Management Information Technology and Quality Service Delivery in Government Institutions

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Abstract: - The study was aimed at establishing the impact of management information technology on quality service delivery in government institutions using Greece as a case study. Specifically, the study sought to examine the relationship between IT infrastructure management, IT support systems, and Informational products and quality service delivery respectively. A cross-sectional survey research design based on a sample size composed of different government officials in Greece government institutions was conducted. Data was collected using survey questionnaires and document review. Data was first presented, analyzed and results interpreted based on descriptive statistics for categorical data and narratives for open ended questions. The study confirmed a significant positive relationship between the different independent variables (IT infrastructure management, IT support systems, and Informational products) and the dependent variable (Quality Service delivery) ($p<0.001$). The ANOVA results indicated that respondents had varying opinions about informational products and relatively similar information about quality service delivery in government institutions. The regression results showed that the three study variables could only predict a 34.1% change in quality service delivery in the different government institutions in Greece. Among the different predictors of service quality, control (Beta = .351, $p < .01$) was a better predictor. The Study confirmed that there is the relationship between the different aspects of management information technology and quality service delivery in government institutions. The study recommended that government institutions should adopt new advanced tools of developing and managing information systems or technologies so as to enhance service delivery in these institutions. The study also advised more research be conducted to explore the different strategies that can be applied towards improving the robustness of management information technologies in public institutions.

Key-Words: IT infrastructure management, IT support systems, and Informational products, Quality Service delivery

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1 Introduction

1.1 Background to the Study

According to [1] government institutions play a very important role concerning the general economic development of the country despite the fact that they face numerous problems or challenges associated with the implementation of different initiatives across the country. Most local authorities or institutions of the government in most developing and developed countries tend to rely on manual file based information storage systems which normally complicates the processes of disseminating information. The general concept of management information systems is commonly based on strengthening the overall efficiency of information flow across different government institutions [2]. This is normally achieved through making ICT in different government institutions more comprehensive, reliable and available to the public. Most governments have focused on making management information systems and other ICT applications more accountable to the citizens most especially by using them to meet the different needs of the general public. Furthermore most governments across the world with UAE inclusive have to a greater extent acknowledged the relevance of adopting different e-government systems and consequently introducing reforms in the management information systems of the different public institutions [3].

E-government, which forms the basis of management information systems, is commonly defined as the general production and delivery of different government services through utilization of different ICT applications. E-government is also associated with different processes of transforming or modifying the relationships that exist between the government and its different stakeholders that may include; citizens, businesses and employees. In this case, ICT applications are used to improve the levels of transparency, accountability, effectiveness and general efficiency in delivery of government services to the general public [1].

E-governments that involve the use of different management information technologies have helped in enhancing the quality and effectiveness of administration in most public institutions in different countries across the world. The different emerging technologies in the field of management and information are offering various opportunities to utilize in enhancing the operations of an e-government most especially concerning the delivery services to the general public through the different government or public institutions [4].

In addition to influencing delivery of quality services, E-government also plays a key role in the reformation of the way different policies are formulated and consequently implemented most especially in terms of efficiency, general accountability, transparency, and active participation of citizens. The establishment of a highly pervasive internet that is facilitated through several disruptive technologies has brought about a new landscape where both private and public sector organizations ought to operate if they are to register quick success. In the new landscape of information technology, knowledge is recognized as the most relevant factor, whereas learning, that emerges majorly through cooperation, alongside increased reliability and trust, is considered as the most important process. E-government is also concerned as the use of ICT systems to enhance government performance in most critical areas. In this case, performance is normally measured or assessed based on the ability to offer effective and more efficient services, establishing new channels for people to access government and official information, and consequently making government more accountable to its citizens [2].

[1] indicates that a few developed countries such as Canada, Singapore, and Sweden have registered success in using the different technologies associated with the e-government, though most pother government have not succeeded whereby benefits in most countries has been achieved in a relatively smaller part of the society [2]. Several studies confirm the existence of several disparities concerning the use of technology and that these may persist if no action is taken at different national and international levels which nay continuously affect the quality of services delivered by government to the general public.

Service delivery in most government or public institutions has net been effective for a long time and this is attributed to different factors that cut across corruption, absence of robust information systems to enable quick service delivery, limited funding of institutions, and incompetent personnel among others.

Studies indicate that citizens have to wait for a long time at various departments in order to receive different services and this is associated with wastage of time. [5] indicate that most of the public institutions are associated with dismal performance in the different facets of service quality such as reliability, responsiveness, accessibility, and tangible assurance.

The report by the [6] revealed that management information systems are essential in government institutions most especially the areas of finance, planning and execution or formulation of annual government budgets. In this case, the different ICT applications help in the provision of highly timely and consequently accurate information to the decision makers. There is increased pressure from the general public concerning accountability of the different resources that are meant for public use and the government can only achieve transparency and effective allocation of resources by utilizing more innovative strategies that are much associated with ICT. This therefore forms the basis of this study to assess the impact of management information technology on service delivery in government institutions using Greece as the case study.

1.2 Problem Statement

Most governments across the world are undertaking different reforms to improve the levels of transparency and efficiency concerning delivery of public services by the public sector. New technological advancements or innovations are continuously embraced by most developed countries as a way of meeting the different needs of the general public since most traditional ways of resource allocation have appeared less effective on most government institutions whereby they to uneven distribution of resources and poor accountability for the services delivered by the government [5]. There is empirical evidence indicating that most organizations are faced with different problems associated with information management systems and these may include little integration or coordination between information systems and poor quality of informational products as well as including lack of consistency of the information systems, which greatly affects service quality in most of these organizations. There is however limited evidence and few studies that have been conducted to assess the concept of management information technologies in government institutions which forms the basis of this study that aimed at assessing the impact of management information technologies on quality service delivery in these institutions.

1.3 Objectives of the Study

1.3.1 General Objective

The study was majorly aimed at establishing the impact of management information technology on quality service delivery in government institutions using Greece as the case study.

1.3.2 Specific Objectives

1. To establish the relationship between IT infrastructure management and quality service delivery in government institutions
2. To determine the relationship between IT support systems and quality service delivery in government institutions
3. To explore the relationship between Informational data and quality service delivery in government institutions

1.4 Research Hypothesis

In order to establish the most required and useful information in this study and achieve the study objectives, it was important to have a number of research hypotheses. Arising from the objectives of the study, this research aims to test the following hypotheses:

H1: There is a relationship between IT infrastructure management and quality service delivery in government institutions
H2: There is a relationship between IT support systems and quality service delivery in government institutions
H3: There is a relationship between Informational data and quality service delivery in government institutions

1.5 Conceptual Frame Work

The model below shows the relationship between the different aspects of management information technology as the independent variable and service quality as the dependent variable. The conceptual framework is presented in Figure 1.

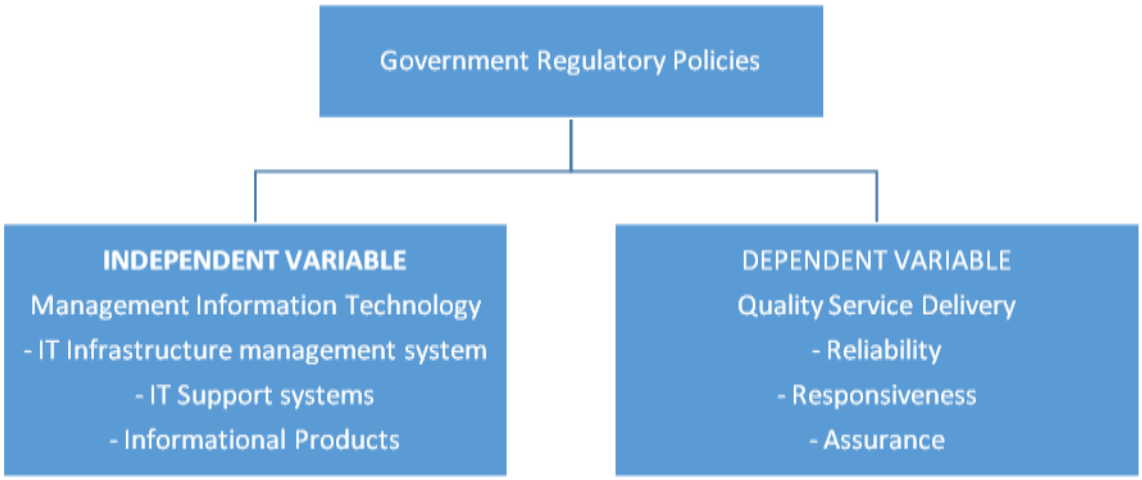

Fig. 1: Conceptual framework (authors own work)

The model shows that service quality is dependent upon the different aspects of management information technology. Service quality has three dimensions of timeliness, responsiveness and reliability of the required public services. On the other hand, management information technology has three dimensions of IT infrastructure management, IT support systems, and Informational data.

1.6 Significance of the Study

The evidence from the study will be useful to the field of management information technology mist especially to the IT personnel in the government institutions as it will generate knowledge on how to utilize the different aspects of information systems towards enhancing service quality in public institutions. The findings will also add to the existing body of knowledge to be used by various academicians for further research. Results from the study will enlighten the UAE government and other stakeholders on the relevance of the e-government systems or the management information technologies towards Improving Service Delivery In The Country.

2 Literature Review

2.1 Theoretical Review

2.1.1 Service Quality (SERVQUAL) Model

The study was based on the different aspects of the service quality (SERVQUAL) model advanced by [7], which states that service quality has five dimensions namely; reliability, tangibility, responsiveness, empathy and assurance. Reliability looks at performance of a promised service correctly, tangibility of a service looks at assessing the appearance of personnel, physical facilities and tools for provision of a service; responsiveness looks at the willingness to provide services promptly, immediately responding to requests and solving problems, empathy looks at the care and personalized attention the firm provides to its customers while assurance focuses on the knowledge, skills, and courtesy of service providers as well as their level of confidence conveyed while delivering the service [8].

Service quality then is an estimation of how well services delivered equals customer expectations and that the central objective of focusing on quality is to meet the needs of customers while remaining competitive economically. [9] indicate that the SERVIQUAL model is relevant to the study because it proposes a key dependent variable of the study i.e. service quality. The model suggests the need to evaluate internal and outsourced service quality of partners in the form of reliability, tangibility, responsiveness, empathy and assurance in offering logistics services to parties in the contract. The [7] service quality model therefore suggests the use of the above parameters to assess the influence of various logistics management aspects on service quality. For example; [10] established that there is a link between the Model's dimension of "responsiveness" to the delivery of the right amount of a product, at the right place and time, in the right condition with the right information.

Service quality government institutions are associated with the effectiveness of the management information technologies which involves IT infrastructure management, procedural systems, IT

support systems, quality management and informational data. For example, the nature of IT infrastructure management greatly influences the robustness of the equitable, timely and reliable delivery of services to the general public. This is the same case for IT support systems and informational data in government institutions whereby their level of robustness helps in influencing service quality as explained in the subsequent sections [10], [11], [12].

2.2 Management Information Technology Practices

Management information technology is comprised of different elements hence requires highly multidisciplinary perspectives. The different aspects of management information technology are considered very important concerning the effectiveness of different government institutions in the delivery of public services to the citizens [13]. Huge investments in information technology have been observed in most developed countries where governments have forced in enhancing the level of technology in the most sensitive institutions as a way of improving on the levels of transparency, accountability, employee performance and quality service delivery most especially through equitable allocation of resources [14], [15] .

Management Information technology aspects are associated with the concept of E-government which is basically an inclusion of different applications of both information and communication technologies that focus on enhancing the general level of efficiency, effectiveness, transparency and accountability of daily administration of government institutions in developed countries such as the UAE. According to [16], E-Government can be defined as a general application of different Information and Communication Technology (ICT) aspects in order to transform the operations of government institutions by majorly making these institutions and their services more accessible, effective and accountable to the general public. Reports by the United Nations reveal that e-Government is basically a government that uses different elements of ICT to transform its different internal and external relationships and consequently improve service delivery [17], [18].

The management information technology practices in e-governments are majorly grounded on two specific sub-systems that include an internal communication sub-system commonly known as Intra-com and an external communication subsystem also known as Extracom. Scholars indicate that to obtain the best level of quality service delivery, the two subsystems have to be strongly linked or interconnected. In this case, intra-com applications are efficient in supporting different service production processes also commonly known as Agency to agency-A2A- applications. On the other hand, Extra-com applications are majorly concerned with boosting different supporting service delivery processes hence are termed as Agency to citizens and businesses applications [13].

2.2.1 Infrastructure Management

Infrastructure of any public institution is key towards the efficiency of information systems of that particular organization or public institution. Studies indicate that for most people working in the different institutions associated with the physical infrastructure of an organization, the most ideal place to store essential or sensitive information is the organization's network. Research indicates that it is always important to put into consideration the different aspects of both security and accessibility when making data placement decisions. The general integration of databases of different public institutions helps to increase or improve the usability of data across multiple databases. The other aspect of infrastructure management is the data warehousing systems which has continuously provided different powerful tools for comprehensively understanding data trends majorly through enabling multi-dimensional analysis of data collected from different operational databases in a public institution [19].

A study conducted by [20] revealed that most public institutions across the world are increasingly focusing on the provision of a common network computing and information infrastructure that is readily accessible by the general public. This to a greater extent helps in collectively addressing the most pressing challenges of the information systems at a wider scale. Most organizations and public institutions that have in the past been fond of opening up their operations to the entire external world through different IS-enabled concepts like virtual enterprise, are now associated with a worldwide form of momentum [21], [22].

2.2.2 Procedural Systems

[23] indicate that systems development is one of the most core elements in management information technology since it forms the basis for the different

operations executed by the different information technologies. Systems development is a core element of most information systems curricula hence it is always advised to accord a lot of time to the different aspects of procedural systems towards enhancing the effectiveness or robustness of information systems in any public institution. The entire process of developing a robust information system or infrastructure is normally broken into different independent and well-defined systematic processes.

These cuts across proper planning, requirements elicitation, analysis, the specification processes, design, general implementation, operations and support, maintenance and evolution [23]. The other processes associated with procedural system are the verification and validation processes which are associated with different activities such as testing and these need to be carried out in parallel with the main production processes. Most of the different lifestyle activities are much associated with active participation from the different stakeholders in the public institutions where the management information systems are implemented for use in enhancing service delivery. For example [24] indicate that technical feasibility and different business priorities as well as the risks involved in management information systems, are normally reviewed at different predefined checkpoints in any public institution.

[19] indicate that in scenarios where different externally provided components or subsystems are involved in the lifestyle of any information system, there tends to emerge other additional processes concerned with procurement and integration. The robustness of any information systems based on the procedural systems applied helps in enhancing the levels of transparency and accountability of an organization which in the long run improves on service quality levels. Similarly in different public or government institutions, the efficiency or effectiveness in the delivery of public services is determined by the nature of the procedural systems involved in developing different management information systems [23].

[21] in their study indicated that systematic processes are a very important element in the field of management information technology. Systematic approaches play a key role in budget control processes, scheduling activities, allocating resources and consequently guiding in the utilization of different opportunities to enhance performance of different information systems and the organization as a whole. Studies however reveal that lack of systematic process is still a concern in most public institutions with UAE inclusive and this has greatly contributed to the poor quality or poor performance of most software or information systems in organizations. Most organizations are continuously involved in different efforts to enhance the robustness of information systems majorly by institutionalizing good practices in systematic processes, through quality standards, assessment and certification, as well as process improvement initiatives [6], [25].

2.2.3 Support Systems

Support systems which are composed of qualified teams of personnel are very important in enhancing the effectiveness of management information systems and consequently improving service quality in different organizations or public institutions. The qualified teams are majorly concerned with the general development and maintenance of the information systems and consequently ensuring that such systems are utilized to improve transparency and accountability the performance of an organization through effective or efficient service delivery. Research indicates that for effective execution of different tasks or activities in an organization, the different support systems must be conversant with the different dynamics of such activities. For example concerning Information systems, organizations are continuously advised to employ staff that are highly qualified in handling different IT infrastructure since it influences the level to which ICT enhances services delivery in the organization.

Studies indicate that some IT tasks in organization require great familiarity with the IT application domain, whereas requires very deep knowledge concerning particular Information Technologies and platforms. Research also indicates that some IT operations require great meticulous attention to detail, while others require oversight and vision. A study by [26] confirmed that well-functioning organizations with well established support systems hold great importance in the same way as the different technical capabilities required for the general success of particular projects. Research indicates that the quality of every work product is greatly dependent on the time and efforts invested towards producing such a product [27]. In this case, support systems are entirely responsible for showcasing the highest level of commitment when executing different operational

tasks in an organization and consequently in delivering different services.

Studies reveal that most social organizations are normally much concerned with how different processes and products are organized, rather than explicitly designed, and this is majorly due to the fact that there are few aids beyond generic project management tools in such organizations. A study by [27] confirmed the general importance of human knowledge and ingenuity in systems development and quality service delivery in organizations. This therefore indicates that there is a great relationship between IT support systems and level of quality service delivery in organizations [28], [29].

2.2.4 Informational Products

Informational products also form part of a reliable and effective information systems unit in any organization [6]. Studies indicate that the management information technology practices are majorly concerned with the production processes that are greatly interconnected with a particular information system of an organization. The production processes majorly encompass products and artifacts that are highly visible to the end-user and these may include; executable codes, documentations, and different training materials, as well as various intermediate products that are internal to the entire system development of an organization. When more than one organization is involved in the creation and maintenance of a system, there are intermediate products that are shared or flow across them [30], [31].

Studies indicate that large system projects are associated with different types of processes that produce several kinds of information products related to one another in a number of complex ways [32]. Most meta-modeling and repository technologies are in most cases applied as a tool for managing the different large sets of information systems or the vast amounts of the information produced in a particular project. These technologies are essential in enhancing retrieval, updating, and consequently supporting coordination among different project team members, which in the long run influences project success [33], [34].

2.2.5 Qualities Management

[5] indicate that proper management of quality of different systems in an organization provides an opportunity to improve on the quality of services delivered in a particular period. Studies indicate that whereas different processes and products constitute the most highly tangible aspects of Information Systems work, less tangible issues of quality are absolutely very important for the general success of the entire system. Most customers and users of IT systems always require systems that not only provide or offer the most preferred functionalities, but also different important non-functional requirements that are sometimes conflicting such as performance, general costs, delivery schedules, reliability, responsiveness, safety, and accuracy, as well as usability, among many others [2] .

Most organizations or entities as well as the different software and information systems professionals, are faced with a big challenge of meeting different competing quality requirements [14]. This to a greater extent affects the flow of operations under different information systems which in the long run greatly impacts the overall quality of services delivered by a particular organization. Most system developers lack the capacity to guarantee correctness of large systems and consequently fail to meet the different nonfunctional requirements of clients or beneficiaries of a particular set of information systems thereby affecting the positivity of targeted project outcomes in a particular organization. Most modern entities still face various issues associated with the incompetence of most software developers that fail to control or manage quality of relatively larger information systems [35].

Different scholars have suggested specific techniques or mechanisms that can be based on to address the issues of quality management in Information Systems as well as ways on how to enhance the different non-functional requirements such as performance, accuracy and reliability, among many others. Research however indicates that some qualities such as reusability are very hard to characterize. It is important to note that in situations where multiple requirements have to be traded off against each other, different systematic techniques are required to deal with the arising or existing synergistic as well as conflicting interactions among the multiple functional or non-functional requirements [36].

Studies indicate that most goal-oriented approaches have been introduced to support the systematic refinement, general interaction analysis, and operationalization of different non-functional requirements. On the level of project management, different institutionalized software process

improvement programs tend to target the overall project quality improvements. It is important to always focus on measuring and keeping a track record of quality improvements, with the obtained results being fed back into new initiatives of improving the quality of the existing Information Systems [37].

2.3 Quality Service Delivery

Studies indicate that all organization or entities are always aimed at providing quality services or products to their clients. Customers derive satisfaction and improve on their loyalty through accessing quality services in a more responsive and timely manner. E-governments are founded on a mission to use different management information systems to deliver quality services to citizens and other stakeholders of government. Through different government institutions, the IT infrastructure is relied on as a mechanism of effectively managing IT processes that lead to production and delivery of different products and services in any organization or government institutions [23].

Service delivery in different organizations is associated with comparison of expectations with performance of an organization. [30] indicates that the general quality of services offered by a particular organization, is a measure of the extent to which a delivered service matches the different preferences or expectations of the end user. [8] identified the main determinants of service delivery as tangibles, level of reliability, level of responsiveness, rate of assurance and empathy [38].

[24] explains reliability as the ability to perform and deliver the promised services consistently, dependably, and consequently accurately thereby meeting the needs of customers. Reliability has often been cited as the most important dimension in assessing the quality of service and is therefore a fundamental requirement for businesses to compete in the marketplace. However, many services are labor intensive and human service providers make mistakes. Consequently, a high percentage of service failures are a result of human error in the delivery process, which may take the form of either inappropriate intentions or actions not proceeding as intended. The other aspect of service quality is responsiveness which explains the willingness of an organization or institution to respond to the needs of customers or beneficiaries by offering highly quality, desirable and fast services. Responsiveness helps to lower the rate of complaints that normally arise from customers following poor service delivery that involves delay in attending to customer needs or providing less quality products or services. Studies indicate that responsiveness involves attending to different customer needs promptly without having to delay or subjecting customers to several bureaucracies [32].

[39] explains responsiveness as a systematic process that involves undertaking different actions or activities in a quick manner so as to meet the different needs and desires of the customers or clients. [39] further indicates that responsiveness is much concerned with keeping customers informed about an ongoing activity to meet their requests and consequently giving the clients a sense that fulfilling their demands is a priority of an organization.

2.4 Summary and Knowledge Gap

In relation to the different studies assessed in the literature review, it is clear that service quality in different organizations or public institutions greatly depends on the robustness of information systems based on different management information technologies. However most of the studies reviewed were majorly focused on other areas other than government institutions or the public sector and for other countries whose approach to the e-government systems is quite different from that of Greece. This therefore presents a research gap concerning the applicability of management information technologies in the perspective of Greece most especially in relation to delivery of quality public services [15].

3 Methodology

3.1 Research Design

[31] defines research design as a conceptual structure where research is conducted which establishes a basis for collection, measurement and analysis of data. The research design was cross-sectional survey to enable observation of several variables simultaneously and the study employed both quantitative and qualitative approaches for data collection and for hypothesis testing.

3.2 Study Population

According to [31], [21], population refers to a set objects or individuals that have shared noticeable features where generalization can be made. The study targeted the different government officials employed in the different public institutions or government

institutions in Greece. The study majorly targeted employees in the IT sector and institutions concerned with delivery of public services in Greece. This population was targeted since the different government officials in such institutions are associated with great knowledge concerning the impact of management information technology on the levels of service delivery.

3.3 Sample Size

3.3.1 Sample Size

Sampling refers to the selection of subjects representing the larger group they were drawn from i.e. a sample and this was based on the [40] model. The sample size was 88 respondents who included 70 respondents selected from the different institutions concerned with IT and service delivery in Greece.

3.3.2 Sampling Techniques and Procedure

The study was based on probability sampling techniques that include stratified and simple random sampling. Stratified sampling is a probability sampling technique that involves the researcher dividing the target population of the study into distinct subgroups commonly known as strata, and then undertakes a random selection of the final sample proportionally from the strata. In this case the target sample was arrived at using stratified sampling and the final sample was extracted from the strata using simple random sampling technique. The advantage with simple random sampling is that it creates samples that are highly representative of the population though it may be very tedious and time consuming, especially when creating larger samples [41].

Table 1 presents the different sub groups of respondents used in the study and the corresponding methods of data collection that were used for each individual subgroup from the Greece government.

Table 1. Study population, sample size, techniques and data collection methods

Category	Population	Sample	Sampling Technique	Data collection method
Directors	8	8	Purposive	Questionnaire
IT officers	70	60	Simple random	Questionnaire
Top managers	10	10	Simple random	Questionnaire
Total	88	78		

3.4 Data Collection Methods

Primary and secondary methods of data collection were used in the collection of data from the different participants selected from the different government institutions in the UAE especially those concerned with IT and service delivery. These methods included; questionnaire survey method and document review method.

3.4.1Questionnaire Survey

The questionnaire is one of the most convenient and popular methods of data collection. This is because it is less expensive as it covers a large number of respondents in a short time and it encourages respondents to easily reply to sensitive questions without fear of criticism or disapproval from the researcher. A questionnaire was used to gain insight into the phenomenon of management information technology and service quality from the different government employees because it was assumed that being employed in the IT and service delivery public institutions of government, they would possess great knowledge to help in addressing the different aims of the study.

3.4.2 Document Review

Document review is concerned with examination of different documents that have or contain information about the topic of study. In this research study the different reviewed documents included; strategic plans, financial records, guidelines, annual reports, evaluation committee minutes and reports, among others. This gave additional information to add to the one collected from the primary data instruments towards establishing the relationship between the different aspects of management information systems and service quality in government institutions.

3.5 Data Collection Instruments

3.5.1 Self-administered Questionnaire

[42] argues that what makes questionnaires appropriate is its ability to cover a large population. [42] describes a questionnaire as a series of questions asked to obtain information on the study objectives from respondents. Therefore, closed-ended questionnaires were administered to collect primary quantitative data from 70 government employees.

3.5.2 Document Review Checklist

[43] submits that a document review checklist can be used to expose an area of investigation and inform researchers on the salient issues in that field. A document review checklist was used to collect data objective by objective in line with logistics management system for improved service quality. Primary and secondary data was collected from strategic plans, financial records, guidelines, annual reports among others. Use of documents required thematic analysis processes whereby key themes were identified for further analysis and conclusions.

3.6 Pre-testing (Validity and Reliability)

3.6.1 Validity

Validity was assessed using both face validity and content validity as explained below:

3.6.1.1 Face Validity

To establish the face validity of the research instruments, the researcher presented them for a comprehensive cross examination by a research consultant. This was to establish whether they were suitable for using in the data collection process and if these instruments could ensure collection of accurate and consistent data. The supervisor was also contacted to confirm that the instruments used are suitable enough to help in collecting relevant information for the study.

3.6.1.2 Content Validity

[45] defines validity as the correctness and significance of suggestions founded on results from research. Content validity was established using CVC. [42] recommends a minimum CVI of 0.7 to test content validity index. Therefore; CVI = n/N, where, n= number of questions deemed valid, N= Total number of questions in the questionnaire.

$$Content\ Validity\ (CVI) = \frac{Number\ of\ Valid\ Questions}{Total\ number\ of\ questions}$$

The values for each individual section of the questionnaire and the total CVI are presented in Table 2.

Table 2. Content validity index the research instrument

Variable	Anchor	CVI
IT infrastructure management	5 point	0.81
IT support systems	5 point	0.83
Informational data	5 point	0.78
Service Quality	5 point	0.85
Average	5 point	0.83

Source: Primary Data (2022) (authors own work)

Content validity =0.83
The results show that the instrument was valid based on the content validity index (CVI) that was above 0.5.

3.6.2 Reliability
Reliability is defined by [44] as a measure of the grade instruments yield dependable results after repetitive trials. The reliability analysis of the questionnaire was carried out through Cronbach's Alpha Coefficient test.

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

Whereby N = is the number of items,
C = average covariance between item pairs and
$\bar{V}$ = Average variance

[44] argues that for any instrument to be rendered reliable for use in data collection, the reliability test must first yield a value of 0.7 or higher. This value should be obtained on a well-defined substantial sample of the study. In a bid to test the reliability of the research instruments, 10 respondents who were not part of the final study were selected and used to pilot test the questionnaire. During this process, the respondents were requested to undertake a critical check-up of the questionnaire mostly concerning its nature of design or construction, the clarity of the language, and its breadth.

Table 3 presents the Cronbach Alpha Values for each aspect of the independent and dependent variables.

Table 3. Reliability test of the research instrument

Variable	Anchor	Cronbach Alpha Value
IT infrastructure management	5 point	0.863
IT support systems	5 point	0.821
Informational data	5 point	0.713
Service Quality	5 point	0.817
Average	5 point	0.804

Source: Primary Data (2022) (authors own work)

The results in table 3 show that the instrument was very reliable as confirmed by the values of both coefficients which were above 0.5.

3.7 Data Collection Procedure

After successful proposal writing, an introductory letter from the university was obtained seeking permission to conduct the study based on data to be collected from UAE government employees. Respondents were identified and questionnaires administered to them. The researcher ensured confidentiality and anonymity by requesting them not to confirm their willingness to participate in the research study. After conducting interviews and collecting data from the government employees using the questionnaire, the researcher held a focus discussion with the selected inmates to collect data about their opinions concerning management information technology and service quality UAE government institutions. The researcher also visited relevant offices of UAE government institutions to collect different documents which were based on fir document review.

3.8 Measurement of Variables

The variables were measured by defining concepts operationally. For example, questionnaires were designed asking responses about management information technology and service quality in government institutions. These were converted into measureable and observable elements to allow development of an index concept. A five-point Likert scale namely: 5-Strongly agree; 4- Agree; 3- Not sure; 2- Disagree; 1- Strongly disagree was used to measure the independent and dependent variables. Age of prison warders as indicated in the questionnaire was broken down into distinct age groups whereby each group is a status in the social structure in the study population.

3.9 Data Analysis

[29] defines data analysis as the method of conveying order and structure to data. Quantitative data scores from the questionnaire were organized, coded and be analyzed using frequencies and percentages, standard deviations and means for each of the items in the study. Pearson's correlation statistics was employed to check relationships at 99% level of confidence interval. ANOVA statistics of adjusted R^2 values, beta values were used to carry out regression analysis and significance values suggested by [42] to determine the extent to which the different aspects of management information technology influence the level of service quality in government institutions.

Regression analysis was conducted in a bid to establish the overall predictive strength of the different independent variables on the dependent variable of the study. In this case a multiple regression model was of great importance in estimating different predictive values.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where;
Y= Service delivery in UAE government institutions
β0= constant (coefficient of intercept);
X_1= IT infrastructure management
X_2= IT support systems
X_3= Informational data
ε = Represents the error term in the multiple regression model

β1…β3= Represents the regression coefficient of the three independent variables which double as aspects of logistics management system and which helped in determining the level of influence that the independent variables (IT infrastructure management, IT support systems, and Informational data) on the dependent variable (service quality) in UAE government institutions.

The error term in this research study was based on the assumption that there was absence of autocorrelation. Thus therefore indicates that the aspect of autocorrelation was not considered in this research study. The hypotheses of the study were tested at the 5% (0.05) level of significance and the rejection and acceptance of the null hypotheses was based on the decision rule that if $p<0.05$, then the null hypothesis should be accepted and if $P<0.05$, then the null hypothesis should be rejected.

3.10 Ethical Considerations

There are different ethical requirements that must be put into consideration if any research study is to be successful. Consequently, the researcher observed a quite number of ethical issues which will be aimed at avoiding any occurrence of harm during the process of the study.

Firstly, permission to carry out the study will be obtained from relevant authorities at the institution

especially at the stage of data collection where the researcher has to first obtain a letter from relevant authorities.

Secondly the researcher will ensure that there is informed consent whereby respondents were informed about the details of the study and consequently the researcher assessed their willingness to participate. This was in addition to observing a high level of confidentiality and privacy when handling the data collected from respondents.

Finally, the respondents were given the freedom to answer questions based on their own interpretation of the different opinion questions. This will help in obtaining broad answers especially for the open-ended questions.

3.11 Limitations of the Study

There is anticipation of response bias. Personal characteristics of participants may influence their responses to questions, resulting in the phenomenon of social desirability of response, extreme of response and acquiescence. The questionnaire technique, explanation of the purpose of the research to the participants and assurance of confidentiality as well as the signed consent form will be useful in reducing the above traits.

Transient personal factors may also affect final results. Some temporary states of participants, such as anxiety and fatigue, could influence their response. To limit this, the researcher will try to engage the different participants during morning hours

There is also anticipation of researcher's bias. The researcher is the main conductor of the study in the participants' natural environment. The researcher practiced bracketing as well as reflexivity to overcome this problem. The researcher will go back participants to verify and clarify their responses.

3.12 Conclusion

This chapter has deeply explained the research setting or design, population and sampling to be used in the study as well as the sample size from the study population. The different instruments for the data collection and analysis have been fully discussed and ways on how quality will be ensured have been presented. Finally, this chapter as highlighted the ethical considerations that will be taken into consideration so as to obtain accurate results.

4 Results

This chapter presents a detailed account of the analysis, presentation and interpretation of the research findings obtained using the different quantitative research tools. This chapter first discussed the response rate and demographic characteristics of the government employees whose information was collected using the questionnaire. This was followed by analysis of variance (ANOVA) for the different variables. The chapter then discussed the different specific objectives by establishing the relationship between the variables using Pearson's rank correlation coefficient. The chapter then presented the regression analysis with the subsequent interpretation of the results.

4.1 Response Rate

Response rate refers to the general computation obtained after collecting data using the available data collection tools. Table 4 presents the rate of response for each data collection tool used in the study.

Table 4. Rate of response

Instrument	Target response	Actual Response	Percentage
Questionnaire	78	60	76.9

Source: Primary data (2022) (authors own work)

The results in Table 4 show that the study registered a response rate of 76.9% as this was considered a good response since it was above 50% as suggested by [42].

4.2 Demographic Characteristics

To collect demographic data about the study participants, questions of the first section of the questionnaire were used as indices asking the respondents to indicate their sex, age group, level of education, marital status of respondents, and the years they had spent in the different government institutions. The findings collected are presented below.

4.2.1 Sex of Respondents

The respondents through the questionnaire were requested to indicate their sex and the prison warders gave varying responses.

Table 5 presents the distribution of government employees based on their sex.

Table 5. Sex of the participants

Sex	Frequency	Percentage
Male	53	88.3
Female	17	11.7
Total	**60**	**100.0**

Source: Primary data (2022) (authors own work)

Findings in Table 5 clearly indicate that both males and females participated in the research study whereby 53 were males representing 88.3% of the total respondents and the remaining 17 were females representing 11.7% of the total number of respondents. This therefore indicates that majority of the study participants were males though all gender cohorts were represented thereby fulfilling the notion of gender balance. With this gender balance, it meant that the results obtained after data collection represented the views of both males and females in the different government institutions in Greece. Furthermore the high number of males in this study meant that to a greater extent males make up the largest number of government employees as compared to women.

4.2.2 Age of Respondents

The researcher through the questionnaire also requested the participants to indicate their age bracket and their responses are presented in Table 6.

Table 6. Age of the participants

Age bracket	Frequency	Percentage
18 – 30	17	28.3
31– 40	29	48.4
41 – 50	8	13.3
51 and above	6	10.0
Total	**60**	**100.0**

Source: Primary data (2022) (authors own work)

The study findings presented in Table 6 revealed that majority of the participants were in the age bracket of 31– 40 years representing 48.4% of the total number of respondents. This was followed by 17 respondents in the age bracket of 18–30 years representing 28.3% of the total number of respondents. The least number of respondents was in the age bracket of 51 years and above and this was representing 10% of the total number of respondents. These results show that data was collected from people of sound age hence they were able to give articulate answers concerning the influence of management information technology and service quality in government institutions.

4.2.3 Marital Status of Respondents

In order to further establish more demographic characteristics of respondents, the researcher requested them to indicate their marital status and their responses are presented in Table 7.

Table 7. Marital status of participants

Number of years	Frequency	Percent
Single	13	21.7
Married	28	46.7
Separated/Divorced	16	26.6
Widow/Widower	3	5.0
Total	**60**	**100.0**

Source: Primary data (2022) (authors own work)

The results presented in Table 7 indicate that majority of the respondents were married representing 46.7% of the total number of the participants. This was followed by those who were separated or divorced representing 26.6% of the total number of respondents and then the single representing 21.7% of the respondents. The least number of respondents were widows or widowers representing only 5% of the total number of respondents.

4.2.4 Highest Level of Education of Respondents

In a bid to find out the level of education of respondents, they were requested to indicate their age and their varying responses are presented in Figure 2 below:

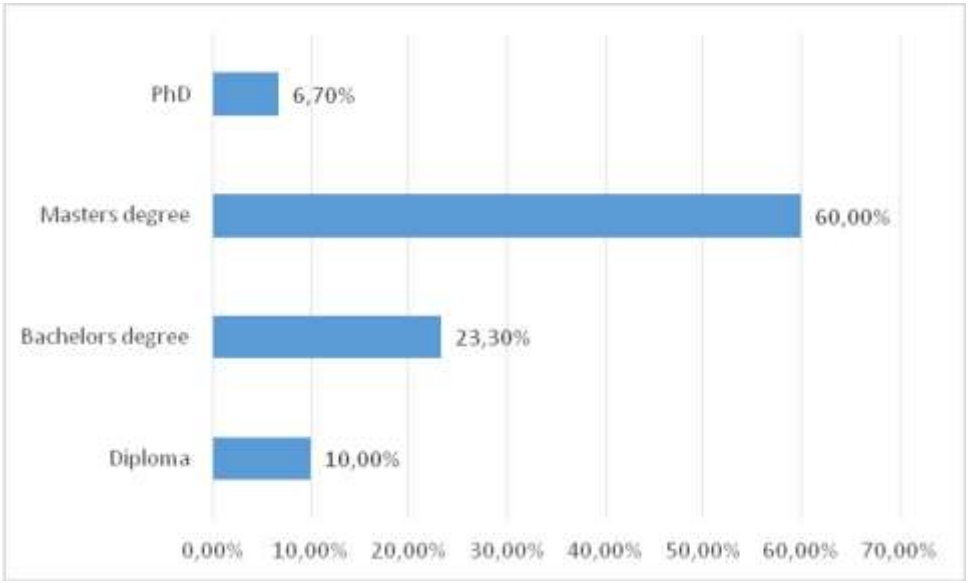

Fig. 2: Level of education of government employees
Source: Primary data (2022), (authors own work)

The results presented in Figure 2 revealed that majority of the government employees (60%) had attained a masters degree, 23.3% had attained a bachelors degree, 10% had attained a diploma while the least number of respondents. These results clearly showed that majority of the government employees had attained high levels of education hence possessed great knowledge to clearly articulate different issues

associated with the impact of management information technology on service delivery in government institution particularly in Greece.

4.2.5 Years Spent at in the Government Institution

To further understand the demographic characteristics of respondents, the researcher requested to indicate the years they had spent in the Greece government institution and their responses are presented in Table 3.

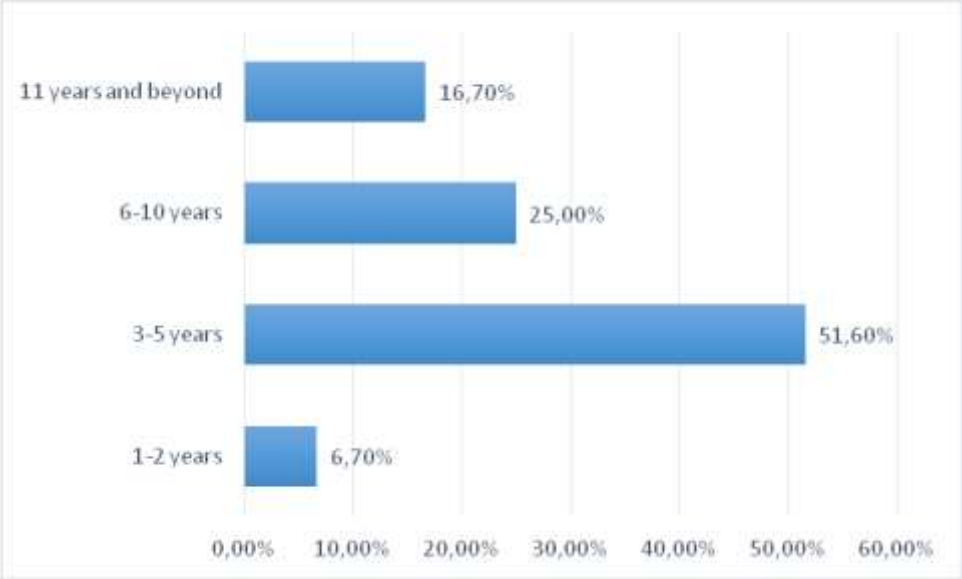

Fig. 3: Years spent in the government institution
Source: Primary data (2022, (authors own work)

The results presented in Figure 3 indicate that majority of the respondents had spent 3-5 years working in the UAE government institution representing 51.6% of the total number of respondents. This was followed by 15 respondents who had spent 6-10 years in the UAE government institution representing 25% of the total number and then 10 respondents who had spent 11 years and beyond representing 16.7% of the total number. The least number of respondents had spent 1-2 years representing only 6.7% of the total number. The results show that majority of the respondents had employed in the different IT and service delivery sectors in the different government institutions in the UAE hence had enough experience to express balanced opinions on the impact of management information technology on service delivery.

4.3 Analysis of Variance (ANOVA)

In order to assess the level of similarity or variation between the responses provided by Prison Warders, analysis of variance was undertaken and this helped in evaluating the level of variation based on mean and standard deviation as presented in Table 8.

Table 8. ANOVA results for years spent working in the UAE government institutions by the different study variables

	Years spent in the government institution	Mean	Std. Deviation	Std. Error	F	Sig.
IIT infrastructure management	1-2 years	3.24	1.08	0.35	3.211	.032
	3-5 years	3.08	1.52	0.08		
	6-10 years	3.17	1.25	0.12		
	11 years and beyond	3.51	0.92	0.17		
	Total	3.25	1.19	0.18		
IT support systems	1-2 years	3.53	0.84	0.13	1.016	.061
	3-5 years	3.31	1.13	0.04		
	6-10 years	3.80	0.57	0.06		
	11 years and beyond	3.41	1.06	0.14		
	Total	3.54	0.09	0.09		
Informational products	1-2 years	3.62	0.73	0.17	5.124	.003
	3-5 years	4.17	0.38	0.13		
	6-10 years	4.23	0.57	0.09		
	11 years and beyond	4.31	0.44	0.14		
	Total	4.08	0.53	0.13		
Quality service delivery	1-2 years	3.91	0.73	0.20	1.618	.152
	3-5 years	4.20	0.65	0.04		
	6-10 years	4.13	0.25	0.10		
	11 years and beyond	4.23	0.52	0.09		
	Total	4.12	0.53	0.11		

Source: Primary Data (2022) (authors own work)

The results presented in Table 8 show that the different government employees within the four categories of years spent at the UAE government institution significantly differed in their opinions concerning IT infrastructure management ($p=.032< .05$). This can be attributed to the fact that having been at different time periods, the employees could have had varying experiences in applying different aspects of IT infrastructure in delivery different services to relevant people.

The results showed a no significant variation among the government employees' opinions concerning IT support systems in the different UAE government institutions ($p = .061 > .05$). This indicates that for no matter the number of years spent in the government institution, most employees are conversant with the relevance of different IT support systems such as the qualified IT personnel and other important resources towards enhancing the level of quality service delivery in an organization or government institution.

The results also indicated that there was a significant variation in the responses provided by the study participants concerning informational products in regard to service quality in the Greece government

institutions (p=.003>.05). This variation could be attributed to lack of a uniform and systematic flow of IT performance based information in some of the government institutions that would enable employees to have relatively same knowledge concerning the impact of Information systems on service quality.

Finally there was no significant variation concerning the opinions of respondents on service quality in the different government institutions (p=.152<0.05). This implies that all government employees included in the study were conversant with the level of quality service delivery in the government institutions as influenced by the management information technologies hence these employees do not vary much in perception concerning service quality.

4.4 Relationship between the Study Variables

This section provided an explanation concerning the relationship between the different variables of the study.

4.4.1 Relationship between IT Infrastructure Management and Quality Service Delivery in Government Institutions

The first objective of this masters' thesis was to establish the relationship between IT infrastructure management and service quality in UAE based government institutions. In order to achieve this objective, a cross tabulation of the responses on IT infrastructure management and service delivery was done and consequently the correlational analysis was conducted to establish the level of the relationship. The results obtained and the subsequent Pearson's coefficient values are presented in Table 9.

Table 9. Correlation between IT infrastructure management and Quality service delivery in government institutions

		IT infrastructure management	Quality Service Delivery
IT infrastructure management	Pearson Correlation	1	.248**
	Sig. (2-tailed)		.000
	N	60	60
Quality service delivery	Pearson Correlation	.248**	1
	Sig. (2-tailed)	.000	
	N	60	60

**. *Correlation is significant at the 0.01 level (2-tailed).*
Source: Primary Data (2022), (authors own work)

The relationship between IT infrastructure management and Service Quality was determined using Pearson's Correlation coefficient. After the cross tabulation and analysis, it was established that there is a significant positive relationship between IT infrastructure management and service quality at UAE government institutions ($r= 0.248^{**}$, n=60, p=.000). The results clearly show that the different aspects of IT infrastructure management under management information technology greatly influence the level of service quality in the different government institutions. These results also led to the acceptance of the null hypothesis H_1 that there is a significant relationship between IT infrastructure management and quality service delivery in government institutions. Through document review of Annual reports by different government institutions most especially from the IT sector, it was established that proper management of the IT infrastructure helps to keep a robust and effective information systems that encourages transparency and proper decision making processes in the different government institutions in Greece.

4.4.2 Relationship between IT Support Systems and Quality Service Delivery in Government Institutions

The second objective of the study was to establish the relationship between IT support systems and service quality in UAE government institutions. In order to achieve, correlational analysis was conducted to establish the relationship between inventory control influence service quality and this would then help in determining how inventory control influence service quality in Greece government institutions. The results obtained and the subsequent Pearson's coefficient values are presented in Table 10.

Table 10. Correlation between inventory control and service quality in government institutions

		IT support systems	Quality service delivery
IT support systems	Pearson Correlation	1	.326**
	Sig. (2-tailed)		.000
	N	60	60
Quality service delivery	Pearson Correlation	.326**	1
	Sig. (2-tailed)	.000	
	N	60	60

***. Correlation is significant at the 0.01 level (2-tailed).*
Source: Primary Data (2022), (authors own work)

Pearson's Correlation coefficient was used to establish the relationship between IT support systems and Service Quality in Greece government institutions. Following cross tabulation and correlational analysis it was established that there is a positive relationship between freight planning and service quality at UAE government institutions (r= 0.326**, n=60, p=.000). The results clearly show that the input and efforts rendered by the different support systems of the information system and the entire IT sector greatly influence the level of service quality in the delivery of services by the UAE government institutions. These results also led to the acceptance of the null hypothesis H_2 that IT support systems has a significant and moderate relationship with quality service delivery in Greece government institutions.

4.4.3 Relationship between Informational Products and Service Quality in UAE Government Institutions

The third objective of the study was to establish the relationship between informational products and quality service delivery in Greece government institutions. Correlational analysis was conducted to establish this relationship and the results obtained are presented in Table 11.

Table 11. Correlation between Information flow and quality service delivery Service

		Informational products	Quality Service Delivery
Informational products	Pearson Correlation	1	.453**
	Sig. (2-tailed)		.000
	N	60	60
Quality Service Delivery	Pearson Correlation	.453**	1
	Sig. (2-tailed)	.000	
	N	60	60

***. Correlation is significant at the 0.01 level (2-tailed).*

Pearson's rank correlational coefficient was used to establish the relationship between informational products and service quality and the results clearly showed that there is a positive and significant relationship between inventory control and service quality (r= 0.453**, n=60, p=.000). This therefore indicates that the nature of access to informational products as per the organization's information systems greatly influences the level of service quality at Greece government institutions. Furthermore since the P<0.01, and r=0.453, we accept the null hypothesis H3 that there is a significant and moderate relationship between informational products and quality service delivery in Greece government institutions.

4.5 Regression Analysis

Regression analysis was also conducted to further establish the level to which the different independent variables (IT infrastructure management, IT support

systems, and Informational products) influence service quality in Greece government institutions based on different predictive values. The results obtained after conducting regression analysis are presented in Table 12.

Table 2. Showing results for multiple regression analysis

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**
Model	**B**	**Std.Error**	**Beta**		
(Constant)	2.441	.354		6.889	.000
IT infrastructure management	.143	.034	.254	4.221	.000
IT support systems	0.090	.035	.351	2.596	.010
Informational products	0.087	.073	.169	1.184	.237
Dependent Variable: Quality Service Delivery					
R	.405				
R Square	.164				
Adjusted R Square	.341				
Std. Error of the Estimate	.629				
Change Statistics					
F Statistic	14.214				
Sig.	.000				

Source: Primary Data (2022), (authors own work)

The results in table 12 showed that the different study variables can predict a 34.1% change in service quality in UAE government institutions (Adjusted R Square = .241). The results indicated that among the different predictors of quality service delivery, IT support systems (Beta = .351, $p < .01$) is a better predictor as compared to IT infrastructure management (Beta = .253, $p < .01$) and Informational products (Beta = .169, $p < .01$). The results indicate that despite management information technology being a determinant of service quality in UAE government institutions, there are other factors that could influence service quality other than IT support systems, IT infrastructure management, and informational products.

5 Discussion

The quantitative study findings, based on a response rate of 87.2%, confirmed that there is a relationship between the different aspects of management information technology (IT infrastructure, IT support systems, and Informational products) and service quality in the different government institutions in UAE. This clearly shows that the robustness of the information systems in the different public institutions in UAE greatly influences the timeliness, responsiveness, and reliability of the services provided by the different government institutions to the general public. The study also confirmed that among different aspects of IT infrastructure commonly found at different government institutions, it is the application servers, LAN/WAN, databases and operating systems that have a relatively higher influence on the level of quality in service delivery as compared to other aspects of IT infrastructure. This therefore indicated that proper management of application servers, system databases and the different operating systems encourages high level of accountability, transparency and proper decision making in government institutions thereby enhancing

the quality of services delivered by these organizations [1]. The study also established that the different activities involved in the lifestyle of management information systems or technology that entirely make up the procedural processes, are very essential in enchaining the robustness of information systems and consequently the level of service quality in government institutions. It was established that that the most important systematic processes that have a great impact on quality of services delivered include; general maintenance and evolution, the verification and validation processes that may also involve testing, IT operations and support and requirements elicitation [46].

The study further established that the different aspects of IT support systems are very essential in enhancing the effectiveness of management information systems which in the long run has a positive impact on service quality levels in the different government institutions in Greece. In this case, the study confirmed that the most important personnel in management information technology are the experts conversant with the different information systems applications' domain. The study further revealed that to have an active IT support system, there should be degrees of task specialization among the different IT staff in the government institutions, staff flexibility for the task at hand should be very high and human intellectual capital perspectives should be of great quality. The study further revealed that the different aspects of information management technology in terms of quality management, have a great influence on service quality in government institutions. The key features of quality management that are most effective in enhancing service quality majorly included; continued provision of the different desired functionalities and proper operationalization of the different non-functional IT requirements in the government or public institutions. The study clearly confirmed that the informational products of information systems or technologies have a great impact on service quality in public institutions. The study indicated that the key aspects of informational products that are most effective concerning quality delivery of services included; executable codes and budgets formulations and schedules. The study deduced that IT infrastructure management had the greatest effect on quality delivery of service in Greece government institutions, followed by IT support systems, and then informational products. The literature review also confirmed that procedural systems and quality management have continuously been associated with a highly positive and significant relationship with service quality in government institutions [47].

6 Conclusions

From the key study findings, it can be concluded that the different elements of management information technology majorly IT infrastructure, IT support systems and informational products, have a great positive impact on quality service delivery in government institutions. From the study findings it was clear that the different elements of IT infrastructure management most especially application servers, databases, and operating systems, as well as network security greatly influenced the level of service quality on the Greece government institutions.

The study also concluded that the general maintenance and evolution, verification and validation, requirements elicitation, design of information systems, proper planning, analysis and specification greatly influence the level of service delivery in government institutions in Greece. The study further concludes that the service delivery in most government institutions in Greece is also normally affected by the IT support systems which majorly involve the human resource or the IT personnel or expertise. On the same the study concludes that the aspects of human capital that greatly affect level of service delivery in government institutions majorly include; having knowledge about information systems and their application domains, and encouraging high degree of task specialization among the different IT staff, as well as ensuring staff flexibility for the different activities or IT tasks at task. Furthermore it is clear that quality management for any information system greatly influences the service delivery in the different government institutions in Greece.

The study concludes that the aspects of qualities management that influence service delivery in Greece government institutions cut across the general operationalization of non-functional requirements, optimizing organizational strategies and IT investments, provision of the desired functionalities, synergistic and conflicting interactions, IS reliability,

quality improvements, and use of consistent and methodical processes when consolidating or reengineering systems. Finally the study concludes that informational products such as executable code budgets and schedules, work breakdowns and allocations, requirements and specifications, architectural diagrams and descriptions, documentation, technology investment decisions informed by business strategy, test plans and training material affect the service delivery in the different Greece based government institutions.

6.1 Recommendations

Based on the different study findings presented in this study, different recommendations were raised whereby it is encouraged that government institutions should focus on improving their IT infrastructure majorly by employing more effective infrastructure management strategies which in the longrun could ably improve service quality in the different government institutions. The study further recommends that the different government institutions should ensure that they award appropriate salaries and allowances to the human resource. This could act as source of motivation to the employees who are a crucial determinant of the quality of service delivery in the public or government institutions.

The study also recommends that Greece government institutions and other public institutions across the world should focus on maintaining quality management information technologies or systems that are reliable and effective. This will ensure that there are no delays due to unexpected breakdowns or system failure. In addition, the government institutions should collaborate with different experts who may help to identify system hitches appropriately and consequently advice accordingly in advance. The study also recommends that the different government institutions in Greece continuously focus on ensuring that their overall informational products are regularly updated so as to give current and actual information. This in the longrun eliminates the issues associated with miscommunication that are normally raised by out dated information.

6.2 Limitations of the Study

The main limitations of this study were; the small size of the sample in addition to a partial response rate which to a greater extent could have limited the confidence in the results and as well as limiting generalizations to other situations. Some respondents decided to withhold information which they considered sensitive and classified. This to a greater extent reduced the general probability of attaining a more conclusive study. However, conclusions were made with this response rate. The study looked at government institutions in UAE. This could limit the generalizations to other public institutions in the country since the study only focused on the systems in these institutions only.

6.3 Suggestions for Further Research

The study majorly focused on management information technology aspects and their influence on quality service delivery in government institutions. In this case focus was aimed at the performance of public institutions in the Greece as per their use of different management information technologies. The study therefore failed to focus on private institutions hence it would be prudent fir future studies to focus on determining the impact of different management information systems on the service quality in private institutions in Europe.

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