****

**ENGINEERING LAW AND MANAGERIAL ECONOMICS FOR INFRASTRUCTURAL DEVELOPMENT IN NIGERIA: CHALLENGES AND WAY FORWARD**

**BY MKPOUTO UBONG OBOT**

**MATRIC NO: 17/ENG03/015**

**A TERM PAPER SUBMITTED TO: THE DEPARTMENT OF CIVIL ENGINEERING, COLLEGE OF ENGINEERING, MR. OYEBODE OLUWADARE JOSHUA**

ABSTRACT

Engineers have an added responsibility and is to include economics in their calculation and decisions to solve teal life problems. The purpose of managerial economics is to provide a systematic framework for problem analysis and solution**.** The pluses and minuses of various decision alternatives must be carefully measured and weighed. Costs and benefits must be reliably measured; time differences must be accurately reflected. Five civil engineering projects were studied to check compliance with engineering law in the country and managerial economics strategy. Two capital projects were compared for adequate financial justification and compliance with the regulatory law. Analysis were done. It has been concluded that management is crucial to the success of engineering projects.

**TABLE OF CONTENT**

# Introduction…………………………………….. 5

# Law……………………………………………... 6

## Sources of law…………………………………………...... 6

## Criminal law and Civil law……………………………….. 7

# Contract………………………………………… 8

## Interpreting a Contract……………………………………. 9

## Discharging a Contract…………………………………… 9

## Breach of Contract………………………………………... 9

# Managerial Economics…………………………. 10

# Infrastructure…………………………………… 12

## Differences between good and poor infrastructural facilities….12

## The benefits of infrastructure in National development…….14

## Visual representation of the differences between good and poor infrastructure… 14

## Challenges of infrastructural development in Nigeria……… 15

## Ways to aid infrastructural development in Nigeria………... 16

# Conclusion……………………………………... 18

# References……………………………………… 19

FIGURES

# Figure 1………………………………………. 6

# Figure 2………………………………………. 9

# Figure 3………………………………...…….. 13

# Figure 4………………………………...…….. 14

# Figure 5……………………………...……….. 15

# Figure 6………………………...…………….. 16

INTRODUCTION

Engineers perform services or creative work as consultation, testimony, investigation, evaluation, planning, analysis, design and design coordination of engineering works and systems, planning the use of land and water, performing engineering surveys and studies, and the review of construction or other design products for the purpose of monitoring compliance with drawings and specifications. Engineering law (or law in engineering) is the empiricalstudy of the application of lawsand legal strategy in engineering[.](http://en.wikipedia.org/wiki/Engineering)

The knowledge of engineering law is important to every engineer as we are involved in construction, contracts, consultancy services on capital projects, design, analysis, fabrications, adjudication of tender, bill of engineering measurements and evaluation.

It does not mean that the legal profession plays a part in every contract; the majority of contracts are executed with both parties satisfied with their involvement and these never come to the court. However, when there is a dispute, provided that the courts are satisfied that a valid contract existed, they will enforce the details of the agreement. When alternative courses of action are available, the decision that produces a result most consistent with managerial objectives is the optimal decision. The process of arriving at the best managerial decision, or best problem resolution, is the focus of managerial economics.

Forecasting refers to the process of analyzing available information regarding economic variables and relationships and then predicting the future values of certain variables of interest to the firm or economic policymakers. A good forecast should be timely, simple to understand, accurate, reliable and cost effective Sources of law.

Sources of law means the origin from which rules of human conduct come into existence and derive legal force or binding characters. It also refers to the sovereign or the state from which the law derives its force or validity. There are many different sources of law in any society. Some laws will be written in the country's Constitution; others will be passed by the legislature (usually a parliament or congress); others will come from long social tradition.

LAW

Law can be defined as those rules and regulations, backed by sanctions when flouted, which guide the conduct and behavior of members of a community or society, and which they accept and consider as binding.



Figure 1

SOURCES OF LAW

Sources of law is a legal term that refers to the authorities by which law is made. There are a number of different sources that are used to define the creation and force of law, though not all are used equally. Some examples of sources include legislation, government regulation, court decisions, and custom. Several factors of law have contributed to the development of law. These factors are regarded as the sources of law. There are different sources of law:

1. The constitution
2. Customary law
3. Common law
4. Legislation
5. Case law

There are two main kinds of law: Criminal law AND

Civil law

Criminal law deals with offences by people against society as a whole. Prosecutions are usually brought in the name of the Head of State, or of the State itself.

Civil law deals with offences by people against other individuals. This may include disputes over fences and other land matters, defamation cases, damaged property, broken promises or a host of other disputes between people.

In a criminal court, the two sides are called the prosecution and the defense. In a civil court the two sides are called the plaintiff (that is the person who is bringing the complaint) and the defendant or in some cases, the respondent.

In a criminal court, the judgment at the end of the hearing will be that the defendant is either guilty or notguilty. In a civil case there is no question of guilt, because nobody has been charged with any crime; the judgment will simply be either fortheplaintiff or forthedefense.

In a criminal court, a defendant who has been convicted (that is, found guilty) will be sentenced - usually by either a fine or imprisonment. In a civil case, there is no sentence. However, if judgment is for the plaintiff (that is, the person bringing the complaint wins), the court may award damages against the defense. This means the court agrees that the plaintiff has been wronged by the defendant, and orders the defendant to pay a sum of money (called damages) by way of compensation. The court may also, under certain circumstances, order the losing side to pay all the legal costs of the winning side. This would happen usually if the judge considers that the loser has acted unreasonably in fighting the case at all, and should have settled out of court without forcing the other person into expensive legal proceedings.

***Contracts***

A contract is a legal agreement between two parties which is enforceable in a court of law or by binding arbitration. In other words, a contract is an exchange of promises with a specific remedy for breach of those promises.

A contract must contain:

1. An offer which is made and accepted,
2. Mutual intent to enter into the contract,
3. Consideration,
4. Capacity, and 5. Lawful purpose.

A contract will contain a number of terms as well perhaps supporting documentation. A term requiring performance of one of the parties is said to specify an obligation for that party. An obligation essential to the contract is called a condition while a non-essential obligation is called a warranty. A term obligating a party to not do something is a *negative covenant*.

****

Figure 2

Interpreting a Contract

The rule of contra proferentem is used in interpreting the terms (i.e., against the party drafting the term) and while there may be implied terms (see The Moorcock, 1889), no addition or variation to the terms can be made by parole evidence (by verbal but not written terms).

Discharging a Contract

The contract is discharged (concluded) when all parties have satisfied their obligations, when there is an agreement to discharge, by the terms of the contract, or by frustration.

Breach of Contract

If a party, under the terms of the contract, fails to perform one or more obligations, it is said to be the defaulting party and it has breached the contract with the innocent party. The breach of an obligation may result in damages to the innocent party for which the innocent party may seek a remedy, but it requires a breach of a condition for the innocent party to consider the contract discharged by the breach.

MANAGERIAL ECONOMICS

Managerial Economics is a discipline that combines economic theory with managerial practice. It tries to bridge the gap between the problems of logic that intrigue economic theorists and the problems of policy that plague practical managers

“Managerial Economics is concerned with the application of economic concepts and economic analysis to the problems of formulating rational managerial decisions.”

The role of managerial economist includes:

1. Spencer and Siegel man have defined the subject as “the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management.”
2. He studies the economic patterns at macro-level and analysis it’s significance to the specific firm he is working in.
3. He has to consistently examine the probabilities of transforming an ever-changing economic environment into profitable business avenues.
4. He assists the business planning process of a firm.
5. He also carries cost-benefit analysis.
6. He assists the management in the decisions pertaining to internal functioning of a firm.
7. A managerial economist helps the management by using his analytical skills and highly developed techniques in solving complex issues of successful decision-making and future advanced planning.
8. Accurately values all operations (support and production) of an entity (i.e. the supply and consumption of resources) in monetary terms. Provides information that aids in immediate and
9. future economic decision making for optimization, growth, and/or attainment of enterprise strategic objectives.
10. Project Management
11. planning, directing, and controlling resources (people, equipment, material) to meet the technical, cost, and time constraints of the project.
12. The application of knowledge, skills, tools, and techniques to project objectives to meet stakeholder needs and expectations
13. Project as “an organization of human, materials and financial resources in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, defined by quantitative and qualitative objectives so as to achieve a beneficial change”.
14. Achieving Quality on Projects requires:
15. Quality of the management process (most important).
16. Quality of the product (ultimate goal).

Management can be defined as the organ or body of an organization specifically charged with planning, organizing, directing and controlling the use of the organization’s resources effectively and economically to attain the organization’s objectives.

Managerial economics for engineers is concern with the systematic evaluation of the costs and benefits of proposed technical and business projects. It involves technical-economic analysis with a decision assisting objectives; mathematical modeling with emphasis on the economic effects is the primary analytical technique used to select between defined feasible alternatives.

INFRASTRUCTURE

Infrastructure can be defined as the basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise.

The term typically refers to the technical structures that support a society, such as roads, water supply, sewers, electrical national grids, telecommunications, and so forth, and can be defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions" (Fulmer, 2009).

DIFFERENCES BETWEEN GOOD AND POOR INFRASTRUCTURAL FACILITIES

The Infrastructural report of Nigeria just like any third world country is nothing to write home about. The housing situation is in a sorry state both quantitatively and qualitatively (Agbola, 1998; Ajanlekoko, 2001; Nubi, 2000; Onibokun, 1996 Oyedele, 2006). Most infrastructures are now decayed and need repair, rehabilitation or replacement. Government is the system that plans, organizes, controls and supervises the people who are live in an area in other for all to have a conducive environment for living and a sense of belonging. Governments have the power to put in place all measures that will make an environment beneficial for living for everybody.

Examples of such facilities: A flooded street in Lagos



Figure 3

Vendors displaying goods for sale while contesting for space with public transport vehicles



Figure 4

THE BENEFITS OF INFRASTRUCTURE IN NATIONAL DEVELOPMENT

Infrastructure can help solve four problems: social; health and environment; development; and, economics. A region's infrastructure network, broadly speaking, is the very socio-economic climate created by the institutions that serve as conduits of trade and investment. Some of these institutions are public, others private. In either case, their roles in the context of integration are transformative, helping to change resources into outputs or to enhance trade by removing barriers. Therefore, an improvement in regional infrastructure is one of the key factors affecting the long-term economic growth of a region.

The linkages between infrastructure and economic growth are multiple and complex. Not only does infrastructure affect production and consumption directly, it also creates many direct and indirect externalities. It also involves large flows of expenditure, thereby creating additional employment. Studies have shown that infrastructure can have a significant impact on output, income, employment, international trade, and quality of life. Infrastructure development can reduce stress and promote good health. It will also reduce crime level.

VISUAL REPRESENTATION OF THE DIFFERENCE BETWEEN GOOD AND POOR INFRASTRUCTURE

Good



Figure 5



Figure 6

CHALLENGES OF INFRASTRUCTURAL DEVELOPMENT IN NIGERIA

1. Lack of Visionary Leaders: Visionary leaders are the builders of a new dawn, working with imagination, insight, and boldness. They present a challenge that calls forth the best in people and brings them together around a shared sense of purpose.
2. Demand and supply: Due to poor performances of most past leaders in the area of infrastructure provision, the desire for infrastructure development overwhelms the provision. Unfortunately, over 70% of the federal roads are in bad state of repair. In the area of housing, Nigeria requires about 17 million housing units and 60 trillion naira in order to meet its housing needs.
3. PESTLES Analysis: The challenges of infrastructural development in Nigeria can be discussed under PESTLES Analysis. Challenges infrastructural development can be: political, economic, social, technology, legal, environmental and safety.
4. Procurement Method**:** The procurement methods being adopted are prone to criticisms. The Public Finance Initiatives, especially the Concession Method and Public/Private Partnership (PPP) are questionable and seems to mortgage others who are not part of the arrangement to the scheme’s future.
5. Corruption: Corruption does not only raise the price of infrastructure, it can also reduce the quality of, and economic returns from, infrastructure investment. The corruption in Nigeria is very high and unbearable for effective infrastructural development.

WAYS TO AID INFRASTRUCTURAL DEVELOPMENT IN NIGERIA

1. Better project planning: Robust and diligent project planning is usually perceived by project sponsors to be an expensive undertaking. However, the shortcuts sometimes taken by sponsors consistently results in very expensive project failures, as well as improperly structured or poorly executed capital projects. These have signiﬁcant unfavourable implications for the sponsors, investors, and ﬁnanciers of such projects, and the infrastructure sector track record in Nigeria as a whole.
2. Stronger technical partnerships and commitment to knowledge transfer: Infrastructure projects typically require a broad mix of diverse skills and competencies for successful delivery. The level of competence required for successful and timely execution of these projects is usually built over several years of successful project design, development, and delivery.
3. Mobilising the “right” equity for infrastructure projects: Many project sponsors sometimes underestimate the quantum of equity required for infrastructure projects and look for ways to seek short-term returns or save on project developments costs.  This usually ends up being detrimental to project viability, quality of delivered assets and project completion timeline.

Innovative funding arrangements: The Nigerian economy is dominated by short-term ﬁnancing of three to ﬁve years terms, traditionally provided by domestic commercial banks. However, a limited number of deals in the market have been funded with seven to ten-year loan tenors usually with participation from international banks and development ﬁnance institutions, and in some cases with risk guarantees from multilateral organisations like the World Bank.

CONCLUSION

Economists, engineering managers, project managers, and indeed any person involved in decision making must be able to analyze the financial outcome of his or her decision. Quality and cost control are basic requirements for successful engineering projects and so we should take them with the seriousness that they deserve.

REFERENCES

1. R. F. Voss, J. Clarke. Algorithmic Musical

Composition, Silver Burdett Press, Londyn, 1986.

1. W. Zabierowski, A. Napieralski. Chords classification in tonal music, Journal of Environment Studies, Vol.10, No.5, 50-53.
2. A. Abiewskiro, Z. Moplskiiera. The Problem of Grammar Choice for Verification, TCSET of the International Conference, House of Lviv Polytechnic National University, 19-23, 2008.
3. Farquhar C, Protein and DNA Music, Online available.