An-Najah National University
Faculty of Engineering
Industrial Engineering Department

Final Report

Twasol Center
Graduation Projects Unit

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Final report of

Graduation Project

Institutionalizing the process of identify, supervising, evaluating, and marketing Graduation Projects

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Chapter 1 Introduction

This Chapter includes the next sections:

- Abstract
- 1.1 Objectives of Project
- 1.2 Methodology
- 1.3 Expected Output
- 1.4 The Importance of the Project
- 1.5 Chapter to follow
Introduction

Abstract:

The idea of this project was born as a result of the weak relation between the local market and the Engineering Faculty at An-Najah University. One way to strengthen this relation is by linking the graduation projects to the needs of the local market; for this link to be sustainable, we found it necessary to institutionalize the process of identifying, executing, evaluating, and marketing the Engineering Graduation Projects.

Graduation Project is very important course for the engineering student; in which he applies what he learned in the courses. The outputs of the Graduation Projects must reflect good quality and strong abilities and skills of students in an appropriate way. So, the University must give this course large interest to improve its image among other Universities.

In short, this Project was concerned with the Engineering Graduation Projects at An-Najah University, this project proposes an integrated system that institutionalizes the process of Identifying, executing, evaluating, and marketing Graduation Projects. The Proposed system is expected to remove different barriers facing students during the course of their Graduation Projects. The proposed system suggests the establishment of a Graduation Projects Unit to be part of Twasol Center of the Engineering Faculty at An-Najah University.

1.1 Objectives of this Project:

1- Providing continuously students and supervisors with graduation project ideas that reflect Local Market needs.

2- Institutionalizing the process followed in managing Graduation projects at Faculty of Engineering.

3- Supporting and developing the relations between Faculty of Engineering and the Local market.

4- Secure financial support for graduation projects.
1.2 Implementation Methodology:

1. Literature review and Data Collection
   Data and Information were collected regarding the following issues:
   - The process of identifying the Graduate Projects.
   - Capture Types of projects which have interests by local markets.
   - Local market needs and level of cooperation with universities.

2. Diagnostic Study of the current situation
   - The current situation for the steps that are followed in managing Graduation Projects, the situation was studied by interviewing a number of academic staff (supervisors); a list of important points was discussed with supervisors from all departments at Faculty of Engineering.
   - Analyzing the current situation, the points of weakness that present in the current practices (model) in managing Graduation Projects.
   - Suggesting solutions to overcome weaknesses.

3. Institutionalization of Graduation Project Process
   The institutionalization of the process of managing Graduation Projects includes the following steps:
   1. Identifying idea of the Project.
   2. Executing the Project.
   3. Evaluating the Project.
   4. Marketing the Project.

4. Proposed Model in managing Graduation Projects
Analyzing the old model in managing Graduation Projects leaded us to suggest a new model that overcomes all previous weaknesses.

5. Organizational structure and Job Descriptions:

Developing the organizational structure of the suggested Graduation Projects Unit to be part of Twasol center.

1.3 Expected Output:

Comprehensive study for establishing a Graduation Project Unit to institutionalize the process of Identification, execution, evaluation, and marketing Graduation projects at An-Najah Engineering Faculty, strengthen the relationship between local market and Faculty of Engineering, market the Graduation Projects, and secure financial support to students in all Engineering departments.
1.4 The Importance of this Project:

Necessity is the mother of inventions; our world is full of humanitarian needs which need to satisfy. Except needs, there are problems faced by humans need to solve. Hence, the development of human being led to developing the graduation projects in the Universities of a practical nature.

After studying the current situation of our graduation projects by making a survey through introducing checklists to the stakeholders, ask questions related to graduation projects. Analyzed their answers, out with an overview of a model, roles of stakeholders, and the processes which are explain the current situation, and found the results that show a lack of institutionalized coordination.

We proposed a new model to clarify and institutionalize the relationships between stakeholders; also we proposed the roles of stakeholders, processes, and established a proposed organizational structure.

In order to avoid errors in our proposal, we did a study of some educational institutions in Western countries. I quote a practical illustration of graduation projects in North Carolina, including the reason for its establishment and the institutions supporting this project:

**Why NC Business Leaders Support the Graduation Project**

*Like many states, North Carolina faces an urgent educational challenge: Too few students graduate from high school—and too few of those who graduate are prepared for college and employment in the global economy.*

*The North Carolina Business Committee for Education (NCBCE) survey identified skills and qualities necessary for students to succeed in the workplace.*
The top five include:

• Applying basic mathematical concepts and skills;
• Working effectively as a member of a team;
• Using integrated information and communication technology;
• Conducting oneself appropriately in line with social responsibility and sound ethics;
• Reading and comprehending materials of varying complexity.

The NC Graduation Project is a performance-based assessment that provides students with a vehicle to demonstrate what they know and are able to do as they prepare to graduate from high school. Moreover, the NC Graduation Project reflects a four- or five-year high school experience benchmarked by specific skills through the middle grades to encourage and support self-directed learning. The project allows students the opportunity to apply the practical, real-world skills they need as they transition to work or post-secondary education in the 21st century.

There are four major components:

• A research paper demonstrating research and writing skills;
• A product created through the use of knowledge and skills;
• A portfolio to catalogue and document tasks, record reflective thinking and insights; and
• An oral presentation.

This year, House Bill 223 was signed into law. This law states that “the State Board shall not require any student to prepare a high school graduation project as a condition of graduation from high school prior to July 1, 2011; local boards of education may, however, require their students to complete a high school graduation project”. In a recent survey of all 115 school systems, 70% indicated they will continue to require the Graduation Project as a local exit standard for 2009-2010.

NCBCE board member, Jane Martin says “NCBCE’s support of The Graduation Project is yet another example of an essential strategic linkage between the outputs of North Carolina’s education process into the primary economic engine for the state: the business community”. He defined The Graduation Project as a focused tool that will assess the readiness of our youth to
step into the next level of the education process and eventually into North Carolina’s workforce.

Students can showcase their knowledge and skills in authentic ways by completing a graduation project. It provides students the opportunity to demonstrate learning in some of the following ways:

- **Critical thinking**—being able to analyze an area of interest and articulate their research in written and oral formats
- **Communication**—being able to present to a panel what they learned in a succinct yet comprehensive manner
- **Self-directed learning**—selecting an area of interest and personal relevance to explore in depth
- **Work ethic**—working with an expert or mentor in their selected area in order to discover the necessary skills needed to be a professional in a domain and document that work in a portfolio.
- **Product development**—creating a product, doing community service, or assisting others as a way to demonstrate what they have learned about their topic of interest.

Every year, North Carolina companies donate **millions of dollars** to support education in their state. **Funding** is important, but as business leaders we need to do more than open our wallets if we are going to help prepare students for careers in the global economy. We also should be generous with our time, knowledge and experience. These gifts may seem small, but their ability to shape a student’s future is priceless. That is why professionals from every industry should get involved with the North Carolina Graduation Project.”

**Graduation Project Procedures:**

To propose a good flexible system to institutionalize the processes followed in Graduation Projects, we must have a further look about success stories, after having researches with many sources, we found out that this processes are as followed:
1. Sources to determine the Graduation Projects

In this paper we searched for the sources and methods for determining graduation projects in various universities in the West. We found a lot of ways to get information leading to the selection of the project, from these sources:

- **Self-Select, Investigate, and Plan a challenging Graduation Project to solve a significant problem.** Utilize a thoughtful preliminary process, to self-select a significant problem to serve as the focus for the Graduation Project (e.g. assess career-related and personal interests, gather initial research sources, analyze feasibility of continued research of the problem, discuss with others to hone the research question/topic).

- **Graduation Projects proposed by the academic staff,** Whether the crew is familiar with the current situation of industrial development, or present the draft of a theoretical nature

- **Industrial institutions** and the direct support of the graduation projects to get solutions and better alternatives for its production lines, even without direct support, the support as a source of information provided to students the problems of the global market and to seek solutions to these problems is supportive of the project ideas

These three points represent the inventory of a very large number of sources of the graduation projects.
2. The process of determining project

We need the necessary tools and means to implement the idea of the graduation project and reflect product, selecting a topic which adopted the project requires a number of questions must be taken into consideration.

General Considerations for Topic Selection:
- Will it be possible to research the topic?
- Is published information available?
- Is a resource person available?
- Will it be possible to create a project based on the research?
- Will it be feasible in the areas of time, cost, materials, and equipment?
- Will it interest me for the required time period?
- Will it broaden my knowledge and experience?
- Is it something new?
- Will it be unique?
- Will I be likely to use this knowledge after I graduate for a career, a hobby, or recreation?
- Will my topic showcase my talents?
- Will the project be a positive reflection of me, my school, and my community?
- Will it be challenging, creative, and rigorous enough to fulfill a major requirement for graduation?

These questions represent the initial step for selection of the project needed to reflect as a specific product.

3. Embodiment of Graduation Projects

First, What is the product?
- A student-generated project
- A tangible, visible project that demonstrates the student’s knowledge gained.
- Product, which has space in the local market or the World.
- Product does not conflict with reality and society.
Embodyment of the project for a product requires that the draft with a clear idea, process, not a requirement to be new, cost-competitive, that receive a positive response from the community as a whole and in particular stakeholders.

4. Product Marketing

After the embodiment of the product, we must pass the critical point, the marketing process. Marketing process is very important for the product to see the light and take a correct position in the market, so it was necessary for us to Take a glimpse of Marketing a product and know the correct way to publishing.

Under the marketing concept, the firm must find a way to discover unfulfilled customer needs and bring to market products that satisfy those needs. The process of doing so can be modeled in a sequence of steps: the situation is analyzed to identify opportunities, the strategy is formulated for a value proposition, tactical decisions are made, the plan is implemented and the results are monitored.

1.5 Chapters to Follow:

Briefly, in chapter 2 we have studied and discussed the current situation that we shall call it the old situation from now on, this study was preceded by interviews with the academic staff, the interviews were structured using the checklists attached in appendix (A-1) to (A-7).

Our conclusions about the advantages and disadvantages of this situation led us to propose a new model in Chapter 3 that shows the roles of the stakeholders, organizational structure of the proposed Graduation Projects Unit, job descriptions of the employees in this unit.

While Chapter 4 presents the work procedure to be followed by this unit.
Chapter 2 Analysis of Current Situation

This Chapter includes the next sections:

2.1 Checklists

2.2 Analysis of the results of the Checklists

2.3 Analysis of the Old Model
Analyzing any system must be based on a good understanding and studying of the situation. There are many methodologies that followed in studying any situation, varies according to its nature. Our study for the situation of Graduation Projects in Faculty of Engineering was based on listing number of questions and discuss them with the academic staff and supervisors in Faculty of Engineering at An-Najah University. Next section explains the nature of questions and staff that we targeted.

2.1 Checklists:

Have you ever tried, if only from curiosity door to know the quality of graduation projects of students at the College of Engineering? Some might be surprised and say: “what interest? Our projects do not address the hot topics and solutions that might actually change for the better”. Here I say stop, our projects may not receive appropriate attention but some, if not most of them important to improve and develop our way of life.

In the first steps in our project was the issue of graduation projects in the College of Engineering; mechanism for determining the nature of projects and ideas in all departments of the College of Engineering at Al Najah University. Regardless of the fact that this is an important step, but we expect extracting a huge amount of important issues for the advancement of the level of graduation projects in our university in particular. The issue is not lost on many students of engineering colleges in the Arab world, as is well known that the last year in the university level - Year of graduation - the engineering disciplines whose main purpose is to pay a student to apply part of what is acquired through years of study, and Works on the graduation Project to reconcile the past academic years, and the practical applications in future.

We did interviews with academic staff in the Faculty of Engineering (doctors, engineers and teachers) and we raised some questions and inquiries about the performance of departments in the case of the graduation projects; mechanisms of identifying the graduation project, project ideas, the nature of projects, the most appropriate way to identify project ideas, Assess the level
of communication with the local market, the parts and tools used in the graduation projects, the average cost of projects and cost coverage, problems and obstacles facing students during the implementation of the project.

**Procedure:**

We have access to a group of selected academic staff from the Faculty of Engineering, asking a series of questions on the draft graduation, on the mechanism of project identification, nature of the projects, project cost and how to cover these costs, problems and obstacles faced by students, and other questions related to the subject of graduation projects.

The academic staff we interviewed was listed in Appendix A-0, the list of question and answers were recorded also in appendix A-1 to A-7.
2.2 Analysis of the Results of the Checklists:

Our project focused on the mechanism for identifying graduation projects and the outputs from these projects, studying the problems facing the project, students, supervisors and the local market, we have came out with some ideas and summaries in the first part of the project, recalling the most important ones as follows:

- **Lack** of a special budget for graduation projects, and the students cover most projects’ cost.
- **Limited** workshop and tools for projects implementation.
- **Large** number of projects compared with the energies and capacity of the teaching staff, leading in some cases to inefficient project outputs.
- **Weak** communication between departments of Engineering faculty and the local market directly.
- **Poor** management of time during the implementation of project tasks.
- **Limited** availability of spare parts.
- **Scarcity** of resources and services that enable students to gather information.
- **Students** choose to work on a simple projects and nearly similar to that previous Graduation Projects.
- **Weak** relation with Engineers Association in regard of graduation projects.
- **The presence** of an obstacle to communication between the engineering departments themselves to achieve a project that need sharing between two or more departments, either from lack of time or the absence of coordinates between the administrative sections.
Based on the interviews with academic staff, we could conclude the following:

- From our discussion of the academic staff, we concluded some of the ideas to fund and support projects such as the establishment of the Graduate Projects unit to follow-up and secure financing of the Engineering Graduation Projects.
- Upgrade the workshops and laboratories with the modern engineering tools, parts, and devices that contribute to the completion of Graduation Projects.
- Create harmony between the number of students and the capacity of the academic staff to be able to supervise students.
- Form links between the various departments in the Faculty of Engineering and the local market.
- Fill the gap between the local market and Engineering Faculty, to encourage the students working on good projects that serve the local market.

2.3 Analysis of the Current Situation:

Studying the current practice for identifying, executing, evaluating, and marketing Graduation Projects (Old Model) was based on meeting with the stakeholders, discussing the procedures that are followed to achieve good outputs of the projects. The procedures were occur spontaneously, relations between the stakeholders are not clear, but could get out with relations can be present in all departments of Faculty of Engineering, in general.

The model shown in Figure 1 represent the current situation, the relations between the stakeholders can be summarized as follows:
a) Supervisor:

Supervisor is the link between the various parties, where his responsibility is not limited to supervising, but his role may extend to communicate directly with the businessmen. His relations with the other stakeholders are as follows:

- With Student: The supervisor usually introduces and exchanges project ideas with students, and then he gives direct supervision and guidance.
- With Local Market: Access to local market needs through personal relation, or through direct communication with employers.

b) Student:

His relations with stakeholders are as follows:

- With Supervisor: Exchange and discuss ideas with the supervisor, follow the instructions of the supervisor.
- With Local-market: Identify problems of local market through practical training or personal contact with employers.

c) Local-market:

The local market is working in all its capacity to satisfy customer needs, and to satisfy the needs, there should be studies to looking at what and how to satisfy those needs. The relationship between the market and other parties is as follows:

- The role of the local market is limited; in very limited cases the local market approaches the Faculty of Engineering to solve some of their problems, also the Local Market participates yearly in Evaluating few graduation projects

d) Engineers Association:

The role of Engineers Association is almost limited in the participation of the evaluation of some Graduation Projects.
e) **University administration:**

The University offers some of the facilities and sometimes financial support for students, the financial support is usually given to students after the completion of their projects.

The figure (Fig. 2.1) presents the different stakeholders and their inter-relations in the current practices of managing Graduation Projects which we shall call "Old Model of Managing Graduation Projects".
Figure 2.1: The Old Model
The Roles of Stakeholders:

To clarify the roles of the stakeholders of graduation projects at all stages, we will consider the main stages of managing graduation projects in all departments of the Faculty of Engineering, the stages are:

1. Identification of project:
   - **Students**: Find ideas for the graduation project, such as problems experienced by the market and identify them during the practical training.
   - **Supervisor**: Present and discuss some of the various ideas for the graduation project.
   - **Local market**: In some limited cases provide problems that need academic solutions.

2. Execution and control:
   - **Student**: Execution of the project.
   - **Supervisor**: Direct supervision of the project followed up of students and evaluates their performance.
   - **University administration**: Provide facilities for students, limited financial support for some of the projects during implementation.
   - **Local market**: Very limited financial support and adoption of projects.

3. Evaluation and marketing of the project:
   - **Supervisor**: Final evaluation of student performance and outputs of the project.
   - **University administration**: Cover part of the cost of some successful projects and take advantage of the graduation projects outputs to meet certain needs of the university.
   - **Local market**: Participation in the evaluation of the graduation project, and rarely adopt successful projects.
   - **Engineers Association**: Limited participation in the evaluation of the graduation project.

The next Figure shows the roles of stakeholders in the different steps of the project. (Figure 2.2)
### The Old Roles of Stakeholders

<table>
<thead>
<tr>
<th></th>
<th>Student</th>
<th>Supervisor</th>
<th>University Administration</th>
<th>Local Market</th>
<th>Engineers Association</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identifying Project</strong></td>
<td>Find ideas for the graduation project, such as problems experienced by the market and identify them during the practical training.</td>
<td>Present and discuss some of the various ideas for the graduation project</td>
<td>Provide facilities for students, limited financial support for some of the projects during implementation</td>
<td>In some limited cases provide problems that need academic solutions</td>
<td></td>
</tr>
<tr>
<td><strong>Execution and Supervising</strong></td>
<td>Execute the project</td>
<td>Direct supervision of the project followed up of students and evaluate their performance.</td>
<td></td>
<td>Very limited financial support and adoption of projects</td>
<td></td>
</tr>
<tr>
<td><strong>Evaluating and Marketing</strong></td>
<td>Final evaluation of student performance and outputs of the project</td>
<td><strong>Final evaluation of student performance and outputs of the project</strong></td>
<td><em>Cover part of the cost of some successful projects.</em>  <em>Uses of the successful graduation projects outputs to meet certain needs of the university.</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Participation in the evaluation of the graduation project  
*Rarely adopt successful projects.*

Limited participation in the evaluation of the graduation project

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**Figure 2.2:** The old Roles of Stakeholders.
The Old Process of managing G.P

1. Identifying Projects
   - Student
   - Supervisor
   - Local Market
   - Evaluate and adopt outputs very limited
   - Limited participation in the evaluation of project outputs

2. Executing & supervising projects
   - Direct supervision and guidance
   - Facilities & limited financial support

3. Evaluating & Marketing Project Outputs
   - Evaluate students & project outputs
   - Limited involvement in the evaluation of project outputs

Figure 2.3: Old Processes of managing Graduation Project
Advantages of the Old situation:

Each system or methodology followed has advantages and disadvantages, our study of the current situation of the methodology used in managing graduation projects has came out with some positives, can be summarized as follows:

- Each department follows methodologies and procedures that differ from those of other departments in the Faculty of Engineering, but it comes beneficial to the outputs of the project or the students themselves, for example, Civil Engineering Department, forcing students to visit engineering offices and direct contact with some engineers, this gives students a good communication skills.
- Forcing the student to gather ideas of the graduation project ideas expanding their horizons, and urging them to persevere in the stage of practical training to observe and record the problems experienced by the sector where he has served.

Disadvantages of the Old situation:

- There is a problem in finding suitable idea for each group of students projects which needs to waste their time in researching.
- Supervisor doesn’t withstand complete responsibility to create communication between the student and the local market at the same time which leads to limit communication with the market that results to uncertainty outputs of project.
Chapter 3 Proposed Solution

This Chapter includes the next sections:

3.1 Institutionalize the process
   3.1.1 Identify Project Idea
   3.1.2 Execution The Project
   3.1.3 Evaluation the Project
   3.1.4 Marketing the Project

3.2 The Proposed Model
3.3 The Roles of Stakeholders
3.4 Organizational Structure
3.5 Job Descriptions
Proposed Solution

Our Study and analysis to the current situation in chapter 2 led us to propose solutions for problems that face the current system. This chapter presents the proposed solution.

3.1 Institutionalizing the process of managing Graduation Projects

Graduation Project is very important course for the engineering student; in which he applies what he learned in the courses. The outputs of the Graduation Projects must reflect good quality and strong abilities and skills of students in an appropriate way. So, the University must give this course large interest to improve its image among other Universities.

This Chapter proposes an integrated system that institutionalizes the process of Identifying, executing, evaluating, and marketing Graduation Projects. The Proposed system is expected to remove different barriers facing students during the course of their Graduation Projects.

Therefore, we launched the institutionalization of the operation steps of the project to avoid any barriers that may delay the project, such as lack of sources of project’s ideas, The absence of a financier or supportive of the graduation projects and the full costs on the student shoulders, almost complete absence of the marketing of the graduation projects, leading to the accumulation of projects on the shelf, and lack of trust between the local market and the quality of project graduation outputs at An-Najah national University in general and especially Faculty of Engineering.
These barriers and others have urged the development and institutionalization of the processes of managing graduation projects. Institutionalization of the process the following steps:

1. Identifying idea of the Project.
2. Execution of the Project.
3. Evaluation of the Project.
4. Marketing the Project.

Next Sections explain the five steps smoothly, showing the procedures that may require to be followed.

3.1.1 Identifying Project idea:

Ideas create a starting point to begin any project, this point is an important step in Project life. Therefore, it is very important to consider this phase as constituent phase of the project as a whole. Of course, the existence of a set of ideas reduces the trouble of looking and searching for ideas dramatically, our study and analysis of the current situation shows lack of sources of information, this brings the idea of creating a unified database for Graduation Projects, containing a wide range of ideas and problems concerning the local market.

Configure the database that contains problems and ideas derived from the direct relationship with the local market help the graduation projects unit to provide supervisors and student with suitable ideas.

Supervisors are provided with a set of ideas, either through meetings and discussions between the unit and supervisors or by providing them with periodic reports on the latest ideas and problems the market has.

These ideas are discussed among supervisors and students. This process can be presented simply as follows:
1. After creating a database that proceed and saves huge data of informations about problems faced the local market, this database is continuously updated by direct contacts with the market employers.

2. Provide the supervisors in First semester with models that contain ideas for projects that may adopt (see model C.1).

3. After the models submitted to supervisors, each supervisor discussed them with the groups of students to get of one idea to each group to adopt.

3.1.2 Executing of the Project:

Carrying out a project is usually a complex task involving a number of students, working as a project team. The success of the project depends largely on how well the team work and managed, and so focus on this aspect of the project in planning an evaluation is important, there is must to be a procedures from the supervisor and students during execution period that summarized as follows:

- During the execution of the project the procedures followed must be scheduled to prevent any cumulative mistakes and time waste. Also the supervisor direct and guide the student to how they will work.

- Monitoring the processes during the execution stage of the project (i.e. during planning, execute and development) can help the supervisor in diagnosing problems and allow for suitable corrective action to be taken.

These are evaluation activities that the supervisor takes in their stride, and so are not ‘additional’ tasks to consider.
3.1.3 Evaluating of the Project:

Evaluating the outputs of any project seems to be an important process that its success meant to access to next process (Marketing). Evaluation the projects based on bases which there is performance indicators in Industrial Engineering Department for Graduation Projects, so it’s useful to publish these indicators to other departments in the college.

3.1.4 Marketing the Project:

The students try to choose an idea for their graduation projects that may be adopted from the beginning, and marked after finishing.

In the current situation a very small number of graduation projects have been marketed, so we need to support the communication with the local market through graduation projects unit that promote the vast majority of projects.

Marketing is done by many measures, we cannot limit the measures in certain points but we can mention some processes that help in marketing of projects, including exhibitions, and the unity of the media can play a role in marketing projects, or promote projects through the reports on the different disciplines in the Faculty of Engineering and annual project published in daily newspapers.
3.2 Proposed Practice for managing Graduation Projects

The proposed model for managing graduation projects is a model that presented the different parties (stakeholders) and the relations between each other; in this model we have six stakeholders; they are (student, supervisor, engineering association, university administration, graduation projects unit and local market).

The model shown in Figure 3.1 presented the relationships between these stakeholders:

a) Student:

There is no big deference in the relations between the student and the different stakeholders, but he will have in this proposed situation a good, obvious, and trusted sources to deal with, we can explain his relations with:

- With Supervisor: Exchange and discuss ideas with the supervisor, follow the instructions of supervisor.
- With Local-market: Identify problems of local market through practical training or personal contact with employers.

b) Supervisor

Supervisor has a relationship with student and graduation projects unit, this as presented below:

- With Student: the supervisor is responsible for supervision and guidance of student and to exchange ideas of graduation projects.
- With Graduation projects unit: exchange and discusses ideas of graduation projects which respond to the needs of the local market, the supervisor introduce his opinion about the idea of the project and its suitability to be implemented by students.

c) University Administration
University administration has relationship with student, supervisor and graduation projects unit; the university administration provides facilities and financial support.

d) Local Market

The local market has a relationship with student, supervisor and graduation projects unit, the local market participates in evaluating the quality and validity of project outputs.

- With Student: the student recognizes the problems of the local market, through practical training, or to communicate directly with the business.
- With Graduation Projects Unit: Exchange mutual Graduation Project ideas.

e) Engineering Association

Engineering association participates in evaluation of the quality and validity of the output of the Graduation Project.
Figure 3.1: The Proposed Model

The Proposed Model

Student

Supervisor

Graduation Projects Unit

Engineers Association

Local Market

University Administration

Provide Facilities and financial support.

Supervision and guidance of students.

Exchange graduation projects ideas.

Recognize the problems of the local market through practical training, or communicate directly with the business.

Support / adoption of the graduation projects.

Evaluation of the quality of project output.

Ask mutual graduation project ideas.

Present and discuss the graduation project ideas and all research needs.

Participate in the evaluation of the quality and validity of project output.
3.3 Roles of Stakeholders

Here we want to talk about the proposed roles for graduation projects unit. In this proposed roles we have six stakeholders whom are:

1. Students.
2. Supervisor.
3. Local market.
4. University administration.
5. Engineers Association.
6. Graduation Project Unit.

And there are three stages which are:

1. Identifying the Project.
2. Execution and supervision of the project.
3. Evaluate and marketing stage.

The proposed role shows that each stakeholder plays number of roles at least in one of the three stages:

1. Identification of project:
   - **Students:**
     - Prepare set of ideas for graduation project, either from problems experienced by the market and identify them during the practical training, or from graduation projects unit which offers a number of ideas periodically.
   - **Supervisor:**
     - Exchange of ideas with graduation projects unit.
     - Present and discuss ideas with students.
   - **Local market:**
     - Exchange ideas with the Graduation Projects Unit.
   - **Graduation Project Unit:**
     - Collect project ideas from the Local market or from different researches.

2. Execution and control:
   - **Student:**
32

• Supervisor:
  o Supervise project execution.
  o Guiding students and evaluate their performance.

• University administration:
  o Provide support the Graduation Projects with coordination with the Unit and supervisor.

• Local market:
  o Support projects and offering of facilities for students.

• Graduation Projects Unit:
  o Coordination with the competent authorities.
  o Providing facilities and logistical support for project.

3. Evaluation and marketing of the project:

• Supervisor:
  o Evaluate the performance of students and final project outputs.

• University administration:
  o Evaluation of project outputs, provide rewarding for successful projects.

• Local market:
  o Evaluate project outputs.
  o Adopt some of completed and successful projects.

• Engineers association:
  o Evaluate the quality of project outputs.

• Graduation Projects Unit:
  o Promotion and marketing projects.
### The Proposed Roles of Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Student</th>
<th>Supervisor</th>
<th>University Administration</th>
<th>Graduation Project Unit</th>
<th>Local Market</th>
<th>Engineers Association</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identifying the Project</strong></td>
<td>Prepare set of ideas for graduation project.</td>
<td>Exchange ideas with the Graduation Projects Unit.</td>
<td></td>
<td></td>
<td>* Suggest ideas for projects that meet the needs of the market. *adopting some projects</td>
<td></td>
</tr>
<tr>
<td><strong>Project execution</strong></td>
<td>Supervision of the project steps, and guide students and assess their performance.</td>
<td>Provide support for projects, and to give facilities for students.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation and Control</strong></td>
<td>Assessment of student performance and outputs of the project</td>
<td>* Evaluation of project outputs by academic staff at the college. * Recognize and reward outstanding projects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation and Marketing</strong></td>
<td>* Evaluation of project outputs * The adoption of some of the projects</td>
<td>Promotion for marketing projects.</td>
<td></td>
<td></td>
<td></td>
<td>Evaluation of project outputs</td>
</tr>
</tbody>
</table>

Figure 3.2: The Roles of Stakeholders
The Proposed Process

1. Project Identification
   - Collect project ideas from the local market
   - Exchange ideas with the local market
   - Exchange ideas with the graduation projects unit

2. Execution & Supervision of Project
   - Provide support for projects with coordination with the supervisor
   - Supervise project execution
   - Prepare a set of ideas for graduation projects

3. Evaluation & Marketing
   - Support projects and offering of facilities for students
   - Evaluate project outputs and adopt some of them
   - Evaluation of project outputs, providing reasoning for successful projects
   - Evaluate the quality of project outputs
   - Evaluate the performance of students and real project outputs

Figure 3.3: The proposed Process
3.4 Organizational Structures

Organizational structure is a hierarchical concept and formal system of task and reporting relationships that controls, coordinates, and motivates employees so that they cooperate to achieve an organization's goals. And determines how functional a company is in developing, pursuing, and executing missions necessary for growth. Without the proper organizational structure or chain of command, a company loses its foundation through organizational conflict a hierarchical concept.

Significance of an organizational structure:

1. Encourages employees to work hard and to develop supportive work attitudes
2. Allows people and groups to cooperate and work together effectively.

Organizational Structure affect:

1. Behavior.
4. Teamwork and cooperation.
5. Intergroup and Interdepartmental relationships.
Types

To identify and configure the Center's organizational structure we must be aware of the types and the pros and cons of each type, in this section we make a research about Organizational structures. Certain organizational structures include matrix, functional and divisional. Each structure offers a unique reporting sequence to manage a company's operations by influence employees to perform at their best.

Functional Structure:

Functional structure - groups people together because they hold similar positions in an organization, perform a similar set of tasks, or use the same kind of skills. This division of labor and specialization allows an organization to become more effective.

Advantages of a Functional Structure

Coordination Advantages

1. Easy communication among specialists: People grouped together according to similarities in their positions can easily communicate and share information with each other.

2. Quick decisions: People who approach problems from the same perspective can often make decisions more quickly and effectively than can people whose perspectives differ.

3. Learning: Makes it easier for people to learn from one another's experiences. Thus a functional structure helps employees improve their skills and abilities and thereby enhances individual and organizational performance.
Motivation Advantages

1. Facilitates performance evaluation for supervisor: Supervisors are in a good position to monitor individual performance, reward high performance, and discourage social loafing. Functional supervisors find monitoring easy because they usually possess high levels of skill in the particular function.

2. Facilitates performance evaluation for peers: Allows group members to monitor and control one another's behavior and performance levels.

3. Creates teamwork: Can also lead to the development of norms, values, and group cohesiveness that promote high performance.

4. Creates a career ladder: Functional managers and supervisors are typically workers who have been promoted because of their superior performance.

Disadvantages of a Functional Structure

1. Serving needs of all products: When the range of products or services that a company produces increases, the various functions can have difficulty efficiently servicing the needs of the wide range of products. Imagine the coordination problems that would arise, for example, if a company started to make cars, then went into computers, and then went into clothing but used the same sales force to sell all three products. Most salespeople would not be able to learn enough about all three products to provide good customer service.

2. Coordination: As organizations attract customer with different needs, they may find it hard to service these different needs by using a single set of functions.

3. Serving needs of all regions: As companies grow, they often expand their operations nationally, and servicing the needs of different regional customers by using a single set of manufacturing, sales, or purchasing functions becomes very difficult.
Divisional Structures:

A divisional structure that overlays functional groupings allow an organization to coordinate intergroup relationships more effectively than does a functional structure.

Advantages of a Divisional Structure

Coordination Advantages

1. Quality products and customer service - Functions are able to focus their activities on a specific kind of good, service, or customer. This narrow focus helps a division to create high-quality products and provide high-quality customer service.
2. Facilitates communication - between functions improve decision making, thereby increasing performance.
3. Customized management and problem solving - A geographic structure puts managers closer to the scene of operations than are managers at central headquarters. Regional managers are well positioned to be responsive to local situations such as the needs of regional customers and to fluctuations in resources. Thus regional divisions are often able to find solutions to region-specific problems and to use available resources more effectively than are managers at corporate headquarters.
4. Facilitates teamwork - People are sometimes able to pool their skills and knowledge and brainstorm new ideas for products or improved customer service.
5. Facilitates decision making - As divisions develop a common identity and approach to solving problems, their cohesiveness increases, and the result is improved decision making.

Motivation Advantages

1. Clear connection between performance and reward - A divisional structure makes it relatively easy for organizations to evaluate and reward the performance of individual divisions and their managers and to assign rewards in a way that is closely linked to their
performance. Corporate managers can also evaluate one regional operation against another and thus share ideas between regions and find ways to improve performance.

2. Customized service - regional managers and employees are close to their customers and may develop personal relationships with them-relationships that may give those managers and employees extra incentive to perform well.

3. Identification with division - employees' close identification with their division can increase their commitment, loyalty, and job satisfaction.

**Disadvantages of a Divisional Structure**

1. High operating and managing costs - because each division has its own set of functions, operating costs- the costs associated with managing an organization-increase. The number of managers in an organization, for example, increases, because each division has its own set of sales managers, manufacturing managers, and so on. There is also a completely new level of management, the corporate level, to pay for.

2. Poor communication between divisions - Divisional structures normally have more managers and more levels of management than functional structures have, communications problems can arise as various managers at various levels in various divisions attempt to coordinate their activities.

3. Conflicts among divisions - divisions may start to compete for organizational resources and may start to pursue divisional goals and objectives at the expense of organizational ones.
Matrix Structure

A complex form of differentiation that some organizations use to control their activities results in the matrix structure, which simultaneously groups people in two ways - by the function of which they are a member and by the product team on which they are currently working.

In practice, the employees who are members of the product teams in a matrix structure have two bosses - a functional boss and a product boss.

Coordination Advantages

1. Facilitates rapid product development
2. Maximizes communication and cooperation between team members
3. Facilitates innovation and creativity
4. Facilitates face-to-face problem solving (through teams)
5. Provides a work setting in which managers with different functional expertise can cooperate to solve non-programmed decision-making problems.
6. Facilitates frequent changes of membership in product teams

Motivation Advantages

The matrix structure provides a work setting in which such employees are given the freedom and autonomy to take responsibility for their work activities.

Disadvantages of a Matrix Structure

1. Increase role conflict and role ambiguity - Two bosses making conflicting demands on a two-boss employee cause role conflict. Reporting relationships in the matrix makes employees vulnerable to role ambiguity.
2. High levels of work stress - Conflict and ambiguity can increase feelings of stress. Difficulty employees have in demonstrating their personal contributions to team performance because they move so often from one team to another.
3. Limited opportunities for promotion - because most movement is lateral, from team to team, not vertical to upper management positions.

The extent of these problems explains why matrix structures are used only by companies that depend on rapid product development for their survival and that manufacture products designed to meet specific customer needs. Matrix structures are especially common in high-tech and biotechnology companies.

❖ **Integration: Mechanisms for Increasing Coordination:**

- **Tall and Flat Hierarchies** “The larger and more complex an organization is, the taller is its hierarchy”

  **Tall** organizations have many levels in the hierarchy relative to their size; **flat** organizations have few. Problems of integrating between hierarchical levels emerge when an organization's hierarchy becomes too tall. More specifically, communication and decision-making problems start to occur. As the number of management levels increases, the time it takes to send messages up and down the hierarchy increases and decision making slows.

  Information passed from person to person can be distorted or filtered as messages become garbled and managers naturally interpret messages according to their own interests. These problems further reduce the quality of decision making.

- **Decentralizing Authority**

  To reduce the communication and decision-making problems that accompany a hierarchy's growth, organizations may prefer decentralization to centralization, choosing to distribute authority to managers at all levels of the hierarchy and giving them responsibility for making decisions.
Authority is said to be **centralized** when only managers at the top of an organization can make important decisions. Authority is **decentralized** when managers throughout the hierarchy are allowed to make significant decisions.

**What are the benefits of decentralization of authority?**

1. Communication and decision-making problems because lower-level managers do not have to continually consult or report up the hierarchy to their superiors.
2. At the same time, greater job responsibilities can increase motivation by making lower-level jobs more interesting and rewarding.

**Organizational Structure of Tawasol Center:**

In our project an organizational structure of Tawasol center is developed the structure includes graduation project unit and other units such as (Community service unit, Engineering training unit, Engineering activities and media, Incubator of, and the Graduation Projects Unit).

Now we will clarify the roles of each of these units as following:

1. **Community Service Unit:**
   
   This unit aims at developing community service to meet the different disciplines where each student training in the area of specialization.

2. **Engineering Training Unit:**
   
   Training unit aims to provide engineering training opportunities for all engineering disciplines by coordination with the local and regional market.
3. **Engineering activities and media unit:**

   ✓ **Media unit:**
   - Send achievement of engineering faculty to the media.
   - Disseminates Engineering News.
   - Increase the engineering awareness in the community through the dissemination of information and engineering publications.

   ✓ **Engineering activities:**
   - Establishing system for extra-curricular activity and communicates with other departments in the college.

4. **The Incubator:**

   Based on incubate successful projects and student works.

5. **Graduation Projects Unit:**

   - Providing the students and supervisors with graduation project ideas, continuously.
   - Institutionalizing the procedures followed in Graduation projects at Faculty of Engineering.
   - Support and develop the relations between Faculty of Engineering and the Local market.
   - Increasing the percentage of promoted projects by institute marketing process.
   - Providing logistic support to the graduation projects.

Figure 3.4 shows the proposed organizational structure of Tawasol center.
Figure 3.4: Proposed Organizational Structure for Twasol Center
3.5 Job Descriptions

A job description is a list of the general tasks, or functions, and responsibilities of a position. Typically, it also includes to whom the position reports, specifications such as the qualifications needed by the person in the job, main responsibilities and activities, etc. A job description is usually developed by conducting a job analysis, which includes examining the tasks and sequences of tasks necessary to perform the job. The analysis looks at the areas of knowledge and skills needed by the job. Note that a role is the set of responsibilities or expected results associated with a job. A job usually includes several roles. The job description might be broadened to form a person specification.

Purpose of Job Description

The objective of a job description is to have a clear outline of duties and responsibilities to make the screening process as direct and focused as possible.

Job descriptions may have the following elements:

- Improvement cooperation by giving all members of the organization insight in existing responsibilities/roles.
- Enabling career moves within the organization.
- Determination of amount of pay per function.
- Increase of results by specification of responsibilities and key performance indicators.
- Development of job owner by specification of competences.
- May include the phrase "perform other duties as assigned".
Director of the Twasol Center:

<table>
<thead>
<tr>
<th>Information Structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job Title</strong></td>
<td>Director of the Twasol Centre</td>
</tr>
<tr>
<td><strong>Directly responsible</strong></td>
<td>------------------</td>
</tr>
<tr>
<td><strong>Subordinates</strong></td>
<td>Secretarial, staff, G.P's Unit Director.</td>
</tr>
</tbody>
</table>

**Summary of the Job**

Administrative function, where the management of Tawasol Centre controls and organizes the work, distributes and follow-up subordinates.

**Job Qualifications**

1- Required to have a master's degree in engineering.
2- A good degree of persuasive power and the ability to establish relationships with others.
3- Wide knowledge about theories, principles and systems related to the field work, planning, organization and management.

**Main Responsibilities and Activities**

1- Management Department at the Tawasol center.
2- Prepare an annual report containing the achievements of the Centre.
3- Carrying out all correspondence of the Centre.
4- Receive the reviewers and guests.
5- Discuss the subjects with subordinates in matters related to their work.
6- Evaluate the work of staff at the center.
7- Meetings with the status of relations with communication.
8- Work on the development of the Centre.
9- Cooperation and coordination with the local market and the College of Engineering.
# Authorities

1- Direct all employees at the center.

2- Discuss with subordinates in matters related to their work.

3- The preparation of the annual plan for the Centre.

4- Evaluate the work of staff at the center.

# Evaluation Indicators

1- Completion of the annual plan.

2- Commitment to regulations and laws.

3- Evaluate the achievements of the Centre and annual comparison on past accomplishments.

4- A good example for staff in commitment and action
Executive Secretary:

<table>
<thead>
<tr>
<th>Information Structure</th>
<th>Job Title</th>
<th>Executive Secretary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directly responsible</td>
<td>Director of the Communication Centre</td>
<td></td>
</tr>
<tr>
<td>Subordinates</td>
<td>----------</td>
<td></td>
</tr>
</tbody>
</table>

**Summary of the Job**

Administrative Function, where the secretary's work have a relationship with manager and staff, and in the process of insert and implementation data.

**Job Qualifications**

1 - Bachelor of Engineering.
2 - Good knowledge of secretarial methods and procedures.
3 – Having special certificates for computer sessions.
4 - Full knowledge of the functions of the Centre Director.
5 - Full knowledge of the regulations and instructions in the Centre.
6 - The ability to coordinate and arranged things.
## Main Responsibilities and Activities

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The executive of the administrative work, helping written under the guidance of Director</td>
</tr>
<tr>
<td></td>
<td>of the Centre.</td>
</tr>
<tr>
<td>2</td>
<td>To receive correspondence and transactions received, recorded and delivered to the</td>
</tr>
<tr>
<td></td>
<td>Director.</td>
</tr>
<tr>
<td>3</td>
<td>To receive correspondence and transactions issued by the Director of the Centre as</td>
</tr>
<tr>
<td></td>
<td>directed.</td>
</tr>
<tr>
<td>4</td>
<td>Sort transactions and submit them to the Director to take action.</td>
</tr>
<tr>
<td>5</td>
<td>Conservation of correspondence and transactions in files.</td>
</tr>
<tr>
<td>6</td>
<td>Receive phone calls and redirecting them to the Director.</td>
</tr>
<tr>
<td>7</td>
<td>Arrange appointments and official engagements for the Office of the Director and to</td>
</tr>
<tr>
<td></td>
<td>reminding him.</td>
</tr>
<tr>
<td>8</td>
<td>Receive reviewers and report the Director.</td>
</tr>
<tr>
<td>9</td>
<td>Print the notes and transactions and important correspondence in both Arabic and</td>
</tr>
<tr>
<td></td>
<td>English.</td>
</tr>
<tr>
<td>10</td>
<td>Make calls within and outside the Centre to execute the business entrusted to him.</td>
</tr>
<tr>
<td>11</td>
<td>Do any related actions that assign to.</td>
</tr>
<tr>
<td>12</td>
<td>Insert and implemented data.</td>
</tr>
</tbody>
</table>
**Authorities**

Execute of all responsibilities and activities required

<table>
<thead>
<tr>
<th>Evaluation Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Evaluation of Administrative Performance.</td>
</tr>
<tr>
<td>2- Speed in completing the work.</td>
</tr>
<tr>
<td>3- Commitment the official working hours.</td>
</tr>
<tr>
<td>4- Commitment to deadlines to deliver the business assigned to them.</td>
</tr>
<tr>
<td>5- Organization and Training at Work.</td>
</tr>
<tr>
<td>6- Documenting and correspondence files properly.</td>
</tr>
<tr>
<td>7- Work and accept comments by the director.</td>
</tr>
<tr>
<td>8- Low mistakes in works assigned by.</td>
</tr>
</tbody>
</table>
Graduation Projects Unit Director:

### Job Descriptions

<table>
<thead>
<tr>
<th>Structural Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Title</td>
<td>Graduation Projects Unit Director</td>
</tr>
<tr>
<td>Directly Responsible</td>
<td>Director of the Centre</td>
</tr>
<tr>
<td>Subordinates</td>
<td>-------</td>
</tr>
</tbody>
</table>

### Summary of the Job

Administrative function, where is responsible for communicating with all those involved in graduate projects, and helps to give ideas for graduation projects, and work on marketing projects and adoption.

### Job Qualifications

1. Having Bachelor's degree in Engineering
2. A good degree of ability to persuade and build relationships with others.
3. Wide knowledge of theories, principles and systems for the field work, planning, organization and management.

### Main Responsibilities and Activities

1. Management Department at Graduation Projects Unit.
2. Reception reviewers and guests.
3. Conducting meetings with the relevant projects of graduation.
4. To develop and Graduation Projects Unit.
5. Cooperation and coordination with the local market and the College of Engineering.
6. Providing ideas for graduation projects, as they realize the needs of the local market and help the student.
<table>
<thead>
<tr>
<th>Authorities</th>
<th>Evaluation Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- To discuss with relevant Graduation Projects.</td>
<td>1- How to communicate with the local market and Faculty of Engineering.</td>
</tr>
<tr>
<td>2- Action plan of developmental projects for the unity of graduation</td>
<td>2- Completion of developmental plans for graduation projects.</td>
</tr>
<tr>
<td>3- Commitments with regulations, laws.</td>
<td>3-</td>
</tr>
</tbody>
</table>
Chapter 4 Work Procedures

This Chapter includes the next sections:

A. Data Collection and Database Configuration
B. Exchange of Ideas with the Local market
C. Present and Exchange Ideas with supervisor
D. Evaluating the Graduation Projects Outputs
E. Marketing the Graduation Project
Work Procedures

After the study, which went on the proposal to create a unit for graduation projects, then we must clarify the functions of the unit and the functions of each staff member are to be clear-cut. Thus, any unit or center will follow documented procedures and processes to avoid any administrative errors.

These documented procedures must be scheduled within a time frame gives those who work the ability to organize and manage the unit effectively. So we proposed the inclusion of procedures that must be followed in the unit, procedure should include:

- **The procedure name (Title):**
  
  Name of the procedure is a brief of operations or the target set for it.

- **Objective:**
  
  Obtain the desired result through the application of this procedure, and various processes.

- **Scope:**
  
  Where and how to apply this procedure within the unit or outside.

- **Responsibilities and powers:**
  
  This item explains job description for each employee through the operations carried out within the procedure so that all employees are fully aware of their duties and rights.

- **Operations:**
  
  Insert the steps to be followed in this procedure, taking into account the chronological and functional, to reach our goals from this procedure, include these operations a set of models for each process.
- **Performance Indicators:**
  
  After you perform the procedure there should be a criterion or indicator of the performance and effectiveness of this procedure, so there must include a performance indicator by which we infer the efficiency of this procedure and outputs.

- **Related documents:**

  - The inclusion of documents and drawings illustrating the steps of this procedure.

After explaining the procedure and its contents, we will briefly mention the procedures to be followed in the unit, they are as follows:

1. Data collection and database configuration.
2. Exchange of ideas with the local market.
3. Presentation of ideas and exchange information with supervisors
4. Evaluation the outputs of graduation projects.
5. Marketing Graduation Projects.
A. (Data Collection and Database Configuration)

Objective:
- Collect data about previously successful graduation project ideas.
- Configure a database of project ideas from different directions.
- Collect data on projects facing the local market.

Scope:
- Field data collection
- Data Entry
- Database management

Responsibilities and authorities:
- Database Configuration (access to the programming system directly or through the secretary’s qualifications)
- Data collection (through the official unit graduation projects or field team)
- Data Entry (secretary).

Processes:
- **Data collection:**
  - Collection of data on project ideas comes out earlier from the Faculty of Engineering in all departments and other universities as well. (Model A.1)
  - Collect information and ideas for graduation projects from various points, especially local market.

- **Database entry:**
  - Introduce what has been collected to the system compiler and its codification by the secretary.
  - Classification of data, each according to their nature.

Performance indicators:
- Degree of efficiency of the database.
- The ratio of graduation projects carried out from the Faculty of Engineering and derived from the database.
Related documents:
Outlines the sequence of operations Records

Records:

<table>
<thead>
<tr>
<th>Record</th>
<th>Its number</th>
<th>Save period</th>
<th>Save place</th>
<th>Contact person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert list of submitted ideas from academic staff</td>
<td>A.1</td>
<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
<tr>
<td>Data Collection of Previous Graduation Projects</td>
<td>A.2</td>
<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
</tbody>
</table>
the sequence of operation(A):

Model A.1

Data collection of previous graduation projects

Model A.2

Insert the list of submitted ideas from the academic staff

Introduce the collected data to the system

Classification of data

End

Executive Secretary

Executive Secretary

Executive Secretary

Executive Secretary
<table>
<thead>
<tr>
<th>التغطية التفصيلية: جمع البيانات وتكوين قاعدة بيانات (A)</th>
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</thead>
</table>

**نموذج جمع أفكار من الكادر الأكاديمي (A.1)**

<table>
<thead>
<tr>
<th>التاريخ:</th>
<th>/ / 2010</th>
</tr>
</thead>
</table>

أولاً: المعلومات الشخصية:

- التخصص: 
- الاسم: 
- البريد الإلكتروني: 
- الهاتف الشخصي: 

ثانياً: بيانات المشكلة المطروحة:

- وصف المشكلة: 
- طبيعتها: 
- القسم المستهدف: 
- مدى أهمية المشروع: 
- الحلول المتوقعة للمشكلة: 

أي معلومات أخرى:

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
<th>رقم النموذج</th>
<th>تابع لطريقة العمل</th>
<th>تاريخ الإصدار</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1.00</td>
<td>A.1</td>
<td>A</td>
<td>2010/5/5</td>
</tr>
</tbody>
</table>
Model A.2: Data Collection of Previous Graduation Projects

<table>
<thead>
<tr>
<th>هل تم تبنيه</th>
<th>اسم الطلاب المنفذين للمشروع</th>
<th>اسم المشرف</th>
<th>طبيعة المشروع</th>
<th>اسم المشروع</th>
<th>الرقم التسلسلي</th>
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</table>

| اسم الإجراء التنفيذي: جمع البيانات وتكوين قاعدة بيانات |

نموذج جمع أفكار مشاريع تخرج سابقة

التاريخ: 2010

الكلية: __________________________

القسم: __________________________

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
<th>رقم النموذج</th>
<th>تاريخ الإصدار</th>
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Model A.2: Data Collection of Previous Graduation Projects

<table>
<thead>
<tr>
<th>رقم المعلومة</th>
<th>اسم المشروع</th>
<th>أسماء الطلاب المنفذين للمشروع</th>
<th>رقم الهاتف/الجوال</th>
<th>مكان الإقامة</th>
<th>عنوان البريد الإلكتروني</th>
<th>الرقم التسلسلي</th>
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</table>

توقيع رئيس القسم

<table>
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<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
<th>رقم النموذج</th>
<th>تابع لطريقة العمل</th>
<th>تاريخ الإصدار</th>
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<tr>
<td>2</td>
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<td>1.00</td>
<td>4.2</td>
<td>A</td>
<td>2010/5/5</td>
</tr>
</tbody>
</table>
B. (Exchange of Ideas with the Local Market)

Objective:
- Deal with ideas that meet the needs of the local market.
- Get ideas for graduation projects from various sources.

Scope:
This procedure is implemented through meetings with the local market, as well as through the problems observed by students, entered in the reports of engineering training course.

Responsibilities and authorities:
- Responsible of unit: meetings
- Secretary: General Coordination
- Responsible of Training Unit: provision of information

Processes:
1. Requiring students in engineering training course to include problems related to the trained organization and submit a report to the Head of Unit. (Model B.1)
2. Data is collected from the local market through (Model B.2)
3. The department will present the ideas of graduation projects to Tawasol Centre (Model B.3)
4. The Tawasol Center will give the ideas to the local market (Model B.4)
5. After the agreement the department will respond to Tawasol Center (Model B.5)
6. The Memorandum of Understanding is written between the departments of the Faculty of Engineering and the local market (Model B.6)

Performance indicator:
Output operations inclusive of the ideas to meet market needs and student
Related documents:

Outlines of the sequence of operations

Records:

<table>
<thead>
<tr>
<th>Record</th>
<th>Its number</th>
<th>Period save</th>
<th>Place save</th>
<th>Contact person</th>
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</thead>
<tbody>
<tr>
<td>Data Collection from Training parties</td>
<td>B.1</td>
<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
<tr>
<td>Data Collection from Local Market</td>
<td>B.2</td>
<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
<tr>
<td>): Present the idea of graduation project from department</td>
<td>B.3</td>
<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
<tr>
<td>Present the idea of graduation project to local market</td>
<td>B.4</td>
<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
<tr>
<td>department responding Tawasol centre</td>
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<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
<tr>
<td>Memorandum of Understanding</td>
<td>B.6</td>
<td>3 years</td>
<td>Twasol Center</td>
<td>Executive Secretary</td>
</tr>
</tbody>
</table>
the sequence of operation(B):

- **Model B.1:** Including problems that related to the trained organizations
  - Student

- **Model B.2:** Collecting the data from local market
  - Executive Secretary

- **Model B.3:** Presenting the idea of a graduation project to Tawasol center
  - Major of department

- **Model B.4:** Giving the idea to the local market
  - Graduation Projects Unit Director

- **Model B.5:** Department responding to Tawasol center
  - Major of department

- **Model B.6:** Writing the memorandum of understanding
  - Executive Secretary

- **End**
نموذج جمع بيانات من الجهات التدريبية (1)

<table>
<thead>
<tr>
<th>الرقم الجامعي:</th>
<th>جوال/سلكوم شخصي:</th>
<th>البريد الإلكتروني:</th>
<th>العنوان:</th>
<th>الكلية:</th>
<th>التخصص:</th>
<th>الفصل التدريبي:</th>
</tr>
</thead>
</table>

أنواع الإجراء التنفيذي: تبادل الأفكار مع السوق المحلي (B)

<table>
<thead>
<tr>
<th>اسم المؤسسة التي تدرب فيها:</th>
<th>رقم هاتفي المؤسسة:</th>
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</table>

<table>
<thead>
<tr>
<th>البريد الإلكتروني للمؤسسة:</th>
<th>عنوان المؤسسة:</th>
</tr>
</thead>
</table>

هل كان تدريبك في هذه المؤسسة مناسباً لمجال تخصصك:  
لا  
نعم

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
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<th>رقم النموذج</th>
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<th>تلفون المنزل:</th>
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</table>

© نموذج جمع بيانات من الجهات التدريبية (1) - 2010
نموذج جمع بيانات من الجهات التدريبية (1.1)

اسم المشروع: تبادل الأفكار مع السوق المحلي

الذكر/ي أهم مشكلة تلاحظها في الشركة:

<table>
<thead>
<tr>
<th>اسم المشكلة</th>
<th>التكلفة المتوقعة</th>
<th>الحل المقترح لماشكلة</th>
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توقيع الطالب:

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Model (B.2): Data Collection from local market

اسم الإجراء التنفيذي: تبادل الآفكار مع السوق المحلي (B)

نموذج جمع بيانات من السوق المحلي (2.2)

التاريخ: 2009

اسم المؤسسة الصناعية: 

العنوان: 

لاستقلايل المؤسسة: 

تلفون المؤسسة: 

جهال/سکوم شخصی: 

طبعه عمل شركة: 

اذكر أهم مشكلة واجهتها شركتكم؟ 

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<tr>
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<th>عدد الصفحات</th>
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Model (B.2): Data Collection from local market

Nombre: جمع بيانات من السوق المحلي (B.2)

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<th>طبيعة المشكلة</th>
<th>اسم المشكلة</th>
</tr>
</thead>
</table>

إذا كانت لها تكلفة مادية هل لها أثر سلبي على الأرباح:

نعم 
لا 

إذا كانت الإجابة نعم وضح هذا الأثر:

---------------------------

هل يوجد خطورة من وجود المشكلة على الأفراد:

نعم 
لا 

إذا كانت الإجابة نعم بين ذلك:

---------------------------

في حال عمل دراسة للمشكلة هل ستعلمون على دعم هذه الدراسة:

نعم 
لا 

توقيع مدير المؤسسة:

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<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
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Model (B.3): Present the idea of graduation project to local market

<table>
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<tr>
<th>اسم الإجراء التنفيذي: تبادل الأفكار مع السوق المحلي (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>نموذج طرح أفكار مشروع التخرج للسوق المحلي (B.3)</td>
</tr>
</tbody>
</table>

التاريخ: 5/5/2010

لقد قامت كلية الهندسة بتزويدنا نحن مركز تواصل بقائمة لأفكار مشروع تخرج مختلفة تناسب جميع أقسام كلية الهندسة ليتم تطبيقها بالتعاون مع السوق المحلي.

نُمِين نحن من حضوركم التعاون معنا لتنفيذ هذه المشاريع، وذلك دعماً لسيرة التعليم وتوطيد العلاقة ما بين كلية الهندسة والسوق المحلي.

ومن هذه الأفكار التالي:

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
<th>رقم النموذج</th>
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<td>1.00</td>
<td>B.3</td>
<td>B</td>
<td>5/5/2010</td>
</tr>
</tbody>
</table>
각 70

Model (B.3): Present the idea of graduation project from department

اسم التنفيذ: تبادل الأفكار مع السوق المحلي

نموذج عرض أفكار مشاريع التخرج من القسم (ب.3)

التاريخ: 2010

قامت كلية الهندسة بإدراج قائمة لأفكار مشاريع التخرج، ونأمل أن يحضركم بمساعدة ننطبق هذه الأفكار وذلك بالتعاون مع السوق المحلي. وهذه بعض الأفكار من قسم الهندسة:

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

توقيع رئيس القسم: ________________________

<table>
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<tr>
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<th>تاريخ الإصدار</th>
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</table>
Model (B.4): Present the idea of graduation project to local market

اسم المشروع التنفيذي: تبادل الأفكار مع السوق المحلي (B)

نموذج طرح أفكار مشاريع التخرج للسوق المحلي (B.4) «

التاريخ:     /  / 2009

اسم المؤسسة الصناعية: 

العنوان: 

تلفظ المؤسسة: 

جوال/رقم شخصي: 

هل لديكم القدرة على دعم واحدة من هذه الأفكار

نعم

لا

إذا كانت الإجابة نعم اكتب الفكرة المناسبة لكم:

ما هو سبب اختياركم لهذا المشروع

ما هي نسبة الدعم التي تتمكن شركائنا بتزويدنا فيها

توقيع مدير المؤسسة:

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
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</table>
نموذج يرد فيه القسم على مركز تواصل B.5

التاريخ: 2010

اسم الشركة: 

عنوان المشروع: 

الوقت اللازم لحل المشكلة: 

التكلفة المتوقعة لحل المشكلة: 

المؤهلات التي تحتاجها لحل المشكلة: 

مدى الالتزام بتنفيذ المشروع: 

توقيع رئيس القسم: 

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
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</table>
نموذج مذكرة تفاهم B.6

اسم الإجراء التنفيذي: تبادل الأفكار مع السوق المحلي (B)


التاريخ: / 2010

الطرف الأول:

الطرف الثاني:

اتفق الطرفان على أن يقوم مجموعة الطلاب بإشراف المدرسة بتنفيذ مشروع في مدة عام أكاديمي "علمًا باختصار التكاليف المتوقعة لتنفيذ هذا المشروع، على أن يتضمن:

1.
2.
3.

هذا وسيتم تغطية المبلغ على النحو التالي:

علمًا "بأن القسم يتبعه بالقيام بأعلى ما يستطيع لإنهاء العمل على أكمل وجه.

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
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<th>تابع لطريقة العمل</th>
<th>تاريخ الإصدار</th>
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<td>1.00</td>
<td>B.6</td>
<td>B</td>
<td>5/5/2010</td>
</tr>
</tbody>
</table>
C. (Present and Exchange of Ideas with Supervisors)

Objective:
Purification ideas which presented by the Unit through discussion it with supervisors.

Scope:
- Conduct periodic meetings with supervisors.
- Present the ideas to supervisors in one way or another (through the network).

Responsibilities and powers:
- Secretary: coordinate the dates for meetings.
- Manager: doing meetings by presence of persons which have a relationship.

Operations:
1. Preparing to the unit Meeting of the.
2. Processing of the meeting (attended by persons with the relationship to discuss project ideas).
3. Supervisors select the ideas that are more in tune with the students. (Model C.1)

Performance indicator:
Percentage of projects that are adopted by the teachers.

The relevant documentation:
The scheme of the sequence of process.
### Records:

<table>
<thead>
<tr>
<th>Record</th>
<th>Its number</th>
<th>Period save</th>
<th>Place save</th>
<th>Contact person</th>
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</thead>
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<tr>
<td>Exchanging Ideas with supervisor</td>
<td>C.1</td>
<td>3 years</td>
<td>G.Ps Unit</td>
<td>G.Ps Unit Director</td>
</tr>
</tbody>
</table>
the sequence of operation (C):

1. Start
2. Preparing to the unit meeting
3. Processing of the meeting
4. Selecting the suitable ideas for student
5. End
Model C.1: Exchanging Ideas with supervisor

C.1

«نموذج إرسال وتبادل الأفكار مع المشرف

التاريخ: / 2010

اسم المشكلة:

اسم المؤسسة التي طرحت المشكلة:

أسباب هذه المشكلة:

الأقسام المقترحة لحل المشكلة:

ما رأيك بهذه المشكلة:

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
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<th>تابع لطريقة العمل</th>
<th>تاريخ الإصدار</th>
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Model C.1: Exchanging Ideas with supervisor

<table>
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<tr>
<th>(C) نموذج إرسال وتبادل الأفكار مع المشرف 1</th>
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</thead>
</table>

- اسم الإجراء التنفيذي: تقييم صلاحية وجودة مخرجات المشاريع (C)  
- اسم الإجراء التنفيذي: تقييم صلاحية وجودة مخرجات المشاريع (C)  
- اسم الإجراء التنفيذي: تقييم صلاحية وجودة مخرجات المشاريع (C)  
- اسم الإجراء التنفيذي: تقييم صلاحية وجودة مخرجات المشاريع (C)  
- اسم الإجراء التنفيذي: تقييم صلاحية وجودة مخرجات المشاريع (C)  
- اسم الإجراء التنفيذي: تقييم صلاحية وجودة مخرجات المشاريع (C)  

هل تناسب التخصص الذي تشرف عليه:

ما هي نسبة استفادة الطلاب:

ما هي نسبة نجاح المشروع:

هل لديه الرغبة بتقديم هذا المشروع:

إذا كانت الإجابة نعم، ما أسماء الطلبة المنفذون؟

1.
2.
3.
4.
5.
6.

توقيع المشرف:

<table>
<thead>
<tr>
<th>رقم الصفحة</th>
<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
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</tbody>
</table>

78
D. (Evaluating the Graduation Projects Outputs)

**Goal:**

Evaluate the Graduation Projects Outputs Through Discussions.

**Scope:**

Make Discussion out.

**Responsibilities and Authorities:**

- Secretary: schedule the discussion dates, invite the stakeholders.
- Discusser's staff: the supervisors and the invited stakeholders are give their opinions about the output and its quality.

**Processes:**

1. Appropriate Scheduling for Discussion.
2. Special preparation for introducing and discuss number of special Projects to evaluate it.
3. Invite the stakeholders either from local market or other parties to discuss the projects.
4. Make the discussion out.
5. Evaluate the outputs by supervisors and the invited parties.(Model D.1,Model D.2)

**Performance indicator:**

- Percentage of projects that have been marketed.
- Percentage of increasing or decreasing of the number of promoted projects.

**The relevant documentation:**

The scheme of the sequence of process.
## Records:

<table>
<thead>
<tr>
<th>Record</th>
<th>Its number</th>
<th>Period save</th>
<th>Place save</th>
<th>Contact person</th>
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<tbody>
<tr>
<td>Graduation Project Evaluation Model (1)</td>
<td>D.1</td>
<td>3 years</td>
<td>G.Ps Unit</td>
<td>Director of G.Ps Unit</td>
</tr>
<tr>
<td>Graduation Project Evaluation Model (2)</td>
<td>D.2</td>
<td>3 years</td>
<td>G.Ps Unit</td>
<td>Director of G.Ps Unit</td>
</tr>
</tbody>
</table>
the sequence of operation(D):

1. Start
2. Appropriate scheduling for discussion
3. Special presentation
4. Invitation of the stack holders from local market
5. Making the discussions
6. Evaluating the output of graduation project
7. End

Model D.1, Model D.2

Executive Secretary

Executive Secretary

Executive Secretary

Supervisors And external discusser

Supervisors And external discusser
اسم الإجراء التنفيذي: تقييم مشاريع التخرج (D)

<table>
<thead>
<tr>
<th>اسم المشروع</th>
<th>اسم الطلبة المشاركون في المشروع</th>
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<tbody>
<tr>
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<th>الموضوع</th>
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<tbody>
<tr>
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<td>تقييمات الإعداد</td>
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<td>المناقشة والعرض</td>
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<td>عيادة الشخصية</td>
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<td>طريقة العرض</td>
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<td>القدرة على الاستجابة</td>
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<td>المجموع</td>
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</table>

توقيع: ____________________________
اسم المdía : ________________________
اسم المشروع:

أسماء الطلاب المشاركون في المشروع:

تاريخ المناقشة:

أولاً : علامة المشرف

<table>
<thead>
<tr>
<th>اسم الطالبة</th>
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المجموع

ثانياً : علامة المناقشين

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<thead>
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<th>المعدل من 100</th>
<th>العلامة من 37.5</th>
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<tbody>
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ثالثاً : العلامة النهائية

<table>
<thead>
<tr>
<th>الاسم</th>
<th>العلامة</th>
<th>التوقع</th>
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<tbody>
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</table>

اسم المشرف على المشروع:
E. (Marketing the Graduation Project)

Objective:
Marketing the outputs of graduation projects.

Scope:
- Doing the Exhibition of graduation projects.
- To be on touch between the Unit of graduation projects and the concerned authorities to promotes the outputs of graduation projects.

Responsibilities and powers:
The secretary format the suitable dates for the exhibition and interviews with marketing agencies.

Operations:
1. Promotion and marketing of the outputs of graduation projects, sometimes at the beginning of the project.
2. Coordinate the suitable dates to the exhibition.
3. Coordination of interviews with marketing agencies.
4. Send the Invitations to the involved people.
5. Holding the exhibition.(Model E.1)
6. Hold meetings and interviews to marketing the outputs of projects.
7. Marketing the successful projects.

Performance indicators:
The percentage of marketing projects.

The relevant documentation:
The scheme of the sequence of process.
### Records:

<table>
<thead>
<tr>
<th>Record</th>
<th>Its number</th>
<th>Period save</th>
<th>Place save</th>
<th>Contact person</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Exhibition Model</td>
<td>E.1</td>
<td>3 years</td>
<td>G.Ps Unit</td>
<td>Director of G.Ps Unit</td>
</tr>
</tbody>
</table>
the sequence of operation(E):

1. Start
2. Promoting and marketing the output of graduation project from the beginning
3. Coordinating the suitable date of the exhibition
4. Coordinating of interview with marketing agencies
5. Sending the invitation to the involved people
6. Holding the exhibition
7. Holding marketing and interview
8. Marketing the successful projects
9. End

Model E.1
نموذج المعرض 1

<table>
<thead>
<tr>
<th>اسم المشروع التنفيذي: تسويق مشاريع التخرج</th>
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التاريخ: 2010/ /

المنشأ:_____________________________

المشرف:

اسم المشرف:
رقم الجوال:
بريد الإلكتروني:

أسماء الطلبة

الطالب الأول:
رقم الجوال:
بريد الإلكتروني:

الطالب الأول:
رقم الجوال:
بريد الإلكتروني:

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<th>عدد الصفحات</th>
<th>رقم الإصدار</th>
<th>رقم النموذج</th>
<th>تابع لطريقة العمل</th>
<th>تاريخ الإصدار</th>
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<td>2010/5/5</td>
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</table>
نموذج المعرض 1

التاريخ: 5/5/2010

الطالب الأول: ______________________________

رقم الجوال: ____________________________

البريد الإلكتروني: _______________________

وصف المشروع وفوائده:

الاحتياجات اللازمة لعرض المشروع في معرض الإبداعات الهندسية

المساحة: ________________________________

احتياجات أخرى:

- كمبيوتر
- كمبيوتر محمول
- توصيلات كهربائية

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<thead>
<tr>
<th>رقم الصفحة</th>
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<th>رقم الإصدار</th>
<th>رقم النموذج</th>
<th>تابع لطريقة العمل</th>
<th>تاريخ الإصدار</th>
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<td>1.00</td>
<td>E.1</td>
<td>E</td>
<td>5/5/2010</td>
</tr>
</tbody>
</table>
Chapter 5 Conclusions and Recommendations
Conclusions and Recommendations

Last but not the least, we can deduce from the above analysis and presentation of models and procedures proposed, we would like to note that for each system done by human, blunders and mistakes can be avoided by trial and error, but we put in your hands what can be applied actually not only in theory. However, we also refer to mention what we conclude from our experience and our work on this project:

Existence of an administrative body links between University in general with local market sectors is great, easy to talk about, but if we are talking about good outcomes of this body there must be Seriousness by the parties concerned. This unit is not only a formal unit, but also an effective unit which can accomplish a lot, but also need a lot of merging of efforts to accomplish its mission, as mentioned above.

Also we suggest sentences of recommendations that will be supportive action to the graduation projects, as well as will support the university variously:

1. Develop a database in the productive field.
2. Action guide for graduation projects, where this guide contains:
   - Giving the serial number for each project
   - The name of the group - Students
   - Summary of the project
   - Appropriate image, if any, for each student participant in the project until it is to take advantage of those employed in the future.
3. Amendment to some courses such as course of community service and course of leadership communication skills, that they are special of faculty of engineering to develop the skills of engineers, so aims to provide community service in his field and preferably that the students took this course in a fourth or a fifth studying year, after to have the ability to deal with community and community service be possible parallel with training in another place. For the English course for example in the workplace, preferably taken in the first years of the study and to refine the student's personality and the
development of various skills for the student to be able to cope with the difficulties faced by students in recent years.

4. Enhance communication with the media through the establishment of an engineering media unit within Tawasol Centre and its importance appear in the following:

- Transfer the outputs of engineering faculty to the media.
- Bring General Engineering information (Engineering News).
- May have authority over the engineering and control
- Increase the engineering culture in the community through the dissemination of information and engineering publications.

5. Provision of special rooms equipped with all necessary equipment for the work of discussions of graduation Projects.

6. Faculty of Engineering in An-Najah University has a good number of physical projects that need physical supports mainly, we recommend to provide the workshops in the Faculty with enough supports to cover students and projects needs.
Our graduation project in first semester was based on guidance of our supervisor Dr. Ahmad Al-Ramahi, and collecting data either from libraries, internet or from Interviews with professors and teachers in Faculty of Engineering, where we were discussing and asking questions, we can mention group of sources and references that we quoted some information from, as following:

**References**

1. **North Carolina High School Graduation Project Handbook.**
   
   Source of Handbook:
   

2. **UNSW – The University of New South Wales.**
   

3. **J. H. Rose High School Graduation Project Handbook.**
   
   Website: [http://www.Pittschools.org/jh](http://www.Pittschools.org/jh)

4. **University of Tasmania.**
   
Appendix

A-0 List of Academic Staff
A-1 Industrial Engineering Department Checklist
A-2 Mechanical Engineering Department Checklist
A-3 Civil Engineering Department Checklist
A-4 Electrical Engineering Department Checklist
A-5 Chemical Engineering Department Checklist
A-6 Construction Engineering Department Checklist
A-7 Computer Engineering Department Checklist
### A-0 List of Academic Staff

<table>
<thead>
<tr>
<th>Department</th>
<th>Academic Staff</th>
</tr>
</thead>
</table>
| **Industrial Engineering Department** | ✓ Head of Department Eng. Sulaiman Al-Doaifee.  
                               | ✓ Dr. Ahmed Al-Ramahi.                                                        |
| **Mechanical Engineering Department** | ✓ Head of Department Dr. Basher Al-Noori  
                               | ✓ Eng. Iyad Assaf                                                            |
| **Chemical Engineering Department**  | ✓ Head of Department Dr. Abdulrahim Abu Al-Safa  
                               | ✓ Dr. Hassan Arafat                                                          |
| **Civil Engineering Department**     | ✓ Head of Department Dr. Essam Jrdaneh.  
                               | ✓ D. Hafez Shaheen                                                          |
|                                     | ✓ D. Khaled Al-Sahlee                                                      |
|                                     | ✓ M. Imad Qasim                                                            |
| **Electrical Engineering Department** | ✓ Head of Department Dr. Maher Khammash  
                               | ✓ Dr. Mazen Al-Rasegh                                                        |
|                                     | ✓ Dr. Samer Mayaleh                                                         |
| **Construction Engineering**         | ✓ Head of Department Dr. Mo'tasem Babaa.                                     |
| **Computer Engineering Department**  | ✓ Dr. Louay Malhees                                                         |
## A-1 Industrial Engineering Department Checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Department</th>
<th>Industrial Engineering</th>
</tr>
</thead>
</table>
| 1.   | 1. Mechanisms of determine the graduation project. (Project Idea) | - The Supervisor determines the idea of project for each group.  
- Some idea’s come from the industrial sector, and some done by coordinate with industrial sector. |
| 2.   | 2. Nature of Projects. (Studies, Physical, or Theoretical) | - Feasibility studies, Strategic plans.  
- Lean Manufacturing and Management, Projects work on design and manufacturing. |
| 3.   | 3. The Best way to determine the Idea’s of G.P that make good contacts With Local market. | - Depending on the problems, some problems must determined by the industrial sector, other determined by the Supervisor of the project and students. |
| 4.   | 4. Evaluation of contact between department and local market. | - Could be argued that fairly well. In another words its good contact, on contact with 30% of industrial sector. |
| 5.   | 5. Facilities & Requirements which always needed for establish the G.P’s. | - Depend on the type of project, in practical projects need engineering laboratories, some equipments which easily to obtained under budget. |
| 6.   | 6. The average cost of G.P’s, and how to be covered. | - Projects average cost ranged between (200-1000 JD) depending on the type of project.  
- 60% from above cost covered by the university. |
| 7.   | 7. Projects that have been adopted or were funded by other parties. | - Let's say that some of the projects adopted by private companies, or funded from the private sector, such as Al-Quds medicines and medical products.  
- Some projects covered in its first steps. |
| 8.   | 8. Nature of projects that achieve market satisfaction and requirements. | - All projects serve the Local market needs and industrial sector. |
| 9.   | 9. Problems and obstacles faced students during the implementation of the project | - High cost of G’P’s.  
- Large number of students in each group, number of graduate projects for each supervisor is high.  
- Complaint of weakness in the engineering laboratories, either technically or in terms of intensive use and lack of time for students to complete their projects. |
<table>
<thead>
<tr>
<th>Item/Department</th>
<th>Mechanical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mechanisms of determine the graduation project.</td>
<td>▪ A supervisor idea’s that depends on practical experience.</td>
</tr>
<tr>
<td></td>
<td>▪ By students themselves, either from researches or facing some problems that appear in life.</td>
</tr>
<tr>
<td>2. Nature of Projects.</td>
<td>▪ Theoretical projects (i.e. air conditioning).</td>
</tr>
<tr>
<td>(Studies, Physical, or Theoretical)</td>
<td>▪ Physical ‘Design’ projects like Robots and prill printer.</td>
</tr>
<tr>
<td>3. The Best way to determine the Idea’s of G.P that make good contacts With Local market.</td>
<td>▪ Depends on the problems which face Local market, or the requirement and need of market.</td>
</tr>
<tr>
<td>4. Evaluation of contact between department and local market.</td>
<td>▪ Weak, no enough communication with Local market, but still there is special communication outside university.</td>
</tr>
<tr>
<td>5. Facilities &amp; Requirements which always needed for establish the G.P’s.</td>
<td>▪ Engineering workshop, some mechanical parts and tools which the students buy.</td>
</tr>
<tr>
<td></td>
<td>▪ Workshops used outside the university.</td>
</tr>
<tr>
<td>6. The average cost of G.P’s, and how to be covered.</td>
<td>▪ Depend on nature of the projects, practical projects just like design the average cost between 500-5000$.</td>
</tr>
<tr>
<td></td>
<td>▪ Covered by students, in some cases the university cover apart of total amount doesn’t exceed 60%.</td>
</tr>
<tr>
<td>7. Projects that have been adopted or were funded by other parties.</td>
<td>▪ Some projects like prill printer or basketball ring.</td>
</tr>
<tr>
<td></td>
<td>▪ Some covered at first steps of project, but the most after seeing the results.</td>
</tr>
<tr>
<td>8. Nature of projects that achieve market satisfaction and requirements.</td>
<td>▪ Most practical &amp; physical project that serve market (i.e. sun heater).</td>
</tr>
<tr>
<td>9. Problems and obstacles faced students during the implementation of the project</td>
<td>▪ Problems in collecting data, High project cost.</td>
</tr>
<tr>
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<td>▪ Scarcity of the market from mechanical parts required likes motors, and having difficult to get it.</td>
</tr>
</tbody>
</table>
# A-3 Civil Engineering Department Checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Department</th>
<th>Civil Engineering</th>
</tr>
</thead>
</table>
| 1.   | Mechanisms of determine the graduation project. (Project Idea) | Students collect a number of project’s ideas and the supervisor selects the most appropriate.  
Or the supervisor displays a number of projects. |
| 2.   | Nature of Projects. (Studies, Physical, or Theoretical) | Most is practical, exceed 90%.  
Studies 10%. |
| 3.   | The Best way to determine the Idea’s of G.P that make good contacts With Local market. | Combination of two methods, the idea of harmony between the supervisor and the idea of student |
| 4.   | Evaluation of contact between department and local market. | Unanimously very weak and virtually non-existent.  
The communication is between students and engineering offices. |
| 5.   | Facilities & Requirements which always needed for establish the G.P’s. | Geometric designs.  
Desktop PC’s equipped with SAP Program at least.  
Tables’ structural design that gives the laws of construction and are available at the University.  
Field devices, cameras, simple equipment available in the university |
| 6.   | The average cost of G.P’s and how to be covered. | No cost for the projects comparing with other department’s projects. |
| 7.   | Projects that have been adopted or were funded by other parties. | There is no funding from outside companies.  
But some projects are adopted such as the Palestinian Legislative Council, and the Faculty of Engineering project in An-Najah University.  
All projects adopted were after accomplished, but the only project was the communication project it was adopted by UN before beginning. |
Road design, transportation planning projects, and can integrate them. |
| 9.   | Problems and obstacles faced students during the implementation of the project | Limited availability of data  
The lack of some services at the university and is borrowed from outside companies. |
<table>
<thead>
<tr>
<th>Item</th>
<th>Department</th>
<th>Electrical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mechanisms of determine the graduation project. (Project Idea)</td>
<td>▪ Depend on the large proportion of the Project Supervisor, without ignoring the ideas of students. This means that there is an agreement between Dr. (supervisor) and a group of students.</td>
</tr>
<tr>
<td>2.</td>
<td>Nature of Projects. (Studies, Physical, or Theoretical)</td>
<td>▪ A high proportion of projects Hardware 'Physical', which go beyond the 90%, and the remaining low percentage, Studies, Research.</td>
</tr>
<tr>
<td>3.</td>
<td>The Best way to determine the Idea’s of G.P that make good contacts With Local market.</td>
<td>▪ The project should cover the greatest possible courses that the student studied so as to harmonize with what serves the market (market need love). ▪ The idea eventually selected by supervisor on his experience to determine if the project is viable.</td>
</tr>
<tr>
<td>4.</td>
<td>Evaluation of contact between department and local market.</td>
<td>▪ Unanimously very weak and virtually non-existent, with knowledge that there is engineering unions that directed the universities in developed countries.</td>
</tr>
<tr>
<td>5.</td>
<td>Facilities &amp; Requirements which always needed for establish the G.P’s.</td>
<td>▪ Workshop where electricity is available the necessary equipment to cover the project, the university offers these devices by 90%. ▪ Tools and Technology pieces that must be available in the market which does not allow the occupation forces.</td>
</tr>
<tr>
<td>6.</td>
<td>The average cost of G.P’s, and how to be covered.</td>
<td>▪ Total project cost between $ 200 -700 $ is covered by the students themselves. ▪ In very rarely by The University of the amount does not exceed 50%.</td>
</tr>
<tr>
<td>7.</td>
<td>Projects that have been adopted or were funded by other parties.</td>
<td>▪ Did not exceed the adopted projects of 15%. ▪ Striking is funding of a project for a group of students in excess of $ 100,000.</td>
</tr>
<tr>
<td>8.</td>
<td>Nature of projects that achieve market satisfaction and requirements.</td>
<td>▪ Which bear the stamp of High Technology so to speak, and projects related to control. ▪ While in the field of communication was very difficult, for the high cost and needs for high-Technologies lacking in our markets.</td>
</tr>
<tr>
<td>9.</td>
<td>Problems and obstacles faced students during the implementation of the project.</td>
<td>▪ Void in the labor market, a lack of financiers and sponsors of the projects which reduce the Hamas student. ▪ Lack of parts and modern technological equipment to prevent it, whether by occupation or for the very high cost, Laboratories suffer from technological backwardness. ▪ Bad management or lack of time management and the many constraints faced by the student.</td>
</tr>
</tbody>
</table>
A-5 Chemical Engineering Department Checklist

<table>
<thead>
<tr>
<th>Item\Department</th>
<th>Chemical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mechanisms of determine the graduation project. (Project Idea)</td>
<td>▪ The supervisor will determine the idea of project for each group. ▪ Some special cases the students bring the idea of project.</td>
</tr>
<tr>
<td>3. The Best way to determine the Idea’s of G.P that make good contacts With Local market.</td>
<td>▪ The way in which the supervisor followed is good enough according to the academic staff.</td>
</tr>
<tr>
<td>4. Evaluation of contact between department and local market.</td>
<td>▪ Most of projects have a good contact with local markets, serving the market with the feedback they got.</td>
</tr>
<tr>
<td>5. Facilities &amp; Requirements which always needed for establish the G.P’s.</td>
<td>▪ Labs, Scientific centers, sometimes students manufacture the required instruments. ▪ Equipments and compounds from outside.</td>
</tr>
<tr>
<td>6. The average cost of G.P’s, and how to be covered.</td>
<td>▪ 100-800 $, in some cases above this average. ▪ Most of the G.P’s covered by the students themselves, in some cases the university covers part of the costs, sometimes the industry sector cover and support some special projects.</td>
</tr>
<tr>
<td>7. Projects that have been adopted or were funded by other parties.</td>
<td>▪ There were projects such as those relating to paint, health care. ▪ E.g. Al-Safa Project</td>
</tr>
<tr>
<td>9. Problems and obstacles faced students during the implementation of the project</td>
<td>▪ Scarcity of some resources and equipment that not available in local markets. ▪ High cost.</td>
</tr>
<tr>
<td>Item\Department</td>
<td>Construction Engineering</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 1. Mechanisms of determine the graduation project. (Project Idea) | ▪ A supervisor idea’s showed to his students and they select a suitable one.  
▪ Students collect some ideas about the project from here and there. |
| 2. Nature of Projects. (Studies, Physical, or Theoretical) | ▪ In the most was practical, exceed 70%.  
▪ Some cases studies 10-20%. |
| 3. The Best way to determine the Idea’s of G.P that make good contacts With Local market. | ▪ The student search for idea’s either from markets needs and problems or from the different sources of data like internet, libraries, or engineering offices. But the idea eventually selected by supervisor on his experience to determine if the project is viable. |
| 4. Evaluation of contact between department and local market. | ▪ Weak, and virtually non-existent.  
▪ The communication is between students and engineering offices. |
| 5. Facilities & Requirements which always needed for establish the G.P’s. | ▪ Desktop PC’s.  
▪ Tables’ structural design that gives the laws of construction and are available at the University.  
▪ Field devices, cameras, simple equipment available in the university. |
| 6. The average cost of G.P’s and how to be covered. | ▪ No cost for the projects comparing with other department’s projects. |
| 7. Projects that have been adopted or were funded by other parties. | ▪ Rarely happened that a company adopted a project at first steps, but there is some projects adopted but it was less than 10%. |
| 8. Nature of projects that achieve market satisfaction and requirements. | ▪ Projects that are directly related to the environment and systems engineering services buildings and construction technology and building construction and construction management. |
| 9. Problems and obstacles faced students during the implementation of the project | ▪ Limited availability of data  
▪ The lack of some services at the university and is borrowed from outside companies. |
### A-7 Computer Engineering Department Checklist

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<th>Item</th>
<th>Department</th>
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<td>1. Mechanisms of determine the graduation project.</td>
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| (Project Idea) | ▪ Working relationship between the teaching staff and the market, the Supervisor determines the idea of project for each group.  
▪ Creation idea’s come by students themselves, or from summer practical training. |
| (Studies, Physical, or Theoretical) | ▪ Only Physical, programming, and some hardware. |
| 3. The Best way to determine the Idea’s of G.P that make good contacts With Local market. | ▪ Choosing the projects that aim to give a good service to local markets, intersecting with increasing the skills of students. |
| 4. Evaluation of contact between department and local market. | ▪ There is no communication or direct connection with local market. |
| 5. Facilities & Requirements which always needed for establish the G.P’s. | ▪ CAD/CAM Laboratory, Engineering Workshop, wood boxes, LCD projector, some sensors, iron wires, previous projects. |
| 6. The average cost of G.P’s, and how to be covered. | ▪ 100-500 NIS, covered by students themselves.  
▪ Some cases the projects are highly cost, the university cover part of the total cost. |
| 7. Projects that have been adopted or were funded by other parties. | ▪ Some projects covered in its first steps, but in general the projects adopted at presenting the work. |
| 8. Nature of projects that achieve market satisfaction and requirements. | ▪ Internet projects can achieve market requirement & needed, also hardware that compete in price. |
| 9. Problems and obstacles faced students during the implementation of the project | ▪ Missing some hardware’s, sensors, and electronic pieces. |