Figure 3.2: Multiple Perspectives Framework

#### 3.1.2.1 Logic-Based Stream of Inquiry

In the logic-based stream of inquiry, suitable human activity systems are defined and models based on the root definitions of these systems are compared with the real world situation. It primarily involves the using of CATWOE model: Customers, Actors, Transformation, Worldview, Owners, and Environmental constraints.

### **3.1.2.2 Cultural Stream of Inquiry**

The cultural stream of inquiry consists of an examination of the intervention itself as well as of the situation as a social and political system, then later to a process of understanding the context which involving stakeholder identification, Stakeholder analysis and assumption surfacing, and Future analysis.

The two streams involve the process of organizing the data that were gathered during the fieldwork. The two streams interacted with and informed each other. The initial stage within the logic-based stream of analysis, which is the exploration of IS quality, was formed largely through discoveries within the cultural stream of analysis. However, the three perspectives of IS quality, in turn, also changed the understanding of the situation. From the interaction of the two streams of inquiry, a socially constructed meaning of IS quality within the particular socio-cultural context emerged.

The technical (T) perspective of IS quality' is the most common perspective of IS quality found in IS quality literature. It relates to the attributes of the IS products and artifacts, including the equipment, the software program code, the communication lines, the forms and documentation, and the data produced by the IS. It is concerned with their performance, features, reliability', conformance, durability, and maintainability, among other things. Technical (T) quality is tangible and thus is usually easy for stakeholders to describe and articulate.

The organizational (O) perspective relates to the stakeholders' views about the IS in the support of their purposeful activities within the organizational context. This relates to the stakeholders' opinion about the effect of the information produced by the IS on their activities, referring to characteristics such as the timeliness, relevance, meaningfulness and understandability of the information. While personal (P) quality is about satisfying the IS stakeholders, organizational (O) quality is about the fulfillment of the organizational goals and purposes.

The personal (P) perspective is based on the perceptions of the stakeholders. The most tangible form within this perspective in previous work on quality is 'service quality', which concerns mainly IS personnel and the IS department. The relevant service quality factors identified in literature are reliability, responsiveness, emotional assurance, empathy, and image projected by tangible aspects in the IS department (such as. sophistication of the equipment). Personal quality is also concerned with the personal opinion of the stakeholders (both the IS provider and customer) about other stakeholders during their interactions during IS development, usage, and provision.

The use of the MPF in this study involved two systemic iterations. Each iteration addressed different objectives of the study. The first iteration of MPF was used for organizing and analyzing the data that were obtained from the field studies. The outcomes of this first iteration are the fieldwork. The second iteration, the Multiple Perspectives Analysis constitutes the final analysis of the research.

## **4 MULTIPLE PERSPECTIVES FRAMEWORK ANALYSIS**

This chapter describes the second iterative analysis within the MPF. The multiple perspectives analysis consists of two interacting streams of inquiry: a logic-based stream of inquiry, and a cultural stream of inquiry. The interaction between these two streams of inquiries forms a focal point of the analysis.

It described the Multiple Perspectives Analysis within the relationship between the two iterations of the analytical process encompassed by the MPF and showed the process of naming relevant systems that abstracts IS quality descriptions in the two case study organizations according to the technical, organizational, and personal (TOP) perspectives. Each of these relevant systems is named using a root definition, which expresses the essence of a particular expression of IS quality. The formulation of a root definition is made by considering six essential elements in a relevant system which forms the CATWOE mnemonic. An IS social context consists of patterns of interaction that are eventually institutionalized and become institutional properties of an organization [35]. It discussed four primary institutional properties ((culture, IS processes, IS strategies, and IS structures) within the external and organizational contexts of the two case study organizations, which mediated processes of IS development, IS provision and IS use, and were reinforced or transformed by interactions of IS stakeholders and then compared the influence of these four institutional properties on the technical, organizational, and personal (TOP) perspectives of IS quality.

### **4.1 LOGIC-BASED STREAM OF INQUIRY**

The logic-based inquiry abstracts the multiplicity of the IS quality concept through a brief excursion into systems thinking. The logic-based inquiry in the MPF adopts the ideas within Soft Systems Methodology (SSM), and Multiview stage of human activity systems analysis [10].

SSM essentially entails gaining a perception of the real world situation, and providing a definition of relevant systems based on CATWOE criteria and root definitions. Root definitions provide idealized statements of relevant system components, and conceptual models identify minimum sets of logical activities for carrying out the purpose of those system components. A conceptual model not only depicts in a diagrammatic form how various activities in the relevant system are related to each other, it also serves as a communication medium between users and designers about the improvement to the situation. Root definitions are used to provide idealized notions of systems of IS quality, and conceptual models identify minimum sets of activities necessary for achieving transformations intended by those systems.

### **4.2 CULTURAL STREAM OF INQUIRY**

This section describes the stream of cultural inquiry within the second iteration of the Multiple Perspective Framework (MPF). Its objective is to identify relationships between the wider notion of IS, the institutional properties, and the human agents

(IS stakeholders) in the organizational contexts of the case studies. The social context and social process of IS provision in these organizations were analyzed.

Structurational theory was employed to conceptualize the linkages between context and process in social systems. Structurational theory illustrates how an IS in an organization is involved in mediating (facilitating and constraining) human action implicated in the process of IS provision, and hence maintains or transforms the social contexts of the organization.

The analysis shows that although all four institutional properties influenced the technical (T) perspective description of IS quality, it is mainly influenced by the procedures, structures, and action taken during the IS development process. The organizational (O) perspectives of IS quality are influenced by the structures and strategies that were established for IS provision in the organization. The values that shape the culture of stakeholders in an organizations were the main influence to the personal (P) perspective abstraction of IS quality.

The following is a summary of the outcomes of the above inquiries:

- Themes from the multiple perspective classification of IS quality descriptions can be abstracted into relevant systems for IS quality through root definitions that signified particular socially-constructed IS quality meanings in the organization. Each root definition differentiated the stakeholders according to the customers, the actors, and the owners who are implicated by that IS quality meaning. The underlying worldview and the environmental constraint placed upon that meaning are also identified. Sets of relevant systems within the TOP perspectives provided a conceptual view of multiple perspectives of IS quality in an organization;
- The institutional properties were: culture, IS processes, IS strategies, and IS structures. Each institutional property was discussed according to features identified by the researcher in the field work. The processes of IS development, IS provision and I S usage in the institutional contexts of the two case study organizations were mediated (facilitated or constrained) by these properties.
- The four main institutional properties constitute the institutional contexts of the two organizations which were investigated. The influence of the institutional contexts on the relevant systems signifying the meanings of IS quality
- The four institutional properties influenced the stakeholder's perception of IS quality in different ways and degrees. Different institutional properties influence different perspectives of IS quality. Analysis indicated that technical (T) perspectives of IS quality are influenced by IS processes, organizational (O) perspectives of IS quality are influenced by IS strategies and IS structures, and personal (P) perspectives of IS quality are influenced by culture.
- Stakeholders perform multiple perspectives of IS quality through the structuration process between them and the institutional properties through the institutional conditions of construction of IS quality.

### 4.3 STATISTICAL QUALITY CONTROL TECHNIQUES

In the quest for ever-improving quality and performance, the industrial world has employed statistical quality control (SQC) techniques with great success. The SQC techniques described here are the most basic ones.

#### 1. Pareto Chart

A Pareto chart (also called Pareto diagram, Pareto analysis) is a form of bar chart with the items arranged in descending order so that the longest bars on the left and the

#### 2. Scatter Diagram

A scatter diagram examines the relationship between paired data. This SQC technique is usually used by the when it wants to establish the relationship between cause and effect, the relationship between one cause and another, or a relationship between one

#### 3. Histograms

Processes' outputs naturally vary from one to another. A product may be said to be uniform, but actually no two units are exactly the same.

#### 4. Control Charts

First proposed by W. A. Shewhart of Bell Telephone Laboratories in 1924, are used for maintaining both process and manufacturing control in a stable condition.

#### 5. Cause and Effect Diagrams (Ishikawa Diagrams)

1. This diagram composed of lines and symbols is designed to represent the relationship between effects and their causes. It is sometimes called an Ishikawa diagram, after Dr. Kaoru Ishikawa who is considered the father of QC Circles.

#### 4.3.1 Statistical Quality Assurance (SQA)

The statistical quality assurance is an application of statistical principle, and techniques in all stages of production, design, maintenance and services, directed toward the economic satisfaction of demand. The statistical quality assurance is a system of application, that embraces all formal quantitative aspect of planning, design, purchase, production, services, marketing and re-design of product, it helps to find problems to state them in meaningful terms, and to solve them, it provides a plan, a road-map, that leads to better competitive position.

#### Statistical Process Control

Statistical Process Control (SPC) aims at quality improvement through reduction of variation. The best known tool of SPC is the control chart. That seen in data taken on a process can be viewed as decomposable of Shewhart fundamental concept as:

$$\text{Overall observation variation} = \text{Baseline variation} \\ + \text{Variation that can be eliminated} \quad (1)$$

Firstly, the baseline variation in (1), It is a kind of variation that one should always expect to experience, this variation occurred from many physical causes that are small, unnamable, and unrecognized. A process with only this kind of variation

can practically be considered as a stable process or process in statistical control. Secondly, the variation that can be eliminated in (1), this type of variation is called "assignable cause", assignable causes will occur, seemingly at random, resulting in a "shift" to an out-of-control state, where a larger amount of the process output does not conform to requirements.

The basic working of Control charts is this: we periodically takes samples from the relevant process, and computes a statistic Q, to summarize process behavior in the relevant period. These values plotted against time order of observation and compared them to control limits drawn on the chart. These divide in some sense, values for the statistic that are, plausible if it is in fact stable from ones implausible under this situation. While the plotted points remain inside control limits, one assumes that all is well (the process is stable) and thus leaves it alone. When a point falls outside control limits, this is a sign that a physical change has probably occurred and that one should intervene. The following figure is a plot of a generic control chart where the plotted statistic is Q, upper control limit and lower control limit "UCL<sub>Q</sub> and LCL<sub>Q</sub>" are respectively, and there is one "out of control" point.

Control limits:

$$UCL = \mu + 3\frac{\sigma}{\sqrt{n}}$$

Upper Control Limit  
CL =  $\mu$

Center line

(median)

$$LCL = \mu - 3\frac{\sigma}{\sqrt{n}}$$

Lower Control Limit

$\mu$  = process mean

$\sigma$  = process standard deviation

n = sample size

### Control Charts "Shewhart Control Chart"

A typical control chart is a graphical display of a quality characteristic that has been measured or computed from a sample versus the sample number or time. The chart contains a center line that represents the average value of the quality characteristic corresponding to the in-control state. Two other horizontal lines, called the upper control limit (UCL) and the lower control limit (LCL) are also drawn. These control limits are chosen so that if the process is in control, nearly all of the sample points will fall between them. As long as the points plot within the control limits, the process is assumed to be in control, and no action is necessary.

However, a point that plots outside of the control limits is interpreted as evidence that the process is out of control, and investigation and corrective action is required to find and eliminate the assignable causes responsible for this behavior. The control points are connected with straight line segments for easy visualization.

### Uses of Control charts

Control chart is a device for describing in a precise manner what is meant by statistical control. Its uses are

1. It is a proven technique for improving productivity.
2. It is effective in defect prevention.
3. It prevents unnecessary process adjustments.
4. It provides diagnostic information.
5. It provides information about process capability

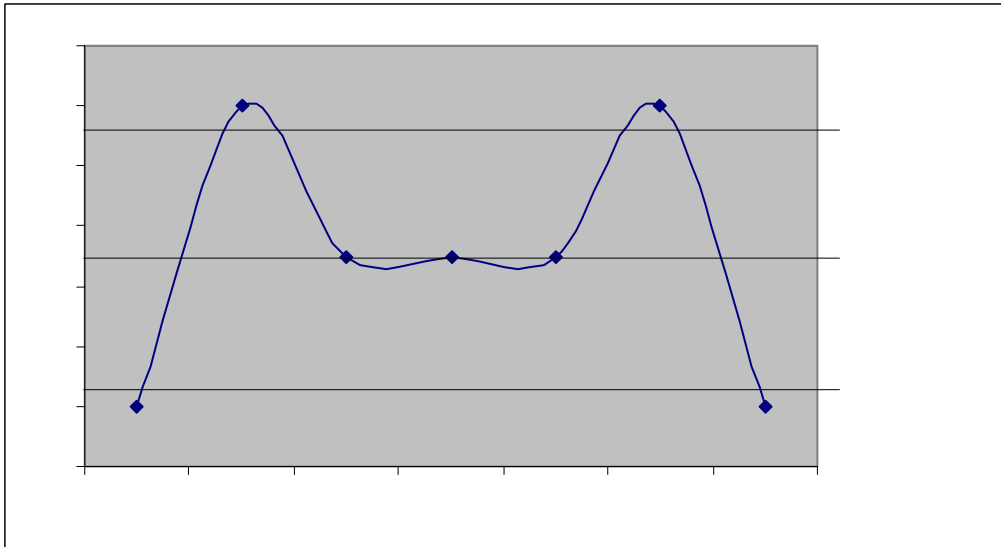


Figure 4.1: Relationship of users to IS Quality

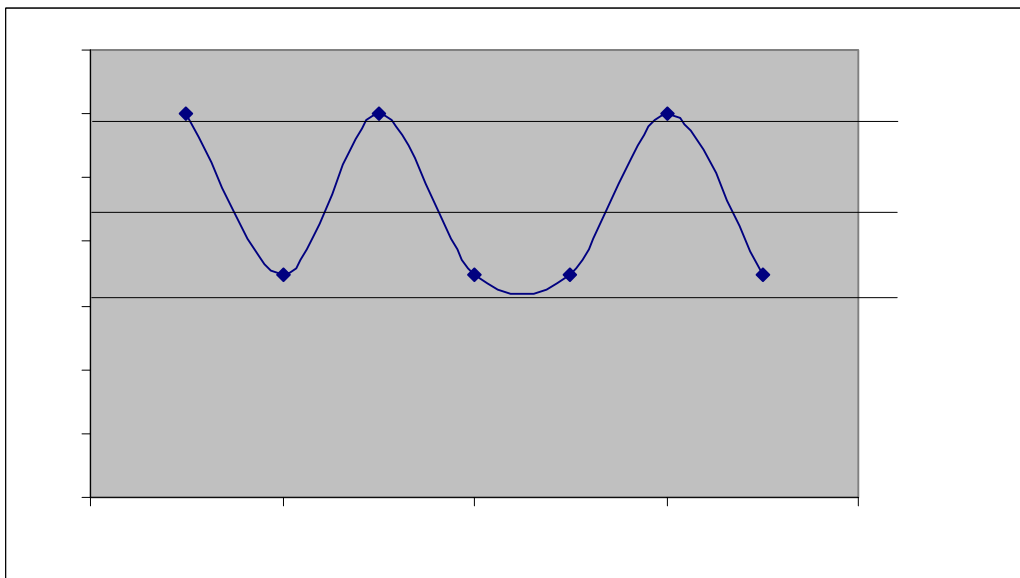


Figure 4.2: Relationship of Staff to IS Quality



## **5 RESEARCH REFLECTIONS AND FINDINGS**

Before conclusions for the study are made in Chapter 6, the researcher pauses in this chapter to reflect upon lessons from the research. Reflections and findings are made on the research methodology, the MPF, and the area of investigation.

### **5.1 RESEARCH REFLECTIONS**

These lessons described in the section inform the synthesis of the research findings and allow the drawing of more meaningful conclusions, which will be discussed in the final chapter.

#### **5.1.1 Reflections on the Multiple Perspective Framework**

The Multiple Perspective Framework was used to analyze and conceptualize findings from a study of two public-sector organizations. This section describes lessons about the MPF and the framework of ideas it incorporates.

*Lesson 1: The MPF brings different levels of understanding to the researcher.*

The MPF was the conceptual basis for the research and allowed different levels of understanding.

*Lesson 2: The MPF is appropriate for analyzing IS quality in the particular cultural context of this study, but it may need adjustments when applied in a different context.*

This study adapted the MPF while data gathered in the empirical work were being organized and analyzed. Hence, the analytical framework was developed specifically for the cultural context of this study.

At the outset of this research, the MPF was declared as a framework towards understanding the relationship between the multiple perspectives of IS quality held by IS stakeholders and the IS context surrounding the IS provision in public organizations. Further, the study did not consciously seek to intervene and to actuate improvements in the IS quality situation of the case study organizations. The understanding was mainly for the researcher rather than for the members of the organizations. While this scope may suffice for a public sector organization, the private sector organization expects more direct benefits from the application of the MPF. The expectation requires extending the MPF from a framework for conceptualization into a framework for action.

#### **5.1.2 Reflections on the Research Methodology**

Identification of an appropriate research methodology requires knowledge about a range of issues within the broad spectrum of inquiry systems, including philosophical assumptions, research approaches and methods, and research design. Reflection is not an admission of mistakes, but is an act of learning for improving future research actions.

*Lesson 3: Limitations in the research design that affect the validity of the research must be discussed before conclusions can be drawn from an interpretive analysis.*

Formulation of research methodology was the most critical part of this research because it impacted the execution of subsequent stages of data collection, interpretive analysis, and reporting of findings. It was also a flexible activity, as demonstrated by research design.

*Lesson 4: The length of time in the field influences the execution of the interpretive case study approach.*

Research that focuses on human interpretations and meanings, such as that pursued by this study, usually employs research approaches that involve prolonged and, or intense contact with the field. A few of these research approaches that are commonly used in IS research include the in-depth case study.

### **5.1.3 Reflections on IS Quality**

This section considers three lessons from the exploration of multiple perspectives of IS quality in a particular cultural context of Libya.

*Lesson 5: A socially-constructed notion of IS quality is so complicated and twisted with the IS institutional context.*

This study indicates that IS quality does not stand in isolation from the IS institutional context. At the outset, the MPF incorporated the strengths of both soft and hard approaches. The MPF explored the IS institutional context from a cultural stream of inquiry and elicited the IS quality descriptions through a logic-driven stream of inquiry.

*Lesson 6: While several oriental values are not congruent with values emphasized in Western quality principles, institutionalization of Libyan values into workforce culture facilitates the formation of a quality institutional context.*

This study argued that the organizational culture in the two case studies displayed underlying oriental values. The analysis showed that the oriental values limited the effectiveness of principles and practices for quality improvement suggested in quality literature. Respect, deference, and obedience for elders and authorities meant that the IS stakeholders in both organizations relied upon initiatives and guidance for quality from their leaders.

*Lesson 7: Leadership and management are critical factors for institutionalizing quality into a Libyan organizational context.*

The fieldwork shows that quality improvement guidelines issued by external policy making bodies can be translated into practice, provided the organization has a quality institutional context.

## **5.2 RESEARCH FINDINGS**

This section summarizes the research findings from the MPF analysis on the empirical work.

### **5.2.1 Multiple Perspectives of IS Quality**

The first question of the research sought to identify and understand the TOP perspectives of IS quality.

*Summary of findings from Stakeholders' IS Quality Descriptions, (T) Perspective:*

- IS Quality Themes were:

- (a) UCC case: data integrity, systems characteristics, technology and methodology, and IS quality assurance.
- (b) GIA case: data and database integrity, documentation, and quality assurance.
- Root Definitions for relevant systems for IS quality in UCC case were:
  - (a) Users: A technically efficient computer system owned by university top management, developed and tested by the UCC staff and user representatives, for the benefit of administrative officers, reliable, user friendly, and produces correct data that reflects the image of a technology-oriented university.
  - (b) IS Managers: A technically impressive computer system owned by the university top management, operated by administrative officers, developed by UCC staff and knowledgeable users, supported by availability of latest resources, technology, and methodology.
- Root Definitions for relevant systems for IS quality in GIA case were:
  - (a) Users:
    - i. A technically efficient computer system with appropriate controls and evolutionary database, owned and placed in GIA divisions through collaboration of directors, GIACD staff and external parties;
    - ii. A system to transfer technical expertise from external consultants to GIACD staff, making IS control and maintenance the domain of GIACD.
  - (b) IS Personnel: A technically superior system based on improvement of IS development process through collaboration with directors, GIACD staff and external stakeholders.

*Summary of findings from Stakeholders' IS Quality Descriptions, (O) Perspective:*

- IS Quality Themes in both the UCC case and GIA case were: strategy for computerization, the IS appropriateness, and user participation and involvement in the IS development.
- Root Definitions for relevant systems for IS quality in UCC case were:
  - (a) Users: A system of strategy for computerization, formulated by representatives of all stakeholders, subject to regulations, guiding allocation of resources that produces appropriate and useful computer systems.
  - (b) IS Managers and Staff. A system of strategy for computerization, formulated by leaders and administrators, facilitating IS provision, ensures communication among stakeholders and top management commitment that produces appropriate computer systems.
- Root Definitions for relevant systems for IS quality in GIA case were:
  - (a) Users: A system operated by GIACD and owned by GIA top management and user directors, that plans IS provision, and makes it dependent upon GIA needs and resources.
  - (b) IS Personnel: A system operated by GIACD and owned by GIA top management and user directors that promotes user participation and transfers responsibility for IS appropriateness to user directors.

*Summary of findings from Stakeholders' IS Quality Descriptions, (P) Perspective:*

- IS Quality Themes in both the UCC case and GIA case were: image presented by the IS department and the IS stakeholders.

- Root Definitions for relevant systems for IS quality in UCC case were: All stakeholders: A system owned and operated by university and UCC top management that improves IS provision by evoking action and communication among all stakeholders, and promotes trust, shared understanding, and cooperation.
- Root Definitions for relevant systems for IS quality in GIA case were:
  - (a) Users: A GIA top management owned system, operated by GIACD personnel, to continue the good image of GIACD IS provision and to achieve balance between assistance and self-reliance.
  - (b) IS Personnel: A GIA top management owned system, operated by GIACD personnel, to increase the dependability and professionalism of GIACD IS provision by focusing on nurturing the personal values of the IS stakeholders.

### **5.2.2 Context of IS Provision**

summarizes of the findings from the cultural stream of analysis for understanding the IS quality situation in the two organizations studied during the fieldwork.

*Summary of findings from Cultural Stream of Analysis within the MPF:*

#### i. Analysis of External Context

- Textual analysis of change initiatives introduced shows:
  - (a) Assumptions behind the initiatives are rooted in the functionalist paradigm.
  - (b) The initiatives do not take into consideration the values of the civil service workforce.
- Preliminary study (through a questionnaire survey of, and unstructured interviews with, a selected set of organizations) indicates that IS quality brings different notions and manifestations to different organizations.

#### ii. Analysis of Organizational Context

- Social Context Analysis of the Case Studies found contrasting contexts of IS provision:
  - (a) UCC case: several structural changes in historical context, amicable yet cautious social relations among stakeholders, and lack of social infrastructure.
  - (b) GIA case: stable historical context, harmonious social relations, and extensive social infrastructure.
- Social Process Analysis of the Case Studies found contrasting social processes of IS provision:
  - (a) UCC case: uncoordinated IS provision and action is contingent upon outcomes of power struggles and IT interests of current leaders.
  - (b) GIA case: collaborative IS provision and action follows computerization strategy.

#### iii. Analysis of Context-Process Linkage

- The processes of IS provision in both organizations were influenced by social structures of signification, domination, and legitimation in their social contexts. Interaction of stakeholders during the processes of this provision transformed or reinforced these social structures.

#### iv. Structural Analysis

- Structural Analysis: The patterns of interaction within the social contexts were institutionalized and became the institutional properties of both organizations, which are: organizational culture, IS policies and processes, IS strategies, and IS structures.

The research findings also show that the TOP perspectives are not independent of the IS context. The outcome of the context-process and structural analyses allowed the investigation of the final research objective: an understanding of contextual issues that shape the multiple perspectives of IS quality are presented in the next subsection.

#### **5.2.3 Social Construction of Multiple Perspectives of IS Quality**

The research problem was the lack of understanding about the multiplicity of the IS quality notion and their construction in a particular Context. One of the research question addresses the relationship between the multiple perspectives of IS quality and the context of IS provision. This leads to understanding about how multiple perspectives of IS quality are constructed by stakeholders in a particular context.

*Summary of findings from IS Contexts and Perspectives of IS Quality Relationship:*

- A technical perspective of IS quality is socially constructed from the stakeholders interaction with institutionalized IS processes in the IS context.
- An organizational perspective of IS quality is socially constructed from the stakeholders interaction with institutionalized IS strategies and structures in the IS context.
- A personal perspective of IS quality is socially constructed from the stakeholders interaction with institutionalized culture within the IS context.

Stakeholders described IS quality through their action and interaction with an IS. The relationship between the institutionalized properties and the TOP perspectives indicate that the definition of IS viewed within a particular perspective of IS quality, reflects the property in the context which supports that IS conception.

The analysis also indicated that properties within the culture system and the social structure systems are in a complex relationship of legitimating and supporting one another. The nature of the relationship depends upon changes in the environment of the external context or of the organization itself. The actions and interactions of the stakeholders during IS activities are constrained by the relationship between the two systems. Stakeholders perform multiple perspectives of IS quality through the structuration process between them and the institutional properties through the institutional conditions of construction of IS quality.

## 6 CONCLUSIONS

This thesis has been concerned with exploring the construction of multiple perspectives of IS quality by stakeholders within a particular cultural context. A review of relevant research approaches and frameworks for discussing IS quality resulted in the formulation of the Multiple Perspective Framework (MPF). This thesis has concluded that IS quality is a phenomenon that can be viewed from a multiplicity of perspectives, and is socially constructed from the interaction of social components within the IS context.

### 6.1 CONCLUSIONS

Conclusions that were found from a synthesis of findings on the multiplicity of IS quality are the following:

- IS quality is a wider notion than the standard quality definition.
- TOP perspectives of IS quality highlight multiple angles of the IS: the horizon of IS products and processes (T perspective), the use of and services by the IS (O perspective), and the symbols produced by the IS provision (P perspective).
- TOP perspectives of IS quality allows IS to be viewed in its totality: the features and characteristics of the IS artifacts or components (T perspective), the management and support of IS provision (O perspective), and the stakeholder values and image of the IS supplier (P perspective).
- Quality in IS is the ability to meet not only customer needs, but also to fulfill stakeholder expectations.

Thus, synthesis of findings on the analysis of the case studies reached the following conclusions about the context of IS provision:

- Paradigmatic assumptions underlying change initiatives in the external context determine the extent of their influence on IS provision in an organization.
- The structuration of the culture system and the social structure system in an organization, and the institutionalization of properties within them, constrain the agency of stakeholders in the processes of IS provision.
- The mediation between different values in the culture system influences that stakeholder agency in IS provision.

To summarize, multiple perspectives analysis found that structurational processes in the IS context constrain stakeholder agency in IS provision, while mediation between different values in the culture system influence the extent of that agency.

The following are conclusions made about the social construction of multiple perspectives of IS quality:

- Stakeholders of an organization draw upon their repeated interaction with institutionalized properties in the culture system and the social structure system of the IS context, to construct the multiple meanings of IS quality.
- Each TOP perspective of IS quality is influenced by a particular institutionalized property in the IS context.

- The definition of IS emphasized within each TOP perspective of IS quality reflects the institutionalized property in the IS context that supports or produces the definition.

To summarize, the construction of each TOP perspective of IS quality is an outcome of the stakeholders repeated interaction with its relevant institutional property or properties in the IS context.

## **6.2 CONTRIBUTIONS**

This thesis contributes by adding more rigorous understanding to IS quality in a public sector in Libya. This thesis also contributes by providing empirical evidence of influences of stakeholders culture on IS quality. This is the first study to investigate the influence of stakeholders in Libyan society on IS quality by adapting multiple perspectives framework.

For practical contribution, this study has shown that the adoption of IT technology in Libya is not simply a process of employing technology based on the western model. This research suggests that to achieve high utilization model of IS quality, it is important to consider the local environment.

## **6.3 FUTURE WORK**

The progression from this study to further research is natural. The execution of further studies may forward the program of research in the area of IS and quality. This section recommends three further studies:

- (a) An empirical grounding of the MPF.
- (b) Extension of the MPF in a different context or area of application.
- (c) Employment of a questionnaire survey method.

## **6.4 CONCLUDING REMARKS**

The following are the main conclusions drawn from the synthesis of findings on each of the research questions forwarded in Chapter 1:

- IS quality is a wider notion than the standard quality definition.
- IS quality is a phenomenon that is not concrete, but socially constructed from interaction of stakeholder with institutionalized properties in the IS context.
- Structural processes in the IS context constrain stakeholder agency in IS provision, while mediation between different values in the culture system influence the extent of that agency.
- The social construction of each TOP perspective of IS quality is an outcome of the stakeholders repeated interaction with its relevant institutional property or properties in the IS context.
- IS quality is a broader conception that focuses on the totality of features and characteristics of the IS as a product, a service, and a symbol, and the production, usage, management and impact of IS that bear on its ability to meet stated or implied customer needs and fulfill expectations of stakeholders in a context.

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## **Abstract**

This thesis is concerned with understanding how stakeholders in a particular cultural context construct the multiple meanings of 'Information Systems Quality' (IS Quality). A review of literature on approaches and frameworks for IS quality shows that the IS quality is generally examined through a 'hard approach'. This study demonstrates that IS quality can be meaningfully understood through an interpretive paradigm, and that IS quality is socially constructed and influenced by the IS context. The study began with an exploratory survey of twenty Libyan organizations. Data were gathered through a case study of two public sector organizations in Libya. A Multiple Perspective Framework (MPF) that incorporates ideas from structuration theory, multiple perspectives concept, and soft systems methodology (SSM) was used to analyze the empirical work. The findings revealed that: (a) IS quality is a broader conception than the traditional quality definition, (b) the multiple perspectives of IS quality are influenced by repeated interaction between the stakeholder and institutional properties in the IS context, and (c) mediation of different values in the culture system and in the external context influence the extent of stakeholder agency and interaction in the IS context. The study concluded that the social construction of multiple perspectives of IS quality is influenced by the structuration processes between stakeholders and properties in the IS context.

## **Abstrakt**

Záměrem předložené disertační práce je porozumět tomu, jak investoři v konkrétním společenském kontextu vnímají význam kvality informačních systémů. Ze studia literatury zabývající se přístupy a rámci hodnocení kvality informačních systémů vyplývá, že tato kvalita je obecně hodnocena z hlediska striktního přístupu. V této práci je ukázáno, že kvalitu informačního systému lze smysluplně pochopit použitím interpretačního paradigmatu a že kvalita informačního systému je definována společensky a ovlivňována kontextem tohoto systému. Studie byla zahájena průzkumem dvaceti libyjských organizací. Podrobnější data byla získána z případové studie dvou vybraných libyjských organizací působících ve veřejném sektoru. Při empirické analýze nashromážděných dat bylo využito rámce mnohočetné perspektivy, který zahrnuje hlediska teorie strukturalizace, pojem mnohočetných perspektiv a metodologii měkkých systémů. V práci se dospělo ke zjištění, že: a) kvalita informačních systémů je pojata širě, než je tomu u tradiční definice kvality, b) mnohočetné perspektivy kvality informačních systémů jsou ovlivněny opakovanou interakcí mezi investorem a institucionálními vlastnostmi kontextu informačního systému a že c) rozdílné hodnoty v kulturním prostředí a vnějším kontextu ovlivňují rozsah působnosti investora a interakce v kontextu informačního systému. Ze závěru práce vyplývá, že společenská skladba mnohočetných perspektiv kvality informačního systému je ovlivněna strukturalizačními procesy mezi investory a vlastnostmi v kontextu informačního systému.