

## “What should I do today?” A Case Study on the Current Practices and Software Requirements Specification of a Web-Based Planner and Productivity Tracker

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**Abstract:** Productivity can be targeted and tracked in various ways. People may use the traditional pen-and-paper approach, or they can use various task-managing or productivity-tracking applications. This study aimed to determine the practices of faculty and staff of the University of the Philippines Open University (UPOU) for planning and productivity tracking. It also aimed to identify useful features for a web-based planner and productivity tracker based on the needs of UPOU employees leading to the development of a web-based planner and productivity tracker. This study focused on gathering requirements and conducting a needs analysis for the said web-based application. Requirements gathering and needs analysis showed that different people have different approaches to planning tasks and tracking productivity. However, based on identified user needs, it is still worthwhile to propose a possible solution that attempts to cover current practices and address most user needs. The output of this research was therefore a System Requirements Specification (SRS) developed using information gathered from an online focus group discussion and an online survey conducted on UPOU employees. The SRS will be used for Phase 2 of the study. Phase 2 will involve the actual development of the system and testing to determine the usefulness of the final web-based system. This study’s main implication is that the proposed web application could be able to help increase the productivity of those in the field of education while assisting them in their day-to-day planning. Further studies can be conducted to validate this upon the completion of the web-based system.

**Keywords:** Requirements Gathering, Needs Analysis, System Requirements Specification, Task-Managing Application, Productivity Software

## INTRODUCTION

### BACKGROUND OF THE STUDY

There is value in being productive (Rifkin 1987). Productivity in the private sector can be defined as how much output can be defined per unit of input, however, defining productivity in education is not so straightforward (Hanushek & Ettema 2017). In addition to this, there appear to be no universal means of measuring office productivity, yet a self-assessed measure of productivity is better than no measure of productivity (Haynes, Suckley, & Nunnington 2017).

People can be more productive when they remind themselves of all the tasks they need to do (Wilcox et al. 2016). With the dawn of the Digital Age, numerous tools to plan tasks and track productivity can be found online and are used by teams and individuals to be more organized and get the right things done. These various tools offer varying functionalities some of which may or may not be useful for certain individuals or organizations like those in the University of the Philippines Open University (UPOU).

UPOU faculty, being part of the University of the Philippines system, are expected to devote percentages of their time to research, extension, administrative work, and professional growth in addition to teaching (OVPA University of the Philippines 2004). There could be instances, however, that certain tasks are more prioritized than others and the faculty member can neglect other tasks which are required for their role. A productivity tracker could help keep track of the activities the faculty member does, allowing him or her to identify whether or not he or she

should do more research, more extension, more administrative work, and so on. The tracker could even help the user identify if they need to do less of any of the categories mentioned. Other UPOU employees, meanwhile, could also benefit from this as they can see what sort of tasks take up most of their time. In addition, a planning tool could help these employees be more organized given the numerous tasks they may find themselves having to do.

A proposal was therefore submitted to design a web-based planner and productivity tracker to fit the needs of UPOU faculty and staff. Many tasks in UPOU are done on laptops or computers connected to the Internet, thus the proposal to make the system web-based. Since task-managing systems and productivity software already exist, a review of these existing alternatives was conducted and is presented in this paper.

## OBJECTIVES

This study's main objective is to produce a Software Requirements Specification (SRS) for a web-based planner and productivity tracker for UPOU faculty and staff.

Specifically, it aims to:

1. Determine the current practices of UPOU faculty and staff for planning and productivity-tracking; and
2. Identify useful features for a web-based planner and productivity tracker based on the needs of UPOU faculty and staff.

## REVIEW OF EXISTING SOFTWARE ALTERNATIVES

Systems that allow users to plan tasks or track activities and productivity already exist. Several of these applications are outlined here, yet, it should be noted that some features can still be added to make these systems more intelligent and more suited to UPOU needs.

### TODOIST

Todoist is a task-management software that allows users to “keep track of everything in one place, so you can get it all done and enjoy more peace of mind along the way” (Todoist 2018). Some of its key features include organizing tasks according to projects, setting recurring tasks, setting priorities for tasks, adding people to projects, and having intelligent input (smart date entry). Users can view tasks per day or week. In addition, productivity can be visualized through graphs. There were 10 million downloads of Todoist's mobile app in the Google Play store in 2019 (Pinochet, Tanaka, Azevedo, & Lopes 2020).

Todoist, however, does not measure or give a report on the time spent on each task. And, although it allows users to specify the tasks that they need to do, it does not have the functionality to suggest tasks to work on based on previous reports. A screenshot is shown in Figure 1.

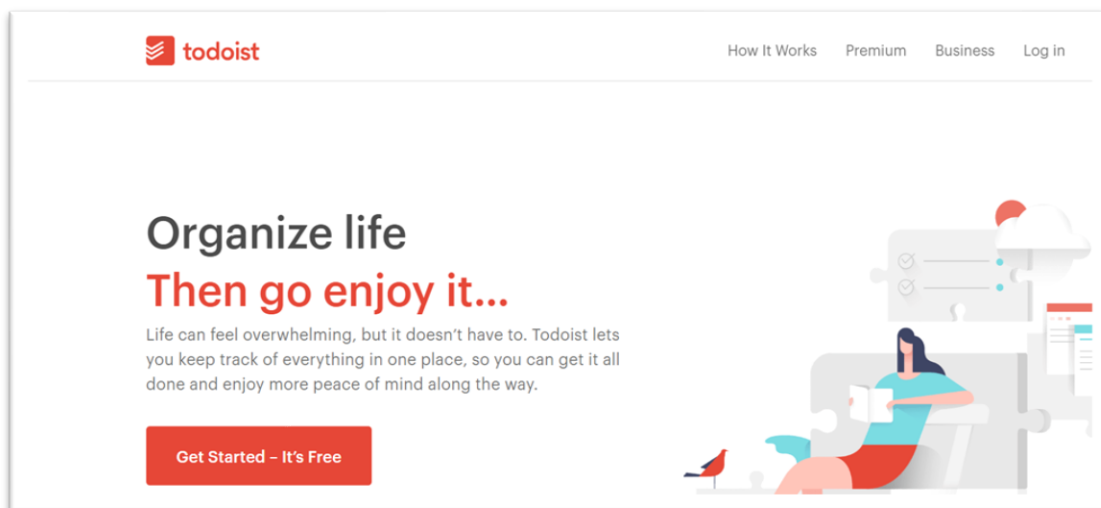


Figure 1. Screenshot of Todoist Home Page. From Todoist Website, by Todoist, 2018, <http://todoist.com>

## REMEMBER THE MILK

Remember the Milk also manages tasks by allowing users to add these specifying due dates, priority numbers, tags, whether it repeats or not, and so on while typing out a single statement (Remember the Milk 2018). It is synced across devices which makes notifications easier. Remember the Milk makes staying organized easier and “is perfect for technical services librarians because it provides for creating alerts for tasks that need regular scheduling as well as tasks that require repeated follow up” (Berger 2014).

It is, however, a straightforward to-do list with no productivity visualizations and task suggestions. A screenshot is provided in Figure 2.

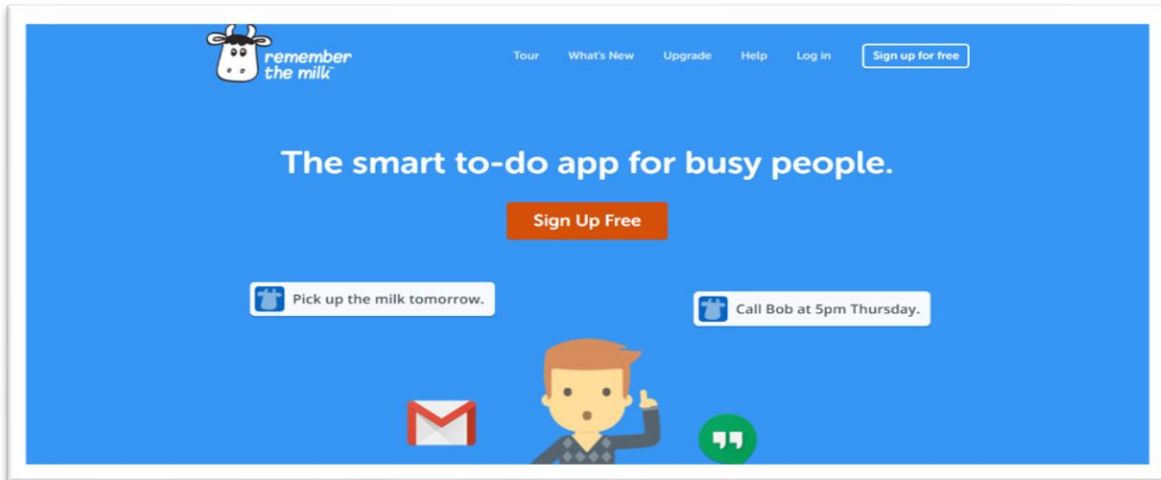


Figure 2. Screenshot of Remember the Milk Home Page. From Remember the Milk Website, by Remember the Milk, 2018, <http://www.rememberthemilk.com>

## WUNDERLIST

Similar to *Todoist* and *Remember the Milk*, Wunderlist allows users to keep track of all their personal and professional to-dos. Tasks are organized according to lists, reminders can be set, and lists can be shared collaboratively (Wunderlist 2018). There were 13 million users around the globe in 2016 (Azfar, Choo, & Liu 2016). There are, however, no productivity visualizations or task suggestions. It was also discontinued in December 2019. A screenshot taken in 2018 is shown in Figure 3.

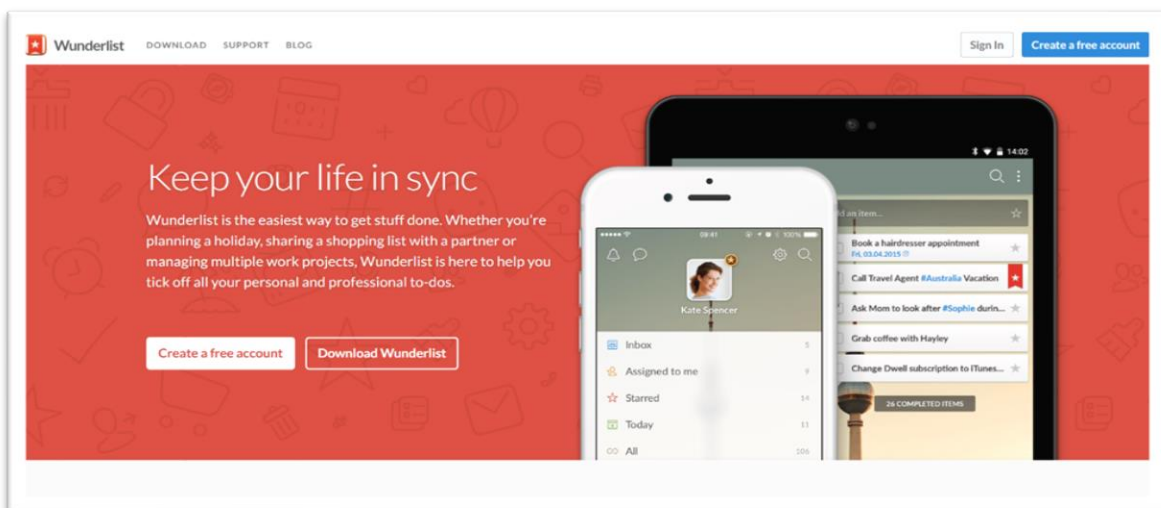


Figure 3. Screenshot of Wunderlist Home Page. From Wunderlist Website, by Wunderlist, 2018, <http://wunderlist.com>

## ANY.DO

Any.do boasts in syncing its to-do lists across platforms. It has the usual features like organizing to-dos in lists and projects, sharing tasks, and adding reminders while being shown as a smart calendar (Any.do 2018). In 2019, the mobile version of the application had 10 million downloads in Google Play (Pinochet, Tanaka, Azevedo, & Lopes 2020). It was also one of the top ten productivity apps in the United States (Azfar, Choo, & Liu 2016).

It should be noted that there are also no productivity visualizations and task suggestions in Any.do. Figure 4 shows the screenshot of the Any.do home page.

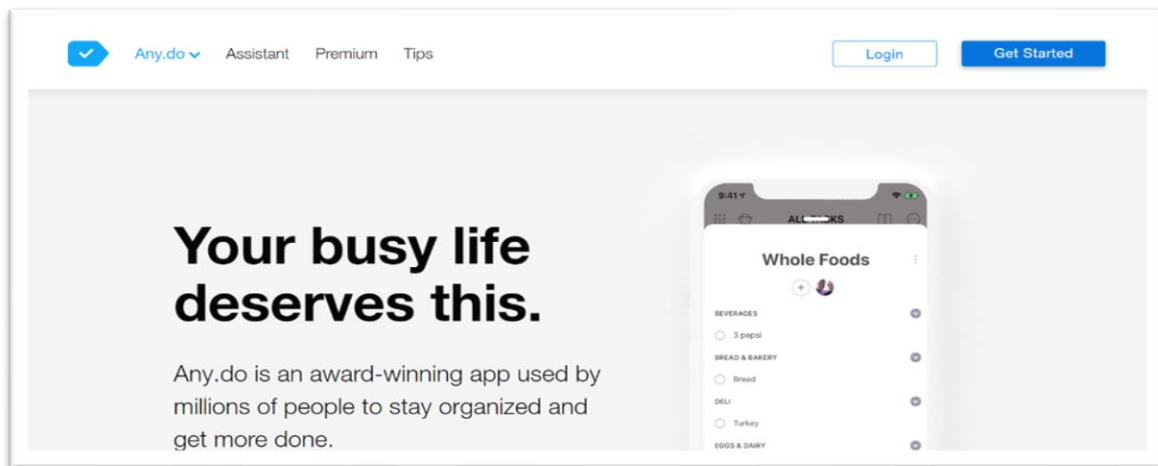


Figure 4. Screenshot of Any.do Home Page. From Any.do Website, by Any.do, 2018, <http://www.any.do>

## TRELLO

Trello is a project management application that focuses on getting work done across a team. It allows users to create boards with lists and color-coded tasks (Trello 2018). It was included in Student Affairs Today's list of seven "cheap or free apps" that could help in office productivity (Sutton 2016). There were 5 Million downloads of Trello's mobile application for Google Play in 2019 and a study on the intention of users in using mobile productivity apps showed around a third of the respondents using the mobile app (Pinochet, Tanaka, Azevedo, & Lopes 2020).

Add-on applications are required though to visualize the team's productivity. However, since Trello is designed for collaborative work, many of its features can be too complicated for people wishing to use it non-collaboratively. A screenshot is seen in Figure 5.

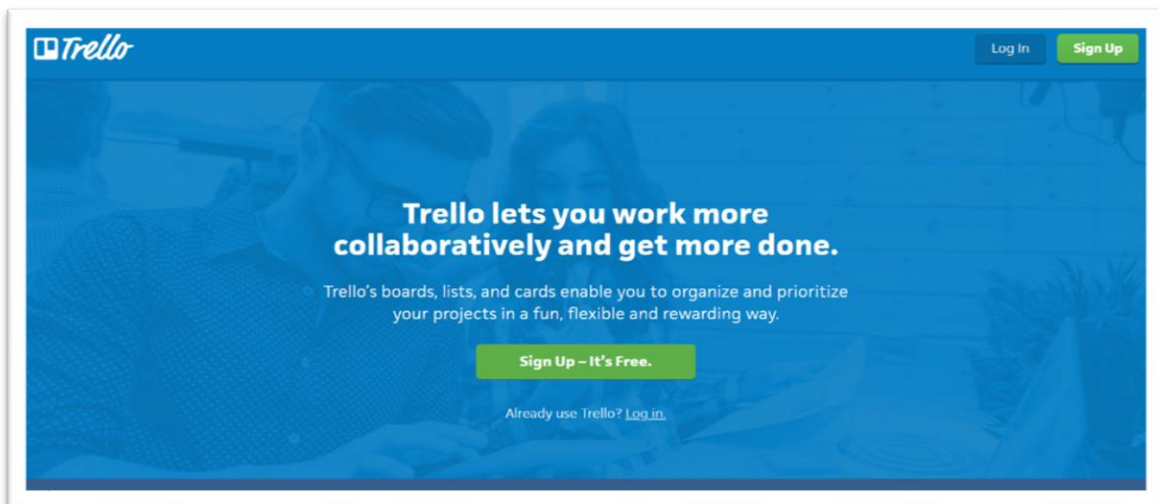


Figure 5. Screenshot of Trello Home Page. From Trello Website, by Trello, 2018, <https://trello.com>

## DESKTIME

Among all the applications in the list, DeskTime has the most comprehensive activity and productivity tracker. Its features include automatic time tracking, offline time tracking, project time tracking, URL and app tracking, automatic screenshots, and a private feature to turn these off to name a few (DeskTime 2018). It considers tasks as projects and mostly keeps track of these as they are done in real-time, not encouraging users to list and plan out small tasks to be done throughout the day. In addition to these, though the features are good, it could seem to be too invasive and inflexible to be used by a university that promotes openness. Its software collects information like the number of employees who are working, as well as those who are absent or who don't seem to be working, and measures productivity by categorizing the applications employees use as either productive, distracting, or neutral (Kranz 2013). Figure 6 includes a screenshot of the available features of DeskTime.

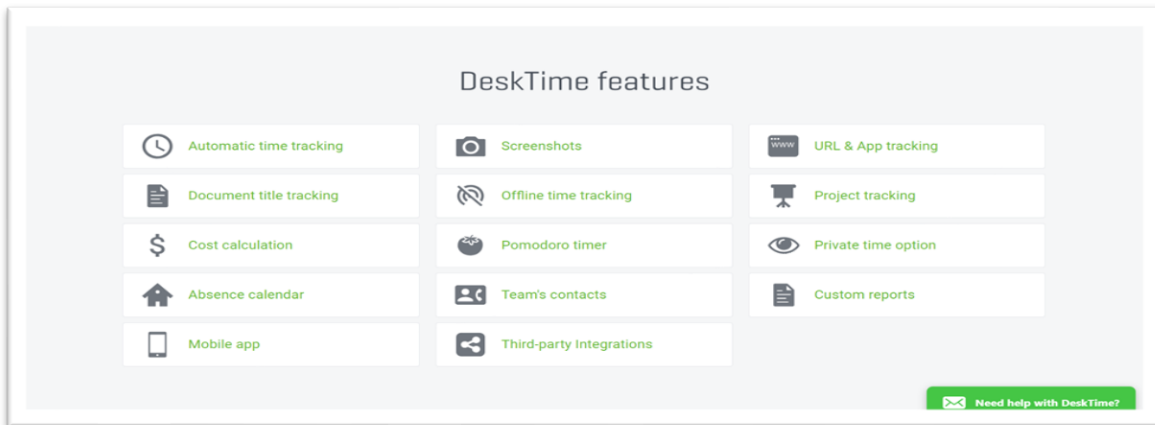


Figure 6. Screenshot of DeskTime Features List. From DeskTime Website, by DeskTime, 2018, <https://deskttime.com/>

## TOGGL

In terms of the way it visualizes data, Toggl could be the most useful for UPOU faculty and staff. Toggl allows users to enter the task they are currently working on while running a timer to keep track of how much time is being devoted to that task (Toggl 2018). These tasks can be organized using projects and tasks. In “Twelve Tips from Working from Home”, Toggl is mentioned as a helpful tracking application (Lopez-Leon, Forero, & Ruiz-Díaz 2020). However, tasks are not plotted in advance and are added on the fly unlike what is done in to-do list applications. In addition, the application itself doesn't suggest what tasks the user should focus more on though inferences can be made in the chart shown in the dashboard. The dashboard is seen in Figure 7.

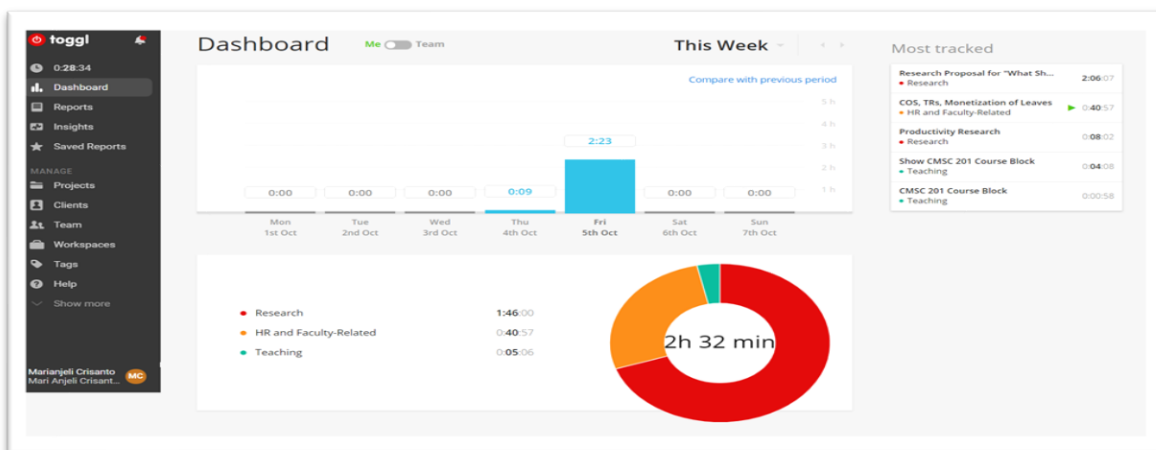


Figure 7. Screenshot of Toggl Dashboard. From Toggl Website, by Toggl, 2018, <http://toggl.com>

## COMPARISON OF SOFTWARE APPLICATIONS

Table 1 provides a comparison of the key features of the aforementioned applications.

Table 1.

Comparison of Task-Management Tools and Productivity Software.

Features	Todoist	Remember the Milk	Wunderlist	Any.do	Trello	Desktime	Toggl
Organize tasks	Yes	Yes	Yes	Yes	Yes	Creates Projects	On the fly
Recurring tasks	Yes	Yes	No	Yes	Yes	No	Can toggle time for tasks done repeatedly
Task Priorities	Yes	Yes	Starred only	Yes	Yes	No	Not explicit
Assigning People to Projects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intelligent Input	Yes	Yes	No	No	No	No	No
Visualize Productivity	Yes, but does not report time spent on each task	No	No	No	Add- ons needed	Yes	Yes
Suggest task to work on based on previous reports	No	No	No	No	No	No	No
Notification System	Allows to set up reminders	Yes	Allows to setup reminders	Yes	Yes	Part of the feature request	Alerts based on time usage
Time-tracking	No	No	No	No	No	Automatic	Yes, Toggle to start
Application- tracking	No	No	No	No	No	Yes	No

These features and those lacking in the reviewed applications can be used as the jumping board for the features to be considered in the prospective web-based planner and productivity tracker.

## RESEARCH DESIGN & METHODS

The software development process typically consists of the following stages as outlined by Kay (2002):

1. **Requirements gathering & analysis.** Involves determining and analyzing user needs to develop them into functional requirements.
2. **Design.** Describes the proposed features in detail, with a focus on how to deliver the required functionalities. The main output is the System Requirements Specification (SRS).
3. **Development.** Converts the requirements and design into a complete information system, software, or application.
4. **Testing.** Conducts various tests to determine whether the developed platform follows the functional requirements.
5. **End-Users Training.** Potential end-users are trained to utilize the platform before deployment. The representation of this process is shown in Figure 8.

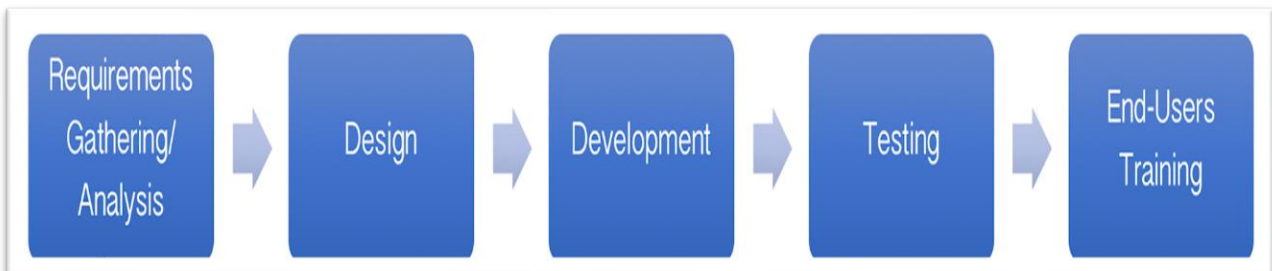


Figure 8. The Systems Development Lifecycle for the “What Should I do?” web-based application.

This research only covered the first two stages, namely 1) requirements gathering and analysis and 2) design. Phase 2 will involve development, testing, and end-user training.

An online focus group discussion with 5 UPOU representatives was conducted to gain insight into what features would be useful for a web-based planner and productivity tracker. According to Paetsch, Eberlein, & Maurer (2003), "Focus groups help to identify user needs and perceptions, what things are important to them and what they want from the system." These FGD participants were given informed consent forms which included the following details:

1. A statement that the study involves research.
2. A statement describing the purpose of the study.
3. Expected benefits to the community or society, or contributions to scientific knowledge
4. The responsibilities of the participant.
5. The expected duration of participation in the study.
6. A statement that participation is voluntary, and that participant may withdraw anytime without penalty or loss of benefit to which the participant is entitled.
7. A statement that the records identifying the participant will be kept confidential and will not be made publicly available, to the extent permitted by law; and that the identity of the participant will remain confidential in the event the study results are published; including limitations to the investigator's ability to guarantee confidentiality.
8. A statement describing the access of participants to the result of the study.
9. Foreseeable circumstances and reasons under which participation in the study may be terminated.
10. Sponsor, institutional affiliation of the investigators, and nature and sources of funds.
11. Person(s) to contact in the study team for further information regarding the study and whom to contact in the event of study-related injury; and
12. A statement that the UPOU IREC Ethics Review Panel (specify) has approved the study and may be reached for information regarding the rights of study participants, including grievances and complaints.

Signed consent was given by the respondents signifying their response to join the online FGD held on June 20, 2019. The online FGD took place from 2:00 PM to 3:00 PM and was done through Google Hangouts. Here, a set of open-ended guide questions written in English was administered by the researcher:

1. How do you go about doing your tasks in UPOU? Do you use planners, to-do lists, etc.?
2. How would you describe a productive working day?
3. What tools do you use to help you be more productive?
4. Do you believe in using tools for planning and productivity?
5. If you were to use a web-based app for planning and activity tracking, what features would be useful for you?

English, together with the local dialect, was used in the discussions. The hour-long online FGD was recorded with consent and was later transcribed. Data from the transcript was then analyzed using thematic analysis. An online questionnaire created using Google Forms was then distributed to UPOU employees to gather quantitative data for analysis. 21 respondents composed of representatives from each UPOU sector recruited through convenience sampling took part in the survey. Answering the questionnaire was done voluntarily and included a consent form for the users to indicate their participation in the study. This online informed consent form also included the details stated in the form used in the online FGD. The questions used in the survey were initially drafted out during the proposal phase and were later refined based on the information gathered from the online FGD. Based on the data from the online FGD and online survey, the SRS was made as part of the design step. This will be used in the creation of the web-based app in the second phase of the study.

## RESULTS AND DISCUSSIONS

Five participants composed of 3 regular faculty members and 2 research assistants took part in the online FGD facilitated by the researcher. More participants were invited but it was only those five who said yes to the invitation.

Based on the discussion, the following points were identified:

1. Different people have different ways to plan tasks and schedules. Some rely on computer and mobile applications, some rely on paper-based tools, and some rely on both.
2. Productivity is somehow related to satisfaction and can be measured by the lack of guilt that accompanies doing hobbies and personal tasks. Productivity does not necessarily equate to the number of work tasks done for the day.
3. The following features could be useful for a web-based planner and productivity tracker for UPOU:
  - 3.1. Tracking task completion
  - 3.2. Tracking overdue tasks
  - 3.3. Tracking system for mental/physical energy
  - 3.4. Scheduling system
  - 3.5. A flexible system that allows changing of schedules and plans
  - 3.6. Syncing across devices
  - 3.7. Reminders and notification system
  - 3.8. Analytics to determine patterns of productivity
  - 3.9. Room for integration with other applications
4. It could be possible that UPOU employees will not see the need for a customized web-based planner. The researcher should be open to this sentiment.

The online FGD provided valuable insight into what should be included in the online questionnaire used in the second part of the study. Based on the discourse that took place during the online FGD, an updated version of the online questionnaire was created and distributed to UPOU employees via email blast and the UPOU internal communication system. The Google Form recorded 22 responses, however, one was a duplicate entry. Thus, only the 21 distinct responses were considered for the results.

Figures 9 to 13 show the demographics of the participants. In Figure 9, the distribution of the respondent's gender is shown.



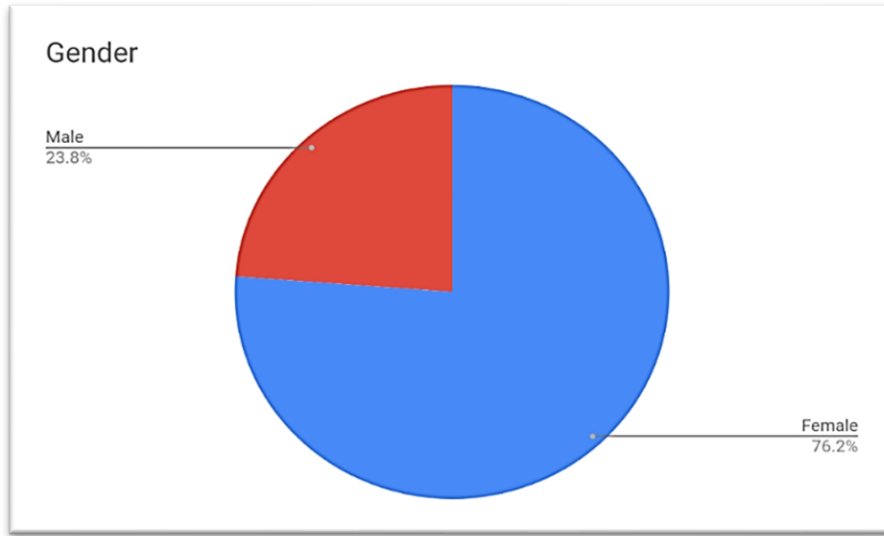


Figure 9. Gender of Online Survey Participants

Of the 21 respondents, 5 were male and 16 were female. This could mean that this study's resulting SRS might be more suited for women since more women in UPOU gave feedback compared to their male counterparts.

Figure 10, meanwhile, shows how the ages of the online survey respondents are distributed.

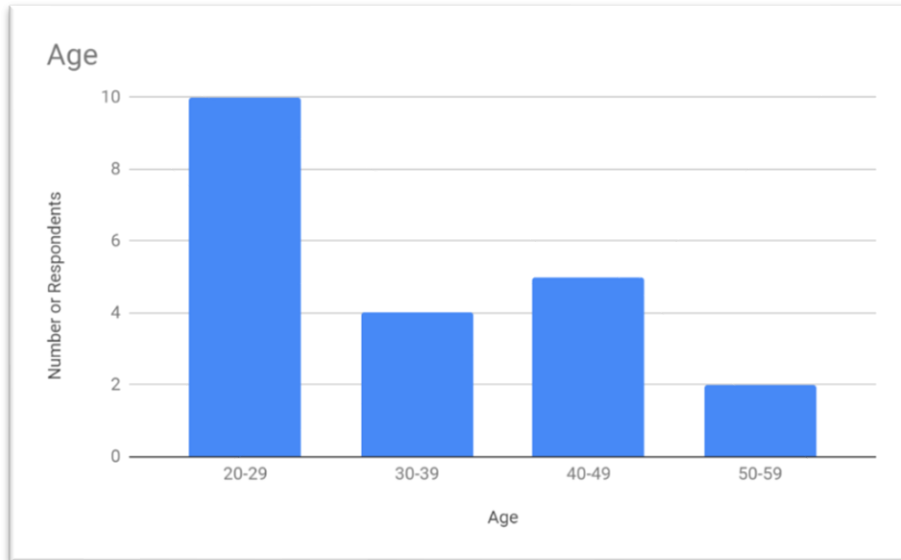


Figure 10. Age Distribution of Online Survey Participants

The majority of respondents who answered the survey were between the ages of 20 and 29. There were 10 respondents in the said age range, 5 respondents aged 40-49, 4 respondents aged 30-39, and 2 respondents 50-49. There were no respondents below 20 and above 60. The resulting SRS could therefore be suitable for UPOU employees aged 20 to 59 years old.

Figure 11 presents which Faculty of Study or office the respondents came from.

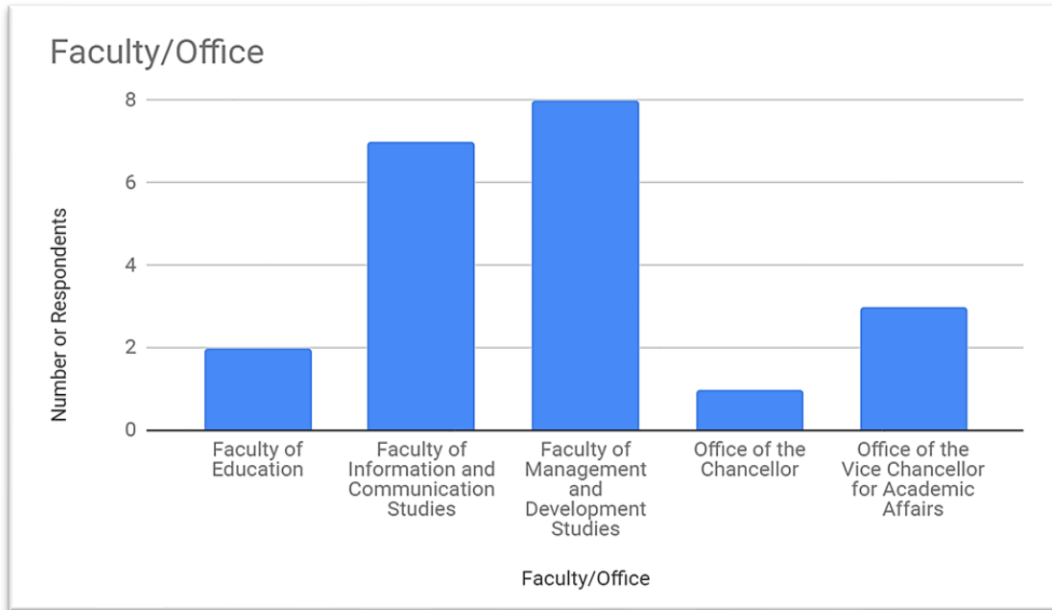


Figure 11. Faculty/Office of Online Survey Participants

Most of the survey's respondents were from the Faculty of Management and Development Studies (FMDS). 8 employees from FMDS took part in the online survey, 7 came from FICS, 3 came from the OVCAA, 2 came from FEd, and 1 came from the OC. There were no respondents from the Office of the Vice Chancellor for Finance and Administration. Still, most of the faculties and offices of UPOU were covered. As for the specific positions of the participants, these are shown in Figure 12.

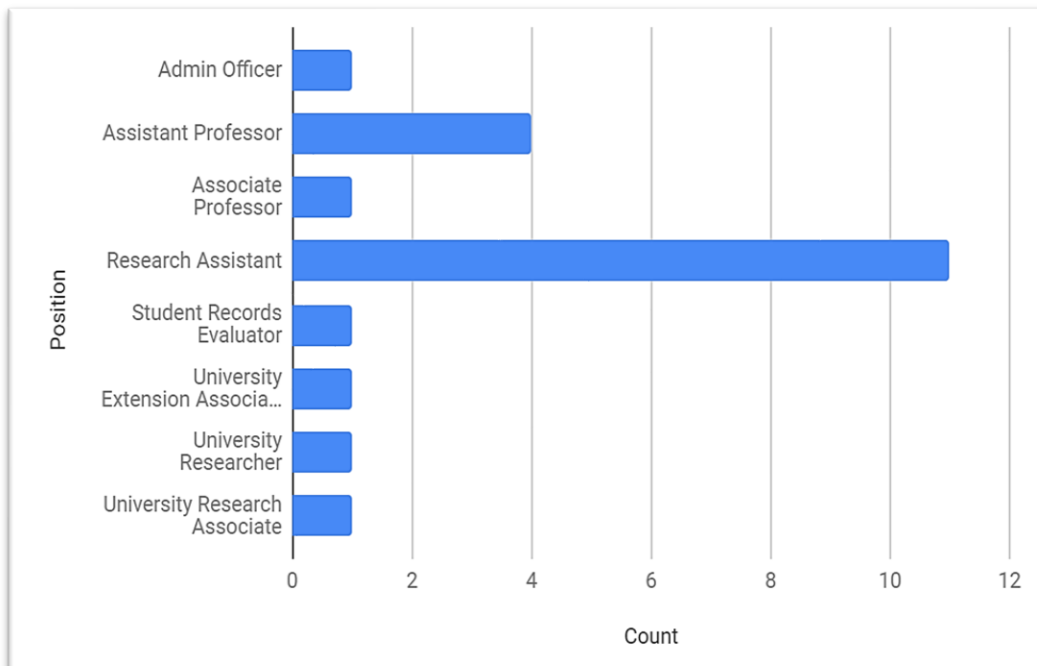


Figure 12. Positions Held by the Online Survey Participants

The majority of UPOU employees who participated in the online survey were research assistants, making up 52% of the respondent demographics. The remaining 48% was composed of representatives from the other sectors of the UPOU community (i.e. regular faculty and staff).

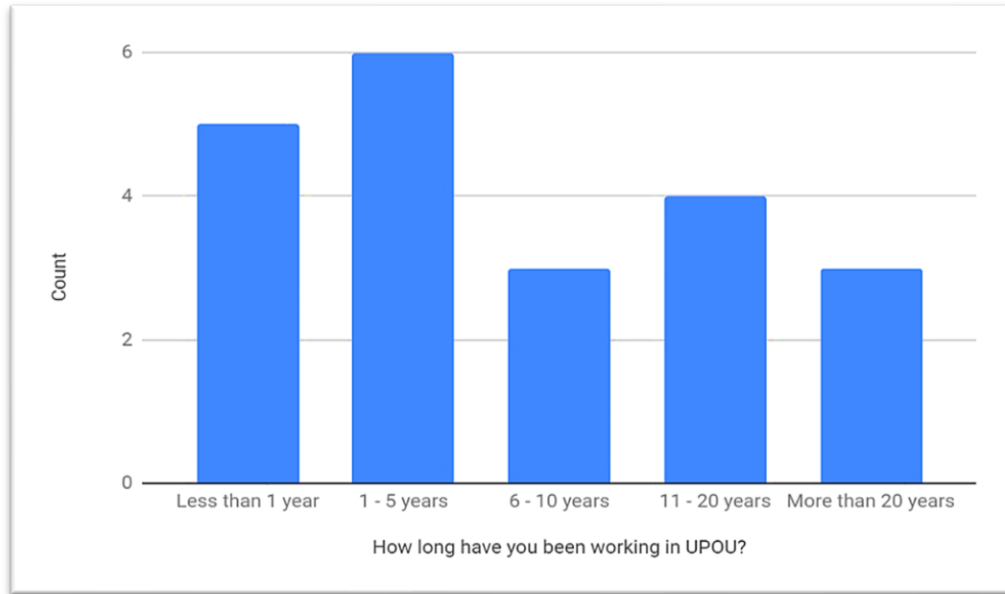


Figure 13. Number of years respondents worked at UPOU

As for the number of years the respondents had worked at UPOU, there was a good distribution ranging from less than 1 year to more than 20 years, though the top answer was 1-5 years as shown in Figure 13. This distribution, however, helps produce an SRS suitable for employees who have worked at UPOU for any number of years

When asked if they were using any tools (mobile/web-based/paper-based) for planning work activities, 1 out of the 21 respondents replied “no” while the rest replied “yes” as seen in Figure 14.

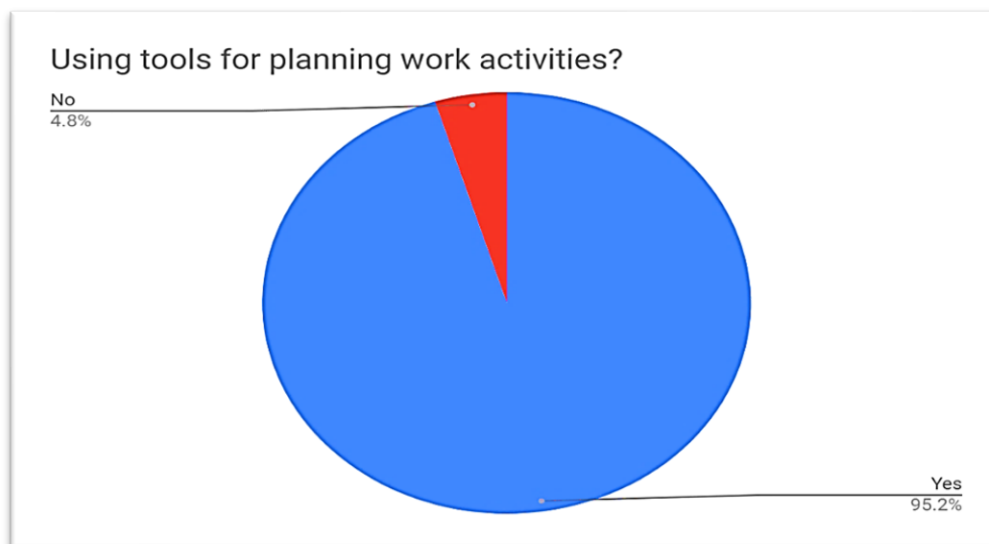


Figure 14. Answer to the Question “Are you currently using any tools (mobile/web-based/paper-based) for planning your work activities?”

The respondent who answered “no” indicated that she couldn’t find a tool that suited their needs. The rest who answered “yes” identified tools both paper-based and non-paper based used in their planning. Figure 15 shows the summary of tools used for planning identified by these respondents.

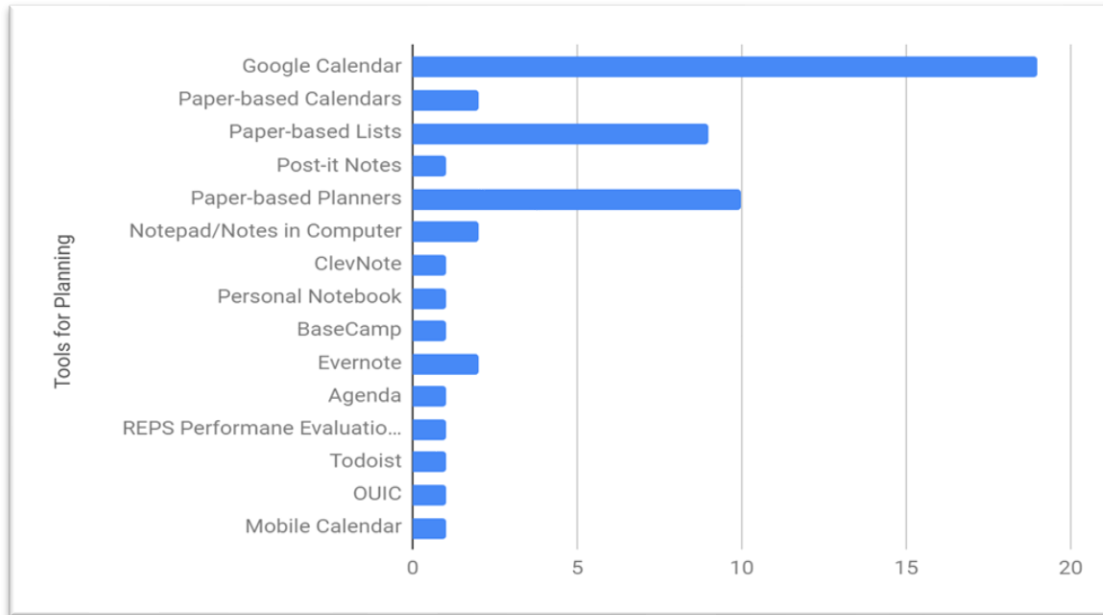


Figure 15. Tools Online Survey Participants Used for Planning Work Activities

The top three tools were Google Calendar used by 19 respondents, paper-based planners used by 10 respondents, and paper-based lists used by 9 respondents. According to the respondents, they used these tools and the others listed in Figure 15 because of the following consolidated reasons: they were easy to use, easy to track, convenient, readily available, accessible, lightweight, portable, handy, fast, free, and synchronized across devices. They also allowed the respondents to organize events and tasks, have reminders, see priority tasks, plan, and collaborate with other people. One respondent said there was a fondness for using paper-based tools. These should therefore be translated into the planner portion of the web-based planner and productivity tracker.



Figure 16. Answer to the Question “Are you currently using any tools (mobile/web-based/paper-based) to track your productivity?”

Meanwhile, when asked if they were using any tools to track their work productivity, 6 responded with “no” and fifteen 15 responded with “yes” as seen in Figure 16.

Reasons for answering “no” included not having time to update their progress or to try new tools, being used to working with traditional tools, not having apps or tools that suit their need, being used to using their head to track their productivity, and not have felt the need to use any tools.

Figure 17, meanwhile, shows which tools were used by the 15 respondents who answered “yes”.

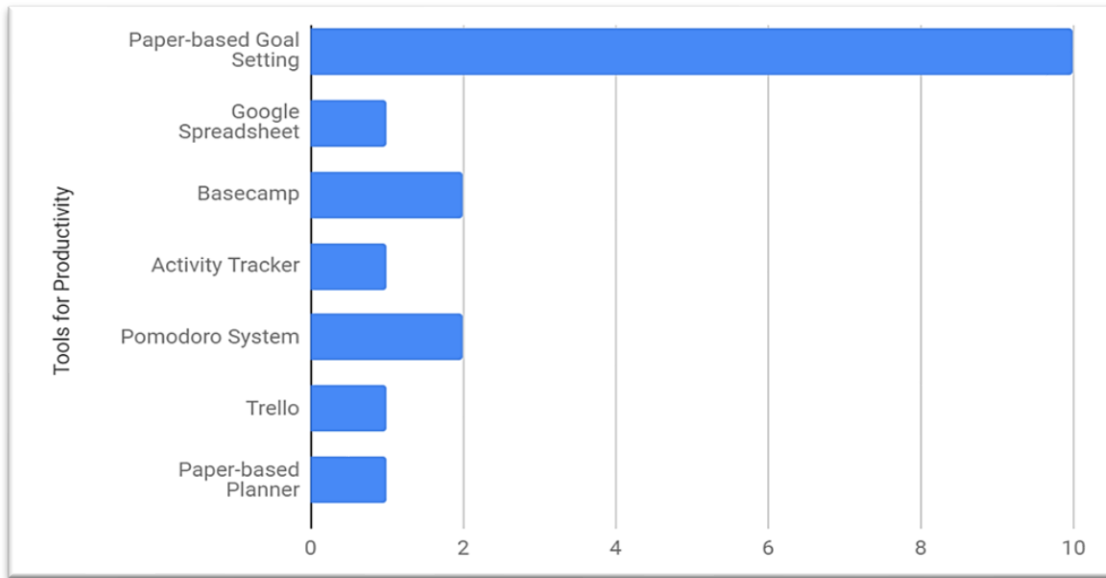


Figure 17. Tools Online Survey Participants Used for Tracking Productivity



Figure 18. Features of a Web-Based Planner and Productivity Tracker Selected by Online Survey Participants

A majority of respondents identified that they used paper-based goal setting for tracking their productivity with 10 listing this down. The next two tools used by two respondents each were Basecamp and the Pomodoro System. Reasons for choosing these tools as well as Google Spreadsheet, Activity Tracker, Trello, and paper-based planners included the following: it allowed monitoring, provided a sense of satisfaction leading to feelings of productivity, allowed thoughts to be reorganized, facilitated focus on tasks, and enabled enjoyment of break times.

The identified tools, especially the paper-based ones, were also easy to use even without a computer or internet, readily available, personal, and customized, and gave greater recall through writing. Others mentioned they used their selected tools because they were used to it or because it was referred to or required by a superior. These must be translated, too, into the productivity-tracker portion of the web-based planner and productivity tracker.

Finally, when asked if there's a need to develop a web-based planner and productivity tracker designed for the UPOU Community, all 21 respondents replied yes. Features selected by them from the list provided can be seen in Figure 18.

Table 2.

Other Suggested Features for a Web-Based Planner and Productivity Tracker

Respondent #	Suggested Feature(s)
R2	A reminder of what has been accomplished the previous day for motivation
R3	Incorporation of university and faculty activities.
R4	Add a tracker that monitors a healthy working routine, or something of that sort.
R5	Archiving (the more important items only) for future use (e.g. during calls for promotion, applications for grants, etc.)
R8	To-do list for the day
R9	Checklist feature, categorization of the task, task comments, convo feature, file management
R13	It should be user-friendly and readily accessible.
R14	Something to compute workload and determine to what extent someone is overworked. The unit-loading system is supposed to be that, but I think is inadequate. An additional birds-eye view needs to include engagement in other things such as committee work, etc.
R15	It may be useful for scheduling thesis defense with the advisory committee.
R18	Tracking group tasks, finding common meeting times
R19	Reward system for being productive (i.e. earning a badge etc)
R21	A feature that motivates like "Focus now on your work", "Do it now", "Now or never"

Table 2 shows the verbatim summary of additional features suggested by several of the respondents.

Given the above results, a Software Requirements Specification (SRS) document was created to serve as the blueprint for the development of the web-based planner and productivity tracker. Since all 21 respondents said there was a need to create this planner, a future research proposal for the development phase shall be made using the resulting SRS.

Figure 19 shows the main functionalities considered for "What Should I do Today?" by release and priority and Figure 20 shows features by functional area.

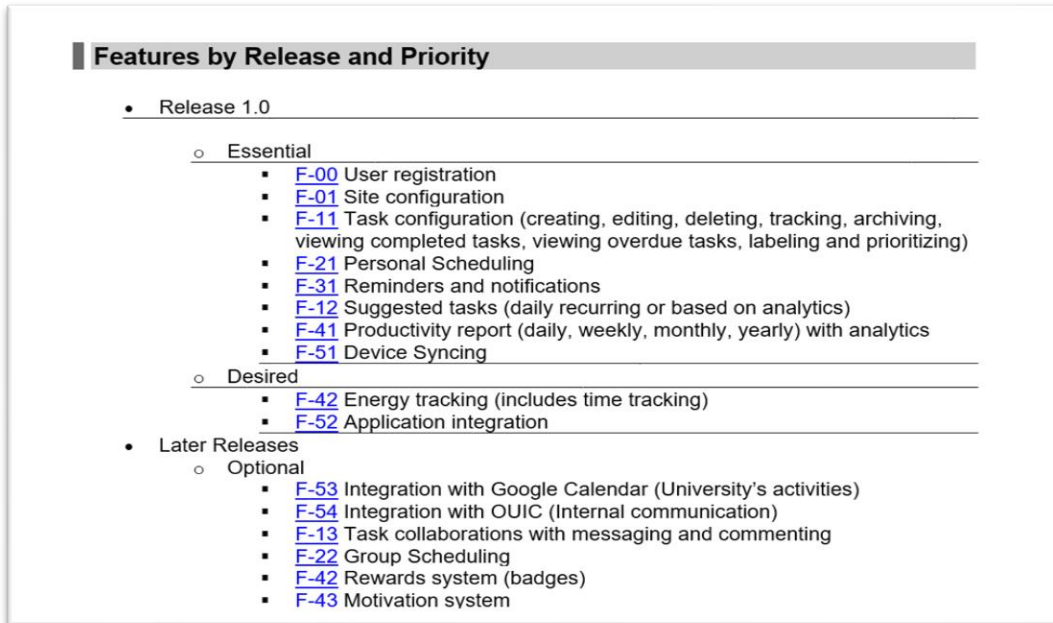


Figure 19. “What Should I do Today?” Features by Release and Priority

Release 1.0 includes all the features from the selection included in the online survey since each feature was selected by more than 50% of the total respondents. Most of the features are identified as “Essential” in the resulting SRS, however “Energy tracking” and “Application integration” are only tagged as “Desired” because of potential difficulties with the scope and algorithms involved.

The suggested features coming from individual respondents were also considered for later releases and have been tagged as “Optional”.

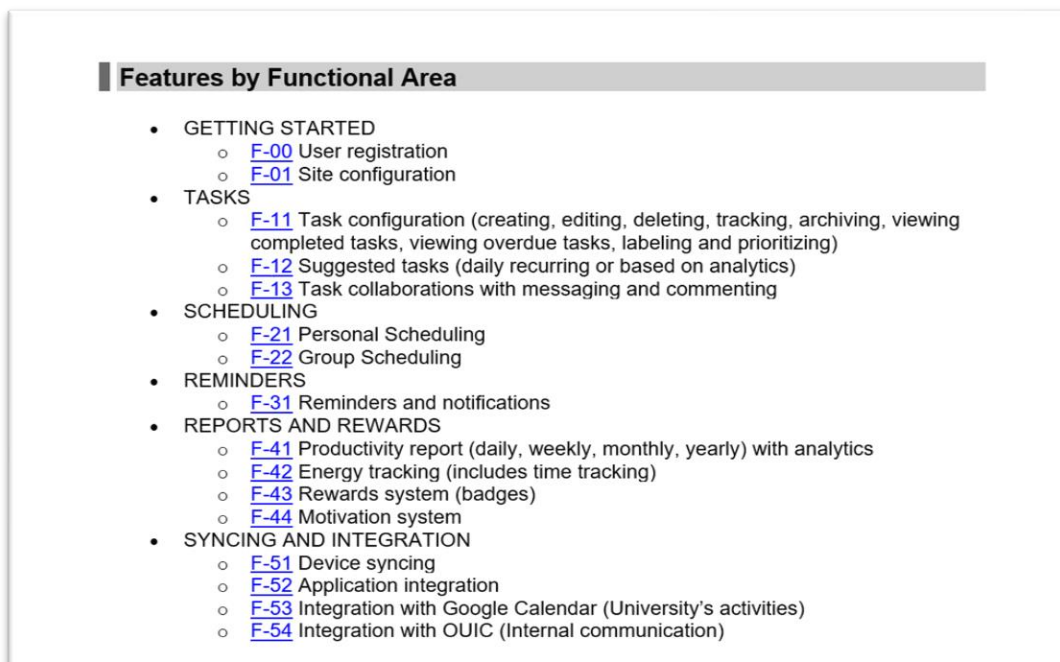


Figure 20. “What Should I do Today?” Features by Functional Area

The proposed web-based application, therefore, has 6 main functional areas covering planning and productivity-tracking: 1) Getting Started; 2) Tasks; 3) Scheduling; 4) Reminders; 5) Reports and Rewards, and 6) Syncing and Integration.

1. **Getting Started.** This functional area allows users to sign up and configure their accounts. Registered users can configure their accounts and change themes, font sizes, and enabled/disabled features.
2. **Tasks.** Tasks involve creating to-do lists and having suggested to-do lists based on overdue tasks, recurring tasks, or analytics-derived tasks. For a future release, collaborative tasks are also considered.
3. **Scheduling.** This functional area involves creating events for a calendar. For Release 1.0, the calendar is personal to the user, however, for later releases, this calendar could be shared and could involve integration with Google Calendar.
4. **Reminders.** Reminders send push notifications and emails about tasks and scheduling, depending on the configurations set by the user.
5. **Reports and Rewards.** Reports are essential (except for energy reports) and rewards are optional. This functional area involves algorithms used to produce daily, weekly, monthly, and yearly productivity reports. It also involves badges as a reward system for a later release.
6. **Syncing and Integration.** “What Should I do Today?” is web-based but must be responsive enough to be able to be properly accessed through tablets, phones, and other mobile devices. Later releases should allow integration with other applications, particularly with Google Calendar and UPOU’s Internal Communication system (OUIC).

The Feature Set and Use Case Suite in the SRS detail the descriptions and main success scenarios of the individual features and use cases.

## CONCLUSION

Different people have different approaches to planning tasks and tracking productivity. One solution might not be suitable for all. However, based on identified user needs, it is still worthwhile to propose a possible solution that attempts to cover current practices and addresses most user needs.

In UPOU, most use Google Calendar for planning tasks and events. For those who track their productivity, most prefer to do it through paper-based approaches rather than digital approaches. However, when asked if there’s a need to develop a web-based planner and productivity tracker designed for the UPOU Community, all of the respondents to the online questionnaire for the study said yes.

Thus, an SRS attempting to translate the response of the respondents from UPOU into a web-based planner and productivity tracker was created. This will be used as a blueprint for the development phase of the web application called “What Should I do Today?”

Once the web application is developed, it is recommended that an iterative approach be taken in enhancing the application’s features. The application may be presented to another group of UPOU respondents who can provide input on how to improve the system before the final round of user testing takes place.

It should be noted that data collection for this study took place before the COVID-19 pandemic when most works was done onsite and not all employees were allowed to do remote work. However, with flexible working conditions allowed in government institutions since March 2020, it would be worthwhile to know the following:

1. Did the available productivity tools evolve in terms of features and functionality to better assist remote workers during the pandemic?
2. Were there changes in the tools used by UPOU employees to better suit the work-from-home set-up allowed during the pandemic?
3. Will a customized tool still be needed or have the available tools already been upgraded to address the needs identified in this research paper?

Future research may be done to explore these questions.



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