

1.1 PROBLEM STATEMENT

What problem is your project trying to solve? Use non-technical jargon as much as possible.

Our project aims to solve the problem faced by Nathan, the manager at Reiman Garden, and his volunteer lead, Kathleen, during the Spirit of The Garden event held every year during the Halloween season. Hundreds of volunteers attend the event every year, and Kathleen must look up all the stencil information from the excel file to update it, which takes up a lot of time and effort.

To solve this issue, we plan to develop a web application that both the admin and volunteers can use to update the information for the pumpkin/stencil during the event. All volunteers can update the information by themselves, saving time and effort during the event. The admin will control all printing and cutting processes and choose which stencils they want to appear during this year's event. Moreover, the admin will also update, confirm, and correct information if the volunteer updates the wrong status. The web application will help solve the problem and streamline the process, making the Spirit of The Garden event more efficient and effective.

1.2 REQUIREMENTS & CONSTRAINTS

List all requirements for your project. This includes functional requirements (specification), resource requirements, qualitative aesthetics requirements, economic/market requirements, environmental requirements, UI requirements, and others relevant to your project. When a requirement is also a quantitative constraint, separate it into a list of constraints or annotate it at the end of the requirement as “(constraint).” Other requirements can be a single list or broken out into multiple lists based on the category.

Functional Requirements

The mobile website requirements encompass two categories—stencil status tracking system and stencil recognition.

Tracking System for Stencil Status

- a. The app must allow *admins* to...
 - **search** stencils using their code.
 - **edit stencil info** (i.e., name, category, code, image).
 - **sort or categorize** stencils as desired (i.e., by category, status, and week used).
 - **upload stencil PDFs/images** into the system (can be local as long as it's unified).
 - **update status** efficiently (status: printed, cut, traced, and carved).
 - **approve** stencils that are in the pending status queue (i.e., for ensuring that stencil code is written at the back)
 - **print stencils in one go**, using the same print settings for all stencils.
 - **select** stencils that will be used for the current year and which weeks they will be carved or displayed in the event.
- b. The app must allow *volunteers* to...
 - **input stencil code** to see its status (traced or carved).
 - click a button to **start or end the current stencil process**—tracing or carving.

Stencil Recognition

- a. The app must allow visitors and admins to use their phone cameras, take a picture of a jack-o-lantern, and display which category it's from.

Economic/Market Requirements

- a. The app must be maintainable for the admin users to be used throughout the years (i.e., let variables be settings editable for admins).
- b. The app must be accessible in the United States, more importantly, inside Ames, IA.

UI Requirements

- a. The UI should be intuitive and fluid across mobile or desktop browsers.
- b. The app must have a search box to type in stencil code for searching.
- c. The app must include as few clicks as possible for each operation.
 - i. For example, the app must have a parent radio button that will be used to specify the current process. If the current day focuses on carving pumpkins, the radio button will be set to "Carve" status (to avoid multiple button clicks when updating the status).
- d. The app must show thumbnails of stencil images so that users can know how it looks without loading another page (i.e., during the stencil selection process).
- e. The app must have a save button (or automatic save) so that user progress on edits/selections would not be lost.
- f. The app must not show any possible, copyrighted stencil images.

Constraints

- a. The app must be accessible online through a browser on mobile and desktop.
- b. The app response time for searching and showing stencil info from AI should be very low.

1.3 ENGINEERING STANDARDS

What Engineering standards are likely to apply to your project? Some standards might be built into your requirements (Use 802.11 ac wifi standard), and many others might need to be added to the design. For each standard listed, also provide a brief justification.

- 1. 12207-2017 - ISO/IEC/IEEE International Standard - Systems and software engineering -- Software life cycle processes ([link](#))**

This standard will guide this project's development as it provides a common framework for software lifecycle processes. The project will utilize processes that are defined in this standard that are geared towards agile software development as well as pointers for requirements gathering and documentation.

- 2. 29119-2-2021 - ISO/IEC/IEEE International Standard - Software and systems engineering - Software testing -- Part 2: Test processes ([link](#))**

This standard will guide software testing practices in developing the web app. The group will consult manual and automated testing practices defined in this standard.

3. **20148-2018 - ISO/IEC/IEEE International Standard - Systems and software engineering -- Life cycle processes -- Requirements engineering** ([link](#))

This standard will serve as a guide for good requirements definition on the software and how to apply these requirements effectively on the web application.

4. **W3C Standards for web design and application and web architecture** ([link](#))

This is a helpful resource for standards or recommendations for web development. The standards/recommendations regarding mobile web interface, APIs, HTML, CSS, and HTTP will be helpful for this project.

1.4 INTENDED USERS AND USES

Who benefits from the results of your project? Who cares that it exists? How will they use it? Enumerating as many "use cases" as possible also helps ensure your requirements are complete (each use case may give rise to its requirements).

1. Volunteer Admins

These are the primary users of our application who are the volunteers supervising the Spirits in the Gardens event. The admins want to make tracking the stencils' statuses less tedious and exhausting. They want an easy and fast-to-use application to help run the event efficiently. These superusers can:

- a. Initiate a new event for the upcoming year.
- b. Specify how many weeks the event will be.
- c. Enter, modify, and delete the stencil information from the system.
- d. Scroll through the stencils and select the ones that will be used in the next event.
- e. Select which stencils will be used for week one or two of the event.
- f. Simultaneously print stencils using the same printer settings.
- g. Print all stencils that were not brought back for cutting.
- h. Search for any stencil by its code.
- i. Update stencil status to Printed, Cut, Traced, or Carved.
- j. Approve stencils in the pending queue so they can check if the volunteer has added the stencil code at the back of the pumpkin.
- k. View stencil information easily by taking a picture of the carved pumpkin and identifying the stencil it was carved from.
- l. Sort or categorize stencils as desired.

2. Volunteers

The subcategory of primary users also includes the volunteers who help trace and carve the pumpkins at the Reiman Gardens. The volunteers will be interested in accessing the application through their Android or iOS devices and experiencing a user-friendly UI. As such, they will have only a subset of the admins' capabilities. Particularly, volunteers can:

- a. Search for any stencil information by entering its code.
- b. Submit a status update on the pumpkins showing whether they are traced or carved for the admins to approve.
- c. Take a picture of the carved pumpkin and get information about its stencil.

3. Visitors

The secondary users of our application will include the visitors who attend the Spirits in the Gardens. They will be interested in the following:

- a. Recognizing the stencil the pumpkin was carved from using their cameras with an AI
- b. Finding more information about the stencil, including its title, category, source, etc.
- c. Voting for the most liked stencil/pumpkin.