**Chapter One**

* **Introduction**
* **Background Information**

Defense Engineering College established in 1997, by Ministry of National Defense to produce highly professional and technically efficient military. The driving force for establishing DEC, among other things, was that Minster of National Defense did not have sufficient technical military personnel and that the higher institutions did not have programs compatible with the demands of Minster of National Defense. On its effort to achieve academic excellence, the college community goes through many days to day functions. In each department there are many students, teachers, assistants, staff members and leaders which are actively participating in the education tasks.

In the world of rapidly changing technology environment and new inventions reach us every day which may or may not help us to attain our goal, members of the community specially students frustrate on choosing the best technology and to be in line with the rest of the world. Graduate students of the college face problems when they join the work force because most of the technologies they learn and the technologies in the real-world experience are far apart. They start to struggle to be competent when they join the task force. This show us that being competent only on the curriculum-based learning will not meet the aim of the organization.

The college have been producing highly professional and technically efficient military personnel for the past twenty-two years. Hence the college have a large pool of community members which can help students and the community with their real-world experience. One of the best ways to get practice is to look for problems and challenges posted on forums related to the technology, questions from people who are trying to use the technology in the real world.

* **Statement of the problem**

To produce highly professional and technically efficient graduates from the college using only the current and which has been revised before 11 years’ curriculum and methodology is not feasible specially at the time being where the technology changes rapidly and new and better ways of doing things has grown as never before. For students and teachers learning and teaching what the curriculum provide will not make them competent and as effective as the rest of the world and understanding the subject matter only will not meet the aim of the organization.

The current condition in the college has the following limitations.

* Sharing experience and idea between community of the college is a great problem.
* The curriculum is not revised to be in line with the current technology.
* Students doesn’t have any relation with senior community of the collage.
* There is no online platform that connect the community of the collage.
* Junior students don’t get information prior to teachers about their courses. They don’t  
  have the chance to learn by their Owen self.
* Senior students and graduates of the DUCE doesn’t have a means to share their experience with the students.
* Students and teachers doesn’t have a means to discuss about the subject matter and other things other than personal contact.
* Teachers don’t have an online platform to recommend sites, video channels, forums, references, blogs and this enforces them to do it for every class they teach and they don’t have the chance to reach for all community members.
* Going every time to department to read notice is waste of time and energy thing to do.
* Because the other platforms are developed for general purpose the community uses many sites to accomplish their need.
* Most of the students doesn’t get the chance to participate on big events in the country because they didn’t have the information.
* Students doesn’t have a clear idea on what is expected from them when they join the working environment.
* **Objective of the project**
* **General Objective**

The general objective of this project is to develop a system that will reduce the gap between the current curriculum and the rapidly changing technologies in the information technology world.

* **Specific Objective**
* To understand the problems that the community is facing to be in line with the current technologies.
* To implement discussion forums that the community will participate on specific topics.
* To implement a platform to update the community on the current technologies.
* To implement a platform to announce the community on outside and college events and on other relevant announcements.
* To implement a platform that will make the community to share their ideas and experience.
* To provide a platform that will make users to have their own profile and edit whenever they want.
* To implement a way to filter contents that are
* Abusive words
* Advertisements
* Not relevant to the aim of the system
* To provide an approval mechanism on the ways the information will be shared.
* **Significance of the project**

The development of this project is significant because, the system will make the students to be able to know the real-world technologies. The system will help the students in guiding what they should master other than their subject matter and have an understanding of what is expected from them when they join the working environment. The system will also help teachers to get insight on real world technologies and make them able to help their students in a better way. The graduated students of the college will have the chance to help their college students and since they know, the struggle they face on their journey these will help the students even more. Most importantly this will project will help the college at achieving its aim which is to produce highly professional and technically efficient military.

A prime benefit of knowing the current technological advancements and the experience of the working force will make the students relate on the subject matter they are learning and have an insight on how to implement what they are learning.

* **Beneficiaries of the project**

Generally, a beneficiary is an institution or person who receives benefit from a particular entity  
or system. As a general beneficiary since the project is based on the problems observed and  
existing in the College. The primary beneficiary of this project is going to be Defence  
Engineering College. Specifically, teachers, students, staff members and alumni of the  
college will be able to use the system.

All Ethiopian military colleges and universities are also beneficiary since the platform is  
going to be dynamic. Example health Science College has almost similar work area in their  
college with defense engineering college and they can use this system

All universities and colleges of Ethiopia can use this project for sharing experience, build their  
Owen e-learning database to increase social interaction and forums, to construct knowledge without lecture in the class, to update the curriculum easy and put it online for concerned people.

Since this project have like the behavior of social networking sites like Facebook, Gmail LinkedIn, it can be used in all Ethiopian military force organizations like in air force (to share  
job experience and students who are learning pilot), in defense companies (for exchange of data and database of social interaction for the workers) and for organizing staff members information in one database. Since huge projects are being done in all companies, the projects will get a platform that can organize the projects into its department. Forums to discuss the things they are doing and to share their progress. They can also use to announce events, meetings, or inform the members on current issues.

**Application area**

At the beginning, the main users of this system are DUCE community but the number of users will grow and encompass others who want to contribute for the community.

* **Methodology**
* **Data collection methodology**

This project will use the following methodologies for the following different tasks: -

* Interview
* On job observation
* Review of relevant documents
* Review of similar platforms
* System development Methodology

OOP is a programming methodology based on objects, which is concerned to develop application on real time, so more emphasis is given on data unlike the other programming Styles like structured or functional.

* **Development Environment and programming tool**

The following development environments and programming tools are selected based on the following criteria:

* Primarily team members experience with the tools and Software.
* By the rate given to the software’s in different sites.
* The features that the tools have to make the project more effective.
* Operating system:
* Windows 10
* Data base:
* MongoDB
* Scripting language:
* express,
* JavaScript
* Front end language:
* HTML,
* CSS,
* Bootstrap,
* EJS(React)
* Server:
* NodeJS
* Tracking changes
* Git- local repository
* GitHub-remote repository
* Text editor:
* Visual studio code
* MS word 2016- for all word processing tasks and documentations.
* Postman for testing backend routes
* Visio 2016 to draw diagrams.
* **Testing Procedure**

Software testing is an activity to check whether the actual results match the expected results  
and to ensure that the software system is Defect free. It involves execution of a software component or system component to evaluate one or more properties of interest. Software testing also helps to identify errors, gaps or missing requirements in contrary to the actual requirements. It can be either done manually or using automated tools. Some prefer saying Software testing as a white box and **Black Box Testing.**

We will conduct the following tests

* Unit Testing
* Integration Testing
* System Testing
* Stress Testing
* Performance Testing
* Usability Testing  
  In testing the functionality of the website the following will be tested:

**Link test**i. Internal Links  
ii. External Links  
iii. Broken Links  
**Forms test**i. Field validation  
ii. Error message for wrong input  
iii. Optional and Mandatory fields  
**Session Test**i. Session handling  
**Database test**Testing will be done on the database integrity

* **Scope of the project**

Our project mainly focusses on teachers, students, alumni’s and on the community members who are organized under different departments. The scope of this project is limited by the activity that is done by the stakeholders of this project. And the stakeholders are teachers, students, alumni, and other members of the community. This project aims at supporting the learning process and improving the performance for the DUCE community and the project in its first phase will be applicable only on this community.

* Teachers, students, alumni and other members of the community who created an account will have access to having their own profile, participating in the chat, raising a discussion point on forums, answering questions and suggestions on the forums, and giving comment’s and likes for posts.
* Moderators will have a privilege as all signup users and in addition they will have the privilege to create posts, to make announcements.
* The top admin will have the privilege to select moderators and to filter contents in forums, message and posts.
* Gusts who doesn’t sign up will have access to see publicly available contents.
* **Risk, Assumption and Constraints**
* **Risk**

Risk Identification in the project is critical in order to manage and complete the project successfully. A risk factor is a situation that may give rise to one or more project risks. A risk factor itself doesn’t cause you to miss a product, schedule, or resource target. However, it increases the chances that something may happen that will cause you to miss one.

|  |  |  |
| --- | --- | --- |
| Risk | Description | Mitigation |
| Risks | * To attain expected benefit from the project * To estimate accurate project cost estimates * To estimate accurate project duration | * Understanding the users’ requirements very well will improve the benefits of the project, * To approach estimation for accuracies of the project cost and duration feasibility study is used. |

* **Assumptions**

Assumptions are external factors that have the potential to influence (or even determine) the success of a project, but lie outside the direct control of project managers. They are the answer to the question: “What external factors may impact project implementation and the long-term sustainability of benefits, but are outside project team’s control?”

* **Constraints**

Project constraints are anything that restricts or dictates the actions of the project team. That can cover a lot of territory. The triple constraints—time, resources, and quality are the big hitters, and every project has one or two, if not all three, of the triple constraints as a project driver. Many projects in the Information Technology area, for instance, are driven by time.

|  |  |
| --- | --- |
| Assumption and Constraints | Description |
| Constraint | Time and material resources |
| Assumptions |  |
|  |  |

* **Project organization**

A project organization is a structure that facilitates the coordination and implementation of

project activities. Its main reason is to create an environment that fosters interactions among

the team members with a minimum amount of disruptions, overlaps and conflict.



Figure 1- 1: project organization detail work structure with the team members.



Figure 1.2: Project organization and role of team members.

**Feasibility study**

The six types of feasibility are described as follows:

**Economic feasibility**

**Benefits**: Benefits are further divided into tangible and intangible benefits (Hoffer, 2000).

**Tangible benefits**: are benefits derived from the creation of an information system that can be

measured in Birr and with consistency such as:

* The great advantage of e-learning is the flexibility it affords to all participants
* E-learning and discussions in particular, can support learning that is not always tutor/teacher-centered, your role will be important, especially as an online community begins to develop.
* A group of students can become a community to participants who begin to grow in their understanding of course material and individual contributions to the knowledge construction process.
* Very flexible and more convenient system for users.
* Simple message exchanging.

**Intangible benefits**: are benefits derived from the creation of an information system that

cannot be easily measured with money and with consistency such as:

* Increasing student moral of learning by oneself
* Increase teachers’ moral to get and share resource materials, blogs and ideologies.
* Makes the college one of few colleges using this technology.

Costs: The team may further classify these costs as tangible and intangible costs.

**Tangible costs**: are costs associated with an information system that can be measured in Birr

and with certainty such as:

* Hardware costs
* Labor costs
* Operational costs

**Intangible costs**: are costs associated with an information system that can’t be easily

measured in Birr and with certainty such as:

* Loss of teachers’ moral to use the system
* Loss of students’ moral to use the system
* Loss of Alumni’s moral to use the system

**Technical feasibility**

Although a technical training is necessary to introduce the new technology, the system is going

to be developed according the target users of our campus there will not be any technical

difficulty in implementing and using the system. We believe that the system will be easily

familiarized with the teachers, students and different level administrators.

**Operational feasibility**

In order users like students, teachers, community members and administrators use the full

features of the system effectively; they need training on how to use the system. More than the

training they get it is known that using the system and exploring it repeatedly will help them to

know it fast. Having this in mind we believe that the system is operationally feasible.

**Schedule feasibility**

According to our time plan, all of the objective of the project will be done in line with time

schedule. Even though it is difficult to forecast the things that are going to happen in the

feature, based on the time taken to accomplish every module of the project we believe that it is

schedule feasible.

**Political feasibility**

The development and implementation of this system will be use-full for students, teachers and

departments for learning, teaching and filling the gap between departments and community

members in information respectively, it will have a positive impact on the system and the

campus.

**Legal and Contractual feasibility**

The only agreement that we have regarding this system is with the department of computer and

information technology of defense engineering college. Because of this the system is free from

any legal contractual risks.

**Estimated Project Cost and time table**

* Estimated Project Cost

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Material** | | **Minimum Requirement** | **Quantity** | **Estimated price (ETB)** |
| 1 | Computer | | -200 GB Hard Disk  -4GB RAM  -Core i5 processor (x64 based) | 1 | 20,000.00 |
| 2 | Paper | | A4 size | 5000 | 150.00 |
| 3 | Typing Cost | | | 200.00 | |
| 4 | | Printing cost | | 300.00 | |
| 5 | | Binding cost | | 200.00 | |
| 6 | | Proposal | | 500.00 | |
| 7 | | Data collection | | 500.00 | |
| 8 | | System analysis and design | | 500.00 | |
| 9 | | Implementation | | 1000.00 | |
|  | | **TOTAL** | | **23,700.00** | |

* **Work plan of the project**

