Determinants of Delays in Realization of Information System Projects: a Mixed Method Approach within a Cameroonian Banking

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ABSTRACT

This article focuses on key determinants of delays in the realization of an information system (IS) project. In particular, we assess the impact of the non-appropriation of project management methodology by project managers and the lack of software to manage collaborative on delays in projects' implementation. Using a mixed-method approach, the study found that these two determinants have a positive relationship with delays in IS projects' implementation. Implications for research and practice are discussed.

Keywords: project management, information system, delay optimization, structural equations, problem tree.

1 INTRODUCTION

The current international economic context compels every company, which runs in a competitive environment, to anticipate its customers' needs in order to increase their satisfaction. This goal can be met through innovation. It's an obligation nowadays, companies get control on their growth by implementing projects which enable them to run their development.

Banks work hard in order to give total satisfaction to their customers. For instance, they develop strategies and models to anticipate their needs and therefore, help them in providing the best solutions. That's the reason why their projects' portfolio increases over the years.

In many companies around the world, the majority of projects are completed beyond the deadline. Saying "projects are late" has become familiar, providing that the perfect forecast in project management will never be. Nevertheless, there is a limit not to exceed to avoid bankruptcy in term. This limit can be set at 33% of the time beyond previsions. Indeed, the off-time deliveries may have dramatic consequences on the well-being of companies. A non-exhaustive list of these consequences is: operational losses, image degradation and lack of trust in the projects management team.

In 2012, more than 50% of delays in the execution have been registered in the bank SGC (Societé Générale Cameroun). Faced with these poor results on projects achievement, this article aims to define the factors beyond and to find out ways of reducing these delays.

More specifically, the paper aims at answering the following research questions:

RQ1: what is the impact of the non-appropriation of project management methodology by project managers on delays in projects' realization?

RQ2: What is the impact of the lack of software to manage collaborative on delays in projects' implementation?

The rest of this paper is structured as follows: after the Introduction, Section 2 presents the theoretical background of the study. Section 3 deals with the methodology, while data analysis is exposed in the next section. Section 5 discusses the results of the study. Section 6 deals with implications and limits. Finally, Section 7 serves as the conclusion of the study.

2 THEORETICAL BACKGROUND

2.1 Management Project Models, Tools and Methodologies

Unlike other management fields such as accounting and marketing, there's no literature about project management [1]. In the early twentieth century, practitioners such as Taylor and Fayol, on the basis of their experiences on organization theories, have developed approaches to solve common and recurring problems. Following them, practices have been institutionalized (through tools and professions structuring) and models were set out. In fact, the first models of project management came from areas such as craft industry, civil engineering and shipbuilding. Conception seems to be of primordial importance as it's the time to anticipate the object to come, make representations and simulations based on physical laws and existing constraints. The architecture allows the division of work into tasks and plans its realization in time.

The entrepreneurship model comes from the model of startups development, which has been adapted from Project Management by Middler [2]. Two aspects emerge from this model: the project is identified with the birth and development of a business; collaboration is largely based on trust between employees, charisma and brotherhood. This model highlights the advantage of creating a strong personal mobilization. However, the contractor's search of skills for the project is limited to its social network. These skills are easily found with the application of the newest models of project management in large companies through tenders or project team meetings. These practices are derived from the standard model of the Project Management Institute.

Indeed, from the 1960s, institutions have been created in order to organize the project management. Therefore, they disclose project management tools, and a standard model has emerged for project engineering. Among these institutions are: The AFITEP (Association Francophone de Management de Projects), the IPMA (International Project Management Association), and the PMI (Project Management Institute).Over the years, PMI standardizes business practices of project management and has supported three major initiatives in the early 1980s (Navarre, 1993, P. 189): (i) the development of a synthetic knowledge in project management body (the Project Management Body of Knowledge – PMBOK); (ii) the development of project certification; and (iii) the adoption of a written charter and an oath framing the profession of project manager.

Project management has changed its orientation despite enrichment of various tools, formalization, standardization and dissemination of PMI model. In fact, since developing countries impoverishment, the international growth of risk and the arrival of new competitors on engineering market, PMI model found itself in crisis. It has been questioned due to the arrival of new challenges and new requirements [3].

Yet, manufacturing industry didn't adopt the standard model, but kept dealing with the current one before formalization of the model PMI: the Taylorist model or sequential model. Project development is symbolized by a relay race [4]; its realization goes from a function to another. This model is based on three characteristics [2]: (i) integration in the company of most needed skills for the project growth; (ii) separation of expertise in the various functions; and (iii) hierarchical coordination of professional expertise realizing the project.

Even though this sequential organization has been effective in the past, it actually shows some limits. Today's world requires high speed when it comes to developing and innovating products. Instead of individual and successive changes in the various functions involved in the project, a simultaneous increase of the whole project team is favored: that's the main characteristic of what we call concurrent engineering.

Developed in the mid-1980s, the concurrent engineering model was firstly a response to

the need of more rapid project developments. The Japanese auto industry will be the first user. Managerial principles of this model can be summarized in four points [5]:

- Phases recovery;
- Heavy project supervision;
- Coordination of activities in tray;
- Association with partners in development process.

This need for rapid development in project management has led to several studies on costs and delays control. The results of the first annual survey of "*Observatoire des projets en France à dominante SI* " launched in January 2011 by the consulting firm Daylight Group, showed out the main dysfunctions of IT ? projects in terms of time. It is reported that 70% of IT projects do not respect the initial planning and 16% simply lead to failure. The study of Panorama Consulting Group, realized on about among 1,600 worldwide organizations which have implemented an ERP project between 2005 and 2009, resulted in similar findings: 57% of projects have not respected the planning and 54% of projects exceed the initial budget [1] .Another study the Standish Group conducted in the United States of America revealed that only 16% of projects have been accomplished according to the forecasts[2].

Faced with an increasing number of project failures due to poor preparation, lack of tools, low skills in project management methodology, and many other reasons, decision makers, experts and organizations have studied the factors of success and failure of projects. Thus, many tools and methodologies for project management have been developed and enriched.

Project management methodologies are developed according to a scientific approach, and sometimes on the basis of proven practices so that they help controlling costs and time limits of a project. It is therefore reasonable to think that any methodology, suitable to the company's context, should allow decision makers to fulfill planning constraints. This brought us to think that delays could be due to a lack of methodology in project management. Then, we have the first hypothesis:

H1: Non-appropriation of project management methodology by project managers has a positive effect on delays in the projects' realization.

2.2. Delays and IS projects success

Several software have been developed to help managers in achieving project management process in better conditions. These tools propose (to managers) sophisticated functions for project management, including planning, resource management, budget management, collaboration and document sharing. Given the increasing number of projects in companies and the broad quantity of data they generate, working without software would be a great handicap for project management. Hence the second hypothesis:

H2: The lack of software to manage collaborative work is a major cause of delays in projects' implementation at the SGC.

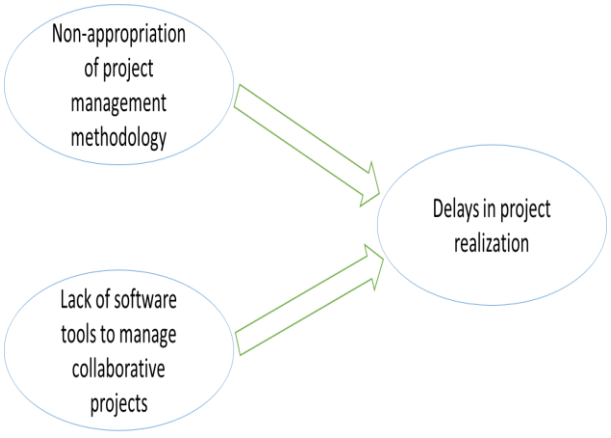

Figure 1: Study model for projects realization on time.

Figure 1 shows our two hypotheses of study: the links between delays in the realization of information system project.

[1] http://www.sage.fr/espaces/default.aspx?tabid=5736&articletype=articleview&articleid=446 (13/08/2012)
[2] http://www.developerfusion.com/article/84858/why-projects-fail-8211-mastering-the-monster-part-1/

3 METHODOLOGY

This study uses a mixed method approach involving both qualitative and quantitative data. For the qualitative study, a case study was conducted within the SGC (Société Générale Cameroun, a leading Cameroonian bank which was launching a new IS. A case study strategy is suitable for studies where researchers are trying to answer the research questions such as "how" and "why" things are done[6]. In addition, case study permits the investigation and the understanding of complex phenomena within real-life settings [7], and thus induces theories [8]. For the quantitative phase of the study, a survey was administrated to key stakeholders involved in the project.

3.1 Research Setting

This study has taken place in Société Générale Cameroun (SGC). It is a retail bank, which is a subsidiary of the French group Société Générale, with a capital of 12.5 billion CFA francs (since 2010) divided between the State of Cameroon, Société Générale and 6 private investors. It settled in Cameroon in 1947 with his headquarters establish in Douala since 1978. With a network of 26 branches, it offers services for business customers and private customers. Major actor in Cameroon financial sector, it employs about 618 employees. In the 14th edition of the magazine Jeune Afrique Special finance edition, SGC was rank 1st among Cameroonian banks and 134th among African banks for the 2011 period.

The Information Technology and Organization Department, which is concerned in this work, depends on the General Secretary. It includes the following services: Local exploitation, Networks and Telecommunication, help desk, Data bases and systems, and Organization. The Organization service is responsible for users' access management, configuration of bank conditions, training users, updating bank procedures, and the management of banking projects. In its operation, all project can be initiated by business users, the organization department, or the group "Société Générale". Except for projects initiated by the group, the organization department should formalize expressions of needs, write specifications and conduct all projects from the beginning to the end.

3.2 Data Collection

Data collection has taken place between July and October 2012. There were about 40 projects underway at this time and the four major ones were:

- Automation of activities by the creation of a special ATM to centralize all operations of an important client namely the autonomous port of Douala;
- Creation of a new branch at Foumban town, the development of Information Technology aspects in this project were concerned;
- Creation of a virtual platform from which customers would be able to do their banking operations, and communicate more easily with the bank;
- Migration to the latest version of bank ERP.

The data collection was conducted using multiple sources including: (i) direct observation of employees during their work on IT project management; (ii) a questionnaire administered to project managers, to prime contractors, and functional employees; (iii) semi-structured interviews; (iv) industrial reports; (v) participative observation; and (vi), technical and non-technical documents, and thus allowing us to ensure the validity of our constructs [9] [6].

For the quantitative study, two questionnaires were developed. One questionnaire for functional aspects of the project and another one for project managers and prime contractors. The goal is to get the vision of each stakeholder involved in the project.

For all functional aspects of the project, 10 individuals were interviewed. This group is composed of department heads and their team members. For prime contractor, 8 individuals divided in three groups were included. First, the members of INF-ORG (Informatique et Organisation), department that accounts for 3 project managers who are supervisors for the majority. Second, 5 regular employees of CSM (Centre de Services Mutualisés) who has responsibility to conduct the projects. Third, 5 former managers who have recently been transferred in the last six months to other departments. With regard to the project management, 8 employees of the two departments, who are regularly concerned with project execution, have been interviewed in this proportion: 4 in INF-ORG and 4 in CSM. Overall, of 47 employees invited to participate to the study, 26 agreed to participate and provide useful responses for further analysis (response rate=55%).

4 DATA ANALYSIS

Analysis of data collected with questionnaires highlights the causes of delays: non-appropriation of project management methodology and lack of project management software. To optimize the delays now means to find solutions to these two main causes. To ensure the effectiveness of the solutions, it is necessary to perform a causal analysis of delays. Thus, a confirmatory factor analysis is performed. The used tool is a structural equation model with latent variables.

The structural equations model with latent variables is a complex statistical method to relate concepts. These models are subject of an extensive literature generally classified into two schools of thought. The first, which comes from [6], is built on the estimation of covariance. While the second approach, which was initiated by [7], is built on a least squares estimation. This work is based on Jöreskog approach.

In their use, the aims of structural equations are twofold: an exploratory analysis or a confirmatory analysis. It is the second approach that is used here because the objective is to confirm a pre-theoretical model. It allows to test hypotheses about the relationship between observed variables and latent variables [8].

5 RESULTS

The objective of the first analysis is to identify the main causes of delays in project implementation. From the causal analysis of factors explaining the delays in the project implementation, a tree of facts is proposed in Figure 2. This tree gathers the causes of problems and highlights the consequences of delays.

After this analysis, it comes to confirm and measure the actual contribution of the main causes of delays. A measurement model and a structural model were developed in this analysis step.

5.1 Structural Model

A structural model is necessary to identify both the effects and determinants of causes that explain delays. Once the model is built, it must be validated by identification and analysis of parameters as suggested by [9]. Figure 3 formalizes the structural model, each circle embodies a latent variable.

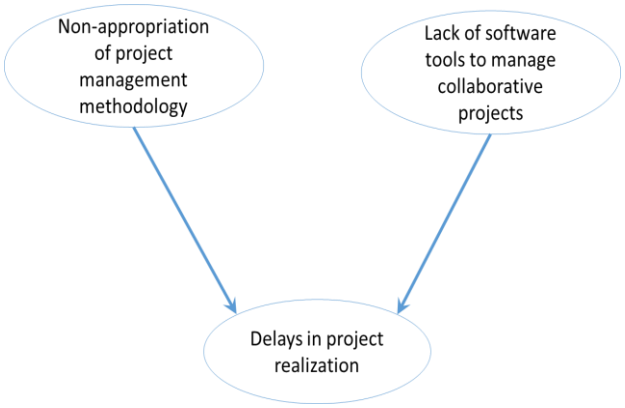

Figure 2: Study structural model.

5.2 Measurement Model

The measurement model involves the manifest variables that are manifestations of

latent variables. Their values are provided by the completed questionnaires. Our measurement model includes 14 manifest variables shared between the latent variables as follows:

- six (06) are attached to the non-appropriation of the project management methodology;
- seven (07) are attached to the absence of a software project management;
- one (01) is attached to penalizing delays in project management.

The complete model is presented in Appendix 1.

At the end of the data processing by the LISREL software, we obtained a list of clues to decide on the quality of the model obtained before any interpretation of this model. At the end of the data processing by the LISREL software, a list of clues to decide is defined on the quality of the model. And then, the interpretation of this model is preceded. As Diamantopoulos and Siguaw[10] suggest, the quality of the model must be based on a chi2 test and the following indices: RMSEA, ECVI, standardized RMR, GFI and CFI.

Table 1: Indices of validity of the model significance on threshold p < 0,01.

Indices	Obtained values	Validity thresholds
Khi-2	101,26	Neither
RMSEA	0,0	Must be< 0,05
Standardized RMR	0,036	Small as possible, preferably < 0,05
GFI	0,979	Must be> 0, 90
CFI	0,87	Must be> 0, 90
ECVI	11,250	The best model has the smallest ECVI

Source: [10].

Upon observation of these indices above (Table 1), we conclude that overall the model is acceptable, so it fits well with our data. So the relations proposed by the structural model are verified. Correlations of the structural model provided by LISREL is presented in Figure 4.

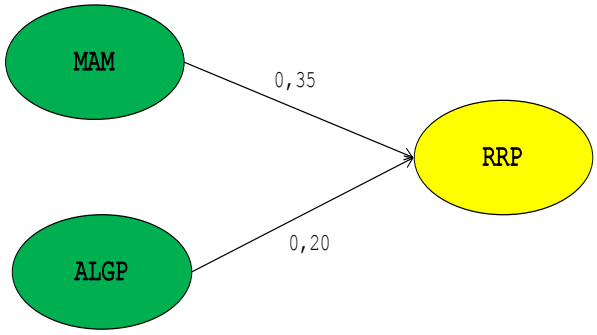

Figure 3: Hypothesis validation scheme.

Figure 4 indicates that 35% of the variance of delays in the project implementation is explained by the non-appropriation of project management methodology, and 20% of that variance is explained by the absence of a software project management. Therefore, the non-appropriation of project management methodology and the lack of software project management explain 55% of the variance of delays in the projects, then research hypotheses are validated.

6 IMPLICATIONS AND LIMITS

6.1 Implications

Approximately 70% of projects related to the information system of the CMS are completed in time. Which is well above the initial delays. But, in a tumultuous economic environment, the enterprise which wants to maintain control of its future must manage more precisely its projects.

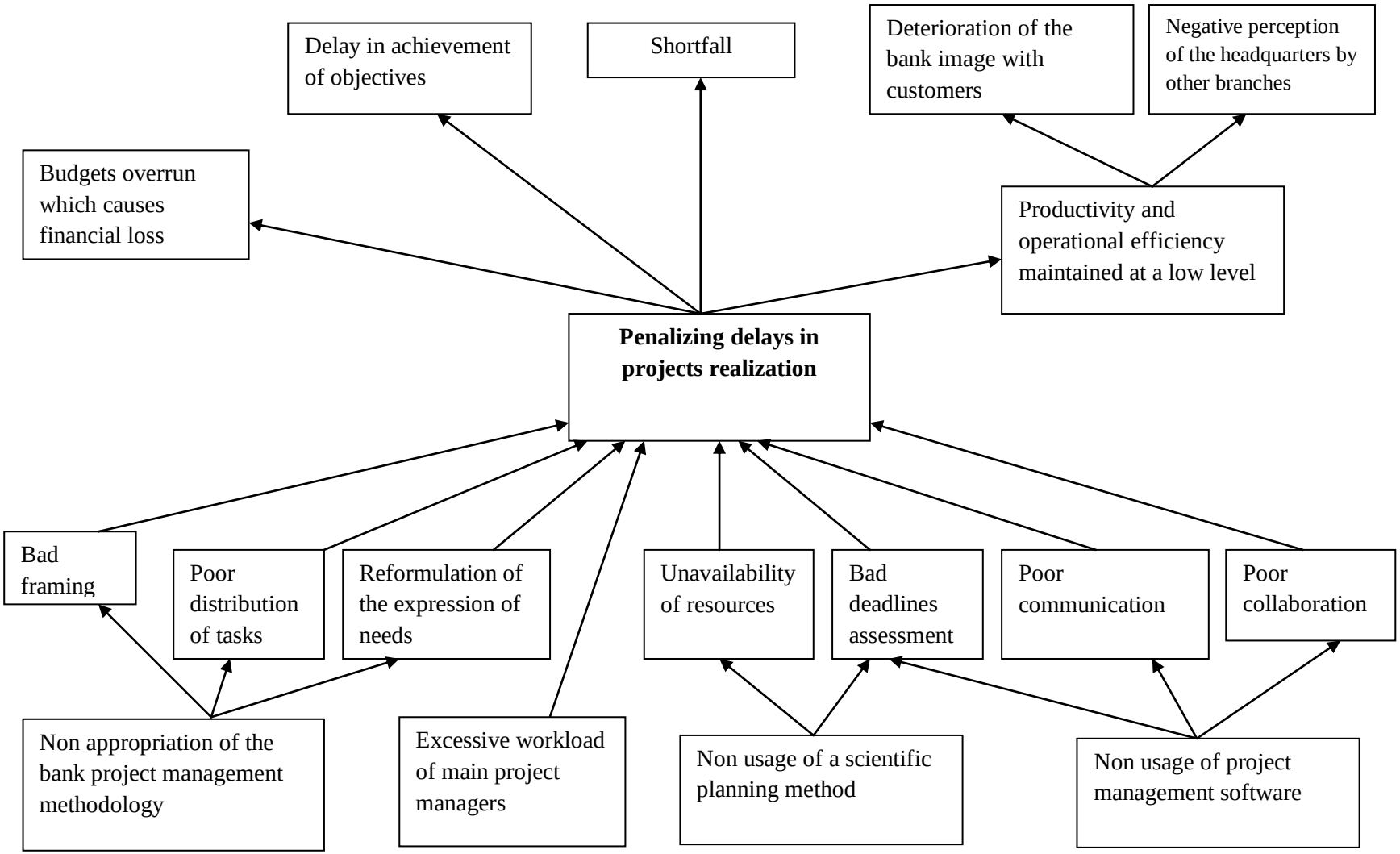

Figure 4: Problem Tree

Most of these consequences are disadvantageous to the performance of the SGC. Some of these consequences are:

- Expenses increase resulting in a budget overrun, then financial losses. This increase is due to the extended resources (including human and material) mobilization;
- Financial losses. Some internal projects determine the start of a new service for which the bank sign contracts with suppliers. The contract provides a date scheduled for the first installment of a monthly payment by the bank to its supplier. The bank starts the monthly payments on the date specified in the contract, even if the benefit of the supplier is not yet effective due to delays.
- Maintain operational efficiency and productivity at a low level, because there are difficulties in effectively monitoring the operations of projects;
- Delays in the achievement of objectives;
- Negative perception of the headquarter by the branches;
- Degradation of the bank image in customer regards.

Analysis of the data collected has allowed identification of various causes of delays. This analysis highlighted the following elements as the main causes of the problem.

- Excessive workload of project managers;
- Non-appropriation of project management methodology;
- Lack of a scientific approach in project planning;
- Absence of a management software for collaborative projects.

Given these causes, we make technical and organizational recommendations. For organizational, the roles and functions of project team members are concerned notably the project workload and project culture within the company. The technical aspect relates to methods and tools to implement. The recommendations are therefore:

- Strengthen project management projects to distribute the workload and improve the monitoring of projects;
- Take action to insure adoption of projects by key stakeholders, to appropriation of PACTE methodology;
- Acquire and use Microsoft Enterprise Project Management 2007, a software solution to help project management. This software integrates probabilistic PERT and GANTT method for better planning and better monitoring of projects. In addition, this software allows you to manage multiple projects, facilitates communication and collaboration.

6.2 Study Limits

Although the structural equation model that we used allowed us to validate our hypotheses, it is important to remember that the size of the population used is far less than the minimum required by this statistical method (25 or 150 is required).

Moreover, it should be noted that the planning method proposed, probabilistic PERT, has two limitations that can lead to false expectations. First, the project manager can impose an unrealistic time to complete a task. Second, the estimated time to perform a task by a mathematical formula is based on too strong assumptions.

7 CONCLUSION

This research is unique in the Cameroonian environment. It is a new field of study in the field of project management in the banking information system. And it leads to a new approach to managing and monitoring projects within SGC.

This work allows us to identify the main causes of delays in the implementation of IS projects in SGC. This situation may be common to several banks in Cameroon financial environment. It also allows to collect and show problems due to delays in project management. Which can enlighten those who do not realize. Thus, they can take action to resolve this recurring problem.

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Appendix

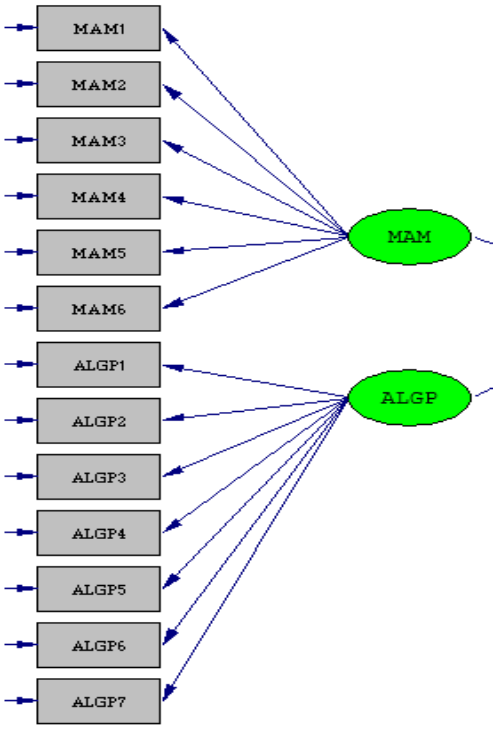

Figure 5 : Model of measurement before estimation.