IOP Conference Series: Materials Science and Engineering

PAPER • **OPEN ACCESS**

Impact of the Feasibility Study on the Construction Projects

To cite this article: Sawsan Rasheed Mohammed *et al* 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **518** 022074

View the article online for updates and enhancements.

This content was downloaded from IP address 106.58.220.56 on 07/11/2019 at 01:09

IOP Conf. Series: Materials Science and Engineering **518** (2019) 022074 doi:10.1088/1757-899X/518/2/022074

Impact of the Feasibility Study on the Construction Projects

Sawsan Rasheed Mohammed[1], Hafeth I. Naji[2], Rouwaida Hussein Ali[3]
[1]ASS Prof. Civil Engineering Department, University of Baghdad/Baghdad.
[2]Prof. Civil Engineering Department, University of Diyala, Diyala. Iraq.
[3]Phd student. Civil Engineering Department, University of Baghdad/Baghdad. Iraq.

Abstract. A Feasibility studies include recognizing and analyzing the power and the flaws of the project, in conjunction, also defining the chance and intimidations external the company within the construction industry. There are a number of problems of the feasibility study as it regards overlooked part in Iraqi construction industry and the problems of feasibility studies abuses. Misinterpretation of study stages and also having incorrect idea of the goal of the feasibility studies. Other factors that affect directly and negatively in the Iraqi industry such as delay, cost, and other issues that affect quality of the construction projects
The aim of this paper Assess the awareness level of the feasibility study in construction projects and to determine the effects of feasibility study in construction industry and to identify the causes of abuses of feasibility study in construction industry.
The methodology of the paper includes survey and formulation of the questionnaire to identify the factor the cause the feasibility study to fail and then use system dynamic to analysis the impact of these factors. The results show that the feasibility study is neglected part in Iraqi construction project due to the fact that its neglected, the were abuse in use the abuse of the feasibility study lead to cost and time over runs, and system dynamic technique approved to be a significant in the analysis of the impact of the.

Key words: Feasibility studies, Impact, abuses of feasibility, system Dynamic

1. Introduction

The study phase of project feasibility includes the construction of study for project feasibility that includes an assessment and examination of the possible of a projected project and is depend on wide examination and study to process of decision-making supportive. Munns and Bjeirmi (1996) [1] mentioned that the definition of the project and initial decision making is dangerous to whole success and propose that the wider decisions in choosing a right project in the early time are more likely to impact the total project success. The phase of feasibility of the project is the lifecycle second phase of a project but the conceptualization phase is first one [2]. The feasibility studies made by government as a method of finding the sum of resources to be assigned to the cost of the government from the country's limited resources [3]. It supports rationally correct the policymakers priorities with respect to new projects that require large cost in the budgeting process [4].

A feasibility study considers as a stage in pre-contract in which should prepare with great attention. In every growth, a valuer would be appointed by the clients or quantity surveyor to make the feasibility study regarding market and financial. The vital need for a study of the feasibility for the owner can assess the development has the possible return on investment and feasible to progress for the planned project. As stated by Katharina Bause (2014) [5] decided that the feasibility study definition in economic logic are examinations that try to find whether a development of product is a

Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.
Published under licence by IOP Publishing Ltd

cost-effective and feasible for a client to continue the proposed development or not. Additional definition, Corrie, (1991) [6] describe in detail the feasibility study definition that the valuation of assessment for proposed project in terms of valuation of the economic, valuation of the financial, risk valuation, issue of the social and environmental. The results of the complete valuation must allow the clients to choose with considerable confident that the project is possible to continue and worth following. The old-style feasibility study involves the group and data arrangement of various project substitutions to abstract information and measurements to assess every alternative in order to support decision-making [7]. Typically, it is separated into the following steps.

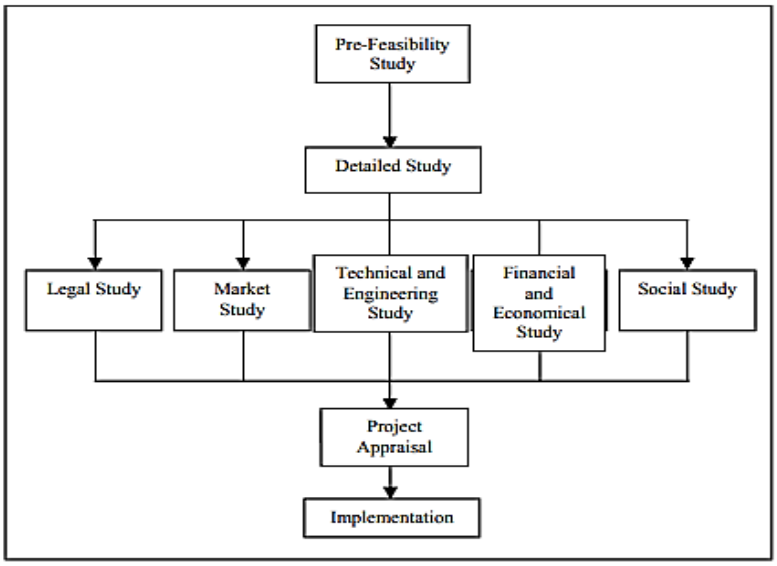


Figure 1. The old-style Feasibility Study Procedure.

The classification of the feasibility Study depends on many factors: according to the kinds of profit, according to the Function. The table below show it according the profit in different sector [8].

Table 1. Arrangement of Feasibility Studies Agreeing to the Profit Kind.

Type	Costs	Benefits	Purpose
Private Feasibility Study	Include costs of the project assets	Expresses the self-benefits Of the project	Maximize the self-benefits of the project to its investors or founders
Public Feasibility Study	Include costs of the project assets and externalities costs	Expresses the self-benefits Of the project, the externalities benefit and any side effect of this project on other projects or the national economy of the country	Minimize the self-benefits of the project to the society as a whole

Table 2. Arrangement of Feasibility Studies Agreeing to the Purpose

Function	Central Consideration	Study Purpose
Legal feasibility study	Legal aspects	The legality of the project
Marketing feasibility study	Market studies	The project marketing
Technical and engineering feasibility study	Technical studies	Study the technical aspects of the project
Financial and economic feasibility study	Funds and economical studies	Convert the above studies to costs, required funds, and expected benefits
Social feasibility study	Social benefits	Measures the social profitability of the project

The aim of the paper is to study the impact of the feasibility studies on the construction industry using the system dynamic techniques.

2. Methodology

A scientific research methodology is adopted which includes three stages:

A-Theoretical Study

1. A review of the scientific literature and sources (books, magazines, engineering, research). Which dealt with all of them.
2. Feasibility study concept and Strategies in construction projects.
3. Studying feasibility study, types, and factors affecting it with the study of the causes of their failure.
4. Studying the simulation method and the steps of its procedures and its uses in the construction projects

B- Field Study

The field study includes the following:

1- Open Questionnaire

This stage includes conducting many interviews with the experts. The interviews include managers and University professors, and other parts of the projects in the following ministries, The Ministry of Higher Education and Scientific Research, The Ministry of Construction and Housing and Ministry of Education. These interviews have a very important role in helping the researcher in the later stage, also discussion about the questionnaire which is initially prepared from the literature and previous studies as well as doing some modifications on the form and add another question with the help of the experts to make sure of the success of the method and questions presented

2-Closed Questionnaire

After doing interviews with many experts have been finished. The problems of the research were divided into several groups which include, feasibility study phases, Abuses of Feasibility Study, Misleading Use of Feasibility Study

C- Stage of System Building and Software Design

In light of the responses received from the questionnaire and the practical study, analysis of the feasibility study using system dynamic. System dynamics is a methodology of dynamically complex systems studying and management simulation model building [8] System dynamics (SD) development was in the late of 1950s for industrial systems analysis (Forrester,1961). SD has been applied successfully to problems, ranging from social, environmental and industrial project management systems.

View of the world of an event-oriented or linear causal thinking cannot solve complicated problems adequately [9]. Figure 2 shows the paradigm of the unidirectional thinking, that is grounded on the conjectural hypothesis which is the effect of collective of series causes or inputs that shape the outputs or events sequentially [9]. This kind of thinking tool that used for many problems, has the ability to show the variation of the current state and the state that desired or expected, then it can select and handled the problem by separating it from the environment that surrounds the problem.

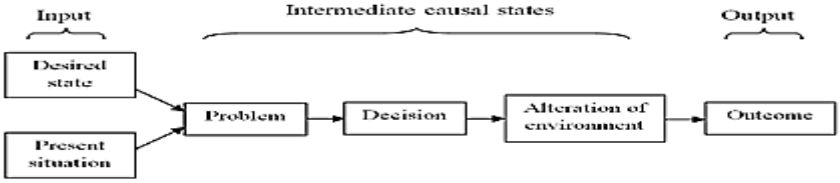


Figure 2. Linear causal thinking (adapted from Sterman, 2000).

3. Results and Discussion

The result of the paper divide to the following

1- The results of the Questionnaire: which shown in the table below
2- System dynamic results

First, we simulate the project at normal conditions without any problems and it was shown as below

Table 3. Show the results of the Questionnaire

Economic and Marketing	Financial and Environment	Abuses of Feasibility Study	Misleading Use of Feasibility Study
Governmental strategic development policy	High overhead cost.	Lack of Information of Market Demand	Do Not Carry Put Feasibility Study Properly
Project function and size	interest rate.	Poor Cost and Revenue Estimate	Deliberately Fraudulent Occurred in Feasibility Study
Market forecast	Break Even Point	Poor Time Estimate	Do Not Follow Governmental Rules and Regulations
Market competition	Environment	Budget estimate	Ignoring Some Aspects of Contractual Requirement
Budget estimate	Air pollution	Demand and supply anaylsis	Failure to Plan for the Next Study Phases
Demand and supply anaylsis	Ground water pollution	Poor Forecasting of Cash Flow	
Market demand exchange for type of property	project location	Lack of Land Information	
Not good in promotion.	waste assessment	Lack of Sustainability Concern	
National economic growth		Lack of Sustainability Concern	
regional economic impact			
Uncontrolled inflation.			

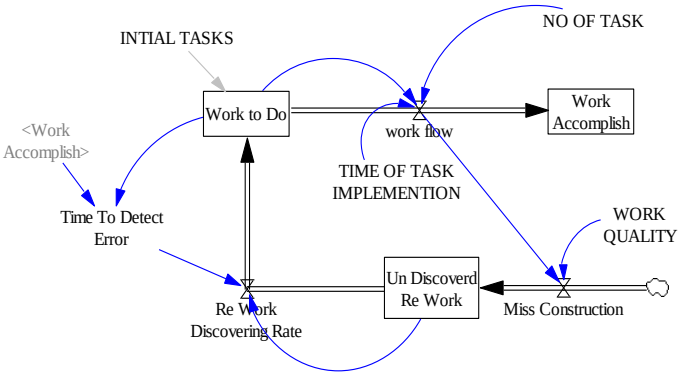


Figure 3. Normal project condition

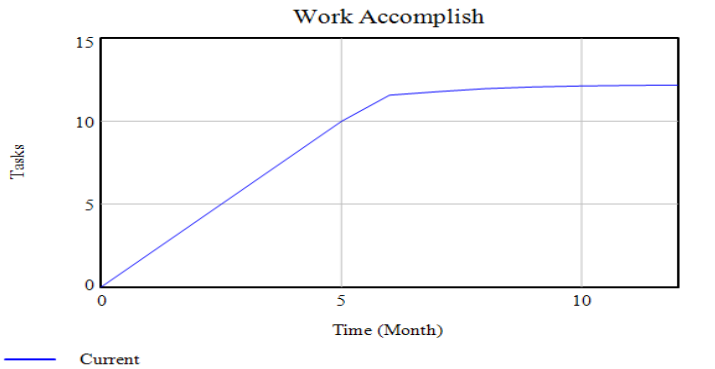


Figure 4. Normal project progress

Its show that the project progress normally without any problem and finish the tasks that supposed to finish with time

After that, we enter the feasibility study factors

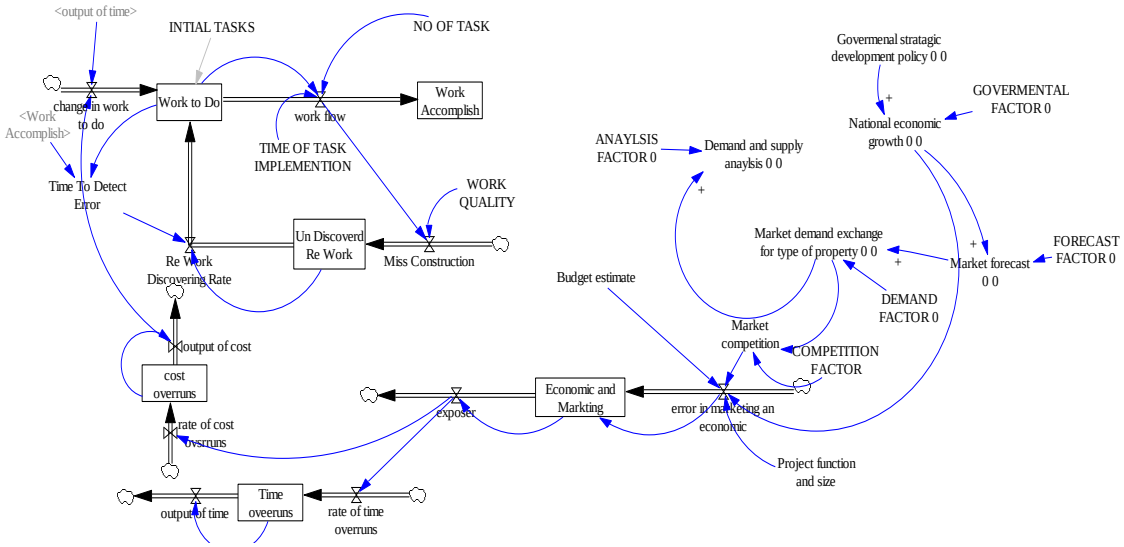


Figure 5. feasibility study problems

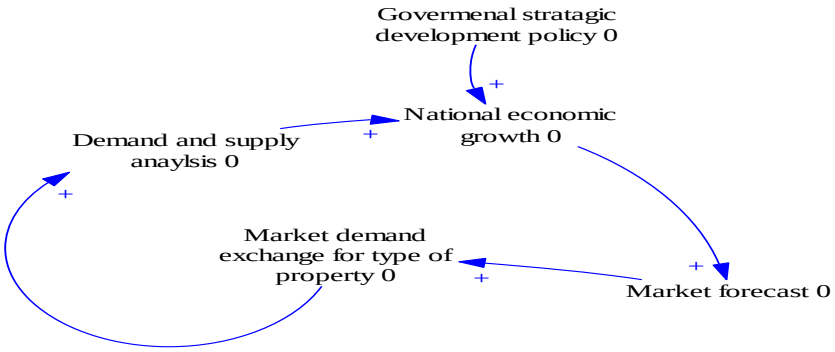


Figure 6. National growth casual loop

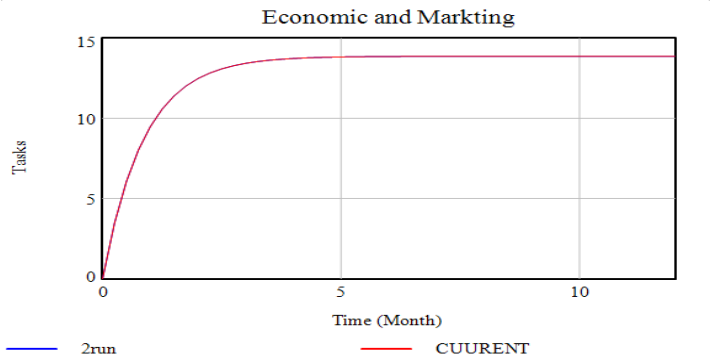


Figure 7. Economic and Marketing

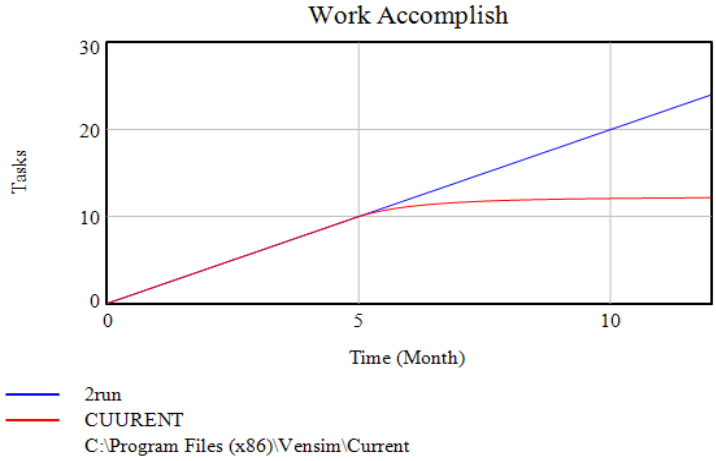


Figure 8. Work Accomplish After the Impact of feasibility study

The figures above show that when the feasibility study is not done properly, it may increase the tasks that performed by the projects to almost the double.

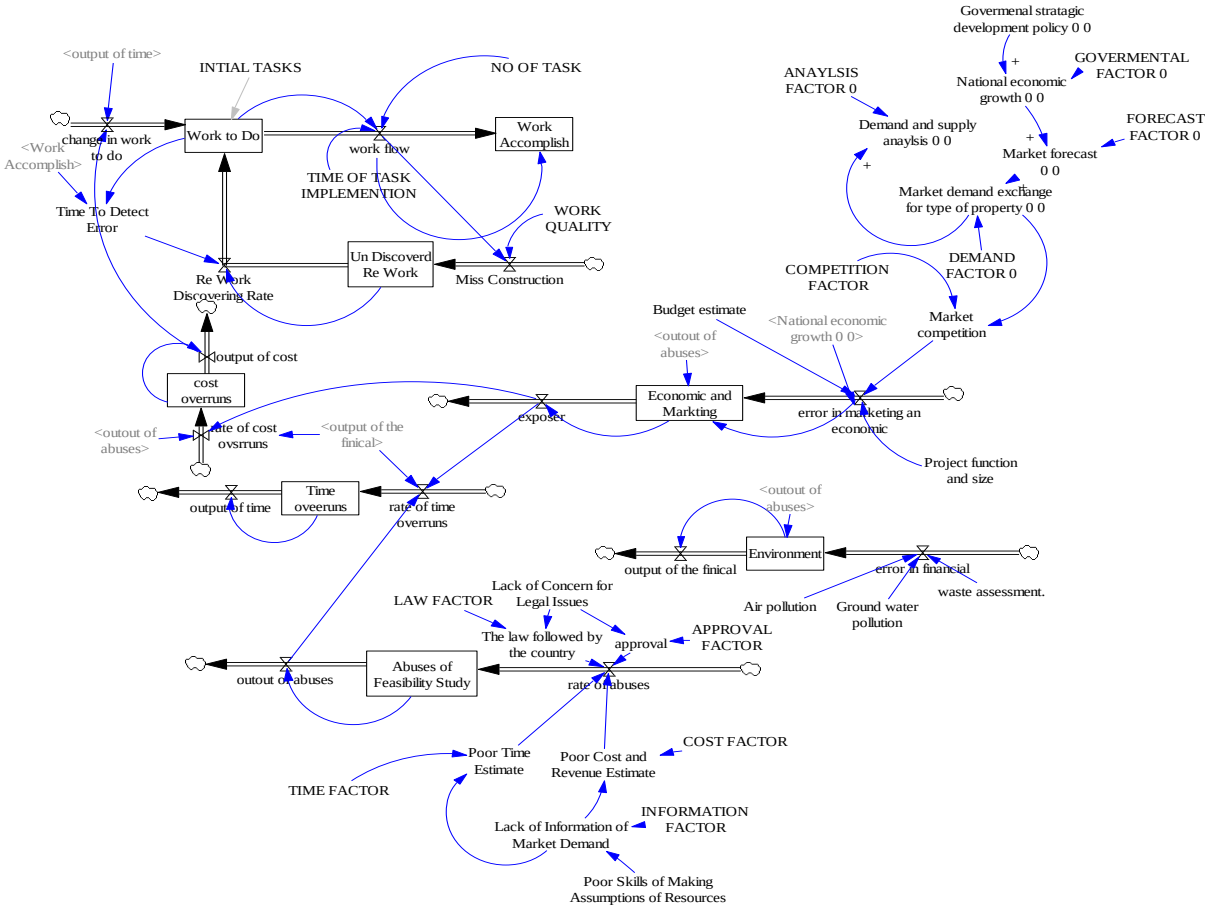


Figure 9. The whole model

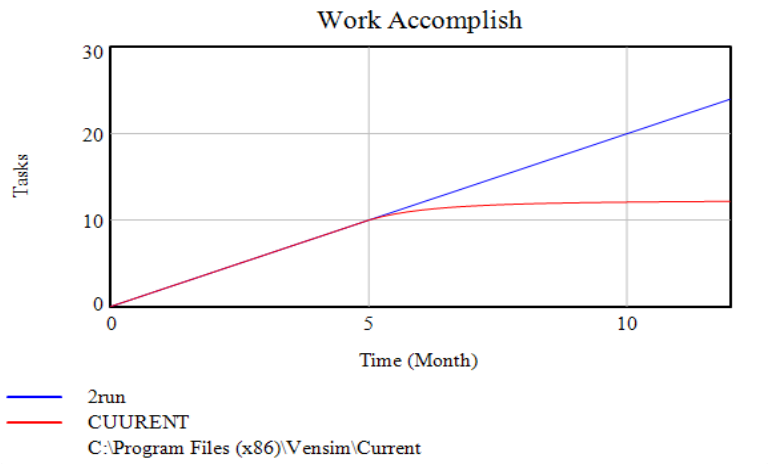


Figure 10. Work Accomplish After The whole model performed

The above show the whole model of the projects and its show that how the tasks will increase very rapidly when the feasibility study are not conduct in the right method

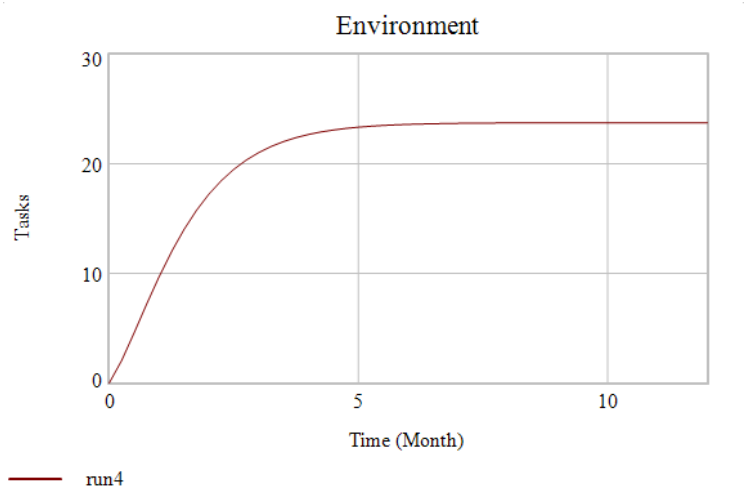


Figure 11. Environment impact

The figure above the feasibility study regard the environment will lead to increase the tasks performed by the project to almost 21 tasks and that due to insufficient study which affect negatively

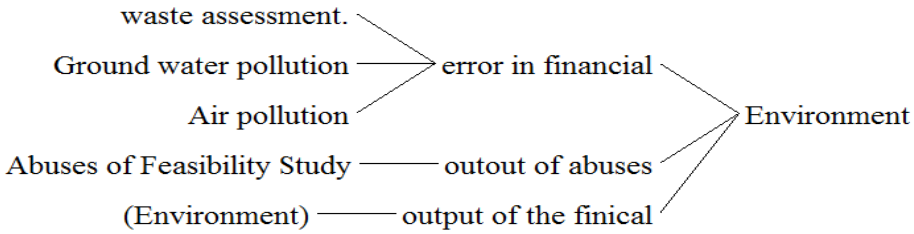


Figure 12. cause tree Environment impact

4. Conclusions

The feasibility study is neglected part in Iraqi construction projects. Due to the fact that its neglected, the were abuse in use

The abuse of the feasibility study leads to cost and time over runs, the environment impact has negative impact on the time and cost of the project which lead to increase the time and the cost both

System dynamic technique approved to be a significant in the analysis of the impact of the feasibility study and should be used in these studies in order to simulate the impact of unsuitably feasibility study

References

[1] Munns, A. K., & Bjeirmi, B. F. 1996 The role of project management in achieving project success. *International Journal of Project Management*. Vol. **14**. No. 2, pp.81-87.

[2] Kerzner, H. 2006 Project management: *A systems approach to planning, scheduling and controlling (9th ed)*. Wiley.

[3] Powell, J. 2006 *Toward a standard benefit-cost methodology for publicly funded science and technology programs*. National Institute of Standards and Technology, Technology Administration, US Department of Commerce.

[4] Engers, M., & Mitchell, S. K. 2006 R&D policy with layers of economic integration. *European Economic Review*, **50**(7), 1791-1815.

[5] Katharina Bause, Aline Radimersky, Marinette Iwanicki, Albert Albers. 2014 Feasibility studies in the product development process. *Elsevier*, **21**, 473-478.

[6] Corrie, R. K. 1991 *Project evaluation: Thomas Telford Ltd, London*.

[7] Abou-Zeid, A., Bushraa, A., & Ezzat, M. 2007 Overview of feasibility study procedures for public construction projects in Arab countries. *Engineering Sciences*, **18**(1).
[8] Ford, D., Anderson S. and Darmon J. 2002 Managing Constructability Reviews to Reduce Highway Project Durations., *J.Constr. Engrg. and Mgmt. ASCE*.**130**. pp.33-42.
[9] Sterman, J.D. 2000 *Business dynamics, systems thinking and modeling for a complex world. McGraw-Hill*, Boston.