

A Feasibility Study

for

JU Online Exam Form Fill up

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Introduction

We know that the exam registration system of our University is a long term analog system. This process waste valuable times of any student. This feasibility analysis is prepared for an automated and online exam registration system for Jahangirnagar University. This university is one of the best universities of Bangladesh. Here the students have to register before appearing on the examination. The reason for this exam registration is to determine which and how many student are going to appear in the examination. This registration process is divided into several phases which have to be completed individually. This registration process is manual so far and the students have to be physically present in different offices for completing the registration process. Now the university authority has decided to make the registration system automated and online to reduce the hassle of the students. The first part of this feasibility analysis report provides **the objectives of making this report**. Later there is **a short description of the old system and the necessity of the new online system**. Later there is **a description of the proposed system**. Then the scope of this project has been described. The later part analyzes **the feasibility of this project**. This report analyzes the **financial feasibility, technical feasibility, behavioral feasibility and operational feasibility** of this proposed project. At the end of this report there are recommendations and conclusion.

Objectives of this Feasibility Analysis Report

The main objective of this report is to determine whether the proposed system is possible from different points of views. The objectives are:

- ☐ Gather information about the project and develop an outline of the tasks of the project so that the approximate cost of the project can be estimated. This approximation will be matched with the budget of the project provided by the stakeholders.
- ☐ Determine whether the functions of this projects are possible to make with the current technologies in hand and if it is technically sound. The current technical ability will be matched with the required technology for the development of the proposed system.
- ☐ Determine whether this system will be accepted and used by the students that represents the behavioral feasibility of the process. This will determine how the system will be accepted by the students and will they use it.
- ☐ To find to which extent the proposed system will solve the current problems of analog examination registration system and how the system will be suitable for the university.
- ☐ To find out the possible challenges in the way of building the system and finding possible remedies of those problems. Alternative solutions will also be provided in case of severe challenge.

Description of the existing system

The current registration system is tedious and analog where the students have to be present physically in different offices. Workflow of the current system is given below:

- (i) Students have to collect a registration form from the respective hall office
 - (ii) The form have to be filled in by hand following the specified instruction in the form.
 - (iii) Then the form have to be submitted to the department office for the signature of the honorable chairman.
 - (iv) After the form is signed by the chairman of the department it is to be submitted to the respective hall office.
 - (v) All the dues of the residential halls have to be cleared and then the form will be signature by the hall provost.
 - (vi) Students have to pay the examination fees in the bank and collet the pay slips.
 - (vii) This pay slip and the registration form have to be brought into the registrar office where the dues will be checked and the form will be signed by an officer.
- In the last step this form have to be submitted to the examination control office and the admit cards will be collected from the department.

Why the automated and online system is required

The need of the automated and online system arises because there are some drawbacks of the system.

Firstly the system is very time consuming. The students have to go in different office and stand in the queue which takes a lot of time to get the works done. Besides getting the signature of departmental chairman and hall provost is dependent on their availability which also consumes time. Here is the need of an online system which will save much time.

Secondly, the whole process is very tedious and error pron. Students have to be present physically in different offices to complete different parts of the registration process which is very tiresome. To remove this drawback an automated and online system is necessary through which the students will be able to register for the exam at home.

The present system is costly for the students as they have to roam from offices to offices. If the registration can be done online it will be very cost effective for the students.

Security of the data is a big issue for this manual registration system. Any kind of student data can be compromised and there is a high chance of data loss. As there is no central database system the student registration information is vulnerable to loss and a student may not get the admit card because of any kind of data loss due to the unconsciousness of the employees or students who are involved in this manual system.

An online registration system will store all the data in the centralized database and will keep backup for the data. This automated system is less error pron than the manual registration system.

Overview of the proposed system

The proposed system is a web based application that allows students to register online providing the required details. It adopts the online payment feature that was seen in the Jahangirnagar University before.

The system will have an interactive user interface which will be convenient to the users. This user interface will be used to collect information from the students in an interactive manner.

Each student will be provided with unique id and password which will have to be submitted to the system before the registration process begins. This is for the authentication of the student. If the student is verified as a valid student then the registration form will appear in the user interface.

The student will have to fill out the form with required information.

The system is interactive and no invalid information will be taken as input. After verifying the information the information will be saved in the database. The chairman of respective department and provost of the respective hall will verify the information state the student as clear to appear in the examination.

When the student is clear to appear in the examination then the payment process comes. Student will not have to go to the bank and rather the payment will be done through some options. The options include DBBL Mobile Banking, Bkash, Mobicash and UCBL Xoom (A paypal service).

After all the dues are cleared through these payments the student will be given the admit card in PDF format which have to be printed and brought in the examination hall.

Technical Overview of the system

The system is an object-oriented programming system, implemented using the Spring MVC framework which is a JAVA framework that provides a set of tools for the construction of fault-tolerant distributed applications. Objects obtain desired properties such as concurrency control and persistence by inheriting suitable base classes. The system supports the computational model of nested atomic actions (nested atomic transactions) controlling operations on persistent (long-lived) objects. Atomic actions guarantee consistency in the presence of failures and concurrent users, and objects can be replicated on distinct nodes in order to obtain high availability.

Distributed execution in the system is based upon the *client-server* model: using the remote procedure call mechanism (RPC), a client invokes operations on remote objects which are held within server processes. Distribution transparency is achieved through a stub generation tool that provides client and server stub code that hides the distributed nature of the invocation. The client stub object is the proxy of the remote object in the client's address space; it has the same operations as the remote object, each of which is responsible for invoking the corresponding operation on the server stub object, which then calls the actual object.

Based upon the experiences of the manual registration process, it was anticipated that 100 front-end machines would be necessary for the purposes of the registration exercise. These machines (PC-compatible machines and Apple Macintosh systems), would be distributed throughout the University campus. For each of these two types of machine, a user friendly interface program (*front-end*) was written, which would display the equivalent of the original paper registration form. But the number of students is an issue for the 100 machines. For this the system is compatible with smartphone technology and students can also register through their android or iOS smartphones which will reduce the need of disposable front end machines.

It is important that the student information is stored and manipulated in a manner which protects it from machine crashes. Furthermore, this information should be made accessible from anywhere in the campus, and kept consistent despite concurrent accesses. Therefore, a distributed information store (the *registration database*) was built using the facilities provided by the system. The database represents each student record as a separate persistent object (approximately 1024 bytes), the *StudentRecord*, which is responsible for its own concurrency control, state management, and replication. This enables update operations on different student records (StudentRecord objects) to occur concurrently, improving the throughput of the system. Each

StudentRecord object was manipulated within the scope of an atomic action, which was begun whenever a front-end system requested access to the student data; this registration action may modify the student record, or simply terminate without modifying the data, depending upon the front-end user's requirements.

At the start of each registration day each front-end system is connected by a TCP connection to one of the five HP710 UNIX systems. One process for each connected front-end is created on the UNIX system; this process is responsible for interpreting the messages from the front-end and translating them into corresponding operations on the registration database. This is the system's *client* process mentioned earlier, and typically existed for the day. In order to balance the load on these systems, each user was asked to connect to a particular client system. If that system was unavailable, then the user was asked to try a particular backup system from among the other machines.

Having described the overall system architecture we shall now examine the operation of the registration system, showing how existing students were registered, new students were added to the system, and the data was examined.

Feasibility Study

Financial feasibility

Being a web application the proposed system will have an associated hosting cost. The hosting is required for the storage of student information who have registered for the examination. Most of the data transferred through the system is in text format. Since the system doesn't consist of any multimedia data transfer, bandwidth required for the operation of this application is very low. The system will follow the freeware software standards. No cost will be charged from the students. The system has to be maintained properly and regularly. Bug fixes and maintaining tasks will have an associated cost. At the initial stage the potential market space will be the local universities and higher educational institutes.

Beside the associated cost, there will be many benefits for the students. Especially the extra effort that is associated with manual registration system will be significantly reduced while the effort to create admit card for each student, since admit card generation is fully automated.

From these it's clear that the project is financially feasible.

Technical feasibility

The project is a complete web based application. The Spring MVC framework will be used for this development. The main technologies and tools that are associated with the project are

- ☐ HTML
- ☐ CSS
- ☐ JSP
- ☐ MySQL
- ☐ JS
- ☐ NetBeans
- ☐ Diagram drawing tools
 - NCLASS
 - Microsoft Project
 - Visio
 - Draw.IO

Each of the technologies are freely available and the technical skills required are manageable. Time limitations of the product development and the ease of implementing using these technologies are synchronized. Initially the web site will be hosted in a free web hosting space, but for later implementations it will be hosted in a paid web hosting space with a sufficient bandwidth. Bandwidth required in this application is very low, since it doesn't incorporate any multimedia aspect.

From these it's clear that the project is technically feasible

Operational feasibility

The university is in need of an online examination registration system which will aid the students to register for their examination in an easy, cost saving and time saving manner. The system should also be hassle free. The issue of security is also a concern.

The proposed system is online based so students can register for their examination by sitting anywhere. This will save much physical effort. Students won't have to roam in different offices for completing different parts of registration process. This reduces the hassle of the students. The roaming was very time consuming. The students now will be able to register for the exam very fast which saves a lot of time besides the system will be integrated and interactive.

All the information is saved into a central database and there will be backup for the database so the chance of data loss is reduced significantly. Since the whole system will be automated, the chance of human error is lesser than any time before.

So it can be said that the system is operationally feasible.

Behavioral feasibility

People are inherently resistant to change, and computers have been known to facilitate change. An estimate should be made of how strong a reaction the user staff is likely to have toward the development of a computerized system. It is common knowledge that computer installations have something to do with turnover, transfers, retraining, and changes in university status. Therefore, it is understandable that the introduction of a candidate system requires special effort to educate all the stakeholder and the users.

The main user of the system is the students. The students are tired of the manual exam registration system which is tedious. They want an online and automated system for a hassle free registration.

So the proposed will be accepted by the students cordially as the system is not being imposed to the students. Students themselves need the system.

The system is web based which has a full smartphone support. As most of the students of the university has computer knowledge so that will not be a problem for them to use it. Besides, smartphones are in all hands today. So the smartphone support will make the system more acceptable to the students.

So, it can be said that the proposed system is behaviorally feasible.

Considerations

Performance:

The system requires a very low bandwidth, hence the performance will not degrade with increasing number of potential users. At the development stage, a free hosting service will be used. But when installing the system to a real university environment, it will be hosted in a much more reliable server to increase the performance. MySQL will provide the adequate speed for database transactions. Since no big data analysis is done, MYSQL is the ideal database for this project.

Response time: less than 2 seconds

Processing time: Less than 2 seconds (no batch processing involved)

Query and reporting times: yet to be tested

Throughput: yet to be tested

Storage: yet to be tested

Security:

Security measures are provided in many aspects in this system.

User authentication:

Users will have to authenticate using the username and passwords. Depending on the access level each user will gain functionality of the system. Passwords can be changed by the user.

Login details:

Each user's login time and logout time will be recorded in the system, to make the tractability process easy in case of a faulty action.

Usability and ease of use:

Users will be provided with a complete user manual as a pdf. The interfaces are designed to make it easy for any potential user to get familiar with the system within one hour. No additional training is required to use the system.

Capacity and scalability:

The system can accommodate many simultaneous users. The system is designed to make it easy to integrate to an existing system like the Moodle system.

Availability:

System will be available throughout the 24 hours. Mean time to failure and mean time to repair will be decided to increase the availability. With a paid hosting space, the availability can be guaranteed to a great precision.

Conclusion

From the start Jahangirnagar University is using the manual examination registration system which is tedious and time consuming. The university authority has decided to make the online and automated which is a great decision. The system will reduce the times consumed and hassle faced by the students as well as the cost of the registration process. With this new project some considerations come along. The considerations are the feasibility of the system in different aspects. The above document has described different aspects of the proposed system and come to the conclusion that the proposed online and automated examination registration system is financially, technically, operationally and behaviorally feasible. This system also lessen the amount of human error which was possible in the manual system.