A Proposal for Digital Kanban Boards

Team Octo

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ABSTRACT

A large issue in collaborative SE is disorganization that grows as projects evolve, often stemming from team miscommunication. This leads to great gaps in productivity and employee frustration.

To counteract this, we are proposing an online version of the Kanban board. The Kanban board is an agile method in which the board is divided into lists, with each list representing the completion status of the *cards* they contain, Each card, typically a sticky note, represents one specific task and which team member is working on it. These kinds of visualizations help the entire team understand and prioritize tasks and have a better grasp of the workflow.

INTRODUCTION

Many development teams do not possess the capacity and foresight required to map their project's development cycle: it can be costly and borderline impossible for large projects. Instead, they rely on *sprints*, which are bite-sized chunks of development focus that are easier to manage. Unfortunately, it's often the case that teams grow more and more disorganized with each subsequent sprint: lack of communication causes dysfunction that, if not resolved, can topple huge projects.

To confirm this is the case in our modern era of SE, we conducted a survey targeted at experienced Computer Science students at Virginia Tech. Results show that more than half of survey respondents have experienced projects that drift into disarray over time.

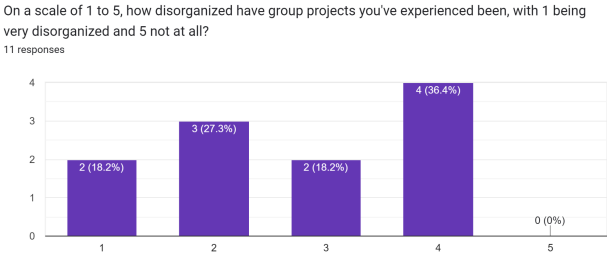

Figure 1: **Survey Data for the Surveryee's Experience with how disorganized group projects have been**

Furthermore, the survey we conducted shows that not one individual had prior knowledge of the Kanban practice.

Timestamp	How familiar are you with the Kanban practice, i.e. cards?
9/20/2024 14:08:39	never heard of them
9/20/2024 14:15:25	Never heard of the name
9/20/2024 14:42:59	No idea
9/21/2024 19:19:54	None
9/22/2024 15:46:29	Not familiar
9/23/2024 1:31:05	Not familiar
9/23/2024 2:19:08	Never used site
9/23/2024 8:06:09	Not too familiar
9/23/2024 11:05:30	not familiar
9/24/2024 18:18:30	Not familiar
9/27/2024 0:23:54	What

Figure 2: **Survey Data for the Surveryee's Familiarity with the Kanban Practice**

While Kanban might be quite an old practice that's stood the test of time in the field of SE, clearly it is not widely used among the newer generation of programmers. Furthermore, Kanban's physical nature makes it unsuitable for the current age of SE: many, many teams operate on a remote or hybrid basis, meaning that a significant chunk of one's team

might not have easy access to the space where the Kanban board is located. This is why we propose a fully digital solution, wherein any person can access and visualize the project's state from anywhere in the world. Similar services do already exist but suffer from hefty paywalls and a steep learning curve: our goal is to make something streamlined that any developer can use free of charge, making teams on the smaller side our primary stakeholders.

Relevant Software Tools or Research Studies

One of the most widely used instances of the Kanban practice in the industry is *Trello*, a piece of software that allows easy group access to self-created Kanban boards with lots of functionality we want to implement ourselves. In Trello, not only can tasks be easily dragged between different sections,but each task can have it's own step-by-step guide, with a clear icon for if all steps can be completed. While there are many features that are in Trello that are well implemented and looked upon. There are many that we have created ourselves that are either missing or locked behind expensive paywalls.

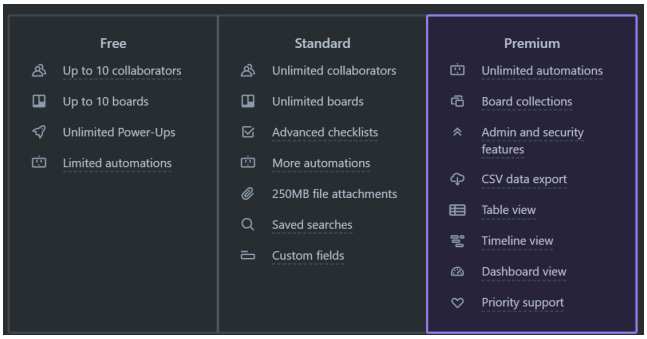

Figure 3: **The "Plans" page on Trello for different levels of features and services**

While some of the services on the free level are more than enough for average users (e.g. 10 collaborators, 10 boards), there are many additional features that the free user can not access that will greatly benefit them. For example, on Trello, you can only access the calendar view and table view in the premium version [2], which based on the survey, shows that it is a rather beneficial and essential need for there to be alternate ways to look at the tasks like in list by priority, or via calendar for projects that run over the course of a semester [1].

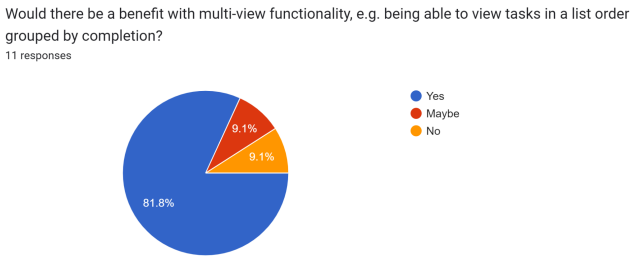

Figure 4: **Survey Data for Opinion of Multiview Functionality should be implemented**

In addition, unlike Trillo, we want to make our cards have the ability to be fully customizable/painted. In Trillo, cards can have a "tab" above it with color or image, however with how easily tasks can build up it can become confusing and misleading. So instead we aim to color the tabs entirely to help better represent different types of tasks or it's priority.

Based on our survey there was also a desire for the ability to communicate on the Kanban board itself, which will allow more clear communication as users can refer directly to the cards and boards they mean.

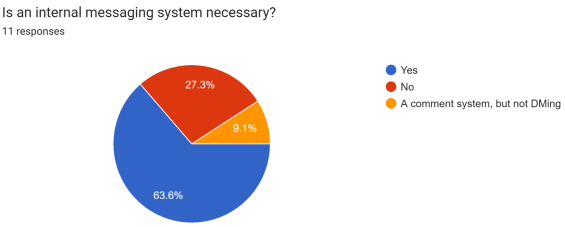

Figure 5: **Survey Data for is Internal Messaging System Necessary**

SE Process of Choice

Throughout the development of this project, we plan on making use of the Agile design process. Our reasoning for doing so is because while this is a relatively small project with a simple goal and end product, we have relatively loose definitions for exactly what we need, regarding code design and actual implementation.

The adaptability and flexibility of Agile works well in scenarios like ours where our project requirements are not explicitly defined and are susceptible to change.

We believe the short iterations of Agile would be beneficial to us. Every 2 weeks, we're able to take a step back to examine the state of the project and determine what's important, which features we want to pursue developing and which are no longer feasible or no longer match the project goals.

REFERENCES

[1] Aaron Ye, Rodrigo Azzolin, and Wills McGraw. 2024.CS3704 Team Octo PM1 Requirements Elicitation. *Blacksburg, VA, USA.* https://forms.gle/9GGxVPDKBcFYg5Vw5

[2] 2024. Trello. *New York City, NY, USA, 2 pages.* https://trello.com/