Lab 1 Schedule Puzzle

Pablo Castaneda

Old Dominion University

Professor Thomas Kennedy

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1. Introduction

The product is called Schedule Puzzle. This is a user schedule creation, automation, and prioritization tool. People in society are consistently flooded with things that they need to do. Often time they will create a plan, but then another event pops up and derails their plans. On other occasions their scheduling was done poorly and there are errors in their plan. Schedule Puzzles goal is to help people with these challenges quickly generate a highly accurate schedule tailored to their needs.

Individuals' struggle with time management is well documented. In a 2022 study of 500 employees across several industries, less than 1 in 5 people (18%) have a proper time management system. (Richardson, 2022). Additionally, about one in five people audit themselves to check if they are accomplishing with their time what they set out to do. Figure 1 is a diagram highlighting the current process that most people use to schedule their tasks. The problem areas of the current process flow are surrounded by a purple box. The biggest issues are with keeping track of all the individual events and not scheduling them in a way which will cause time conflicts.

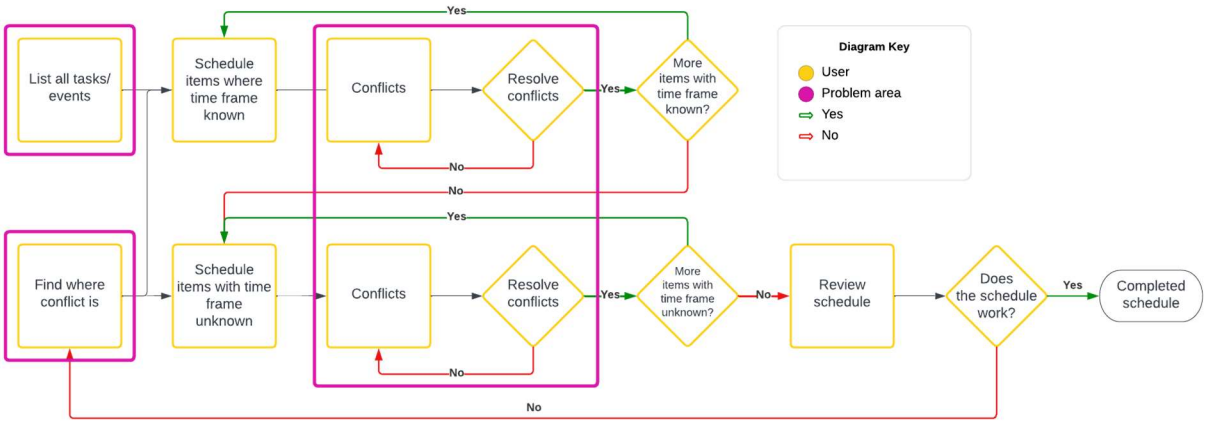

FIGURE 1 CURRENT PROCESS FLOW

The boxes on the far left represent a list of tasks. With schedule puzzle users will not need keep track of all their tasks. Each task will be given the option to add characteristics. Schedule Puzzle will use those characteristics to schedule the tasks based on the prioritization criteria derived from the characteristics.

2. Schedule Puzzle Product Description

Schedule Puzzle is a web application tool designed to help users create personalized schedules to help maximize their productivity based on what tasks are most important to the user. There are skilled at making schedules to complete their task; the goal of Schedule Puzzle is to help the average individuals who don't have those skills accomplish more. The objective of schedule Puzzle is to take the user error out of planning and management of schedules. This is accomplished using prioritization logic and automation.

2.1 Key Product Features and Capabilities

Schedule Puzzle's job is to give the user a schedule on a calendar that has all the tasks that a user needs to get done organized in a way to achieve maximum productivity. As the user is importing their tasks, they add characteristics to tasks that enable the application to add them to a calendar based on the urgency of each task. The contribution of this application is significant because save the user time by generating the schedule and creating a schedule that will maximize their time. The features of this application help solve the problem of remembering tasks, organizing tasks, and increasing to opportunity for completing tasks.

2.2 Major Components (Hardware/Software)

Web applications are software application that are hosted and accessed via the internet and not locally stored on a user's desktop. Database functionality is provided by SQLite which is provided by Django by default. Real world version of this application would use PostgreSQL due to the higher volume of users requiring the ability to scale our databases. Desktops, tablets, and phones that can access the internet should be able to access the website. The website will be hosted on Amazon Web Services[1]. The front end of the application will be put together with the Python Django Framework and the data will be stored via PostgreSQL. The schedules will be exported to Apple, Microsoft, and Google calendars.

3. Identification of Case Study

This product is being developed for individuals looking to move the work to create a schedule to a software program. This program will help people be more productive, leading to the opportunity to stress less or accomplish

[1] The location of the website is still being finalized, but it will be hosted via the cloud.

more. This results in better quality of life. The key functionality of the product, the automation of scheduling and prioritization, can be implemented in solutions for business to schedule their employees and projects.

4. Schedule Puzzle Product Prototype Description

The prototype will be an interactable web application. The interaction will consist of displaying a weekly calendar, adding tasks to the calendar, and creating a list of tasks to that can be automatically added to the calendar to best suit the needs of the user. The product described in CS 410 is has this functionality, plus the ability to import from calendars from other applications such as Apple, Google, and Outlook calendars. Currently, the plan is to host the web application prototype on a personal device to meet deadlines. If the project progresses ahead of time, the next step will be to host the web application on a dedicated web server. The initial versions of the prototype will be created on a Linux operating system.

4.1 Prototype Architecture (Hardware/Software)

Key features of this prototype will be importing tasks and creating a weekly schedule. The web application will have a function to create a list of tasks. The properties of the tasks will be editable. For the schedule, a one-click-away schedule will automatically generate with the task populated on it. The tasks on that schedule will be organized in a way tailored to the user to maximize their chances of completing their tasks. Below is a diagram that highlights what features will be in the prototype, and what features will be in the completed real-world product.

Features	**Real World Product**	**Prototype**
Modify Tasks	✓	✓
Behavioral suggestions	✓	Not included
Custom prioritization	✓	✓
Semi-automatic conflict resolution	✓	✓
Automatic schedule creation	✓	Partially

Natural language processing	✓	Not included

TABLE 1 COMPARISON BETWEEN REAL WORLD PRODUCT AND PROTOTYPE

4.2 Prototype Features and Capabilities

This prototype demonstrates that an individually optimized schedule can be created. This is significant because people will be able to offload the task of creating a plan and begin working towards completing the plan, saving time and being efficient. The risks of incorrect user inputs will be mitigated by the feature of being able to edit the schedule. Risks of data loss and accidental deletion will be mitigated by creating backups to lists and schedules. The objective of the prototype is to be able to give stakeholders something they can see and interact with to demonstrate feasibility and progress. The prototype will include task creation with the ability to set a priority level and semi-automatic schedule resolution. It will have partial automatic schedule creation, and it will not have natural language processing or behavioral suggestions.

4.3 Prototype Development Challenges

Challenges facing this prototype are a lack of knowledge on how to use Django, the Python web application framework, and Amazon Web services, which is the primary option for hosting the website. This application tries to forecast schedules, which creates the challenge of trying to optimally schedule tasks.

5. Glossary

Natural Language Processing (NLP): Machine learning used to interpret human language.

PostgreSQL: A relational database management system.

Python: A programming language used to create a variety of different programs.

Semi-automatic deconfliction: The feature that uses user input to be the deciding factor as to what task will be prioritized on a schedule.

SQLite: An embedded, server-less relational database management system.

Task: An object is placed on a schedule with characteristics. The characteristics are used by the program to prioritize and schedule the objects.

6. References

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