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| Start | Finish | Author | Description | Reason | Version |
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| 02/07 | 22/07 | Alex | Initial Draft of Operational Study | Complete production of feasibility study | 1.0 |
| 26/07 | 27/07 | Alex | Added conclusion and more sections | Study was lacking a finality to it | 1.1 |

**Introduction**

This project aims to introduce a Real Time Online Scoreboard system to the MATHEX competition. The system aims to work alongside the current pen and paper system and intends to make the current system work faster and more efficiently rather than replace it altogether.

The operational feasibility study aims to cover and answer the following issues about the new system:

* **Process:**How the users will use the new system and its processes.
* **Implementation**: Implementation options and the benefits of each.
* **Evaluation**: Whether the system can work and cover key goals covered in the project scope.
* **Resistance**: Which users, stakeholders or individuals will have the most resistance and how resistance will be managed.
* **Strategies**: How the environment of the competition will be affected by the new system and whether it is necessary to implement new processes or strategies to overcome negative effects.
* **Adaptation and review**: After change resistance is managed and the system is implemented, then how will the product's effects be reviewed and monitored. How changes will be made if negative effects are to occur.

**Process**

The system is used by three main users: Spectators, Judge, Markers/Scorers. The system will benefit each of the users differently.

Spectators

Currently, the spectators are able to see their team's scores and which is team is currently winning from the caster and general atmosphere of the competition. The new system will enable the spectators to track a selected team and see how well they are currently doing in the competition.

Marker/Scorer

Currently, the marker/scorers use a pen and paper system as well as a board to mark and post scores of teams. The new system works in tandem with the existing pen and paper system. It does not benefit the markers much and may hinder the marking process.

Judge

Currently, the judge determines who the winning teams for the competition by tallying team points and completion time. The new system aims to make all of this information accessible at a glance as well as the ability to sort teams depending on their performance.

**Implementation**

Partial Implementation:

An option is to implement the new system partially into the MATHEX competition. In this case, instead of the spectators accessing the scoreboard through a portable device, a physical scoreboard will be setup though a screen or projector for the spectators to view instead. This will eliminate the need to develop a separate application for the spectators and instead focus on the markers and a single scoreboard. This implementation is much more feasible as well as the fact that it will reduce the time and cost of developing and implementing the scoreboard. However, the venue the competition is held in has limited space and may not be able to accommodate a large scoreboard. Therefore, if this option is to be considered then the location and layout of the scoreboard must be determined beforehand.

Testing:

It is possible to test the new system by only implementing a portion of the new system into the competition. While it would not benefit the competition, data can be gathered and reviewed about how well the system functions in its intended environment as well as user interaction and response.

**Evaluation**

Implementation:

The implementation of the system will change how the project will work and what goals it will meet. A full implementation meets the goals but may not end up working due to server overload. It is also the most expensive option and may not meet expected project costs. A partial implementation is much more likely to work but may not meet all the requirements that the client has set for the project.

Scope:

It is possible for the system to meet all the goals stated in the scope. However, its implementation may be different from what is stated in the scope depending on technical or other limitations such as time and cost. It is likely that the way the system functions will be different to how it is described in the scope with some features revamped to fit these limitations.

**Resistance**

Marker Proficiency:

The new system will function vastly differently from the current system. The new system will require the markers at the event to use new technologies that they have possibly never used before. As a result of this, some markers may be resistant to the new system. Some solutions will include picking markers that are adept at using portable devices or to implement a training course for markers.

System Costs and Feasibility:

markers with devices capable of working with the system may deter stakeholders from funding the project.  In order to reduce costs, the project will have to be scaled down with less devices or hiring resources instead of buying them.

Change Resistance:

Currently, the competition runs well and the new system is somewhat non-essential. In the worst-case scenarios, it may even hinder the competition. For these reasons, the new system may be seen as an intrusive and unnecessary change to the competition and may garner resistance from users and stakeholders.

**Strategies**

Contingency strategies:

In case of System failure, measures must be taken to ensure that the competition does not fail. Since the new system works in tandem with the old system, the new system must be designed to switch to the old system at any point in the competition.

System input strategies:

It is possible that the system may hinder or confuse the markers during the marking process. In this case, it is recommended that the scorers themselves handle the input of scores into the system. However, the system would have to be designed to accommodate more teams due to the lesser number of scorers.

**Adaptation and Review**

Adaptation

The new system aims to work alongside the existing system by complementing and adding new functions.

Review:

As outlined in the Scope of the project proposal, the aim of the product is effectively improve the experience and efficiency of the MATHEX competition. Therefore, following a completion of a MATHEX competition where the new system was used, user opinion and reaction should be surveyed. This survey should query each specific user on the following areas:

* Audience: How easy it was to track the competition/your favourite team and if this is not your first MATHEX experience, has the inclusion of the scoreboard improved your MATHEX experience?
* Markers: How easy the system was to use and if there were any problems or issues with the marking process?
* Judge: Was it easy to discern which team were winning and their scores? Did it have any impact on the judging process?

Moreover, general feedback and suggested improvements should be recorded and scrutinised to identify areas of the system we should improve. In the worst-case scenario, where the new system fails then the whole system needs to be examined starting first from the areas which had failed.

**Conclusion**

From an operational standpoint, assuming the system itself does not fail and its build and implementation itself is feasible then the system will be able to operate and integrate itself into the competition without much trouble. However, the method that the system operates will likely differ from how it is described in the project scope. Ultimately, this will be dependent on other factors rather than operation.