
WEB-BASED CONSTRUCTION CLAIMS MANAGEMENT SYSTEM: OPERATION OF THE PROTOTYPE

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ABSTRACT

Claims are a fact of life for most construction projects. However, the management of claims is not a simple straightforward task. The submission of claims requires some evidence to substantiate, certain details to be included, some procedures to be followed, and needs to be submitted within a specified time-frame. This task can be made even more complicated due to the lack of an efficient document management system and competent staff to oversee the whole process, and also the departure of key personnel in the project particularly the one who knows the most about a claim. Without an efficient system for managing claims, disputing parties may find themselves at the losing end, as challenging the claims by an opposing party who is well prepared may prove to be difficult. This paper introduces a prototype Web-based construction claims management system acting as a common communication platform for the client, architects, consulting engineers, contractor and sub-contractors, through which the architect's instruction can be issued, extension of time (EOT), loss and/or expense (L&E), additional expense, and interim payment claims can be submitted and processed. A mechanism is developed to automatically track the deadlines for the submission of notices and claims, and to respond to others according to the conditions of the contract (i.e. PAM Contract 2006 used in Malaysia). Furthermore, intuitive and context-aware messages are provided on the relevant pages to alert and guide the users on what to do next and what to expect from others. Other than improving the practice of managing claims, the system also helps reduce the number of potential disputes through the higher transparency and the more efficient documentation facilitated.

Keywords: claims management, Web-based system, construction claim, ICT in construction, PAM Contract 2006

1. INTRODUCTION

In a typical construction project, the contractor claims for the work done and any additional loss or expense which are essential to generate the cash inflow for the him to fund the subsequent construction operations and to sustain his business. Therefore, claims are part of the life of construction projects. Hughes and Barber (1992) define claim as "a request, demand, application for payment or notification or presumed entitlement to which the contractor, rightly or wrongly at this stage, considers himself entitled with respect to an agreement has not yet been reached". The challenge is that the clients and consultants may not always agree with the claims submitted by the contractors due to various reasons. In view of the amount of the claims and the other implications to both the contractor and the client/consultants, it is logical that both sides exercise due care in the preparation and evaluation of claims. In real life, however, due to practical reasons such as high workload, inexperience, unfamiliar with the conditions of the contract, departure of key personnel handling claims, and the loss of relevant critical documents or information, handling of claims may turn out to be far more complicated that they seems to be. It is also not uncommon for claims to lead to disputes between the parties involved. Without, at least, an efficient system for managing claims, disputing parties may often find themselves at the losing end as challenging

the claims by an opposing party who is well prepared may prove to be difficult. The same applies to the submission of a claim as well. The submission of claims requires some evidence to substantiate, certain details to be included, some procedures as spelled out in the contract to be followed, and needs to be submitted within a specified time-frame. Some construction companies notice that their claims or defence of claims have failed to stand the scrutiny of the opposing party. The reasons behind this are wide-ranging, but include the lack of critical details and documents or evidence which were either incomplete, lost or non-existent, and failed to abide by the deadline stipulated in the contract.

This paper begins with a discussion on the issues with claims and the use of information and communication technology (ICT) for claims management in the construction industry. This is followed by the findings from the case studies conducted on the end-users' requirements for the design of a Web-based construction claims management system. The system's architecture is then presented and the operations of the various functions are explained. Further works of the research are also discussed.

2. ISSUES WITH CLAIMS

Zaneldin (2006) contends that in order to enhance the chances of success, contractors submitting claims must closely follow the steps stipulated in the contract conditions, provide a breakdown of alleged additional costs and time, and present sufficient documentation; for clients, they need to follow an overall comprehensive step-by-step procedure for tracking and managing the claims submitted by contractors. The input from an experienced competent contract administrator is hence vital as far as management of claims is concerned. However, the construction industry in Malaysia is known for its relatively high staff turnover. The heavy reliance on contract administrator, which role is normally assumed by the project manager, may lead to some problems when one leaves an organisation due to retirement or other reasons as the person who knows best about the claims is no longer around. The problem will be further aggravated if there are still some critical loose ends for the claims pending the action of the contract administrator who is leaving or has already left.

The preliminary review of existing literature does not reveal any dedicated information system developed for managing both the documentation of claims and the knowledge created. The lack of IT system support means that most parts of the contract administration are done "manually" with most of the details residing in the head of the contract administrator, whilst the rest distributed amongst members of staff involved in the particular project. As a consequence, when things turn ugly and the parties have resorted to arbitration or litigation, it becomes evident that there is a problem of the loss of information, documents and important knowledge vital to the winning of the case due to the departure of the key people with the knowledge regarding the issues and compounded by inefficient document management system.

Some of the problems pertaining to claims identified by Chovichien and Tochaiwat (2006) and Hughes and Barber (1992), as depicted in Table 1, may be partially attributed to the staff's lack of familiarity with the contract, such as the failure to recognise disruption at the appropriate time and maintain contemporary records, not knowing what to claim, and poor presentation by the contractor of the claim to show cause and effect. Chovichien and Tochaiwat (2006) have even explicitly mentioned the "lack of knowledge" on how to handle claims among the project staff as one of the problems.

Table 1: Issues and problems pertaining to claims

Chovichien and Tochaiwat (2006)	Hughes and Barber (1992)
<ul style="list-style-type: none"> - Incomplete document - Too many documents - Lack of knowledge - Insufficient time - Delayed response - Unclear regulation - Lack of personnel - Not knowing what to claim - Inconsistency between departments - Oral or multi-person instruction - No standard form 	<ul style="list-style-type: none"> - The (erroneous) assumption that an extension of time is automatically linked to additional payment for loss and expense - The failure to recognise disruption at the appropriate time and maintain contemporary records - The failure to keep an updated programme - The poor presentation by the contractor of the claim to show cause and effect - The practical and commercial pressure on the employer to complete on time and on budget, irrespective and the delays and disruption that commonly occur

A number of research projects have been conducted to address some of the aforementioned issues.

3. INFORMATION AND COMMUNICATION TECHNOLOGY SUPPORT FOR CLAIMS MANAGEMENT

Advancements in information and communication technology (ICT) have led to the proliferation of various ICT tools for the project management related tasks, which include the management of claims. Hassanein and Nemr (2008) propose to improve claims documentation and filing procedures through the introduction of claims filing systems and the utilisation of electronic document management systems within organisations. Related to this, Al-Sabah et al (2003) have developed a Microsoft Access database management system to document and analyse claims for additional payment and time for completion on construction projects. However, there is no function available for the relevant supporting documents to be captured in the system which is critical for claims substantiation. In addition, the system's utilisation is restricted to the office where it is installed as it does not support access through internet by other offices due to the lack of Web-based capability.

In the field of advanced artificial intelligence research for claims management, Ren et al (2003) have developed a multiagent system (MAS) for construction claim negotiation (MASCOT) in which autonomous agents, acting on behalf of project participants, can directly negotiate with each other to resolve construction claims. A study has also been conducted on the adoption of a Particle Swarm Optimisation-based (PSO-based) artificial neural network approach for the prediction of the outcome of construction claims, based on the characteristics of each individual case and the corresponding past court decisions (Chau, 2007). Chau (2007) argues that the approach will furnish an alternative in assessing whether or not to take a case to litigation, as the latter has been known to be costly and time consuming. Chen (2008) developed the K-Nearest Neighbour (KNN) based knowledge-sharing model for severe change order disputes in construction which facilitates knowledge sharing among the users and helps prevent disputes. The knowledge-based decision guidance system developed by Palaneeswaran and Kumaraswamy (2008) can help all concerned parties in navigating through the various options available to them in order to rationalize their approaches towards the preparation and evaluation of the EOT claims. There are also instances where fuzzy case-based reasoning and text mining are used in construction contract administration to help resolve disputes (Chen et al, 2009; Fan and Li, 2013).

Ho and Liu (2004) developed the Claims Decision Model (CDM) based on "game theory" which explains people's behaviour during a potential or existing claiming situation, how different claiming situations are related to opportunistic bidding behaviour, and what situations encourage or discourage opportunistic behaviour. The model can help various project participants to analyse construction claims systematically and rationally and to provide better understanding of each other's position which is imperative for arriving at a settlement.

Williams et al (2003) introduce a very systematic approach for preparing a claim using cause-mapping and system dynamics. It comprises a format for a claim document that presents first the disruptive triggers and involves the use of a formal qualitative model to build the claim from the interacting effects of the aforementioned triggers. Subsequently, the model is transformed into a computer simulation to explore the different scenarios to provide the quantum of the claim.

However, there was hitherto insufficient research done on the development of a Web-based claims management system which does not only assist in the documentation of claims and ensuring adherence to stipulated timeframe, but also helps to capture and share the critical knowledge vital to the success of claims. This research aims to study the existing practice of the Malaysia construction industry in managing claims to identify the areas that IT-based document management system may contribute to better manage the whole process. Subsequently, a prototype Web-based claims management system will be developed based on the findings. Compared with conventional desktop applications, Web-based systems can offer simultaneous instant access to the system across geographically dispersed offices, which help to facilitate instant sharing of critical knowledge that the other applications cannot deliver.

4. RESEARCH METHODOLOGY AND BACKGROUND OF CASE STUDY PARTICIPANTS

A case study approach was selected because it provided an in-depth insight into the issues with claims and the end-users' requirements for the development of a Web-based construction claims management system. The case studies involved semi-structured interviews with ten participants from nine organisations whose positions ranged from contracts manager to executive director to ensure that a comprehensive view was obtained. Background information of the participants is presented in Table 2:

Table 2: Background of Case Study Participants

Participant	Background
1	Director of a quantity surveying consultancy
2	Executive director of a construction firm
3	Claims consultant
4	Executive director of a public construction research centre
5 & 6	Contracts manager of a construction firm
7	Director of a quantity surveying consultancy
8	Director of a quantity surveying consultancy
9	Chief resident engineer of a construction firm
10	Senior project manager of a property development company

5. END-USER'S REQUIREMENTS FOR THE DESIGN OF A WEB-BASED CLAIMS MANAGEMENT SYSTEM

The main end-users' requirements as to the design and features of the system identified from the case studies can be grouped into two categories, namely generic and specific requirements. For the former, these include reliability, security, accessibility, user-friendliness and well-designed forms for different types of claims or purposes. These are critical since the system is to be made available as a service through the Web. The specific requirements identified are as follows:

5.1 Tracking of the status of the claims

The transaction of claim may not always be a straight forward one-off transaction, i.e. the contractor submits a claim and the consultant grants it accordingly. In fact, this can be rather iterative in nature. It is therefore desired that the claims management system will be able to help track the submission of documentation for the claim,

status and decision of the consultants regarding the claim, decision made and further action to be taken by the contractor, as well as the final outcome of the claim to take the burden off the contract administrators.

5.2 Reminder function

The reminder function required serves to alert the contractor the relevant deadlines for submitting required documentations, notices and claims. Such reminders will be useful to the client and consultants as well since there are also deadlines applicable for them to respond to the action of the contractor.

5.3 One centralised database to access the information about all the claims

The current practice of recording claims on project by project basis has led to the isolation of information and does not facilitate easy access to this information. As for a claim, there would be a series of notices, official letters, final claim, and also the relevant attachments to each of the formers passed amongst those concerned. Currently, the files or attachments pertinent to a claim are saved in a less systematic way (and even separately in physical folders) which makes it difficult to others to locate and understand their relationship with the claim. Therefore, a centralised system that can provide the essential direct access to all the information about a claim and the relevant files to various notices, etc. of a claim of any project operated by a company through the internet or intranet is desired.

5.4 Online claims transaction

The transaction of claims need to be performed electronically online, which will help to improve the efficiency of the overall process and curb bribery due to increased transparency. Related to this, the status of a claim (i.e. granted or otherwise) and decisions of the consultants as to the claims need to be made visible to all the users, which may include the client or his representative.

These requirements identified from the case studies were analyzed to formulate a methodology for managing construction claims, which is subsequently being encapsulated into a software tool. The details of the methodology is depicted in its system architecture, as shown in the following section.

6. SYSTEM ARCHITECTURE OF THE WEB-BASED CONSTRUCTION CLAIMS MANAGEMENT SYSTEM

In order to provide a centralised database for all the claims and the ease of access to the information, the construction claims management system comprises a Web-based database and a Claims Transaction System that handles the logics and procedures for processing claims (See Figure 1).

6.1 Web-based database

Web-based database allows the users to access the information at anytime and any place via computing devices with Internet connection. The Web-based nature of the system requires only a Web browser, and no additional application, to be installed on the computing device used to access it. This facilitates cross-platform access and, as most of the computations are performed in the Web-based system, the performance requirement for the computing device used is very minimal.

6.2 Claims transaction system

The life cycle of a claim starts with the initiation of a claim and ends with the settlement of the claim. In between, however, there may be also a series of negotiations and counter claims as this is hardly a very straight forward process. Moreover, many construction contracts contain specific procedures for submission and processing of claims, including notice, documentation requirements, timelines, and who should receive the claim (Bramble and

Callahan, 2000). Failure to abide by these conditions may risk the claim to become invalid. This is also the case for The Malaysian PAM Contract 2006 (with quantities), which is a widely used standard form of contract for construction projects in the country. To address the aforementioned issues, an automated mechanism is created to take over the responsibility for tracking the deadlines and ensuring that everything is carried out according to the specified procedures. A Claims Transaction System is hence envisaged; it is capable of managing a claim throughout its lifecycle without much manual intervention in accordance with all the conditions, procedures and deadlines as spelled out in the contract. The Claims Transaction System also has to cope with the different workflows for different types of claim and is designed to manage the various formats of files uploaded into the system. The Claims Transaction System has the following modules:

- a) Architect’s Instruction Module
- b) Engineer’s Instruction Module
- c) Extension of Time Module
- d) Loss and/or Expense Module
- e) Additional Expense Module
- f) Interim Claim Module
- g) Weather Records Module
- h) Holiday Management Module
- i) Setting Up Module

For most of the modules, the system provides intuitive context-aware guides (see Figure 2) on the deadlines, next action required, options for action available (e.g. to request the Architect to specify the clause that empowers the issuance of an instruction), implication of an action or non-action, latest status of the relevant users’ activities, etc. The context-aware guides are programmatically generated based on a set of predefined rules and the roles of the user (e.g. architect and contractor) where different guides will be shown to different types of user. How this feature works is covered in the subsequent section on the “operation of the prototype system”.

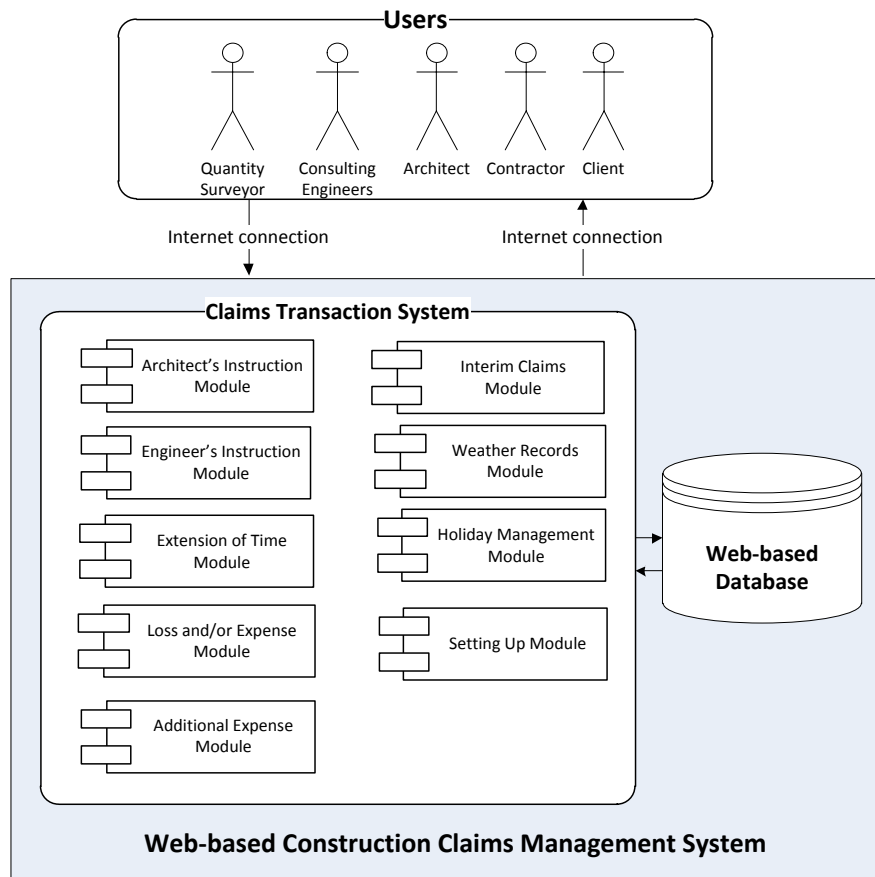


Figure 1: System architecture of the prototype Web-based construction claims management system

The functions of the respective modules of the Claims Transaction System are explained in the following section that covers the operation of the prototype system.

7. OPERATION OF THE PROTOTYPE SYSTEM

Prior to using the system for the first time, a new project has to be setup with its details and that of the companies and users involved in the project. The setting up is performed through the “Setting Up Module” whereby the users’ login credentials and roles are recorded and configured accordingly. The next task is to configure the “Holiday Management Module” to ensure that all the gazetted national and state holidays are properly recorded. This operation is critical as the calculation of various deadlines under PAM Contract 2006 excludes the gazetted holidays in the state where a project is located. For all the users’ action, such as the issuance of instruction and responses made, the respective date and time are recorded automatically by the system to prevent the malpractice of backdating. The system provides intuitive and context-aware messages (i.e. depending whether the user is the contractor’s staff, architect or quantity surveyor) on the relevant pages to alert and guide the users on what to do next and what to expect from others.

7.1 Architect’s Instruction (AI)

The architect can issue the AI through the system and attach relevant documents as necessary. The architect may specify the clause(s) that empowers the issuance of the AI from the dropdown list. The system also prohibits the architect from specifying a deadline for compliance that is less than 7 days from the date of issuance in accordance with the conditions of PAM Contract 2006. The architect can update the status of the contractor’s compliance of the AI in the system.

Upon issuance, the contractor can immediately view the AI online and be reminded that he has to comply with the AI by the deadline; otherwise the employer may employ other person to execute the work necessary to give effect to the AI. On the contractor’s screen, the contractor is informed by the intuitive context-aware guide (see Figure 2) that if the clause(s) that empowers the issuance of the AI is not specified, he can click on a link to submit a request to the architect as stipulated in the conditions of PAM Contract 2006. In this situation, the architect will see on his screen the request and can respond accordingly. If the AI will lead to the claim for extension of time (EOT), loss and/or expense, or additional expense, the contractor can click on the relevant link to prepare the respective claim. This will be explained in detail in subsequent section.

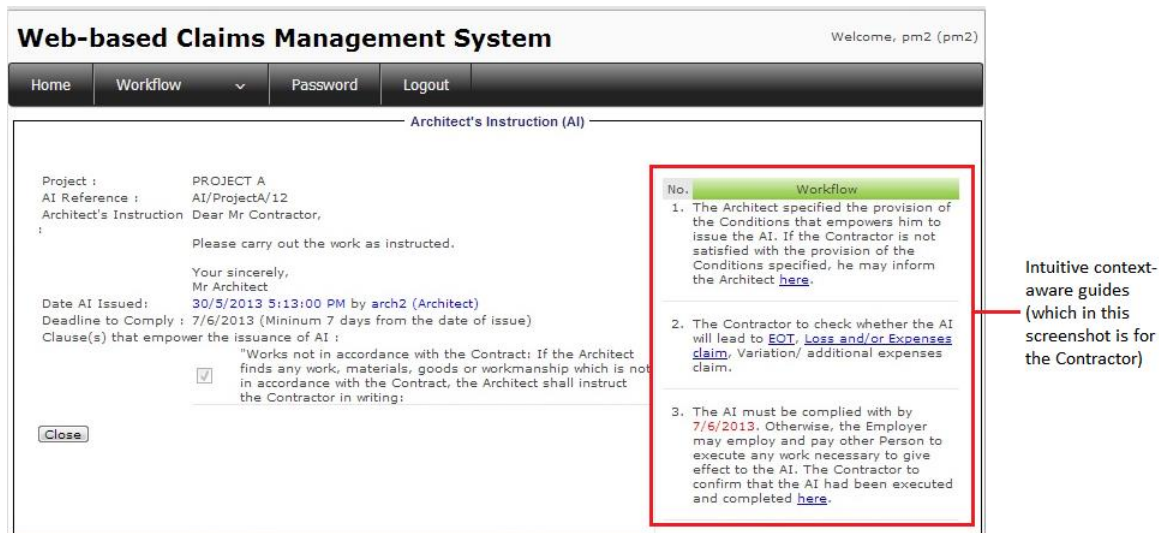


Figure 2: Screenshot of the page for managing Architect’s Instructions

7.2 Engineer's Instruction (EI)

Under PAM Contract 2006, consulting engineer is not authorized to issue EI and the contractor may not be paid for executing the EI. However, it is a common practice in the country, albeit not proper under the contract, for engineer to issue EI for tasks related to engineering/structural works. This is mainly due to convenience and the reluctance of the architect to issue AI for the purpose, for allegedly being not too familiar with engineering works. This module allows the engineer to issue EI to the contractor but the contractor will be cautioned by the system that he needs to request the architect to confirm the EI with an AI prior to execution. The architect can then issue an AI to authorise the works required by the EI, and reference to the respective EI in the system.

7.3 Extension of Time (EOT) Claim

The operation of the functions for claiming EOT, loss and/or expense, and additional expense are quite similar. Therefore, only the operation for claiming EOT is explained. The claim for EOT comprises two steps: the submission of the notice of intention to claim and the submission of the final claim. The former is condition precedent to the entitlement for the claim.

For the notice of intention to claim, the contractor first needs to specify in the dropdown list whether or not the AI is related to any AI and the clause(s) that entitles him to EOT claim. Subsequently, he needs to provide information such as the date of the commencement of the event that leads to delay and initial estimate of the number of day of EOT claimed, and then fill in the details and upload the relevant attachments (if any). He can either submit the notice straightaway or save the notice as a draft first. For the latter, the deadline for submitting the notice (i.e. 28 days from the date of commencement of the event that leads to the claim for EOT) will be calculated automatically and shown on the intuitive guide on the same page. The architect may either accept or reject the notice; for the latter the contractor may appeal and the appeal will be recorded. Upon submission of the notice, the system will remind both the contractor and the architect the deadline for submitting the final claim. The procedure for submitting the final claim is very similar to that of the notice, and hence is not elaborated.

The screenshot shows a web-based interface for a 'Notice of Intention to Claim Extension of Time (EOT)'. The page title is 'Web-based Claims Management System' with a user greeting 'Welcome, pm2 (pm2)'. A navigation bar includes 'Home', 'Workflow', 'Password', and 'Logout'. The main content area is titled 'Notice of Intention to Claim Extension of Time (EOT)' and contains the following details:

- Project :** PROJECT A
- Reference to AI/ CAI : (if relevant)** AI-July-27 (27/7/2012)
- Date Notice Submitted** 30/5/2013 5:24:00 PM by pm2 (Contractor's Project Manger)
- Cause(s) of EOT :** Clause 24.3(a) Not having received the AI and any other information in due time for which the Contractor had specifically applied in writing to the Architect
- Date of AI/ CAI/ Commencement of Event :** 30/5/2013
- Deadline to submit notice to claim :** 27/6/2013 (28 days from the above date)
- Subject/ Reference :** (brief Notice of Intention to Claim EOT heading)
- Detailed Elaborations to Substantiate Claim/ Cover Letter :** Dear Architect, Due to the delay of your side in issuing the required drawings, this has caused the delay of 5 days in the progress of the project. We hereby serve you the notice of our intention to claim for EOT according to the above clause in the conditions of the contract.
Yours sincerely,
Contractor
- Initial Estimate of EOT :** 5 Days
- Attachment(s)**

At the bottom left, there are 'Cancel/ Close' buttons. On the right side, a 'Workflow' section lists the following steps:

1. The Contractor to give written notice to the Architect his intention to claim for EOT by 27/6/2013. Written notice was given by Contractor to Architect on 30/5/2013.
2. The Contractor confirmed that the date of the end of the cause of delay is 4/6/2013. The deadline for the Contractor to submit the final claim for EOT is 2/7/2013 (28 days from the end of the cause of delay).
The Contractor may request the Architect to [Extend the Deadline](#) to submit EOT claim. Otherwise, the Contractor to submit the EOT claim [here](#). The Contractor [submitted the final claim](#) on 30/5/2013.
3. The Architect may, before **6/27/2013** (i.e. within 28 days from the date of submission by the contractor), request Contractor to provide further particulars for the EOT Claim.
4. The Architect to decide to accept or

Figure 3: Screenshot of the page for EOT claim

The architect may request the contractor through the system to provide further particulars about the final claim within 28 days from the date of submission by the contractor; the provision in the contract is shown clearly in the intuitive guides to the contractor and the architect. The architect's request and the contractor's response(s) will be recorded accordingly in the system. The system also allows the architect to reject, grant the EOT claim as claimed by the contractor or grant different number of days of EOT to the contractor. Related to this, the contractor may appeal numerous times the decision of the architect and the architect may change his decisions in

response to the appeals. The track of the interactions is revealed also in the intuitive guides section and the details are accessible.

7.4 Interim Claims

The contractor can prepare the interim claim by directly filling either the value of the work done for the various items for that particular month. The system will then automatically determine the amount for the retention fund (which is 10% of the value of the work done in the month) and the amount claimable by the contractor. Upon submission, the quantity surveyor (QS) can view the details of the claim submitted and recommend the amount to be paid to the contractor for the various items. The architect, with or without the evaluation or recommendation from the QS, can then make the final decision as to the amount payable to the contractor. Set-off may be performed too by the architect as appropriate. The history of the claims and amounts granted by the architect are visible to the contractor, architect, QS and the client. If the contract sum has been adjusted (e.g. due to omissions or addition), the QS may revise the limit of the retention fund accordingly in the system. The summary screen of interim claim function also reveals the status of the interim claims (e.g. granted or pending), the amount granted and the date on which a claim is submitted.

Item	Description	Amount	Contractor				Architect				
			Previous Progress (RM)	Current Progress (%)	Current Progress (RM)	Total Progress (%)	Total Progress (RM)	Current Progress (%)	Current Progress (RM)	Total Progress (%)	Total Progress (RM)
1 Preliminaries & General											
1.1	Site clearing, levelling and preparation	3000	49	20	600	69	2070	0	0.00	49	1470.00
1.2	2400mm high site hoarding with timber frames and metal sheet	4000	62	1	40	63	2520	0	0.00	62	2480.00
1.3	Construction signboard	1500	16	5	75	21	315	0	0.00	16	240.00
2 Piling Works											
2.1	Allow for mobilization and demobilization of all plants and equipment as required including moving and handling of piling frame at site	4200	50	0	0	50	2100	0	0.00	50	2100.00
2.2	Supply only of 200x200x6m starter pile (4 Y10)	6804	20	0	0	20	1360.8	0	0.00	20	1360.80
2.3	Ditto for extension pile (4 Y10)	27216	45	0	0	45	12247.2	0	0.00	45	12247.20
3 Works Below Lowest Floor Level											
Excavation for pile caps and around beams not											

Figure 4: Screenshot of the page for interim claim

7.5 Weather Records

Inclement weather is one of the conditions that entitles the contractor to claim for EOT. The contractor can enter everyday's record of the weather condition into the system on hourly basis (or longer), upload relevant files and add some notes into the system. The consultant can then verify the records directly through the system. This assists the contractor and the architect in the submission and evaluation of the claim for EOT due to inclement weather.

8. DISCUSSIONS

The Web-based construction claims management system has basically automated most of the processes involved in the transaction of claims and the issuance of AI in projects under PAM Contract 2006. It has also made the whole process more transparent, efficient and less susceptible to human errors. In addition, it has reduced the potential impacts caused by the departure of key personnel responsible for managing claims by creating a history of the claims submitted together with the latest status and impending action, and keeping a copy of the relevant documents/information in the system. This allows the successors to take over the job with ease and contributes to a more systematic way of administering construction contracts. The intuitive context-aware guides generated programmatically based on the role of the users has incorporated some intelligence into the system, which not only helps to further eradicate human mistakes but also provides training/education to those less well versed in the

conditions of the contract used. The prototype system has been receiving positive comments in seminars from various parties in the construction industry. It is currently undergoing testing using real construction project in Malaysia, which will be followed by a full evaluation. Further refinements will be made to the system based on the outcome and the feedback of the users involved in the testing and evaluation, and the workshops to be conducted.

Building Information Modeling (BIM), which has been increasingly adopted by the construction industry, is currently in a trend to go cloud-based. For the projects that adopt BIM, the submission and processing of some claims may necessitate the direct reference to the large model file which resides in the Web or cloud servers; all these can be done with ease using the Web-based claims management system if compared to the conventional paper-based approach. In addition, as both systems are cloud and Web-based there is a potential to integrate the system with BIM application to further enhance the efficiency and effectiveness in managing claims.

9. CONCLUSIONS

The importance of an efficient and effective system for managing construction claims has been identified. The review of existing literatures shows the dominance of IT-based systems developed for the purpose of construction claims management, which functions focus mainly on the analysis, negotiation and prediction of outcome of claims. There is a need for a Web-based system for the management of construction claims that is accessible any time and any place with internet connection, and capable of providing a collaborative platform for the parties involved (i.e. the consultants, contractor and the client) through which claims can be documented, submitted and processed online. In this regard, a prototype Web-based construction claims management system is developed based on the end-users' requirements identified from nine case studies, which comprises a Web-based database and a Claims Transaction System. The latter includes modules for setting up the system, issuing instructions, and managing various types of claims. There is built-in intelligence in the prototype system, which provides intuitive context-aware guides to the various parties according to their roles on the next action required, deadlines for various actions, implication of an action or non-action, latest status of the relevant users' activities, etc. Further work includes the extensive testing using real projects and evaluation of the system with the aim to refine and enhance its features. The local construction industry may benefit from the system through the reduced human errors pertaining to the administration of claims, greater transparency, more systematic recording, intuitive context-aware guides, and other features of the system. The system can also be a useful training tool on contract administration for the consultants, contractors, clients and students.

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