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Problems And Obstacles which Constrain the Optimal Construction Site Management into Libyan Large-Scale Projects

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Abstract The management of the construction site (CSM) includes a combination of a number of activities that can reflect the project in its final form and directly influences security, material supply, resource utilisation, health and safety, planning, cost and all other aspects of construction that permeate the implementation of the project. Practically, it is not a simple procedure to manage a site successfully. Construction work has become a complex set of processes, and there are numerous management challenges which are continually occurring on construction sites. Hence the importance of this paper, which aims to study "problems and obstacles which constrain the optimal management of the construction site, as well as to identify approaches and methods that can be used to address these difficulties and obstacles and solve these problems".This study adopted a mixed approach that included many research activities, including an in-depth review of the relevant literature to explore the most important problems facing CSM and the possible solutions used in previous studies. In the context of the on-site study, a qualitative approach, including field visits and semi-structured interviews, was used within five large-scale projects suggested by organisations which have worked on behalf of GMRWUA in Libya. This was followed by an assessment of the CSM Problems in terms of their importance and frequency of occurrence, through the use of the quantitative approach (questionnaire).The main findings of the paper focus on the identification and classification of the problems of the CSM in terms of their effect on managing construction sites, and their frequency of occurrence. In addition, the problem-solving approaches to be taken by the CSM team were identified in the GMRWUA Projects, which can help in mitigating the CSM problems in future.
Keywords: construction site management,(CSM), CSM problems, CSM solving-approach, Great Man-made River Water Utilization Authority (GMRWUA), Problems Evaluation; Importance Rank, and Frequency Rank.

المشاكل والعقبات التي تقيد الإدارة المثلى للمواقع الإنشائية في المشاريع الليبية واسعة النطاق

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الملخص ادارة موقع الانشاء تتضمن تجمع وتداخل عدد من النشاطات والتي يمكن ان تُعكس على المشروع في صورته النهائية، و تؤثر بشكل مباشر في توريد المواد، استهلاك الموارد، الامان والتامين، التخطيط والكلفة وكل اوجه الانشاء الاخرى التي تتخلل تنفيذ المشروع. عليه فان ادارة موقع الانشاء يعتبر عنصر اساسي لنجاح اي مشروع، خاصة وانه لا توجد اساليب بسيطة بديلة عن الادارة الشاملة للمشاريع، حيث ان عملية انشاء المشاريع اصبحت مجموعة نشاطات مترابطة ومتزامنة ويتطلب انجازها ادارة العديد من التحديات التي يمكن ان تحدث في مواقع الانشاء. من هنا جاءت أهمية هذه الورقة التي تهدف دراستها إلى "لتحقيق في العوائق التي تمنع تطبيق إدارة موقع الإنشاء بالشكل الامثل، وكذلك تحديد النهج والطرق التي يمكن استعمالها لتدليل هذه الصعاب والعوائق. هذه الدراسة اعتمدت النهج المختلط الذي شمل العديد من الأنشطة البحثية، بما في ذلك استعراض متعمق للأدبيات ذات الصلة وذلك لاستكشاف أهم المشاكل التي تواجه إدارة موقع الإنشاء والحلول المستخدمة في الدراسات السابقة. وفي إطار الدراسة الموقعية، استخدم النهج النوعي بما في ذلك الزيارات الميدانية والمقابلات شبه المنظمة، إلى خمسة مشاريع ضخمة تابعة لجهاز استثمار مياه النهر الصناعي، للتحقيق في اهم المشاكل التي تواجه ادارة تللك المواقع واساليب التغلب عليها. أعقب ذلك التحقق تقييم لتلك المشاكل التي تواجه ادارة مواقع البناء من حيث درجة اهميتها شدة أهميتها من خلال استخدام النهج الكمي (الاستبيان). النتائج الرئيسية للورقة تتركز في تحديد وتصنيف مشاكل ادارة مواقع الانشاء من حيث أهميتها في مدى تأثيرها على إدارة مواقع البناء، بالإضافة إلى وتيرة حدوثها. وعلاوة على ذلك، تم تحديد نهج حل المشاكل المستخدمة في مشاريع النهر الصناعي العظيم للمساعدة في التخفيف من مشاكل ادارة مواقع الانشاء في المستقبل.

الكلمات المفتاحية: ادارة موقع الانشاء، مشاكل ادارة موقع الانشاء، نهج حل المشاكل، جهاز استثمار النهر الصناعي العظيم–المنطقة الوسطى تقييم مشاكل الموقع ترتيب الاهمية والتكرارية.

Introduction

The very directness objectives of project management are to accomplish a project within scope requirements [1] on reasonable budget and schedule [2-3], quality [4], safety, security levels, and satisfactory risks [5]. In fact, construction management process is applicable to projects of any size and complexity. Wideman [6], Newcombe et al [7] and Fapohunda [8] argue that CSM is the act of implementation the majority of the these objectives to the entire construction process from inception to completion on a site.

No doubt that successful construction projects are accomplished by properly skilled construction managers. These individuals can identify the degree of uncertainty at any point in the execution of the project and organize the efforts of others to achieve clearly defined objectives that result in successful completion of the final product [9]. It can, therefore, be seen that a construction site manager carries out the every single, most arduous, demanding, and responsible function of the construction process [10], and faces several engineering challenges that occur on the site [11]. Accordingly, necessity to investigate challenging issues associated with site management is dramatically intensifies. For that reason, this research seeks to explore the problems face construction site managers and to expand knowledge of the current problem-solving approaches.

In this paper, a state of art of CSM is first introduced as well as the most challenging issues obstacles application of CSM are considered. In order to make it clear, five projects are described and discussed as a case study, in which CSM problems from a practical perspective are analysed, and a conclusion regarding different problem-solving approaches is outlined. In addition. the frequency of CSM problems and the ranking of their importance, in terms of their effect on managing construction sites, are also presented within the frame of the ten problems that are considered by the literature as the most significant problems are occurring in managing a construction site.

Construction Site Management (CSM):

All the difficulties involving in different construction sites, such as subsoil conditions, surface topography, weather, transportation, material supply, utilities and services, local subcontractors, labor conditions, and available technologies are an innate part of construction. Therefore, recognition of site management should be a priority to be considered by contractors, since on site profit and reputations can be built or damaged. Monies may be made or lost, and there is considerable scope for improving efficiency, productivity and quality [12-13]. As already mentioned, site management involves a combination of a large number of activities including, site investigation and preparation as pre-construction activities and CSM practices during the construction process [11]. This research focuses on CSM practices, which can be divided into six sub-processes: planning, monitoring and control; management, supervision and administration; delivery and materials' handling; commercial management; production on and off-site; legal and health and safety [14-16]. From cumulative experience in this field, almost every project having a defect in at least one of these processes.

Construction Site Management Problems:

Mohamed and Anumba [16] and Alzohbi [17] believe that numerous problems and engineering challenges occur when managing these site processes. There is an urgent need to investigate the problems that are faced by the construction site manager, and to identify existing constraints and proposed optimal solutions. Through the review of recent literature, it was discovered that the most recognised problems affecting CSM have been categorized into two categories; external constraints and internal constraints [10,18-21].

External Constraints:

External constraints are defined as those constraints that arise out of a site manager's own organization, and particularly, they may arise before the work commences, or during the site activities started. Such constraints relate to complications in technical studies, design issues, poor information transfer and inadequate co-ordination of site management activities [18], as explained here after.

Design: Wilde [19] believes that design issues and drawings deliverables are often among the site-problem sources. Abadi [22] stresses that basic information concerning construction operations is required before commences site activities. Moreover, it is not always evident that the systematic update of drawings takes place when modifications occur, which inevitably leads to delay in the execution of work, unforeseen costs, and conflicts.

Technical Studies: Technical studies are often given too little time and consideration, which may impact on construction processes, estimated budgets and productivity [18,23]. Poor technical studies can often lead to unforeseen work causing unjustified costs.

Co-ordination of Construction Site: Construction may be considered as the result of the interaction of a group of actors, and there is an unavoidable need for co-ordination between these actors. Barton [24] and Dorn [25] believe that co-ordination on the construction site is the most difficult task facing site management.

Information Transfer: Kimmance [26] supports Morrison & Morrison [27] who stated that the majority of information transfer problems on the site arise from one or both of the following problems: the problems that occur because all drawings are not systematically updated when

modifications are introduced; and problems that are covered up on site by staff without informing the site manager.

Internal Constraints:

The internal constraints are those which are inside to the site manager's organisation, and involve a large number of elements. Holroyd [1], DeCuyper [18] and Doran [25] view the following internal constants as the most influential internal constraints for the site management and organisation.

Estimating Requirements: incorrect evaluating causes many problems to occur during site work. These include: labour shortages, failure to obtain needed equipment on time, defective and damaged materials [16].

Quality Control: Doran [25] confirms that insufficient inspection and test plans, which should be prepared from the technical specifications, workshop drawings and method statements, could be major reasons behind the problem of quality control.

Planning: Poor planning is the most significant factor influencing management of the construction site [28]. De Cuyper [18] reported that the majority of site problems arise from; a lack of planning, no time scheduling being used, no evaluation of the efficacy of site work, and misunderstanding of the client's requirements at an early stage of a project.

Materials Supply and Storage On Site: Ibn-Homaid [29] believes that "material management is the most common and frequent cause of delays in projects". Holroyd [1] and Guthrie et al [30] believe that a non-compliance with International Material Storage and Supply standard causes mainstream problems.

Health and Safety: Griffith and Watson [31] see legislation relating to health and safety on site as one of the most problematic issues facing construction site managers. Cheng and Li [32] argue that the lack of using and complying with the standards and regulations of health and safety causes serious accidents on sites.

Multicultural Projects: construction site managers who carry out work beyond national borders often face special problems, such as operating within local regulations and social customs, dealing with multiethnic work teams, and the import of materials [33].

Research Methodology:

A research approach is a means of pointing out a particular technique and employing different methods for conducting research; nevertheless, the choice could be justified as the most appropriate available method that can achieve the research objectives and answer the research questions. The Mixed Research (Triangulation) Method is a method whereby both qualitative and quantitative research approaches can be adopted at the same time in a research project in order to cope with the potential bias and limitation of a single method approach [34-36].

Based on its advantages, the triangulation-mixed method (qualitative and quantitative) is adopted by this research for fulfilling the research aim and objectives. The research techniques adopted for the data collection process comprise the literature review, the case study technique, and the questionnaire survey.

Data Collection Process/Technique:

Literature Review: It was drawn from related peer-reviewed books, journals, papers and research reports. This survey aimed to report recent research in this area in order to understand a site manager's role, identify theoretical problems in managing construction sites and resolutions undertaken by site managers.

Case Study Technique (Qualitative): The case study approach has become one of the most powerful research methods in construction and operation management, and it is suitable for learning more about a little known or poorly understood situation [3,35,3738–]. The Great Man-Made River Project (GMRP), which is considered as one of the largest civil engineering projects in the world in addition to being the largest for the transportation of water from the Sahara Desert [39], was chosen as a case study for the research. Five construction sites identified by international organisations, which have worked on behalf of the Great Man-made River Water Utilization Authority (GMRWUA)-central zone in Sirte City, were used as shown in Table (1). Through the case study protocol, the techniques of the site observation and structured interviews were mainly adopted to collect data required for the case study approach. This technique aims to investigate the problematic issues of CSM and the problem-solving approaches that are used in the GMRWUA in Libya.

Questionnaire Survey (Quantitative): A "group administrated questionnaire" survey was administered to a sample of site managers who are working on construction projects in the GMRWUA. Questions were formulated to evaluate the CSM problems, through identifying the frequency of the problems occurring in managing construction sites, and ranking the importance of the site problems in terms of their effect on managing the construction site.

Analysis and Discussion:

Based on the data collected from the related literature review, "Structured–Interview" ttechnique was formulated for Site Manager, Construction Manager, and Chief Resident Manager in each organisation involved in the case study (see Table (1)). This technique aims to investigate the problematic issues of CSM and the problem-solving approaches that are used in the GMRWUA in Libya. Table(1) indicates details of respondents highlighting nationality, experience and current role.

Table 1: Project personnel involved in the interviews

No	Organisation ID	Nationality	Years of Experience	Current Position
1	Org A	German	15	Const-Manager
		Austrian	21	Site Manager
2	Org B	English	43	Chief Resi-Engineer
		English	36	Site Manager
3	Org C	Cypriot	26	Site Manager
4	Org D	Bosnian	28	Construction Manager
		Bosnian	16	Site Manager
5	Org E	Egyptian	25	Construct-Manager
		Egyptian	25	Site Manager

Key problems of the construction sites:

Table (2) summarises the problems identified from projects representing the case study, in relation to the ten construction site management problems outlined in the literature and deemed to have the greatest influence on effective management of construction processes. Moreover, Table (2) indicates the Problem-solving approaches used by the case study sites.

Organisations (A), (B), (C) and (E) experienced planning problems as both the original problem (X), and resulting from other problems (o); from a lack of estimating requirements, and in particular poor material supply. In Organisation (D), although the planning process was affected by several issues, it was not the origin of the problem. Essentially, this was caused by the lack of understanding the client's requirements clearly CSM team before commencement of work on site.

While Organisations (A), (B), (C) and (D) suffered from material supply problems owing to the majority of materials being from overseas, organization (E) did not. The reason was that the majority of materials used by Organization (E) were imported from its home (Egypt), Libya's neighbour, which does not suffer restrictions through complex customs procedures, and also because of the well-known professional suppliers in the organisation's home country. This confirms that poor materials supply arrangements cause the majority of materials problems on the site [1].

Although Organisation (E) had experienced problems from the complexity of design specifications, the only other organisation that had suffered major design problems was Organisation (C). This resulted from the design being carried out by another consultant and without involvement of the site manager. This goes with the advice of DeCuyper [18], Abadi [22] and Bresnen et al [40], who stress the importance of engaging the site manager in the early stage of design.

Owing to the differences in language, religion, culture and regulations (Multicultural Projects), Organisations (A), (B), and (C) experienced communication problems in dealing with multicultural teams and staff, local authorities, and local regulations. This also tends to impact on project planning, as witnessed in Organisation (B). Organisation (E) has been not affected by multicultural problems because of its Arabic origin and having the same language, religion, culture and often the same regulations to that of the client. In spite of the difference in language, culture and regulations, organization (D) has not been affected by the multicultural problems. The reason being that the CSM team obtained intensive cross-cultural training before entering Libya to work on the project. This is further supported by Burgess and Enshassi [33], Anbari, et al. [41], Luong, et al. [42], who observed that there is a pressing need to recognize and consider cross-cultural training as an integral part of construction management if organizations are to remain competitive and successful.

Problems with technical studies were experienced by Organisation (D) on an infrequent basis. However, this problem was seen to affect the majority of other construction processes, such as planning, design, estimating requirements, material supply and quality control. This proves that "too little attention and time is given to the technical studies, although they are of primary importance for reaching a high productivity and high quality" [18].

Table 2: The Summary of the Problems and Solving Approaches identified from the case studies.

Case problems/construction Approaches to site processes	Design	Technical Studies	Coordination of the site management	Information Transfer	Estimating of Requirement	Quality Control	Planning	Material supply	Health and Safety	Multicultural Projects	Approach to Problem Solving
Case 1 (Org A)											*Informal site meeting & discussions * Using E-mail to transfer drawings & information. * Understand the client requirements. * Choosing professional suppliers. * Understanding in depth the Local Regulation and Policies. * Training the local labours.
- Information Transfer				X			O				
- Poor Planning							X				
- Poor Material Supply (MS)							O	X			
- Difference of Language										X	
- Shortage Qualified Labours					X		O				
Case 2 (Org B)											* Trying to plan day-to-day work on the site * Taking a more practical approach to quality control * Reporting senior manager & client. * Trying to manage a schedule for Local labour. * Adopting the UK health and safety Standards. *The use of manuals and guidance.
- Poor Planning							X				
- Lack Quality Control & MS						X	O	X			
- Poor co-ordination			X				O				
- Language problems										X	
- religion attitude							O			X	
- Poor local and health and safety regulations									X		
Case 3 (Org C)											* Developing knowledge and experience from previous projects. * Discussion with the designer and Suggest solutions. * Employing local coordinator. * Finding suitable alternatives of suppliers. * Using E-mail to transfer drawings
- Poor Planning							X				
- Shortage Qualified Labours.					X		O				
- Poor Design & Info Transfer	X			X			O				
- Poor Communication.										X	
- Poor Material Supply							O	X			
Case 4 (Org D)											*Informal site meeting & discussions * Reporting senior manager & client. * Developing knowledge and experience from previous projects. * Adjusting project activities according to new situations.
- Poor Technical Studies	O	X	O		O	O	O	O			
- Poor Material Supply							O	X			
Poor Quality Control						X	O				
Case 5 (Org E)											*The site managers draws his Previous experience. *Technical problems are discussed and examined on and off site. *Referring the problems to company's engineering division
- Inaccurate Planning.							X				
- Complexity of designs.	X						O				
- Poor health and safety.							O		X		
- Poor co-ordination.			X				O				

Note: **X** is Origin of problem; **O** is Sub-processes is affected.

Generally, other problems, such as "poor health and safety", "lack of quality control", "poor co-ordination of the site activities" and "lack of the estimating requirements", have normally happened with organizations at the commencement of work.

The Problems-Solving Approaches

Beside the problems that identified from projects representing the case studies, Table 2 also summarises the problem-solving approaches used by organisations, although these were seen to differ from one case to another.

Organizations (C) and (D), with extensive knowledge of Libyan culture, followed informal approaches that were heavily reliant on previous experience, informal site team meetings, discussions between the site team and experts in order to solve problems, and reports to senior management and the client.

Such procedures were reflective of the area-culture (the tribal nature in Libya); where in the tribe system any dispute or internal problem.

Questionnaire Data Analysis:

The questionnaire survey was developed on the bases of the findings obtained from the literature review and the main investigation process (Site visits and Interviews). Basically, the survey is intended to evaluate the identified CSM problems; to rank the CSM problems in terms of their frequent of occurrence on construction sites, and to rank their importance in terms of their effect on managing projects. A "group administrated questionnaire" survey was conducted to generate a wider response from the CSM experts in the GMRWUA.

A total of 37 questionnaires were handed to CSM professional experts within nine different

A descriptive statistics analysis was administrated for the analysis of the questionnaire data. Generally, the descriptive analysis enables researchers to reduce and summarise large masses of data using measures that are easily understood by observers, besides, it deals mainly with ranking of the variables based on their mean value [3,43].

Due to its simplicity and ability to represent the data properly, especially for identifying the ranking of items [44], 'Mean Score' and 'Median' were used for ranking the CSM problems, and as the measure of the central distribution to draw inferential differences from measured values [45-48], in addition to using the mean score as a measure of the central tendency in this study. Many of similar researches have been used a similar approach (mean and median) with survey data, such as; Ali [3], Alzohbi [38], Higham [48], Li [49], and Hatmoko [50].

In order to provide robust and structured analysis, it was recommended to use the Statistical Package for the Social Sciences (SPSS), which described as is the most popular statistical software package used by social science scholars and engineering researchers [3,51].

Table (3) shows that three basic types of construction sites were involved in the questionnaire survey. Different types of sites were selected based on the belief that although there are general problems that occur in the majority of sites, each site has its own specific problems. The targeted respondents are the people who work on the site and practically deal with the site problems day to day (75% of respondents were 'Construction Site Manager', and 25% were 'Site Engineer'), as illustrated in Figure (1).

organisations have worked on behalf of GMRWUA, as illustrated in the Table (3). However, 33 of the completed questionnaires were used in the analysis (90% of respondents). Five questionnaires were removed as considered invalid (Ex; incomplete questionnaires, the lack of logic in the majority of answers, or the loss or unreturned of some answering sheets).

Table 3: Organisations and sites involved in the questionnaire survey

Organisation	Nationality	Type	Current Position
1	German	Private	Construction Buildings Irrigation Works
2	English	Private	Supervision of the Construction Pump Stations Works
3	Cypriot	Private	Pipe Line & Pump Stations Works
4	Bosnian	Private	Pipe Line & Pump Stations Works
5	Egyptian	Private	Pipe Line & Pump Stations Works Irrigation Works
6	French	Private	Construction Buildings Pump Stations Works
7	South Korean	Private	Construction Buildings Irrigation Works
8	Tunisian	Private	Construction Buildings
9	German	Private	Construction Buildings Pump Stations Works

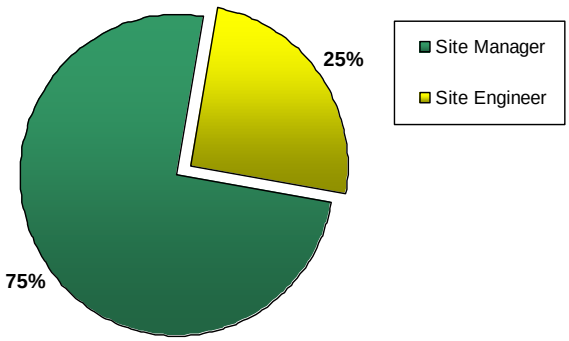

Fig 1: The position of the respondents involved in questionnaire

The majority of the respondents (80% more than 15 years of experience) had wide experience of working in construction sites (see Figure 2), which added to the in-depth findings of the research.

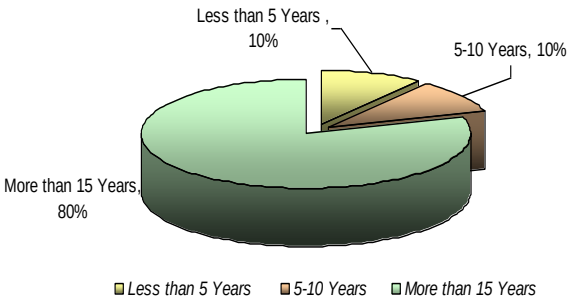

Fig 2: The years of respondents' working experience

The results above indicate that very high experienced respondents have participated in this questionnaire survey, and this could mean that those, who have a good experience in working within the construction industry and particularly in the CSM process, may have better dealing with the construction site management problems, and they better understanding the factors that reach the successful site management. With such long experience of work, in addition to the diversity of the construction site's types, it can be said that the information gathered was reasonably reliable, since the involvement of experienced professionals in the survey can increase the validity and reliability of the results, and thus the validity and reliability of the entire study.

Evaluation of CSM Problems:

In order to find out the assessment of site management problems, the professional experts were asked to evaluate the CSM problems, in terms of their importance and frequent of occurrence, through answering evaluation questions using five-point Likert Scale.

With the purpose of investigating the importance of the CSM problems, in terms of their effect on managing the construction site, respondents were asked to rank (1 = least important and 5 = most important) the importance of the ten problems according to their experience. The statistics were computed by the SPSS 22 to generate the 'Mean Score' and 'Median Value', as summarised in Table (4).

Table(4) gives more details about ranking the importance of the CSM problems based on the mean score and Median value. It can be noted that "IP7: Planning" had the highest mean score and importance index with a mean score of 4.37 and median value of 5. It is then followed by "IP1:Design", "IP8:Material Supply", "IP2:Technical Studies", "IP4:Information Transfer", "IP5:Estimating Requirements", "IP6:Quality Control", "IP3:Co-ordination of the Site", "IP9:Health and Safety". The least important problem is "IP10:Multicultural Projects" with a mean score of 3.14 and importance index of 0.801.

Table 4: The Importance-Rank of the CSM Problems

Rank	Label	Problem Title	Mean Score	Median Value
1	IP7	Planning	4.37	5
2	IP1	Design	4.00	5
3	IP8	Material Supply	3.64	4
4	IP2	Technical Studies	3.63	4
5	IP4	Information Transfer	3.08	4
6	IP5	Estimating Requirements	2.48	3
7	IP6	Quality Control	2.30	3
8	IP3	Co-Ordination Of The Site	1.91	2
9	IP9	Health And Safety	1.61	2
10	IP10	Multicultural Projects	1.57	2

Besides ranking the importance of the CSM problems, the quantitative approach (Questionnaire Technique) was used to identify the frequency of the site management problems occurring on construction sites. To do that, the respondents were asked to rank (1 = never happened and 5= always happens) the frequency of the ten problems which occur while managing construction sites. The responses are presented in Table (5).

Table 5: The Frequency-Rank of the CSM Problems

Rank	Label	Problem Title	Mean Score	Median Value
1	FP8	Material supply	4.6	5
2	FP1	Design	2.95	3
3	FP7	Planning	2.8	3
4	FP4	Information Transfer	2.5	3
5	FP3	Co-ordination of the site	2.45	3
6	FP2	Technical Studies	2.3	3
7	FP9	Health and Safety	2.3	2
8	FP10	Multicultural Projects	2.2	2
9	FP5	Estimating Requirements	2	2
10	FP6	Quality Control	1.7	2

Examination of the Table (5) provides an evaluation of the frequent occurrence of each CSM problem. It shows that "FP8:Material Supply" ranked the most frequent problem occurring while managing the construction site, whereby it had the highest "mean score of 4.6, and median value of 5".

Based on their mean scores and median value, the remaining CSM problems have been ranked (in a descending order) from the most frequent to the least frequent as follows; FP1:Design, FP7:Planning, FP4:Information Transfer, FP3:Co-ordination of the Site, FP2:Technical Studies, FP9:Health and Safety, FP10:Multicultural Projects, FP5:Estimating Requirements, and the

least frequent problem was FP6:Quality Control with mean score of 1.7 and median value of 2.

Conclusion

The in-depth literature review discovered that the most recognised problems, which affect CSM have been categorized into two types; external constraints and internal constraints. The external constraints includes problems of "Design", "Technical Studies", "Co-ordination of Site Management", and "Information Transfer". The Internal Constraints comprises "Estimating Requirements", "Quality Control", "Planning", "Materials Supply and Storage On Site", "Health and Safety", and "Multicultural Projects".

Based on the discussion of the findings that resulted from the cross-cases analysis for the six case studies (main investigation), it was concluded that the most significant problems faced the site managers in the GMRWUA projects were consistent with the problems identified from reviewing the related literature; both external and internal constraints. Moreover, it was found that the problem-solving approaches used in GMRWUA projects can be classified into two main categories:

1) Informal methods - these encompass previous experience, discussion or informal meetings and reference to experts.
2) Structured methods - these encompass practical approaches to control quality, day-to-day planning and health and safety procedures.

The analysis of the questionnaires discovered the following;

- The most frequent problems in managing construction sites were: 'material supply' followed by 'planning', 'information transfer', 'co-ordination on site', 'technical studies', 'health and safety', 'multicultural projects', 'estimating requirements' and 'quality control'.
- The ranking of the most important problems on construction sites, in terms of their effect on managing construction work were problems of 'planning' followed by 'design', 'material supply', 'technical studies', 'information transfer', 'estimating requirements', 'quality control', 'co-ordination on the site', 'health and safety' and finally the problem of 'multicultural projects'.

The comparison of the importance and the frequency of the CSM problems, it can say that, the ranking of the importance of construction site management problems is not always based on the frequency of occurrence on site. For example, although the problem of the technical studies occurred infrequently, it was seen to affect the majority of construction processes on the site.

Although the problem of multicultural projects has a negative effect on site management effectiveness, in contrast to Burgess and Enshassi [33], this problem is considered as the least important problem of site management in terms of their effect on managing construction work. However, the importance of cross-cultural training is an essential requirement for effectively managing overseas projects successfully.

Paper Contribution:

The objective of this exploratory study has been to investigate the problems which constrain optimal CSM, and to identify the approaches which have been taken to solve these problems. The study makes important scholarly and practical contributions and identifies interesting avenues for future research.

From the site visits, whether those were paid in Libya (in particular, the discussions that were made with the decision makers in Libya) or those conducted through the case studies within the GMRWUA Projects, it can be concluded that there is no such study regarding the assessment of the CSM problems in terms of their importance or frequent occurrence within the GMRWUA Projects, or may be in Libyan Construction Industry. This finding was confirmed by data collected from the Libyan previous studies. In view of that, it can be noted that this study is the first of its kind to be conducted in Libyan Construction Industry, and it will be beneficial to society, especially the society of construction contractors.

The majority of studies, which were conducted on the construction industry, used only empirical approaches [33]. According to Boyer and Swink [52], Singhal et al. [53], and Tangpong [54], there is a growing consensus that the use of multiple research methods (whether in one study or across different studies on related topics) is critical to the investigation of the construction management field as different methodological approaches have different strengths and limitations (e.g., Babbie [55]). Therefore, the body of research that has applied multiple research methods is less susceptible to systematically biased findings [52]. In line with that finding, multiple research methods are applied in this study whereby the CSM problems were identified from the critical analysis of the comprehensive literature review process, and then was examined and tested empirically within the case study technique (the Site Visit, Interview & Questionnaire). This gives the study additional unique value provides further support to the study validity and reliability.

The research findings, whether those resulting from the literature review or from the data collection analysis, provide a foundation for additional work to investigate within the problems of managing the construction sites and to develop approaches to solve these problems. Besides, this study encourages Arab researchers to enter the field of construction site management.

Paper Limitation:

This research has highlighted the major problems which have occurred within the GMRWUA. Even though the ten major problems in CSM are common problems in many countries, there are numerous other problems that can occur in the CSM. Therefore, in order to obtain a broader and clearer picture of the problems in terms of managing construction sites, large sample sizes will be required to produce more reliable findings and validation of data.

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