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MASTERS THESIS

THE IMPACT OF ORGANIZATIONAL CULTURE ON THE
RELATIONSHIP BETWEEN INFORMATION QUALITY AND ITS USE

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Yazid Jaradat

IZJAVA O AVTORSTVU

Podpisani(-a) Yazid Jardat, študent Ekonomske fakultete Univerze v Ljubljani, avtor predloženega dela z naslovom THE IMPACT OF ORGANIZATIONAL CULTURE ON THE RELATIONSHIP BETWEEN INFORMATION QUALITY AND ITS USE, pripravljenega v sodelovanju s svetovalcem profesorjem Jurijem Jakličem

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Podpis študenta: _____

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INTRODUCTION

A international questionnaire prepared by Deloitte Consulting LLP in 2016 showed that 69 percent of managers around the world believe that organizations capability to sustain their mission and vision is influenced directly from organizational culture. (Redwood & Holmstrom, 2016). Yilmaz and Ergun discuss that organizational culture is a source of competitive advantage because of its ability to ease business aims through unifying the company abilities and ways to give answers for the challenges faced by the organization.

Decision-making is core part of management process. It relies on information and procedure (Nath & Badgular, 2013). The real power of information technology systems clarifies in its ability to principally change traditional and common ways of operating, for businesses and individuals. This change requires considering corporation culture as critical factor when making decisions about the amount of technology usage to avoid creating a gap between employee's needs, expectations and system qualities and ability. Information systems adoption in all organizational cultures will not be the same. It is common sense to assume that managers will use best fit systems to respond to business challenges while reducing costs is critical.

Considering the great impact of information systems in all business activities; it is adequate to motivate employees and customers towards more efficient behaviors and usage towards enterprise systems. Employee motivation is a management phase where managers try to create and insure internal drivers for employees towards compatible practices with enterprise. Improving employee engagement in business processes is attainable through many such as enabling employees recognize their sequel benefits from information systems usage. Understanding a culture requires acknowledging its triggers, employee behaviors are essential to consider. Higher managers can form people norms, values and beliefs (Räikkönen, 2017). Accepting and tolerating change in organizations is solid questions.

Culture is embedded set in the organizations. Such fact hardens change accepting. Employee behavior "symbols, rituals, and values" towards organizational strategic and operational aims is concrete base for organizational overall success. Such thing, requires deeper definitions and different perspective among certain culture holdings to ease communication, collaboration, and network.

The cornerstone of exploring the relationship between information systems and organizational culture is to assess information systems according to several organizational cultural measures. In accordance, evaluating the level of proper adoption. Researchers validate human resources as concrete basis for real competitive advantage, more importantly as corporation's success cornerstone. Employees with positive aspects and behaviors towards their job have the implication of perceived satisfaction which is improved by adapting information systems that empower their job functionality. Organizational culture is the main unique and constrictive feature that differentiate companies in having competitive advantage. (Cameron & Quinn, 1999).

Information system management has been a central focus for researches, the outstanding technology development in all business has improved all businesses capabilities. A powerful

information system allows business units to measure and control workflow process in quantitative and qualitative methods. The impact of information system to corporation strategic success is very critical and dynamic.

The terminology behind information systems adoption, diffusion, use, and consequences consider culture as important factor for system failure or success. It is crucial also to study human interaction with system, by acknowledging their behaviors and attitudes. Companies seek to improve organizational effectiveness by preparing their organizational culture for their business operations adaption. The quality of this operations is a matter of information management in which quality of information measured through six dimensions.

System quality assessed through factors such as ease of use, system flexibility, system reliability (Petter, DeLone, & McLean, 2008). Approaches to enhance system quality is a matter of enhancing information technology applications and the relative human dimension for such change. Organizational culture is the fundamental source in information technology implementation (Randolph, 1994). In which, insures the importance of studying relevant measures for understanding organizational culture corresponds to the use of information systems. It is critical to conceptualize user satisfactions factors to improve system quality. (Aronson, Halawi, & Aronson, 2008) indicated to the existence of correlation between system quality and user satisfaction.

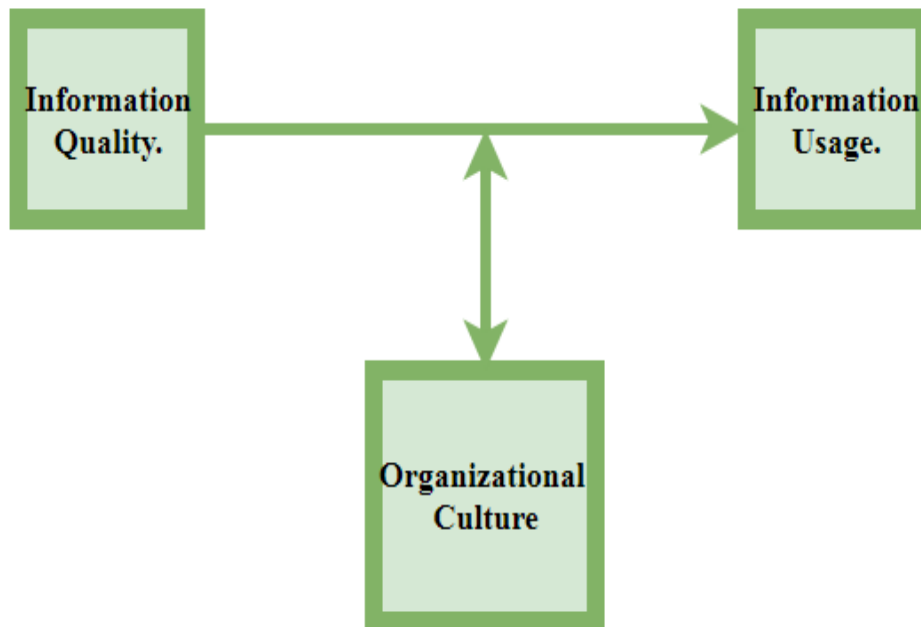
“Analytical decision-making culture necessarily improves the use of information but it may suppress the direct impact of the quality of the information content” (Popovič et al ,2012). There is a positive impact of information quality on it is usage therefore, studying the moderating effect of organizational culture upon this relation can lead to empower this relation by cultural means. Figure one represents the research general model.

This research main goal is to explore the moderating effect of company’s culture on the relationship between information quality and information usage. This study is centered in recognizing some properties and dimensions in the area of organizational culture relation to information technology.

Several different aspects of related topics will be discussed and analyzed to objectify research questions. This study aims to find out the impact of organizational culture towards information quality relation to information usage in which put on focus the key elements for organizations to consider in empowering information technology representation and implementation.

Also a theoretical discussion of the importance of adopting more information technology in companies will be presented. The thesis also discusses organization culture different theories and texture. The research as well investigate practices of adopting this new technology and what cultural changes needed for that change.

Figure 1 : Main Model



1 LITERATURE REVIEW

The research studies several aspects on the theoretical level upon both the field of technology and organizational culture. Firstly, a brief theory of organizational cultures is represented then information systems theory and success factors. Later on some technology adoption theories is reviewed. Finally, information technology and organizational culture theories is represented to find common understanding for criteria of the relationship between them.

1.1 Organizational culture overview

Modern organizations emphasis on their strategic goals by building responsive structure that takes in account as well cultural aspects. Organizational culture can be seen as the labor environment where business areas are operating (Schein, 1985) defined the existence in a culture through three different levels: assumptions, values, and creations in which those three levels are shared among labor in organizations. Social environment of organization consists of assumptions and beliefs and represents the culture and it is seen in all employees. (Aycan, Kanungo, R.n., Sinha, & J.b.p, 1999).

Although shared values and beliefs in the company cannot be standardized for maximal business process operating. A high level of homogenous culture existence across all departments can be

achieved through making sure that the business strategy considers higher labor involvement across cognitive levels in business process and by using a measurable action plan. (Schein, 1996) see the culture as “set of shared, taken-for-granted implicit assumptions that a group holds and that determines how it perceives, thinks about and reacts to its various environments”.

This definition holds three considerations for organizational culture, first it addresses the issue of socialization by referring on the way of passing the culture to new comers. Secondly, the influence of organizational culture on behavior at work and thirdly the relativity of organizational culture among different organizational level. Understanding organizational culture has many advantages such as (Cameron & Quin, 2010) :

- ✓ Raises recognition in current and the preferred culture, it raises what is next question.
- ✓ Provides opportunity to predict change factors that will increase the effectively.
- ✓ Managers will in deep their knowledge of change.
- ✓ Baseline to support innovation and creativity between employees.

Owens as well agrees that organizational culture is seen as scheme of shared values that evolve through time dimension leading to set of behaviors. A more comprehensive view for understanding organizational culture is built through acknowledging the factors that shapes a culture. Firstly, indirect factors’ macro-environment of an organization’ that affects organizational culture through economic, social-cultural, political-legal, scientific-technological, natural environment and international events level. Secondly, direct factors “micro-environment of an organization” in which interacts with cultural levels through consumers and customers, partners and other organizations. (Brenton & Gerald W. Driskill, 2005) . Leader impact believed to have effect on the culture itself. The leaders set the environment and the culture, which makes them critical reason for deeper understanding for a culture.

Organizations is related to the culture as individual is related to personality (Johnson, 1990), in which indicates that culture distinguishes organization from anther . Assuming that two identical companies operates in the similar environments will increase the chance of having similar organizational culture is not always valid. According to (D, Sripathi, & Londhe, 2015) ,Brown sees the fact of existence of different schemes that contains both shown and hidden cultural sub values, and beliefs will give the organization its distinctive character .

Shared values and beliefs act as reference for competitive advantage in companies due to the fact that it shapes the companies processes and put the companies capabilities in unified ways to provide business solutions, so generally it helps in achieving overall business goals (Yilmaz & Ergun, 2008).

Organizational culture has been an interest of focus for many researches in the previous decades, many scientists from different fields have developed incremental conceptualization for cultural research. A various set of topologies and classifications were developed through previous researches. A short summary table 1 below describes some of previous definitions and conceptualization in organization culture theories.

Table 1 : Conceptualization in organization culture theories

Researcher	Cultural modeling	Description
Herman, 1978	The Upper half (systems, structures, policies, technologies) The lower half (attitudes, beliefs, values, and perceptions).	Iceberg model differentiate between the (visible/formal) and invisible/informal aspects of an organization.
Deal & Kennedy, 1982	Tough-guy culture/ work-hard/play-hard culture/ bet-your company culture/ process culture.	Four generic types of cultures to describe organizational culture.
Handy, 1985	Power/ role/task and person cultures.	Four types of classification.
Schein, 1985	Artefacts, values and basic underlying assumptions.	Three levels to explain organizational culture.
Scholz, 1987	Stable, reactive, anticipating, exploring and creative.	Five primary culture topologies.
Cooke & Lafferty, 1987	Constructive cluster Passive or defensive cluster aggressive/defensive.	Twelve behavioral norms grouped into 3 culture types.
Hampden-Turner, 1990	Role, power, task and atomistic cultures.	Four types of culture to describe organizational culture.
Rousseau, 1990	Artefacts Patterns of behavior (visible signs of culture). Behavioral norms/values (invisible signs of culture) Fundamental assumptions (invisible signs of culture).	Multi-layered model structured as concentric rings and divided into outer rings.
Hofstede, 1991	power distance, individualism/collectivism, uncertainty avoidance, masculinity/femininity and confusion dynamism.	Cultures differ based on five dimensions.

Table continuous.

Table 2 : Conceptualization in organization culture theories(continued).

Researcher	Cultural modeling	Description
Oreilly, Chatman, & Caldwell, 1991	Innovation and risk-taking, attention to detail, outcome orientation, people orientation, team orientation aggressiveness and stability.	Seven primary characteristics to describe organizational culture.
Avolio & Bass, 1992	Coasting/loosely guided /predominantly to moderately bureaucratic or internally competitive/pedestrian/garbage can/high contrast/predominantly and moderately cultures.	Seven culture types.
Harrison, 1993	power-oriented culture; role oriented culture; achievement-oriented culture; and support-oriented culture.	Four cultural dimensions.
H.Schien, 2004	Artefacts (Visible organizational structures and processes) Espoused values (Strategies, goals, philosophies) Basic underlying assumptions(Unconscious, taken-for-granted believes, perceptions, thoughts, feelings).	First two phases of an organization life defined as birth and early growth, relies on management leadership and a results-oriented attitude. Third phase mid-life: culture identity.
H.Schien, 2004	Artefacts (Visible organizational structures and processes) Espoused values (Strategies, goals, philosophies) Basic underlying assumptions (Unconscious, taken-for-granted believes, perceptions, thoughts, feelings).	First two phases of an organization life defined as birth and early growth, relies on management leadership and a results-oriented attitude. Third phase mid-life: culture identity.

Table continuous.

Table 3 : Conceptualization in organization culture theories(continued)

Researcher	Cultural modeling	Description
Moble, Wang., & K, 2005.	Two Paradoxes: Level of consistency versus adaptability, and top-down vision versus bottom-up involvement.	Assess the outcomes of the existent organizational culture.
Cameron & Quinn, 2011.	Clan culture Adhocracy culture Market culture Hierarchy culture	Competing Values Framework Model, four culture types.

Many theories were done to understand organizational culture, no author can measure one hundred percent accurately a certain culture, neither can assume that a certain culture can lead to maximal benefits. A strong culture doesn't necessarily implicit for more business advantages nor a weak culture can always lead to business disadvantages.

(Khan, Usoro, Grzegorz, & Kuofie, 2010) defines what really matters for culture is to be effective to the business needs which can be seen in stability and flexibility measures. Stability is seen through the unchanged vision, mission and values, and flexibility is the ability of company to adopt their structure and operations internally and externally.

The nature of organizational culture research differs mainly on the assumptions on which it is conducted for (Creswell, 2009). Organizational cultural theory has been treated from several different perspectives, sociologists researched in the critical factors that composes and defines a culture. For instance, Taylor construct of culture includes the knowledge, beliefs, morals, custom, and other behavioral actions that affect the culture of organizations.

Rousseau went through studying visible and invisible cultural behavior in which considered as stepping forward in the direction of modeling a culture under certain generalization degree. Some researchers went further, Schein introduced time dimension into his model in which he studied the levels of culture creation till it is mature. (Denison & Mishra, 1995) thought differently and built their own model that assess the outcomes of the existent organizational culture through balancing consistency versus adaptability, and top-down vision versus bottom-up involvement paradoxes.

Herman's presented in the early of seventies his model and named it iceberg. In which he studied the difference between visible and invisible behaviors in company's cultures. Mainly Organization culture is observed from two abstract views in previous research work, it is the dilemma of treating the culture objectively or subjectively, in the mean of considering the culture as separated component of organization that include unique functionalities and purpose or integrated content upon organization where it can be modeled in subjective interpretation.

1.2 Organization culture assessment instrument

Quinn and Kim model, the competing values framework includes four organizational cultures. Their basic conceptualization that each company contains a mix of this organizational cultures. OCAI instrument is widely used in the field of examining the organizational culture, according to OCAI company report, this instrument has been used by 10,000 worldwide companies.

This instrument is applied to companies through specific questionnaire addresses six dimensions for users to judge. In which resulted in thirty-nine indexes to measure efficiently and culture. Internal focus versus external focus and flexibility versus discretion are believed by Quinn and Kim through the competing values framework to differ cultures strongly. Figure 2 below represents competing values framework.

Cameron and Quinn believes that clan and adhocracy are believed to share flexibility and discretion in management, on the other hand stability and control management tends to be found in hierarchy and market culture. The other two dimensions' studies whether companies are internally focused or not. Clan and hierarchy cultures focuses more in internal strategies in management while adhocracy and market cultures are externally focused. The characteristics of organization is represented by four types of cultures summarized below in table 2.

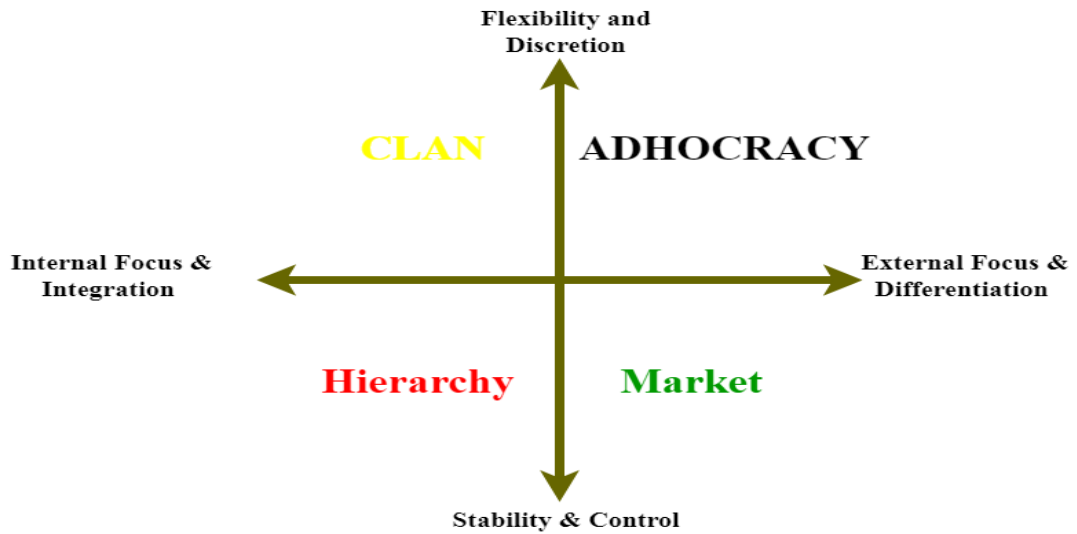
Clan culture is friendly place where employees act like family in companies, the management focuses on creating comfortable social surroundings, where team work and high cooperation between employees is built beyond working code. Clan culture can bring openness in work but on the other hand it can allow inefficient time management.

Adhocracy culture is as well friendly place where management focuses on empowering entrepreneurship strategies by welcoming risk takers and constant support for out of box thinkers. This strategy can lead to more innovative business process but on the other hand it can increase costs by taking unneeded risks.

Market culture encourages goal achieving, the company serves direct market needs by setting management strategy that evaluate workflow on goal orientation bases, employees are expected to deliver certain output to serve the overall goals of the organization. This way of operating can decrease entrepreneurship and new ideas between employees, but at least in insures respecting goals and projects delivery.

The strictest business model is hierarchy culture as formal codes and rules organize each step in the work flow, employees are expected to do their jobs as it is clearly required and instructed. this type of management insures delivering accurate results in time.

Figure 2 : Competing values framework developed by Quinn and Kim



Source: Cameron & Quinn, *Diagnosing and changing organizational culture: Based on the competing values framework*, 2001, p.35, Graph 3.1

Competing values framework is based on three fundamentals in competing the values and measures, the strength and the type of the culture are important measures to see whether cultural congruence is reached, congruence in a culture is valid when culture is strongly present in all company's values.

Table 4 : OCAI.

Culture Type	Description
<p>Clan Culture. Dynamic culture where employees feel home.</p>	<p>Leader Type: facilitator, mentor, team builder. Internally focused.</p> <p>Desires flexibility and discretion.</p> <p>Value Drivers: commitment, communication, development.</p> <p>Theory for Effectiveness: human development and participation produce effectiveness.</p> <p>Quality Strategies: empowerment, team building, employee involvement Human Resource development, open communication.</p>

Table continuous.

Table 5 : OCAI model(continued).

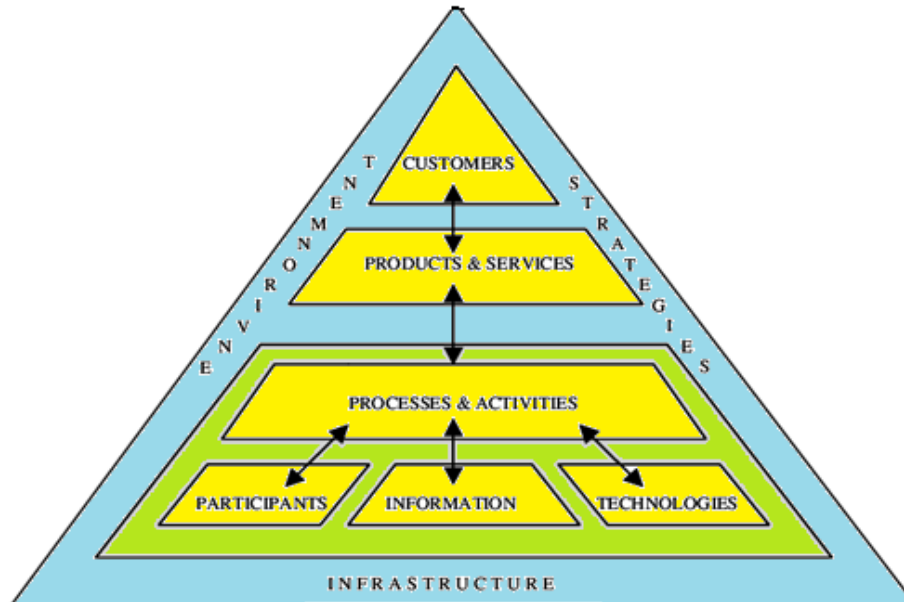
Culture Type	Description
<p>Adhocracy Culture. Dynamic culture where employees act as entrepreneurs.</p>	<p>Leader Type: innovator, entrepreneur, visionary. Externally focused, Desires flexibility and discretion</p> <p>Value Drivers: innovative outputs, transformation, agility.</p> <p>Theory for Effectiveness: innovativeness, vision and new resources produce effectiveness.</p> <p>Quality Strategies: surprise and delight, creating new standards, anticipating needs, continuous improvement, finding creative solutions.</p>
<p>Market Culture. Dynamic culture where employees are result oriented.</p>	<p>Leader Type: hard driver, competitor, producer Externally focused, Desires stability and control.</p> <p>Value Drivers: market share, goal achievement, profitability.</p> <p>Theory for Effectiveness: aggressive competition and customer focus produce effectiveness.</p> <p>Quality Strategies: measuring customer preferences, improving productivity, creating external partnerships, enhancing competitiveness, involving customers and suppliers.</p>
<p>Hierarchy Culture Formal culture where employees have strict rules and procedures for work.</p>	<p>Leader Type: coordinator, monitor, organizer. Internally focused, Desires stability and control.</p> <p>Value Drivers: efficiency, punctuality, consistency and uniformity.</p> <p>Theory for Effectiveness: control and efficiency with appropriate processes produce effectiveness.</p> <p>Quality Strategies: error detection, measurement, process control, systematic problem solving, quality tools.</p>

Source: Cameron & Quinn, *Diagnosing and changing organizational culture: Based on the competing values framework*, 2001, p.35, Graph 3.1

1.3 Information System

Defining what is information is the main core of any functioning information system. Information is relative in definitions and applications. By using the regular dictionary, the term of information can mean knowledge communicated or received. Reflecting this definition on certain machines with relevant software structures will lead to an information software system. In addition, reflecting this definition on humans will lead as well to information system that is acknowledged by certain individual, for instance a lawyer can be considered as information system for his customers. The main objective here is to find accumulative definition of information system which can hold all sub interpretations. Alter designed deeper view for information system, which can be considered as basic framework for information systems, figure 3 below (Alter S. , 2010) model (The work system framework). The model consists six entities: customers, products (and services), business processes, participants, information, and technology. The work system method is used in this research for defining information systems as it provides clearer understanding of what is information system in a company on both technology, human related aspects. The work system method that uses the general idea of work system as baseline to manage and improve systems in organizations. (Alter, 2002). Each entity in workflow will be treated as unique but related information systems. To sum up, this research refers here to information system as the software system and uses Alter definition.

Figure 3 : The work system framework.



Source: Alter S., *Viewing Systems as Services: A Fresh Approach in the IS Field*, 2010, vol. 26, article 11.

Information systems include wide range of operation levels in companies, depending on business type and requirements. A cashier in small sized business can be good fit as information system, thinking bigger on bigger organization scales with more departments and business process created

the need of new level of information system for operating. Some organizations model requires more than that, for example a public information system for a university in which can store and process information from community.

This research is applied to all companies that have at least an enterprise system management to support their business. Enterprise system management can be seen as information system that manage all the information and process to ensure the functionality of organizations operations. ERP system provides many functionalities such as manufacturing, inventory, shipping, logistics, distribution, in voicing, accounting and many other services.

Due to the high integration of ERP systems in companies, ERP system designers relied on 3 layers between the user and the system information to ensure compatibility with complex tasks. First tier is the user interface where information is transmitting as input or output. The interface should be user friendly to increase positive usage. The interface tire is connected with middle tier that serve as information processor and connection point between the user and database, this tier helps the organizations to achieve faster information retrieval and more secure connections with the database. The last tier is location where information is stored as data in hardware components to be saved.

Information systems varies through wide range of functionalities, in addition to ERP systems other forms of less multipurpose information system are introduced such as procurement systems where the main focus is to control and automate the purchasing process. Manufacturing systems on the other hand support production process. Sales and marketing systems handles the 4p (product, price, place, and promotion) concerns in companies by supporting customer ordering processes.

Information systems plays critical role in decision-making, as information systems can provide quality information for business process. ERP system sustains successful decision-making by managing form single point all components in the system, through processing activities to achieve control (Bush & Bell, 2002). The role of information system in decision support is referred as DSS in which decision support system (DSS) defined according to (PK) as information system that makes effective decision rules, models, through giving the user structured insights on the business operations , leading to precise and valid decisions in solving complex problems. Many other researchers attempted to characterize decision support systems to create comprehensive model for data treatment. According to Alter DSS are designed in supporting more than computerizing decision making as well it should satisfy users evolving needs. Lee, Wagner and Shin triggered the user effects for decision support systems in solving issues. Their study concluded that problem-solving actions depends critically on the user previous knowledge (Lee, Wagner, & Shin, 2008). Which creates the need of preparing user for functioning on systems. Generally, it is critical to understand the impacts of cultural variations when applying decision support systems. (Reinecke & Bernstein, 2014) sees that culture allows to align groups that have in common, ideas and perspectives to relative extent. In accordance, it is important to acknowledge cultural types and conflicts in assessing information systems . (Coombs, Abubakre, & Coombs, 2013).

1.4 IS Success Factors

Applying successfully information systems in companies is forward critical step towards improvements. Researchers tried to modify the criteria of success factors, in context many models were introduced to simulate and measure degree of success of a system. A fundamental model in correspondence were built in 1992 by McLean and Delone determined the interdependent variables of the components of IS success. In 2003, McLean and Delone modified their model to updated version represented in Table 3 below.

Finding standardized measures for this dimension is complex task. According to (Petter, DeLone, & McLean, 2008), information technology is affected by several indirect factors such as people and even the total environment where the organization run , therefore it is relative and complex to measure those impacts. Figure four shows the connected components of information system success.

Table 3: Components of IS success.

Dimensions of success	Definition	Characteristic
System quality.	Desirable characteristics of an information system.	Ease of use, system flexibility.
Information quality.	Desirable characteristics of the system outputs. reliability, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility, and response times.	Relevance, understandably, accuracy, conciseness, completeness, understandability, currency, timeliness, and usability.
Service quality.	Quality of the support that system users receive from the IS department and IT support personnel.	Responsiveness, accuracy, reliability, technical competence and empathy of the personnel staff.
System use.	Degree and manner in which staff and customers utilize the capabilities of an information system.	Amount of use, frequency of use, nature of use, appropriateness of use, extent of use, and purpose of use.
User satisfaction.	Users' level of satisfaction with reports, Web sites, and support services.	

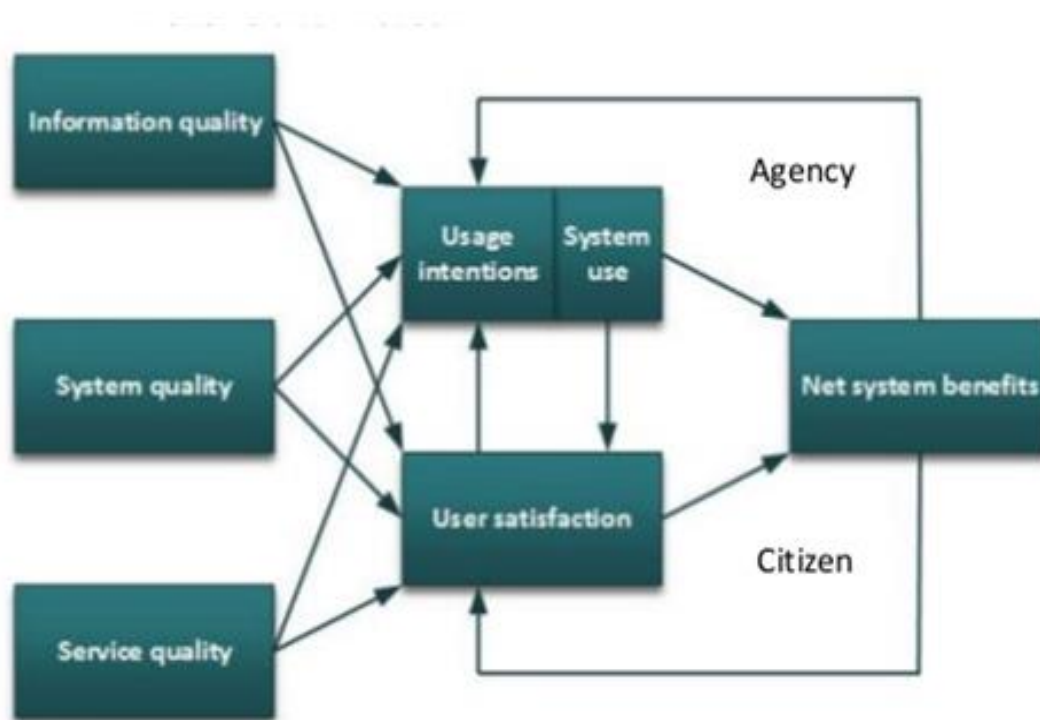
Table continuous.

Table 3: Components of IS success (continued).

Dimensions of success	Definition	Characteristic
Net benefits.	IS are contributing to the success of individuals, groups, organizations, industries, and nations.	Improved decision-making, improved productivity, increased sales, cost reductions, improved profits, market efficiency, consumer welfare, creation of jobs, and economic development.

Source: McLean and Delone, *The DeLone and McLean Model of Information Systems Success: A Ten-Year Update*, 2003.

Figure 4: components of information system success.



Source: McLean and Delone, *The DeLone and McLean Model of Information Systems Success: A Ten-Year Update*, 2003.

McLean and Delone pointed out to 15 causal relationships between IS dimensions, with description of the operationalization's of each dimension in order to measure it, they agreed in their research to the importance of information quality dimension of end-user satisfaction.

Leading to the consideration of measuring information quality as leading effect to user satisfaction. Employees' intention to use information to take a decision and other process management activities, relays on the quality of available information and amount of IS use. (Popovič et al.). Table 4 below (Omar et al , 2010) represents some assessments of information quality.

Table 4: Assessments of information quality in different theories

Researcher	Quality characteristic	Researcher	Quality characteristic
Craig M Gustin & Daugherty, 1995	Accuracy Reliability Accessibility	Li & Lin, 2006.	Accuracy, timeliness, adequacy and credibility.
Singh, 1996	Timely, accuracy and visibility	Folinas et al, 2006.	Information transparency and accuracy.
Lee et al. 1997a; Lee et al. , 1997b	Reliability and accuracy of customer orders	Forslund and Jonsson, 2007.	Accuracy, timely, adequacy and credibility (Reliable forecast information).
Mason-Jones & Towil.	Timely and accuracy (Undistorted sales information).	Rabren, 2010.	Speed and quality of data.
Monczka et al. ,1998.	Accuracy, timely, adequacy and credibility	Ramayah & Omar, 2010.	Timeliness, accuracy, completeness, adequacy and credibility.
Raghunathan , 1999.	Accuracy		
Moberg et al., 2002.	Timely, accuracy, adequacy, completeness, and credibility		

Source: Omar, T, Lo, Sang, & Siron, *Information sharing, information quality and usage of information technology (IT) tools in Malaysian organizations*, p.2491, table 2, 2010

To assess information quality, many approaches can be done, such as assessing the quality of information based on comparing the information through their self-measures or similar information measures. As well a more generic approach can be done to assess the quality of information by comparing it with bigger information that contains more descriptions of the content and its characteristics such as creation date, size, and other measures. Rating the information by

users and intelligent systems is helpful as well in assessing the quality of this information, companies use different assessment depending on their need.

1.5 Information Technology Adoption

Information systems integration should be aligned with the general strategy of the company; therefore, a successful strategy operates through reactive systems that allow employees to exchange business related information. Mainly the corporations tend to update their systems through time to be able to face new challenges, so information system adoption is continuous process that relays on up to date improvements and monitoring. Successful information system adoption is the first step towards achieving information systems optimized benefits.

Adopting Information systems in companies is wide and relative task, mainly the nature of business helps to conceptualize the needed purpose of adopting information system in the organizations. Such a process starts by increasing information systems user awareness till the point where technology is fully adopted. Validating right conditions for information system adoption has been focus interest since the early nineties where many different approaches are discussed on both individual and organizational levels. Adoption at individual and organizational levels increases the possibility to reach diffusion of technology state in the organization.

Diffusion is the “stage when technology spread across all its overall usage and application”. (Rogers, 2003). Rogers developed innovation adoption curve in which he introduced the theory of diffusion of innovation and presented the process of innovation integration in the culture over time. (Colby & Parasuraman, 2007) referred to technology readiness concept and considered it as people tendency to accept and use new technologies for getting the task done.

According to their research they divided technology users into five groups of explorers, pioneers, skeptics, paranoids, and laggards. Other researchers introduced different models on the individual level, for instance TAM model which were introduced in 1989 and considered important theoretical resource to apply and adopt information systems. TAM model has been updated many times over the last decades to meet better requirements. Many external factors that affect the user attitude and intention to work with technology have been introduced later in advanced TAM models. Table 5 summarizes some of theories developed in understanding the usage and adoption of information system.

(Cavusoglu et al, 2010) designed data model to propose IS implementation in which it he found that employee’s interaction level affects information systems integration. They divided the studied groups users in three categories – “influential,” “opponents,” and “imitators,” The opponent group’s behaviors in which they resist information usage that can lead to critical failure in implementation, as they reduce the acceptance behavior of the influential group who accepts information system in more positive practices. According to the study imitators will react with of the opponent’s behavior leading to increase the possibility implementation process. Applying a certain model depends on the strategic emphasis that a certain company hold, the relatively of accepting technology in firms defines which constructs to be used as measures for predicting the effect of technology integration process. Strategic management theories discuss success factors

that drive competitiveness. (Porter, 1985) defined five competitive forces in which he assessed that sustaining competitive advantage through innovation which can be achieved by technology adoption, his research considers technology adoption as one of critical drivers for success. Porter as well pointed to resources as a competitive force, which means the organizational culture should adopt to new technologies to maximize benefits. Employees rejection for current or new working practices can lead to the failure of an information system integration , form organizational perspective (Wagner, Erica, Newell, & Sue, 2011). Adopting certain technology is a question of preparing the culture, as previously presented many models have been discussed to define a culture on individual or firm level.

Table 5: Relevant theories developed in understanding the usage and adoption of information system.

Researcher	Theory	Model (Construct)	Description
Fishbein & Ajzen, 1975	Theory of reasoned action.	Behavioral intention Attitude Subjective norm.	Through math it can be found that behavioral intention is the summation of attitude and subjective norms.
Ajzen, 1991	Theory of planned behavior.	Perceived behavioral Control Behavioral intention Attitude Subjective norm.	Added the perceived behavioral control concept to theory of reasoned action.
Davis F. D, 1989	Technical adoption model.	Perceived usefulness Perceived ease of use.	Predicting the possibility of adoption of new technologies at individual level in organizations.
Thompson, Higgins, & Howell, 1991	The model of PC utilization.	Job-fit Complexity Long-term consequences Affect Towards Use Social Factors Facilitating Conditions.	Built on the theory of human behavior behavior is determined by what people would like to do (attitudes), what they think they should do (social norms), what they have usually done (habits), and by the expected consequences of the behavior”.

Table continues

Table 5: Relevant theories developed in understanding the usage and adoption of information system(continued).

Researcher	Theory	Model (Construct)	Description
Davis, Bagozzi, & Warshaw, 1992	The motivation model	Extrinsic motivation Intrinsic motivation	Example of extrinsic motivation: perceived usefulness, perceived ease of use, and subjective norm Examples of intrinsic motivation: Feelings toward using the software.
Venkatesh & Davis, 2000	Extended TAM2 model	Social influence processes Cognitive instrumental processes.	Additional components such as social influence processes for example: subjective norm, voluntariness and image Example of cognitive instrumental processes: job relevance, output quality, result demonstrability and perceived ease of use.
Venkatesh & Bala, 2008	Technology acceptance model (TAM 3)	Individual differences System characteristics Social influence Facilitating conditions.	Perceived usefulness perceived ease of use.
Viswanath, Thong, L., & Xin, 2016	Unified Theory of Acceptance and Use of Technology	Performance expectancy Effort expectancy Social influence Social influence Facilitating conditions.	Added: Removing attitude toward using technology, self-efficacy, and anxiety constructs

In order to understand the adoption process, it is essential to understand the nature of the relationship between information system and incubator body that involves human interaction level with the system, for example many systems allow authority flow in access and usage for the system, managers have more power in their interaction level, thus it is valid to assume that information systems draw authorities in the work process and support the management chain. This effect may create different values and perspectives for certain user, those unrelated values create a culture. Each organization deals with information technology in different approach, some companies prefer to associate their strategies with exciting information technology, others prefer to build their own systems that will serve their strategies. It is a solid question that face IT managers, whether to make or buy a system. Both ways should ensure information technology solution. Culture factor as well is considered to take such decision. Buying a new system can change the culture so many specialized procedures is to be taken to ensure stabilizing the culture after acquisition. Making a system is another option for capable organizations, it insures security and specialized functionality thus making a system can empower positive values for the organization which affects information usage directly.

1.6 Information Technology and Organizational Culture

Companies are able to gain evolving business goals through investing in information systems , information technology alone can improve the products and services through changing the work process (Peppard & Ward, 2004). Information technology plays a major role in organizations through improving the decision making process. Researchers found that the effective use of information technology in any organization is affected to certain extent by the organization culture. According to (Llopis et al, 2001)

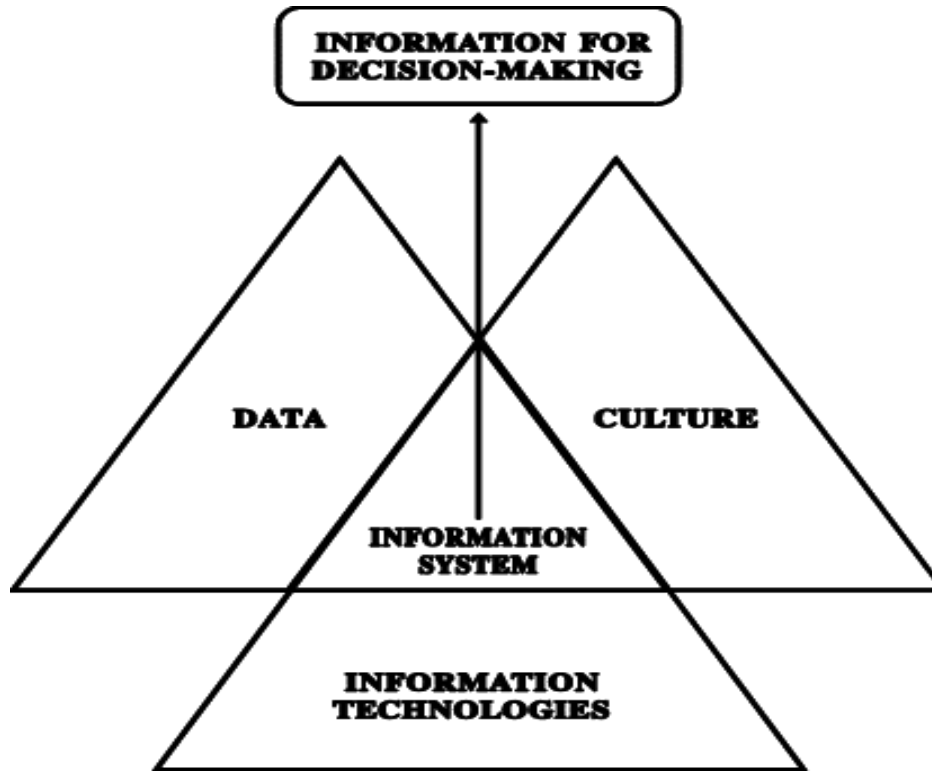
It is important to study the relationship between organizational culture and information systems to assess whom leading and controlling the other, whether organizational culture puts the framework for information system possession and integration. Or information systems sets and align cultural values of a company through the general use. It is convenient to state that information systems integration in companies is gaining bigger fortune in all the departments, leading to the fact it can change the business process and even align common cultural values in each department.

On the other hand, employees of an organization can understand the power of information technology, so they are expected to empower their correct usage within an IS, such expectation can drive competitive advantages on both company or individual level. Increasing the achievements will enforce the idea of information technology adoption. Many policies and procedures can increase user's association with a system such rewarding. (Llopis et al, 2001).

Both theories and ideas are valid and lead to the high existence of the relationship between information technology and organizational culture. the success of an information system in a company depends on three components represented in figure four below the data, the information technology and the people. The role of information system is to transform data to information for good usage and information technology is to operate this information in

manageable terms, finally the culture will interact with those components leading to better decision making. Figure 5 below represents the model for information for decision making.

Figure 5: Influence among it, is and organizational culture.



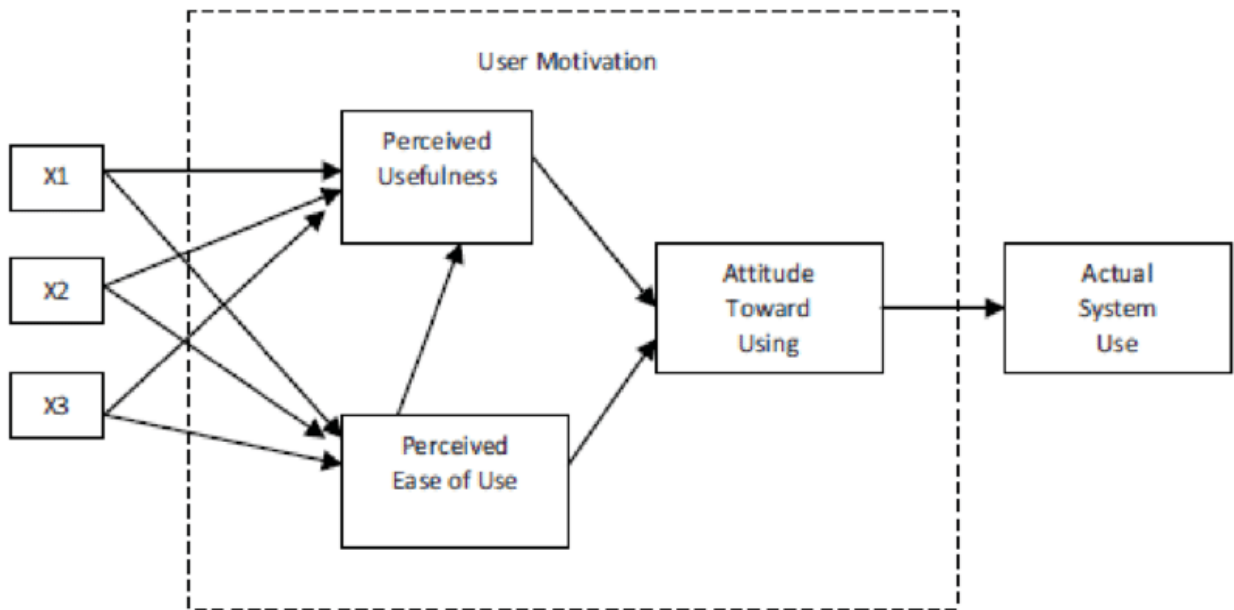
Source: Llopis et al, *Influence among it, is and organizational culture*, 2001.

2. CONCEPT DEVELOPMENT

Information quality is a major factor to be seen in system output, many measures developed by DeLone and Maclean to characterize such critical factor; relevance, accuracy, completeness, usability, etc. Information content quality has a direct and positive impact on the use of information in business processes' (Popovič et al, 2012). Hence sustaining quality information is a challenging task for organizations to ensure required amount of information usage.

Davis proposed that the attitude of user towards a system is a key factor for real usage of system or rejecting the system, in which the attitude of user towards a system can be measured by two factors. The perceived usefulness, stated as the belief of how useful a certain system in empowering the job process and performance and the perceived ease-of-use which is defined by the belief of how a certain system can be easy used to deliver and process information (Davis F., 1989). In this regard, those two characteristics can be enhanced and empowered by improving the quality of the system. He proposed as well that those two factors are defined by three information system inputs represented in figure 6 below. Later on, TAM model continued to seek improvements through enhancing and adding more determinants to increase the accuracy of the measures for this relation.

Figure 6 : Original technology acceptance model developed



Source: Davis F, *perceived usefulness, perceived ease of use, and user acceptance of information technology*, vol. 13 (3) p. 319–340,1989

Venkatesh and Bala in 2008 proposed TAM 3 model represented in figure 7 below, it is observed that quality of system output is a pre-determinant factor for perceived usefulness of a system as it will affect the actual usage. This implies for the positive and linear relationship between system quality and system usage, implying the sub existence of positive and linear relationship between information quality and information usage.

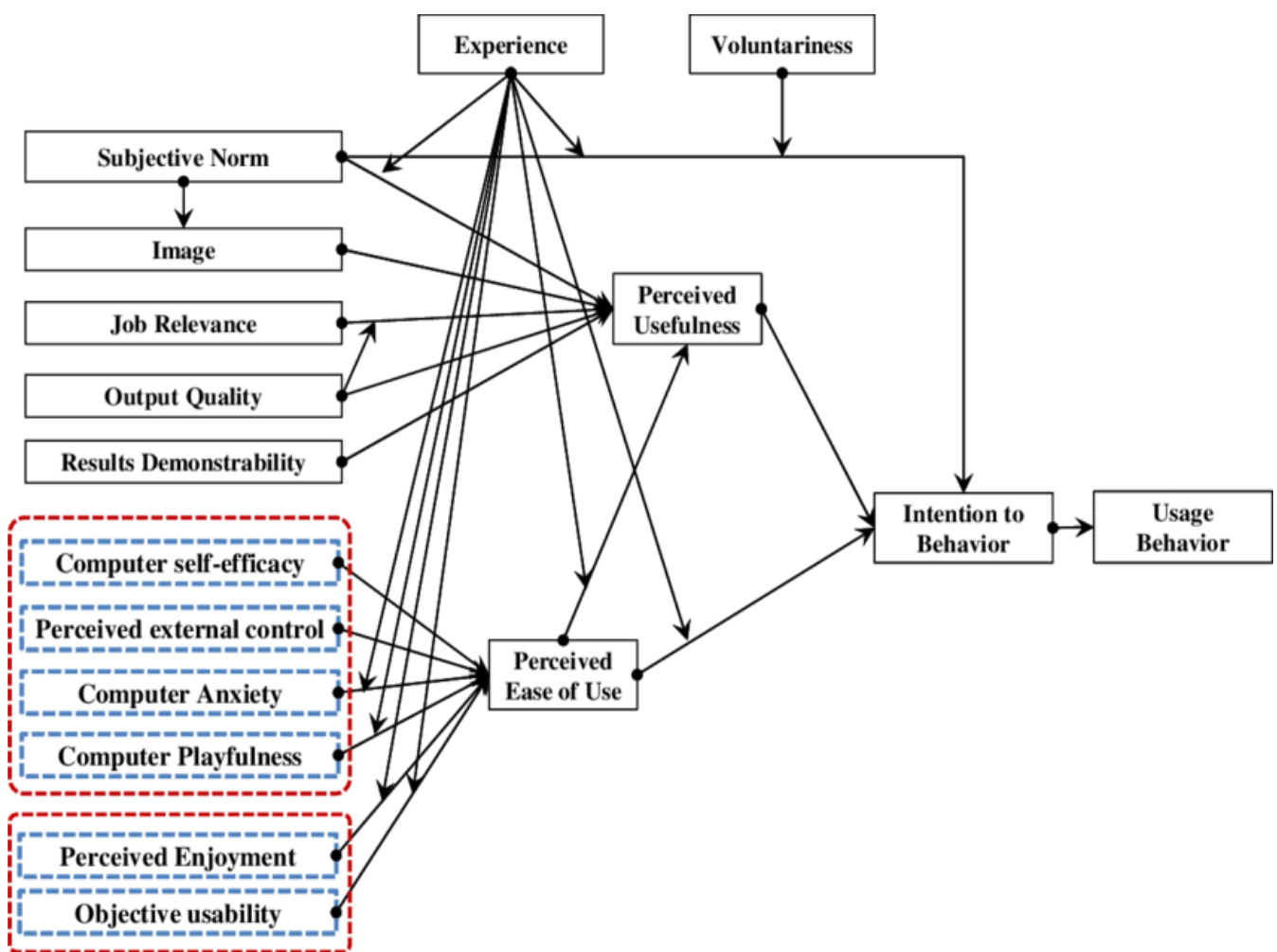
The main concept of the thesis is to address the potential of understanding this relationship through different organizational cultures. System usage can be determined by the user attitude and ability to go within certain system.

User has certain beliefs and attitudes towards his job developed based on certain organizational culture. The overall user’s attitude in organizations is one factor of forming organizational culture that raises the importance of studying system usage from cultural perspective as well.

In order to study the effect of each organizational culture upon the information quality-usage relation, it was essential first to prove the linearity of this relation. From the collected data in the research this relationship proved to be positive and linear. In Addition, it was proved to be significant in many previous researches Figure 8 represents the linear relation between information usage and information quality in conducted research by FELU team, this is obvious the high relevance in the results as it proved to be (0.493; $p < .01$). Superposition allow the researcher to divide the research work in different parts and study the effect of each individual part upon the whole parts , this principle states that if a system is linear , the main response happened by two or more factors in the linear system equals the sum of each response. (Illingworth, 1991)

This concept allows the researchers to study the effect of each component individually on certain relationship knowing that each organization have at least one or more cultures. So, by measuring the effect of each individual culture according to the information quality-usage relation, this will result in dividing this relation to four parts in order to compare them together and with the original information quality usage relation. To sum up the research hypothesis that leads to develop this concept, organizational culture has effect on information systems usage and adoption in general. Information quality, as well, affects it is usage positively. The moderating effect of organizational culture upon the relationship between information quality and usage can lead to empower this relation through making the right corrections and directions in certain culture as it adopts more to the use of technology which is a success factor for any business growth.

Figure 7:TAM 3



Source: Venkatesh, & Bala, *Technology acceptance model 3 and a research agenda on interventions. Decision Science* ,vol 39 (2),p. 273-312,2008.

Figure 8 : Relationship Between IS and IU.

Structural model results and effects sizes (F)				
Criterion	Predictors	R-sqaure	Path coefficient	F
Path coefficients				
IU	BISQ	0.43	0.079	0.01
	IQ		0.493**	0.29
	ISV		0.094	0.06
	ISV * BISQ		0.054	0.00
	ISV * IQ		-0.191*	0.03
IQ	ISV	0.21	0.452**	0.27
Notes.				
*Significant at the 0.05 level (one-tailed test).				
**Significant at the 0.01 level (one-tailed test).				

Source: Popovic, A., Hackney, R., Coelho, P. S., & Jaklic, J. *How information-sharing values influence the use of information systems: An investigation in the businessintelligence systems context.* 2014,p.270–283.

3.RESEARCH METHODOLOGY

Positivists methods were considered and applied in conducting the research workflow. Leading to the fact that culture can be acknowledged which implies at least certain measures can be managed .(Kilmann, Saxton, & Serpa, 1985).The main hypothesis in the thesis is that there is a relation between organizational culture and information technology. Quantitative and qualitative methods were applied to give better understanding for this relationship.

Influences of organizational culture upon organizational effectiveness is the main driven of the hypothesis. OCAI (Organizational Culture Assessment Instrument) is used for profiling the culture off the studied group. A comprehensive questionnaire has been handed to employees in different organizations, the questionnaire profiles the organization cultures and as well assesses information system quality and usage. Employees are to be instructed through labels varying from “Totally disagree” till “Totally Agree” to each statement. Scores to reflect the degree of attitudinal positiveness through a 10-point Likert scale.

The addressed sample varies through different geographical locations. The research will cover very wide range of business and professions. The research is conducted among telecommunications, information technology, medical, educational, media, financial, industrial, small nonprofit organizations and NGOS sectors.

Employees from human resources, information technology staff, operations, finance, customer service departments who ranged within department hierarchy will participate. Analysis and comparison of the collected data has been simulated and analyzed on different software’s to insure scientific processing. Relevant literature approves practical practices on the data such as superposition, clustering. Open coding approach is applied in the research which is used through inquiring and constant comparisons, to be able to sustain subjectivity of the research , and constant examination of the data with itself. (Corbin & Strauss, 1990).

4.DATA COLLECTION

Data had been collected through several stages and ways. Both soft and hard copies of a comprehensive questionnaire managed by research group from FELU have been sent to all participating companies.

Figure 8 and 9 demonstrate both determinants of the information usage and quality scores. Knowing that BIS (Business Intelligence Systems) had been changed to MIS (Management Information systems) for the companies that doesn’t has business intelligence systems to run their operations. Banking sectors as well had this change to their own built systems. In addition, it is shown in both figures below that the scale for answers is from one to seven. This scale, however, were normalized to be out of ten for data processing purposes.

Figure 9: Information usage from the questionnaire.

*	I intend to use information provided by BIS as a routine part of my job over the next year.	1 2 3 4 5 6 7
*	I intend to use information provided by BIS at every opportunity over the next year.	1 2 3 4 5 6 7
*	I plan to increase my use of information provided by BIS over the next year.	1 2 3 4 5 6 7

Figure 10: Information quality from the questionnaire.

*	Overall, I would give the information from BIS high marks.	1 6	2 7	3	4	5
*	Overall, I would give the information provided by BIS a high rating in terms of quality.	1 6	2 7	3	4	5
*	In general, BIS provides me with high-quality information.	1 6	2 7	3	4	5

Determining the organization culture have been done through OCAI instrument for the data inputs. Only confident employees to their organization culture had been taken to second stage of processing in which each cell in the six dimensions had scored out of ten instead on treating the whole dimension score out of ten as proposed by OCAI instrument.

This change insured that the employee is confident to his/her corresponding organization culture. The linear summation of each cell in the dimension for the corresponding culture was the method then taking the maximum value for the certain organizational culture was the determinant of the organizational culture.

Figure 10 shows the measures of the questionnaire for profiling organizational culture, the measure is assessed through OCAI questions regarding certain culture, it notes mentioning that OCAI follows two dimension for scores the actual and preferred, in this research respondents answered for their actual cultures. Then, the process of removing outliers and nonsense data in order to cleanse the data for software process. Employees whose score was non relative data were removed from research. Participants judged the six dimensions of their organization.

Figure 10 :Organizational Culture Measures

ASSESSMENT OF ORGANIZATIONAL CULTURE	
Divide 10 points among four alternatives of each section below, depending on the extent to which each alternative is similar to your own organization. Give a higher number of points to the alternative that is most similar to your organization.	
D.1	Dominant Characteristics
	The organization is a very personal place. It is like an extended family. People seem to share a lot of themselves.
	The organization is a very dynamic entrepreneurial place. People are willing to stick their necks out and take risks.
	The organization is very results oriented. A major concern is with getting the job done. People are very competitive and achievement oriented.
	The organization is a very controlled and structured place. Formal procedures generally govern what people do.

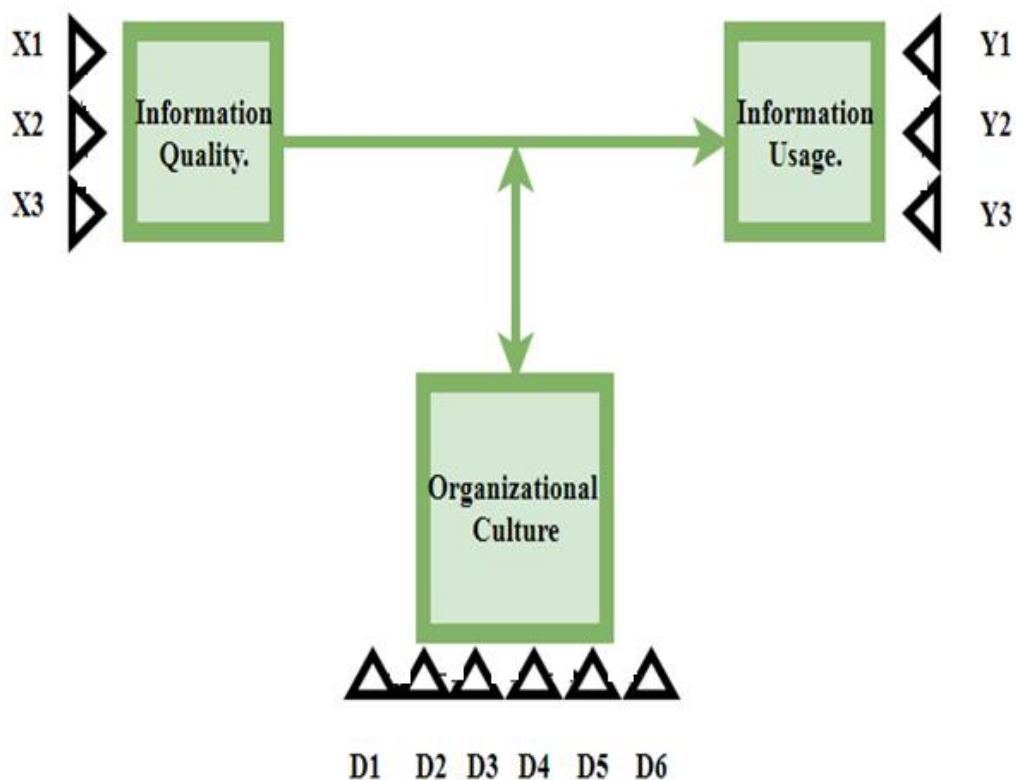
D.2	Organizational Leadership
	The leadership in the organization is generally considered to exemplify mentoring, facilitating, or nurturing.
	The leadership in the organization is generally considered to exemplify entrepreneurship, innovating, or risk taking.
	The leadership in the organization is generally considered to exemplify a no-nonsense, aggressive, results-oriented focus.
	The leadership in the organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency.
D.3	Management of Employees
	The management style in the organization is characterized by teamwork, consensus, and participation.
	The management style in the organization is characterized by individual risk-taking, innovation, freedom, and uniqueness.
	The management style in the organization is characterized by hard-driving competitiveness, high demands, and achievement.
	The management style in the organization is characterized by security of employment, conformity, predictability, and stability in relationships.
D.4	Organization Glue
	The glue that holds the organization together is loyalty and mutual trust. Commitment to this organization runs high.
	The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge.
	The glue that holds the organization together is the emphasis on achievement and goal accomplishment. Aggressiveness and winning are common themes.
	The glue that holds the organization together is formal rules and policies. Maintaining a smooth-running organization is important.
D.5	Strategic Emphases
	The organization emphasizes human development. High trust, openness, and participation persist.
	The organization emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.
	The organization emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant.
	The organization emphasizes permanence and stability. Efficiency, control and smooth operations are important.
D.6	Criteria of Success
	The organization defines success on the basis of the development of human resources, teamwork, employee commitment, and concern for people.
	The organization defines success on the basis of having the most unique or newest products. It is a product leader and innovator.
	The organization defines success on the basis of winning in the marketplace and outpacing the competition. Competitive market leadership is key.

The organization defines success on the basis of efficiency. Dependable delivery, smooth scheduling and low-cost production are critical.

Each component in the model is connected to several inputs in each they affect it in direct and linear procedures. Connecting those components together is represented in the detailed modeling graph in figure 11 below. Each component was measured separately then the outcomes of the quantitative analysis were combined together to estimate the power of organizational culture across the relationship between information quality and usage.

Assessing the culture depended on six general measures where employee express how they see their culture from different aspects. This shall increase the accuracy of the measure and give the researcher more options to define the belonging culture for the respodandet. The corosponding scale for OCAI is to divide 10 points on each description of culture situation .

Figure 11: Research model.



5. QUANTITATIVE ANALYSIS

The research data had been collected from two different countries that is geographically far located from each other and have different background cultures for employees who filled the questionnaire. In addition, data had been taken from very wide range of businesses starting from small profit organizations to huge companies with over than one thousand employees, different employees whom working in different positions were instructed to fill the questionnaire to in order of sustaining the objectivity and un causality of the data set. Due to the randomness of the collected data, certain measures and treatments were put to ensure that it meets the research purposes and aims, clesnsing and preparing the data will ensure increasing the research output quality in which some replies were non convneiant and illogical with the research hypothesis. Table 6 summarizes the process of treating and smoothing data then processing it on Mat lab software. Matlab software had been used because it is low abstract software that can help the user to get in touch with data and increase the control ability in quantitative analysis.

Table 6: Process of treating data.

Process numbers	Process definition	Process description	Method used
Process one	Process of determining the belonging organizational culture for each respondent.	Each respondent shall be sure in his/her answer to the closest organization culture that exist in the company by giving it the highest score.	Linear summation. Arithmetic operations.
Process two	Determining the subset information quality and usage scores for that respondent.	Each chosen organization culture has certain values for the answered scores for information quality and usage.	Linear summation. Arithmetic operations.
Process three	Clustering the data to four sets.	Each set contains the predicted organization culture and their relative information quality/usage scores.	Polynomial curve fitting.
Process four	Studying the effect of each culture on the information quality-usage general curve.	Each subset of information quality-usage relation for each culture have different representation and effect the general curve differently.	Superposition principle.

6. RESULTS AND DISCUSSION

Firstly, Confirmatory analysis which involves testing the measurement tool with corresponding variables wasn't applied on the survey conducted in the research due to the fact that the research depends on reliable and frequently used questionnaire, which have been tested and validated several times in different organizational cultures. This lead to the reliability of the conducted analysis on high reliable scales. Secondly, exploratory analysis which involves analyzing the data sets to summarize the main characteristics, with visual methods was applied. The assumed relations between the research parts were tested and approved. Figure 12 below demonstrates the linear and positive relationship between information quality and usage with correlation factor R square value of 0.34. This value proves the existance of positive coefficient of determination between the tested data sample for information quality and usage. Figure 13 shows the calculations corresponding for regression analysis on the information quality and usage.

Figure 12: Relationship between information usage and information quality.

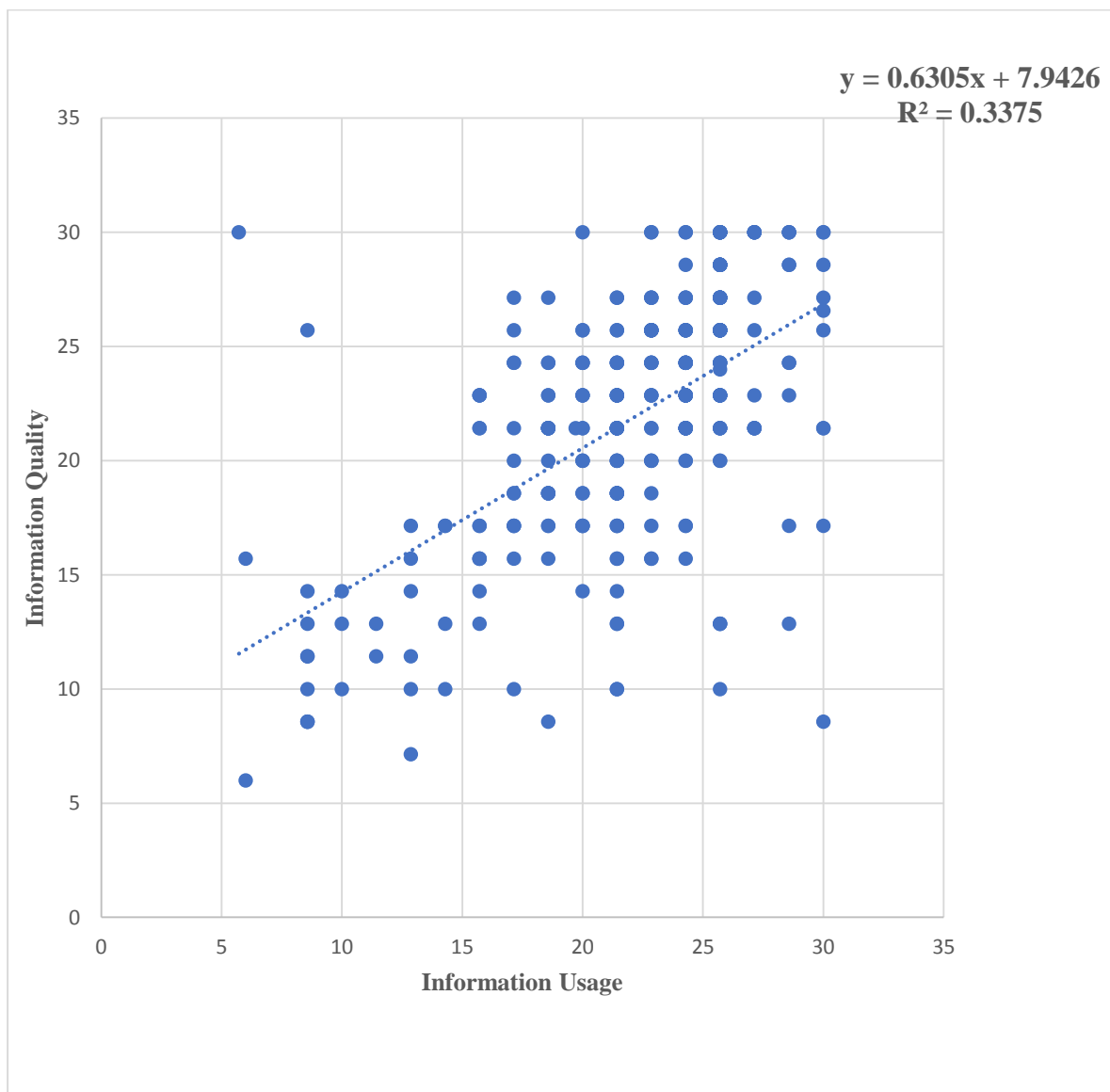
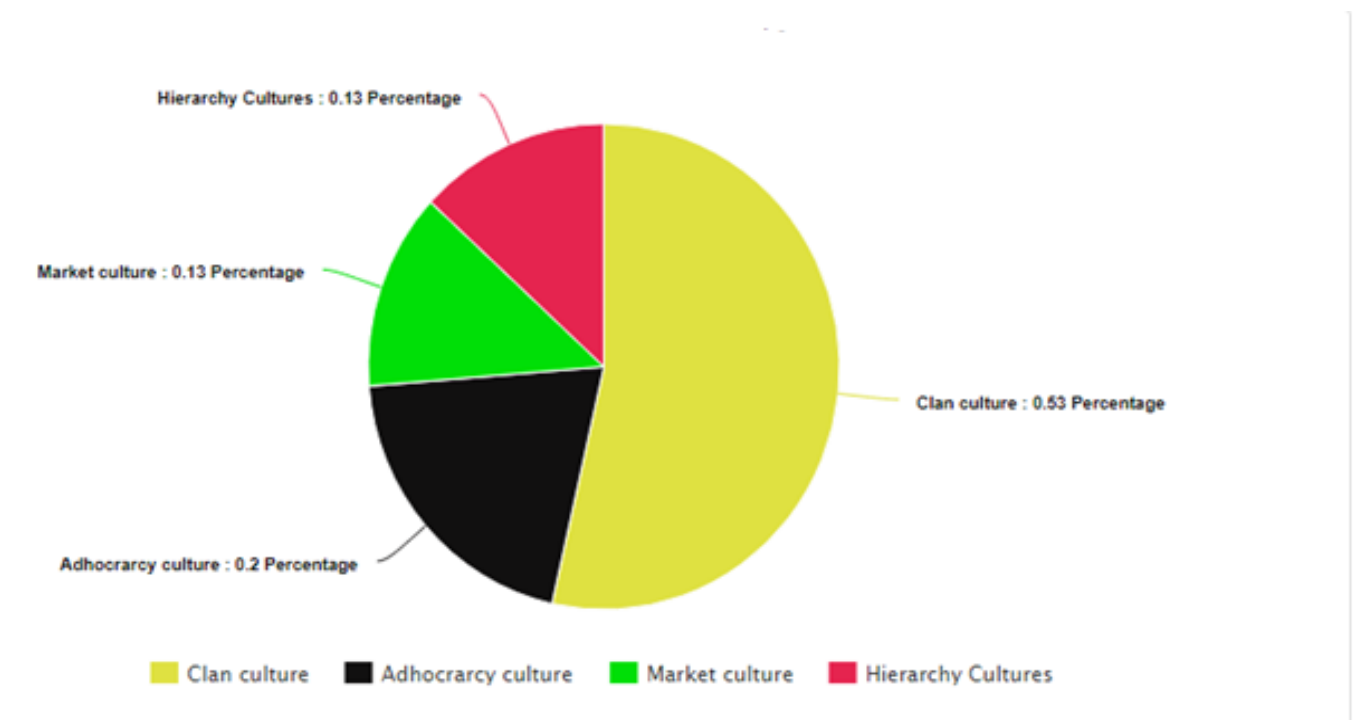


Figure 13: Regression analysis output.

			Curve Fit Report			
Model Estimation Section						
Parameter Name			Parameter Estimate	Asymptotic Standard Error	Lower 95% C.L.	Upper 95% C.L.
A			7.94264	1.18122	5.61738	10.26791
B			0.63049	0.05298	0.52619	0.73478
Iterations			4	Rows Read	280	
R-Squared			0.337497	Rows Used	280	
Random Seed			9054	Total Count	280	
Estimated Model (Information Usage).			(7.9426)+(0.63048)*(Information Quality).			
Pearson Correlations						
	Information Usage	Information Quality				
Information Usage	1.000	0.5809				
Information Quality	0.5809	1.000				
Cronbach's Alpha=0.7333	Standardized Cronbach's Alpha = 0.7349					

The first interpreted results in exploratory analysis is the corresponding percentage of organizational culture in the whole data set, figure 14 below shows the existence percentage of each organizational culture, it is observable that clan culture was highly presented among other cultures while market and hierarchy cultures have relatively similar minimum existence. The high existence of clan culture validates the research outcomes due to the fact that a lot of information technology companies and small cooperation's were handed the survey, generally those types of organizations have flexible and smooth process in running their operations. Meanwhile, a small group of big companies and banks agreed to participate in the survey which explains the low percentage of hierarchy cultures.

Figure 14 : Organizational culture distribution in companies.



This research divides the information quality and usage presence results for each individual organizational culture starting with clan, adhocracy, market, and hierarchy cultures. Pie graph 14 below demonstrates the main findings for information quality scores for clan culture. The scores are clustered to three groups (Low, Average, High). Average information quality score has the maximum presence while the high information quality score is relatively close to it.

The information usage score for clan culture is represented below in the bar graph 16 in which the y-axis is the number of participant organizations and the x-axis is the information usage score. More than 70 percent of companies scored high usage while other companies varied between low and lower ceiling of average information usage

Figure 15: Information quality score distribution in clan culture

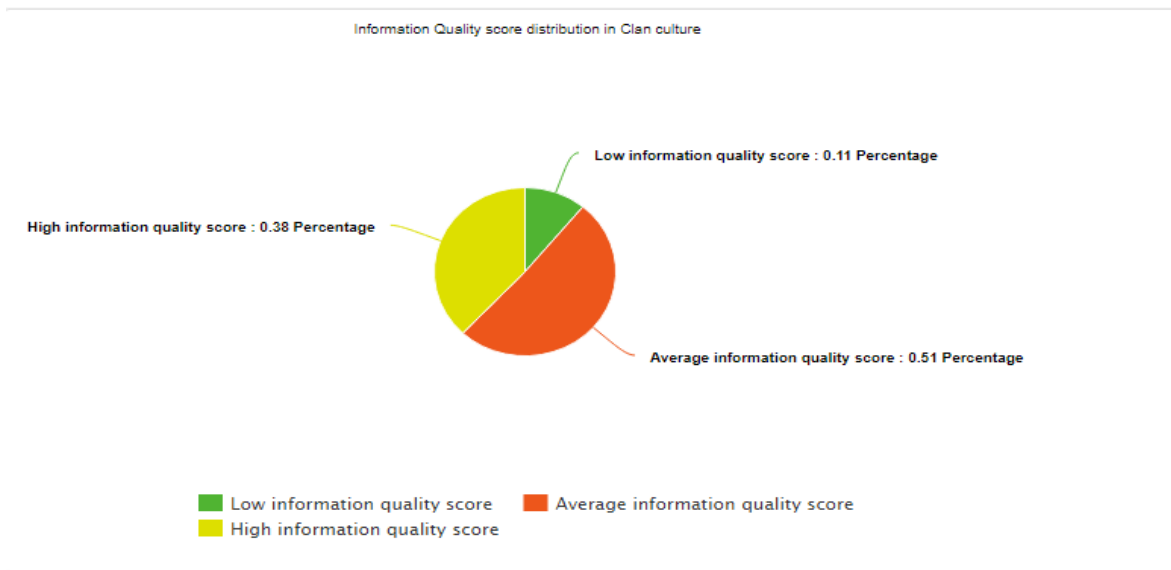
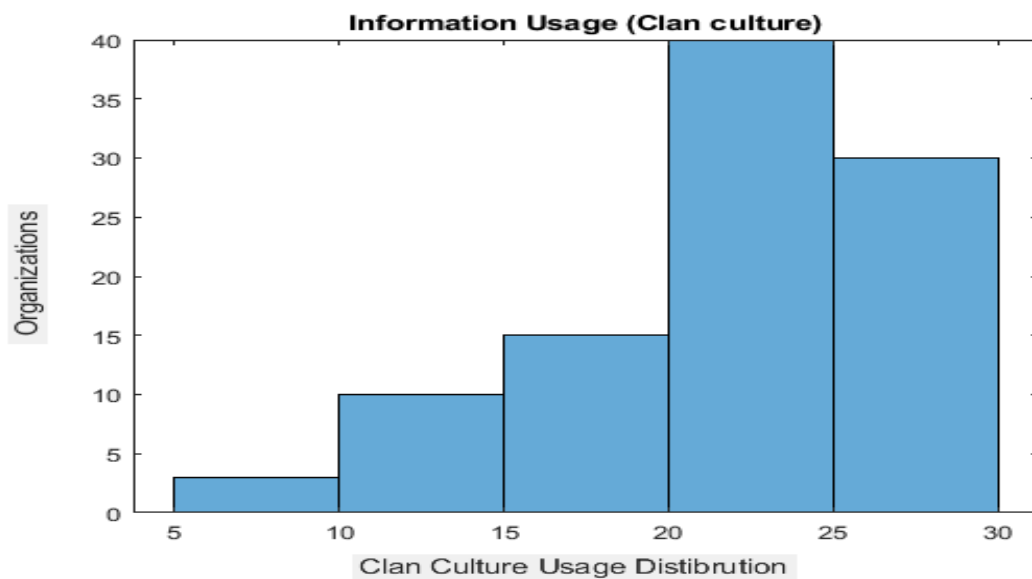


Figure 16: Information Usage score distribution in clan culture



The following below graph describes the information quality and usage scores for adhocracy culture (Figure 17; 18). Adhocracy cultures companies tend to have higher information quality than clan culture. Average and high scores for information quality are relatively close in terms of presence. It is noticeable as well the very low presence of low information quality while information usage presence is demonstrated to be high but lower than clan culture in terms of percentage. Commitment to experimentation and innovation are the main drivers of this culture, which leads to the existence of higher information usage than quality. Employees are entrepreneurs

who are willing to try everything to get the job done, which increases the information usage regardless of relevance quality.

Figure 17: Information quality score distribution in adhocracy culture

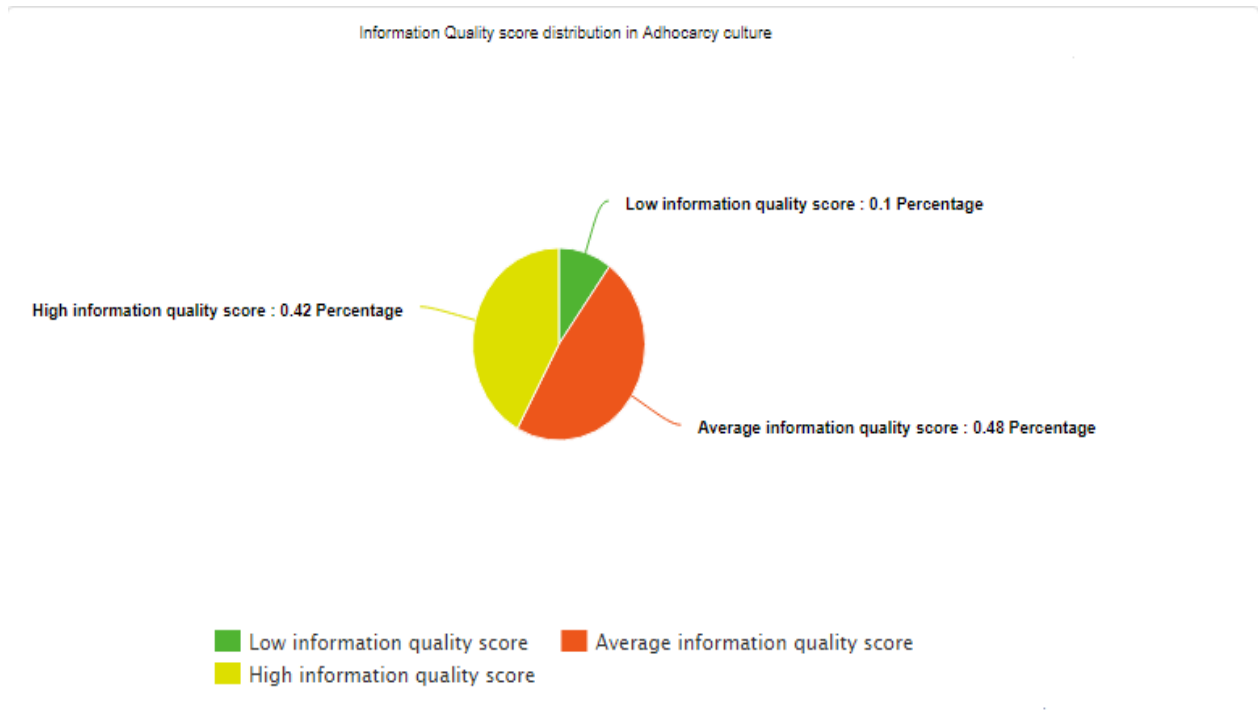
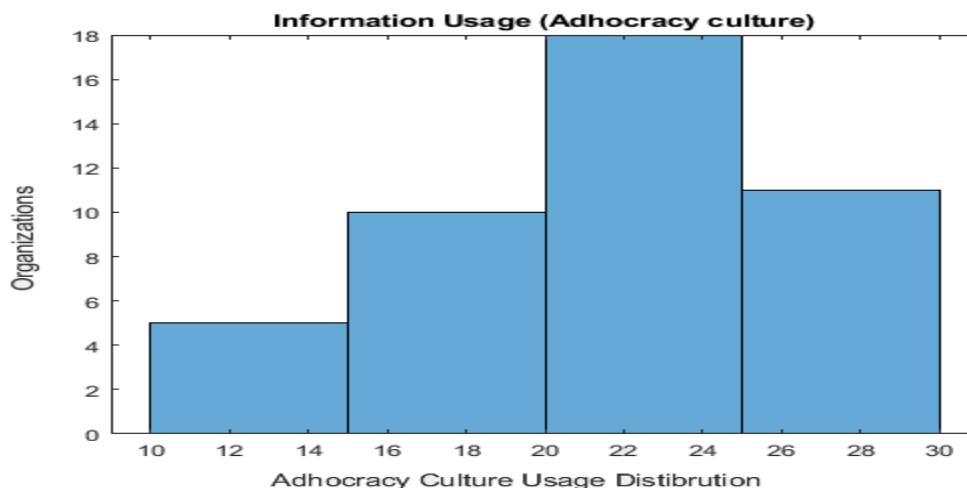


Figure 18: Information usage distribution in adhocracy culture.



The following below graph (19; 20) describes the information quality and usage for market culture. It is observable the existence of high information quality in organizations that has market culture. Market culture tends to rely on information usage in high measures. The main goal in market culture is to get the job done, it is a result-oriented structure, so using the information through systems is predicted to be high, information quality as well should at least meet average

requirements to allow better information usage for better decision making. The following below graphs (21; 22) describes the information quality and usage for hierarchy culture.

Figure 21: Information quality score distribution in market culture.

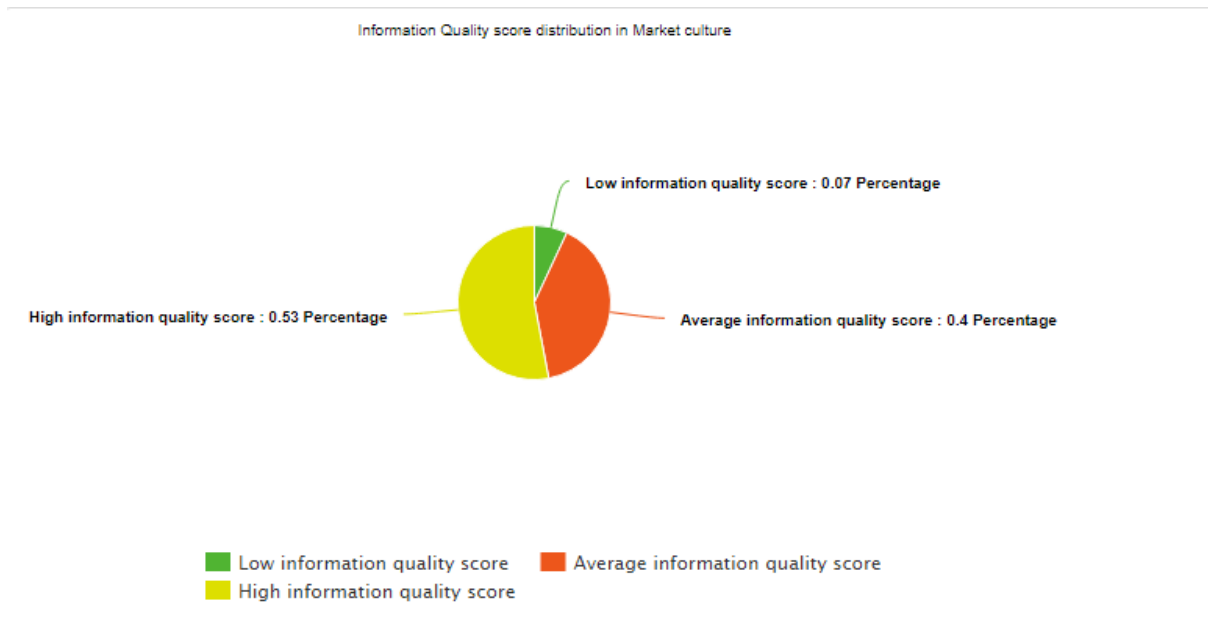
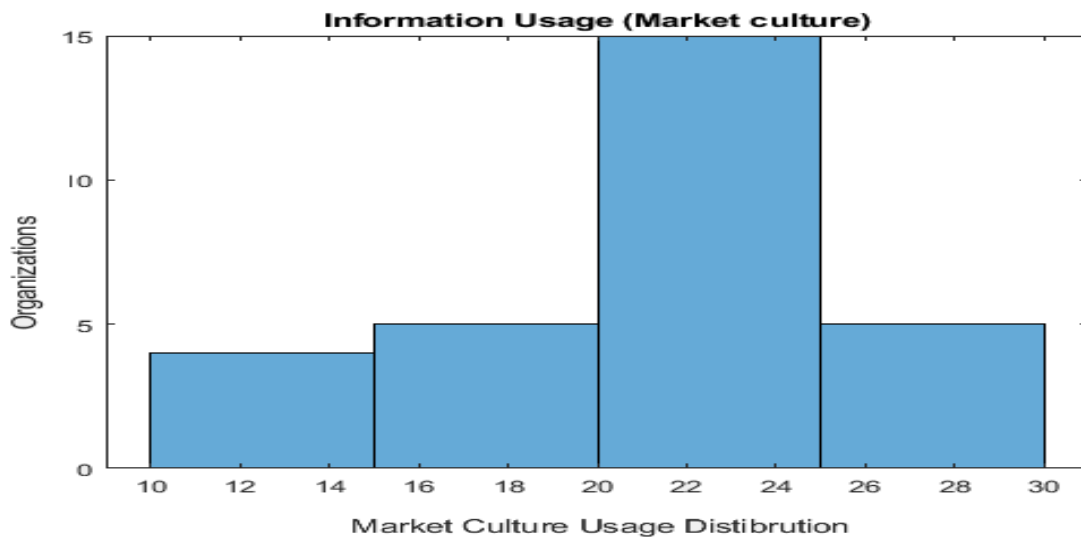


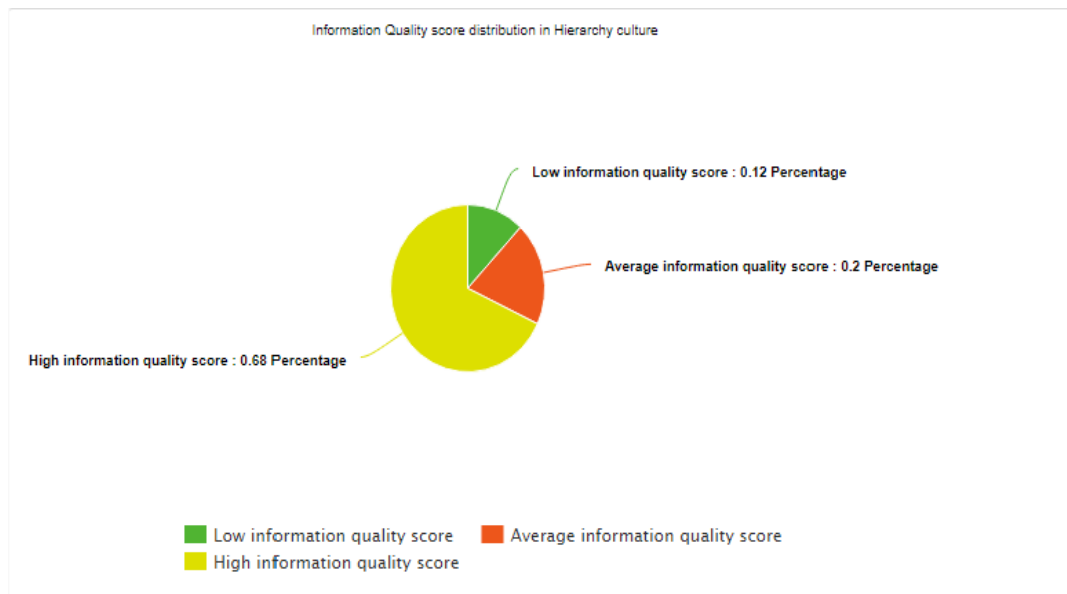
Figure 22: Information usage score distribution in market culture.



The culture scored really high information quality and relative average score, which means that the existence of high quality information is preferable and applied in this culture. Information usage varied between relatively high and average scores with the existence of low information usage score. which proves the fact that procedures govern what people do? Maintaining a smooth-running organization is very critical.

To do such operations, data and information should be accurate and clear and ready for processing. So the quality on information is a critical need to empower the internal structure in the company. After determining the presence of information quality and usage of each individual organizational culture, a comparison test is applied to observe the correlation between those scores and the whole data set of scores for information quality and usage.

Figure 23: Information quality score distribution in hierarchy culture



Clan and Adhocracy cultures scored the lowest close means for amount of information usage compared to the total information usage for all organizational cultures in the researched sample, which shows that cultures that have a tendency for flexible smooth operations have lower information usage than more structured, formal cultures. It is as well evident that hierarchy cultures have the highest mean score for information usage while market culture have average mean score between the four cultures. Also, it is observable that information usage will remain static at high levels for all cultures. Figure 24 demonstrates the distribution points for the companies across the information usage. Information quality have positive linear relationship with information usage, which should lead to similar pattern for information quality score for organizational cultures. Clan and adhocracy cultures scored the minimum mean in terms of information quality compared to the whole data set for all organizational cultures, while hierarchy sustained the highest mean score for information quality. Market culture scored mean average numbers as well.

Figure 23: Information usage score distribution in hierarchy culture.

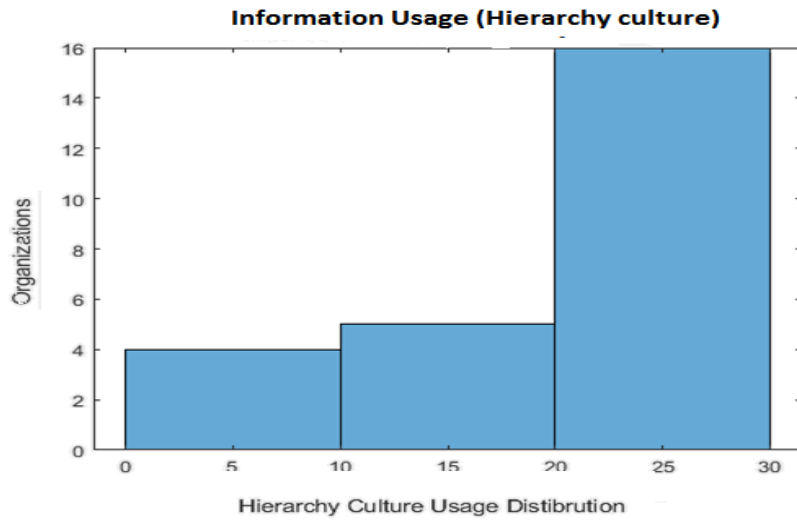
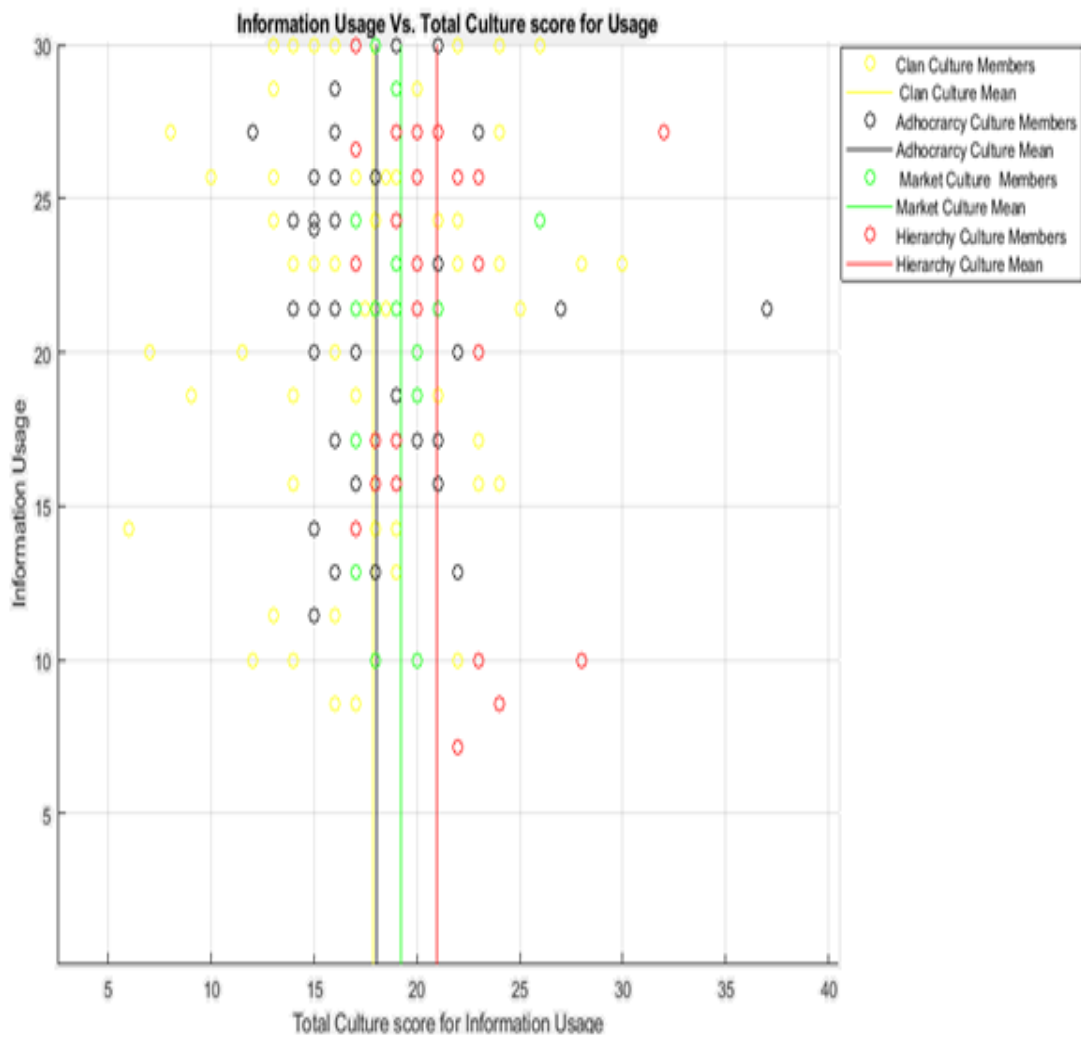


Figure 24: Information usage layout



It is observable that information quality remains static at high levels for all organizational cultures. Figure 25 demonstrates the distribution points for the companies across the information quality.

Figure 25: Information quality layout

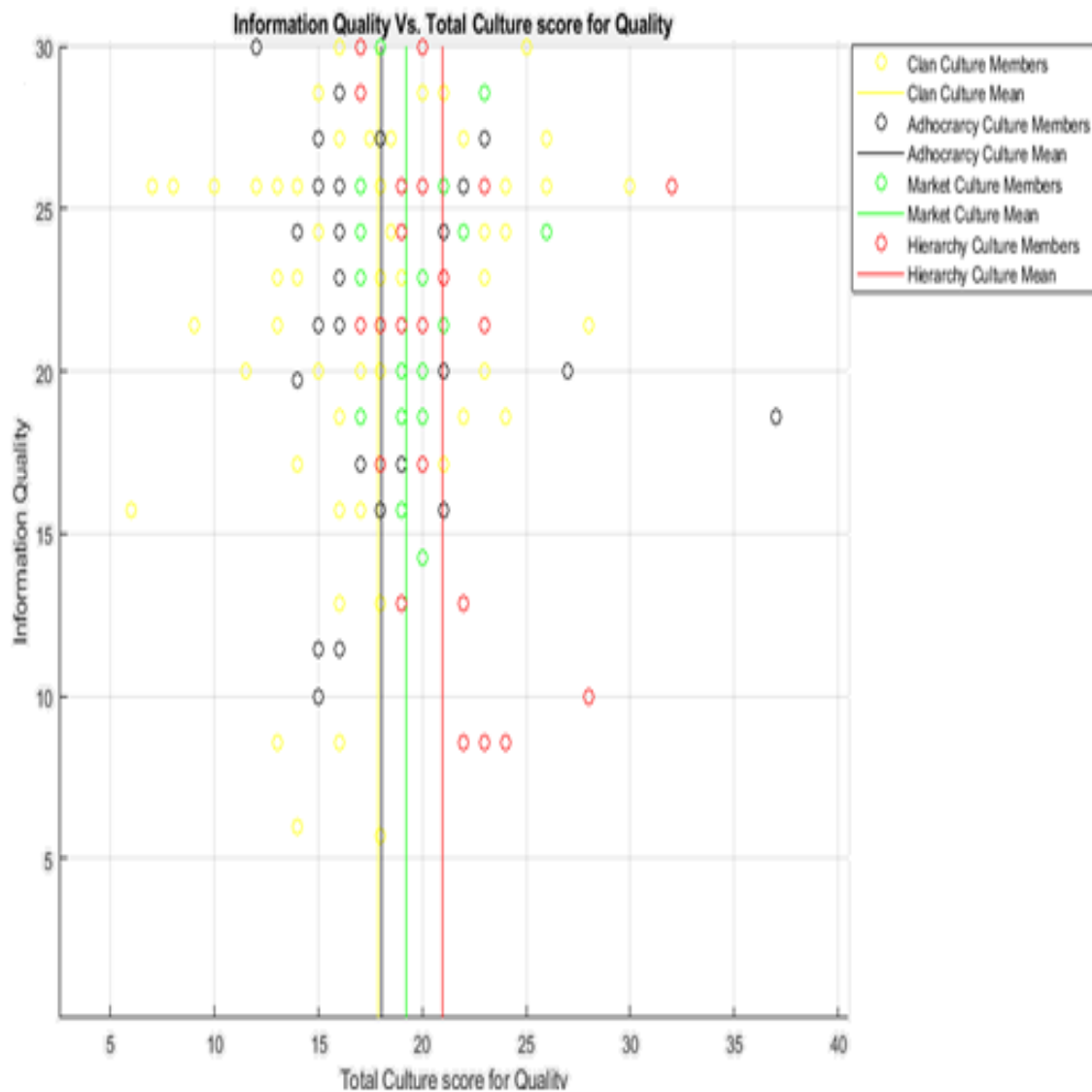


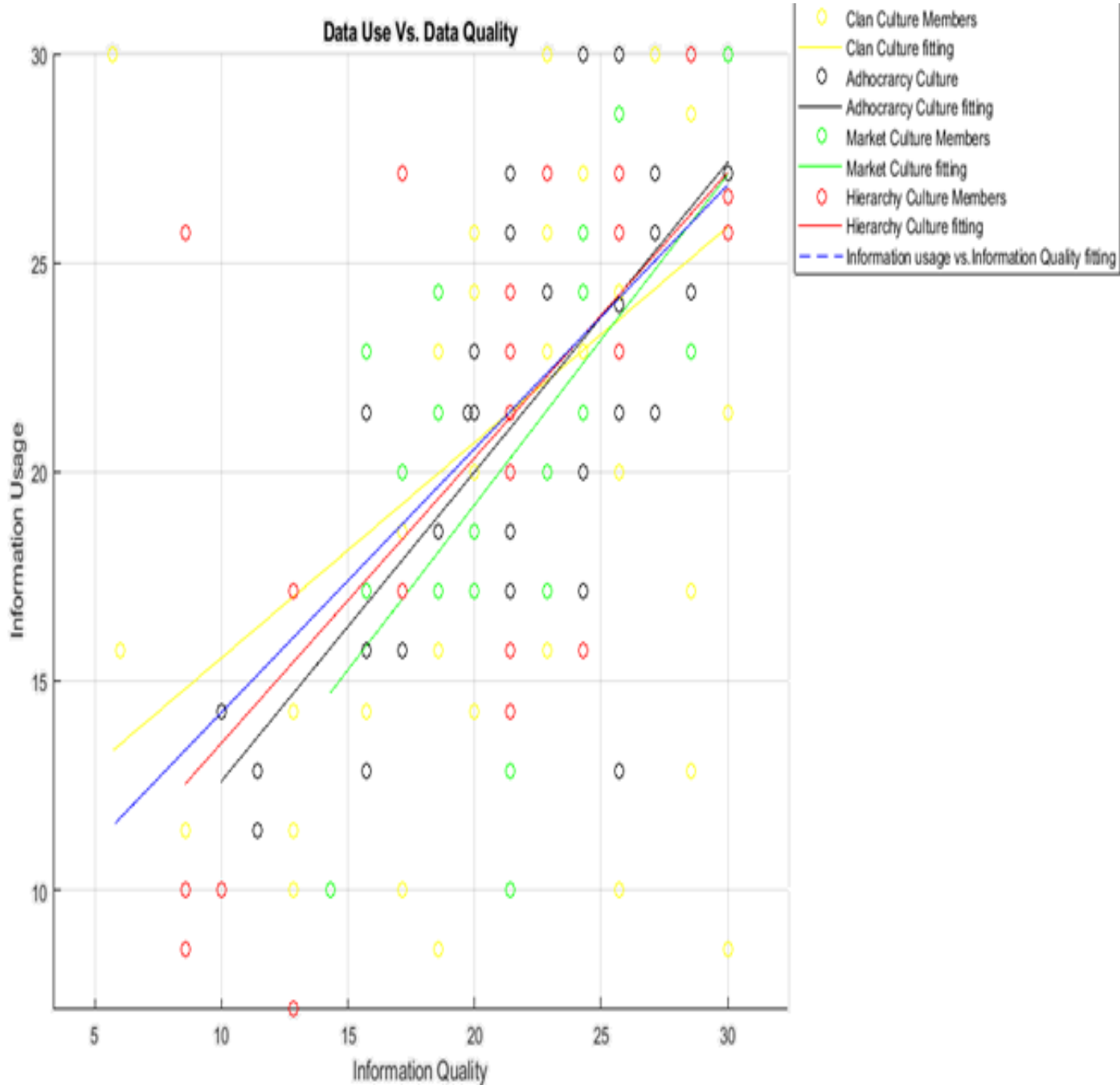
Figure 26 below explains the overall sub slopes for information quality -usage relationship for the four organizational cultures, all linear and positive. The main finding in that figure is that, at high information quality-usage relation points clan culture will diverge from the main slope, meaning that usage will diverge or remain static at some points for high information quality inputs.

Other cultures will remain increasing and will have deeper slope compared with that relation. The highest information quality-usage slope is found in market cultures, in which information quality and usage scores are not below average values at any rate.

Some organizations that were represented by clan culture had low information usage while the information quality is high. Some organizations that were represented by hierarchy cultures had

average information usage at relatively high information quality scores. It is observable as well the existence of outliers in the organizations, represented as market cultures in which the same information usage scores for different information quality scores. Organizations, represented as market cultures in which the same information usage scores for different information quality scores.

Figure 26: Overall sub slopes for information quality -usage relationship



The ratio between the main slope and clan culture slope is 0.8172, leading to the idea that clan culture should do less clan practices across the main six dimensions for a culture to improve the information quality-usage relation. Figure 27 has the representation for clan culture.

The reason behind this diverging effect is that the two slopes intersect at average scores for both information usage and quality. In addition, information usage is higher than information quality at high stages in the graph but lower at low stages, which means that information usage is less related to information quality. Figure 28 shows the corresponding calculations for the relationship between information quality and usage in clan culture.

The ratio between the main slope and adhocracy culture slope is 1.1732, conveying that adhocracy culture is higher than the main slope across the main six dimensions for a culture.

The reason behind this converging effect is that the two slopes intersect at high scores for both information usage and quality. In addition, information usage is higher than information quality at several stages in the graph 29, which means that information usage is more related to information quality while taking into consideration the original linear and positive relationship between information quality and information usage. Figure 30 shows the calculations.

Figure 27: Information quality-usage (clan culture)

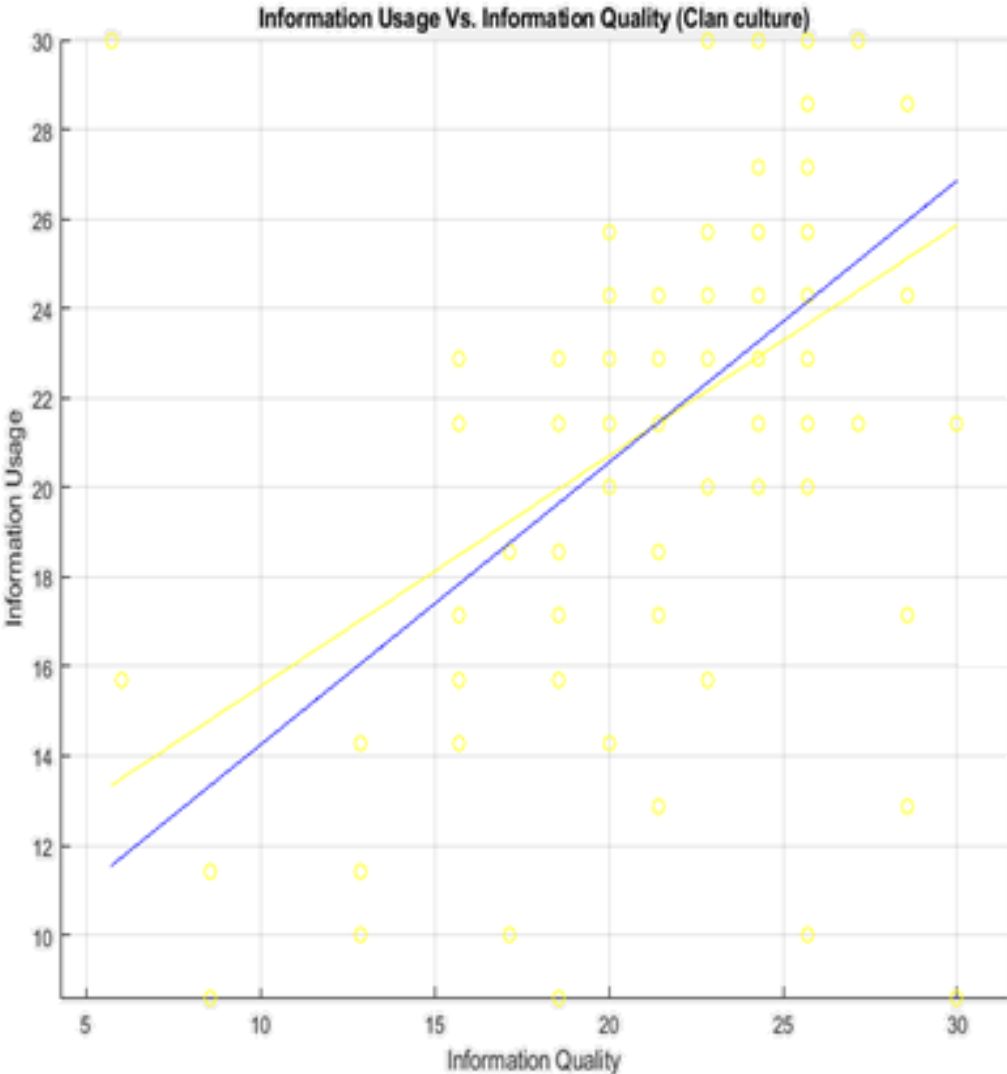


Figure 28: Information quality-usage curve fit report (clan culture)

			Curve Fit Report			
Model Estimation Section						
Parameter Name			Parameter Estimate	Asymptotic Standard Error	Lower 95% C.L.	Upper 95% C.L.
A			13.4703	1.7961	9.9051	17.0357
B			0.39567	0.07980	0.2372	0.55407
Iterations			4	Rows Read	98	
R-Squared			0.2038	Rows Used	98	
Random Seed			12669	Total Count	98	
Estimated Model (Information Usage).			(13.4703)+(0.3956)*(Information Quality).			
Pearson Correlations						
	Information Usage	Information Quality				
Information Usage	1.000	0.4515				
Information Quality	0.4515	1.000				
Cronbach's Alpha=0.6184	Standardized Cronbach's Alpha = 0.6221					

Pearson Correlations		
	Information Usage	Information Quality
Information Usage	1.000	0.4515
Information Quality	0.4515	1.000
Cronbachs Alpha=0.6184	Standardized Cronbachs Alpha = 0.6221	

The ratio between the main slope and market culture slope is 1.2514. This manifests that market culture is higher than the main slope across the main six dimensions for a culture shown in figure 31. The reason behind this high converging effect is that the two slopes intersect at relatively maximum scores for both information usage and quality. Figure 32 shows the corresponding calculations.

Figure 29: Information quality-usage (adhocracy culture).

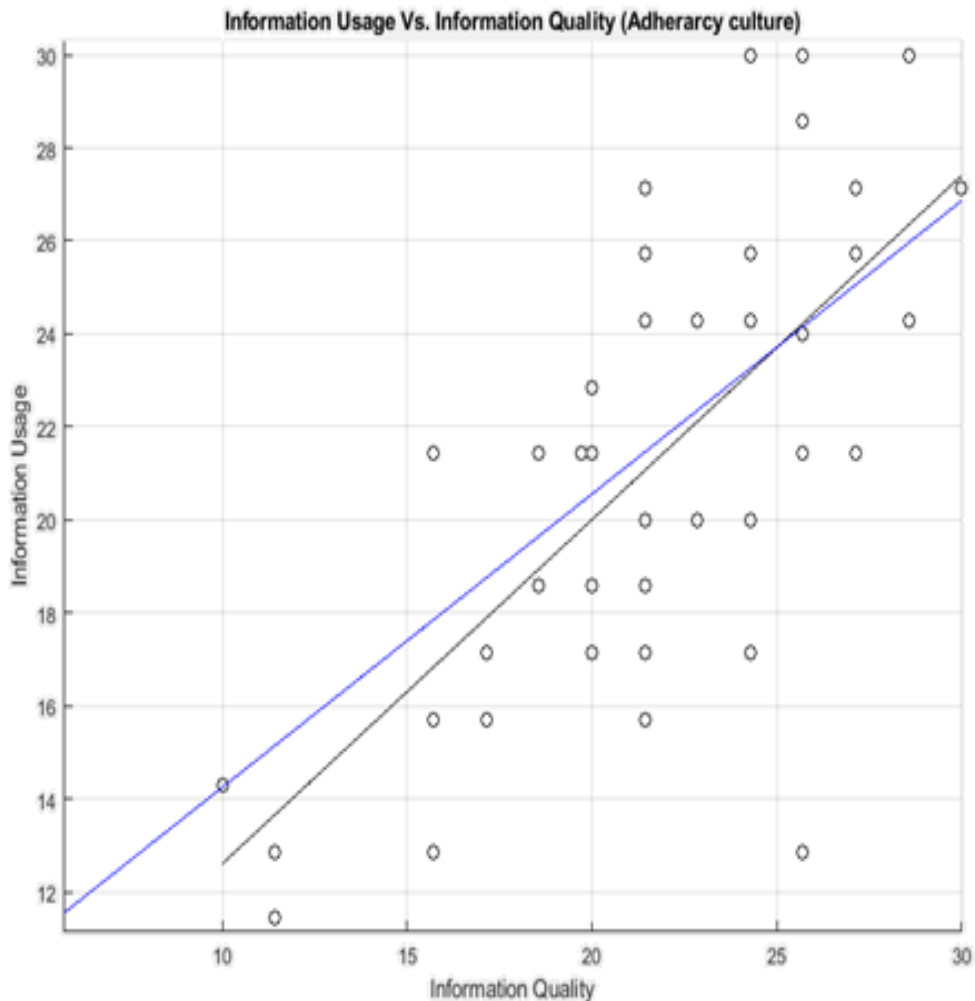


Figure 30: Information quality-usage curve fit report (adhocracy culture).

			Curve Fit Report			
Model Estimation Section						
Parameter Name			Parameter Estimate	Asymptotic Standard Error	Lower 95% C.L. C	Upper 95% C.L.
A			8.3753	2.2868	3.7601	12.9904
B			0.6312	0.1040	0.4211	0.8412
Iterations			4	Rows Read	44	
R-Squared			0.2038	Rows Used	44	
Random Seed			12669	Total Count	44	
Estimated Model (Information Usage).			(8.3753)+(0.6312)*(Information Quality).			
Pearson Correlations						
	Information Usage	Information Quality				
Information Usage	1.000	0.6833				
Information Quality	0.6833	1.000				
Cronbach's Alpha=0.8103	Standardized Cronbach's Alpha = 0.8118					

Figure 31: Information quality-usage (market culture).

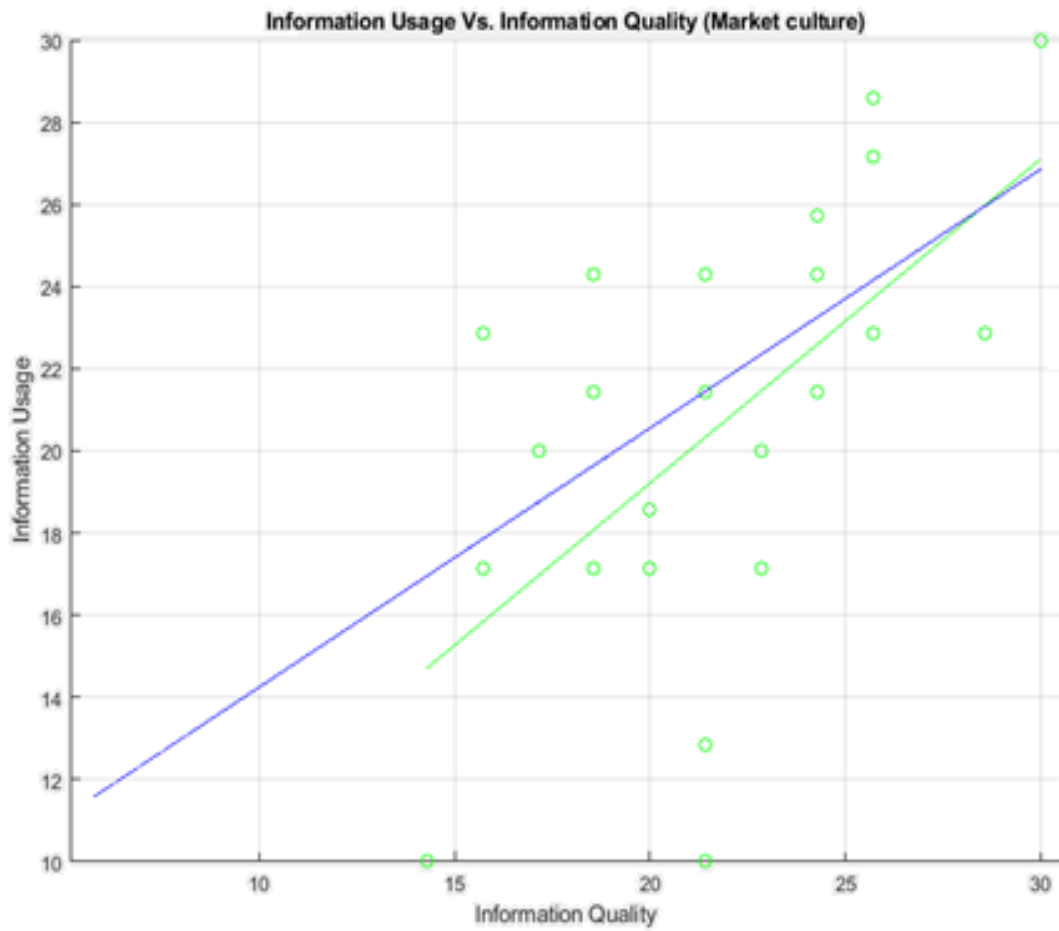


Figure 32: Information quality-usage curve fit report (market culture)

Curve Fit Report				
Model Estimation Section				
Parameter Name	Parameter Estimate	Asymptotic Standard Error	Lower 95% C.L.	Upper 95% C.L.
A	13.5988	2.1472	8.6390	18.5586
B	0.3998	0.1133	0.1672	0.6324
Iterations	3	Rows Read	29	
R-Squared	0.3154	Rows Used	29	

Random Seed			12864	Total Count	29	
Estimated Model (Information Usage).			(13.5988)+(0.3998)*(Information Quality).			
Pearson Correlations						
	Information Usage	Information Quality				
Information Usage	1.000	0.5616				
Information Quality	0.5616	1.000				
Cronbach's Alpha=0.6934	Standardized Cronbach's Alpha = 0.7193					

Figure 33 shows Information quality-usage relationship in hierarchy culture and figure 34 shows the corresponding calculations.

Figure 33: Information quality-usage (hierarchy culture).

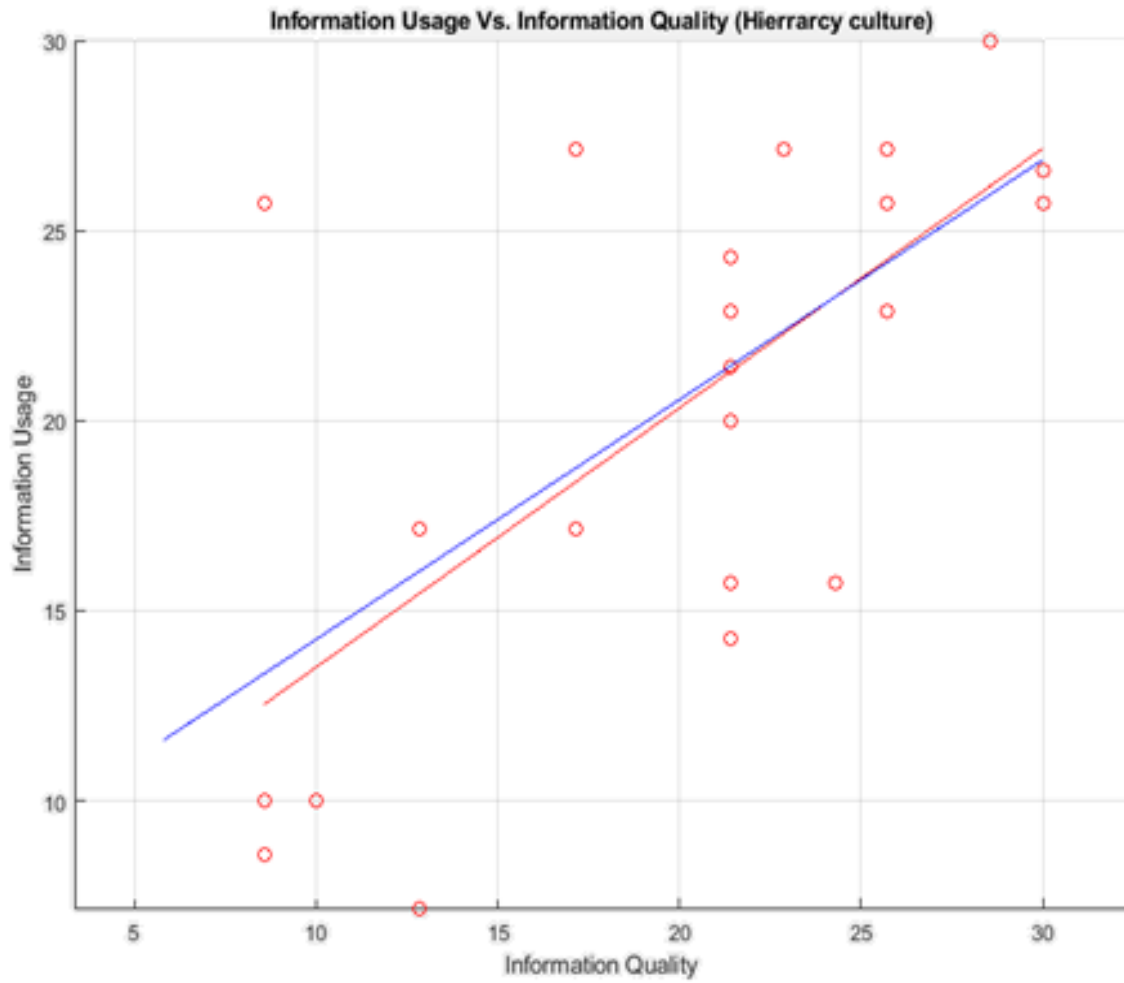


Figure 34: Information quality-usage cuve fit report (hierarchy culture).

	Curve Fit Report			
Model Estimation Section				
Parameter Name	Parameter Estimate	Asymptotic Standard Error	Lower 95% C.L.	Upper 95% C.L.
A	6.3835	3.2777	-0.3968	13.1640
B	0.6756	0.1524	0.3606	0.9909
Iterations	4	Rows Read	25	

R-Squared			0.4607	Rows Used	25	
4Random Seed			13246	Total Count	25	
Estimated Model (Information Usage).			(6.3836)+(0.6756)*(Information Quality).			
Pearson Correlations						
	Information Usage	Information Quality				
Information Usage	1.000	0.6788				
Information Quality	0.6788	1.000				
Cronbach's Alpha=0.8086	Standardized Cronbach's Alpha = 0.8086					

Comparing r square value between the fourth culture scored as expected highest correlation in hierarchy culture with 0.47 which is relatively high. Clan scored lowest correlation factor with 0.2 leading to the fact that information quality and usage are lowest correlated in clan culture.

The ratio between the main slope and hierarchy culture slope is 1.0817, meaning that hierarchy culture is higher than the main slope across the main six dimensions for a culture. The reason behind this high converging effect is that the two slopes intersect at relatively high scores for both information usage and quality. In addition, information usage is relatively identical with information quality at relatively high stages in the graph, which means that information usage is directly affecting information quality at relative high scores for information quality. Information usage is as well relatively identical with information quality at low stages with the existence of some outliers.

Those outliers can be represented through the nature of the business. For instance, banking sectors can have high information usage while the information system provides minimum accepted information quality. Some small banks rely on their own built systems to only do the job while knowing that information usage will remain high. Another reason can explain those outliers in

which some companies rely on employing more employees to use the system more it can handle which will lead in low information quality output, but information usage will remain high.

Generally speaking, the hierarchy culture has the most identical slope pattern to the main slope. At average scores for information quality, the information usage will increase in a relatively parallel form, which means that information usage is highly related to information quality.

Information usage is higher than information quality at average stages in the market culture, meaning that information usage is more positively related to information quality when at least average scores exist in information quality, which respectively illustrates that market culture organization shall sustain at least an average information quality in order to improve their information usage.

The interpreted results have proven the research purpose; each set of results in the research proved to be relatively valid. The questionnaire was handed to many institutes that can be considered clannish oriented cultures where agile and sprints is the main driven for operations. This was reflected within the research in the high presence of clan culture among the study data set. The reason behind the high acceptance of those companies to participate in the research is their belief in the role of IT in empowering their business if applied in correct procedures. Those companies relied mostly on using the information in different levels and procedures to do the job. Their information quality should satisfy this usage, but it is not a very important measure. The strategic goal of market culture is to create goal oriented competitive environment that involves both customers and employees. Market culture tends to make a balance to stratify all parties involved in work.

However, the information system is used for different reasons by many different users. This way of operating improved the information usage and quality both on high level, it is needed to have a high-quality operating system to function for different parties and purposes. Information usage as well is high because of the external aspect of the market culture structure.

The main relation between information quality and usage had a relatively high slope, which means each company, regardless of its cultural structure, tends to be in the need of improving their information quality to improve the usage. It is understandable that each company has a mix of cultures, but the research remains valid by the hypothesis of treating each culture individually. The big data set allowed the researcher further processing in order to get more precise results.

External focused cultures proved to have better relationship in terms of information quality and usage than internal focused cultures. Flexible cultures proved to have lower information usage and information quality than stricter firms. Strict cultures as well presented more identical relationship with the main relationship. Flexibly in a culture showed to have higher information usage while information quality remains having lower effect. External focused cultures results showed that they should sustain at least average information quality in order to have high information usage.

It is shown as well the existence of higher information quality-usage in external focused cultures that either flexible or strict strategic views.

CONCLUSION

Information technology and organizational culture relationship research is relatively low. Many of the researches done in this field is on theoretical level rather than practical level. It is important to understand the culture in order to integrate valid usage of information systems. Understanding the culture has many valid theories that validate the premises of the purpose, mainly all organizations proved the importance of having quality information to increase usage. This applies to the need of adopting efficient technology in companies through giving more measures for organizational culture, as this shall be a critical factor of the success of the process.

A Fundamental issue in research improving is to address specific dimensions that should be further explored in information quality and usage research. In addition, more measurements can be studied in exploring the organizational culture research. It is also important for further research to study the customer's perspective towards IT usage and quality provided by their producers. Data producers and data consumers have different attitude and aims for system usage that empower the idea of measuring the difference reactions towards IT and innovation.

The importance of the culture in strategic thinking is highly observed through proving one example in the information systems field studies and cultural studies. The culture proved to affect the relation between information quality and usage, which can be studied as a measure in implementing and adopting information systems. Other measures can be searched in future to understand further the effect a culture does on information system adoption, leading to the improvement of the right system usage, thus enabling decisions to be taken more accurately.

Theoretical research in cultural field for organizations is very relative, where there is a lot of theories and perspective on how to view culture. Measuring organizational culture to certain dimensions is a valid approach to understand culture in a systematic way. Undoubtedly, organizational culture affects business development and can have major effect in decision making, it is thus not logical to draw an artificial boundary between organizational culture research and other factors for business success. Likewise, it is important to connect management theory with IS theory to improve IS implementations and outcomes.

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