

# **Developing New Methods in designing Management Information Systems to solve Management Problems by using Classical Approach**

Mohammad M M Abu Omar  
PhD- Candidate  
Limkokwing University of Creative Technology  
Malaysia

## **ABSTRACT**

Management problems can be solved by building management information systems through using one of information systems methodologies such as: classical approach, structured approach, objects oriented approach.

The using of classical approach in building management information system (MIS) does not always achieve the best solution to build the (MIS). Some management information systems may be built with a good level of efficiency by using classical approach, but in other cases, using classical approach in building management information systems will lead to consume more effort, time and cost, which will not make it as a suitable method for users to build their (MIS).

This research introduces a development in designing management information systems, by using classical approach. It implements new approaches in order to enable the classical approach to build management information systems with a good level of efficiency and without need to consume more effort, time and cost. Which will achieve what are the systems builders looking for.

## **General Terms**

Management information systems (MIS), management problems.

## **Keywords**

Information system life cycle, (MIS), classical approach, general management problems, determined management problems.

## **1. INTRODUCTION**

Management information systems can be built by using of information system life cycle, which is adopted by classical (traditional) approach through using of the following five stages:

1-Planning Stage: it is the first stage in the information system life cycle, the responsibilities of this stage are:

-Defining the problem and collecting the required information about problem which the system will solve it.[7],[8]

-Determining the user's requirements, which the developed system will solve them.[5],[7]

-Determining the estimated budget and time to accomplish the system. [7],[8]

-Suggesting a solution or list of solutions to the problem.[6],[7]

2-Analysis Stage: it is the second stage in the information system life cycle. In this stage the system analyzer will study each solution in the list of the suggested solutions that is obtained from the previous stage (planning stage) and then choose the best solution.[6],[7],[8]

3-Design Stage: it is the third stage in the information system life cycle. Here, the designer's team will provide all the design necessary requirements such as: input screens, output screens, reports, database and system algorithms.[7],[8]

4- Development Stage: it is the fourth stage in the information system life cycle. Here the system will be programmed and operated.[5],[7]

5-Test and Maintenance Stage: it is the fifth (final) stage in the information system life cycle. Here, the system will be tested if it includes some errors or if it needs to some improvements to be better and effective.[7],[8].

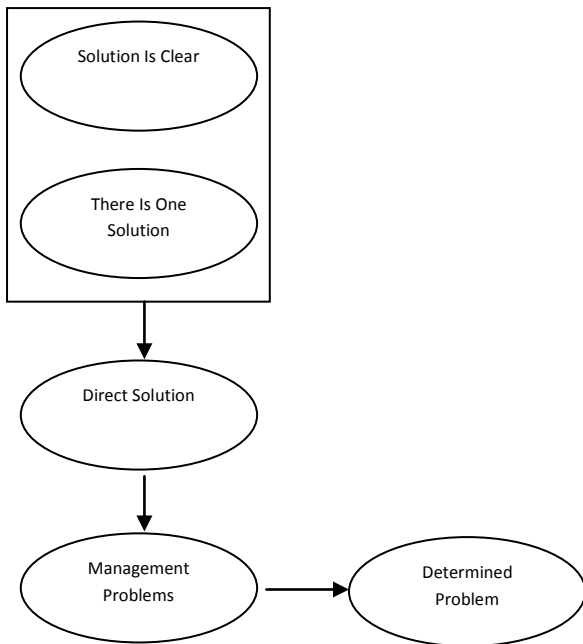
## **2. RESEARCH METHODOLOGIES**

The research shows a new concept in order to define the wide range of management problems according to their nature and properties. In this issue, the research divides management problems into two main types, the first is: (General Problems), the second is: (Determined Problems). According to this, the research divides the building of management information systems in order to solve management problems into two main parts according to the type of problem.

### **2.1 DETERMINED PROBLEMS**

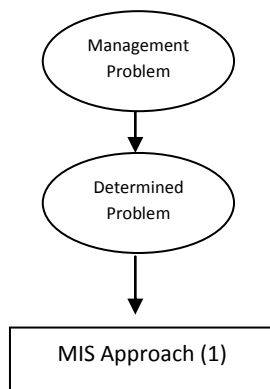
The research defines the management problem as: Determined Problem, when its solution is clear, and it is usually one, you need only to collect the required information about this problem in order to implement it. So the solution for this type of problems will be defined as: direct solution.

In this case, there is no need to find multiple solutions to the problem and choose the best solution. This means that there is no need to consume more time, effort and cost in using analysis stage, which is the second stage in the information system life cycle that is adopted by classical approach.



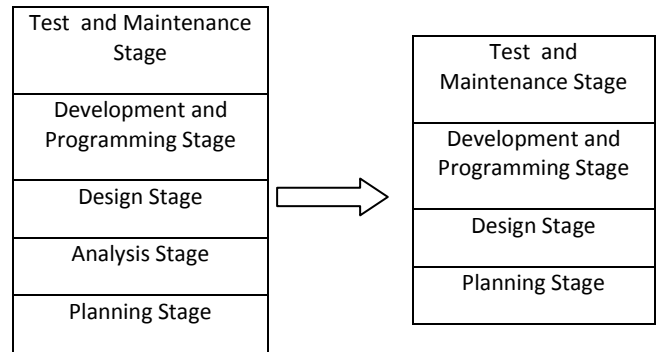
**Fig 1: Determined Problem**

Now, and according to the properties of the determined problems, which have been mentioned in this section, the research develops the MIS approach (1) to build the management information systems which will be used to solve this type of problems. This approach (MIS approach (1)) will avoid the using of analyses stage through building the management information system by using classical approach. Using this stage is not only needed in this case, but also must be avoided, since if it is used, this will consume more time, effort and cost through using of the analysis stage, which the determined problem doesn't need, due to its nature and properties.



**Fig 2: Using MIS approach (1) to build and design the management information system to solve the determined problems**

The MIS approach (1) will use the classical approach and skip the second stage in building the management information system which will be use to solve determined problems.

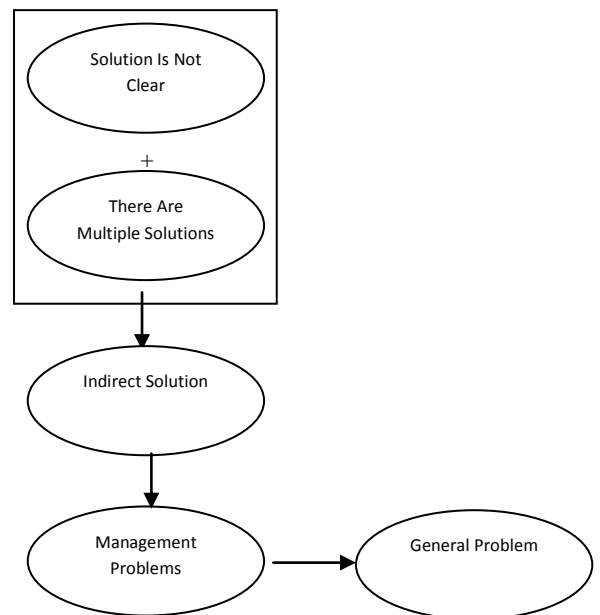


**Fig 3: The first (left) approach is the information system life cycle that is adopted by classical approach; the second (right) approach is the MIS approach (1)**

## 2.2 GENERAL PROBLEMS

The research defines the management problem as: General Problem, when its solution is not clear, and there are usually list of multiple solutions. So the solution for this type of problems will be defined as: indirect solution.

This means that these problems are undetermined, there is a need to clarify the solution of the problem and search to find the list of suggested solutions in order to choose the best one, so there is a need to use the analysis stage while using of classical approach, which will help these problems to change from general (undetermined) to be (determined).

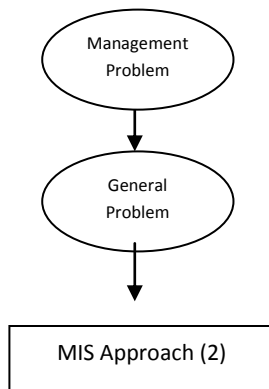


**Fig 4: General Problem**

In this case, the research agrees with the current approach which classical approach uses in designing and building management information systems which includes all stages of information system life cycle, and defines it as: MIS approach (2), so there is no skip to the second stage in the information system life cycle as in MIS approach (1), all stages must be used, this is because of the properties of this type of problems which are:

a- Solution of this type of problems is not clear; it needs work to be identified, so the implementation of the planning stage will give a list of suggested solutions to the problem.

b- Probability of the existence of multiple solutions for this type of problems, will lead to the need to study each of these solutions in order to detect the best, this means that this type of problems needs ( analysis stage ) which is the second stage in information system life cycle that is adopted by classical approach.

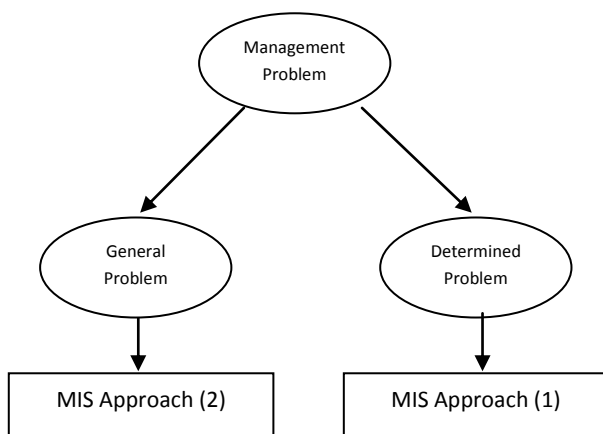


**Fig 5: Using MIS approach (2) to build and design the management information system to solve the general problems**

The MIS approach (2) will use the all stages of information system life cycle which are adopted by classical approach in building the management information system which will be use to solve general problems.

Test and Maintenance Stage
Development and Programming Stage
Design Stage
Analysis Stage
Planning Stage

**Fig 6: The MIS approach (2) which uses all stages of classical approach**



**Fig 7: Research Methodology**

### 3. APPLICATION EXAMPLES

The research shows some practical examples for the two types of management problems that research defines through research methodologies which are: determined problems and general problems, and accordingly the research clarifies how to choose the suitable method to build and design the MIS in order to solve the problem.

#### 3.1 APPLICATION EXAMPLE 1

A construction company wants to work in a major street paving project in one of the cities. Project manager needs to know the estimated time to accomplish the project. He looks forward to find a MIS to solve this problem.

According to the developed concepts which the research shows in its methodologies, before the start of building MIS, firstly we should determine the type of management problem that MIS will solve, then choose the suitable approach to build and design the required MIS.

The solution of this problem is to know the estimated time of the project, which will be achieved by using of MS-Project software package, from this, we can notice that the solution is clear, and it is also one, so the research defines the solution for this problem as : direct solution, and it classifies this management problem as : determined problem. In this case, the research methodology advises to use the MIS approach (1), to build the required MIS that can solve the problem without consume more time, effort and cost.

Here, the resulting management information system from the use of MIS approach (1) will contain three stages which are: data collection, processing, results and solutions, which are explained through introduction.

In data collection stage, all the required data will be collected, which are: the project tasks, tasks duration, and tasks predecessors. In processing stage, the collected data from previous stage will be processed by MS-Project software package, and according to the output of processing, the third stage of MIS will introduce the solution.

#### 3.2 APPLICATION EXAMPLE 2

A factory needs to increase its lucre; the management council of the factory looks forward to find the MIS in order to achieve this goal.

According to the developed concepts in designing the MIS by using classical approach to solve the management problems which the research shows in it's methodologies, the research advises that before the start of building MIS, firstly we should determine the type of management problem which MIS will solve, then choose the suitable model to design and build the required MIS.

Here, there is no determined solution in order to solve this problem, since there are multiple solutions which may achieve the company requirements in increasing the lucre. For example, these multiple solutions may be as in the following:

- Increasing the price of factory products.
- Change the size of the amount of products.
- Increase the number of the working hours.

So, the solution is not clear, and there is a list of multiple solutions for this problem so the research defines the solution for this problem as: indirect solution and it classifies this management problem as: general problem. In this case, the research methodologies advise to use the MIS approach (2) to

design and build the management information system by using classical approach, which will use all stages in the classical approach in order to generate successful MIS that can achieve the user requirements.

As we see, the MIS approach (2) can't skip the second stage in classical approach, which is: analysis stage, not as MIS approach (1), and this is due to the following reasons:

- A- Solution is not clear; since it is not one, and there are multiple solutions, so there is a need to clarify a list of the suggested solutions, so the implementation of the planning stage will show a list of the suggested solutions in order to solve the problem.
- B- According to the previous reason in point (a), there is a need to study each solution from the solutions list, in order to detect the best one, this means that there is a need to (analysis stage) which is the second stage in the classical approach.

So, the result of using the analysis stage in the classical approach, will detect one and clear solution for the problem, so, the problem will be converted from general problem to determined problem. The use of all stages of classical approach through MIS approach (2) will build the suitable MIS which can solve the management problem in example 2.

#### **4. CONCLUSION**

The use of all stages in information system life cycle by classical approach in order to build management information systems to solve management problems, doesn't always be a good and effective method, the full use of all stages in information system life cycle may sometimes lead to consume more time, effort and cost without a really need. To avoid this problem, this paper introduces a new classification for management problems, and according to this classification, the paper introduces new developed methods in the using of information system life cycle to build management

information systems, these methods will lead to a fully or partially use of information system life cycle stages which will help to save time, effort and cost during the design and build of management information systems.

#### **5. REFERENCES**

- [1] Mathias Riechert, " Research Information Standardization as a Wicked Problem: Possible Consequences for the Standardization", In Proceedings of The International Conference of Current Research Information Systems, At Rome, 2014, Volume 12.
- [2] Ram L Kumar, Antonis C Stylianou, " A process model for analyzing and managing flexibility in information systems ", European Journal of Information Systems, 2013.
- [3] Valdis Vizulis, Edgars Diebelis, " *Self-Testing Approach and Testing Tools*", Journal of University of Latvia, 2012, Volume 787.
- [4] Lionel Briand, Yvan Labiche, " *A UML-Based Approach to System Testing* ", Journal of Carleton University, 2002, Version 4.
- [5] Lejk, M. and Deeks. An Introduction to Systems Analysis Techniques, 2nd Ed., Pearson Education Limited, 2002.
- [6] Satzinger, J., Systems Analysis and Design, 2nd ed., Thomson Learning, 2002
- [7] Dennis, A. et al, Systems Analysis and Design: An-Object-Oriented Approach with UML. John Wiley & Sons Inc., 2002
- [8] Maciaszek, A., Requirements Analysis and System Design, Developing Information Systems with UML, Addison-Wesely, 2001.