Framework to identify the affecting factors of electronic service quality of Information Systems of a university: A CONCEPTUAL MODEL

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Abstract— **Electronic media usage is very high in every field with technological innovation. Universities and higher education institutions also use electronic media to see the most effective results on behalf of inputs. Although information and knowledge are separate concepts, they join together to work like a combined socket and the electronic media is the key gear in a given academic environment. Latest technologies have reached the university systems at a higher priority level. From that point, usage of electronic information system has become an essential discussion in the field of education. Many a research have been done in the field of IS and have created an awareness in the direction of service quality of IS in the education environment. Identifying the factors that affect the information system service quality is important to take necessary decisions of IS. This effect was to introduce a framework to identify the affecting factors of IS service quality in a university environment. Introduced framework has principally based on the E-S-Qual model and it has moderated according to literature in this field with findings of the researcher.**

Keywords- Electronic Service Quality, E-S-Qual, Information Systems, Service Quality, University System

I.   INTRODUCTION AND BACKGROUND

Information Systems have been implemented in universities for enhancing the service quality of education. There are many components (e.g. physical facilities, effectiveness of the system, responsiveness of the system etc.) to be considered at the time of implementation of Information Systems. Although it has taken adequate efforts on that criterion, there would be a doubt whether it would become a successful project or not. Some stakeholders of Information Systems used to build their Information Systems with this bad perception. Because of previous experience came as a result of this bad perception. "Many information systems in developing countries can be categorized as failing either totally or partially" (Heeks, 2002, p 101). Although resources have been used for the Information Systems to

provide an efficiency service and still some of the systems have failed or broken down without reaching the expected level. According to Irani, Sharif and Love (2001), it has been described the idiosyncrasies of a case study company by highlighting issues and problems experienced during their

attempts to evaluate, implement and realize the holistic implications of a manufacturing information system.

"Although the Information System was operational for a period of time, it was eventually deemed a failure. The reason for this was that a range of human and organizational factors prevented the organization from embracing the full impact of the system" (Irani, Sharif and Love, 2001, p 55).

"Information systems development is a high-risk undertaking and failures remain common despite of advances in development tools and technologies" (Lyytinen and Robey, 1999, p 85). According to Lyytinen and Robey (1999), they have pointed out some reasons for failures in the Information Systems; organizations fail to learn from their experience in systems development because of limits of organizational intelligence, disincentives for learning, organizational designs and educational barriers.

'Identify the affecting factors of electronic service quality' is a leading obligation when moving to implement process on the above considered situation. Next problem which come with that stage is; whether there is a framework to capture these factors in the field of higher education sector. Lack of guidelines on that may create a lacuna and it would make a hint on disappointments in the process. The objective of this research was to build a framework to identify the affecting factors of electronic service quality of Information Systems of a university.

II.   THEORIES AND MODELS OF IS

SERVQUAL model presented by Parasuraman, Zeithaml and Berry (1985), was considered the most experimented model in the field of service quality (Brochado, 2009). SERVQUAL is based on customers' expectations and perception and comprised of five dimensions which can be defined as follows:

- Tangibles: physical facilities, equipment and appearance of personnel
- Reliability: ability to perform service dependably and accurately
- Responsiveness: willingness to help customers and provide prompt service

• Assurance: knowledge and courtesy of employees and their ability to inspire trust and confidence
• Empathy: caring individualized attention provided by the firm to its customers.

Expectancy-Value Theory is an important theory in this field to evaluate the service quality. This theory shows that people learn from expectations. That is the individual's response based on the development of a belief and what individual would learn to perform the behavior pattern that they expect would result positively (Pearson, Tadisina & Griffin, 2012). Expectancy-Value Theory is the most important to measure and understand the expectations of customers.

The Gap model, developed by Parasuraman, Zeithaml and Berry (1985) has shown the relationship between expected and perceived services as follows:

If expected service is greater than perceived service, then perceived quality is far from satisfactory and implies an unacceptable quality level. If expected service is equal to the perceived service, then perceived quality will be satisfactory. If expected service is less than perceived service, then perceived quality will be quite over the satisfactory level and would reach the ideal quality level (Dursun, Oskaybas & Gokmen, 2013).
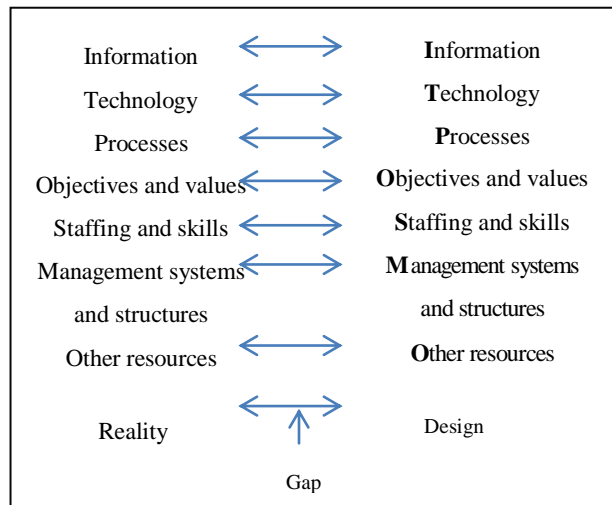
Kaur and Aggrawal (2013) have shown examples on increasing the gaps during implementation and operation of Information Systems. The success rate of Information System projects is increased and the design–actuality gaps need to be reduced or even closed. This means the actuality improvisation: changing local actuality to make it closer to IS design. Design improvisation is changing the information system design to make it closer to user actuality (Kaur & Aggrawal, 2013).

Bartis and Mitev (2008) used the social construction of technology (SCOT) as a basis of their inquiry, as SCOT provides the notion of the relevant social groups, which sheds light on the importance of the different viewpoints that different social groups have a technological artifact. The relationship between technology and society changes is important in IS field. When the technological system grows and develops it has more influence on society and it will begin to shape the society. One reason to use a social constructionist perspective is that 'it emphasizes a view of technological development as a social process thereby enabling and understanding how social factors shape technologies as well as providing a framework for understanding the context in which the technologies have been displaced (Bartis & Mitev, 2008).

Beynon (1999) has described the Sauer model of IS development. Sauer C. has developed a model of IS and it has based on exchange relations. He portrayed the development of information systems as an innovation process based on three components: the project organization; the information system; and its supporters (Beynon, 1999).

Figure 1. Design–Actuality Gap Model

The assessment of the match or mismatch between actuality and system design ("where the design wants to get us") leads to the model called as the design–actuality gap (Heeks, 2002; Kaur & Aggrawal, 2013).There is a need to evaluate concurrently the current system and the future system in an Information System (Figure 1). They cannot simultaneously exist. Although it is easy to do the assessment of the current "actuality" of a system in a particular location, it is not easy to assess the future. Proposed future represents in a design for the system.
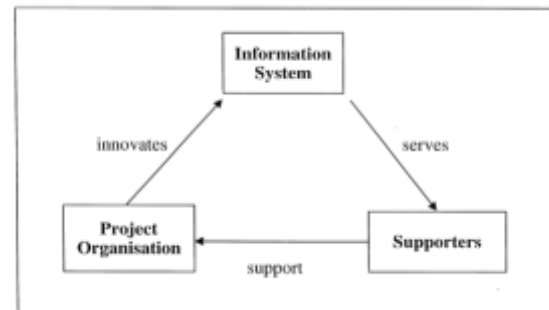

Figure 2 Sauer's model of IS development

The project organization, the information system and its supporters in a triangle of dependencies are working within the context of an environment. This illustrates this triangle of dependencies. Summary of this model is as follows. Information system depends on the project organization. The project organization depends on its supporters. The supporters depend on the information system.

DeLone and McLean (1992) comprehensively reviewed IS success measures and concluded with a model of interrelationships between six IS success variable

categories: 'system quality'; 'information quality'; 'use'; 'user satisfaction'; 'individual impact' and 'organizational impact'. (DeLone & McLean, 1992; DeLone & McLean , 2003; Pitt, Watson & Kavan, 1995; Zaied, 2012).

that the proposed framework is applicable and implementable in the electronic services evaluation process.
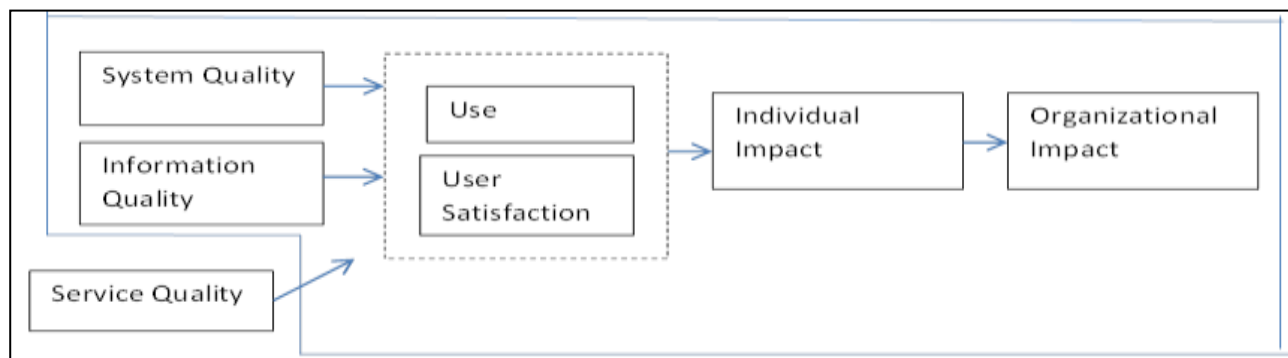

Figure 3 Augmented IS success model of Delone and Mclean

Later, DeLone & McLean (2012) introduced an update to their IS success model. Figure 4 shows the main changes that concerned quality and service quality. They defined their model dimension as follows:
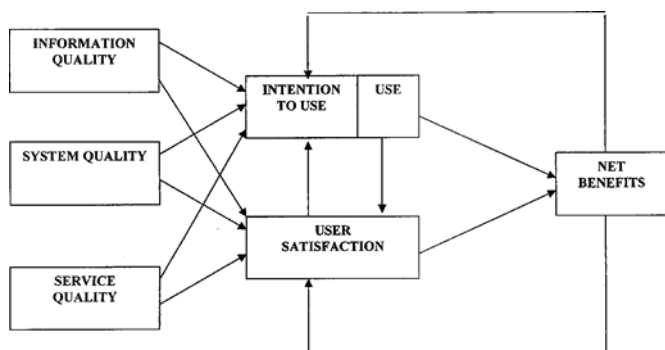

Figure 4 Updated Delone and Mclean IS Model 2003

Systems quality was measured by using adaptability, availability, reliability, response time and usability. Information quality was measured by using completeness, ease of understanding, personalization, relevance and security. Service quality was measured by assurance, empathy and responsiveness. Use was measured by nature of use, navigation patterns, number of site visits and number of transactions executed. User satisfaction was measured by repeat purchases, repeat visits and user surveys. Net benefit was measured by cost savings, expanded markets, incremental additional sales, reduced search costs and time savings.

Zaied (2012) has done a research on "An eServices Success Measurement Framework". The main objective of this research was to study and identify the success criteria of eService delivery and to propose a comprehensive, multidimensional framework of eServices success. Figure 5 shows the dimensions of proposed e-services success measurement framework by Zaied (2012). The study showed
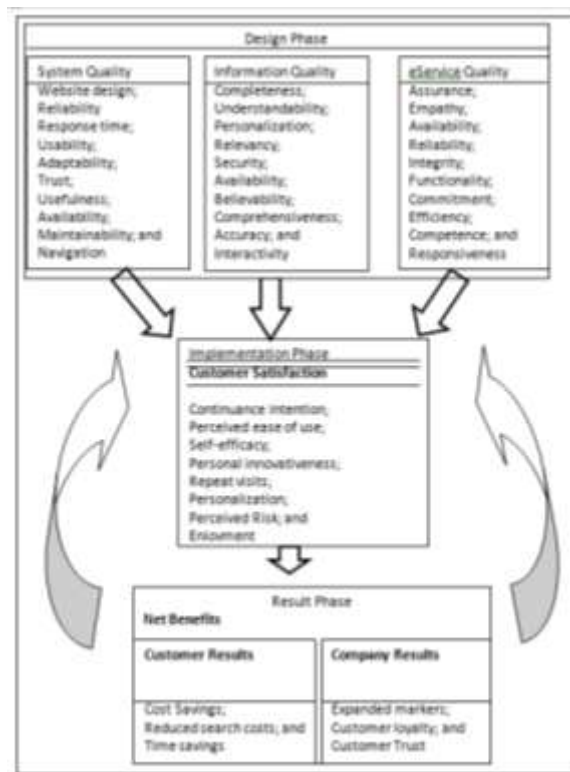

Figure 5 Dimensions of proposed e-services success measurement framework by Zaied(2012)

It also showed that the proposed framework may assist decision makers and eservice system designers to consider different criteria and measures before committing to a particular choice of e-service or to evaluate any existing e-service system (Zaied, 2012).

Hevner et al. (2004) have developed a framework in IS research (see figure 6). Their objective was to describe the performance of design-science research in Information Systems via a concise conceptual framework and clear

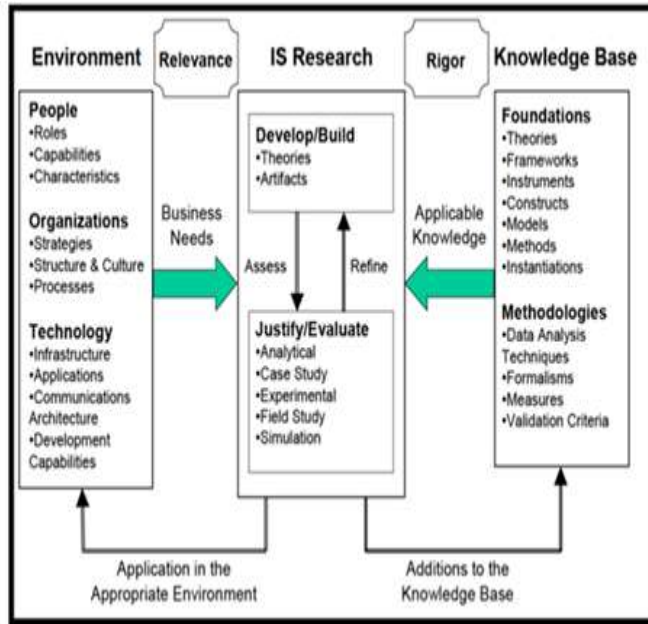guidelines for understanding, executing, and evaluating the research.

Figure 6 Information Systems Research Framework developed by Hevner et al (2004)

"It was noted that due to the importance of service quality in universities and higher education, in recent years a model was developed by Servqual and that is named HEdPERF and its components is designed especially for universities and higher education centers" (Abdullah, 2005; Akbariyeh, 2012, p 62). Abdullah (2005) has conducted a research on "HEdPERF versus SERVPERF; The quest for ideal measuring instrument of service quality in higher education sectors". "Results of that the measurement of service quality by means of the HEdPERF method resulted in more reliable estimations, greater criterion and construct validity with greater explained variance, and consequently better fitting than the other two instruments namely SERVPERF and HEdPERF-SERVPER the findings demonstrated an apparent superiority of the modified five-factor structure of HEdPERF scale in this context" (Abdullah, 2005, p 322).

The first scale developed that effectively captured the nature of electronic service quality from the perspective of online shopping through a Website was the E-S-QUAL scale developed by Parasuraman, Zeithaml and Malholtra (2005).

III. E-S-QUAL

E-S-QUAL is a very important tool to measure the electronic service quality (Alanezi, Kamil, & Basri, 2010; Wu, 2011; Yang, 2008). The E-S-QUAL instrument offered a useful framework for approaching user assessment from the perspective of service quality and helped research persons to evaluate the system (Tyran, & Ross, 2007). E-S-QUAL instrument is an excellent instrument to measure electronic service quality (Boshoff, 2007).

First the e-core service quality (E-S-QUAL) scale consisting of four dimensions and 22 items were developed. These dimensions were efficiency, system availability, fulfillment and privacy. The second scale consisting of three dimensions and 11 sub-items which were e-recovery service quality (E-RecS-QUAL) measured whether or not the problems of customers encountering various non-existent difficulties were resolved. The dimensions comprised of responsiveness, compensation and contact (Alanezi, Kamil and Basri, 2010; Cetinsoz, 2015).

According to Parasuraman, Zeithaml, & Malhotra (2005) E-S-QUAL dimensions web sites have measured the quality level of service and their dimensions are as follows;

1) Efficiency: Measures the usage of the site, access speed and facilitation.
2) Fulfillment: Consists of the dimensions of the fulfillment of the goods and services executed and delivered by the site.
3) System Availability: Contains the appropriate technical functions of the site.
4) Privacy: Involves the level of protection provided by the site in terms of security and customer information.

According to Parasuraman, Zeithaml, & Malhotra (2005) E-RecS-QUAL web sites have measured the quality level of service correction and their dimensions are as follows;

1) Responsiveness: Measures the ability to handle problems effectively and provide feedback through the site.
2) Compensation: Measures the level of compensation to customers because of problems.
3) Contact: Measures the ability to support through telephone or online customer representatives.

Above two (E-S-QUAL and E-RecS-QUAL) have combined by some researchers and they have named it as "E-S-QUAL" (Akbariyeh, 2012). Therefor both can be seen together in the model "E-S-QUAL" among crucial research of this field.
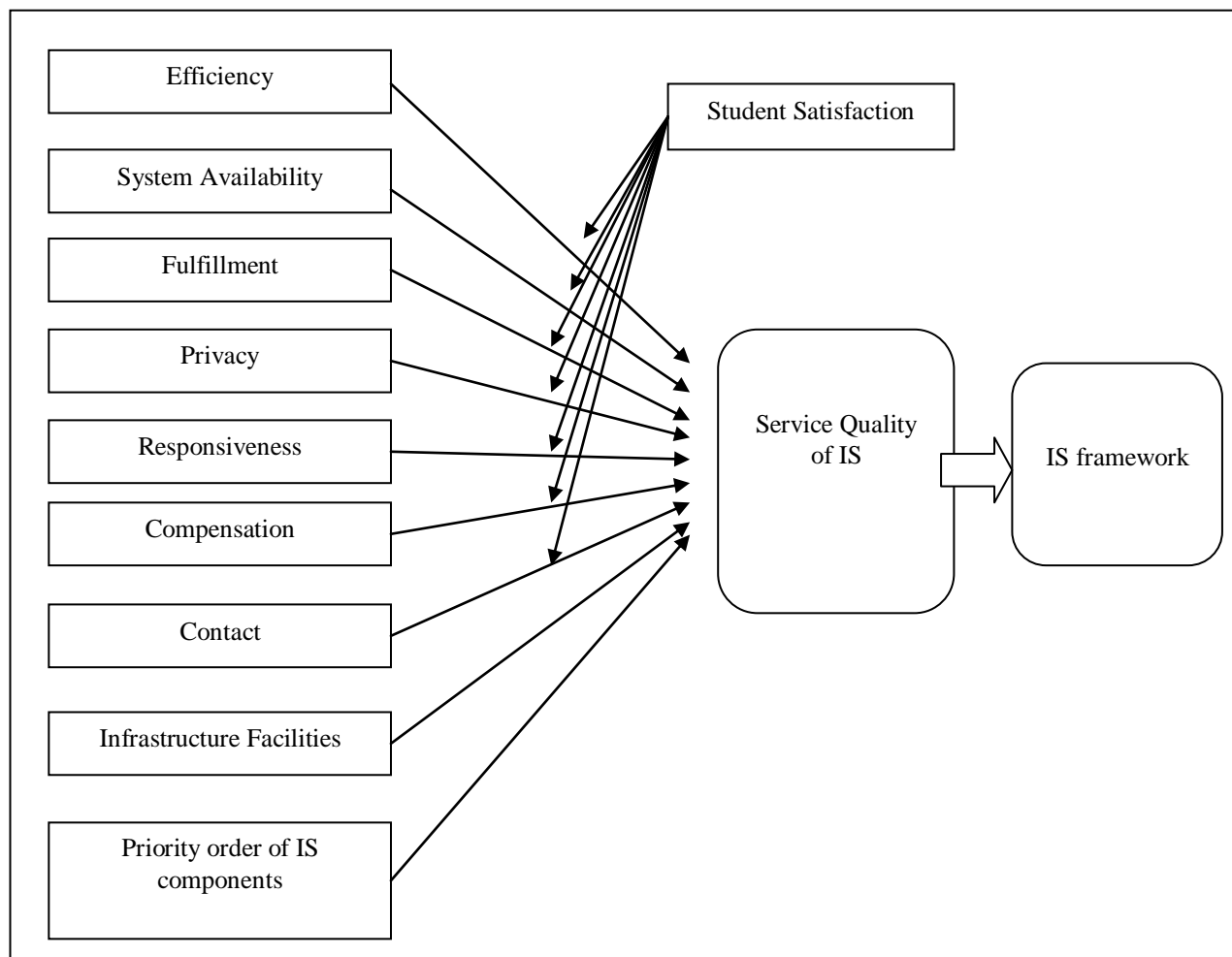
Figure 7 Conceptual Framework

E-S-QUAL has been developed for measuring quality of e-service for education sector supporting learning, research and communication (Kim-Soon, Rahman, & Ahmed, 2014). Akbariyeh (2012) has conducted a research on "A Survey Study on Affecting Factors of Students' Satisfaction from the Electronic Services Quality of Higher Education Institutions". In his research Akbariyeh (2012) has mentioned indicators of E-S-Qual as follows.

Efficiency, System Availability, Fulfillment, Privacy, Responsiveness, Compensation, Contact

IV. CONCLUSIONS

Above sections have discussed measurements of electronic service quality and E-S-QUAL is seemed as a fitting tool for academic institutions. E-S-QUAL is the best tool to measure the efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact of the Information System. However it is required to have a same background and facilities to test this concept in the study area.

When it differs from place to place the results may not reliable and have a possibility to depend on surrounding circumstances. When consider the university setup, some of them have established with rich of facilities and among some it is not fulfilled with even fundamental facilities. Some universities are in the special range like technical universities and some are far away from the technological background. That is why the infrastructure facilities should add to a new model and it acts as a variable. Limited resources have to be allocated among system components (Registration, Exam, Library services …etc.) on resource efficiency. Distribution of resources is a major and important decision of system developers because, that is the tool which decide the Priority order of IS components. User is known as the customer of the system and customer satisfaction cause to provide better service in efficient way. According to that point student satisfaction play the role of moderating variable in Information System of the university environment. Therefore the framework can be built using E-S-QUAL model with other two variables. They are the Infrastructure facilities and Priority order of IS components.

Figure 7 shows the proposed research model with the relevant correlations. Information System service quality is the dependent variable. As independent variables, Efficiency, System availability, Fulfillment, Privacy, Responsiveness, Compensation, Contact are included. This is based on E-S-QUAL and E-RecS-QUAL scale. "Infrastructure facilities" and "Priority order of IS components" are author defined independent variables. "Student Satisfaction" is taken as moderating variables in this Framework.

It is needed to test this model using samples of universities. It seems that case study design could suit with the model to test it in detail. Mainly attention should go to the impact of IS components (registration, exam, Library services...) on their own organization whether which processes are going on electronic services when consider the priority order of IS components. More than ever it would bring different outcomes when compare with other universities and it may difficult to generalize the results. Final outcome of this exertion is to build a framework including decided guidelines based on the results of the model.

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