

**An Investigation into the Elongated Interim Payment
Duration: A Proposal of Optimum Payment Duration**

By

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This thesis is dedicated to my parents and siblings for always being an unending source of love and encouragement.

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ABSTRACT

Elongated interim payment duration in construction contracts persist due to factors of various natures. This study undertook the objective to identify these factors, to quantify the cost impact (if any) of elongated interim payment duration and consequently, to propose an optimum standard interim payment duration for traditional standard contracts published by Pakistan Engineering Council (PEC).

A survey questionnaire was developed in Google Forms and was shared online through professional, social networking sites and experts were engaged by personally visiting their offices. Responses, contract agreements and IPC records of various projects were collected from local industry. Survey responses were collected from clients, consultants and contractors. The data obtained was analyzed using MS EXCEL and IBM SPSS Statistics Version 23. This analysis included Cronbach's Alpha test for reliability of data, Shapiro Wilk test for normality of data, Kruskal-Wallis test to compare the opinions of clients, consultants and contractors and T-test to check the hypothesis adopted in this study that current 44 days' duration of PEC contract as a maximum duration required for processing interim payments in industry.

The study identified a total of 41 factors causing payment delays out of which 5 were found to be cause of elongated interim payment duration. These elongated payment duration's factors came out to be time for verification of bill with consultant, time for payment of verified bill with client, involvement of too many parties, administration or bureaucracy and duration of project.

The study found that no additional amount is included in bid price for elongated duration of interim payment. Also, the study concluded that maximum processing duration for interim payment certificates in industry is less than 44 days. Hence shortening of standard interim payment duration to 28 days, is preferable and more beneficial to the stakeholders. It is recommended that the duration of interim payment of contracts other than traditional contract should also be inquired about and the survey should be expanded to international industry as well.

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List of Abbreviations

AIA	American Institute of Architects
EJCDC	Engineers Joint Contract Documents Committee
FIDIC	International Federation of Consulting Engineers
GDP	Gross Domestic Product
IPC	Interim Payment Certificate
JCT	Joint Contracts Tribunal
MDBs	Multilateral Development Banks
NEC	New Engineering Contract
PEC	Pakistan Engineering Council

CHAPTER 1

INTRODUCTION

1.1 Preamble:

Construction industry deals with large physical projects which involve large cash flows. Method and timing of these cash flows from client to contractor are controlled through contractual methods(O'Reilly, 1999). Most commonly these cash flows from clients to contractors are in the form of interim or progress payments and stage payments (Ansah, 2011). Along with these methods of payment, there are contractual provisions specifying the duration and stage in which the due amount has to be reimbursed. In traditional standard construction contracts of FIDIC 4th Edition and FIDIC 99 standard duration for interim payments is 56 days where as other standard contracts propose a lesser duration such as PEC (44 Days), NEC-3 (21Days), ConsensusDocs-200 (20 Days), EJCDC-C700 (20 Days), JCT-2011 (14 Days), AIA-A201 (10 Days). Thus, forms of contracts offer various methods and duration of interim payments and parties involved have the choice to agree upon any method suited to their project. Any payment made after the contractual duration is a delayed payment and incurs either a financial penalty or an extension in deadline.

Different contractual provisions, legislations and administrative provisions have been developed and adopted to tackle the problem of delayed and default payments in construction industry(Ramachandra and Rotimi, 2010). Many countries have introduced legislations to address payment defaults issues including United Kingdom (UK), Australia, New Zealand and Singapore (Din and Ismail, 2014). Few of these legislations are: Housing Grants, Construction and Regeneration Act 1996, UK; Building and Construction Industry Payments Act 2004 of Queensland, Australia; Building and Construction Industry Security of Payment Act 1999 in New South Wales, Australia (Ramachandra, 2010). These legislations are directed towards reducing payment delays and defaults hence results in timely payments, timely dispute resolution, and entitlement to payment for the work done. In other words, all these legislations are for scenarios of

under payment, late payment and non-payment. But elongated interim payment duration has not been sufficiently investigated and evaluated.

In developing countries, with inflationary economies, elongated duration of interim payments cause financial problems to contractors and it has harmful effects on construction industry as well (Ye and Rahman, 2010, Conlin et al., 1996, Kennedy, 2005, Touran et al., 2004, Wu et al., 2008, Wong and Hui, 2006, Arditi and Chotibhongs, 2005). These elongated interim payment durations may tempt the contractors to include hidden additional amount in bids.

The construction industry of Pakistan is in a developing state. It's GDP contribution is 2.74 percent and it absorbs 7.31 percent of labor force of the country(Finance, 2017). Cash flow problems in Pakistan's construction industry due to onerous usage of contractual payment provisions by clients are evident (Zubair et al., 2016). But there is no such study on the impact of systematic waiting time of progress payment of standard forms of contract on the economy of local construction industry as well as regional contexts. In other words, the economic implications of duration for progress payment are unknown. Thus, it is imperative that a thorough evaluation of contractor, consultant and client's satisfaction with interim payment duration of traditional standard form of contracts be carried out. To fulfill this goal and cover the gap in literature, objectives set for this study are to identify factors causing elongated interim payment duration and to quantify the additional amount included in bid price due to elongated interim payment duration. Based on the outcome, the study further proposes an optimized payment duration based on experts' opinion. In order to achieve these objectives, through a thorough review of literature, factors are identified followed by extensive data collection from local construction industry. Based on the opinion of local experts, the impact of elongated interim payment duration on overall cost is estimated and an optimum duration of interim payment is proposed.

1.2 Objectives:

Objectives of this research are

1. To identify factors causing elongated interim payment duration.
2. To quantify the amount added in bids due to elongated interim payment duration.
3. To propose optimized payment duration.

1.3 Research hypothesis:

Following are the hypothesis adopted by this study

H_0 = In industry IPC's maximum processing duration is 44 days.

H_1 = In industry IPC's maximum processing duration is less than 44 days.

1.4 Scope of the study:

The study undertakes the literature review to identify the factors causing elongated interim payment duration. Then it adopts a survey questionnaire to target experts of local industry. In light of that opinion of clients, consultants and contractors and data collected from industry, this study will propose required modification (if any) to the existing interim payment duration of traditional standard contracts published by PEC.

1.5 Significance of the study:

Optimized shorter payment duration will have a positive impact on cash flow of construction projects. General contractors, sub-contractors, suppliers, vendors will also be benefited from smooth and prompt cash flow. It will create opportunities for these service providers to invest in other projects as well.

1.6 Limitation of the study:

The study only proposes optimized interim payment duration for the traditional standard contract published by PEC and these recommendations are based on the opinions of experts of local industry.

1.7 Layout of thesis:

This thesis has been organized into five chapters. Chapter 1 is 'introduction' it includes an introduction to the research, objectives of the study, research hypothesis, scope of the study, significance of the study, limitation of the study. Chapter 2 is 'literature review' it focuses on the previous studies related to payment problems and provides essential information and synthesis. Chapter 3 is 'methodology' of the research. It explains how the research has been carried out to obtain our objectives. Chapter 4 is 'results and discussion' that covers the analysis and findings, of data collected, according to our research objectives. It also explains how the data is interpreted to produce the results. Lastly, chapter 5 is 'conclusions and recommendations' where conclusions and recommendations have been drawn and summarized.

LITERATURE REVIEW

2.1 Introduction:

This chapter focuses on the past literature related to this study. It entails a brief discussion of payments in construction industry, types of payments, comparison of payment provisions of various traditional standard contracts.

Elongated interim payment duration is a significant problem that plague stakeholders in construction industry, this problem actually need to be study in depth to overcome the dire effects in order to continue the process of construction execution without hindrance.

Elongated interim payment duration can be defined as when the cash inflow is significantly less than the cash outflow but within the bounds of contract signed whereas payment delay is defined as failure of paymaster to pay within the period of honoring of certificates as provided in the contract (Harris, 2003). Also payment is the sum of money paid to contractors after their works.

The parties involved in the process of payment claim such as client, contractor, superintending officer, architect, quantity surveyor, banker and other construction players may cause the payment duration to be an elongated one.

Main construction industry players are extending from owners, developers, government, bankers, insurers, planners, consultants, main contractors, sub-contractors, suppliers etc. these stakeholders are involved in payment process.

2.2 Payments in construction industry:

In terms of construction industry, payments can be defined as reimbursement of incurred cost to the service providers (contractor) by the client for the successful completion of desired services (Ansah, 2011). Timely payments to the contractors are critically important for the healthy cash flow and hence successful progress and completion of project (Arditi and Chotibhongs, 2005). Guide lines and detailed procedures for payments in construction projects are defined and governed by construction contract (O'Reilly, 1999). Various methods and types of payments are provided in the contemporary traditional standard construction contracts. It is up to the concerned parties to choose the most suitable payment method to their project. This study briefly defines types of payment provided in various traditional contracts that are mostly used in industry and are most relevant to this research. These types of payments are as follow

2.3 Types of payment:

Due to the scope constraint of the study advance payment and final payment are not discussed here. Periodic payments, also known as progress or interim payments, and phase payment, also known as stage payment, are found to be most relevant to this research. Therefore, only these two types of payments are briefly discussed here. Chen et al. (2005) defined these payment types as follow

2.3.1 Interim Payment:

Periodic payments (interim payments) are made after specified periods in a project. Periods are specified by concern parties for generation of payment bill by contractor, vetting by engineer and payment of this bill by client. In contractual terms, the interim or progress payment are affected by Interim Payment Certificate (IPC). Durations for each step of the whole process of payment is normally the period as agreed in the contract conditions signed.

2.3.2 Phase Payment:

Payments are made at the specific stages of work. Also in some projects, specified monetary value of work is defined as a stage where payment has to be made. This payment type is mostly opted for in combination with small lump sum contract where quantities are not finalized and a fixed proportion of the total sum of contract is agreed to be paid over certain phases.

2.4 Standard interim payment duration of various traditional standard construction contracts:

This comparison of standard interim payment duration is made among the traditional standard traditional contracts of American Institute of Architects (AIA), Consensus Docs, Engineers Joint Contract documents committee (EJCDC), International Federation of Consulting Engineers (FIDIC), World Bank, Joint Contracts Tribunal (JCT), the New Engineering Contracts (NEC) and Pakistan Engineering Council (PEC).

In traditional standard construction contracts published by FIDIC and PEC standard duration for interim payments is 56 days and 44 days respectively (FIDIC-4RTH, 1992, FIDIC, 1999, PEC, 2008). Whereas other standard contracts offer a lesser duration such as NEC-3 (21Days), ConsensusDocs-200 (20 Days), EJCDC-C700 (20 Days), JCT-2011 (14 Days), AIA-A201 (10 Days) (AIA201, 2007, ConsensusDocs200, EJCDC, 2007, JCT, 2011, NEC-3, 2005). Thus, traditional contracts offer various methods and duration of interim payments and parties involved have the choice to agree upon any method suited to their project. Any payment made after the contractual duration is a delayed payment and incurs either a financial penalty or an extension in deadline. Various traditional contracts along with their interim payment duration are shown in Table 2-1.

Table 2-1: Contract types and payment durations

CONTRACT TYPE	TIME FOR APPLICATION BY CONTRACTOR	TIME FOR APPROVAL BY ENGINEER	TIME FOR PAYMENT BY OWNER	TOTAL TIME FOR PAYMENT
FIDIC 1987 (1992)	After end of each month	Within 28 days after contractor application	Within 28 days after engineer certifies payment	56 Days
FIDIC 1999	After the end of each month	Within 28 days after contractor application	Within 56 days after contractor application	56 Days
FIDIC-MDBs Harmonized Edition, 2010	After the end of each month	Within 28 days after contractor application	Within 56 days after contractor application	56 Days
PEC	After end of each month	Within 28 days after contractor application	Within 28 days after engineer certifies payment	44 Days
NEC 3	Predetermined assessment date	Within seven days after assessment date	Within 21 days after assessment date	21 Days
Consensus Docs 200	Specified calendar date of each month	Undefined	Within 20 days after contractor application	20 Days
EJCDC C700	At least 20 days before due date of payment	Within 10 days after contractor application	Within 10 days after application approval	20 Days
JCT 2011	At least seven days before due date/ assessment date	Within five days after due date	Within 14 days after due date	14 Days
AIA A201	At least 10 days before due date of payment	Within seven days of receiving contractor's application	Within 3 days after approval by engineer unless specified otherwise in the owner-contractor agreement	10 Days

2.5 Research hypothesis:

After studying various standard contracts followed in Pakistan, a research hypothesis is developed that is

H_0 = In industry IPC's maximum processing duration is 44 days.

H_1 = In industry IPC's maximum processing duration is less than 44 days.

2.6 Elongated interim payment duration and its effects:

Construction industry deals with large physical projects which involve big cash flows. Cash inflow after an elongated duration cause dire consequences to contractor's financial health and project successful completion. Cash flow problems due to elongated interim payment duration have existed for a long time in industry and still persist. Cash flow problems, construction disputes, construction insolvencies, construction delays, low construction productivity, addition of extra amount in bids are some of major negative effects of elongated interim payment duration (Ye and Rahman, 2010, Conlin et al., 1996, Kennedy, 2005, Touran et al., 2004, Wu et al., 2008, Wong and Hui, 2006).

2.7 Factors causing payment delays:

Numerous factors cause delay in disbursement of interim payments in construction projects. These factors vary in nature depending upon their primary source (Ramachandra and Rotimi, 2015, Wu et al., 2010). This study categorizes these factors into systematic and non-systematic. Systematic factors are those which arise due to the contractual clauses since construction contracts govern mode and timing of payments (O'Reilly, 1999). While non-systematic factors arise due to the trends in construction industry (Abdul-Rahman et al., 2008, Wu et al., 2008, Danuri et al., 2006, Pettigrew, 2005, Sozen and Kucuk, 1999, Procurement and Council, 1996), behavior of different parties involved (Hughes et al., 1998, Kenley, 2002, Cottor, 2005) and country related factors (Wu et al., 2010). In short, non-systematic factors are risks which are materialized resulting into payment delays. A total of 20 relevant papers were accessed as a result of a detailed literature search using keywords 'payment problems', 'delayed payments in construction industry', 'factors causing payment delays', etc. From these papers, a total of 41 factors were identified out of which 35 were found to be non-systematic. Ramachandra and Rotimi (2015) found disputes over claims, poor cash flow due to insufficient initial capital, easy entry and exit of players, payment culture of the industry, unethical attitude of the clients, improper supervision, client's financial mismanagement, cost overruns and lack of knowledge and experience of the field to be the most common factors. Some other non-systematic factors identified by Danuri et al. (2006) are

disagreement on the valuation of work done, deliberate withholding of payments by clients, budget deficits, poor communication and conflicts between parties, delay in submitting payment claims and general lack of understanding of contract provisions.

Due to scope constraint of this study, going forth, only systematic factors are mentioned and discussed in details. Table 2-3 lists the systematic factors causing delay in interim payments along with their frequencies. It was found that complications in contractual conditions, which refer to the ambiguities in contract documents that arise due to use of ambiguous language in the documents, is the most frequently mentioned factor. Such complications result in difference in understanding of the same statements among various contracting parties. Abotaleb and El-adaway (2017) stated that ambiguities also arise when the contracts do not include all possible scenarios. These scenarios may include, but not limited to, rights of contractor in case of underpayment, delayed payment, non-payments, termination of contract by client; what happens when the actual amount of works differ than the estimated quantities, absence of contractual provisions to tackle disagreements on the valuation of work done, delay in the process of payment approval.

The next factor, 'duration of interim payments', is also important for the smooth cash flow of project (Ye and Rahman, 2010). Longer payment duration means financial hardship for contractors which trickles down to the supply chain actors in the downstream. Option of short interim payment duration is contained in the particular conditions of traditional standard forms of contract but this option is left to the choice of contracting parties which is onerous to the financial health of contractors (Zubair et al., 2016).

Likewise , legislative acts is also a systematic factor which is a significant tool for preventing the delays and defaults in payments (Brand and Uher, 2008). Few of these legislative acts are: Housing Grants, Construction and Regeneration Act 1996, UK; Building and Construction Industry Payments Act 2004 of Queensland, Australia; Building and Construction Industry Security of Payment Act 1999 in New South Wales, Australia (Ramachandra, 2010). Legislative acts also provide speedy dispute resolution and security to payments, in case project is halted or terminated by client or client

announces bankruptcy (Din and Ismail, 2014). Thus it can be deduced that lack of such legislations in a country makes it difficult to tackle payment delays and defaults.

Different traditional standard contracts are another very important systematic factor when it comes to the rights granted to contractors in contract in case of non-payment or delayed payments of interim payments. These rights may include but are not limited to slowing the pace of works, suspension of works, invoking guarantees or arbitration agreements but at times provisions granting these rights may be diluted or struck out all together by the client (Abotaleb and El-adaway, 2017). Lack of provisions granting such rights in a contract, makes it difficult for contractors to receive the payments for client in time.

The factor 'Procurement Method' i.e. competitive tendering and negotiated tender plays significant role in finalizing of payment provisions for interim and final payments. Payment provisions under different standard contracts often serve as the starting point for negotiations. Which may result in substantial revision of these provisions (El-adaway et al., 2017). But on the contrary in competitive tendering, in order to win the bid, contractor might not try to negotiate the payment provisions. Most of the times these un-deliberated payment provisions result in an un-healthy cash flow (Zubair et al., 2016).

Lastly the factor 'Reimbursement Basis' is of critical importance for cash flow of a project. Most of projects have homogenous basis for reimbursement that is the reimbursement of all the works would be based on same method. These reimbursement bases include lump sum, unit price, cost plus etc. But some projects are not homogenous from payment point of view; meaning that contractors get paid under different basis for different elements in the same project (Abotaleb and El-adaway, 2017). Based on compensation basis contractors may desire for certain payment durations or may change the price of certain works in their bids.

Non-systematic factors along with their frequencies are shown in the Table 2-2.

Table 2-2: Non-Systematic Factors causing payment problems

S. No	Factors Causing Payment Problems	References	Frequency
1	Attitude of the player: dishonest/un ethical conduct	(Ramachandra and Rotimi, 2015), (Abotaleb and El-adaway, 2017), (Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Wu et al., 2010), (Ramachandra and Rotimi, 2010), (Zakaria et al., 2012), (Ye and Rahman, 2010), (Carmichael and Balatbat, 2010), (Meng, 2002)	13
2	Disagreement on the valuation of work done	(Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2014), (Zakaria et al., 2012), (Ye and Rahman, 2010), (El-adaway et al., 2017), (Carmichael and Balatbat, 2010), (Kinal, 2015), (Latham, 1994)	13
3	Delay in certification/ Time allotted to client and consultant for verification of IPC	(Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2014), (Zakaria et al., 2012), (Ye and Rahman, 2010), (El-adaway et al., 2017), (Carmichael and Balatbat, 2010), (Kinal, 2015)	12
4	Following erroneous payment procedure	(Abotaleb and El-adaway, 2017), (Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2014), (Zakaria et al., 2012), (Ye and Rahman, 2010), (El-adaway et al., 2017), (Carmichael and Balatbat, 2010), (Kinal, 2015)	11
5	Lack of knowledge and experience in the field	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Hansen et al., 2017), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Wu et al., 2010), (Zakaria et al., 2012), (Ye and Rahman, 2010), (Kinal, 2015)	11
6	Variation order	(Abotaleb and El-adaway, 2017), (Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ramachandra and Rotimi, 2014),	11

		(Zakaria et al., 2012), (Ye and Rahman, 2010), (Kinal, 2015), (Latham, 1994)	
7	Improper supervision and financial control	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Hansen et al., 2017), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Abdul-Rahman et al., 2011), (Ansah, 2011), (Ye and Rahman, 2010), (El-adaway et al., 2017), (Kinal, 2015)	10
8	Disputes over payment claims and responses	(Ramachandra and Rotimi, 2015), (Odeyinka et al., 2008), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2014), (Zakaria et al., 2012), (Carmichael and Balatbat, 2010), (Kinal, 2015), (Latham, 1994)	9
9	Cash flow difficulties due to lack of initial capital	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2010), (Ye and Rahman, 2010)	8
10	Payment culture of the industry: chain payment and work first get paid later	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2010), (Ye and Rahman, 2010), (Kinal, 2015)	8
11	Receivership and liquidation of parent and related companies	(Ramachandra and Rotimi, 2015), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ramachandra and Rotimi, 2014), (Ramachandra and Rotimi, 2010), (Ye and Rahman, 2010), (Latham, 1994)	8
12	Disputes over quality of work	(Ramachandra and Rotimi, 2015), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ramachandra and Rotimi, 2014), (Ye and Rahman, 2010), (Carmichael and Balatbat, 2010), (Kinal, 2015)	7
13	Economic and market conditions	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013)	6
14	Structure of the industry: involvement of many commercial parties	(Ramachandra and Rotimi, 2015), (Abdul-Rahman et al., 2011), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Zakaria et al., 2012), (Ye and Rahman, 2010)	6
15	High capital investment nature: reliance on loan capital	(Ramachandra and Rotimi, 2015), (Abdul-Rahman et al., 2011),	5

		(Hansen et al., 2017), (Abdul-Rahman et al., 2013), (Ye and Rahman, 2010)	
16	Lack of proper process implementation	(Abdul-Rahman et al., 2013), (Azman et al., 2013), (Wu et al., 2010), (Wu et al., 2008), (Ye and Rahman, 2010)	5
17	Underpayment of certified amounts by the paymaster	(Danuri et al., 2006), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ye and Rahman, 2010), (Latham, 1994)	5
18	Administration/ bureaucracy	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2013), (Ye and Rahman, 2010)	4
19	Corrupt practice among consultants	(Danuri et al., 2006), (Abdul-Rahman et al., 2013), (Zakaria et al., 2012), (Ye and Rahman, 2010)	4
20	Internal conflicts/ disputes between owners or management team	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2013), (Ye and Rahman, 2010)	4
21	Poor communication among parties involved	(Danuri et al., 2006), (Azman et al., 2013), (Zakaria et al., 2012), (Kinal, 2015)	4
22	Cash flow problems due to delays and non-payments on the other projects	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2011)	3
23	Financial difficulties due to drop in building prices	(Ramachandra and Rotimi, 2015), (Abdul-Rahman et al., 2013), (Ye and Rahman, 2010)	3
24	Lack of regularly cash flow forecast	(Abdul-Rahman et al., 2011), (Abdul-Rahman et al., 2013), (Ye and Rahman, 2010)	3
25	Cost overruns and contract failure	(Ramachandra and Rotimi, 2015), (Ye and Rahman, 2010)	2
26	Easy entry of players with little/ no capital backing	(Ramachandra and Rotimi, 2015), (Abdul-Rahman et al., 2011)	2
27	Failure to identify technical problems and remedial action to be taken	(Azman et al., 2013), (Kinal, 2015)	2
28	Poor credit arrangement with creditors and debtors	(Abdul-Rahman et al., 2011), (Wu et al., 2008)	2
29	Political/ policy changes	(Ramachandra and Rotimi, 2015), (Odeyinka et al., 2008)	2
30	Time overrun of projects	(Ramachandra and Rotimi, 2015), (Odeyinka et al., 2008)	2
31	Disputes with debtors/ creditors	(Ramachandra and Rotimi, 2015)	1
32	Duration of projects (long-run or short-run)	(Ramachandra and Rotimi, 2015)	1
33	Easy exit of players: little/no liability to creditors	(Ramachandra and Rotimi, 2015)	1
34	Financial difficulties due to failure to secure contracts	(Ramachandra and Rotimi, 2015)	1

35	Heavy work load on consultant to evaluate the work done	(Abdul-Rahman et al., 2011)	1
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Systematic factors causing payment problems, along with frequency analysis, is given in the Table2-3.

Table 2-3: Systematic Factors causing payment problems

S. No	Factors Causing Payment Problems	References	Frequency
1	Complications from contractual conditions	(Ramachandra and Rotimi, 2015), (Abotaleb and El-adaway, 2017), (Danuri et al., 2006), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2014), (El-adaway et al., 2017), (Meng, 2002), (Kinal, 2015)	9
2	Onerous/Elongated payment terms from clients(in contracts)	(Abdul-Rahman et al., 2013), (Wu et al., 2008), (Meng, 2002), (Kinal, 2015), (Latham, 1994), (Ramachandra and Rotimi, 2015)	6
3	Legislative procedures (construction contracts act)	(Ramachandra and Rotimi, 2015), (Wu et al., 2010), (Wu et al., 2008), (El-adaway et al., 2017)	4
4	Standard form of contracts used (right to payment and non-payment provisions)	(Ramachandra and Rotimi, 2015), (Latham, 1994)	2
5	Procurement methods used	(Ramachandra and Rotimi, 2015), (Zakaria et al., 2012)	2
6	Contract types used	(Ramachandra and Rotimi, 2015)	1

The factor elongated payment terms from client in contracts are further emphasized upon in this study.

2.8 Factors causing elongation of interim payment duration:

From factors identified as systematic and non-systematic factors for delayed payments, following factors in Table 2-4 were derived as factors causing elongation of interim payments duration.

Table 2-4: Factors causing elongation of interim payment duration

S. No	Factors Causing Payment Problems	References	Frequency
1	Time for verification of bill with consultant	(Danuri et al., 2006), (Abdul-Rahman et al., 2011), (Odeyinka et al., 2008), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Ansah, 2011), (Ramachandra and Rotimi, 2014), (Zakaria et al., 2012), (Ye and Rahman, 2010), (El-adaway et al., 2017), (Carmichael and Balatbat, 2010), (Kinal, 2015)	12
2	Time for payment of verified bill with client	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Hansen et al., 2017), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Abdul-Rahman et al., 2011), (Ansah, 2011), (Ye and Rahman, 2010), (El-adaway et al., 2017), (Kinal, 2015)	10
3	Involvement of too many parties	(Ramachandra and Rotimi, 2015), (Abdul-Rahman et al., 2011), (Abdul-Rahman et al., 2013), (Azman et al., 2013), (Zakaria et al., 2012), (Ye and Rahman, 2010)	6
4	Administration or bureaucracy	(Ramachandra and Rotimi, 2015), (Danuri et al., 2006), (Abdul-Rahman et al., 2013), (Ye and Rahman, 2010)	4
5	Duration of project	(Ramachandra and Rotimi, 2015)	1

2.9 Remedies for delayed payments:

Different contractual provisions, legislative acts and administrative provisions have been developed and adopted to tackle the problem of delayed payments in construction industry (Ramachandra and Rotimi, 2010). Many countries have introduced legislative acts to address payment defaults issues including United Kingdom (UK), Australia, New Zealand and Singapore (Din and Ismail, 2014). Few of these legislative acts are: Housing Grants, Construction and Regeneration Act 1996, UK; Building and Construction Industry Payments Act 2004 of Queensland, Australia; Building and Construction Industry Security of Payment Act 1999 in New South Wales, Australia (Ramachandra, 2010). These legislations are directed towards reducing payment delays hence results in timely payments, timely dispute resolution, entitlement to payment for

the work done. In other words, all these legislations are for scenarios of under payment, late payment and non-payment. A summary of various acts and litigations to counter the delayed and default payments is given in the Table2-5.

Table 2-5: Various legislations to tackle delayed and default payments

NO	ACTS AND LITIGATIONS	FUNCTIONS
1	Housing Grants, Construction and Regeneration Act 1996 (United Kingdom)	To improve payment practices
2	Building and Construction Industry Security of Payment Act 1999 amended in 2002 (New South Wales, Australia)	Reduce payment delay
3	Building and Construction Industry Security of Payment Act 2002 (Victoria, Australia)	Entitlements to progress payment
4	The Construction Contracts Act 2002 (New Zealand)	Facilitate regular and timely payment, speedy dispute resolution, provide remedies for non-payment
5	Building and Construction Industry of Payment Act 2004 (Queensland, Australia)	Entitlements to progress payment
6	Construction Contracts Act 2004 (Western Australia, Australia)	Ensure the money flows in the contractual chain by ensuring timely payment
7	Construction Contracts (Security of Payment) Act 2004 (Northern Territory, Australia)	Facilitate regular and timely payment, speedy dispute resolution, provide remedies for non-payment
8	Building and Construction Industry Security of Payment Act 2004 (Singapore)	Expediting payment and improving cash flow
9	Tasmanian Security of Payment Act 2009	Reform payment behavior in the industry
10	Construction Industry Payment And Adjudication Act (CIPAA), Malaysia	Outlawing the practice of conditional payments, providing security and remedies for the recovery of payment following a decision by adjudicator.

Above mentioned acts and legislations are different steps taken to counter delayed payment problems caused by various factors. It is to be noted here that options of short interim payment duration are available in particular conditions of FIDIC but this option is left to choice of contracting parties. General trend of industry tells us that this option has

been misused by clients as other previous notorious conditional clauses of standard contracts (Zubair et al., 2016). Hence further considerations are advised by this study for shortening of payment duration.

RESEARCH METHODOLOGY

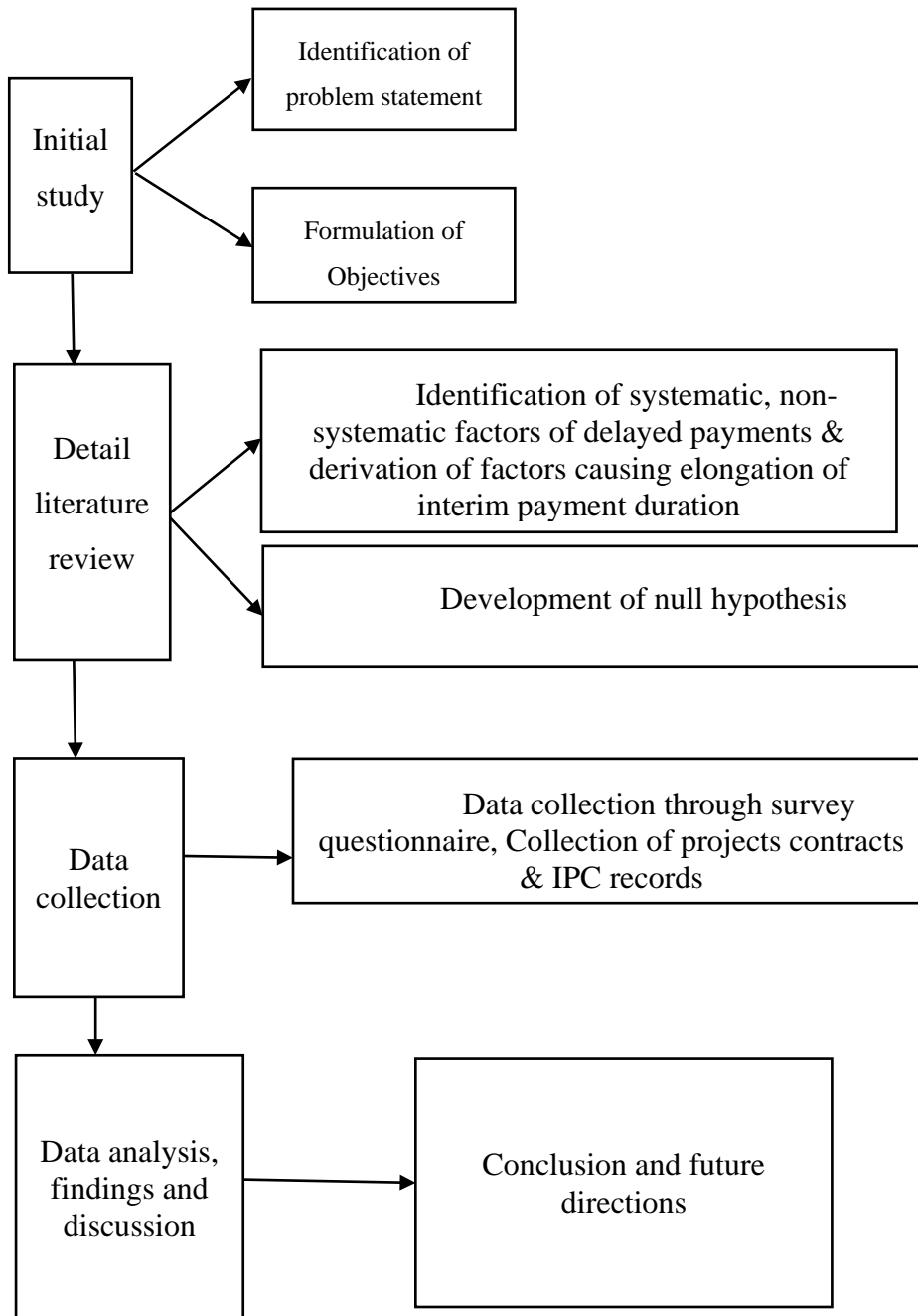
3.1 Introduction:

This study was executed in five phases to achieve the research targets. In the first phase, an initial study was conducted to find the research gap. Fundamental objectives were also developed in this stage. Then in the second phase, a detailed literature review was performed concerning the established objectives and a hypothesis was adopted. The third phase covered the development and dissemination of survey instrument. Data collection, analysis and a detailed discussion on the results was done during the fourth phase. Finally, in the last phase, research findings were validated through data collected. Study flow chart is shown in Figure 3.1.

3.2 Initial study:

A broad set of recent literature was studied to find the research gap. Science Direct, American Society of Civil Engineers (ASCE), and Google Scholar were used to locate the relevant papers. Keywords such as, ‘payment problems in construction industry,’ ‘delayed payments in construction industry,’ ‘payment defaults in construction projects,’ elongated payment durations and ‘cash flow of construction projects’ and were mainly searched. After review of a set of 50 papers, several questions were highlighted: why do the payment problems or cash flow problems still exist? What are the causes of elongated interim payment duration? What options are available to tackle the problem of elongated payment duration in construction industry? Where is the gap in remedies to efficiently tackle the elongated payment duration’s problems in construction industry? In reference to this rationale, a set of well-defined objectives were established to improve the body of knowledge.

Figure 3.1: Study Flow Chart



3.3 Detail literature review:

Detailed literature review helped in establishing the perspective related to different factors causing payment problems in construction industry. These factors can be various risks materialize during the concern period of construction projects or may arise due clauses of standard form of contracts, this leads to the first objective of this study i.e. to identify factors causing elongation of interim payment duration. This objective has been achieved in previous chapter. Literature review was carried out to identify systematic and non-systematic factors, from which factors causing elongation of interim payment durations were derived. Data from journals, books, papers etc. were retrieved to list down these factors. Frequency analysis of identified factors was conducted to establish importance of each factor. Literature review also helped in developing of the following hypothesis:

H_0 = In industry IPC's maximum processing duration is 44 days.

H_1 = In industry IPC's maximum processing duration is less than 44 days.

3.4 Data collection:

To test the hypothesis and to propose an optimum standard interim payment duration, data was collected from the local construction industry. As Kelley et al. (2003) stated that for a large sample collection survey method is relatively more suitable, efficient and inexpensive. Therefore, questionnaire-based survey technique was opted.

The questionnaire was developed in English language and consisted of four sections. First section inquired about the professional details of the respondents including their qualification, organization type, organizational position, work experience and list of countries where they had working experience. Second section was related to the general questions, grouped in heads of contract type selection and administration, in which respondents were inquired about selection of traditional standard forms of contract, usage of standard interim payment duration, opinion about shortening the duration of interim

payments, delay time in interim payments, typical modified interim payment duration and settlement options when interim payment is delayed. Third section was related to systematic factors causing delay in interim payments. Respondents were inquired about the percentage of additional amount included in bid price for the systematic factors causing delay in interim payments. In fourth section, respondents were asked to suggest optimum standard interim payment duration so one might not need to include additional amount for lengthy payment duration in bid.

The questionnaire was developed in Google Forms and was distributed online through professional and social networking sites. Also, experts were engaged by personally visiting their offices. A total of 100 respondents filled the survey which is in compliance with Osborn (2008) suggestion that is in case of unknown population any sample size greater than 96 can be assumed as reasonable.

Also contracts of various projects were collected and to get the actual processing time of IPC in industry, experts belonging to organizations of various clients and consultants were engaged.

3.5 Data analysis, findings and discussion:

In this phase, data collected was analyzed to extract findings and to compare these findings with past studies.

3.5.1 Data Analysis Techniques

The responses were analyzed using MS EXCEL and SPSS V-23. Following statistical technique were used for analysis:

3.5.1.1 Reliability Test

For checking the internal reliability (consistency) of data Cronbach's Alpha test is applied. If value of Cronbach's Alpha is greater than 0.7, the data can be considered reliable for study.

3.5.1.2 Normality Test

An evaluation of the data normality is a pre-condition for use of numerous statistical tests. It is performed to know whether data is normally distributed or not, i.e. is

the data parametric or non-parametric in nature. Shapiro-Wilk test is considered a more thorough examination of normality for datasets of about two thousand (2000) elements or less. For the dataset more than 2000 values Kolmogorov-Smirnov test is more suitable. Hence considering the sample size, for this study Shapiro-Wilk test was performed to check the data for normality. For the dataset to be considered as normally distributed, the significance value should be greater than 0.05.

3.5.1.3 Kruskal-Wallis Test

The Kruskal-Wallis test is used to determine whether three or more independent groups (client, consultant & contractor) are identical or diverse on some variable of interest (Belzer et al., 2014). It is used for non-parametric data. Significance value of greater than 0.05 means that the stakeholders have similar perception about the variable and vice versa. The significance value for this test was of 0.05 which is in line with recommendation of (Elliott and Hynan, 2011).

3.5.1.4 T-Distribution Test

T-distribution test is conducted to check the null hypothesis. This test is recommended when the sample size is less than 30. For this study, number of IPC collected is 11. 95% confidence level is used. The significance value of less than 0.05 means rejection of null hypothesis when confidence level of 95% is used.

DATA ANALYSIS, RESULTS AND DISCUSSION

The methodology adopted for analysis of data collected for this research is described below

4.1 Demographic information of survey respondents:

Table 4-1 provides summary of profiles of the respondents. 58% respondents had BSc degree in civil engineering, 60% respondents had experience of project management, 59% respondents were contractor followed by 30% client and 11% consultant, 19% respondents had an experience more than 25 years in construction industry and majority 27% respondent had an experience of 6-10 years in construction industry. All respondents were working in Pakistan's construction industry.

Table 4-1: Demographic profile of respondents

		Number	Percentage
Qualification	B.Sc.	58	58
	MS	27	27
	B. Tech	8	8
	DAE	6	6
	PhD	1	1
Field of Work	Project Management	71	60
	Contract Management	27	23
	Construction Management	20	17
Organization Type	Client	30	30
	Consultant	11	11
	Contractor	59	59
Professional Experience	1-5 Years	22	22
	6-10 Years	27	27
	11-15 Years	9	9
	16-20 Years	13	13
	21-25 Years	10	10
	More than 25 Years	19	19

4.2 Test for reliability of data:

Cronbach's Alpha test was applied to check the reliability of data collected through survey questionnaire. Cronbach's Alpha coefficient of any value higher than 0.7 is considered satisfactory reliable (Bland and Altman, 1997) . The test of data collected

resulted in, Cronbach's alpha coefficient of 0.741. It can be deduced here that data gathered through survey questionnaire is reliable and can be used for the research.

4.3 Test for normality of data:

Shapiro Wilk test was applied to check the normality of data collected. The coefficient of 0.05 and above in Shapiro Wilk test means that individual inputs are normally distributed (Ghasemi and Zahediasl, 2012)

All values from test, failed to exceed the value of 0.05. Therefore, it can be considered that the data is not normally distributed. Hence Kruskal-Wallis test was used for further analysis.

4.4 T-Distribution Test:

T- distribution test with 95% confidence level was conducted to check the null hypothesis. The null hypothesis is as follow

H_0 = In industry IPC's maximum processing duration is 44 days.

H_1 = In industry IPC's maximum processing duration is less than 44 days.

Sample size, that is IPC collected of different projects from local industry, was 11. Significance value came out to be 0.000 (less than 0.05) and mean value came out be 12.09 this indicates that null hypothesis is rejected in favor of alternate hypothesis.

4.5 Contract type selection and administration:

This section of survey questionnaire starts from question no. 7 and ends at question number 12. Elliott and Hynan (2011) suggested a significance coefficient value of 0.05 for applying Kruskal-Wallis test. Same value was adopted in the present study. The test concluded that there is no significant difference in the opinions of clients, consultants and contractors in regards to selection of typical traditional standard form of contract. Same is the result for opinion regarding shortening of standard interim payment duration in traditional contracts and typical delay time while using standard interim duration. Whereas their opinions are significantly different in regards to use of standard interim payment duration of traditional contract, typical modified interim payment

duration as per project particular conditions and settlement option in case of delayed payment.

Table 4-2: Traditional standard form of contract

Traditional form of contract	Responses Frequency	Percentage
PEC standard bidding document	95	81
FIDIC 4 th , (1987 or 1992)	13	8
FIDIC 99	9	11
Total	117	100

As shown in Table 4-2, due to the option of multiple selections in question 7, a total of 117 responses were collected from 100 respondents. In this question respondents were inquired about usually used typical traditional standard form of contract. In total, 81% responses opted PEC published standard form of contract, 11% responses opted FIDIC 1987 and 8% responses opted FIDIC 1999. As PEC standard form of contract is basically FIDIC 1987, adopted for local use (PEC, 2008), it can deduced from these responses that PEC or FIDIC 1987 is mostly used traditional standard contract in local industry. This finding is in line with findings of past studies which concluded that among different standard forms of contracts used in construction industry, FIDIC is widely used internationally and also many countries have adopted its amended form per the country's requirement for its local projects (Robinson, 2011, Michael Kerr and Dentons, 2015).

Table 4-3: Usage and shortening of standard interim payment duration

	(Yes) Frequency	Percentage	(No) Frequency	Percentage
Usually used standard interim payment duration	27	27	73	73
Should standard interim payment duration be shortened	97	97	3	3

Table 4-4: Modified payment duration

Usually used modified payment duration	15 days	20 days	28 days	30 days	42 days	44 days	Total
Frequency	2	2	44	28	9	15	100
Percentage	2	2	44	28	9	15	100

As shown in Table 4-3, in response to question number 8, do you usually use standard interim payment duration of traditional standard contract, a total of 73% respondents chose the option 'No'. And in response to question number 9, should the standard interim payment duration of traditional standard contract be shortened, a total of 97% respondents chose the option 'Yes'. As shown in Table 4-4, the majority response to question number 11, where respondents were asked to mention the usually used modified interim payment duration as per project particular conditions, was 28 and 30 days (44% and 28% respectively).

It can be deduced from the responses of questions number 8,9 and 11 that respondents consider 56 days (FIDIC) and 44 days (PEC) of standard interim payment duration as lengthy periods and would rather prefer a shorter interim payment duration. The perception of 56 and 44 days being longer duration is further justified when compared with other traditional contracts duration like AIA-A201 (10 days), JCT-2011 (14 Days), ConsensusDocs-200 (20 days), EJCDC-C700 (20 Days), NEC-3 (21 Days). As the responses indicates that in majority of projects these longer durations have been replaced with a shorter one which indicates that these standard longer durations have become redundant and might as well be reduced to a shorter one.

This finding is also in line with the findings of Ye and Rahman (2010); the payment durations should be shorter and clients should make prompt payments to avoid the phenomena of 'lack of cash' faced by the service providers.

Table 4-5: Typical delay time

Typical delay time	11-15 Days	16-20 Days	21-25 Days	26-30 Days	51-55 Days	56-60 Days	91-95 Days	No typical duration	Total
Frequency	3	4	1	5	1	2	1	83	100
Percentage	3	4	1	5	1	2	1	83	100

Table 4-6: Settlement options

Settlement option in case of delayed payment	Charge in final payment	Adjust in liquidated damages	Charge interest after due date as per contract agreement	Addition of extra amount of money in bid for expected payment delays	Just reminders to client	Total
Frequency	38	4	4	2	52	100
Percentage	38	4	4	2	52	100

Furthermore, as shown in Table 4-5, in response to question number 10, where respondents were asked about typical delay time in payments they face under standard interim payment duration of traditional standard contract, a total of 83% respondent replied with 'no typical duration'. Also it is concluded from discussion with practitioners of industry that when interim payments take more days than specified duration, it is not because of processing time required for vetting, clearance and transaction of that bill but either due to un-availability of funds or submission of incomplete documents for interim payments by contractor.

Though, it is the contractual obligation of the client to reimburse the interim payments to contractor within specified duration but the responses indicate that clients delay the payments and that too for an uncertain period. This finding is in line with the findings of Meng (2002); problems of client's payments default in Chinese construction industry are becoming more and more prevalent. Similarly, Carmichael and Balatbat (2010) found out that contractors receive the payments commonly later than that specified in contract.

Moreover, as shown in Table 4-6, in response to question number 12, where respondents were asked about settlement option in case interim payment is delayed, a

majority 52% respondents replied with ‘just reminders to client’, followed by 38% respondent who chose ‘charge in final payment’, this was followed by 4% respondents who chose ‘adjust in liquidated damages’ and this was then followed by 4% respondents who chose ‘charge interest after due date as per contract agreement’ whereas 2% respondents chose ‘addition of extra amount in bid price for expected delay in interim payments’.

It is evident from the responses that clients get away with delaying the payments as contractors usually do not ask for the amount due under the penalties. Similarly, Ye and Rahman (2010) found that late payments are acceptable to some contractors.

4.6 Inclusion of additional amount in bid price:

The result of Kruskal-Wallis test of this section’s data concluded that there is no significant difference in the opinions of client, consultant and contractor.

In this section of survey questionnaire, respondents were given the list of six systematic factors and were asked to mention the percentage of additional amount in bid price that contractors might add for the listed factors. Percentage of additional amount was asked against each factor and for all six of them collectively as well.

Table 4-7: Additional amount in bid price for systematic factors

Additional amount in bid price for systematic factors	Yes	No	Total
Frequency	4	96	100
Percentage	4	96	100

As shown in Table 4-7, in total, 96% respondents replied that no additional amount is added in bid for these factors followed by 2% respondents who responded that an additional amount of 2%, followed by 1% respondents who mentioned an additional amount of 1% and lastly 1% respondents mentioned an additional amount of 3% in bid price for the listed factors. As the overwhelming majority responses (96%) are in contradiction to the practice of inclusion of additional amount in bid price for the systematic factors of delayed interim payments. These responses also infer that no additional amount is included in bids for the factor elongated interim payment duration.

This finding is further endorsed by the findings of study conducted by Ye and Rahman (2010); contractors largely do not incorporate risk of late payment in bids but they will price differently with clients who are known for delayed payments. In that study respondents were not categorically asked for incorporation of risk of late payments ‘due to specific factors’, whereas the present study do.

4.7 Optimum standard interim payment duration:

The last objective of this research that is to propose an optimum interim payment duration for traditional standard contracts was achieved through this last section of survey questionnaire. Heading of this section is “Different Traditional Standard Contracts Along with Interim Payment Durations”.

The result of Kruskal-Wallis test of this section’s data shows that there is no significant difference in the opinions of clients, consultants and contractors. In this section of survey questionnaire, respondents were presented with a table listing various traditional contracts along with duration for interim payments and were asked to propose an optimum standard interim payment duration so that the contractor does not need to include additional amount in bid due to the lengthy payment duration.

Table 4-8: Optimum standard interim payment duration

Optimum standard interim payment duration	10 Days	14 Days	15 Days	20 Days	21 Days	28 Days	30 Days	40 Days	45 Days	56 Days	Total
Frequency	1	4	2	1	9	45	34	1	1	2	100
Percentage	1	4	2	1	9	45	34	1	1	2	100

As shown in Table 4-8, a duration of 28 days for interim payment is the majority response. Clients also favors a shorter duration of payment because it motivates the contractor to keep a higher progress rate that results in on time completion of project. Based on the opinion of experts of local industry and rejection of null hypothesis through T-distribution test (based on IPC record collected from industry), this study proposes that the existing interim payment duration of 44 days in the particular conditions of traditional standard contract, published by PEC, should be replaced with interim duration of 28 days.

Conclusions and Recommendations

5.1 Conclusions

In order to propose optimum interim payment duration, factors causing delays in interim payments were identified from literature. These factors were categorized into systematic and non-systematic factors. Five factors causing elongation of interim payment duration in contracts were derived from these factors of delayed payments. These five factors came out to be time allotted to consultant for verification of bill, time allotted to client for payment of verified bill, involvement of too many parties, administration or bureaucracy and duration of project.

This study concludes that no additional amount is included in bid price for elongated interim payment duration based on the survey conducted from the practitioners of local industry.

It was hypothesized that in industry IPC's maximum processing duration is 44 days. To check this hypothesis, data consisting of IPC record of three different projects and break down of actual time for vetting and payment of interim payments were collected from industry. T-distribution test conducted on 11 number of IPC of three different projects from local industry concluded that, in practice, time required for vetting and payment of interim payments is less than 44 days. Also it is concluded from discussion with practitioners of industry that when interim payments take more days than 28, it is not because of processing time required for vetting, clearance and transaction of that bill but either due to unavailability of funds or submission of incomplete documents for interim payments by contractor.

Based on the actual processing time of IPC in industry and experts' opinion collected through survey questionnaire, this study concludes that 28 days' duration is optimum for interim payments.

5.2 Recommendations

- This study recommends that the existing interim payment duration of 44 days in particular conditions of traditional standard form of contract of PEC should be further reduced to a duration of 28 days.
- Competency should be ensured in contractor, consultant and client teams to avoid the delays in payments process.
- Staff responsible for vetting of IPC should not be overburden with other projects as it may affect the vetting process.

5.3 Limitations

Survey for this study was limited to local industry and cost impact of only systematic factors including elongated interim payment duration were inquired about.

5.4 Future recommendations

- Study should be conducted on the economic repercussions, in terms of arrangement of cash in shortened payment duration, on the local construction industry.
- This survey should be expanded to international market.
- Cost impact of non-systematic factors should be inquired about.
- Interim Payment duration of contracts other than traditional contracts should also be evaluated.

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Annexure – I

An Investigation into the Elongated Interim Payment Duration: A Proposal of Optimum Payment Duration

Dear Sir/Madam,

This survey is being carried out as a part of my MS thesis titled” An Investigation into the Elongated Interim Payment Duration: A Proposal of Optimum Payment Duration”. This survey will help to identify the amount added in bid prices due to elongated interim/ progress payment duration of construction contracts. Interim/ progress payment is payment of work done to contractor at regular intervals pre-decided in contract. It will also help to determine optimum interim payment duration without additional contingent amount in bid prices.

Your contribution towards this research is highly appreciated. Please be assured that the data will only be used for the study purpose and no personal information will be disclosed at any level/ forum.

In case of any inquiry, please feel free to contact.

Regards,
Sarir Ahmad,
MS Student,
Department of Construction Engineering and Management,
National Institute of Transportation,
National University of Science and Technology,
Islamabad, Pakistan.
Email: sarir.cem7@nit.nust.edu.pk

Section 1: Personal Information

1. Please indicate your highest academic qualification

- B.tech/ BS. Tech
- B.Sc/ B.Engg/ BS
- MS/ MSc/ M.Engg/ M.Phill
- M.Tech/ Ms.Tech
- Phd
- other: _____

2. Please indicate your field of work (Tick all that may apply)

- ConstructionIndustry
- Architect
- Project Management
- Engineering
- Construction Management
- Academics
- Other: _____

3. Please indicate your organization type

- Client
- Consultant
- Contractor
- Other: _____

4. Please indicate your job title

- Project Director
- Project Manager
- Construction Manager

- Contract Administrator
- Assistant Manager
- Site Manager
- Project Engineer
- Architect/ Designer
- University Professor
- Consultant
- Other: _____

5. Please indicate your years of professional experience

- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- More than 25 years

6. Please indicate your country's name

Section 2: Contract Type Selection and Administration

7. What typical traditional standard form of contract do you use?

(Tick all that may apply)

- American Institute of Architects (AIA-A201)
- CONSENSUS DOCS Owner-Contractor Construction Contract (Consensus DOCS 200)
- Engineers Joint Contract Documents Committee Owner-Contractor Construction Contract (C700)
- FIDIC 4RTH, 1987
- FIDIC 1999
- FIDIC for Multilateral Development Bank Harmonized Edition (FIDIC-MDBs), 2010 Edition

- Joint Contract Tribunal Owner-Contractor Building Contract (JCT2011)
- New Engineering Contract (NEC 3)
- Pakistan Engineering Counsel Standard Form of Contracts (PEC)
- Other: _____

8. Do you usually use standard interim payment duration of traditional standard form of contract?

- Yes
- No

9. Should the standard interim payment duration be shortened?

- Yes
- No

10. While using standard interim payment duration, what typical delay time in payment, in days, do you usually face?

- 1-5
- 6-10
- 11-15
- 16-20
- 21-25
- 26-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56-60
- Other: _____

11. When modified payment duration is used as per project particular conditions, what interim payment duration, in days, do you usually use? (Please mention number of days in digits)

12. How do you settle, in case interim payment is delayed from contracted duration?

(Tick all that may apply)

- Charge in final Payment
- Adjust in liquidated damages
- Charge interest after due date as per contract agreement
- Addition of extra amount of money in bid price for expected delay in interim payments
- Other: _____

Section 3: Systematic Factors Causing Delay In Interim Payments

Systematic factors exist due to problematic contractual clauses and lack of legislation. Systematic factors mentioned below are collected through literature review.

(Please enter your answer in digits)

No	Factor
1	Complex And Ambiguous Payment Procedure In Contract
2	Lengthy Payment Duration From Client In Contract
3	Status of Legislation (To Improve Payment Practices)
4	Various Standard Form of Contracts Used (Different Payment Duration & Contractor's Rights In Case of Delayed Payments)
5	Procurement Method Used (Negotiated Tenders, Competitive Tenders)
6	Form of Payment Used in Contract (Lump sum, Cost Plus etc.)

13. Do contractors add any additional amount in bid price due to above mentioned factors?

- Yes
- No

14. What percentage (%) of project cost do you add in bid price for expected delays in interim payments due to above mentioned systematic factors?

Note: - In questions 15 – 20 you are asked to subdivide the percentage amount you mentioned in your answer of question no 14. So the sum of percentages in answer of questions 15-20 must be 100.

15. What percentage of “amount added in bid price for delay in interim payments due to above mentioned systematic factors” does account for the factor “Complex and Ambiguous Payment Procedure in Contract”?

16. What percentage of “amount added in bid price for delay in interim payments due to above mentioned systematic factors” does account for the factor “Lengthy Payment Duration from Client in Contract”?

17. What percentage of “amount added in bid price for delay in interim payments due to above mentioned systematic factors” does account for the factor “Status of Legislation”?

18. What percentage of “amount added in bid price for delay in interim payments due to above mentioned systematic factors” does account for the factor “Various Standard Form of Contracts Used”?

19. What percentage of “amount added in bid price for delay in interim payments due to above mentioned systematic factors” does account for the factor “Procurement Method Used”?

20. What percentage of “amount added in bid price for delay in interim payments due to above mentioned systematic factors” does account for the factor “Form of Payment Used in Contract”?

Section 4: Different Traditional Form of Contracts Along with Standard Interim Payment Durations

CONTRACT TYPE	STANDARD DURATION FOR INTERIM PAYMENTS
FIDIC 4RTH, 1992 Edition	56Days
FIDIC 1999 Edition	56Days
FIDIC-MDBs Harmonized Edition, 2010	56Days
Pakistan Engineering Council Standard Form of Bidding Documents (Civil Work)	56Days
New Engineering Contract (NEC3)	21Days
ConsensusDocs-200, Owner-Contractor Construction Contract	20Days
EJCDC700, Owner-Contractor Construction Contract	20Days
JCT2011, Owner-Contractor Building Contract	14Days
American Institute of Architect (AIA-A201)	10Days

21. What should be the optimum standard duration, in days, for interim payments in traditional standard contract, specifically to avoid addition of amount in bid price for the factor “Lengthy Interim Payment Duration”?

(Please enter your answer in digits)

Kindly provide the below mentioned contact information. Please be informed that any personal contact information will not be shared at any level/ forum.

21. Please mention your name

22. Please mention your email id

23. Please mention your company name

24. Please mention your contact number

Thank you for your time.

Regards,

Sarir Ahmad.