نموذج رقم (1)

إقـــــرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

The Possibility for Implementation of E-tendering Methodology in the Construction Bids in Gaza Strip

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DECLARATION

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification

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The Possibility for Implementation of E-tendering Methodology in the Construction Bids in Gaza Strip

إمكانية تطبيق منهجية العطاءات الإلكترونية في العطاءات الإنشائية في قطاع غزة

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بناءً على موافقة شئون البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ **عبدالله عبدالعزيز عبدالله صيام** لنيل درجة الماجستير في **كلية *الهندسة*** **قسم الهندسة المدنية- إدارة المشروعات الهندسية** وموضوعها:

فحص إمكانية تطبيق طريقة العطاءات المحوسبة في صناعة التشييد بقطاع غزة

The Possibility for Implementation of E-tendering Methodology in the Construction Bids in Gaza Strip

وبعد المناقشة التي تمت اليوم الاثنين 18 شعبان 1435هـ الموافق 2014/06/16م الساعة الثانية عشرة ظهراً، اجتمعت لجنة الحكم على الأطروحة والمكونة من:

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واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله ولزوم طاعته وان يسخر علمه في خدمة دينه ووطنه.

والله ولي التوفيق،،،

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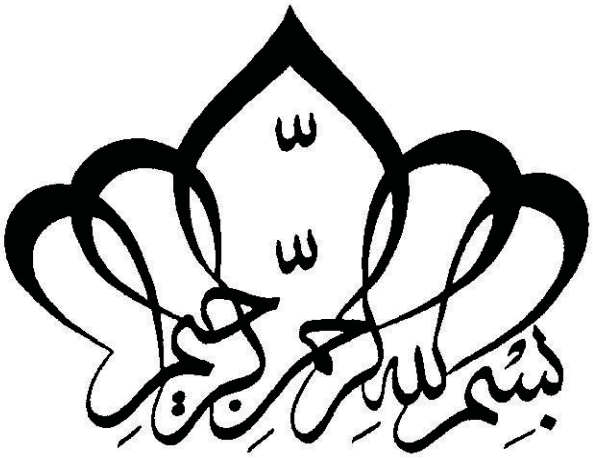

سورة الإسراء – آية 85

Dedication

To My father and mother for their endless support

To my wife for her unlimited encouragement

To my son (Abd El Aziz) who were missing my direct care during my study

To all my brothers, sisters, colleagues and friends for their sustainable support

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May, 2014

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Abstract

E-tendering is one of the information technology tools that has been highlighted by construction industry experts to assist in changing the industry's culture and improving its processes. It will reduce the time and efforts to complete tendering operations; minimize expenses of paper works; improve transparency; and increase competition. However the emergence of e-tendering in construction industry in the Gaza Strip has been very slow or non-existent. This study the possibility of implementation e-tendering system in Gaza Strip. Where this study identifies the state of the art of e-tendering, investigate the barriers that prevent the implementation of e-tendering, investigation of the local understanding of e-tendering, and determining the acceptance and willingness to use e-tendering in the local agencies. To achieve the objectives of the study a literature review was done, and a questionnaire survey was used for clients, consultants, and contractors in Gaza Strip, identifying their views on different aspects of e-tendering, and providing an analysis of the perceived advantages and barriers to implementation of e-tendering. The results showed that most of respondents was encourage the new system in the tendering process expect in the pre-bid meeting phase. Also, time, cost, and sustainability are confirmed as the most significant perceived advantages in implementing e-tendering. The lack of experience and precedence in the legal realm is one of the main perceived barriers. The thesis explores the impact of personal characteristics on attitudes towards e-tendering. Experience are particularly significant, with more experienced respondents being more critical and negative than less experience respondents towards e-tendering. The analysis also identifies that the size and type of company affects attitudes with regard to electronic sharing of information and the related aspects of infrastructure and security. Smaller companies have more concerns with regard to security. Prior use also affects attitudes, with inexperienced users expressing more concerns over the use of e-tendering. The conclusion is that, amongst clients, consultants, and contractors there is recognition that e-tendering system expected to replace the traditional tendering process in the future, and the system can bring benefits, but that there are a number of barriers currently acting as a brake on the uptake of e-tendering. Training, education and support from senior management are required for e-tendering to become widely accepted in the future.

ملخص البحث

إن العطاءات الالكترونية هي واحدة من أدوات تكنولوجيا المعلومات التي تم تسليط الضوء عليها من قبل خبراء صناعة البناء والتشييد للمساعدة في تغيير ثقافة هذه الصناعة وتحسين عملياتها، حيث أنها تساعد في تقليل الوقت و الجهد لإتمام عملية التناقص؛ وتقليل نفقات الأعمال الورقية؛ وتحسين الشفافية؛ وكذلك زيادة المنافسة. إن ظهور المناقصات الإلكترونية في قطاع الإنشاءات في قطاع غزة كان بطيئا جدا أو غير موجود إلى حد ما. لذا فإن هذه الدراسة تهدف إلى دراسة إمكانية تطبيق نظام العطاءات الالكترونية في مناقصات التشييد في قطاع غزة. حيث تم التعرف على معنى العطاءات الالكترونية، ومدى الفهم المحلى لها، كذلك العوائق التي تحول دون استخدام هذا النظام، وكذلك تحديد مدى القبول والاستعداد لاستخدام العطاءات الالكترونية. ولتحقيق أهداف هذه الدراسة تم إجراء مراجعة للدراسات السابقة، وتم استخدام طريقة الاستبيان الذي استهدف كلا من المالكين، والاستشاريين، والمقاولين في قطاع غزة، وذلك لتحديد وجهات نظرهم حول الجوانب المختلفة للمناقصات الإلكترونية، وتحليل المزايا و العوائق التي تحول دون تنفيذها. لقد أظهرت النتائج أن غالبية المستطلعة آراؤهم قد شجعوا وبشدة استخدام هذا النظام الالكتروني في جميع مراحل المناقصة ما عدا مرحلة الاجتماع التمهيدي. كذلك وجد أن الوقت والتكلفة والاستدامة من أهم المزايا المتصورة في تنفيذ المناقصات الإلكترونية. بينما عدم وجود الخبرة و الأسبقية في المجال القانوني هي واحدة من الحواجز التي ينظر إليها بشكل رئيسي. وكذلك تستكشف الدراسة تأثير الخصائص الشخصية تجاه المناقصات الإلكترونية. حيث أثبتت الدراسة أن الخبرة تكتسب أهمية خاصة ، حيث أن أكثر المجيبين ذوي الخبرة كانوا أكثر إيجابية اتجاه نظام العطاءات الالكترونية من ذوي الخبرة القليلة. كما ويبين التحليل أيضا أن حجم ونوع الشركة يؤثر على تبادل المعلومات إلكترونيا والجوانب ذات الصلة بأمن النظام. حيث وجد أن الشركات الصغيرة لديها مخاوف أكثر من الشركات الكبيرة فيما يتعلق بالأمن. خلاصة القول هو أن هناك اعتراف من قبل المالكين والاستشاريين والمقاولين بأن نظام العطاءات الالكترونية سوف يحل محل النظام التقليدي للعطاءات في المستقبل والذي سوف يجلب العديد من الفوائد إلا أن هناك عددا من العوائق التي تعمل حاليا على عدم امتصاص نظام العطاءات الإلكترونية. لذا يلزم التدريب والتعليم و الدعم من الإدارة العليا للمناقصات الإلكترونية لتصبح مقبولة على نطاق واسع في المستقبل.

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List of Abbreviations

BCT	Building Centre Trust
BOQ	Bill Of Quantity
CCDC	Canadian Construction Documents Committee
CI	Construction Industry
CIB	Construction Industry Board
CIOB	Chartered Institute of Building
CITA	Construction Information Technology Alliance
CPSC	Construction Policy Steering Committee
CSFs	Critical Success Factors
EDI	Electronic Data Interchange
EOI	Expression Of Interest
E-tendering	Electronic Tendering
FITLOG	Foundation for Information Technology in Local Government
ICT	Information and Communication Technology
IT	Information Technology
LCPN	Liaison Committee Practice Notes
MHPW	Ministry of Housing and Public Works
NCB	National Competitive Bidding
NCCTP	Network for Construction Collaboration Technology Providers
NGO's	Non Governmental Organizations
OGC	Office of Government Commerce
PCU	Palestinian Contractors Union
PECDAR	Palestinian Economic Council for Development and Reconstruction

PNA	Palestinian National Authority
PQS	Project Quantity Surveyor
QS	Quantity Surveyor
RFT	Request For Tender
RICS	Royal Institution of Chartered Surveyors
RII	Relative Importance Index
SBD	Standard Bidding Document
SME	Small and Medium Enterprises
TTP	Trusted Third Party
UK	United Kingdom
WB	West Bank

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CHAPTER ONE

INTRUDUCTION

1.1 Background

The construction industry is categorized as being an information-intensive industry and described as one of the most important industries in any developed country, facing a period of rapid and unparalleled change (Dawson et al., 2006). The construction industry is increasingly engulfed by globalization where clients, business partners and customers are found in virtually every corner of the world (Lou and Alshawi, 2009).

The rapid pace of technological advancement over the past three decades has transformed the construction industry. Today businesses and governments rely heavily on information and communication technology (ICT) for communication. Growing confidence in the use of the internet for commercial transactions has encouraged the governments entities to take advantage of the efficiencies offered by electronic business systems and establish electronic tendering systems for procuring numerous building, services and sale of goods contracts (Dawson et al., 2006).

Communicating, reaching and supporting them are no longer optional but are imperative for continued business growth and success. A key component of enterprise communication is collaborative environments (for the construction industry) which allows customers, suppliers, partners and other project team members secure access to project information, products or services they need at any given moment (Lou and Alshawi, 2009).

Information technology (IT) has been widely applied in many industrial sectors in order to increase their profit, competitiveness, and to reduce unnecessary project costs. The Oxford Concise English Dictionary defines IT as: the study and use of systems for sorting, retrieving and sending information (Thabet, 2006). Also, IT is defined as: the use of electronic machines and programs for the processing, storage, transfer and presentation of information (Rivard, 2000), (Thabet, 2006).

The Internet has debatably revolutionized the way in which information is stored, exchanged and viewed, opening new avenues for business, which only a decade ago were deemed almost inconceivable (National Procurement Denmark, 2008). Tendering processes are considered to be a suitable mechanism for governments to fairly assign contracts for construction projects and procurement (Betts et al., 2006).

E-tendering is increasingly being adopted throughout the world. E-tendering, in its simplest form, is described as the electronic publishing, communicating, accessing, receiving and submitting of all tender-related information and documentation via the internet, thereby replacing the traditional paper-based tender processes, and achieving a more efficient and effective business process for all parties involved (Dawson et al., 2006).

In public sector, governments can be seen as bulk purchasers, they invest huge amounts in infrastructure improvement, hospital buildings, road's construction, and school structures. From the other side, governments need to get the best value of money and to guarantee transparency and efficiency in the contractors and consultant's selection. Accordingly, several governments adopted e-procurement solutions that enable public institutions and private sector to communicate electronically during the procurement stages (Rambel management, 2004), (Thabet, 2006).

Although tender documents for public works produced electronically in Gaza Strip, but they still need to be transferred and processed manually. This situation leads to a lot of repetitive work, paper consumption, and lose of time. No work has been done on the national level to automate the communication between construction contract parties that are involved in the procurement activities.

New tender and competition regulations are being issued constantly and increasing demands for documented quality, price, delivery, and environmental and energy controls (National Procurement Denmark, 2008).

This research aims to study the applicability of e-tendering in the construction industry in the Gaza Strip.

1.2 Statement of the Problem

Electronic transformation of information in the public procurement process has become important in the information age. The effectiveness and efficiency of this process is essential to obtain works and services at the right quality, cost, and time. The main feature supported by electronic procurement system was tendering (Cagar, 2005).

Information technology (IT) based processes are taking the construction industry (CI) into new dimensions. The key element of success is accepting change and a new way of working within this traditional and fragmented industry. Organizations need to adapt and explore concurrent changes in today's borderless economy, or risk losing out. Businesses are moving away from traditional processes to modern and efficient ways of

working, mainly through electronic media. Data and information are shared and distributed digitally, formulating a cheaper and more effective way of communication. Electronic processes have the potential to generate huge new wealth and to transform the way business is conducted in unprecedented ways. The continuing expansion of e-business and e-commerce provides opportunities for improved business processes, which are more efficient and responsive, reduce the reliance on paper transactions and lead to reduce costs and time. The internet-based collaborative environment is one such opportunity.

The Gaza Strip CI still using the traditional procurement process. The e-tendering process is a new dimension of challenge for the CI in the Gaza Strip. It is important to study the ability of our CI to cope with new advances.

1.3 Research Aim

The aims of this study is to explore the possibility for implementation of e-tendering methodology for the construction projects tenders in Gaza Strip.

1.4 Research Objectives

The aim of this research can be broken down into the following objectives:

1. Identify the state of the art of e-tendering.
2. Investigate the barriers that prevent the implementation of e-tendering.
3. Investigation of the local understanding of e-tendering.
4. Determining the acceptance and willingness to use e-tendering in the local agencies.

1.5 Research Hypothesis

The author's hypothesis for the work were:

1. There is no difference of the opinions between contractors, client, and consultant in the ability to implement the e-tendering system in the construction tenders at significance level $\alpha = 0.05$.
2. There is no difference of the opinions between contractors, client, and consultant in the advantages and disadvantages of the e-tendering system in the construction tenders at significance level $\alpha = 0.05$.

1.6 Research methodology

There were a number of research methods used during the course of this study. Quantitative method was used and their organizational structure was planned, prior to the research being undertaken, to assist the author in achieving the overall aim. The linkage between the thesis objectives and the chosen research methods
is shown in Table 1.1.

Table 1.1: Chapter focus and appropriate research methodology

Thesis Objective	Focus	Selected Research Methodologies	Relevant Chapters
1	E-tendering state of art	Literature Review	2
2	Barriers to implement e-tendering	Literature Review / Questionnaire survey	2 & 4
3	The local understanding of e-tendering	Literature Review / Questionnaire survey	2 & 4
4	The acceptance and willingness to use e-tendering in the local agencies	Questionnaire survey	4

The author began reviewing a wide range of literature on the topic of tendering. This strong foundation of research included utilizing many primary research resources, such as academic conference papers and journals, as well as governmental and industry publications. Also the recent secondary research resources were utilized. This led to establish an understanding of the existing tender process and it's inefficient practices.
Following this work, the methodology allowed the author to undertake an observation of current tendering procedures, their inefficiencies and the use of ICT in the tender process.
An industry wide survey was completed in 2014.This survey focused on the three parties involved in the tender process, client, consultant, and contractor. These parties were surveyed to capture an understanding of the industry's views on the status of ICT

in the tender process to determine to what extent they have the willingness to adopt e-tendering.

1.5 Limitation of the Study

To generalize for large populations, surveys must follow certain struck procedures in defining whom to study and how to select them. The instability of the political, economical and other situation resulted from the imposed closer by Israel after the uprising of El Aqsa intifada till now may affect the precision of the obtained results. The contractors population may also be affected by the contractors who are not extent his registration in the PCU continuously due to the financial crises that face them. Their may be contractors whoare working now and they haven't a valid registration with contractors union. This study is surveyed at Gaza strip only, if we expand our study in west bank (WB) the results could be compared with larger scale and scope.

1.6 Contents of the thesis

Chapter 1: Outlines the project specifications by giving background to the subject area, state the problem of statement, the objectives of the research and the structure used for the presentation of the dissertation.

Chapter 2: Reviews the literature in the area of bidding environments in the traditional process of tendering. It also views the e-tendering system and its advantages and disadvantages. Also the chapter covers the status of tendering in Gaza Strip.

Chapter 3: Identifies the methodology of the research. The data collection was depending on designing a questionnaire. The population was owners, consultants, and contractors. The data then were analyzed by using descriptive methods.

Chapter 4: Results and discusses of the questionnaire survey results.

Chapter 5: Conclusion and recommendations from research.

CHAPTER TWO

LITERATURE REVIEW

This chapter analyses past research to identify the concepts of e-tendering; the utilization of e-tendering in construction industry in general. It also document the experience of other countries in this field, and benefits of e-tendering.

This chapter contains four sections:

- Traditional tendering process and components involved;
- Electronic tendering and its international standards;
- The e-tendering advantages and disadvantages;
- The tendering in Gaza Strip;
- Summary.

2.1 Traditional Tendering

Tendering is a process commonly used in awarding government contracts. The basic components in the tendering process are preformed in sequential order as shown in Figure 2.1. The components are: pre-qualification and registration, public invitation to tender, tender preparation and submission, close or open of tender, tender evaluation, award of tender, and archiving. A tenderer must ensure that their tender is submitted before the tender close time. The opening of tenders occurs after the tender close time. (Du R., 2007)

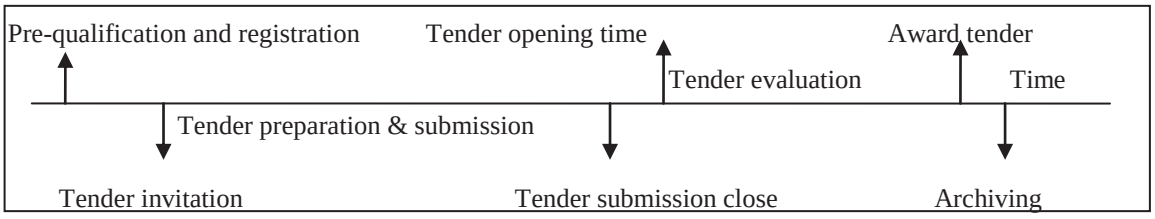

Figure 2.1: Tendering Process (Du R., 2007)

2.1.1 Tendering in Construction

Tendering in construction was portrayed by Runeson and Skitmore (1999) as a process that connects the buyer/client to the market place/construction firm. This process informs the client what construction firms are willing to sell and also indicates the price they are willing to sell those services to the client. The Aqua group (2006, P. 27)

expanded on this by defining tendering as: “A procedure to select a suitable contractor, at a time appropriate to the circumstances, and to obtain from him at the proper time an acceptable offer upon which a contract can be let.”

Construction Policy Steering Committee (CPSC) defined the tenders as "prices, bids, quotations, or consultant proposals" and defined the tenderers as "The parties submitting tenders". Another definition by CPSC (2001) showed that the tender is a formal response to Request For Tender (RFT) as received from a tenderer and it is "An offer to supply goods/products/assets, provide services, or to execute work on stated terms, or an expression of interest, or an application for pre-qualification or the like"(El Karriri, 2008).

The high level traditional tendering processes are shown in Figure 2.2. The Construction Industry Board (CIB, 1997) in the United Kingdom (UK) indicated, that there were four main steps in the tendering selection process. The four steps were established to be the high level process required to complete the tender process (O’Connell, 2010).

The Traditional Tender Process			
Step 1: Qualification	Step 2: Tender invitation and submission	Step 3: Tender assessment	Step 4: Tender acceptance
Firms attempt to gain opportunity to be considered for tender by client	Client invites firms to complete and return tender documents	Client considers completed returned tenders to find suitable contractor	Client accepts most suitable tender

Figure 2.2: The Traditional Tendering Process (CIB., 1997)

The first step involved is qualification. This is the provision by a contractor of information, as part of a preselection process (Chartered Institute of Building, CIOB, 1997; O’Connell, 2010). The client can then review this information to compile a list of suitable contractors to tender for the works. Seeley (1997) maintained that this procedure can be completed without documentation being sent to the contractors. The client can himself compile a list from his/her previous experiences with firms or by

drawing up an ad hoc list of contractors who, from common knowledge, would be capable of completing the type of works involved. The qualified contractors are subsequently invited, at stage two, to submit their tenders for the project. The form of the tender and its documents take into account items, such as, the size of the project, level of pricing, resources of the firms and the character of the project (Hore, et al., 1997; O'Connell, 2010). This documentation typically includes all relevant drawings,Bill of Quantity (BOQ), and the contractual forms, under which, the contract will be carried out. The BOQ is subsequently priced and the form of tender is completed. These documents are then submitted by the contractor on or before the deadline date.

During stage three, the submitted tenders are then appraised and examined for errors by the client's Project Quantity Surveyor (PQS). O'Connell (2010) comments that choosing the best buy "seems absurdly simple". However, he points out that tenders should not only be assessed on the basis of the lowest price but also on factors, such as, project timescale and safety records. Once a contractor is chosen, be it on price alone or a number of criteria, the client and the contractor will sign and counter sign the contractual documents, thus completing the fourth stage (tender acceptance).

2.1.2 Objectives of Construction Tendering

The tendering process begins due to the client's requirement for a new or renovated piece of architecture or similarly engineering works. For that reason, the overall aim of the tender process must be to acquire a firm with the relevant skills to construct this project. However,there are a number of objectives which stem from this overall aim, as can be seen inFigure 2.2.

O'Connell (2010) suggested that the client wishes to obtain a completed building with a acceptable quality and over a suitable timescale. The Aqua group (2006) concurred with Smith's logic, however, they put the client's objectives simply, as the client wanting a building to be completed to the highest quality, at the lowest cost and in the shortest amount of time. Therefore, it can be understood that the client's main objectives with the tendering process, is to arrive at a point where s/he has obtained an offer of a new building at an acceptable cost, over an acceptable time and to a satisfactory standard or quality. However, there are other sub-objectives, as shown in Figure 2.3, that must be considered on occasions. Brooks (2008) noted that political factors have meant that many public projects must be tendered to ensure the public are securing the most cost

effective tenderer to carry out the works. This has parallels with the Aqua group's (2006) understanding that accountability must be considered when selecting a contractor. The Aqua group proceed to suggest that, through the tendering process, the decision to choose one contractor over another must be justifiable.

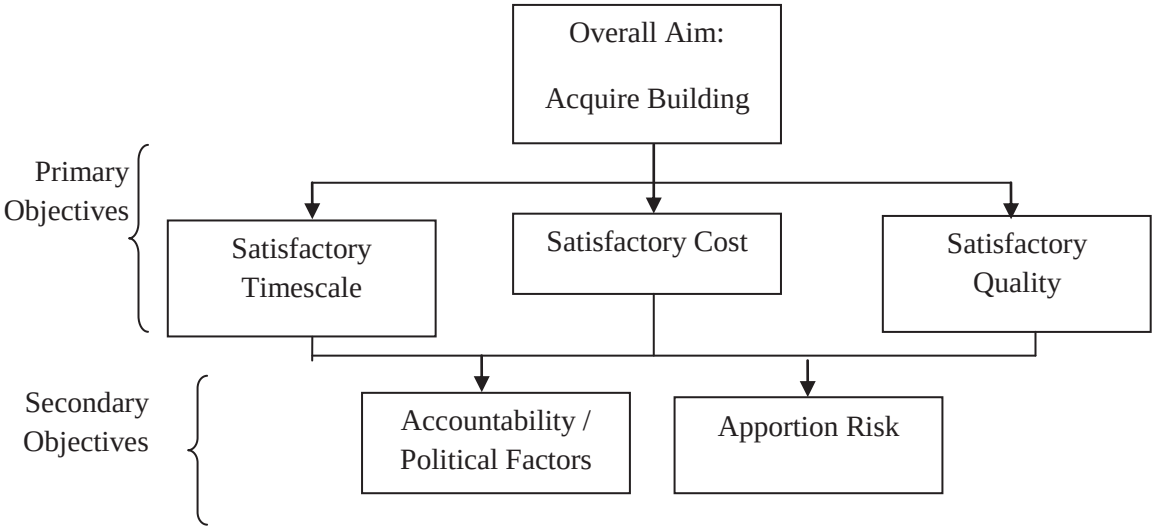

Figure 2.3: Clint's Objectives (O'Connell, 2010)

The client's decision to tender will also be made on a consideration of the risk involved. Through the tender process the client will show the contractor the items of work that s/he will be undertaking and the conditions under which they will be carried out. Therefore, a price is received that will show the clients liability to undertake the works. This should negate the possible loss (The Aqua Group, 2006) or risk from commissioning the building. The contractor's objectives are quite straight forward. O'Connell (2010) states that because the contractor is a profit-seeking organization, their main reason to tender is to obtain profitable work. Therefore, the tender process is a process where both parties objectives can be achieved. The contractor obtains a contract to complete profitable work and the client obtains a contract for a suitable firm to complete his/her proposed schedule of works.

2.1.3 Tendering Phase

The tendering phase in the CIis deemed to be the most critical and important throughout the lifecycle of the construction project (Vee and Skitmore, 2003; Lou and Alshawi, 2009). This phase will shape the contractual and legislative agreements between the client, consultant team, contractor and other members of the project. Based on

traditional contracting, the tendering phase starts when the drawings and tender documents are completed. Compilation and analysis of project data is gathered through the stages of strategic briefing, outline and final proposals, production information, statutory approvals, building contracts and others. This phase is information-intensive and paperwork-heavy. Tender documents comprise of the invitation to tender, form of tender, architectural drawings, bills of quantities, health and safety agreements and others. These documents are paper intensive, not portable, expensive, tedious and troublesome to produce (Lou, 2006). Once the tender documentation is prepared, it is ready to be distributed to interested bidders. Often, problems arise during this process. Among them are human errors in document production–incomplete information or tender document, possible mix up of documents, insufficient copies, possible leakage of restricted information, problems in issuing of addendums and voluminous tender documents (Du et al., 2004;Pavlov and Aleksandrova, 2003).

2.1.4 Tendering Methods

There are a number of tendering methods available for use in a tendering process. These are described in a wide variety of ways depending on the agency, procurement stream, or industry background. The Guidelines identify three generic main categories, being open tendering, multi-stage tendering, and limited tendering. The stages in these three categories are shown and described below in Figure 2.4 (NSW Government, 2011).

2.1.4.1 Open Tendering

An open tendering process is an invitation to tender by public advertisement with no restriction placed on who may submit a tender. Tenderers must however demonstrate in their tenders how they satisfy the evaluation criteria and how they meet the specific RFT requirements. Seeking open tenders is a sound way of gaining assurance of best value for money, particularly in the absence of accurate market price knowledge or clear knowledge of available competent tenderers. It increases competition and gives all potential tenderers the chance to compete for Government business. Open tendering is generally used where there is a broad competitive market and it is not efficient or cost effective to establish pre-qualified or preregistered tenderer lists (NSW Government, 2011).

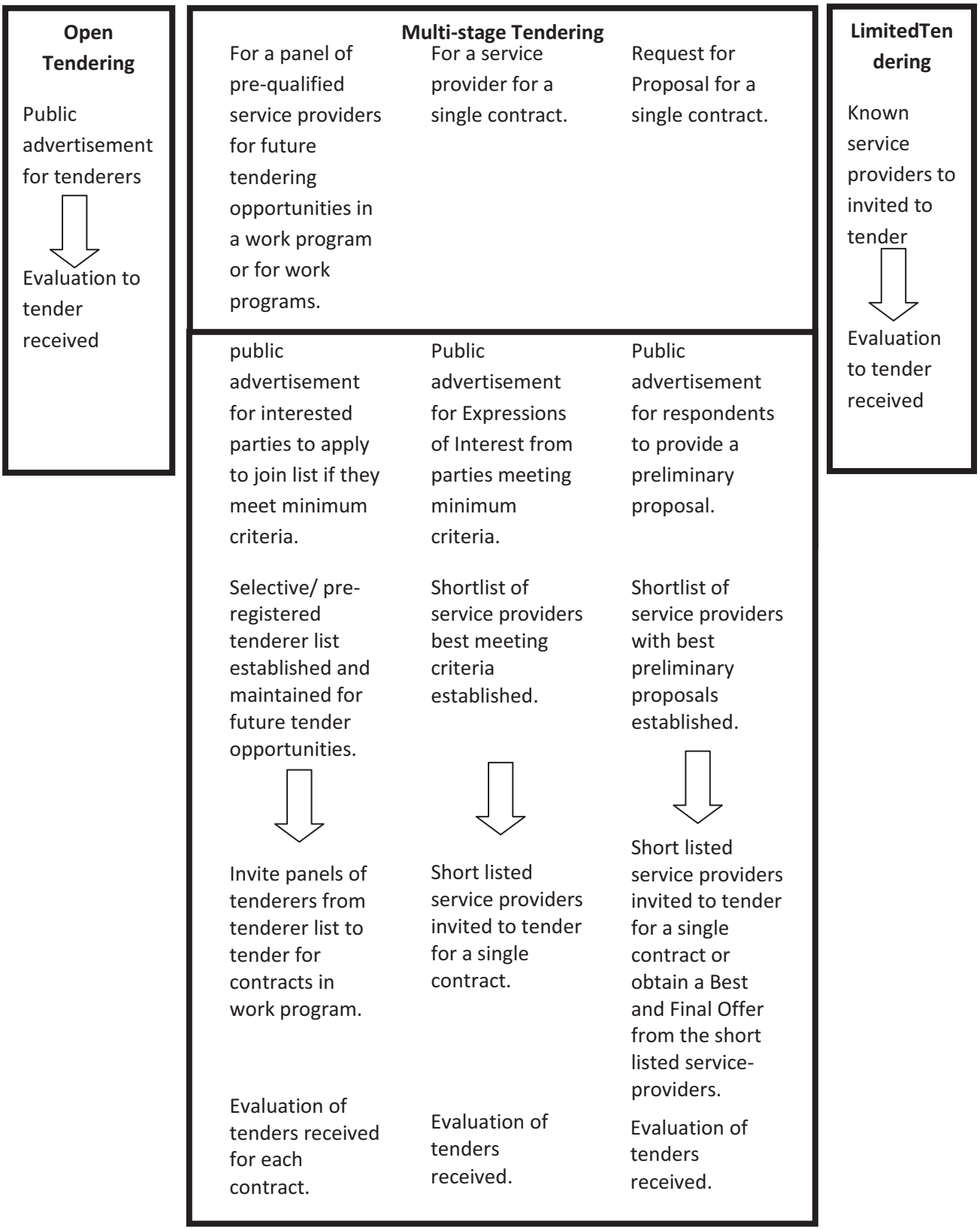

Figure 2.4: Depiction of tendering categories(NSW Government, 2011)

2.1.4.2 Multi-Stage Tendering

Multi-stage tendering may be used to cull a large number of respondents and identify the best service providers in a mature supplier market. It enables the number of final tenderers to be limited to those that can demonstrate the requisite capability to perform the contract. The first stage in multi-stage tendering is an Expression of Interest (EOI) or Request for Proposals. This invites interested service providers to register their interest against the evaluation criteria in the RFT document. This is the process that is followed for the creation of panels in pre-qualification schemes. The Expression of Interest document must explain the further steps proposed beyond the first stage of the tender process. The agency then short lists interested service providers based on their demonstrated ability to undertake the particular contract or future work or service. These pre-qualified service providers are invited to tender in the second stage for either a specific contract or for several contracts in an ongoing work program. Multi-stage tendering can be used to (a) establish a panel of service providers for several contracts in an ongoing work program; (b) establish potential service providers for a single contract; or (c) identify respondents with the best proposals, usually for more complex or unusual procurements (NSW Government, 2011).

2.1.4.3 Limited Tendering

Limited tendering includes invited tendering and direct negotiation (NSW Government, 2011).

2.1.5 Tendering Parties

Parties involved in tendering are the principal, who runs the tendering process, and the tenderer, sometimes called contractor, who makes offers to the principal.

Du R. (2007) defined the principal as "any party inviting and receiving tenders. A principal may include a contractor or subcontractor". And he defined the tenderer as "any party submitting tenders, including contractor, subcontractor, and supplier".

2.1.6 Tender Components

The name and details of steps in the tendering process can be quite different due to the scale of the projects, and from country to country. A tendering process, however, should contain the following common element: Pre-qualification, invitation to tender, submission to tender, closing of opening tender, evaluation of tenders, award of tender, and achieving (Dawson et al., 2006).

Based on common elements, each tendering process may contain special procedures for different type of projects. The code of tendering (AS4120-1994) have classified few types of tendering process: selected tenders, open tenders, preregistered tenders, invited tenders, and negotiation.

2.1.6.1 Pre-Qualification and Registration:

This component is optional but is preferable step for complex projects such as construction projects. The traditional pre-qualification requires a tenderer to supply its qualification to the principal. The principal will normally perform an assessment of the tenderer general expertise, reputation, financial standing, capability and integrity. The assessment result will allow the principal to classify tenderers in to different ability levels or compile a preferred tenderers list (Du R., 2007). Figure 2.5 shows the tender pre-qualification.

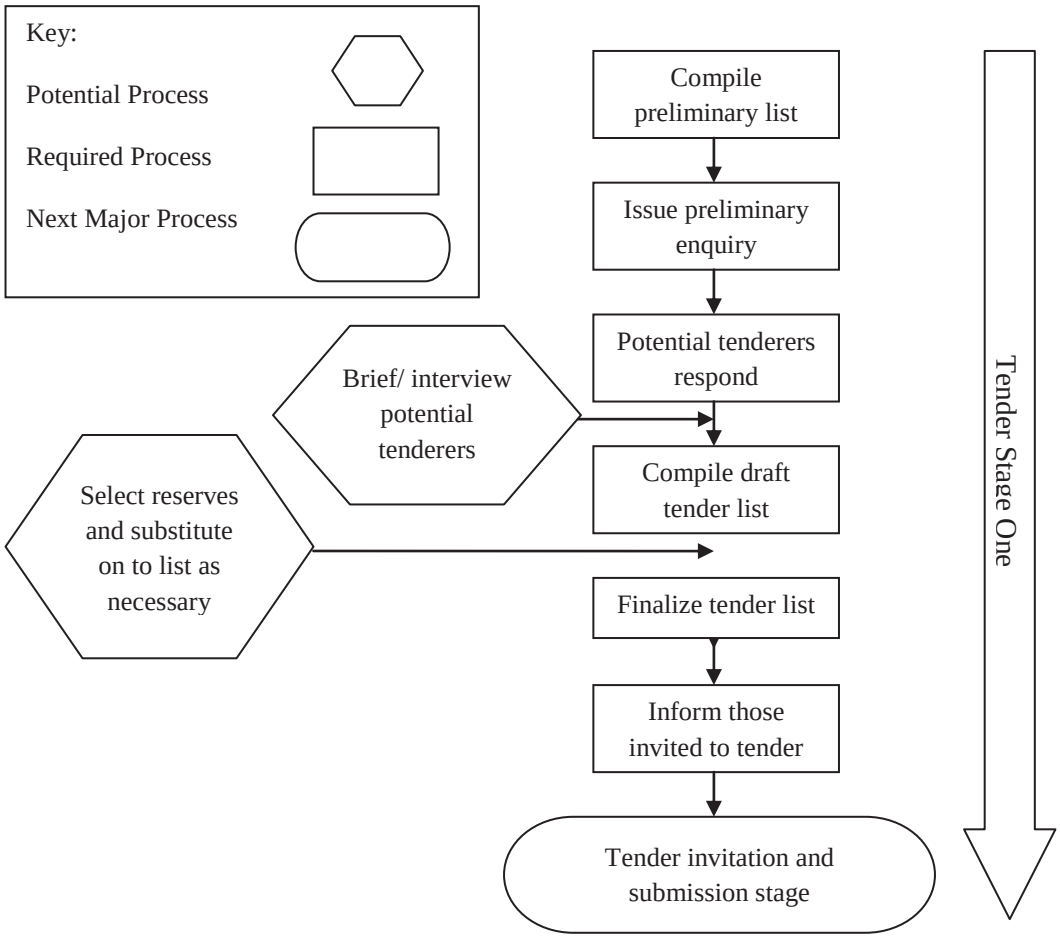

Figure 2.5: Tender Pre-qualification (CIB, 1997)

2.1.6.2 Invitation to Tender

The public invitation to tender begins with the principal establishing a project strategy. This involves writing the normally contains detailed contract terms, and the terms of tender such as tender close time, format of tender or weighting systems for tenderer evaluation. The principal publishes the invitation to tender through media such as newspaper, website or selective invitation. The process ends when tenderers receive tender invitation (Dawson et al., 2006).

2.1.6.3 Tender Submission

On receiving the invitation to tender, interested tenderers should submit their intention to tender and request a detailed tender specification document. When the principal receives the intention to tender submission, it will perform tenderer registration (Du R., 2007).

Potential tenderers will prepare their tender according to the tender terms and conditions. Other activities may involve tenderers requesting the principal to clarify these terms, and the principal distributing the response or addendum to all tenderers. Tenderers then submit tenders to the principal. The process ends when the principal receives tenders (Du R., 2007).

During the tender submission period, tenderers should comply with the tender process and requirements laid out in the tender terms, submit their tenders in the specified format and before the tender close time. These are the most common disputes in tendering process. Failure to comply with the terms and conditions may result in a non-conforming tender (Dawson et al., 2006).

Thorpe and Bailey (1996) point out that at a practical level, the tendering process is vulnerable to abuse. One common collusion is for the contractor to induce an insider either to give special consideration for its offer, or to reveal a competitors offer. There are general practices to guard against these types of collusion in the paper-based system. Sealed bids can be used to stop anybody viewing the bid before all tenders are submitted (Du R., 2007). Figure 2.6 shows the tender invitation and submission.

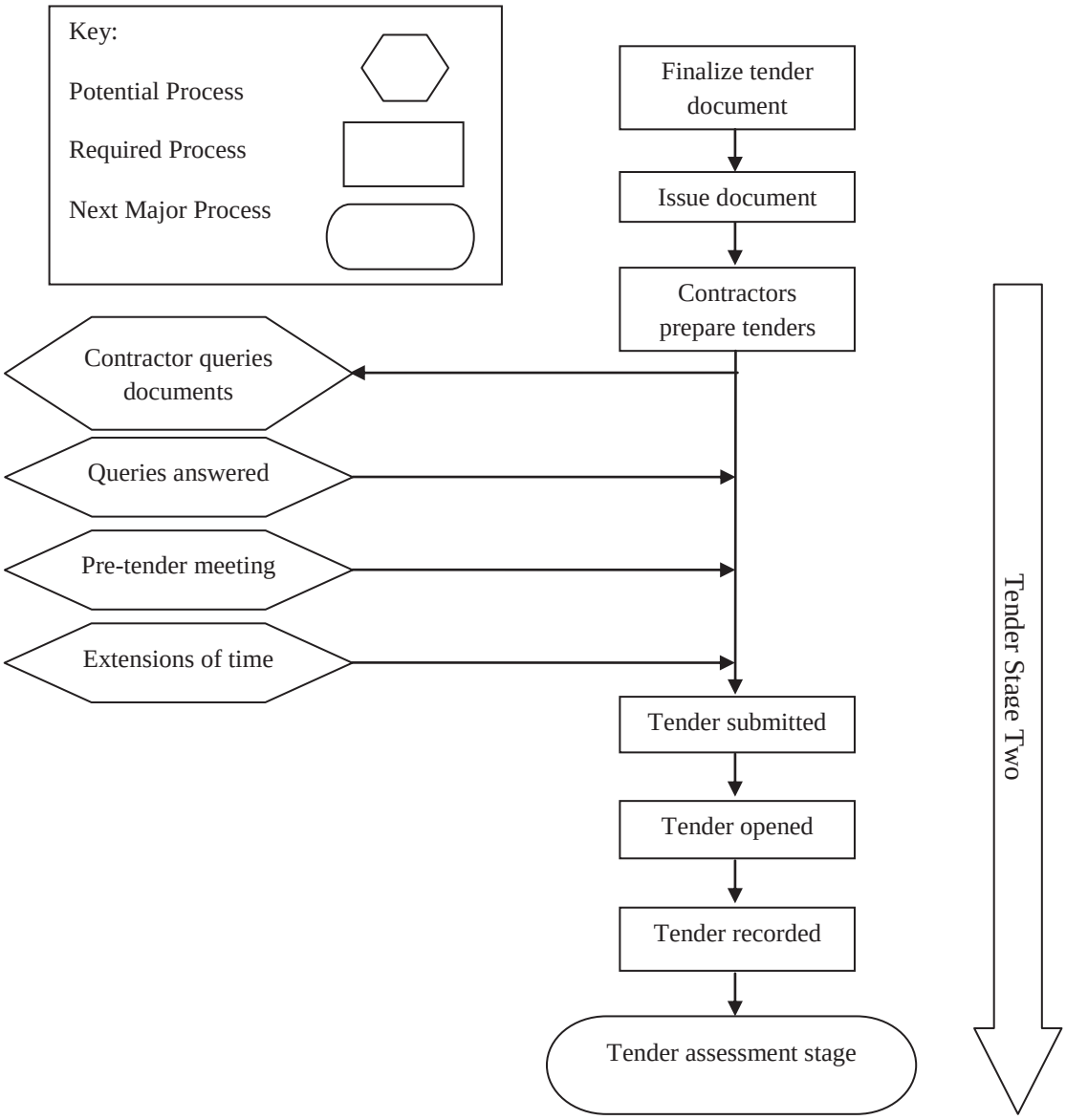

Figure 2.6: Tender Invitation and Submission (CIB, 1997)

2.1.6.4 Close or Open of Tender

The principal will close tender at the tender close time and open the tender box by following all required procedures. A non-conforming tender, due to wrong format or late submission, are rejected after opening (Du R., 2007). If the principal wishes to consider a late tender, it is important that the principal explicitly places this direction to consider a late tender (Dawson et al., 2006). Tender closing and opening procedures are highly sensitive. In order to control opening time and prevent other collusions, it is important that security procedures are not compromised.

2.1.6.5 Tender Evaluation

The principal assesses each offer against its quality and price or through a scoring system. During the evaluation, the principal will also perform post-offer open negotiations to consolidate contractual terms and conditions. In this situation, the principal may need request more information from tender (LCPN, 2006).

In the tender evaluation process, the principal's legal obligation can be imposed by several sources of law: contract low, administrative low, misleading or negligent conduct, equity, and restitution (Dawson et al., 2006).

The administrative law enables a dissatisfied tenderer to have the assessment decision reviewed by the courts for breach of the tendering policy or procedure. Misleading or negligent conduct could occur if the principal fails to follow evaluation procedures stated in the pre-award contract terms (Du R., 2007). Figure 2.7 shows tender evaluation.

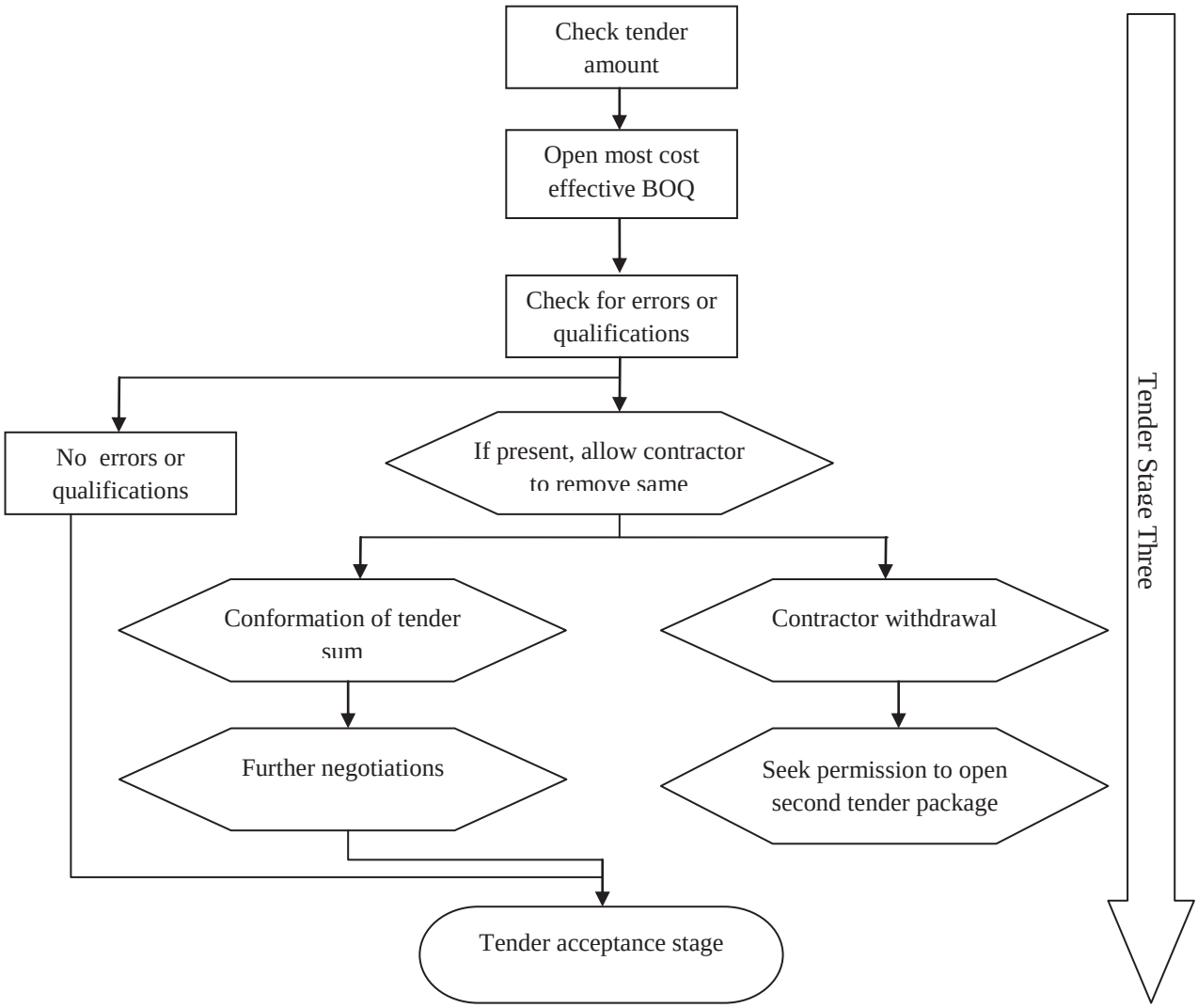

Figure 2.7: Tender Assessment (CIB, 1997)

2.1.6.6 Award of Tender

The principal will accept a tender and send notification to winning tenderer. It also involves the public announcement of the result. A formal contract can then be signed between the principal and the winning tenderer. Under contract law the main contract is formed when the acceptance a tender is communicated to the tenderer. However, formally signing the contract between the principal and the tenderer has been the usual practice. The signing of the contract in the paper based system does not raise any significant legal issues (Du R., 2007).

2.1.6.7 Archiving

Both tenderers and principal need to find a secure way to store their documents. Document retention should consider the file format, access, viewing software and integrity verification. The principal is responsible for secure record keeping (Du R., 2007).

2.1.6.8 Process Particulars

It is important to note that throughout the entire process all parties are treated in a fair and reasonable manner. The CIB (1997) also stresses that a number of key principles must be up held during the process. These include:

- Clear procedures throughout the tender process.
- Identical conditions for all bidding contractors.
- Confidentiality of all parties involved.
- Practices that avoid or discourage collusion should be followed.
- Tender prices should not change on unaltered scopes of work.
- There should be a commitment to teamwork from all parties.

Following these principles should mean that there is a clear, efficient way of receiving compliant tenders for a client who wishes to carry out construction work. Additionally, this process should be confidential and ensure that the client gets the best deal possible. However, as previously suggested, in particular by Eadie et al., (2007) e-Tendering, as opposed to the traditional tender process, appears to be a more efficient method of completing the tender process.

2.1.7 Particular Problems to be Addressed within Traditional Tendering

Hughes (2003) highlighted the substantial cost that is involved in tendering finding that the cost to contractors of tendering was approximately 1.17% of the value of the

work.When considered against a success ratio of, say, one in five, Hughes reported that the cost of each winning bid can be as much as 6% of the value of the work. The Canadian Construction Association(2005), found that tendering costs can account for up to 5.9% of the total value of a project cost to a client on a typical construction project (CCDC, 2005). Construction companies must recuperate this substantial cost, so that it can remain profitable. In addition, the cost of tendering was considered to be very expensive by 93% of respondents to an e-tendering survey carried out by CITA in 2006. Some of the main concerns reported by authorities in respect to e-tendering include:

2.1.7.1 Rekeying of Information

Hore and West (2005) discussed how the re-keying of information in the construction materials acquisition process was inefficient. This logic can be similarly directed towards tendering. Tender documents are largely passed between parties in paper format due to the requirements of the Liaison Committee Practice Notes (LCPN) (2006). Brooks (2008) pointed out that computers are used throughout the tendering process. The Construction Industry Trading Electronically Group (CITE) (2000), went further in indicating that there is a significant element of re-keying of information occurring. With each page of a detailed BOQ requiring item numbering, item description and unit of measurement to be re-keyed, there is a large amount of clerical work to be completed. The CRC in 2006 agreed with these findings. In further studies, Hore and West (2004), found that the cost of producing an invoice could be reduced by over 85% with the removal of inefficient communication processes. The figures Hore found were in line with the findings of Laage-Hellman and Gaade's (1996) findings for Electronic Data Interchange (EDI) usage in a Swedish company. However, Hore and West noted that costs such as web hosting, etc. were not included in the analysis (O'Connell, 2010).

2.1.7.2 Security Concerns

Du et al., (2004) concluded that the traditional tendering process was open to abuse, and he considered that through a lack of adequate security measures with the traditional system, prospective bids delivered to the PQS had the possibility to be tampered with. Tender prices may even be revealed to other prospective contractors. This leads to a tender process which lacks the key requirements of fair play and clarity that are required for a tender process, as laid out by the CIB (1997).

2.1.7.3 Subcontracting

A further inefficient process outlined by CITA (Curtis, 2006) is the labour intensive nature of preparing, sending and receiving accurate sub-contractor tenders for trade packages. Curtis outlined that there are many stages included in this subprocess of tendering. The most labour intensive was seen to be the preparation of the tender package for each trade. Each trade package may contain drawings, specifications and other documentation that the contractor deems necessary to fully describe the project. This individual trade information has to be sorted, photocopied, compiled for each subcontractor and finally checked that all information is present before it is delivered in hard copy to the subcontractor. Curtis explained that, on occasion after completing this work, the subcontractor may not even price the work. This can lead to a large amount of time and resources (photocopying/paper) being spent without any return. Hore et al., (2007) identified inefficient processes in practice and furthermore acknowledged that substantial information was replicated by the main contractor, when issuing documentation to subcontractors for pricing.

2.2 Electronic Tendering

The term electronic tendering has been widely used, but its formal definition has not been properly documents. E-tendering in the public view refers to the use of an electronic medium to facilitate some part of the tendering process. Commonly, tender requests for tenders are posted to an electronic tender distribution service, which may also allow addenda to be distributed, or tenders to be submitted electronically in to a tender box (Du R., 2007).

In 2005, the Royal Institution of Chartered Surveyors (RICS) defined e-tendering as "the electronic issuing and receipt of any tender documentation as part of the procurement process". A fully operational e-tendering process will allow for all stages of the traditional tendering process to take place electronically. This can take place through a web-enabled tender system. The RICS (2005) further explained that a web-enabled tender system is a unique website/extranet that enables access to all the participants of the tender process, via a login name and password, in order to upload and/or download documents. Betts et al., (2006) refer to this website/extranet the "tender box". Technology is already available to allow communication of this type to take place, and is frequently called collaboration software.

E-tendering has been identified for some time as being one of the potential tools to assist in changing the construction industry's culture and improving its processes. TheRICS e-tendering guidance note (2005) explains that at its simplest e-tendering is the electronic exchange of any tender documents as part of the procurement process. It is the administration of the tendering process that this research is focused on, rather than the related but controversial topic of online auctions. The emergence of e-tendering in construction in the UK has been slow (RICS, 2005).

2.2.1 E-tendering Categories

Christensen et al., (2002) further placed e-tendering systems in to three categories, based on level electronic procedures used, each category building on the previous one, principal to tenderer communication; tender submission and two way communication; and electronic tendering contract formation.

In the first category, electronic communication is used only from principal to tenderers. The system allows the principal to post tender documents to a website, from which tenderers can download the tender documents. The tenderers still submit their tender paper, and two way communication is carried out by traditional methods.

The second category is an extension of the first one. It allows two way electronic communication between the principal and tenderers. A tenderer can both download and submit the tender documents through electronic communication.This two way communication may also include distribution of addenda to the tender documentation, and negotiation of further terms. However, the awarding of the tender and contract formation are still usually paper based.

The third category is a fully electronic system which provides all the functionality of the second category as well as the electronic awarding of the tender and formation of the contract.

The adoption of e-tendering systems is intended to replicate the paper-based business process with the more efficient electronic business processes, achieving the same business objective. However, electronic business process has to preserve the same set of core functions including security functions for contract formation (Du R., 2007).

2.2.2 E-tendering Process

An illustration of the change in communication in respect to e-tendering can be seen in Figure 2.8. This figure represents the Network for Construction Collaboration Technology Providers (NCCTP, 2006) view of communications before collaboration

technology, and how communication can be improved with the addition of this technology. The NCCPT describe collaboration software, as a system that is used to eradicate linear communication between team members. This linear communication can lead to islands of information existing between different members of the project team.

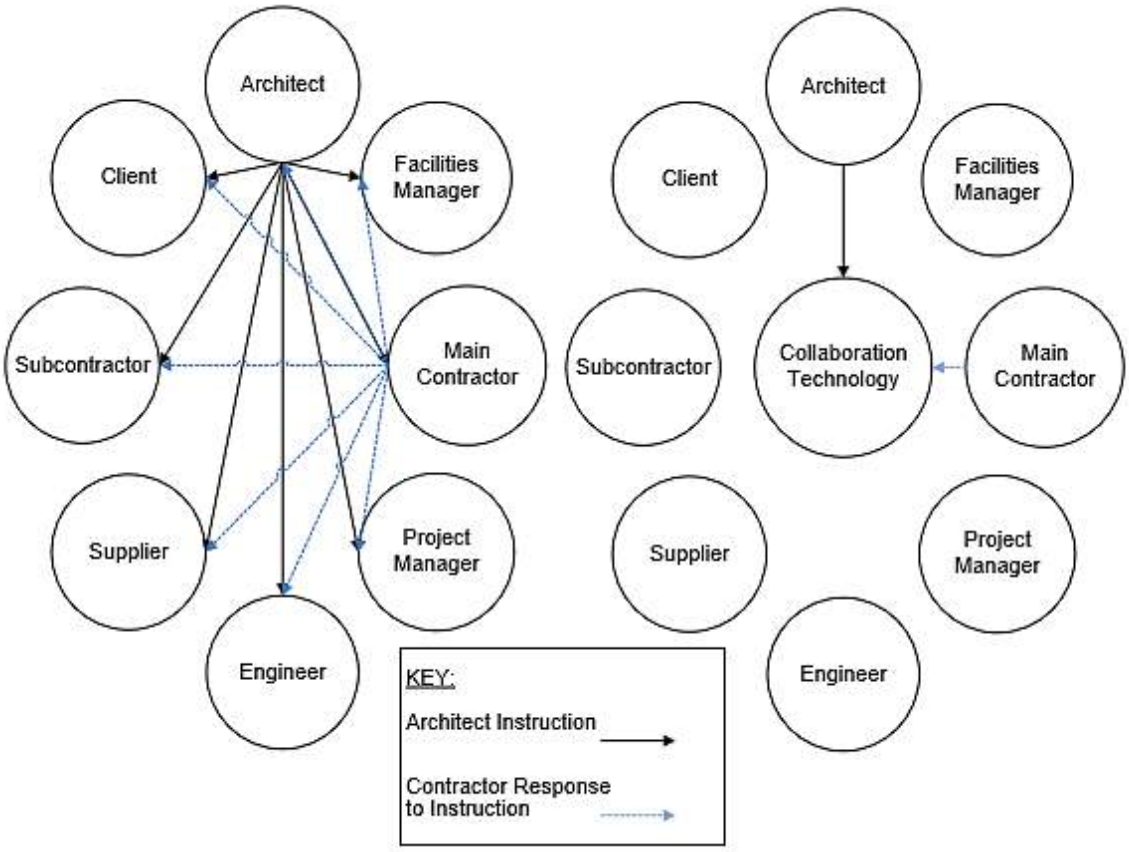

Figure 2.8: Project Collaboration (NCCTP, 2006)

A feature of the web enabled tender system is that all the information is lodged in the tender box and parties can access designated levels of information (RICS, 2005). The parties involved can include those involved in the normal tender process, the PQS and a number of main contractors, to additional participants, such as, the client and main contractors sub-contractors or suppliers. Individual parties will also have different views of the web space. There are an illustration shown in Figure 2.9 that represents the communications and views that the parties have through this system. It shows that, similar to the collaboration technology, the interested parties can access the tender box and view the information that is held in electronic format. However, different parties have separate options and accessibility to items held in this fashion. As per the normal tendering process, the tender submission can only be viewed by the client and his/her representatives and only after the tender deadline has passed (O'Connell, 2010).

Betts et al. (2006) noted that there are two separate types of web-enabled systems being applied at the moment. They are:

1. Principle based; The client administrates security, authenticity etc. aspects of the tender box.
2. Trusted Third Party (TTP); A third party administrates security, authenticity etc. aspects of the tender box.

The RICS e-tendering Guidelines (2005) suggested that the majority of systems are third party based and subject to a subscription fee. The TTP will then complete a range of tasks to ensure the process is secure, confidential and clear to all parties involved. These tasks include monitoring all tender alterations and notifying the tenderers of these changes, as they occur (CITA, 2006). Another task carried out by the TTP is to ensure the tender responses are held securely in the tender box until the deadline for submissions has expired (O'Connell, 2010). A member of the client's team can then 'unlock' the tender box to allow access to the contents.

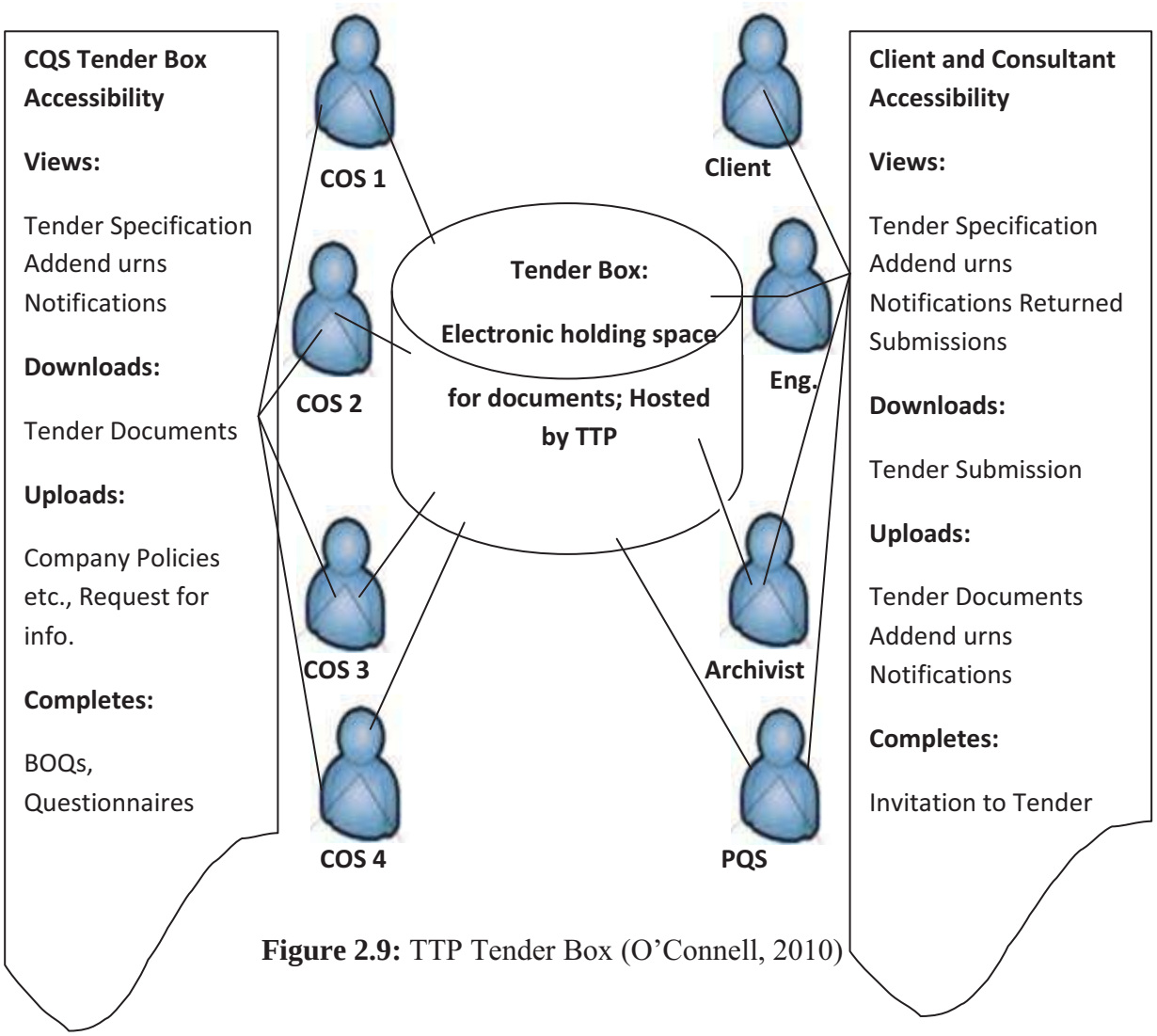

Figure 2.9: TTP Tender Box (O'Connell, 2010)

2.2.3 E-tendering: Perceived Gains, Efficiencies and Barriers

The benefits of e-tendering are perceived to be spread among the clients, their representatives, main contractors and the sub-contractors who are tendering for the works. For the most part, however, they fall under a number of headings.

As shown in Figures 2.10 and 2.11, the issuing of tender documents removes the aspect of having to re-key received tender documents into an estimator's computer. This can lead to significant time savings, which can be seen as the main efficiency generated from the use of e-tendering. These simple changes in the process were implemented in case studies by the Building Centre Trust (BCT), (2000).

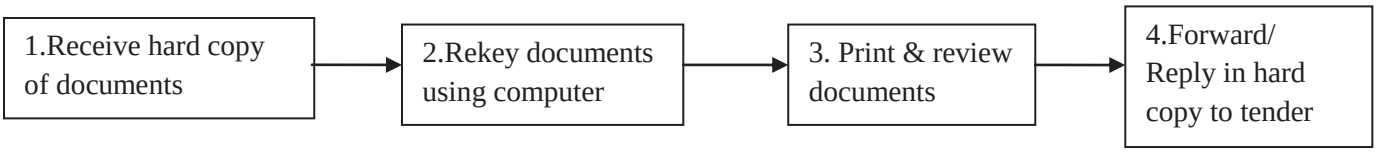

Figure 2.10: Receipt of Tender Documents CIOB (1997) Workflow

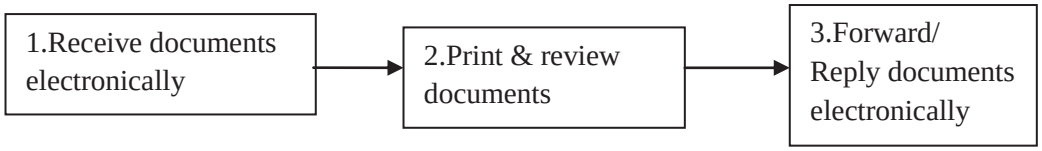

Figure 2.11: Receipt of Tender Documents New Workflow (CIOB, 1997)

One such study carried out with the Northern Ireland Department of Environment found that a saving of 95% on time was accrued due to the tender being sent to the contractor in an electronic form. This 95% saving was generated by elimination of the possibility of 50 pages of the tender not having to be "scanned, printed and verified", an exercise which could have taken upwards of three hours. Instead, the documents were received in an electronic format leading to a download time of just three minutes to the surveyor's computer (BCT, 2000). Booty (2004), in an interview with Leigh Fyffe of Scottish Life, also found that there was up to 1.5 days saved per tender, when an e-tendering system was introduced to their facilities management department. However, it was stressed that when tendering for large construction projects with numerous companies, this time saving could be greater. These time savings can be viewed as substantial, when seen from the employer's perspective. The time saved by reducing such tedious and repetitive tasks, which includes the re-keying of information, can be utilized more effectively by a highly qualified member of staff. Time savings can also

be evident in the tender appraisal. The RICS guidance notes state that the return of an e-tender should allow for more rigorous assessment. This is due to the tenders being returned in a standard computerized format, which means all the information can easily be inserted into one spreadsheet showing all the relevant figures. This removes the re-keying and re-typing exercise that is still required of the client's quantity surveyor's staff.

Crishna et al., (2003) developed a report about the benefit of e-procurement for the government of India. The report stated that there are no grounded figures on benefits. However, there are estimates that e-tendering might save vendors approximately 70% in their costs of transaction (e.g. eliminating travel, courier costs, bribes, etc). Estimated savings for government are as follows: advertising cost savings can be reduced by approximately 75% and printing costs by approximately 90%. There will also be improvements in the speed of the tendering/procurement process. The same report stated that there are likely to be transparency savings in the elimination of the corrupt 'risk premium' that those seeking government contracts find themselves having to pay; this is generally estimated at between 2% and 10% of contract price. Since this payment is always factored into a vendor's budget in normal tendering, this cost saving should also be passed on to government.

Leipold (2003) reported that benefits of e-procurement applications covered wide areas. Table 2.1 represents the report findings regarding the benefit of e-procurement in public projects.

Sell (2005, p13) explains how time and cost savings can be gained. Avoiding the postal system leads to possible reductions in the tender period or use of previously abortive time to concentrate on the production of the tender. Printing costs will drop, as well as copying and postage costs, together with the associated staff time and overhead costs. Horsman (2001, p1) identifies research undertaken by the Office of Government Commerce (OGC) in 2001 which claimed that if a new web-based electronic tendering system was to replace the traditional tendering system in the purchasing of products and services for civil central government, it could produce savings of as much as £13 million in 4 years and reduce suppliers' tendering costs by £37 million over the same period. The Foundation for Information Technology in Local Government (FITLOG) (2002, pp.4–7) suggests that e-tendering creates greater transparency; it is easier to track the progress of tenders through internal systems, consequently keeping a ready made audit trail for both clients and contractors. There is the potential for faster and more

accurate responses to questions and points of clarification during the tender period. When tenders are returned electronically there is the potential for a fairer and fuller assessment of tenders with the use of computerized analysis. Additionally many web-based systems can check automatically for unusual or incomplete entries, reducing the need for additional communications, re-tenders and time spent at the analysis stage of the process (Lavelle &Bardon, 2009). Brown (2006) also argues that paperwork held in electronic format is less likely to get lost or mislaid, either in the post or the office. Additionally, Preston (2001) identifies further advantages as being the reduction in levels of tender administration and providing a single source of information. Also, there is no duplication of any tender documentation including sending multiple e-mails or copying disks, all tenderers have access to the same information all the time and version and revision control is inherent within the system.

Table 2.1: Benefits of e-procurement solutions, (Leipold, 2003)

		Government	Supplier	Public
Transparency		- Anti-corruption - Increased number of suppliers - Better integration and interaction between governments - Professional procurement monitoring /management - Higher quality of procurement decisions and statistics - Political return from the	- Increase fairness /competition - Improved access to govt. market - Open the government market to other suppliers - Stimulation of SME participation - Improve access to public procurement information	- Access to public procurement information - Monitor public expenditure information - Participation - Government accountability
Efficiency	Costs	- Lower prices /transaction costs - Staff reduction - Reduction in fiscal	- Lower transaction costs - Staff reduction - Improved cash flow	- Redistribution of fiscal expenditure
	Time	- Simplification /elimination of repetitive tasks - Communication anywhere/ time	- Simplification / elimination of repetitive tasks - Communication anywhere/ time - Shorter procurement cycle	- Communication anywhere/ time

2.2.3.1 Cost Savings

Following from the above time savings, it is easy to understand that there will also be cost savings on individual tenders due to staff not having to spend large amounts of time checking re-keying and verifying information. However, this is not the only form of saving that is generated through the use of e-tendering. There are also savings to be made on the administration and printing costs. Returning to the earlier example of time savings per tender for Scottish Life (Booty, 2004), they reported a further saving of £1,500 per tender due to the use of a closed-bid e-tendering system. This was merely in the photocopying and other resource areas required to complete the tender package. However, will the clients only benefit from these savings or are these costs merely passed onto the supplier? Passing these costs on to the supplier will in turn only serve to further increase each and every tender price. This was not seen to be the case, however, with the fit out contractors, Interior Design Concepts. They used this system to win contracts from Scottish Life. Booty interviewed their managing director, Mike Aksoy and found that approximately £250 was saved per tender through decreased paperwork and courier costs. Thus, it can be seen that savings can accrue to all parties involved in the tender process.Again Working Borough Council (2003) documented their savings by utilizing a 'paper less' tendering system. They concluded that up to £650 was saved per tender in using this system.

2.2.3.2 Improved Accuracy

In the traditional paper based system, errors can occur in the computation of the tender sum during the manual completion of a BOQ. This task is also known as "inking" a BOQ. The CIB (1997) made particular reference to this. They said specific terms should be defined within the tender documentation regarding computational errors in a BOQ. Specifically the terms should state whether the tender rates or overall price is dominant when an error occurs. With e-tendering these computational errors should not occur. Initially, the BOQ will be received in an electronic format, with only the rate column being accessible for adjustment by the main contractors (CITA, 2006). The software used for the input of information will systematically calculate the overall price based on these rates. This will mean that errors in computation can be removed from the process. This aspect of e-tendering was seen by respondents to CITA's e-tendering Survey (2006) as one of the main factors that attracted industry professionals to the system.

2.2.3.3 Security

Du et al., (2004), suggested that the traditional hard copy tendering system was not as secure, as required for tenderers to feel safe that their confidentiality was protected. However, Du et al., (2004), described how the technology is available, when it is carefully integrated into the e-tendering system, to fully secure all access, uploads and downloads to a web-enabled tender system. This they suggested not only improved efficiency but the security and reliability of the traditional system.

2.2.3.4 Barriers and Disadvantages

Martin (2003) found during his UK survey that project collaboration technologies had a number of advantages, some of which were discussed in the above paragraphs, and disadvantages. As discussed earlier, the advantages of such a system includes items, such as, increased transparency, speed of information transfer and increased accessibility. On the negative side, Martin found that individuals revealed there was a cost, in both time and money, to print scale drawings. Additionally, it was established that some members did not have adequate IT and there was a lack of a filing index. More relevant to e-tendering is the paper by Eadie et al., (2007). Their literature review and survey suggest that there were eleven marked barriers to the e-tendering process being undertaken in Northern Ireland. These barriers were: the legal position of e-procurement, company culture, upper management support, IT infrastructure, IT systems too costly, lack of technical expertise, lack of e-procurement knowledge/skilled personnel, lack of business relationship with suppliers providing e-procurement,security of transactions, interoperability concerns, no business benefit realized.

The CRC Construction Innovation team (2006) explain that one of the main negative issues surrounding e-tendering is security threats impacting on the systems involved, including violations of data integrity and confidentiality. E-tendering critics also point out that it must be considered whether companies are in a position to tender on-line. Research undertaken by the RICS E-Tendering Service in 2004 indicates a concern that the most economically viable contractor may not be selected if e-tendering is exclusively used to procure work. Tenderers may not have access to a computer, the internet or may not have the aptitude to use the associated systems. Small and Medium Enterprises (SME's) in construction do not always readily incorporate internet use in their normal working patterns and some will still be reluctant to engage with projects that require engagement via the internet, despite social norms.

Concerns also exist within the industry with regards to the reliability and standard of the systems that are available to use (Zheng, 2004). For a consultant quantity survey (QS) to adopt an e-tendering web-based system and acontractor to use it they need to be confident that it will not malfunction and can be relied upon.

Rankin et al., (2005) also identify that problems arise with the communication and sharing of information through using e-tendering systems. For example, the contractor may have adequate skills, equipment and capabilities to complete tenders on line. But how do they communicate this information to their subcontractors who may not have such capabilities? This may also be a problem when the consultant QS is requiring input from the client, who again may have no such resource or aptitude to access the required systems (Rankin, 2006).

A further challenge that exists in the successful implementation of e-tendering is converting the functionality of the traditional paper-based system to an electronic environment whilst maintaining legal compliance. Betts et al (2006) identify that the technology that facilitates e-tendering is relatively new and ever changing and as a consequence the law has not yet developed sufficiently to provide certainty of enforcement for electronic transactions.

In contrast to Preston, Zheng et al., (2004) voice concerns over the choice of web based tender systems that are available and identify that mobilization costs may be significant for some participants and constant upgrading of IT systems will have to take place to ensure participants can continue tendering, consequently increasing the cost of utilizing such methods.

These issues coupled with the fact that the construction industry is notorious for being slow to accept change, go some way to explaining the negativity that surrounds e-tendering. Booty (2004) identifies that people are often going to be scared of new ways of working. They need to be assured that the new method is as good, if not better than current methods.

2.3 Tendering in Palestine and Gaza Strip

Assessment of current legal, institutional, and procedural arrangements regarding tendering in Gaza Strip is an important step towards creating sound e-tendering system. This section aims to highlight the current practices in the mentioned issues.

In Gaza Strip, the clients and the consultants are still using the traditional system of tendering with some individual attempts from consultants to use the technology in the tendering process.

In Gaza Strip, tendering units use different bidding documents depending on the donor financing the project. In most cases, they use Word bank (WB) standard bidding documents (SBDs) for WB-financed projects, with modifications for other donor-financed projects. But some Palestinian National Authority (PNA) institutions use bidding documents that they have created themselves. For example, Palestinian Economic Council for Development and Reconstruction (PECDAR) has prepared its own bidding documents for National Competitive Bidding (NCB) which mainly follow WB standard bidding document, and Ministry of Housing and Public Works (MHPW) has just prepared a draft bidding document for the procurement of works, based mainly on the Jordanian national SBD for works. The multiplicity of bidding documents creates additional work and complications during tender and bid preparation (Thabet, 2006).

By the end of the year 2000, it is estimated that more than 60 IT companies and more than 100 small computer stores established in the West Bank and Gaza. Most of IT companies are located in Ramallah, Jerusalem, and Gaza (Thabet, 2006). These companies deal with different types of IT sectors like hardware, software, internet services, office automation equipment, etc. In addition to the local companies, many international firms have already opened direct office, or established direct representative operations in Palestine such as Hewlett-Packard Development Company (HP), Timex, and Siemens.

Several surveys conducted in the past few years to determine the impact IT and the use of e-tendering system at the construction industry in various countries. Such surveyswere conducted in Italy, New South Wales, New Zealand, Scotland, Australia, Japan United Kingdom, Sweden, Denmark, and Saudi Arabia, also other studies for other countries. But in Gaza Strip it is the only study for Thabet (2006)that have been done to investigate IT applications in the construction industry.

Karirri (2008) explain in his study that all respondents (clients, consultants and contractors) agreed that the client who adopts the e-tendering in his system will attain a competitive advantage over other clients. The findings show that, the construction

industry in the Gaza strip in a critical need to adopt the e-tendering system to attain the continuous improvements and sustainable upgrading throughout the informational technologies techniques like (software systems, intranet, internet, groupware and other IT enablers). As well as he concluded that, the majority of respondents (51.9%) believed that, the e-tendering system will need at least five years to be established in the construction industry. This agreement level within the clients, consultants and contractors are consistent and harmonize. These results will guide us to take the rapid corrective actions and the development steps to facilitate adopting this system as possible with a short period of time, and not to wait additional five years.

2.4 Summary

For several years, tendering has been undertaken as part of the traditional contractual procurement process, which operated on the separation of the design and construction phases. However, this has started to change with increased technological complexity, design and build procurement, and client expectancies. E-tendering has been assumed to be more cost effective than the current, traditional method, in addition to time savings offered by the process. In simplistic terms, this will have implications for reduced printing, copying and courier costs and also reduce the chances of miscommunication. There also appears to be a general opinion within the industry that e-tendering should be made more main- stream and accessible to all members of the supply chain.

The author began this chapter with a number of objectives that were to lead to the completion of an overall chapter aim discussed in section 2.1. The first objective was to understand and discuss the traditional tender process in the construction industry. This objective was realized by defining tendering as the process required to obtain a firm price from a suitable contractor to complete the works the client. Further to this, the tender process was broken down into a four-stage process; Pre-qualification, Tender invitation and submission; assessment and contract award. Then the author review the traditional tendering methods which are open tendering and multi-stage tendering. Having discussed the tendering process, the author then assessed the particular problems to be addressed within traditional tendering, which summarized in;rekeying of information; security concerns, and subcontracting. Then, as per the author's second objective, the e-tendering system defined and discussed from the many sides as the e-tendering categories, e-tendering process, and the advantages and disadvantages of the e-tendering system. That transfer us to the third objective which is the main advantages

of the e-tendering system are saving time and cost for all the construction contract parties.Also these systems reduce the need for labour intensive processes, prior to and after the receipt to the communication of any tender documentation. They also ensure that the parties involved are always able to access the information and use it at their discretion when completing a tender for a project. On the other hand there are many disadvantages discussed, where it was established that some organizations did not have adequate IT and there was a lack of a filing index. That need to encourage the IT infrastructure before establish the e-tendering system.This disadvantages lead to some barriers which: the legal position of e-procurement, company culture, upper management support, IT infrastructure, IT systems too costly, lack of technical expertise, lack of e-procurement knowledge/skilled personnel, lack of business relationship with suppliers providing e-procurement, security of transactions, interoperability concerns, no business benefit realized.

The final objectivestudy the tendering process in Gaza Strip in the construction Industry, where found that follow the traditional process of tendering and their are a little efforts to improve the tendering system. The author study the willingness of implementation the new system of tendering by using the questionnaire survey in chapter four.

CHAPTER THREE

METHODOLOGY

This chapter discusses the methodology which is used in this research. The methodology includes information about the research design, population, sample size, data collection, questionnaire design, questionnaire content, instrument validity, pilot study, and the method of processing and analyzing the data. The questionnaire is used as the main approach to collect the data and perspectives of the respondents.

The purpose of any research is to discover answers to questions through the application of scientific procedures. In line with this and as stated in chapter one, the main purpose of this research is to investigate the possibility for implementation of e-tendering in the construction tenders. In addition, the study will explore the benefits and the barriers of e-tendering system.

Kallet (2004) explained that, the methods section should describe what was done to answer the research question/hypothesis, describe how it was done, justify the experimental design, and explain how the results were analyzed. In addition, the structure of methods section should describe the materials used in the study, explain how the materials were prepared for the study, explain how measurements were made and what calculations were performed, and state which statistical tests were done to analyze the data.

3.1 Research Design

In this research, the questionnaire approach was used to collect the data.

In this research, the questionnaire approach was used as a quantitative approach to gain insights and to understand people's perception regarding the bidders' participation process in the construction tenders. The justification to adopt the questionnaire approach returned to the following reasons:

1. The questionnaire approach can be considered as an inductive approach and necessarily encompasses a wide range of research strategies and methods, embracing the perspectives both of researchers and participants, and has a primary aim of understanding the meaning of human action.
2. From the questionnaire approach, the researcher can obtain both, qualitative data which is related to the perspectives and attitudes of the respondents in addition to the quantitative data which present the facts and actual cases in the works.

Both quantitative and qualitative approaches are essential to the developments and continuous improvement of the construction industry.

3. Using the questionnaire approach is considered an easy, rapid and efficient approach to collect the data, facts and attitudes of the contractors, clients, or consultants.
4. The questionnaire approach is the widely used approach for descriptive and analytical surveys in order to find out the facts, opinions and views; this discussion is supportive by many researchers like Fellows and Liu, (2008) and Naoum (2007).

Haseman (2006) explained that, quantitative research embraces a set of scientific, deductive approaches and establishes research questions and hypotheses from theoretical models and then tests them against empirical evidence, while the qualitative research operates quite differently. It prefers inductive approaches and necessarily encompasses a wide range of research strategies and methods, embracing the perspectives both of researchers and participants, and has a primary aim of understanding the meaning of human action.

3.2 Targeted Group

The questionnaire was targeting all the Palestinian Contractors Union (PCU) who are classified under the five categories in all fields during the year 2013. Also the questionnaire targeted the consultants classified by the Engineers Syndicate during the year 2013, and the public owners and clients. Figure 3.1 illustrates the methodology flow chart which includes the objectives of the study, questionnaire design, data analysis, discussion, conclusion, and recommendations.

3.3 Research Period

The study started on June 2013 when the initial proposal was approved. The literature review was completed at the end of August 2013. The validity testing, piloting and questionnaire distribution and collection took two months and completed on the beginning of December 2013. The study was carried out in Gaza strip contractors, consultants, and clients. The analysis, discussion, conclusion and recommendation were completed on the beginning of March 2014.

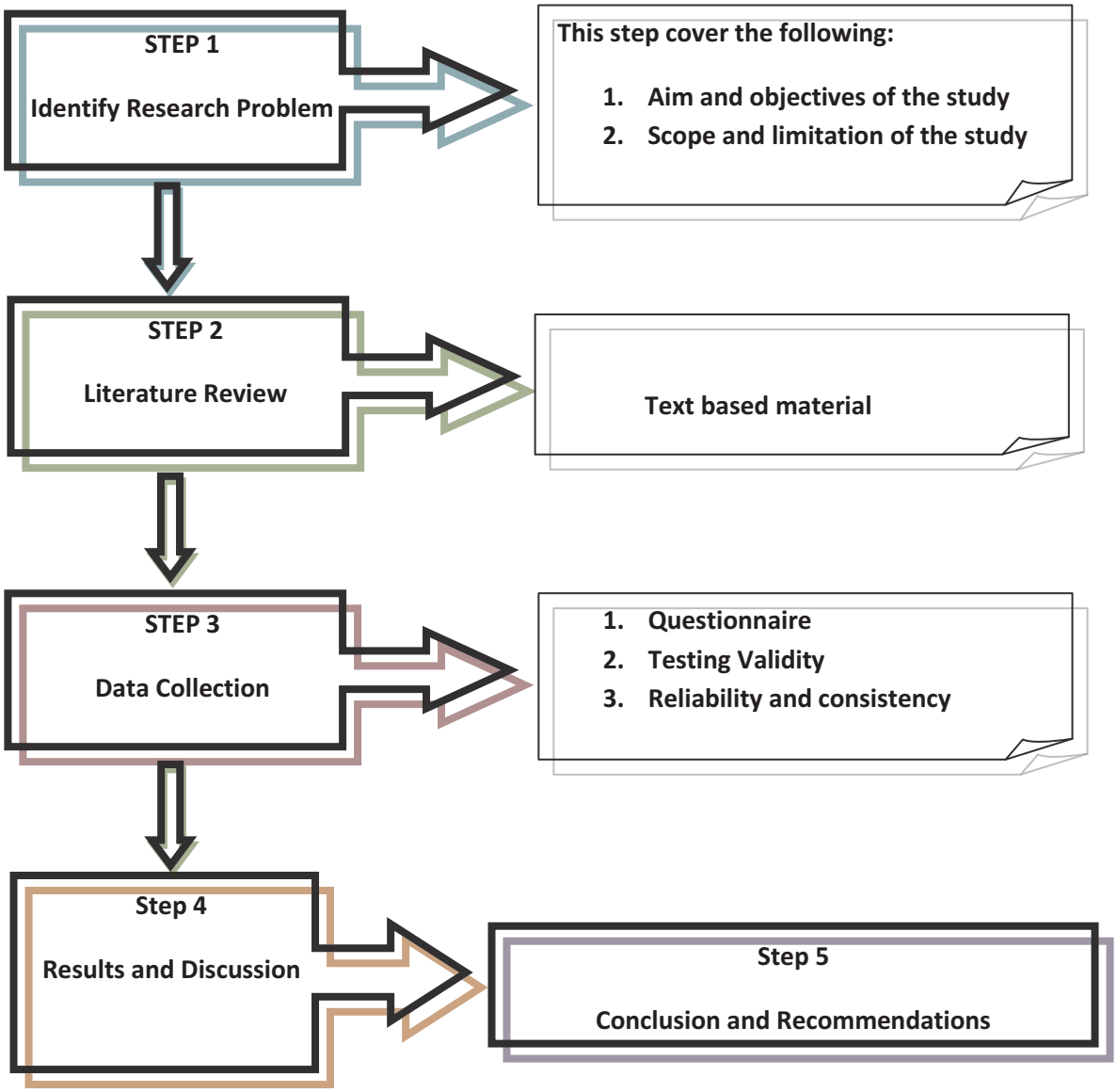

Figure 3.1: Flow Chart of Methodology

3.4 Research Population

Three populations were targeted in this research, the first population is all Palestinian Contractors Union "PCU" categories that are classified in all fields in Gaza Strip. These categories are 1st, 2nd, 3rd, 4th and 5th categories who have valid registration. All categories will be considered in this study as the aim of this research is to study the understanding of the e-tendering in the construction industry and to study the possibility of it's implementation.

Based on the PCU recent list in December 2013, the size of population for the five categories is 297 companies. The second population represents the clients and their representative such as consultants "1st class". Unfortunately, there is no official report

mention the number of clients in Gaza Strip. Such rareness of the data reflect margin of barrier. To overcome this problem, sessions with the expertise and local staff who are working in several associations and ministries were hold to list the names of clients who have experience and works in the tendering and bidding process and mainly in the construction tenders. These steps were taken to verify the consistent and reliable results and output as possible. The total populations that were aggregated were 70 clients.

Based on EngineersSyndicate– Gaza Governorates recent list November 2013, the size of population of client's representatives such as consultants first class is 69. Table 3.1 shows sample figures for the three populations of the contractors, consultants and clients.

3.4 Sample Size

Fellows and Liu, (2008) defined the sample as a part of total population that represent this population. Israel (2003) explained that, there are several approaches to determining the sample size. These include using a census for small populations, imitating a sample size of similar studies, using published tables, and applying formulas to calculate a sample size.

Fellows and Liu, (2008) showed that, three types of sampling can be conducted during the research study; a systematic sampling, stratified sampling, and the cluster sampling. The stratified sampling was used in this study after the sample size determination. Fellows and Liu, (2008) showed that, having determined the strata sampling occurs, most commonly by considering the relative importance of each stratum in population and using such weighting to divide this population, the sample size between strata, the elements to be sampled. Theses elements will be selected randomly from each stratum. To determine the sample size for each population of contractors and clients, Kish (1965) equation was used. Several studies such as (Assaf et al., 2001) and Abdul-Hadi (1999) used this equation. The population of the contractors is 297 while the population of clients is 70, and the population of the consultants is 69.

$$n = \frac{n'}{1 + (\frac{n'}{N})}$$

Where:

n' is the sample size from infinite population, which can be calculated from this formula [$n' = S^2 / V^2$]. The definitions of all variable can be defined as the following:

n: sample size from finite population.

N: Total population (297 contractors, 70 clients, and 69 consultants)

V: Standard error of sample population equal 0.05 for the confidence level 95 %, t=1.96.

S^2 : Standard error variance of population elements, S^2= P (1-P); maximum at P= 0.5

The sample size for the contractor's and clients population can be calculated from the previous equations as follows:

$n' = S^2 / V^2 = (0.5)^2 /(0.05)^2 = 100$

Contractors: $n = \frac{100}{1+(\frac{100}{297})}$ =74.63

Clients: $n = \frac{100}{1+(\frac{100}{70})}$ = 41.15

Consultants: $n = \frac{100}{1+(\frac{100}{69})}$ = 40.81

Table 3.1 show the population, calculated sample size and the response rate for each category of contractors and each type of clients. Although the calculated sample size for contractor, clients, and consultant is relatively small, the questionnaire was distributed more than the sample size as shown in Table 3.1. This will reflect higher reliability and benefits for the study. To overcome the risk of not responding from the contractors and clients, the questionnaires that were distributed were higher than the calculated sample size. Fortunately, the response rate was very high.

For the most questionnaires, the response rate is normally attracting return rates of between 20-30%. According to Moser and Kalton (1971), a response rate of less than 30% is likely to produce results subject to non-response bias. Based on this, this response rate is reasonable and will reflect good results and outputs. The population of both contractors and clients were selected randomly from the available lists of each category. The selection process was done by selecting one (contractor, client or

consultants) from each category and excludes the next till reaching the end of the list (El Karriri, 2008)

Table 3.1: Contractors, clients, and consultants population, sample size and response rate

	Population	Sample Size	Distributed Questionnaire	Number of Respondents	Response Rate
Contractors	297	75	95	85	89.5%
Clients (NGO's, Ministries & municipalities)	70	42	42	35	83.3%
Consultants	69	41	50	47	94.0%
Total	436	158	175	162	92.6%

For the first type of population which is related to the contractors, the sample was selected randomly from each level of the five categories to reach the required sample size with a non replacement selection. For the second type of population which is related to the clients and their representatives (consultants), the sample was also selected randomly from the clients represented by the ministries, Non Governmental Organizations (NGO's), international organizations, municipalities that are working in the bidding and tendering processes, besides, the majority of the consultants that are classified under 1st class category in the engineering syndicate was targeted. The weighted number of each category was calculated.

3.5 Data Collection

Questionnaire was chosen to be the method of collecting data in this research. Scanning by questionnaire can be the fastest and the easiest method of collecting data and is more accurate when starting processing and analyzing these data.

3.6 Questionnaire Design and Content

In the early stage of designing the questionnaire, one version questionnaire was used to collect the data and information from contractors, consultants and clients. This questionnaire includes three sections:

Part one: This part consists of personal information of the responders. This information were(Type of work, organization location, organization years of experience, respondent's position, respondent years of experience, classification of the company according to the National Classification Committee, number of completed projects in the last five years, annual revenue in Dollar, and having an IT department).

Part two: This part consists of questions aim to determine the Internet and communication technology applied by the organization, as well as, to implement the electronic procurement management system. It consists of several questions varied some binary, and (8) sentences answered according to five-point Likertscale.

Part three: This part consists of questions that aim to determine the advantages and disadvantages of electronic tendering system, according to the target groups within the sample of the study. This part consists of (11) sentences answered according to five-point Likertscale.

The content of the draft questionnaire was discussed with the supervisor of the thesis. The questionnaire was developed and distributed to the contractors and clients in Arabic language. The researcher believes that, the Arabic language will be much effective and easier to be understood to get more realistic results. Respondents were asked to give a frank and honest account of their opinions.

3.7 Instrument Validity and Reliability Test

Heffner (2004) explained that, validity refers to the degree in which our test or other measuring device is truly measuring what we intended it to measure.

The amended questionnaire was done by the supervisor and three expertise in the tendering and bidding environments to evaluate the procedure of questions and the method of analyzing the results. The expertise agreed that the questionnaire was valid and suitable enough to measure the purpose that the questionnaire designed for.

Statistically, to insure the validity of the questionnaire, Two statistical tests were applied. The first test is Criterion-related validity test (person test) which measure the correlation coefficient between each item in the field and the whole field. The second test is structure validity test (person test) that used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the whole questionnaire. It measures the correlation coefficient between one filed and all the fields of the questionnaire that have the same level of similar scale. The P- Values

were less than the significance level of 0.05 and 0.01, so the correlation coefficients of the fields are significant at α= 0.01 or α= 0.05 and statistically, it can concluded that the fields are consistent and valid to be measure what it was set for.

Heffner (2004) showed that, the reliability is synonymous with the consistency of a test, survey, observation, or other measuring device. "The reliability test refers to the test's consistency among different administrations. To determine the coefficient for this type of reliability, the same test is given to a group of subjects on at least two separate occasions. If the test is reliable, the scores that each respondent receives on the first administration should be similar to the results on the second round".

Due to complicated conditions that the contractors is facing at the time being, it was too difficult to ask them to responds to our questionnaire twice within short period. Overcoming the distribution of the questionnaire twice to measure the reliability can be achieved by using KronpakhAlph coefficient and Half Split Method through the SPSS software.

Measuring the reliability by using the half split method showed that the corrected correlation coefficients values are between 0.800 and 0.927. This emphasizes that, according to the half split method, the results and questionnaire are reliable. Besides, The KronpakhAlph coefficient was in the range from 0.8330 and 0.9282, This range is considered high; the result ensures the reliability of the questionnaire.

Although, the reliability of the tool of the study has been checked throughout choosing a pilot sample of (30) respondents. The questionnaire was applied twice on them and the results were compared, and they were almost the same. By which the researcher ensured the reliability of the tool of the study. In addition, the researcher used Alpha Cronbach's Alpha for the five-option sentences according to Likert Scale. The results showed that Cronbach's Alpha for part two of the questionnaire is (0.70) and for part three (0.69) and this shows a good degree of the tool of study reliability.

3.8 Data Processing and Analysis

The collected raw data was first sorted, edited, coded and then entered into computer software. Two programs were used, the Excel sheet and SPSS software. Appropriate graphical representations and tables were obtained to understand and analyze the questions. The ordinal scale was used in the analysis process. The ordinal scale is a ranking or rating data which normally uses integers in a seconding or descending

order. The Relative Importance Index (RII) was used in the analysis in addition to other approaches such as the one way ANOVA and frequencies and percentiles.

In this research, Kolmogorove- Smirnov test was used to identify if the data follow normal distribution or not, this test is considered necessary in case testing hypotheses as most parametric test stipulate data to be normality distributed. The results test as shown in table 3.3 clarifies that the calculated P-value is greater than the significant level which is equal 0.05 (p-value > 0.05), this in turn denotes that, the data follows normal distribution, and so parametric tests such as must be used such as (person test, t-test, ANOVA test).

SPSS program was used to analyze all sections, while the excel was supportive in the presentation and layout. The main factors which are used in analysis were the mean and the percentage weight. Ranking was followed by comparison of mean values for all the three parties of the population. The analyzed data was finally presented using descriptive methods for easy interpretation and to enable comparisons and inferences to be drawn.

CHAPTER FOUR

RESULTS& DISCUSSION

In this chapter, the researcher shows the results of data analysis, which was collected by the tool of study (Questionnaire). This is throughout describing the general characteristics of the sample, as well as, analyzing the sentences that are related to other parts of the questionnaire, in order to testing the hypothesis.

4.1 Section One: Organizational Profiles (Contractors, Client and Consultants)

This section includes nine (9) questions that ask about the nature of the work of the respondent organization, place of the organization (contractors or clients), information about the position and the experience of the respondents and organization, classification of the company if the respondents are contractors, number of completed projects inthe past three years, annual turn over, and if the organization have a separated IT department.

4.1.1 Type of Work

The sample of the study included (35) owner's organization such as ministry, municipality, NGO's and International Institutions in percentage of (21%), (47) consulting offices in percentage of (28%), (85) contracting companies in percentage of (51%). Figure (4.1) shows the distribution of respondents.

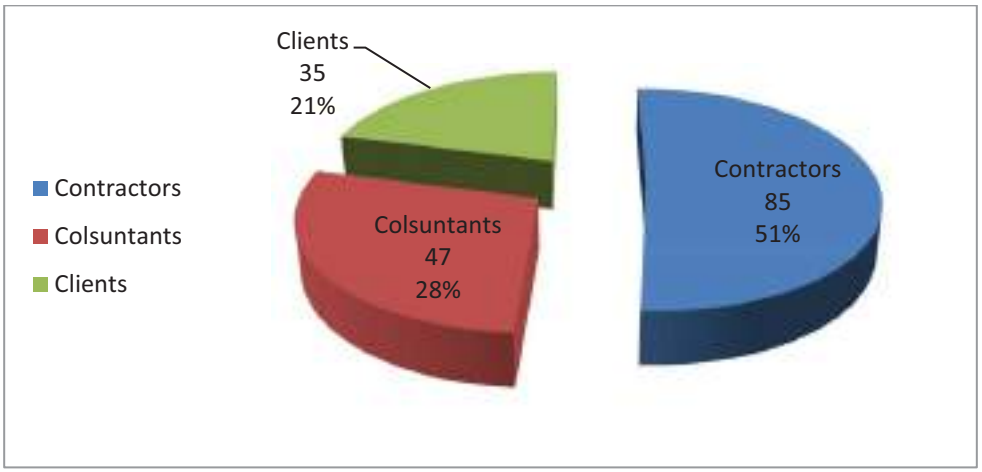

Figure 4.1: The type of works and the percent of the targeted groups

4.1.2 Location of the Contractors, Clients and Consultants

From Table 4.1 it is observed that, 54.3% from client, 78.6% from consultant, and 47% from the contractor (57.5% from the total sample) works in Gaza, and 22.8% from client, 4.3% from consultant, and 22.4% from the contractor (13.8% from the total sample) works in North Area, and 8.6% from client, 4.3% from consultant, and 16.5% from the contractor (11.4 % from the total sample) works in Middle Area, and 14.3% from client, 12.8% from consultant, and 14.1% from the contractor (17.4% from the total sample).

Table 4.1: Location of the contractors, clients, and consultants organizations

Location of organization	Gaza (%)	North Area (%)	Middle Area (%)	South Area (%)	Total (%)
Client	54.3	22.8	8.6	14.3	100
Consultant	78.6	4.3	4.3	12.8	100
Contractor	47.0	22.4	16.5	14.1	100
Total (%)	57.5	13.8	11.4	17.4	100

The culture of clients, consultants, and contractors in Gaza strip may givesome diversities in their opinions due to difference of places. This changing of their thinking may also strengthen in the results of the research.

4.1.3 Years of Experience for the Organization

Table 4.2 shows that, 8.5% from the client, 6.4% from consultants, and 4.7% from the contractor have less than 5 years experience, 5.7% from the client, 6.4% from consultants, and 14.1% from the contractor have an experience between 5 to 10 years, 11.4% from the client, 36.2% from consultants, and 43.5% from the contractor have an experience between 11 to 15 years, and 74.3% from the client, 51.1% from consultants, and 37.6% from the contractor have an experience more than 15 years.

Table 4.2: Sample study based on organization years of experience

Organization years of experience	Less than 5 years (%)	From 5 – 10 years (%)	From 11 – 15 years (%)	More than 15 years (%)	Total (%)
Client	8.6	5.7	11.4	74.3	100
Consultant	6.4	6.4	36.2	51.1	100
Contractor	4.7	14.1	43.5	37.6	100
Total (%)	6	10.2	34.7	49.1	100

From these results it is observed that, 49.1% of the surveyed samples have experiences more than 15 years, while 6% of the surveyed samples have experiences less than 5years for their organizations. This reflect good indicators as the obtained results will be concentrated and comprehensive to add a value for this research throughout the long commutative years of experiences, knowledge and management that these organizations were obtained. Moreover, the variety of experiences between each group (less than 5 years, from 5-10 years from 11-15 tears and more than 15 years) expected to enrich the research with different knowledge and information.

4.1.4 Position of Respondent

Table 4.3 shows that, 14.3% from the client, 21.3% from consultants, and 17.6% from the contractor (18.0% from the total samples that answer the questionnaires) was a project manager. 34.3% from the client, 42.6% from consultants, and 18.8% from the contractor (28.7% from the total sample that answers the questionnaires) was an office engineers. 25.7% from the client, 29.8% from consultants, and 50.6% from the contractor (39.5% from the total samples that answer the questionnaires) was site engineers. And 25.7% from the client, 6.4% from consultants, and 12.9% from the contractor (13.8% from the total sample that answer the questionnaires) was other such as; administrative officer, quality engineer, quantity surveyors, project coordinator, general manager, and accountant.

Table 4.3: Sample study based on position of respondents

Position of Respondent	Project manager (%)	Office Engineer (%)	Site Engineer (%)	Other (%)	Total (%)
Client	14.3	34.3	25.7	25.7	100
Consultant	21.3	42.6	29.8	6.4	100
Contractor	17.6	18.8	50.6	12.9	100
Total %	18	28.7	39.5	13.8	100

4.1.5 Respondent's Years of Experience

Table 4.4 shows that, 5.7% from the client, 10.6% from consultants, and 15.3% from the contractors (12% from the total sample) have years of experience less than 5 years, 37.1% from the client, 23.4% from consultants and 36.5% from the contractor (33% from the total sample) have years of experience between 5 to 10 years. 31.4% from the client, 38.4% from consultants, and 23.5% from the contractors (29.3% from the total sample) have years of experience between 11 to 15 years. And 25.7% from the client, 27.7% from consultants, and 24.7% from the contractors (25.7% from the total sample) have years of experience more than 15 years.

Table 4.4: Sample study based on respondent's years of experience

Respondent's years of experience	Less than 5 years (%)	From 5 to 10 years (%)	From 11 to 15 years (%)	More than 15 years (%)	Total (%)
Client	5.7	37.1	31.4	25.7	100
Consultant	10.6	23.4	38.3	27.7	100
Contractor	15.3	36.5	23.5	24.7	100
Total (%)	12	33	29.3	25.7	100

These results illustrate that, approximately, quarter of the samples 25.7% of the contractors, clients and consultants has an experience more than 15 years, besides, and one third of the respondents 29.3% have experience more than 10 years. These results provide a level of satisfaction that the obtained data reflect what it was designed for. Furthermore, it is important to observe that, the good relationship between the researchers and the respondents will motivate those respondents to provide satisfactory inputs, facts and information. The respondents, who have an experience less than 5 years and answered the questions, did not necessarily designate low level of satisfaction for the researcher. Those respondents have good positions in their organizations to provide an accurate and precise data. The bursting details of the respondents' experiences are shown in Table 4.4.

4.1.6 Classification of Contractor's Companies

As for the classification of the companies according to the National Classification Committee, where this question was for contraction companies, (85) respondent as following: 44.2% work at first class companies, 26.3% at second class companies, 21.1% at third class companies, and 8.4% work at four class and above. Figure 4.2 shows the distribution of contractors on these categories.

This results shows that, the most of the samples 44.2% of the contractors have a first class classification, and approximately, quarter of the samples 26.3%, 21.1% of the contractors have a second and third class classification respectively.That give more accuracy of the results because they have the most experience of tendering.

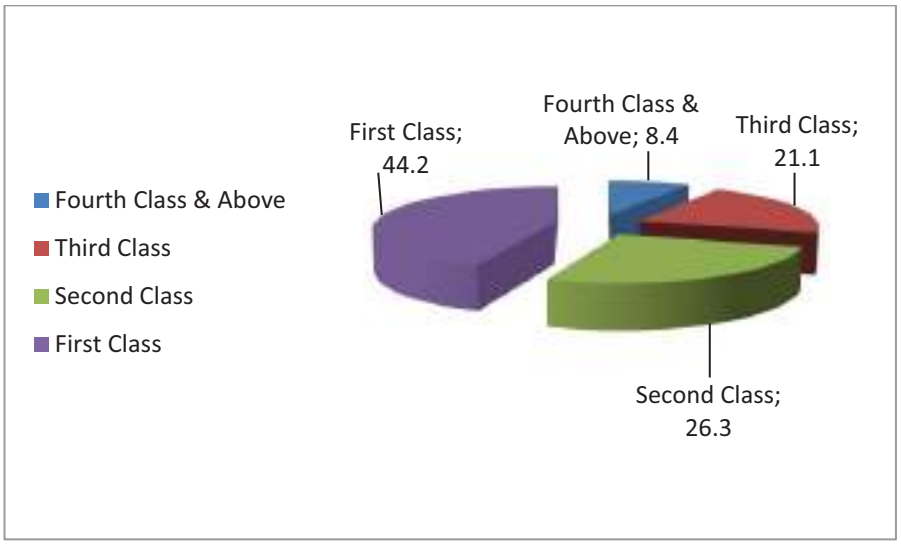

Figure 4.2: Classification according to the national classification committee

4.1.7 Number of Completed Projects for Contractors

Figure 4.3 shows the description of the sample according to the number of completed projects through the last five years at their organizations. The results show that (85) respondents answered this question, and they are as following: 46.2% work at companies that have more than 20 completed project, 27.7% of companies that have 10 to 20 completed projects, 17.7% of companies that have 6 to 10 completed projects, and the rest 8.4% of companies that have 1 to 5 completed projects.

This indicates that most of companies have a very good experience in tendering that enables them to give accurate answers for the research.

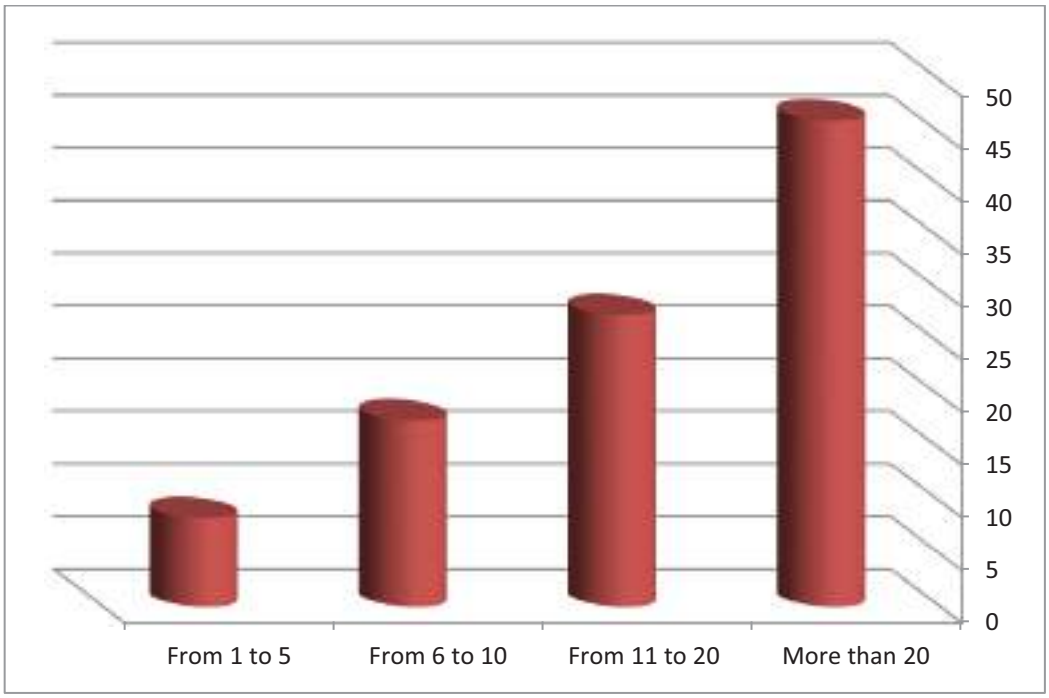

Figure 4.3: Number of completed projects in the past five years

4.1.8 Annual Revenue for the Construction Companies

As for the annual revenue for the construction companies, (82) respondent answered this question as following: 74.4% work at companies that have less than 0.5 million Dollar as annual revenue, 14% at companies that have 0.5 to 1 million Dollar annual revenue, 5.8% at companies that have 1 to 5 million Dollar annual revenue, and the rest 5.8% at companies that have more than 5 million Dollar annual revenue.

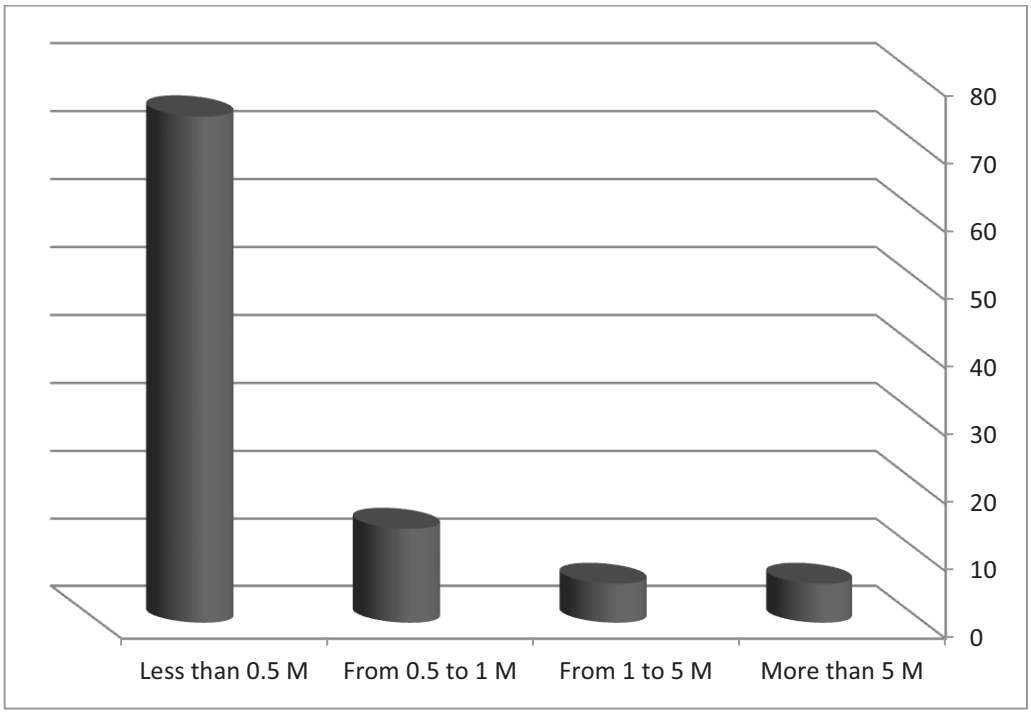

Figure 4.4: Annual revenue for the construction companies

Political situation in the last few years affected the construction business in Gaza; most of the construction companies stated that, their annual turn over is less than one million. Figure 4.4 represents the annual turn over for the companies that were investigated.

4.1.9 Consisting of IT Department

Table 4.5 shows that 71.4% of client, 17.0% of consultants, 15.3% of contractors (27.5% of the total sample) that have an IT department in their organizations. And 28.6% of client, 83% of consultants, 84.7% of contractors (72.7% of the total sample) that have not any IT department.

The results shows that the most of contractors and consultants have not any IT department, and the most of the clients have an IT department, whereas most of clients return for government such as the ministries, and the municipalities, or NGO's and International Institutions.

Table 4.5: IT Department

Does your organization have a separate IT department	Yes (%)	No (%)	Total (%)
Client	71.4	28.6	100
Consultant	17.0	83.0	100
Contractor	15.3	84.7	100
Total (%)	27.5	72.7	100

4.2 Section Two: Internet and Communication Technology

This section includes eight (8) questions that ask about availability of internet connection in the organization, availability of a web site and the purpose of using a web site and the e-mail in the organization, the factors restricting the use of e-mail, also if the Palestiniancentral bidding committee decide to construct a web-site in order to computerize the bidding process and to electronically share the bidding documents, then to what extent the organizations agree to some statements, and finally internet usage for purchasing construction material.

The purpose of this section is to investigate aspects related to the usage of internet and web by the construction community in Gaza.

4.2.1 Availability of Internet Connection

From Table 4.6 we find that 100% of clients, 97.9% of consultants, and 92.9% of contractors (95.8% of the total sample) have a connection to the internet, And 2.1% of consultants, 7.1% of contractors (4.2% of the total sample) have no connection to the internet.

The results Indicates that the connection to internet in the offices is very important for all types of the construction parties, where most of tenders can find it's invitation on the internet web sites, and it helpful for communication purposes with other organizations by using e-mail, facebook, twitter, and other websites.

Table 4.6: Organizations connected to internet

Description	Type of work	Yes (%)	No (%)	Total (%)
Is your organization connected to the internet	Client	100.0	0.0	100
	Consultant	97.9	2.1	100
	Contractor	92.9	7.1	100
	Total (%)	95.8	4.2	100

4.2.2 Availability of the Organization's Web Site

Table 4.7 shows that, 100% from the clients, 57.4% from consultants, and 37.6% from the contractors (56.3% from the total sample) have a web site for their organizations (it is understood that the owners' web sites belong to the institution and not dedicated for the technical directorate in the institution). And 42.6% from consultants and 62.4% from the contractor (43.7% from the total sample) have no web site for their organizations.

Most of consultants and contractors how have no web site mentioned that they have pages on social networking pages such as facebook and twitter which superseded the websites and this social networking pages are cheaper that the websites. But the governorate organization and the NGOs mentioned that no thingsuperseded the websites.

Table 4.7: Organizationshave a web site

Description	Type of work	Yes (%)	No (%)	Total (%)
Do you have a web site for your company or organization	Client	100.0	0.0	100
	Consultant	57.4	42.6	100
	Contractor	37.6	62.4	100
	Total (%)	56.3	43.7	100

4.2.3 Purpose of Having Home Page at the Web

According to the results given in Table 4.7, the respondents who answered (yes) (56.3% of the total sample) have a website for the organization, Table 4.8 that shows the responses of having home page at the web. Using web pages for information regarding the organization and projects is the highest among the three categories (82.6%, 81.5% respectively of the total sample). Only 12.9% of the contractors who have a web site are using it for marketing.

The results mentioned that the most important purpose of having homepage on the web for the clients, consultants, and contractors is the general information about the organization, then they view their projects information. But some contractors who have manufacturing some materials such as concrete, asphalt, tiles, blocks, wooden products, and marble; they use their website for marketing.

Table 4.8: Purposes of having homepage on the web

Description	Type of work	Yes (%)	No (%)
General organization information	Client	85.7	14.3
	Consultant	84.6	15.4
	Contractor	77.4	22.6
Projects information	Client	77.1	22.9
	Consultant	88.5	11.5
	Contractor	80.6	19.4
Material purchasing/marketing	Client	2.9	97.1
	Consultant	3.8	96.2
	Contractor	12.9	87.1
Other	Client	2.9	97.1
	Consultant	3.8	96.2
	Contractor	3.2	96.8

4.2.4 Purposes of Using E-mail

This section aims to identify the reasons for using e-mail by the construction organizations in Gaza. Table 4.9 represents the percentage of responses, categorized into consultants, contractors, and owners. Analysis of the answers to this question shows that the clients and consultants don't use e-mail for procurement, while contractors use it in this area. The conclusion is that, consultants and contractors exchange bidding documents via Internet. The most of the investigated clients, consultants, and contractors are using e-mail for document distribution to other organizations, and they are using this facility as a carrier for formal massages and documents rather than bidding documents. The most of the three categories don't use e-mail for informal massages. For the other purposes some contractors write that they have not an e-mail in their companies.

Table 4.9: Purposes of using e-mail

Description	Type of work	Yes(%)	No(%)
Sending/Receiving informal messages	Client	28.6	71.4
	Consultant	26.1	73.9
	Contractor	35.4	64.6
Sending/Receiving formal messages	Client	80.0	20.0
	Consultant	91.3	8.7
	Contractor	95.1	4.9
Distribution of documentation to other organization	Client	85.7	14.3
	Consultant	91.3	8.7
	Contractor	92.7	7.3
Distribution of documentation within the organization	Client	65.7	34.3
	Consultant	45.7	54.3
	Contractor	41.5	58.5

Table 4.9: Cont.

Description	Type of work	Yes (%)	No (%)
Purchasing/ Procurement	Client	2.9	97.1
	Consultant	6.5	93.5
	Contractor	31.7	68.3
Sending/ Resaving quotation	Client	42.9	57.1
	Consultant	52.2	47.8
	Contractor	58.5	41.5
Sending/ Resaving bidding documents	Client	25.7	74.3
	Consultant	67.4	32.6
	Contractor	40.2	59.8
Other	Client	0.0	100.0
	Consultant	2.2	97.9
	Contractor	4.9	95.1

4.2.5 Factors Restricting the Use of E-mail

Answers of this question may justify previous answers. As noticed in Table 4.10, 41.7% of the investigated clients, consultants, and contractors mentioned that e-mail doesn't have legal standing in legal proceedings, so they don't use it for official documents such as bidding documents. Afraid of loosing or leakages of information are restricting the use of e-mail by consultants, contractors, and clients. 75.5% of the three categories mentioned that problems with Internet service providers might restrict the use of e-mail too.

Table 4.10: Factors restricting the use of e-mail system by the organization

Description	Type of work	Yes(%)	No(%)
Afraid of losing information	Client	2.9	97.1
	Consultant	8.7	91.3
	Contractor	14.6	85.4
Afraid of leakage of information	Client	20.0	80.0
	Consultant	10.9	89.1
	Contractor	26.8	73.2
No user training	Client	8.6	91.4
	Consultant	2.2	97.8
	Contractor	2.4	97.6
Cost	Client	5.7	94.3
	Consultant	4.3	95.7
	Contractor	2.4	97.6
Lack of management support	Client	34.3	65.7
	Consultant	21.7	78.3
	Contractor	22.0	78.0
E-mail does not have legal standing in legal proceeding	Client	40.0	60.0
	Consultant	52.2	47.8
	Contractor	36.6	63.4
Problems in local network	Client	74.3	25.7
	Consultant	71.7	28.3
	Contractor	78.0	22.0
Other	Client	2.9	97.1
	Consultant	6.5	93.5
	Contractor	11.0	89.0

4.2.6 Establishing Web Site for the Palestinian Central Tendering Committee for Procurement Purposes

Table 4.11 shows that 40.4% of the consultants, 68.6% of owners, and 45.9% of contractors strongly agree (49.1% of the total sample), 25.7% of the owners, and 57.4% of the consultants, 51.8% of the contractors agree (47.9% of the total sample), 2.9% of the investigated clients, 2.1% of the consultants, 2.4% of contractors were neutrals, and 2.9% of clients, 0.6% of contractors disagree. In their answers, most of the participants mentioned that this solution will facilitate the communication with the tendering authority. Contractors mentioned that this solution will allow them to deal with one body for searching for new business opportunities, new regulations, and serving as a data bank for construction industry.

Table 4.11: Establishing web site for CTC for e-procurement purposes

Description	Type of work	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean
		(5)	(4)	(3)	(2)	(1)	
Establishing a web site for the Palestinian central bidding committee	Client	68.6	25.7	2.9	2.9	0	4.6
	Consultant	40.4	57.4	2.1	0	0	4.38
	Contractor	45.9	51.8	2.4	0.6	0	4.44
	Total (%)	49.1	47.9	2.4	0.6	0	4.46

4.2.7 E-advertisement

Table 4.12 represents the response to the statement of advertising project notices online. It shows that 62.9% of the investigated clients selected strongly agree to the statement, while 61.7% of the consultants and 63.5% of the contractors agree. 2.9% of the clients and 2.1% of the consultants are disagree.

The investigated organizations mentioned that this solution will reduce the cost and it will facilitate the searching effort.

Table 4.12: E-advertisement process

Description	Type of work	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean
		(5)	(4)	(3)	(2)	(1)	
On-line advertisement for tenders	Client	62.9	25.7	8.6	2.9	0	4.49
	Consultant	31.9	61.7	4.3	2.1	0	4.23
	Contractor	32.9	63.5	3.5	0	0	4.29
	Total (%)	38.9	55.1	4.8	1.2	0	4.32

4.2.8 E-distribution of Bidding Documents

The statement of e-distribution of bidding documents via the proposed web site shows that 31.4% of the clients, 23.4% of the consultants, and 32.9% of contractors are strongly agree. 45.7% of the clients, 63.8% of the consultants, and 61.2% of the contractors agree. 17.1% of the clients, 2.1% of consultants, and 2.4% of contractors are disagree.

Table 4.13:E-distribution of bidding documents

Description	Type of work	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean
		(5)	(4)	(3)	(2)	(1)	
On-line distribution for bidding documents	Client	31.4	45.7	5.7	17.1	0	3.91
	Consultant	23.4	63.8	10.6	2.1	0	4.09
	Contractor	32.9	61.2	3.5	2.4	0	4.25
	Total (%)	29.9	58.7	6.0	5.4	0	4.13

I think that this solution will facilitate the distribution of documents, and it will help in reducing the time and efforts needed to convert the documents into electronic copy once again in their offices. In addition to that, this facility can guarantee more accurate and clearer copies of bidding documents.

4.2.9 E-request for Information

Electronic request for information during the tendering stage shows that, 27.7% of the consultants, 23.5% of the contractors, and 42.9% of the clients (28.7% of the total sample) are strongly agree with this solution. 22.9% of the clients, 60% of the contractors, and 63.8% of the consultants (53.3% of the total sample) are agreed, while 11.4% of the clients, 2.1% of consultants, and 4.7% of contractors (5.4% of the total sample) are disagree to e-request information. Table 4.14 represents the answers to this part.

Table 4.14: On line e-request for information

Description	Type of work	Strongly Agree (%) (5)	Agree (%) (4)	Neutral (%) (3)	Disagree (%) (2)	Strongly disagree (%) (1)	Mean
On-line request for information	Client	42.9	22.9	22.9	11.4	0	3.97
	Consultant	27.7	63.8	6.4	2.1	0	4.17
	Contractor	23.5	60.0	11.8	4.7	0	4.02
	Total (%)	28.7	53.3	12.6	5.4	0	4.04

I think that this solution will make the work easier, cheaper, and faster. Some contractors prefer to deal face to face with clients in this stage.

4.2.10 E-prequalification

Table 4.15 represents the responses to the statement of on line prequalification. 29.8% of the consultants, 22.4% of the contractors, and 34.3% of the clients (26.9% of the total sample) are strongly agreed to use on-line prequalification. 59.6% of the consultants, 61.2% of the contractors and 28.6% of the clients (53.9% of the total sample) responded that they agree, while 14.3% of the clients, 4.3 of the consultants, and 2.4 of the contractors (5.4% of the total sample) are disagree. Only 1.2% of the contractors are strongly disagree.

Table 4.15:E-pre-qualification

Description	Type of work	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean
		(5)	(4)	(3)	(2)	(1)	
On-line prequalification	Client	34.3	28.6	22.9	14.3	0	3.83
	Consultant	29.8	59.6	6.4	4.3	0	4.15
	Contractor	22.4	61.2	12.9	2.4	1.2	4.01
	Total (%)	26.9	53.9	13.2	5.4	0.6	4.01

I believe that this facility will help the consultants in reducing the time and efforts required for prequalification.

4.2.11 E-meeting (Video Conference)

Conducting pre-bid meeting online was also discussed with the investigated organizations. Table 4.16 represents the percentage of organizations that answered this question. 51.4% of the clients, 55.3% of the consultants, and 56.5% of the contractors (55.1% of the total sample) answers were disagree, and 25.7% of the clients, 12.8% of the consultants, and 28.2% of the contractors (23.4% of the total sample) are strongly disagree, while 8.6 of clients, 4.3% of consultants, and 3.5% of contractors (4.8% of the total sample) are strongly agree, and 17% of consultants, 1.2% of contractors are agree.

Table 4.16:E-meeting

Description	Type of work	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean
		(5)	(4)	(3)	(2)	(1)	
On-line (video conference) meeting for pre-bid and tender opening meetings	Client	8.6	0	14.3	51.4	25.7	2.14
	Consultant	4.3	17	10.6	55.3	12.8	2.45
	Contractor	3.5	1.2	10.6	56.5	28.2	1.95
	Total (%)	4.8	5.4	11.4	55.1	23.4	2.13

The investigated participants were reluctant to disagree to this solution, most of them answered that it is not good, because they don't have the equipment to conduct it, and the contractors need to visit the site before the pre-bid meeting with the client or the consultant.

4.2.12 E-submission of Proposals

Table 4.17 shows that 22.9% of clients, 14.9% of consultants, and 12.9% of contractors (15.6% of the total sample) are strongly agree, and 22.9% of the clients, 48.9% of the consultants, and 45.9% of contractors (41.9% of the total sample) are agree to submit their bids electronically. 20% of clients, 19.1% of consultants, 16.5% of contractors (18% of the total sample) are disagree, and 11.4% of clients, 2.1 of consultants, 4.7% of contractors (5.4% of the total sample) are strongly disagree.

Table 4.17:E-submission of proposals

Description	Type of work	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean
		(5)	(4)	(3)	(2)	(1)	
On-line submission for your technical and financial proposals	Client	22.9	22.9	22.9	20	11.4	3.26
	Consultant	14.9	48.9	14.9	19.1	2.1	3.55
	Contractor	12.9	45.9	20	16.5	4.7	3.46
	Total (%)	15.6	41.9	19.2	18	5.4	3.44

The investigation shows that all the participants who select agree conditioned it with high security measures, and the others selected disagree due to security measures too.

4.2.13 E-Payment

The bidders are requested to pay a bid price before getting the tender documents developing e-procurement system calls for the need to establish electronic payment procedures. Regarding this statement, 25.7% of the clients, 19.1% of the consultants, and 23.5% of the contractor (22.8% of the total sample) are disagree. Against 25.7% of the clients, 36.2% of the consultants, and 22.4% of the contractors (26.9% of the total

sample) are agree, while 14.4% of them are strongly agree, and 3.6% are strongly disagree. Table 4.18 represents the results.

Table 4.18: Use of e-payment

Description	Type of work	Strongly Agree (%) (5)	Agree (%) (4)	Neutral (%) (3)	Disagree (%) (2)	Strongly disagree (%) (1)	Mean
On-line payment for the price of the bidding documents	Client	31.4	25.7	14.3	25.7	2.9	3.57
	Consultant	6.4	36.2	29.8	19.1	8.5	3.13
	Contractor	11.8	22.4	41.2	23.5	1.2	3.20
	Total (%)	14.4	26.9	32.3	22.8	3.6	3.26

4.2.14 The Ability to Implement the E-tendering System

Table 4.19, illustrated that, (Establishing a web site for the Palestinian central bidding committee) ranked by clients, consultants, and contractors in the first position with RII (92%, 87.7%, 88.7% respectively) and overall ranked in first position with RII (89.1%). Also the statement (On-line advertisement for tenders) ranked by clients, consultants, and contractors in the second position with RII (89.7%, 84.7%, 85.9% respectively) and overall ranked in second position with RII (86.4%). (On-line distribution for bidding documents) ranked by clients in the fourth position with RII (78.3%), and consultants ranked it in fifth position with RII (81.7%), and contractors ranked it in the third position with RII (84.9%) and overall ranked in third position with RII (82.6%). (On-line request for information) ranked by clients and consultants in the third position with RII (79.4%, 83.4% respectively), and contractors ranked it in the fourth position with RII (80.5%) and overall ranked in fourth position with RII (81%). The statement (On-line prequalification) ranked by clients and contractors in the fifth position with RII (76.6%, 80.2% respectively), and consultants ranked it in the fourth position with RII (83%) and overall ranked in fifth position with RII (80.2%). The statement (On-line - video conference - meeting for pre-bid and tender opening meetings) ranked by clients, consultants, and contractors in the eighth position with RII (42.9%, 48.9%, 39.1% respectively), and overall ranked in eighth position with RII (42.6%).(On-line

submission for your technical and financial proposals) ranked by consultants and contractors in the sixth position with RII (71.1%, 69.2% respectively), and clients ranked it in the seventh position with RII (65.1%) and overall ranked in sixth position with RII (68.8%).

Finally, the statement (On-line payment for the price of the bidding documents) ranked by consultants and contractors in the seventh position with RII (62.6%, 64% respectively), and clients ranked it in the sixth position with RII (71.4%) and overall ranked in seventh position with RII (65.2%).

Table4.19: RII and Rank of the ability to implement the e-tendering system

Statement	Client		Consultant		Contractor		Total	
	RII (%)	Rank	RII (%)	Rank	RII (%)	Rank	RII (%)	Rank
Establishing a web site for the Palestinian central bidding committee	92.0	1	87.7	1	88.7	1	89.1	1
On-line advertisement for tenders	89.7	2	84.7	2	85.9	2	86.4	2
On-line distribution for bidding documents	78.3	4	81.7	5	84.9	3	82.6	3
On-line request for information	79.4	3	83.4	3	80.5	4	81.0	4
On-line prequalification	76.6	5	83.0	4	80.2	5	80.2	5
On-line (video conference) meeting for pre-bid and tender opening meetings	42.9	8	48.9	8	39.1	8	42.6	8
On-line submission for your technical and financial proposals	65.1	7	71.1	6	69.2	6	68.8	6
On-line payment for the price of the bidding documents	71.4	6	62.6	7	64.0	7	65.2	7
Total	74.4%		75.4%		74.1%			

The results shown in Table 4.19 reflect that, our construction industry, especially in Gaza strip and generally, in Palestine in a critical needs for changing our cultures and systems to emerge the e-tendering system in the construction industry and in our institutions. Using the e-tendering system in the tendering stage is interested by the clients, consultants, and contractorsin the bidding process. Where all the target groups prefer to establish a web site for Palestinian central bidding center, and all the process of the tendering by using this web site. They not prefer the on-line pre-bid meeting, and on-line payment for the price of the bidding documents.Several researchers clarified the benefits of adopting e-tendering in construction. These results give good indicators of the consultant's culture of thinking towards the improvements and developments. The different opinions and methodologies between clients and consultants in adopting the e-tendering system in the bidding process may returned to the fact that, the consultants in generals have a high academic degrees such as (Masters and PhD's) which qualified them to proceed in the e-tendering easier than the clients. In additions, the clients' regulations, roles, and procedures are not easy to be changed to adopt new systems, this could need long time, comprehensive trainings, and concentric awareness campaigns.

4.2.15 One Way ANOVA Test for the Differences Between Means

Ho: There is no difference of the opinions between contractors, client, and consultant in the ability to implement the e-tendering system in the construction tenders at significance level $\alpha = 0.05$

To check if there are statistical significant differences in the answers of the respondents concerning the ability to implement the e-tendering system due to type of work (Analysis of variance - ANOVA) test for more than two independent samples has been used to test the significant differences in the answers of the respondents. Table 4.20 shows the ANOVA results - differences in the answers of the respondents concerning the ability to implement the e-tendering system.

Table 4.20 shows that the significant level (P-value) higher than 0.05, Sig = 0.766, which indicates that there are no statistical significant differences in the answers of the respondents concerning the ability to implement the electronic procurement management system due to type of work. This imply to accept Ho hypothesis.

Table 4.20: ANOVA results - implementation e-tendering system

Source of variance	Sum of Squares	df	Mean Square	F	Sig.	Note
Between Groups	0.131	2	0.066	0.267	0.766	There are no statistical significant differences at 0.05 level
Within Groups	40.251	164	0.245			
Total	40.382	166				

Critical value of F at df "2, 101" and significance level 0.05 equal 3.09

Where: (F) is a statistical test called Fish test.

(df) is the degree of freedom which equal (Number of variables-1) or (Number of dependents -1) × (number of independents -1).

4.2.16 Internet Usage for Purchasing Construction Material

This part of the questionnaire asked the organizations if they practiced in purchasing construction material through the web site or not. 94.3% of the clients, 93.5% of the consultants, and 74.1% of the contractors (83.3% of the total sample) answers were no. 33.3% of the consultant who practiced purchasing has paid via letter of credit, the others 33.3% paid via visa cards, and 33.3% mentioned other methods. The other methods refer to the direct payment to the traders representatives. 100% of the contractors and the clients paid through letter of credits. Tables 4.21 and 4.22 show these results respectively.

Table 4.21: Purchasing via internet

Sentence	Client		Consultant		Contractor	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Did you ever purchase construction supplies through the web	5.7	94.3	6.5	93.5	25.9	74.1

Table 4.22: Percentages of participants who use Internet for purchasing purpose

Sentence	Client		Consultant		Contractor	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Via letter of credit	100.0	0.0	33.3	66.7	100.0	0.0
Via master card	0.0	100.0	33.3	66.7	18.2	81.8
Via Bank Transfer	0.0	100.0	0.0	100.0	13.6	86.4
Other	0.0	100.0	33.3	66.7	0.0	100.0

From the above results the respondents are not purchasing via internet, that because low using of IT application in the organizations.

4.3 Section Three: Advantages and Disadvantages of E-tendering

This section includes eleven (11) questions that ask about the advantages and disadvantages of the e-tendering by asking about the degree of agreement to some sentences. Table 4.23 shows the extent of the approval among the sample of the study on the advantages and disadvantages. To determine the most advantage sentence for the electronic tending and the disadvantage one. Statement one which says “Willingness to adopt e-tendering” had a mean of (4.02 of 5) which indicates a high degree of approval, where 65.3% and 21% of the total sample had answered agree and strongly agree respectively. The second statement which says “Likely to save cost” had a mean of (3.87 of 5) which indicates that the most of respondents (58.1% of the total sample) agree that e-tendering is likely to save cost, which indicated that the e-tendering system saves cost, the third statement which says “Likely to save time” had a mean of (4.12 of 5) which indicates a high degree of approval (64.1% of the total sample) that the e-tendering system saves time. Also have noticed that the fourth statement which says “Likely to be fair” has 59.3% of the total sample answer agree with the statement, which give to it a mean of (3.71 of 5).And the fifth statement which says “Likely to be more sustainable” had a mean of (3.81 of 5) which indicate a high degree of approval on the statements which mean that the respondents consider the fairness and the sustainability of the e-tendering system are from the advantages.

Time and cost are considered to be the most important advantages associated with e-tendering, confirming that the two most important measures for success in procurement processes are time and cost. Sustainability was ranked as the third most important advantage e-tendering can bring. As companies and individuals become more aware and under more pressure to act in an environmentally friendly manner and new legislation is introduced to make this happen this particular attribute is likely to become more important. Fairness and improved lines of communication are seen as less important.

As well as, by looking to Table 4.23 that shows that "Concerns over security" had a mean of (3.32 of 5). the seventh sentence which says "Concerns over choice and quality of system" had a mean of (3.17 of 5). "Concerns over complexity and IT skill required" had a mean of (3.05 of 5). "Concerns over reliability" had a mean of (2.99 of5). "Concerns over ability to share information" had a mean of (2.93 of 5).All indicate a medium level of approval, which mean that the respondents consider these statements the disadvantages of the system in a medium degree.

The most important disadvantages identified were the legal issues that surround the use of e-tendering, and the difficulty in sharing information and security concerns, with little difference in importance between these three. Lavelle and Bardon (2009) is in agreement with these findings concluding that legal difficulties are one of the main barriers to e-tendering. Lack of specific legal regulations, different approaches and enforceability are concerns for potential users. Over time, legal regulations may catch up with the speedy development of e-tendering and consequently such concerns would be eased. In examining security and reliability of electronic information exchange, Lavelle and Bardon,(2009), suggests that the world wide web leaks like a sieve; data transmitted on it can be garbled, can reassemble wrongly at the other end, or can only display partially because of incompatible software.

Finally, the results indicate that "In future e-tendering is likely to supercede traditional method", had a mean of (4.07 of 5), had an approval by the most of the respondents, where 32.9% and 49.1% of the total sample are answer strongly agree and agree respectively, that indicates that the most of respondents expect that the e-tendering will supercede the traditional methods in the future.

Kajewski and Weippert (2004) concluded that the implementation of an automated e-tendering process or system enhances the overall quality, timeliness and cost-

effectiveness of a tender process, and provide a more streamlined method of receiving, managing, and submitting tender documents than the traditional paper-based process. This result will render a strong proposal to our clients, consultant and ministries to look deeply in this newly approach in managing the procurement system and specially the tendering stage.

Table 4.23: The advantages and disadvantages of electronic tendering system

Sentence	Strongly Agree (%) (5)	Agree (%) (4)	Neutral (%) (3)	Disagree (%) (2)	Strongly disagree (%) (1)	Mean
Willingness to adopt e-tendering	21	65.3	9.6	3.6	0.6	4.02
Likely to save cost	18.6	58.1	15.6	7.2	0.6	3.87
Likely to save time	25.1	64.1	8.4	2.4	-	4.12
Likely to be fair	8.4	59.3	27.5	4.8	-	3.71
Likely to be more sustainable	14.4	55.7	26.3	3.6	-	3.81
Concerns over security	15.6	29.3	28.1	25.7	1.2	3.32
Concerns over choice and quality of system	9	29.9	32.3	26.3	2.4	3.17
Concerns over complexity and IT skill required	4.8	35.3	23.4	33.5	3	3.05
Concerns over reliability	8.4	24.6	29.3	33.5	4.2	2.99
Concerns over ability to share information	3.6	29.9	26.9	35.3	4.2	2.93
In future e-tendering is likely to supercede traditional method	32.9	49.1	10.8	6.6	0.6	4.07

4.3.1 The Advantages and Disadvantages ofThe E-tendering System

Table 4.24, illustrated that, clients, consultants and contractors believed that, (The implementation of e-tendering system likely to save time). This result was appeared as the clients and consultants ranked this particularity in the first position with RII (86.3%, 83.3% respectively). The contractors ranked it in the third position with RII (80.0%).

The rank by all respondents for this particularity was in the first position with RII(82.3%).

Table 4.24, showed also that, the respondents believed, (In future e-tendering is likely to super cede traditional method). This character was ranked in the third position by the clients with RII (80.6%). The consultants ranked this statement in the second position with RII (80.9%), while the contractors ranked it in the first position with RII (82.1%). The overall rank for this statement was shown in the second position with RII (81.3%) for all members of the samples.(Willingness to adopt e-tendering). This statement was ranked in the second position by clients with RII (82.9%), and was ranked also in the second position by contractors with RII (80.2%), while the consultants ranked this statement in the fourth position with RII (79.1%). The overall rank for this statement was in the third position and with RII (80.3%) for all members of the samples.(Likely to save cost). This advantage ranked in the overall rank was the fourth position with RII (77.3%), where the clients ranked it in fourth position with RII (78.9%), and the consultants ranked it in third position with RII (83.8%), while the contractors ranked it in the fifth position with RII (80.0%).For the advantage (Likely to be more sustainable) the clients and consultants ranked it in the fifth position with RII (74.9%, 76.6% respectively), while the contractors ranked it in the fourth position with RII (76.1%). The overall rank for this advantage was shown in the fifth position with RII (76.1%) for all members of the samples.(Likely to be fair). This advantage ranked in the overall rank was the sixth position with RII (74.1%), where the clients, consultants, and contractors ranked it in sixth position with RII (73.1%, 76.2%, 73.6% respectively). (Concerns over security) was ranked by clients, consultants, and contractors in the seventh position with RII (72.0%, 63.4%, 65.9% respectively) and overall ranked in seventh position with RII (66.4%).

The disadvantage (Concerns over choice and quality of system) ranked by clients, consultants, and contractors in the eighth position with RII (65.7%, 60.4%, 64.0% respectively) and overall ranked in eighth position with RII (63.4%). Also the disadvantage (Concerns over complexity and IT skill required) ranked by clients, consultants, and contractors in the ninth position with RII (58.9%, 58.3%, 63.5% respectively) and overall ranked in ninth position with RII (61.0%).(Concerns over reliability) was ranked by clients in the eleventh position with RII (54.3%) while consultants, and contractors ranked it in the tenth position with RII (57.9%, 63.3%

respectively) and overall ranked in tenth position with RII (59.8%). (Concerns over ability to share information) was ranked by clients in the tenth position with RII (56.6%) while consultants, and contractors ranked it in the eleventh position with RII (54.9%, 61.6% respectively) and overall ranked in eleventh position with RII (58.7%).

Table 4.24: RII and Rank of advantages and disadvantages of e-tendering system

Statement	Client		Consultant		Contractor		Total	
	RII (%)	Rank	RII (%)	Rank	RII (%)	Rank	RII (%)	Rank
Willingness to adopt e-tendering	82.9	2	79.1	4	80.2	2	80.3	3
Likely to save cost	78.9	4	80.4	3	75.1	5	77.3	4
Likely to save time	86.3	1	83.8	1	80.0	3	82.3	1
Likely to be fair	73.1	6	76.2	6	73.6	6	74.1	6
Likely to be more sustainable	74.9	5	76.6	5	76.5	4	76.1	5
Concerns over security	72.0	7	63.4	7	65.9	7	66.4	7
Concerns over choice and quality of system	65.7	8	60.4	8	64.0	8	63.4	8
Concerns over complexity and IT skill required	58.9	9	58.3	9	63.5	9	61.0	9
Concerns over reliability	54.3	11	57.9	10	63.3	10	59.8	10
Concerns over ability to share information	56.6	10	54.9	11	61.6	11	58.7	11
In future e-tendering is likely to super cede traditional method	80.6	3	80.9	2	82.1	1	81.3	2
Total	71.3		70.2		71.4			

The important conclusion that could be observed from these results in Tables 4.23 and 4.24 is the intermediate of score means overall items (advantages and disadvantages) of adopting e-tendering system. The score means were ranged between (2.93 - 4.03), and the RII were ranged from (58.7% – 82.3%). These results will reflect that, the

agreement level is relatively close to the neutral point(3) or agree point (4) which implies that the three parties (clients, consultants and contractors) are not strongly satisfy or understand the e-tendering implementation in the construction industry. The overall results support the argument that, the construction industry in Gaza strip still in a critical need for the continuous improvements and sustainable upgrading throughout adopting the informational technologies, software systems and intranet, internet, groupware and other IT enablers. From the results also, it can be concluded that, a huge efforts and arrangements should be started as soon as possible to activate and setup this system in the construction industry in the Gaza strip.

NSW Government (2011), Kajewski and Weippert (2004) and Betts etal. (2006) showed the benefits of adopting the e-tendering system, such benefits like streamlines the whole tendering process; provides improved and secure access to tender information; brings about innovative business processes; initiates greater opportunities for small and regionally based businesses; allows downloading of electronically submitted tenders in a form suitable for evaluation purposes without having to manually re-enter data; and makes it easier for businesses to obtain tender documentation and to submit an offer on time, provides quick and easy access to public and private tendering information; increased tenderopportunities; improved access for geographically isolated industry organizations; reduces the cost of printing - saving time and resources. increased market share and competitiveness; consistent tendering practice across government; Promotes overall e-Commerce initiative; and other benefits will be expected.

The overall results obtained from Table 4.24 shows also that, RII that was obtained from the contractors perspectives was (61.6%) which is higher than the RII that was obtained from the consultants and clients. These results could reflect positive indicator that the contractors are willing to consider, adopt and proceed in the e-tendering systems rather than other respondents.

4.3.2 One Way ANOVA Test for the Differences Between Means

Ho: There is no difference of the opinions between contractors, client, and consultant in the advantages and disadvantages of the e-tendering system in the construction tenders at significance level $\alpha = 0.05$.

Table 4.25 shows the ANOVA results - differences in the answers of the respondents concerning advantages and disadvantages of the e-tendering system.

Table 4.25: ANOVA results - advantages and disadvantages of the e-tendering system

Source of variance	Sum of Squares	df	Mean Square	F	Sig.	Note
Between Groups	0.127	2	0.064	0.473	0.624	There are no statistical significant differences at 0.05 level
Within Groups	22.087	164	0.135			
Total	22.215	166				

Critical value of F at df "2, 101" and significance level 0.05 equal 3.09

Previous table shows that the significant level (P-value) higher than 0.05, Sig = 0.624, which indicates there are no statistical significant differences in the answers of the respondents concerning the advantages and disadvantages of e-tendering system due to type of work. This imply to accept Ho hypothesis.

4.3.3 Effect of Personal Factors of Respondent's Views on E-tendering

Each respondent was identified in termsof role (clients, consultants, or contractors), experience (number of years in the industry), and size ofcompany. Chi-square and correlation coefficients were calculated to identify the impact on the responses of the variables of role, experience, and size of company. The chi-square results, showing which personal factors are significant in influencing opinions, are summarized in Table 4.26.

Table 4.26 identifies that the two personal factors that separate respondents views on e-tendering the most are age and experience. This is the case in all but three of the questions asked. Size of company, job role and whether a respondent had used e-tendering or not also impacted to a lesser extent on respondent's opinions.

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Table 4.26: Summary of significant personal factors

Statement	Personal factors where significantly differing opinion existed
Willingness to adopt e-tendering	Experience
Likely to save cost	Experience
Likely to save time	Experience
Likely to be fair	Size of company
Likely to be more sustainable	_____
Concerns over security	Experience, size of company
Concerns over choice and quality of system	Experience
Concerns over complexity and IT skill required	Experience, size of company
Concerns over reliability	Experience
Concerns over ability to share information	Job role
In future e-tendering is likely to super cede traditional method	Experience

Once the chi-squared tests had identified where significant differences of opinion existed amongst respondents, correlation analysis was then undertaken to attempt to understand where the differing attitudes within the groups existed. Table 4.27 summarizes the results of this analysis.

Table 4.27 Summary of correlation analysis results

Statement	Personal factors where significantly differing opinion existed
Willingness to adopt e-tendering	Inexperienced respondent are more willing to adopt e-tendering than experienced respondent
Likely to save cost	Inexperienced respondent believe e-tendering can reduce costs more than experienced respondent
Likely to save time	Inexperienced respondent believe e-tendering can reduce time more than experienced respondent
Likely to be fair	Respondent of larger companies believe e-tendering is fairer than those of smaller companies
Likely to be more sustainable	Experienced respondent have greater concerns of sustainability of e-tendering than inexperienced respondent Respondent of smaller companies have greater concerns of sustainability of e-tendering than respondent of larger companies
Concerns over security	Experienced respondent have greater concerns of security of e-tendering than inexperienced respondent Respondent of smaller companies have greater concerns of security of e-tendering than respondent of larger companies
Concerns over choice and quality of system	Experienced respondent have greater concerns over systems available than inexperienced respondent
Concerns over complexity and IT skill required	Experienced respondent have greater concerns with the complexity of e-tendering than inexperienced respondent Respondent of smaller companies have greater concerns with the complexity of e-tendering than respondent of larger companies Respondent who have not used e-tendering have greater concerns with the complexity of e-tendering than those who have
Concerns over reliability	Experienced respondent have greater concerns with the reliability of e-tendering than inexperienced respondent
Concerns over ability to share information	Contractor respondent have greater concerns over sharing information when using e-tendering than client or consultant respondent
In future e-tendering is likely to super cede traditional method	Inexperienced respondent believe e-tendering can take over from traditional methods more strongly than experienced respondent

Experience have a significant impact on respondent's opinions and beliefs towards e-tendering. The results show that generally the more experienced a respondent is the more critical and negative they are towards e-tendering over most of the issues raised by

the questions. Inexperience respondents are younger respondents, they are being educated in a highly technological era and therefore the thought of using information technology as part of the procurement process is not daunting and is more the norm. Tindsley and Stephenson (2008) suggest that many professionals in the industry recognize a requirement for increased implementation of e-tendering, but they feel that training, education and support from senior management are essential requirements for e-tendering to become widely accepted in the future. However it is possible that older, more experienced respondents have a more mature commercial perspective and are sceptical of the hype that surrounds initiatives based on new technology. The mixture of wariness and intransigence can act as a powerful brake on new initiatives, especially when these views are held by more senior individuals within the industry. The size of company respondents worked for also had an impact on their opinions and beliefs on e-tendering. The chi-squared tests identified that company size affected a respondents concerns regarding the complexity of the systems available, the security of the systems available and the fairness of using e-tendering. The correlation analysis indicated that the smaller the company the respondent is employed by, then the more critical and negative they are towards e-tendering systems. Larger companies often have the infrastructure in place to provide training for such innovative systems and have dedicated IT departments to assist with the security, development and implementation of e-tendering. Aranda-Mena et al., (2006) concur with this and identify that the adoption of e-procurement by SMEs in construction lags behind other organizations in the building sector. However, a number of public bodies have signed up to an SME concordat, which means they strive to use local small and medium sized firms. This may help to provide adequate support to smaller companies to help implement e-tendering and to overcome some of the concerns identified. The concerns related to size of company may be linked to the contractors concerns over the sharing of information. Sub-contractors may not have the IT infrastructure, support and systems in place to deal with tender information in electronic format, leaving the contractor with the responsibility and the associated costs of printing any drawings or documents and getting the information to sub-contractors. Previous experience of using e-tendering also affects a respondents opinions and beliefs, with those who had not used e-tendering having more concerns about the complexity of use than those who had. This indicates that respondents have a preconceived idea that using e-tendering is very complex, but that these concerns are eased once use is made of the technology.

CHAPTER FIVE

CONCLUSION & RECOMMENDATIONS

5.1 Summary

The advent of globalization, increased local and international competition and the needto improve the profitability of construction company has resulted internet technology becoming a major focus in the construction industry. The used of internet technology in construction industry is being said to have many advantages including speed, real-time data input and availability, centrally located applications, database and documents; definable user accessibility and increased uptime. Among crucial business application is using the internet technology as a method of tendering for business-to-business, which is also known as e-tendering. It is a relatively simple technical solution based around secure e-mail and electronic document management. It involve uploading tender document on to a secure a website with secure login, authentication and viewing rules. E-tendering offers an opportunity for automating most of the tendering process: from help with preparing the tender specification; advertising; tender aggregation; to the evaluation and placing of the contract. Throughout this study, the possibilityforimplementationof e-tendering system in Gaza Strip, the benefits and the barriers of adopting e-tendering was discussed. To reach this objectives a deep study for a past researches and a questionnaire survey was done. As this is a conceptual study, the findings could contribute much in expanding construction industries' motivation to embark on e-tendering endeavor.

E-tendering allows tenderers to make bids on the internet. Tenderers can participate in biddings from their offices. It simplifies bidding process and more bid applicants might participate in biddings.

E-tendering is one of the many interestingdevelopment in today’s construction industry. It refers to the use of the internet and otherelectronic media to manage and facilitate the tendering process. Fundamentally, it doesnot change the way the tendering process is done, however it enhances the process byutilizing today’s digital technology. The typical e-tendering process generally engaged in by most systems. The components of the systems will facilitate the process of prequalification or registration,public invitation, tender submission, close of tender, tender evaluation and award of tender.

The construction industry in the Gaza strip in a critical need to adopt the e-tendering system to attain the continuous improvements and sustainable upgrading throughout the informational technologies techniques.

5.2 Conclusion

There are several key findings which will now be introduced. It is contended that the main tender processes, when undertaken correctly in e-tendering system will be more efficient than traditional system. This was observed in the results of this study.

The survey major findings show that clients are more familiar with IT applications than consultants and contractors.

Also a little of contractors practiced buying material though the web site, but contractors and clients are reluctant more than consultants to adopt e-payment solutions.

The respondents whether clients, consultants, or contractors agree and ready to use the e-tendering system in Gaza strip with some fears of the quality, security, and complexityof the system.

E-tendering purports to offer a range of advantages for improving the efficiency of the procurement process. However some disadvantages are also evident and there is a slow growth in the uptake of e-tendering, despite it being offered as a service by several IT companies.

Also the experience are particularly significant factor in the attitudes of respondents towards e-tendering. More experienced respondents are more likely to have significant reservations and concerns about implementing e-tendering on projects than less experienced respondents. Also smaller companies may not have the technology or systems in place to be able to take part in e-tendering and may be unable to share information electronically in a reliable and efficient manner.

The awareness about e-tendering among industry professionals is average. However, the level of knowledge about contract procurement on the internet is still elementary. The few professionals who have participated in e-tendering have experienced low level of savings in costs and moderate level of savings in time has been achieved.

The facilities required for the implementation of a viable e-tendering system may be grouped into three separatecategories, hardware, software and internet/network

facilities. The basic facilities necessary for tendering electronically are for the most part, short of average level of availability in the Gaza Strip construction organizations, where 28.6% of client, 83% of consultants, 84.7% of contractors (72.7% of the total sample) that have not any IT department, that cover the hardware and software facilities. And the part cover the internet/network facilities that 100% of clients, 97.9% of consultants, and 92.9% of contractors (95.8% of the total sample) have a connection to the internet. Availability of facilities necessary for participation in e-tendering is not all that is required of prospective adopters of the technology. A fairly high level of skill and proficiency in the use of such facilities is also required.

This study is a pointer to the fact that industry professionals have little or no skill in the use of facilities necessary for participation in e-tendering. However, industry professionals are only averagely skilled at using word processing and spread sheet applications at various stages of tendering. Yet, the extent of usage of ICTs by industry professionals in their respective practices stands at a little below average.

Interestingly, there has been an indication of the will to support the admittance of electronic documents into evidence. One of the greatest impediments to e-tendering in Gaza Strip nonetheless remains the lack of constant power supply. This remains a long standing infrastructural problem in the country that is showing little signs of abating.

5.3 Recommendations

This recommendations suggest the role of each party including contractors, clients, consultants, governments, PCU, world community, and local community which could lead to achieve sustainable and survival bidding environment, and easy participation process for the contractors in the constructions industry in the Gaza Strip.

The Ministry of Public Works and Housing is recommended to setup a research and development unit (RDU) and especially in the procurement and bidding process to attain the continuous improvement and sustainable development and empowerments for the contractors. This RDU could try to remove the barriers that facing the contractors, and could provide the advices and suggestions to overcome the nontraditional problems in the bidding stage.

It is recommended that MOWH to establish a pilot e-tendering project to study its applicability and obstacles tracing the implementation.

The clients, consultants and contractors are recommended to adopt the e-tendering system as a supportive technique to strengthen the contractor's cultures and capabilities. Moreover, the contractors are recommended to start gradually using the software system in the bidding process to mitigate the physiological barrier to use the e-tendering systems.

The clients and consultants are recommended to carry out a periodical meetings, training and sessions with the contractors to explain and provide the supportive information and benefits about the e-tendering system in the bidding process.

The clients and consultants are recommended to setup web sites including the softcopies of the tender documents, drawings, and all other data related to the project concurrent with distributing the hard copies of the tender documents.

The construction industry must take into account that the successful implementation of any e-tendering system often directly depends on the successful integration of innovative ICT/ internet solutions, with traditional and frequently archaic processes. Achieving this integration can be a complex process, and if not done correctly, could lead to failure.

There is need to develop a capacity building knowledge backbone to drive the adoption of e-tendering. The extent of e-tendering basic and applied knowledge being shared in training construction industry professionals in tertiary institutions has not been fully determined.

5.4 Recommendations for Future Studies

Further recommended study is setup a model in the e-tendering system and apply this system in any clients, then investigate the advantages and the disadvantages of the system.

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LIST OF ANNEXES

ANNEX 1

ISLAMIC UNIVERSITY – GAZA

FACULTY OF ENGINEERING

CONSTRUCTION MANAGEMENT DEPARTMENT

The Possibility for Implementation of E-tendering Methodology in the Construction Bids in Gaza Strip

Questionnaire for Contractors, Consultants and Clients in Gaza Strip

Dear contractor or consultant,

To start, I would like to present my appreciation and thanks to you for taking part of your time and effort to complete this questionnaire.

This questionnaire aims to study the possibility of implementation of electronic tendering methodology in construction bids in Gaza Strip. The study is trying to determine the level of conflicts and the barriers of using the electronic tendering for contractors and clients.

- Contents of the questionnaire

1. Section 1, Profile of the company/ client/ consultant.

2.Section 2, This section intends to identify the Internet and communication technology applied by the organization as well as the ability to implement the electronic procurement management system.

3. Section 3, The advantages and disadvantages of electronic tendering system.

All responses and facts will remain fully confidential, and will be used for the research purposes only.

Section One: Organization profile				
1.1 Type of Works	Client (Ministry, municipality, NGO's) ☐	Consultant ☐	Contractor ☐	
1.2 Base of the Client/Consultant/ Contractor "location"	Gaza ☐	North Area ☐	Middle Area ☐	South Area ☐
1.3 Organization years of experience	Less than 5 years ☐	From 5-10 years ☐	From 11 – 15 years ☐	More than 15 years ☐
1.4 Position of Respondent	Project Manager ☐	Office Engineer ☐	Site Engineer ☐	Other(Mention pls) ..... ☐
1.5 Respondent's years of experience	Less than 5 years ☐	From 5-10 years ☐	From 11 – 15 years ☐	More than 15 years ☐
1.6 Classification according to the National Classification Committee (for contractors)	First Class ☐	Second Class ☐	Third Class ☐	Forthe and above ☐
1.7 Number of completed projects in the past three years	1-5 ☐	6-10 ☐	10-20 ☐	More than 20 ☐
1.8 Annual turn over $ (Public owners and consultants are not requested to answer this question)	Less than 500.000$ ☐	From 500.000 to 1 milion $ ☐	From 1 to 5 million $ ☐	More than 5 million $ ☐
1.9 Does your organization has a separate IT department ?	Yes ☐		No ☐	

Section Two:This section intends to identify the Internet and communication technology applied by the organization as well as the ability to implement the electronic procurement management system.				
2.1 Is your organization connected to the Internet?	Yes ☐		No ☐	
2.1 Do you have a web site for your Company / Organization?	Yes ☐		No ☐	
2.2 If the answer is yes, what are the organization primary purposes of having an organization web site?	General organization information ☐	Projects information ☐	Material purchasing/ marketing ☐	Others (identify) …… …… ……
2.4 Purpose of using e-mail by the organization. "Select one or more of the following answers"	Sending/ receiving informal messages ☐			
	Sending/ receiving formal messages ☐			
	Distribution of documentation to other organization ☐			
	Distribution of documentation within the organization ☐			
	Purchasing/ procurement ☐			
	Sending/ Receiving quotations ☐			
	Sending/ receiving bidding documents ☐			
	Others (identify) …… ☐			
2.5 Factors restricting the use of e-mail system by the organization. "Select one or more of the following reasons"	Afraid of losing information ☐			
	Afraid of leakage of information ☐			
	No user training ☐			
	Cost ☐			
	Lack of management support ☐			
	E-mail does not have legal standing in legal proceeding ☐			
	Problems in the local network ☐			
	Others (identify) …… ☐			

2.6 If the Palestinian Central Bidding Committee decide to construct a web-site in order to computerize the bidding process and to electronically share the bidding documents, then to what extent you agree to the following statements?					
Statment	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Establishing a web-site for the Palestinian Central Bidding Committee					
On-line advertisement for tenders					
On-line distribution for bidding documents					
On-line request for information					
On-line prequalification					
On-line (video conference) meeting for pre-bid and tender opening meetings					
On-line submission for your technical and financial proposals					
On-line payment for the price of the bidding documents					

2.7 Did you ever purchase construction supplies through the web?	Yes ☐	No ☐
2.8 If the answer is yes how did you pay the supplier?	Via letter of credit ☐	
	Via Master Card ☐	
	Via Bank Transfer ☐	
	Others (identify)…….. ☐	

Section three: The advantages and disadvantages of electronic tendering system					
3.1 If you use the electronic tendering system, then to what extent you agree to the following statements?					
Statment	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Willingness to adopt e-tendering					
Likely to save cost					
Likely to save time					
Likely to be fair					
Likely to be more sustainable					
Concerns over security					
Concerns over choice and quality of system					
Concerns over complexity and IT skill required					
Concerns over reliability					
Concerns over ability to share information					
In future e-tendering is likely to supercedetraditional methods					

ANNEX 2

الجامعة الإسلامية - غزة

كلية الهندسة

قسم إدارة المشاريع الهندسية

إمكانية تطبيق منهجية العطاءات الإلكترونية في العطاءات الإنشائية في قطاع غزة

استبيان خاص بالمقاولين والاستشاريين وأصحاب العمل في قطاع غزة

الأخ الكريم:

السلام عليكم ورحمة الله وبركاته

بداية أود أن أشكرك على الوقت والجهد الذي تبذله في تعبئة هذا الاستبيان.

هذا الاستبيان يهدف لدراسة إمكانية تطبيق منهجية العطاءات الإلكترونية في فطاع الإنشاءات في قطاع غزة، حيث سيتم دراسة المعوقات والمميزات لاستخدام هذه المنهجية للمقاول والاستشاري وصاحب العمل.

يتكون هذا الاستبيان من ثلاثة أقسام:

القسم الأول: معلومات عامة حول المقاول أو الاستشاري أو صاحب العمل.

القسم الثاني: يناقش تطبيقات الانترنت والتكنولوجيا في المنظمة وكذلك إمكانية تطبيق نظام الشراء الإلكتروني.

القسم الثالث: يناقش مميزات وعيوب نظام العطاءات الإلكترونية.

سيتم استخدام نتائج هذا الاستبيان لأغراض البحث العلمي فقط وستكون هذه النتائج جزء من دراسة بعنوان (إمكانية تطبيق منهجية العطاءات الإلكترونية في العطاءات الإنشائية في قطاع غزة) وذلك لاستكمال متطلبات الدراسة لنيل درجة الماجستير في إدارة المشاريع من كلية الهندسة - الجامعة الإسلامية - غزة .

إن مشاركتكم القيمة معنا في هذا العمل هو إثراء له ونشكركم جزيل الشكر على هذه المشاركة.

والله ولي التوفيق

للاستفسار يرجى الاتصال على:-

م. عبدالله عبدالعزيز صيام

جوال / 0599314177

الجزء الأول: معلومات عامة عن المنظمة				
1.1 نوع العمل	مالك (وزارة ، بلدية، مؤسسة أهلية) ☐	استشاري ☐	مقاول ☐	
1.2 مكان المنظمة	غزة ☐	شمال غزة ☐	المنطقة الوسطى ☐	المنطقة الجنوبية ☐
1.3 عدد سنوات الخبرة للمنظمة	أقل من 5 سنوات ☐	من 5 إلى 10 سنوات ☐	من 11 إلى 15 سنة ☐	أكثر من 15 سنة ☐
1.4 وظيفة معبئ الاستبيان	مدير مشروع ☐	مهندس مكتب ☐	مهندس موقع ☐	أخرى (حدد) ....
1.5 عدد سنوات الخبرة لعبئ الاستبيان	أقل من 5 سنوات ☐	من 5 إلى 10 سنوات ☐	من 11 إلى 15 سنة ☐	أكثر من 15 سنة ☐
1.6 تصنيف الشركة حسب لجنة التصنيف الوطنية (خاص بشركات المقاولات)	درجة أولى ☐	درجة ثانية ☐	درجة ثالثة ☐	درجة رابعة فأكثر ☐
1.7 عدد المشاريع المنجزة خلال السنوات الخمس الماضية	من 1 إلى 5 ☐	من 6 إلى 10 ☐	من 11 إلى 20 ☐	أكثر من 20 ☐
1.8 حجم العمل السنوي بالدولار الأمريكي (خاص بشركات المقاولات)	أقل من $500000 ☐	من 500000 إلى 1 مليون $ ☐	من 1 مليون إلى 5 مليون $ ☐	أكثر من 5 مليون $ ☐
1.9 هل يوجد في المنظمة قسم خاص بتكنولوجيا المعلومات؟	نعم ☐	لا ☐		

الجزء الثاني: هذا الجزء يهدف إلى تحديد مدى استخدام التكنولوجيا والانترنت في المنظمة وكذلك مدى إمكانية تطبيق نظام البيع الإلكتروني				
2.1 هل المنظمة يوجد فيها اشتراك انترنت؟	نعم ☐		لا ☐	
2.2 هل يوجد موقع انترنت خاص بالمنظمة؟	نعم ☐		لا ☐	
2.3 إذا كانت إجابتك نعم في السؤال 2.2، فما هو الغرض الأساسي من موقع الانترنت الخاص بالمنظمة؟	معلومات عامة عن المنظمة ☐	معلومات عن مشاريع المنظمة ☐	تسويق منتجات المنظمة ☐	أخرى (حدد) ....
2.4 الغرض من استخدام البريد الالكتروني الخاص بالمنظمة. (اختر إجابة أو أكثر)	إرسال واستقبال الرسائل الغير رسمية ☐			
	إرسال واستقبال الرسائل الرسمية ☐			
	تبادل الوثائق مع منظمات أخرى ☐			
	تبادل الوثائق داخل المنظمة ☐			
	البيع والشراء ☐			
	إرسال واستقبال العروض ☐			
	إرسال واستقبال وثائق العطاء ☐			
	أخرى (حدد) ..... ☐			
2.5 المعوقات لاستخدام البريد الالكتروني في المنظمة (اختار سببا واحدا أو أكثر)	فقدان المعلومات ☐			
	نقص المعلومات ☐			
	لا يوجد مستخدم مدرب ☐			
	التكلفة ☐			
	نقص دعم الإدارة ☐			
	البريد الالكتروني يفتقر للإجراءات القانونية ☐			
	مشاكل في الشبكة المحلية ☐			
	أخرى (حدد) ..... ☐			

2.6 إذا قررت لجنة العطاءات المركزية الفلسطينية أن تنشئ موقع انترنت لحوسبة العطاءات المطروحة، ويتم تحميل جميع وثائق العطاء الكترونيا، فإلى أي مدى توافق مع العبارات الآتية؟

	أوافق بشدة	أوافق	معتدل	لا أوافق	لا أوافق بشدة
إنشاء موقع انترنت خاص بلجنة العطاءات المركزية الفلسطينية					
الإعلان عن العطاءات إلكترونيا					
توزيع وثائق العطاء إلكترونيا					
طلب المعلومات إلكترونيا					
مراجعة المؤهلات إلكترونيا					
الاجتماع التمهيدي وفتح المظاريف إلكترونيا بواسطة الفيديو					
الترسية بناء على المؤهلات الفنية والمالية إلكترونيا					
دفع ثمن نسخة العطاء إلكترونيا					

2.7 هل سبق وقمت بالشراء من موردي الإنشاءات إلكترونيا	نعم ☐	لا ☐

2.8 إذا كانت إجابة السؤال 2.7 نعم فكيف قمت بالدفع للمورد	حوالة بنكية ☐
	بطاقة الدفع (Master Card, Visa Card, etc.) ☐
	رسالة الدفع (Letter of Credit) ☐
	أخرى (حدد) ☐

الجزء الثالث: مميزات وعيوب نظام العطاءات الإلكترونية

3.1 إذا تم استخدام نظام العطاءات الإلكترونية فإلى أي مدى توافق العبارات الآتية؟

	أوافق بشدة	أوافق	معتدل	لا أوافق	لا أوافق بشدة
الاستعداد كبير لاعتماد العطاءات الإلكترونية					
يساعد على تقليل التكلفة					
يساعد على توفير الوقت					
من المرجح أن يكون النظام عادل					
من المرجح أن يكون النظام أكثر استدامة					
هناك مخاوف أمنية من النظام					
هناك مخاوف من الاختيار وجودة النظام					
هناك مخاوف من التعقيد والمهارات المطلوبة لتكنولوجيا المعلومات					
هناك مخاوف من مدى المصداقية					
هناك مخاوف من مدى القدرة على تبادل المعلومات					
في المستقبل ستحل العطاءات الإلكترونية محل الطرق التقليدية					

List of Abbreviations

BCT	Building Centre Trust
BOQ	Bill Of Quantity
CCDC	Canadian Construction Documents Committee
CI	Construction Industry
CIB	Construction Industry Board
CIOB	Chartered Institute of Building
CITA	Construction Information Technology Alliance
CPSC	Construction Policy Steering Committee
CSFs	Critical Success Factors
EDI	Electronic Data Interchange
EOI	Expression Of Interest
E-tendering	Electronic Tendering
FITLOG	Foundation for Information Technology in Local Government
ICT	Information and Communication Technology
IT	Information Technology
LCPN	Liaison Committee Practice Notes
MHPW	Ministry of Housing and Public Works
NCB	National Competitive Bidding
NCCTP	Network for Construction Collaboration Technology Providers
NGO's	Non Governmental Organizations
OGC	Office of Government Commerce
PCU	Palestinian Contractors Union
PECDAR	Palestinian Economic Council for Development and Reconstruction

PNA	Palestinian National Authority
PQS	Project Quantity Surveyor
QS	Quantity Surveyor
RFT	Request For Tender
RICS	Royal Institution of Chartered Surveyors
RII	Relative Importance Index
SBD	Standard Bidding Document
SME	Small and Medium Enterprises
TTP	Trusted Third Party
UK	United Kingdom
WB	West Bank

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