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Towards High-Impact Community-Based Projects through Data-Driven Monitoring

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Presentation Outline

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Definition of terms

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- **Community-based projects: This are endeavors undertaken by people for the benefit of other people in the society in order to attain sustainability.**
- **Data-Driven Monitoring: It establishes real-time data surveillance as a governing principle in which project progress are monitored via the a site for example a web application.**

Problem and aim

- **Problem.**
- **Impact driven community-based projects are poorly managed making some them get off the main cause and thus are not geared towards community needs.**

- **Aim**
- **A web-based project progress tracking application for managing impact driven community-based projects.**

Objectives

- To identify the challenges that cause a low success rate of community-based projects.
- To identify data that can be used to quantitatively measure the success rate of community-based projects.
- To analyse data processing technologies used for predictive analytics.
- To develop a web-based descriptive analytics tool for maximizing the success rate of community-based projects through intelligent monitoring.
- To test the developed system using existing data from the Community Outreach Program of

Literature review : Data Processing Technologies Used for Analytic Visualizations

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- The essence of a particular project is to be successful in the long run. During the execution of a particular project there is lump sum amount of data generated along the way. In today's world data is an important asset that when studied carefully by the management can unearth meaningful insights that might greatly influence the decision-making process of the management for a better service delivery in the future.
- There exists a numerous number of tools that can be used for visualizations and analytics such as Microsoft BI is an analytics tool that is widely used for analysis and visualization of data [6]. Others include Tableau which has an open-source version of the tool which is free for use [2]. Highcharts is a JavaScript tool that is used for creating powerful visualizations that are real-time and embeddable in web pages.
- Also, Matplotlib is also an open-source visualization library. The library is written with the python programming language [4]. It has a lot of similar functionalities to those of the Highcharts library.

Literature review : Data Used to Measure the Success Rate of Community Projects

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- **For the likelihood of projects to be considered successful there are a number of success metrics laid out. The metrics vary from project to project since there are different number of variables involved in each project. During this research the following key metrics we observed.**
  - Beneficiary Involvement- **Lack of beneficiary participation in the projects affect project sustainability in the long run [12]. Data collected on the various aspects of beneficiary involvement throughout the project lifecycle recorded as survey may be beneficial in decision making to whether the project was impactful and likely to be sustainable to the community in the long run.**
  - Strategic Planning - **Failing to plan is planning to fail. The CBOs ought to come up with a detailed plan on what is needed for each phase of the project. A proper breakdown of the timelines of a particular project and the needed deliverables for each milestone of a specific phase in the project lifecycle. This data will be beneficial when conducting**

Literature review : **Data Used to Measure the Success Rate of Community Projects continued …**

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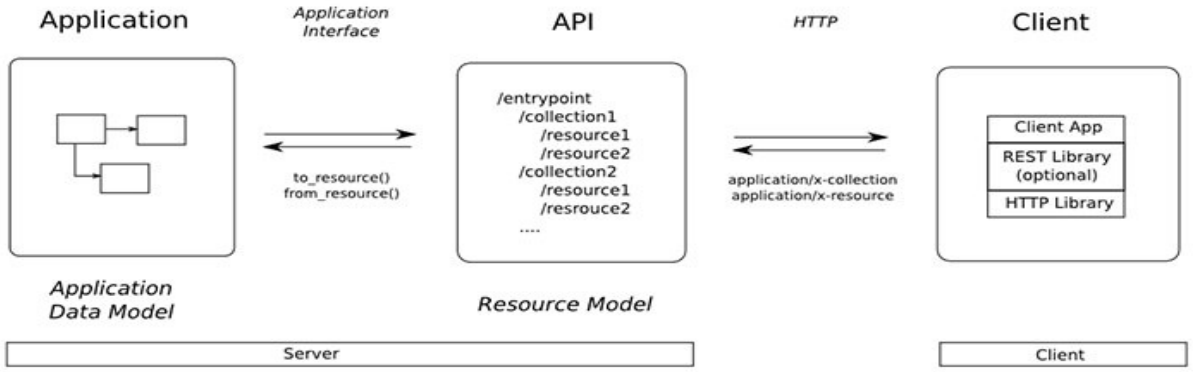
- Leadership and Organizational Structure **- Leadership is a vital role within the CBOs. It is important to have dedicated personnel who are the drivers of change and are conversant and passionate with working on community projects. Skills and knowledge are vital specific areas that affect CBO operations thus influencing the sustainability of the projects [9]. If there is a proper management team they will be able to acquire the right skill set for a particular team required for each project. With data of the availability of skilled personnel per team assigned to a particular project will likely influence the success of a particular project.**

Literature review : System Architecture

- **The proposed system was implemented using a client REST API Architecture. The Server consisted of A REST API that contained the business logic of the Application and a Database Server for storing the data. The client was Web a Go native Template package that communicated with the REST API via HTTP/2 protocol by sending and retrieving resources via APIs endpoints. The web application had a web dashboard whereby the end user interacted with the data and visualization for analysis for example the manager was able add, read, edit and archive**



- **Figure 1 Client REST API Architecture**
- **(The job of the API Designer)**

System Development Methodology : Feature Driven Development

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An Agile methodology was adopted as the methodology for development of the information system since it is best suited for the development of software information system. Particularly we adopted Feature Driven Development methodology.

Feature Driven Development which is a model driven process that encompasses short iterations typically two weeks.

In conformance with Feature driven methodology we modelled a template for the entire project at the beginning, we used this template as baseline and build/designed features (a small useful component of a system that can be presented as a result to the end user).

In general iterations in the development of the information system revolved around developing a baseline model, coming up with a feature list, plan, design and then build a

community-based projects that the organization is engaged in

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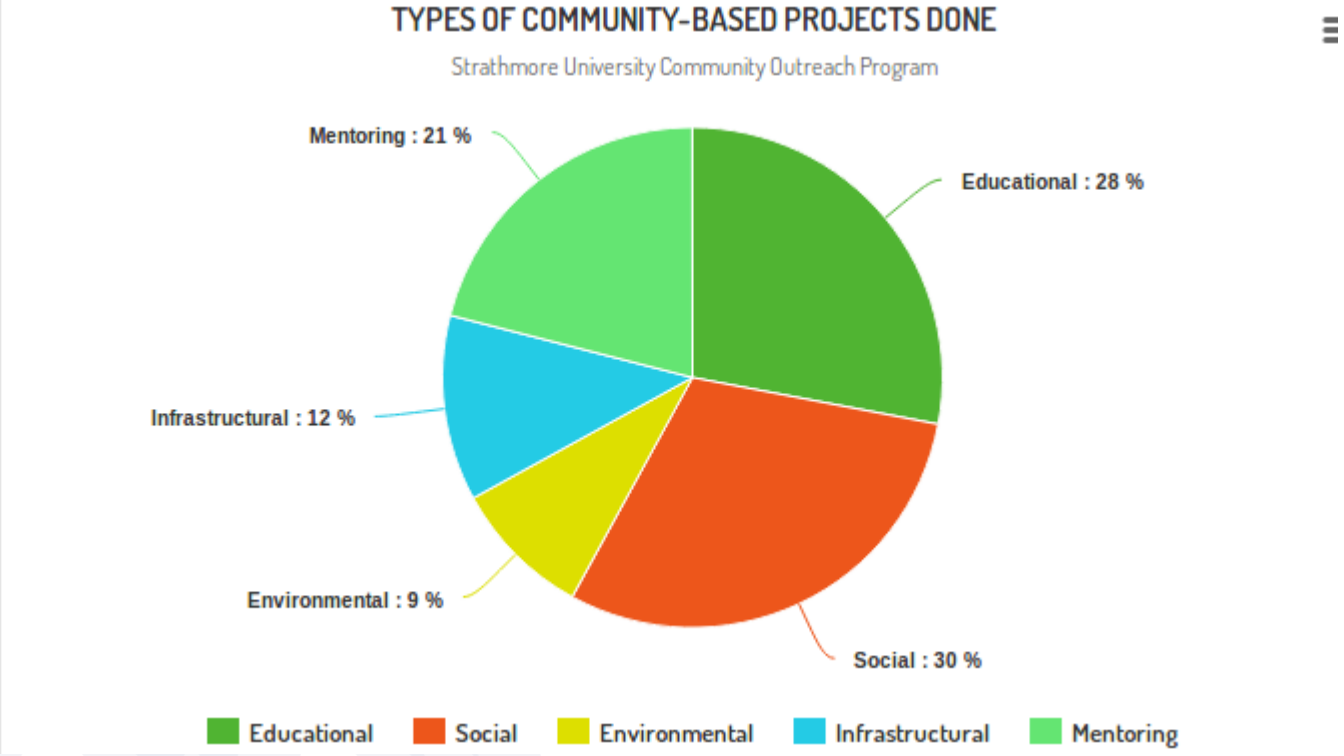

highly likely to be implemented by the community service center

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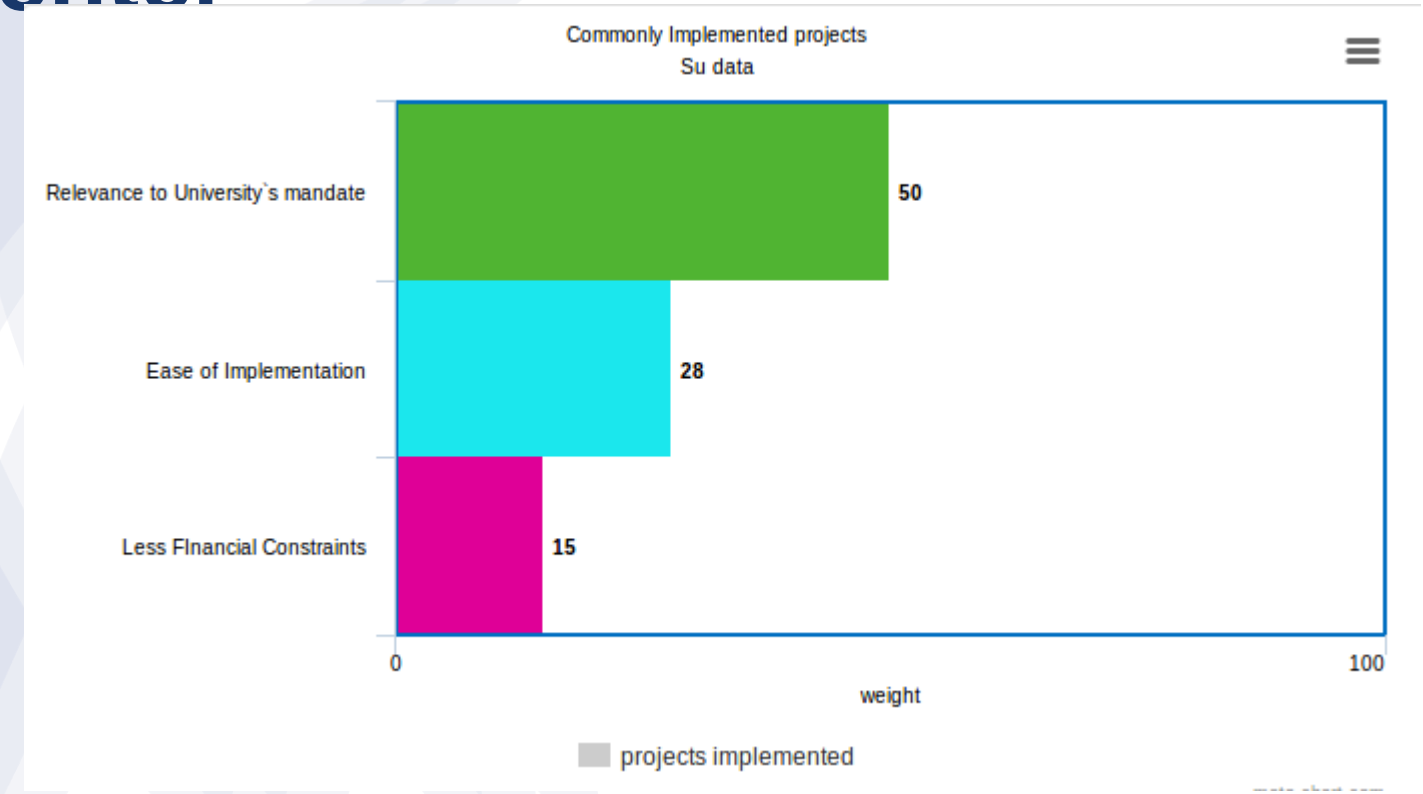

Factors that are considered when deciding which projects to implement

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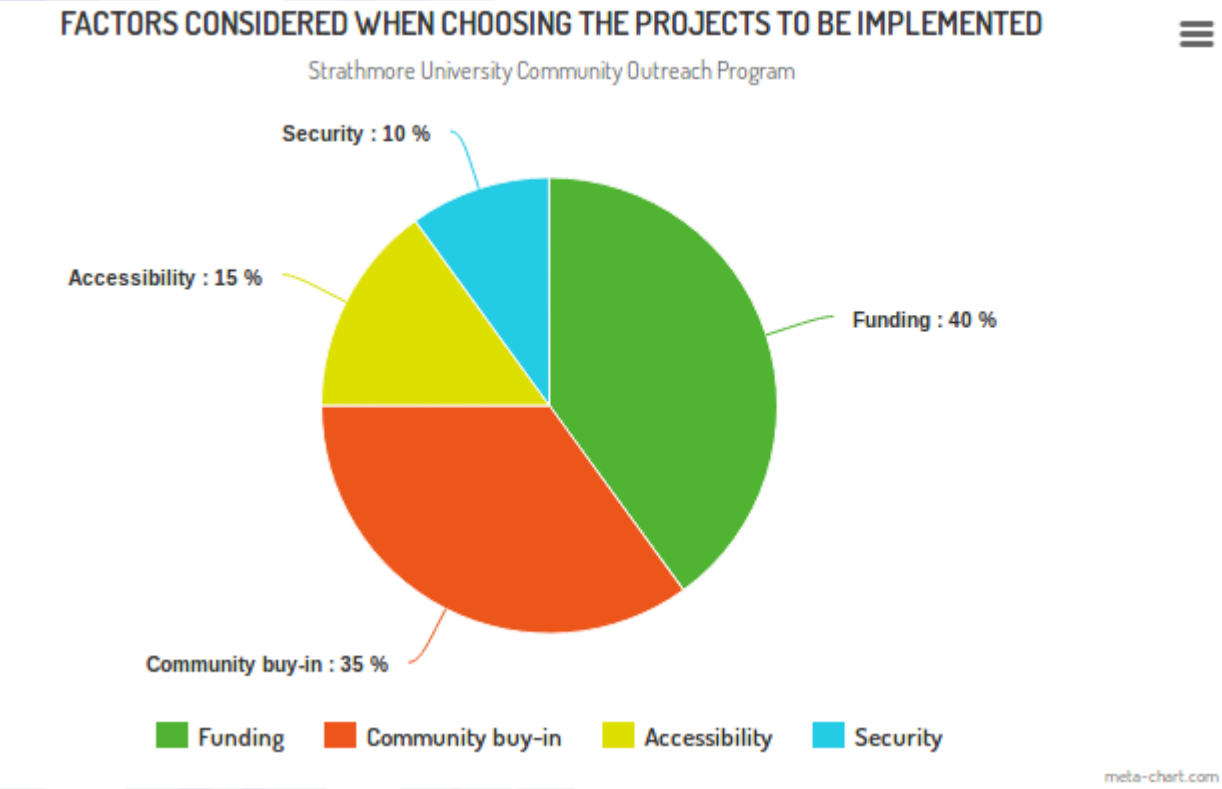

Discussion :Testing the Application

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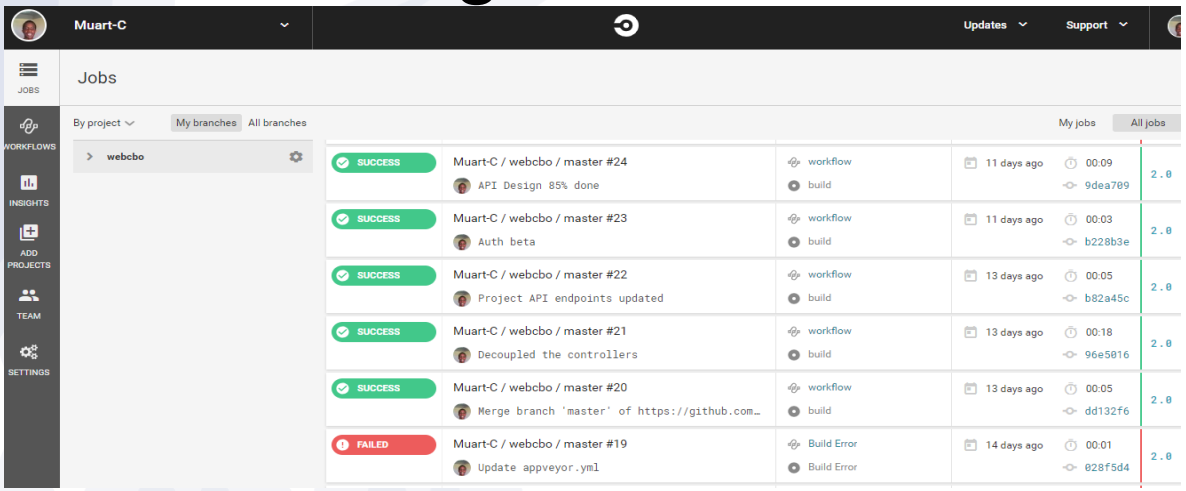
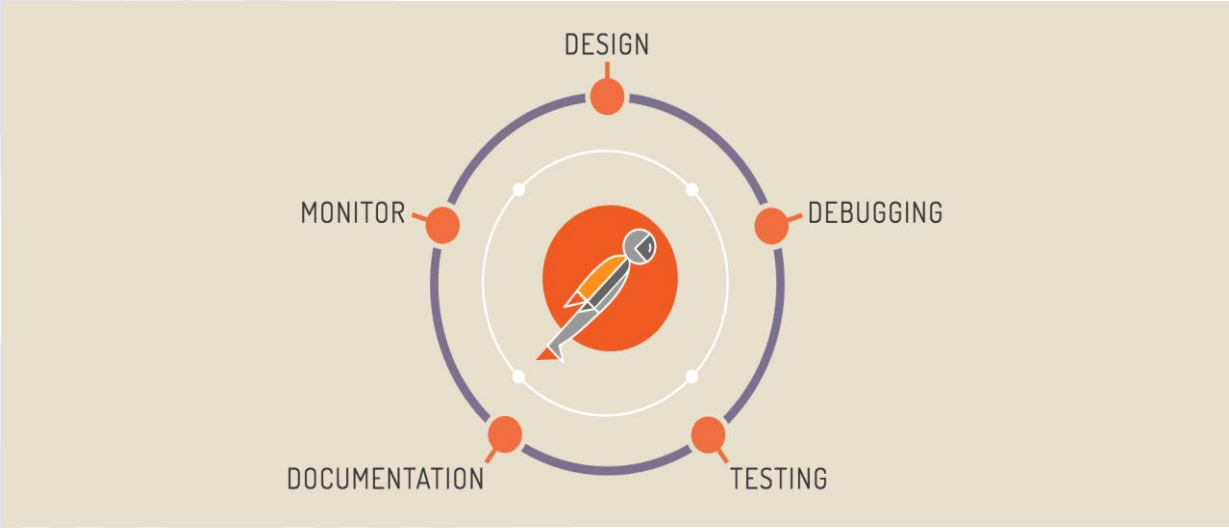
- **Unit and Integration tests**



- **We conducted unit and integration test via a Circle CI a test, integration and build tool that was triggered to run once I pushed my codebase to my online GitHub repository.**
- **We used a tool called codacy available on GitHub. It performed code quality checks such as commenting and naming of variables, functions, Interfaces and Struct. It**

Discussion: REST API

- **Postman for API Testing**



Conclusion

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- The research was done with the aim of finding out how to manage and monitor community-based projects better for maximum impact to the various stakeholders involved or affected.
- There are various issues that arose as the research project was being conducted. The information system codebase evolved over time. Initially we had designed the API alone then the User interfaces alone but we encountered challenges when trying to compile the codebase for testing, integration and then deployment to the server. A lot of dependencies were needed to accomplish a successful software shipping to production, some of these dependencies broke along the build process and it was really had to debug the codebase.

Conclusion …

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- We were able to deliver a well-designed Business logic backend for the web application. Also, usable user interfaces for the end users of the information system. Some of the proposed solution was met is that the users were able to track the projects and all the required components to manage a project efficiently with the help of modules such as Task Management, Activity management, Milestone Management and also Team and Role Management.
- Having setup, a robust Web Application Programming Interface with the best REST Standards and also providing the needed endpoints. The next phase would involve designing of client application that has proper tooling for visualizing the data stored in the database management server. Also, we are considering adding a visualization module dashboard using the support vector graphics embedded on the dashboards` webpages. Another future plan is to reuse third party survey platforms to run the survey campaigns among the community members, thus we will just need to tap into the API and fetch the data into our visualization dashboard instead of reinventing the wheel by

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