



## Centralized Projects System (M): A Proposal to Reduce The Risk of Corruption- Iraq as an Example

**Dr. Abbas Mohammed Burhan**

**Department of Civil Engineering, College of Engineering, University of Baghdad, Baghdad, Iraq**

**Email: abbas\_alshemosi@yahoo.com**

### Abstract:

Yearly corruption costs hundreds of billions of dollars. To build greener, healthier, and wealthier life to the entire globe, people should spare no effort fighting corruption by any means, and could be, by implementing this proposal.

Centralized Projects System (M) is a proposal to reduce corruption in public sector projects (procurement, implementation, and/or services), using contemporary organizational and project management theories, built on IT solutions.

The proposal main concepts are; the locally centralization of the project control system, the standardization and optimization of the processes, the reduction of human interaction by automating every step of the administration activities, and the target level of accuracy and precision to the tender documents and the processes deliverables. Supportive survey was conducted during the study to reveal the probability of the corruption in the example area and whether it has increased, reduced or remained the same after 2014. Findings showed that the probability to encounter corruption of any sort in public sector projects is 73.8%, and 46.4% thought it is remain the same after 2014 comparably to 33.3% stated it is increased and 20.3% reduced.

This proposal M is a management and technical solution could be applied where the corruption in the public sector projects is found to be rampant. It can be applied with the required tweaks elsewhere, other than Iraq, and for any industry as long as the process serves public sector projects.

**Key words:** corruption, construction, Iraq, management, tendering, centralization, standardization.

### Introduction:

Corruption has grabbed great attention worldwide due to its direct adverse effect to a persons' quality of life, and due to the powerful bastions the corrupted systems built defending themselves. Poverty, crimes, and sub-

standard infrastructure are only few ramifications of corruption to mention. Corruption not only raises project cost, but it ultimately lowers the quality of end products.

American Society of Civil Engineering estimated the corruption

cost in worldwide construction about 340 billion dollars each year [9]. The construction is out of 19 industry sectors most likely to find bribes being paid [10]. Having said that, this is still the corruption figure of one industry only.

In general, the fight against corruption, whether in projects or operational processes, consists of two intervention-control mechanisms. The first is the preventive mechanism (which our proposal scope based on), and the second is the corrective control mechanism (the criminal justice system) [2]. As mostly the case, preventive control is more effective and efficient than corrective system. However, no such system exists that can always prevent corruption, no matter how many safeguards were put in place. Whilst opportunities for corruption can be greatly decreased, human always seem to find a creative way to perpetrate corrupt acts. Hence, corrective mechanisms to deal with corruption incidents, when they do eventually happen, must also be put in place [1]. The aim of this study is to suggest a proposal to demonstrate an administration application, which could control the corruption in the public sector projects, via standardized process aided by software application and the automation of management steps whenever applicable.

## Method

Due to the probable adverse impact nature of the corruption, it is likely practical to address the corruption under the applications of the risk (identification, analysis, response planning, and monitoring and control). Previously published literature detailed the root causes of the corruptions [3] [7] [8][11], which, to the authors' opinion, can be classified into two main categories: first, which is more important, the morale system, and second is the administration system. The inseparable relation between the two systems means improving any of them should impact the other after a while. The focus of our proposal is the administration system for two reasons: Firstly, morale system is relatively out of the scope of engineering management studies, secondly, the relative simplicity, measurability, and shorter term observable results of the second system.

The suggested proposal is designed only to serve public sector projects. To ease the proposal demonstration, Iraq as a real case example had been selected. As a reason of the direct consequences of the corruption to the devastating infrastructure and the people's disastrous lives, As per Iraqi Commission of Integrity (CoI) 2014, the total funds missing from government for the last ten years coffers amounted to \$330 billion

[3][8]. The corruption in public sector projects in Iraq comprises three areas;

- 1- Project inception, budget evaluation, tendering document accuracy and tendering process.
- 2- Awarding process.
- 3- Project implementation, payments, change orders and claims management, and handing over.

The probable main administrative root causes of risk of corruption in Iraq are; direct human interaction, lack of accuracy and accountability, undermined monitoring and control systems, no clear processes (if any, it is not effective), human errors, corrupted jurisdiction system, and weak enforcement power, and political structure. The latter three aspects are out of the proposal scope.

The theoretical background of the proposal is based on standardization, centralization, automation, and the level of accuracy and precision of the processes and the deliverables.

A qualitative subsidiary survey to the study was conducted using social media. The participants answered limited queries. The first question was “ what is the current probability to encounter corruption in the public sector projects“ and “has corruption increased, reduced, or remained the same after 2014”(Table 1). The estimated sufficient random sample size was 96 participants, with 95% confidence level, an estimated population size of 1.5 million (engineers, project managers, project administrators, government officers, contractors, suppliers, consultants who dealt directly or indirectly with public sector projects in Iraq), and Confidence Interval of 10.

M is the name given to the electronic software used to automate the proposed processes and the system as a whole. This acronym has been given after the Arabic language translation of the Centralized Projects System (Mandumat Masharee Markazia).

**Table 1: Survey Questions and Results**

Question	Participant sample size	Answers
Based on your experience, what do you think is the probability to encounter corruption, in any form, in the public sector projects?	154	<ul style="list-style-type: none"> <li>- Average probability 73.8%</li> <li>- Standard deviation 16.5</li> </ul>

Based on your experience, after 2014 (after the implementation of The Regulations of Execution of Government Contracts) has the percentage of corruption in any form, Increased, Reduced, or remain the same?	96	- 46.4% Remain the same - 33.3% Increased - 20.3% Reduced
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### Proposal

The proposal is a contract and implementation control measure, which aims to reduce the risk of corruption to at most applicable. Proposal flow chart illustrated (Fig.1). The idea is to control all projects for the specified government entity (department, ministry, local government, etc.) under one centralized hub (the system M). The proposal is built on four pillars;

- 1- Standardization and centralization of the project management processes, and the projects.

Optimization is the foundation to the continuous improvement. In accordance to the CMM (Capability Maturity Model) [Managing the Software Process by Watts Humphrey 1989] optimization could not be fulfilled and adopted to the continuous improvement endeavor, without standardization. The other important aspect of the standardization is the accountability. Standardization

(Manuals, standard operation procedures, work instructions, and record, etc.) helps set and measure clear KPIs (Key Performance Indices) and as a result empower the accountability.

Monitoring and control are vitally important for both the operational and projectized process successful implementation. To strengthen the monitoring and control capabilities, local centralization (governmental department, local government, etc. but not to the federal level) is a proven practical solution for diversity of applications. David et al [4] elaborated on the advantages of the single point of contact and centralization systems.

- 2- Elimination of human interaction by the automation of the processes.

Since the projects, its management processes and documents are standardized, all management operations (including allocating budget) can be automated by electronic

system (M). Human interaction almost eliminated through the stages; from authorization of project until the contract award. And to limit the human interaction consequences during the implementation stage, it is required by the engineer to design the process of project execution verification. It is also required to automate the process as much as applicable by using edge technologies (ex. Computer aided applications, GIS, GPS, automated communication). The automation is the most effective line of defense, but if not applicable, the alternative is to adhere a method reduces human subjective judgment (that is vulnerable to the risk of corruption) and making the activities of quality control and audit fast, easy, and accurate.

- 3- Accuracy and precision of the processes and processes' deliverables, mainly the tender documents. The high accuracy of the tender document eliminates one of the causes of the corruption that is the possible different interpretations.
- 4- Variation order set to zero as a result of the projects standardization, tender document precision and accuracy, and most importantly

the very broad and all-inclusive risk analysis during the design stage. However, these measures may not totally eliminate the possibility of the change order. Therefore, a contingency process to deal with the scarce cases needs to be designed and put in place as well.

On the contract management part of the proposal, Design Bid Build (DBB) is used among other contract types (Design-Build DB, Construction Management at risk CM, and the emerged methods like Integrated Project Delivery (IPD) and Design-Build-Operate and Maintenance (DBOM). However, the proposal tends to use sort of the (IPD) approach by the involvement of different stakeholders during the database building process. By automating the tendering process and standardizing the design, M overcomes (DBB) main disadvantage; that is the prolonged time comparably to the other contract types. (DBB) has been selected as the contract base to design M, since it is the most common system as of today [1], and the design stage separation which is more suitable to standardize the design of projects.

Implementation Steps of proposal M includes:

- 1- The infrastructure; computers, internet, M software, and server.
- 2- Database; generate projects data-base by;

- 2.1- Submit the prospect projects' requirements by the government clients. Preferably requirements provided in standardized Term of Reference.
  - 2.2- Nominate specialized firms to generate design and tender documents. Accurate and precise bill of quantities and definite specification are imperative. In this stage, execution verification is also designed and standardized.
  - 2.3- Risk analysis with appropriate response plan is a must during this stage to cover all possibilities, and assure seamless implementation.
  - 2.4- Upload projects details in a predefined format to the system software.
- 3- Operators;
- 3.1- Provide limited access to each stakeholder (M operators, clients, contractors, suppliers, financial institutes, authorities, laboratories, end users, and any others).
  - 3.2- Provide customized training for each group of stakeholder.

### Discussion

All public sector projects in Iraq are subject to The Regulations of Execution of Government Contracts, with its latest modification on 2014, issued by the Ministry of Planning [5].

Apparently the survey results (Table 1) reveal no improvement by implementing the modified regulation. 79.7% of the survey participants

stated that the corruption either increased or remained the same, after the implementation of the aforementioned regulation in Iraq public sector projects. These findings, along with the high probability to encounter corruption in public sector 73.8%, make it evident; to keep working on improving the current system is not the solution. Hence, overhaul the entire process is the only way to exit the calamity of corruption in Iraq or alike cases.

To compare the proposal with the current system in Iraq, points can be identified are;

1. Eliminate, or reduce to the at most minimum, the change orders;  
Projects Standardization, tender document accuracy and precision and the comprehensive risk analysis are the main factors achieving this improvement. The follow up question, does not oblige extra step in the design (risk analysis) increases design cost? The answer is yes, but it may increase the design cost for the first time only. As, the same design shall be used for multiple projects (projects standardization), the risk analysis extra cost would be considered negligible comparably to the cost saving of designing similar project

each time separately. Not to mention the cost of corruption due to the change orders.

2. Automate project cost estimation, financial verification (payment request approvals, banking transactions, etc.). This part eliminates the corruption result out of padding in the cost estimate and reduces the risk of nominating financially unqualified contractors.
3. In the conventional contract, implementation verification done manually. In the proposed solution, the implementation verification is automated or aided by technology, making the audit accurate and fast. As a result, uncover the corruption during the implementation is more effective and efficient.
4. The level of the accuracy and precision set to the target level of zero conflicts, no ambiguities and multiple interpretations, and no inconsistencies among different projects. Using Building Information Modeling (BIM) in the design of construction projects, and setting standard, clear, detailed, and accurate Term of Reference (TOR) could be good examples of how to increase the accuracy level.

The major bi-product of projects executed under this system is the

quality improvement, because of the level of details required, the accuracy in the design and tender documents, and the implementation verification sufficiency, in addition to the faster responses due to automation.

### Conclusion

The proposal M is a management and technical solution, which could be applied where the corruption in the public sector projects is found to be rampant. It can be applied with the required tweaks elsewhere, other than Iraq, and for any industry as long as the process serves public sector projects.

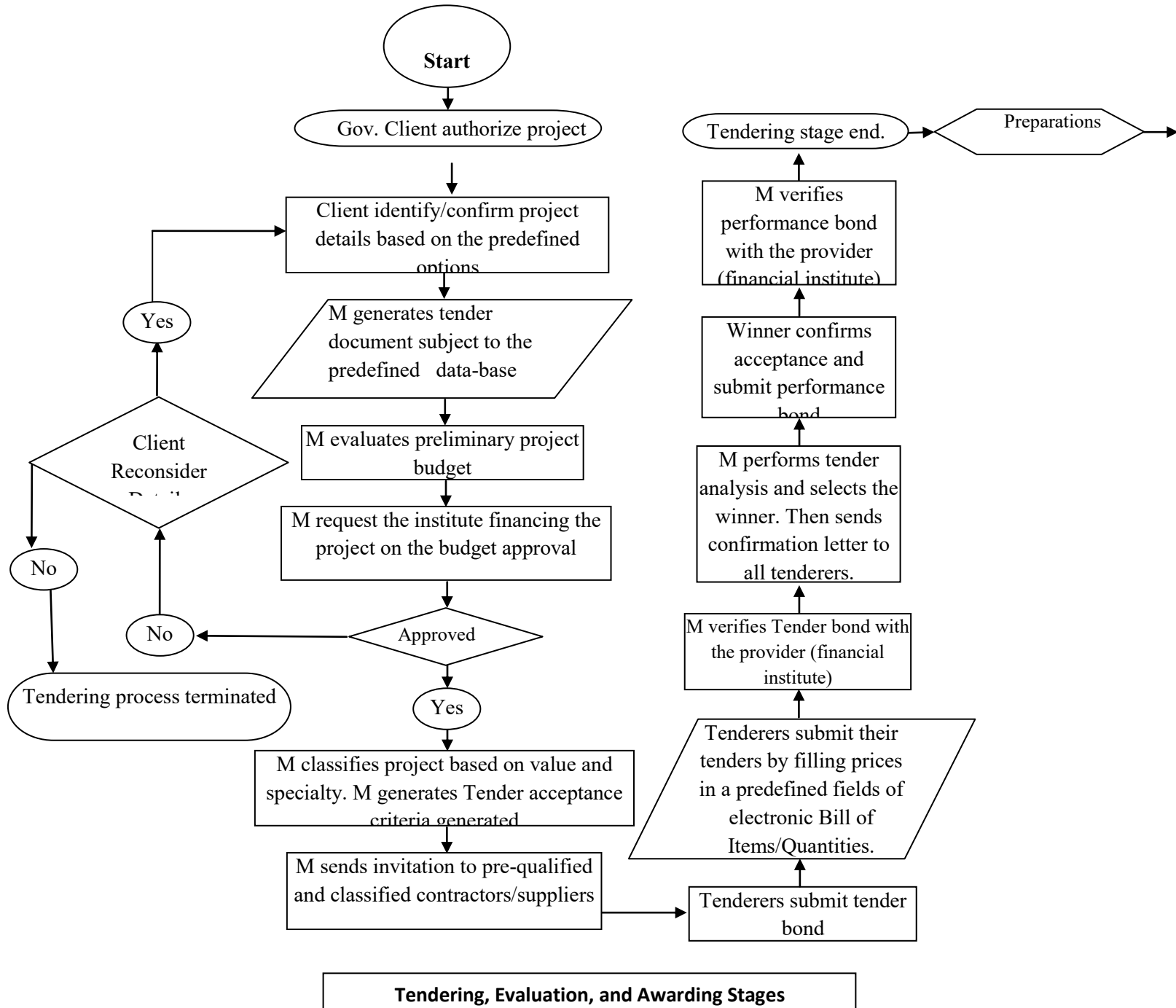
Over the coming 10 years, assuming Iraqi government expenditure will be reduced by 50% due to tight economic condition, 75% of the total corruption money would go through the public sector projects. We assume that the proposal would be capable of reducing 70% of the current level of corruption in Iraq public projects. Therefore, a total of \$ 86.625 billion ( $330 \times 50\% \times 75\% \times 70\%$ ) could be the saving estimated by implementing this proposal. Having those enormous figures in consideration and its effect on people's lives, all efforts need to be exploited convincing senior officials studying the proposal and to adopt it when possible. As Peter [6] says: "If you can't measure it you can't manage it", Further quantitative studies are required to evaluate the current effect of each root cause of the corruption



and the proposal prospect reduction. Institutional, political structure, and enforcement system effects on the corruption have not been studied in

this proposal, therefore qualitative studies are required in tackling the areas of consideration.

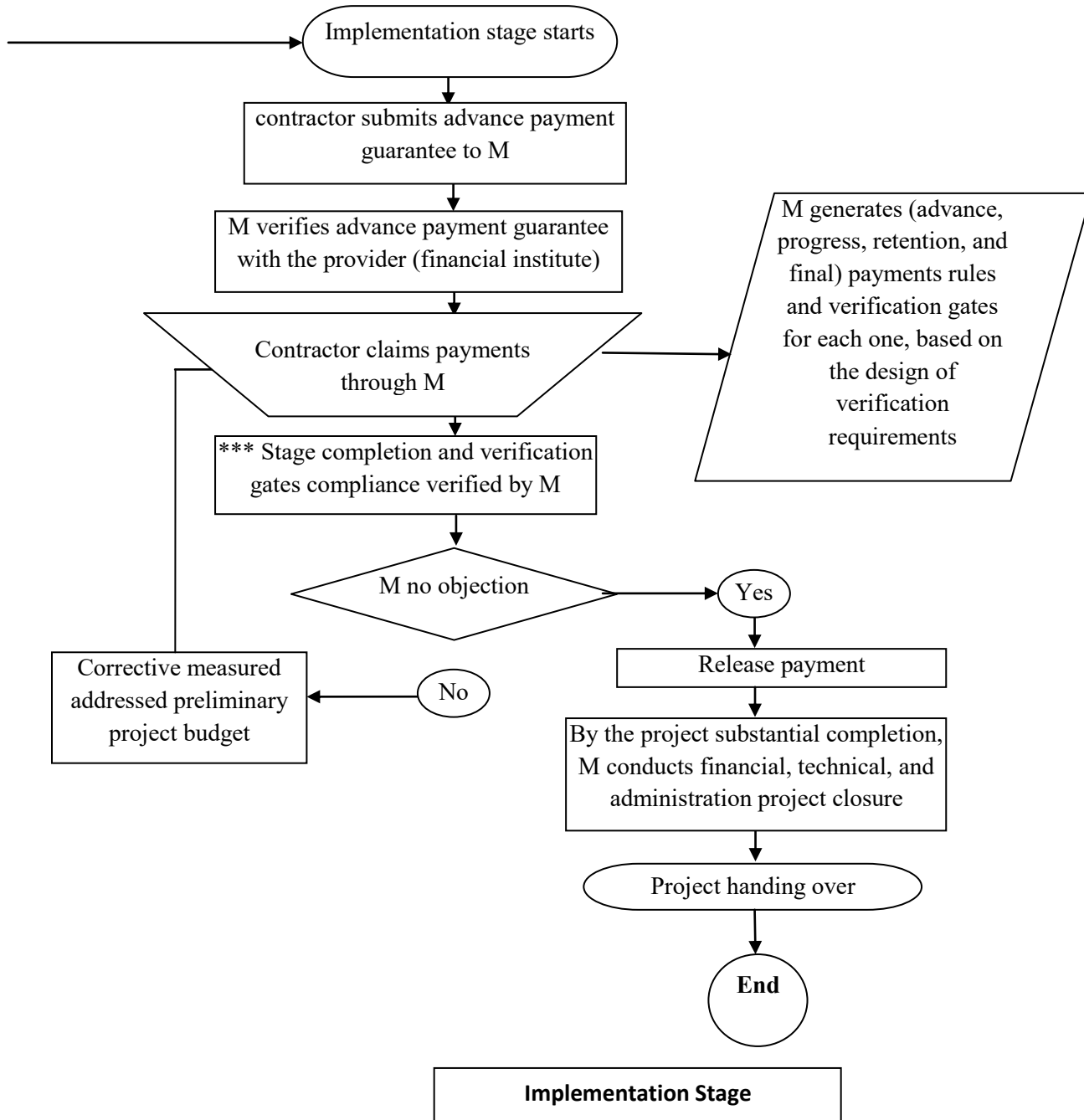
**Fig 1. High Level Process Flow Chart of Realized Projects System (M).**







**Fig 1. High Level Process Flow Chart of Realized Projects System (M) (continued).**



\*\*\* Examples of implementation verification in construction projects; during the design stage 3D modeling software (CAD, RIVIT, or any others) generates the 3D shape to each construction predefined payment stage. Points to capture the 3D virtual model reflected in GPS coordinate. Same points spotted in reality. Using GPS digital camera, photos captured and stored in the project file. Real versus virtual can be verified automatically by M and/or by auditors. Examples on material test compliance. Pre qualified and registered laboratory submits the results directly to M. M compares results with the design specification to verify compliance. If all compliance predefined gates verified, M states no objection to release stage payment.



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## نظام مشاريع مركزي (M) : مقترح لتقليل خطر الفساد - العراق كمثال

مدرس دكتور عباس محمد برهان

قسم الهندسة المدنية/كلية الهندسة/جامعة بغداد

### الخلاصة :

ان الفساد يكلف سنويا مليارات الدولارات. لبناء حياة أكثر اخضرارا وأكثر صحة، والأكثر ثراء في العالم كله، الناس يجب أن تبذل جهدا لمكافحة الفساد بأي وسيلة، ويمكن أن يكون، من خلال تنفيذ هذا الاقتراح.

نظام المشاريع المركزي (M) هو مقترح لتقليل الفساد في مشاريع القطاع العام (بالنسبة للمشتريات، التنفيذ، و/أو الخدمات) من خلال استخدام نظريات ادارة المشاريع والتنظيم العصري، مبنية على حلول تكنولوجيا المعلومات (IT). المبادئ الرئيسية للمقترح تتضمن مركزية محلية لعملية السيطرة على المشاريع، توحيد وتحسين العمليات، تقليل التفاعل البشري من خلال اتمتة كل خطوة من فعاليات الادارة، ومستوى كبير من الدقة والتحكم لوثائق المناقصة ومخرجات العمليات. خلال الدراسة، تم اجراء مسح ميداني للكشف عن نسب احتمالية الفساد في المنطقة ومعرفة فيما اذا هذه النسب ازدادت او تناقصت او بقت كما هي بعد عام 2014. لقد وضحت الاستنتاجات بان نسبة مواجهة اي نوع من الفساد في مشاريع القطاع العام هي 73,8% وان 46,4% من المستبنيين يعتقدون بان نسبة الفساد بقت نفسها بعد عام 2014، بالمقابل فان 33,3% من المستبنيين اشاروا بان النسبة تزداد و20,3% يعتقدون ان النسبة قلت.

ان المقترح M هو حل فني واداري يمكن ان يطبق عندما يكون الفساد متفشيا في مشاريع القطاع العام. هذا المقترح يمكن ان يكون مطبق مع التعديلات المطلوبة في اماكن اخرى غير العراق ولاي صناعة اخرى بشرط ان العمليات تجري داخل مشاري القطاع العام.