

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
THE UNIVERSITY OF TEXAS AT ARLINGTON**

**PROJECT CHARTER
CSE 4316: SENIOR DESIGN I
SPRING 2024**



**SWIFT START
SPRINT O' CLOCK**

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REVISION HISTORY

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1 PROBLEM STATEMENT

The problem statement defines the "Why" of the project. This is the higher purpose, or the reason for the project's existence. This section should avoid mentioning implementation details, and focus more on what the current problem is and what would be gained if the problem were to be solved. In short, this is the reason that you are going to be working on something, not the method(s) that you will be employing.

2 METHODOLOGY

This is the "What" of the project and it states what will be done to address the problem statement. This section should focus mostly on what your solution is going to be and what it is going to do (i.e., we are going to build an app, robot, device, etc. to perform some task which mitigates the problem). If someone were to ask you *"What are you doing for your senior design project?"*, this section is basically what you would tell them.

3 VALUE PROPOSITION

The Value Proposition explains how the sponsors will benefit from your work, and why they should invest funding, time, and expertise in supporting your team. Here, you are essentially making a case for the project. There are many ways in which value can be returned to your stakeholders (industrial sponsors, instructors, the university, etc.), list any that may help you convince them to "buy in".

4 DEVELOPMENT MILESTONES

This list of core project milestones should include all major documents, demonstration of major project features, and associated deadlines. Any date that has not yet been officially scheduled at the time of preparing this document may be listed by month.

Provide a list of milestones and completion dates in the following format:

- Project Charter first draft - Month Year
- System Requirements Specification - Month Year
- Architectural Design Specification - Month Year
- Demonstration of <feature or implementation milestone> - Month Year
- Detailed Design Specification - Month Year
- Demonstration of <feature or implementation milestone> - Month Year
- Demonstration of <feature or implementation milestone> - Month Year
- CoE Innovation Day poster presentation - Month Year
- Demonstration of <feature or implementation milestone> - Month Year
- Demonstration of <feature or implementation milestone> - Month Year
- Demonstration of <feature or implementation milestone> - Month Year
- Final Project Demonstration - Month Year

5 BACKGROUND

An in-depth explanation of the problem, including the "business case". What is wrong with the status-quo or what opportunity exists that justifies undertaking this project (expanding upon the problem statement)? If you have a clear customer or sponsor, why do they want you to work on this? What is the existing relationship, if any, between the development team and the customer? This section should occupy 1/2 - 1 full page.

6 RELATED WORK

Discuss the state-of-the-art with respect to your product. What solutions currently exist, and in what form (academic research, enthusiast prototype, commercially available, etc.)? Include references and citations as necessary using the `\cite` command, like this [1]. If there are existing solutions, why won't they work for your customer (too expensive, not fast enough, not reliable enough, etc.). This section should occupy 1/2 - 1 full page, and should include at least 5 references to related work. All references should be added to the `.bib` file, fully documented in IEEE format, and should appear in the *references* section at the end of this document (the IEEE citation style will automatically be applied if your reference is properly added to the `.bib` file).

ProTip: Consider using a citation manager such as Mendeley, Zotero, or EndNote to generate your `.bib` file and maintain documentation references throughout the life cycle of the project.

7 SYSTEM OVERVIEW

Explain, at a high level, how you will implement a solution to the problem. Include a diagram of major components to the system (not a full architectural design, but a high level overview of the major system components and how a user or external system might interface). Avoid specific implementation details (operating system, programming languages, etc.). This section should occupy at least 1 full page.

8 ROLES & RESPONSIBILITIES

Who are the stakeholders of the project? Who will be the point of contact from the sponsor or customer side? Who are the team members, and what will be their areas of responsibility? Will your team maintain the product owner and scrum master for the whole project, or will that role change periodically? This section should occupy 1/2 - 1 full page.

9 COST PROPOSAL

This section contains the approximate budget for the project, where that money will come from, and any other support. This text should be replaced with a discussion and justification of major expenses, but not the actual monetary amounts (that will go in the preliminary budget section below).

9.1 PRELIMINARY BUDGET

Include a high level budget table for components, fabrication, software licensees, development hardware, etc. This should be in a tabular format broken up into appropriate line items.

9.2 CURRENT & PENDING SUPPORT

What are all of the funding sources for the project, and are there any potential funding sources that haven't been secured yet? List all funding sources (including the default funding amount provided by the CSE department) and their dollar amounts.

EXPENSE	BUDGET
Availability of X sensor module due to contractor delay	0.50
Outdoor testing grounds are not available	0.20
Internet access not available at installation site	0.30
Delays in shipping from overseas vendors	0.10
Certification delays at compliance testing facility	0.15

Table 1: Overview of project budget

10 FACILITIES & EQUIPMENT

What lab space, testing grounds, makerspaces, etc. will you need to complete the project? Will you require any specific equipment, and if so, where will you get it (borrow, lease, purchase, outsource, already present in the lab, etc.). This section should occupy 1/2 page.

11 ASSUMPTIONS

After analyzing our app implementation on how our project is going to be structured, here are our assumptions

- Able to learn UI/Programming implementations that correlates with a watch
- Able to keep track of the goal information of the user using the app which requires data implementation
- Have access to watches in order to test/debug errors with time or distance
- Have someone be able to frequently run,sprint,walk, in order to test the watch and our app
- A suitable system in order to keep our codes and programs in place

12 CONSTRAINTS

The following are the major key constraints that are out of our control for this project

- Technical constraints such as iOS/Android compatibility
- API implementations that could require permission from the government for our watches
- Comply with legal privacy rights
- Final prototype demonstration must be completed by May 2024
- Team is new to all of this app implementation

13 RISKS

This part shows 5 of the most critical risks that will be at a probability of loss in days and exposure in days

Risk description	Probability	Loss (days)	Exposure (days)
Misunderstood use of technology/programs	0.3	10	3
Our resources malfunction. Ex: Watches	0.2	7	1.4
Internet access not available at installation site	0.3	9	2.7
Outdoor testing not available. Ex: Rain, Snow	0.15	1	.15
Certification/Government API use delays such for our watches	.4	20	8

Table 2: Overview of highest exposure project risks

14 DOCUMENTATION & REPORTING

14.1 MAJOR DOCUMENTATION DELIVERABLES

These deliverables are major grade components of the course. Completing these documents should generally be the sprint goal during the applicable sprint period. Refer to current and previous course syllabi and schedules to estimate the due dates of these items. Remove this explanatory paragraph from your draft, but leave the heading.

14.1.1 PROJECT CHARTER

Describe how this document will be maintained and updated (how often, under what circumstances, etc.). When will the initial version be delivered? When will the final version be delivered?

14.1.2 SYSTEM REQUIREMENTS SPECIFICATION

Describe how this document will be maintained and updated (how often, under what circumstances, etc.). When will the initial version be delivered? When will the final version be delivered?

14.1.3 ARCHITECTURAL DESIGN SPECIFICATION

Describe how this document will be maintained and updated (how often, under what circumstances, etc.). When will the initial version be delivered? When will the final version be delivered?

14.1.4 DETAILED DESIGN SPECIFICATION

Describe how this document will be maintained and updated (how often, under what circumstances, etc.). When will the initial version be delivered? When will the final version be delivered?

14.2 RECURRING SPRINT ITEMS

The following items will be documented and maintained during each individual sprint. As above, remove this paragraph from your draft, but leave the heading.

14.2.1 PRODUCT BACKLOG

How will items be added to the product backlog from the SRS? How will these items be prioritized? Who makes the decision (product owner, group vote, etc.)? What software will be used to maintain and share the product backlog with team members and stakeholders?

14.2.2 SPRINT PLANNING

How will each sprint plan be planned? How many sprints will there be (you need to look at the schedules for this course and previous Senior Design II courses during the appropriate semesters to figure this out).

14.2.3 SPRINT GOAL

Who decides the sprint goal? How will you involve your customer in this process?

14.2.4 SPRINT BACKLOG

Who decides which product backlog items make their way into the sprint backlog? How will the backlog be maintained (collaboration software, a "scrum board", etc.)?

14.2.5 TASK BREAKDOWN

How will individual tasks be assigned from the sprint backlog? Will it be up to each team member to voluntarily claim a task, or will it come from the product owner? How will time spent on tasks be documented?

14.2.6 SPRINT BURN DOWN CHARTS

Who will be responsible for generating the burn down charts for each sprint? How will they be able to access the total amount of effort expended by each individual team member? What format will the burn down chart use (include an example burn down chart below).

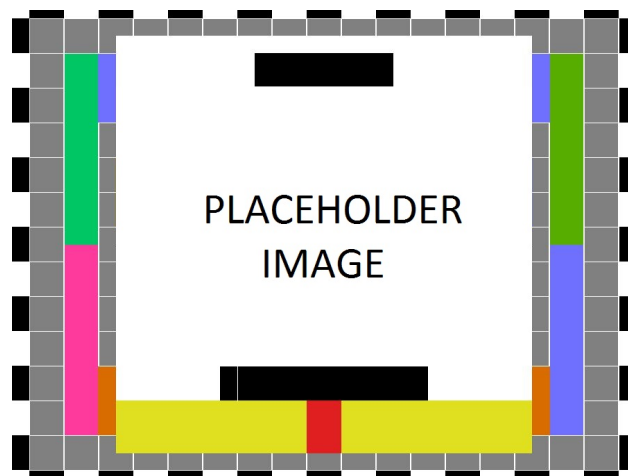


Figure 1: Example sprint burn down chart

14.2.7 SPRINT RETROSPECTIVE

How will the sprint retrospective be handled as a team? When will this discussion happen after each sprint? What will be documented as a group and as individuals, and when will it be due?

14.2.8 INDIVIDUAL STATUS REPORTS

What sort of status will be reported by each individual member, and how often will it be reported? What key items will be contained in the report?

14.2.9 ENGINEERING NOTEBOOKS

How often will the engineering notebook be updated, at a minimum, by each team member? What is the minimum amount of pages that will be completed for each interval, and how long will that interval be? How will the team keep each member accountable? Who will sign off as a "witness" for each ENB page?

14.3 CLOSEOUT MATERIALS

The following materials, in addition to major documentation deliverables, will be provided to the customer upon project closeout. Remove this paragraph from your draft, but leave the heading.

14.3.1 SYSTEM PROTOTYPE

What will be included in the final system prototype? How and when will this be demonstrated? Will there be a Prototype Acceptance Test (PAT) with your customer? Will anything be demonstrated off-site? If so, will there be a Field Acceptance Test (FAT)?

14.3.2 PROJECT POSTER

What will be included on the poster, what will be the final dimensions, and when will it be delivered?

14.3.3 WEB PAGE

What will be included on the project web page? Will it be accessible to the public? When will this be delivered? Will it be updated throughout the project, or just provided at closeout (at a minimum, you need to provide a simple web page at the end).

14.3.4 DEMO VIDEO

What will be shown in the demo video(s)? Will you include a B-reel footage for future video cuts? Approximately how long will the video(s) be, and what topics will be covered?

14.3.5 SOURCE CODE

How will your source code be maintained? What version control system will you adopt? Will source code be provided to the customer, or binaries only? If source code is provided, how will it be turned over to the customer? Will the project be open sourced to the general public? If so, what are the license terms (GNU, GPL, MIT, etc.). Where will the license terms be listed (in each source file, in a single readme file, etc.).

14.3.6 SOURCE CODE DOCUMENTATION

What documentation standards will be employed? Will you use tools to generate the documentation (Doxygen, Javadocs, etc.). In what format will the final documentation be provided (PDF, browsable HTML, etc.)?

14.3.7 HARDWARE SCHEMATICS

Will you be creating printed circuit boards (PCBs) or wiring components together? If so, list each applicable schematic and what sort of data it will contain (PCB layout, wiring diagram, etc.). If your project is purely software, omit this section.

14.3.8 CAD FILES

Will the project involve any mechanical design, such as 3D printed or laser-cut parts? If so, what software will you use to generate the files and what file formats will you provide in your closeout materials (STL, STEP, OBJ, etc.). If your project is purely software, omit this section.

14.3.9 INSTALLATION SCRIPTS

How will the customer deploy software to new installations? Will you provide installation scripts, install programs, or any other tools to improve the process? Will there be multiple scripts provided (perhaps separate scripts for the graphical front end and back end server software)?

14.3.10 USER MANUAL

Will your customer need a printed or digital user manual? Will they need a setup video? Decide now what will be provided and discuss.

REFERENCES

- [1] Kenneth S Rubin. *Essential Scrum: A Practical Guide to the Most Popular Agile Process*. Addison-Wesley Professional, 1st edition, 2012.