Automated CQI

Project Proposal

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1.1 Abstract

Currently, the CQI system of most of the educational institutes rely on websites like Google forms or paid websites like Anthology. Which either are not optimal for CQI or are just expensive yet non-interactive. The proposed system provides a free and interactive alternative to these problems that will be developed in such a way that it can be easily integrated in already existing systems. This proposed system will also enable the admin to see the outcomes in well represented visualisation and also let you download data in a convenient and usable format

1.2 Introduction

Continuous Quality Improvement (CQI) systems are widely used in higher education institutions to assess and improve the quality of education. University of Engineering and Technology has incorporated a system of elective subject registration and outcomes i.e., CLO, PLO, PEO, that can help administration predict if the quality of education is up to the mark or not.

Elective subject registration ensures registration of each student in specific subjects, no student can register more than specified number of subjects. CLO stands for course learning outcome which analyze the quality of course being taught on basis of teaching methodologies and the contents being taught in a course. PLO stands for Program Learning Outcome which is analyzed on the basis of achievement of CLOs. They help analyze if the content throughout the program has taught you well enough. And the last one is PEO which stands for Program Education Outcome, which is analysed through alumni, ex students of the university who are currently working in their respective fields. Purpose of PEO is to analyze

of the content taught was industry applicable and relative.

The traditional methods of collecting and analyzing student feedback data are often inefficient , time-consuming and far from being convenient. Therefore, there is a need for a more efficient and effective system that can streamline the process of data collection and analysis.

UET is currently using google forms and LMS for conducting their surveys. The major problems with using google forms as a CQI is first of all it may raise some security concerns, and second reason is it may not be integrated to other systems seamlessly like LMS, also it does not provide any kind of visualization and so does the current LMS, It is not quite user friendly and does not provide any kind of visualization of the data. On the other hand this system will be a one stop shop for all surveys and would be more user friendly compared to the other options available.

The motivation for this project stems from the need to improve the quality of education by providing a user-friendly and convenient platform for data collection and analysis. The proposed system will enable university administrators to gain insights into student experiences and make data-driven decisions to improve the quality of education.

This proposal outlines the development of a web application using the MySql Database, Express, React, and Node.js that aim to address the challenges of the traditional methods and improve the CQI process. The methodology for developing this system will involve conducting a needs analysis, designing a database schema, creating RESTful APIs using Express, building a user-friendly interface using React, and implementing data visualization tools using Chart.js. The system will also be tested for functionality, usability, and security.

The proposed system has the potential to be used by higher education institutions to improve the quality of education. It will provide a platform for efficient data collection, analysis, and visualization, enabling university administrators to gain insights into student experiences and make data-driven decisions to improve the quality of education..

1.3 Problem Statement

Inefficient , time-consuming and difficult to use traditional methods of collecting and analyzing student feedback data pose a challenge in higher education institutions, leading to delayed insights and decision-making. This highlights the need for a more optimized and user-friendly system that can facilitate efficient data

collection, analysis, and visualization. Such a system will enable university administrators to gain insights into student experiences and make informed decisions to improve the quality of education.

1.4 Objectives

The objectives behind this project are

- To provide an efficient system for registration of elective subjects.
- To provide an efficient, user friendly and quick system for conducting student surveys
- To provide insights obtained from the surveys in a usable and convenient format for further analysis
- To visualize the data in such manner that it is easy to comprehend and examine the change over time
- To enhance the overall quality of education by providing a platform for continuous quality improvement that maintains a record of Quality Enhancement over time

1.5 Scope and Features

The Scope of this project extends to

- Designing, developing, and implementing a web application that can collect, visualize, and provide data for further analysis from feedback data by students, faculty and alumni
- Maintain record of previous surveys over time
- Maintain Profile
- Add or remove Admins/Students/Teachers
- Create subject registration forms
- Create custom survey questions
- Create special surveys on occasions if needed
- Allow downloading data in a reusable format

The features of this project includes:

1. Login for Super Admin
2. Verification of admin credentials
3. Super Admin can add/remove Admins
4. Super Admin can add/remove Students
5. Super Admin can add/remove Teachers
6. Super Admin can make entries both by uploading .csv file or making an entry manually
7. Super Admin and Admins can create subject registration forms
8. Super Admin and Admins can create surveys
9. Super Admin and Admins can edit surveys
10. Super Admin and Admins can delete surveys
11. Super Admin and Admins can view survey reports
12. Super Admin and Admins can download survey reports in an Microsoft Excel file
13. Students, teachers, alumni can view and fill their respective surveys
14. Users will receive notifications

1.6 Tools and Technologies

1.6.1 Software Tools and Technologies

- Visual Studio Code for development
- MySql DB
- Express
- React.js
- Node.js
- Chart.js for visual representations of data

- Latex for Documentation
- JavaScript, XML, CSS, HTML
- Figma for UI/UX
- Draw.io for Wireframes/Diagrams

1.6.2 Hardware Tools and Technologies

- Our System is using a 64-bit Windows 10 Operating system
- 8GB RAM
- Intel(R) Core(TM) i5-6300U CPU @ 2.40 GHz

1.7 Proposed Methodology/System

This project is a survey taking web app that helps in Quality Enhancement for University of Engineering And Technology. This app has an admin side and a user side, admin side is responsible for creating the surveys and analysing the results while the user side is responsible for taking surveys through email.

The system will be developed using agile model which goes in a recursive manner until the product is finished developing.

- Requirements - This step involves gathering requirements for the project
- Design - This step involves designing the wireframes and user interface for the requirements
- Development - This step is the actual development of the designed interfaces
- Testing - This is the developer side of testing which means we make sure that the requirements are fulfilled at the developer side
- Deployment - This is the step where we make the project live and available for the user
- Review - In this step we take reviews from the user and resolve the issues faced by the end user

FIGURE 1.1: Agile Development

1.8 Related Work

This is a CQI website which enables admin to create and analyze surveys. Some other sites like this do exist in market as per now. Major difference between them and this project is that, this project is much more goal oriented and focuses on one major goal i.e., student reviews and quality enhancement of university, also all of these websites, despite being very interactive are still not very easy to use. Some of them are listed below.

1.8.1 Anthology

Since this is one of the most famous CQI system available for usage that co-relates to our goal of Quality enhancement for Educational Institutes. But it does have some limitations like it can be very difficult to use, and it is a paid app so that is not a good thing for obvious reasons. Limited customisability, is also one of the problems faced by Anthology user, although it does provide customisability to some extent but it does not provide complete customisability.
Also we can see that there form design is very basic which fails to gain user attention

1.8.2 Google Forms

Google forms is very useful software for conducting surveys since it is completely customisable and very easy to use. But the problem with using Google forms as a CQI system is we cannot have any kind of visualization for the data we received. So it is good for surveys that take place once or twice but not very useful as a

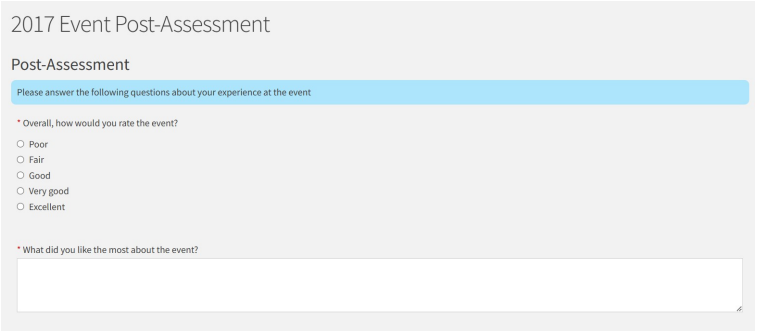

FIGURE 1.2: Anthology Designed form for University of Mississipi

system that needs to conduct these surveys regularly, also it might not integrate with existing systems seamlessly.

Even though Google forms provide many customisable and interactive templates, it is not designed to be a part of a system and will not provide data in Microsoft Excel form instead it gives data in Google sheets, but most of the analysis programs are designed to use Microsoft Excel format.

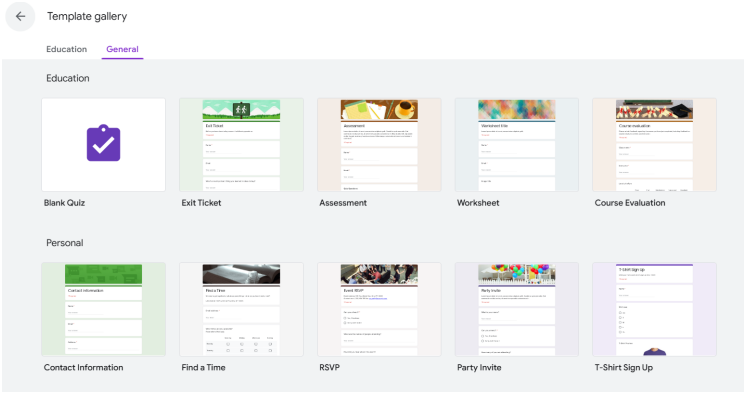

FIGURE 1.3: Google forms Templates

1.8.3 Continuous Quality Improvement in Higher Education

[7]One step toward meeting the demands of the public is for colleges and universities to examine their curricular, particularly in the areas of business, statistics, and engineering. For example, a few years ago, the College of Business at Rochester Institute of Technology (RIT) was experiencing a higher than average attrition rate at around the junior year. They surveyed students who had either switched majors or transferred institutions to find out why this was happening. Students repeatedly told the College of Business they had experienced feelings of alienation, primarily because they did not take any required business courses until their junior year and thus did not really feel part of that College. This response,

echoed by businesses that want to hire graduates with technical and people skills, led to development of a five-quarter sequence of courses required of all freshmen and sophomores in the College of Business, entitled "Business Concepts". During these five quarters, students engage in team building exercises, problem solving processes, and oral presentations, in addition to learning about theoretical aspects of CQI. Current students in the "Business Concepts" sequence are very satisfied.

RIT's College of Business also requires two quarters of cooperative education (internship) credit in every undergraduate business major's program of study. The College of Business has a Placement Office, which assists students in locating suitable internships. Both of these curricular innovations (the Business Concepts course sequence and the internship requirement) deserve praise and recognition for the way that RIT has genuinely met or exceeded customer needs and expectations.

Curriculum and instruction are the areas most likely to be affected by change through CQI

1.8.4 Effect of OBE systems

It is observed globally that outcome based education systems are better in a way that they prepare students not on the basis of who can cram better but on basis of gathering knowledge and improve their performance when they reach industry

[9]Outcome-based Education (OBE) emphasises on two main components in terms of student achievement in an academic programme. One is the Programme Outcomes (POs) which is measured at the point of graduation, and the other, the Programme Educational Objectives (PEOs) is assessed over a longer period of time (around 4–5 years) after graduation. These PEOs are mapped using the guidelines set by the Engineering Council to those required by the Engineering Accreditation Council (EAC), Malaysia. The outcome of the mapping exercise was used to formulate an anonymous online questionnaire survey as a measure of the PEOs' attainment. Key outcomes from this study revealed that graduates are broadly satisfied with their achievement in all eight PEOs. Strategies were also proposed to improve the attainment level in four PEOs with relatively lower attainment rate, as part of the CQI process adopted in the department.

1.8.5 Swedish and American Model for CQI

[8]The Swedish model for Quality Assurance and Enhancement in Higher Education (16, 17) comes comparatively close to the self-regulation concepts described by Graham et al. cited by Bowden and Marton [6].

All institutions of higher education are expected to develop their own quality

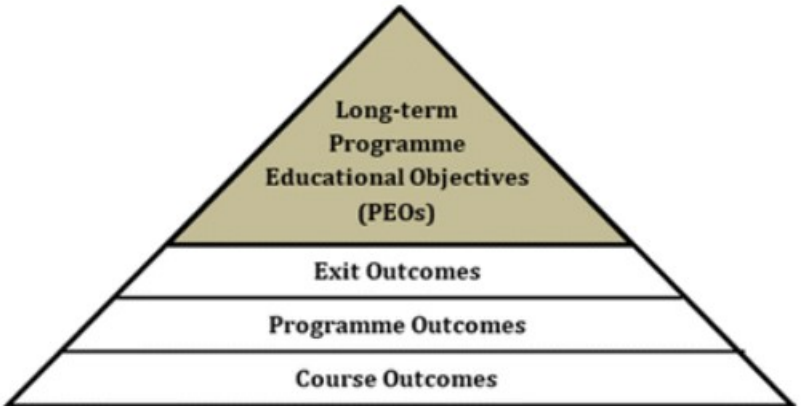

FIGURE 1.4: The proposed linkage of CitationSpady's (1994) top to bottom levels of outcomes development with the incorporation of long-term PEOs.

assurance systems and to account for quality measures in triennial reports to government in connection with the appropriation proposal for the next 3-year cycle.

In the United States dental school accreditation resulted in procedures for continuous quality improvement. In the self-study process recommendations for improvements are made. As part of the site-visit an evaluation is made of whether these recommendations are being implemented (18–20).

The above examples show applications for the use of CQI in a systematic and transparent manner that can be adopted as a standard approach.

1.9 Team Members Individual Tasks

The expected task division among the group members is as given below

1.10 Timeline/Gantt chart

Based on the Work Breakdown Structure (WBS), a timeline or Gantt chart showing the allocation of time to the project phases or iterations should be developed. This Gantt chart would identify major milestones with their achievement criteria. It must contain duration estimation of all the necessary activities to be carried out during the project development along with the human resources responsible for the respective tasks. Activity dependencies are also required to be mentioned in it.

TABLE 1.1: Related System Analysis

Related System	Weakness	Proposed Project Solution
Anthology[1]	A paid website with very non-interactive and non-appealing forms least customisable	A free alternative with interactive,appealing and fully customisable forms.
Google Forms[2]	Doesn't not provide visualization of data also it does not store data in our system instead stores it on Google sheet.	Data should be visualized and stored on our system i.e. in excel format.
Survey Monkey[5]	Displays a simple interface to user and consist of complex set of tools to make surveys also it does not provide free sign-up.	An attractive and easy to use and understand interface will be displayed to user.
Metrics for learning[3]	It does not capture the quality of user engagement, such as whether or not the content is engaging and understandable.	Already created interesting editable surveys will be present.
Qualtrics[4]	It has the risk of data breaches which compromises the confidentiality of study participants	Data should be secured and user's privacy should be kept along with data confidentiality.

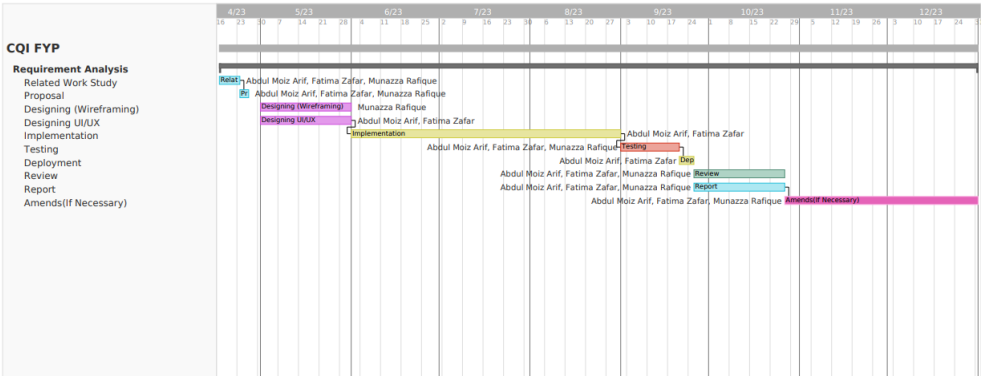

FIGURE 1.5: Gantt Chart

1.11 Data Gathering Approach

Data for this project is gathered from websites that have similar or related work and from the experience since I'm also we (all group members) are also students who have to fill out forms for survey.

We have requested multiple paid websites to provide us with demo surveys so we

Table 1.2: Work Division

Team Member Name	Tasks
Abdul Moiz Arif	- Front-end Development - Back-end development - UI/UX Development - Documentation
Fatima Zafar	- Front-end Development - Back-end development - UI/UX Development - Documentation
Munazza Rafique	- Front-end Development - Back-end development - UI/UX Development - Documentation

can analyze the user interface and survey formats.

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