Development Plan
Bridging Gaps: AI for Diagram Accessibility

Team 22, Reading4All
Nawaal Fatima
Dhruv Sardana
Fiza Sehar
Moly Mikhail
Casey Francine Bulaclac

Table 1: Revision History

Date	**Developer(s)**	**Change**
September 22, 2025	All	Initial version of document
Date2	Name(s)	Description of changes
...	...	...

[Put your introductory blurb here. Often the blurb is a brief roadmap of what is contained in the report. —SS]

[Additional information on the development plan can be found in the lecture slides. —SS]

1 Confidential Information?

[State whether your project has confidential information from industry, or not. If there is confidential information, point to the agreement you have in place. —SS]

[For most teams this section will just state that there is no confidential information to protect. —SS]

2 IP to Protect

[State whether there is IP to protect. If there is, point to the agreement. All students who are working on a project that requires an IP agreement are also required to sign the "Intellectual Property Guide Acknowledgement." —SS]

3 Copyright License

[What copyright license is your team adopting. Point to the license in your repo. —SS]

4 Team Meeting Plan

[How often will you meet? where? —SS]

[If the meeting is a physical location (not virtual), out of an abundance of caution for safety reasons you shouldn't put the location online —SS]

[How often will you meet with your industry advisor? when? where? —SS]

[Will meetings be virtual? At least some meetings should likely be in-person. —SS]

[How will the meetings be structured? There should be a chair for all meetings. There should be an agenda for all meetings. —SS]

5 Team Communication Plan

[Issues on GitHub should be part of your communication plan. —SS]

6 Team Member Roles

[You should identify the types of roles you anticipate, like notetaker, leader, meeting chair, reviewer. Assigning specific people to those roles is not necessary at this stage. In a student team the role of the individuals will likely change throughout the year. —SS]

7 Workflow Plan

- How will you be using git, including branches, pull request, etc.?
- How will you be managing issues, including template issues, issue classification, etc.?
- Use of CI/CD

8 Project Decomposition and Scheduling

- How will you be using GitHub projects?
- Include a link to your GitHub project

[How will the project be scheduled? This is the big picture schedule, not details. You will need to reproduce information that is in the course outline for deadlines. —SS]

9 Proof of Concept Demonstration Plan

Our Proof Of Concept(POC) will consist of roughly the following steps:

1. Identify the types of technical diagrams to target for alt text generation.
    - Such as but not limited to flowcharts, circuit diagrams, graphs, UML diagrams, and mathematical figures.
2. Determine the accessibility requirements and standards for alt text.
    - These requirements will be based on AODA and Web Content Accessibility Guidelines (WCAG) 2.1 guidelines, focusing on clarity, conciseness, and compatibility with screen readers.
3. Develop and evaluate the model's ability to generate alt text for a selected set of diagrams.
    - We will test outputs using a curated dataset of diagrams.
    - Evaluation will include both automated metrics (e.g., text length, keyword coverage) and qualitative user testing with screen reader compatibility checks.

4. Incorporate user feedback to refine the generated descriptions.
    - Feedback will be collected from users using metrics defined in the STEM Alt Text User Testing Project conducted by Ms. Jing in January 2025.
    - A human-in-the-loop process will validate and correct outputs to increase trustworthiness and usability.
5. Compare generated alt text against baseline approaches.
    - We will benchmark our tool's outputs against existing alt text practices (manual descriptions, generic auto-generation) and results from the STEM Alt Text User Testing Project.
    - The goal is to show measurable improvements in accessibility and user comprehension.
6. Demonstrate proof of integration with assistive technologies.
    - Final validation will involve testing with screen readers (e.g., NVDA, JAWS) to ensure proper reading order and interpretability.

The following is a brief list of primary risks to our success and how the POC results can mitigate them:

- **Risk:** The model may not be able to accurately generate alternative text that is considered accessible.
  Mitigation: The POC will include testing for the model on a diverse set of diagrams to evaluate its performance and regulate according to Accessibility for Ontarians with Disabilities Act (AODA) standards.
- **Risk:** The tool may not integrate smoothly with assistive technologies (e.g., screen readers).
  Mitigation: The POC will explicitly test generated alt text with standard screen readers to confirm compatibility and usability.
- **Risk:** End-users may perceive the generated alt text as inaccurate or misleading, reducing trust in the tool.
  Mitigation: The POC will incorporate a human-in-the-loop feedback mechanism, enabling iterative validation and correction of generated text.
- **Risk:** The project may face time constraints that could impact the depth of development.
  Mitigation: The POC will prioritize essential features and functionalities, allowing for a focused approach that can be expanded upon in future iterations.

10 Expected Technology

[What programming language or languages do you expect to use? What external libraries? What frameworks? What technologies. Are there major components of the implementation that you expect you will implement, despite the existence of libraries that provide the required functionality. For projects with machine learning, will you use pre-trained models, or be training your own model? —SS]

[The implementation decisions can, and likely will, change over the course of the project. The initial documentation should be written in an abstract way; it should be agnostic of the implementation choices, unless the implementation choices are project constraints. However, recording our initial thoughts on implementation helps understand the challenge level and feasibility of a project. It may also help with early identification of areas where project members will need to augment their training. —SS]

Topics to discuss include the following:

- Specific programming language
- Specific libraries
- Pre-trained models
- Specific linter tool (if appropriate)
- Specific unit testing framework
- Investigation of code coverage measuring tools
- Specific plans for Continuous Integration (CI), or an explanation that CI is not being done
- Specific performance measuring tools (like Valgrind), if appropriate
- Tools you will likely be using?

[git, GitHub and GitHub projects should be part of your technology. —SS]

11 Coding Standard

[What coding standard will you adopt? —SS]

Appendix — Reflection

[Not required for CAS 741 —SS]

The purpose of reflection questions is to give you a chance to assess your own learning and that of your group as a whole, and to find ways to improve in the future. Reflection is an important part of the learning process. Reflection is also an essential component of a successful software development process.

Reflections are most interesting and useful when they're honest, even if the stories they tell are imperfect. You will be marked based on your depth of thought and analysis, and not based on the content of the reflections themselves. Thus, for full marks we encourage you to answer openly and honestly and to avoid simply writing "what you think the evaluator wants to hear."

Please answer the following questions. Some questions can be answered on the team level, but where appropriate, each team member should write their own response:

1. Why is it important to create a development plan prior to starting the project?

2. In your opinion, what are the advantages and disadvantages of using CI/CD?

3. What disagreements did your group have in this deliverable, if any, and how did you resolve them?

Appendix — Team Charter

[borrows from University of Portland Team Charter —SS]

External Goals

Our team's primary external goal is to gain valuable, workforce-relevant experience by developing a project that enhances our technical and professional skills, particularly in machine learning, natural language processing, accessibility standards (AODA), and inclusive design. We aim to create a portfolio-worthy project that could be showcased in interviews, highlighting our ability to address real-world accessibility challenges. Our goals also include achieving an A+ in the course, presenting our work at the Capstone EXPO for a chance to win a prize, and contributing to McMaster's commitment to accessibility by creating a tool to improve inclusion for students with disabilities.

Attendance

This section explains rules and expectations regarding team member attendance.

Expectations

Our team expects all members to attend weekly meetings consistently and arrive on time to ensure productive collaboration and effective communication. Members are expected to stay for the entire duration of the meeting. If someone must leave early or miss a meeting, they should notify the team at least 24 hours in advance and take responsibility for catching up on any missed discussions or tasks by reviewing the meeting notes. We prioritize respect for each other's time and aim to keep meetings efficient, focused, and adaptable to everyone's schedule. If any team member misses two meetings in a row, they must treat the rest of the team to timbits. For every meeting missed after that, the member must bring a snack for each team member. If a team member is consistently late or misses a meeting, they must provide an appropriate reason. Failure to do so will result in escalation to the TA and then the instructor. To stay organized, the team will use a discord event bot to schedule meetings and send reminders to ensure everyone is aware of upcoming sessions.

Acceptable Excuse

An acceptable excuse for missing a meeting or deadline includes unavoidable circumstances such as illness, family emergencies, technical issues, work events or unavoidable academic conflicts (midterms/exams) beyond one's control, that are communicated to the team in advance. Excuses such as forgetting, poor time management, lack of preparation, or not informing the team ahead of time are not acceptable. We anticipate clear and timely communication to alter duties as appropriate to ensure the project stays on schedule.

In Case of Emergency

If a team member has an emergency and cannot attend a meeting or complete their assigned work, they are expected to notify the team as soon as possible through the group's discord channel or teams channel. In the event, a team member cannot complete their assigned duties, they should inform the team atleast 72-96 hours prior to submission deadlines. The member should clearly explain the situation, indicate whether they will need support or a change of tasks, and provide any available progress or notes so others can continue the work if necessary. In the case where tasks are redistributed, the team member must update the progress board on Github to reflect the changes. The team will then adjust responsibilities collaboratively to ensure that deadlines and deliverables are still met.

Accountability and Teamwork

Quality

Every member of the team is expected to produce high-quality work that meets the agreed-upon standards and contributes positively to the overall project. All members should prepare for weekly check-ins and meetings by doing the following:

- Before every meeting, the team members must review meeting notes from the last meeting and be up-to-date on the meeting agenda.
- The team members must review all the relevant materials and documents related to the project. Team members must create a list of questions to ask at the biweekly meeting with supervisor in order to gain more clarity towards the final goal.
- Assigned tasks should be completed in advance so that meetings can focus on collaboration and decision-making rather than catching up on unfinished work.
- Every team member must provide status updates on their assigned tasks during meetings, highlighting any challenges or roadblocks they are facing.
- All team members should actively participate in discussions, offering constructive feedback and suggestions to improve the project.
- In case any team members require any assistance or support, they should communicate this to the team promptly so that help can be provided.

In order to ensure high-quality work, the team will implement the following practices:

- All code contributions must adhere to the team's coding standards and be reviewed by at least one other team member before being merged into the main branch.

- Issues must be created on the Github progress board for all tasks, and team members should update the status of their tasks regularly.
- All tasks should be completed on the time agreed by the team and the quality of the work should adhere to the rubric of the given deliverable.
- Each team member is responsible for getting their work reviewed and approved by the team before submission.
- All the team members must actively participate in revieweing as well as sincerly and honestly considering feedback provided by other team members.
- If challenges arise that may affect quality, members should communicate early so that the team can provide support or make adjustments.
- The standard of the work should be well documented, well comunicated, well tested and reviewed by the team to ensure it meets the coding standards set by the team.

Attitude

Our team expects all members to approach the project professionally, respectfully, and open to new ideas. Ideas should be openly shared, and all contributions will be carefully considered to foster an environment creativity and innovation. Team interactions should be collaborative and helpful, with members working together to achieve a common goal rather than focusing on individual accomplishments. A positive and accountable attitude is required, in which each individual accepts responsibility for their task while respecting the time and efforts of others. The team will follow the standard code of conduct to ensure respect, diversity and a no discrimination/harassement policy. In case of disagreements/conflicts, the team will address them constructively and professionally, seeking to understand different perspectives and finding common ground internally in a team meeting. If the issue rises, we will inform the TA and then escalate the issue to instructor defining the problem.

Stay on Track

In order to stay track on the project and have effective teamwork, the team will implement the following strategies:
For each weekly meeting, attendance will be tracked and recorded by the meeting notes. The team will be tracking issues and tasks for each member using github projects and github kanban board. Each team member will be assigned weekly tasks and will be expected to complete them by the agreed-upon deadlines. The team will also track individual contributions through git commits and pull requests. The team will track participation in meetings and discussions, ensuring that all members are actively engaged and contributing to the team's progress.

Each week weekly status updates will be given by each team member. We will be evaluating member's contributions through various factors such as attendance, task completion, code contributions, helping team members, complexity of the tasks completed, ideation, code quality, research as well as the number of tickets closed. These factors will be discussed before every deliverable and used as performance indicators. The team will be maintain a folder and using a weighted matrix with the above mentioned factors, a team champion will be declared every 2 weeks to recogonise the work If a team member is not contributing their fair share, the team will first address the issue internally by discussing it with the member and understanding any challenges they may be facing. The main focus is to maintain open communication and provide support to help the member get back on track. In this internal meeting, every member should be understanding and offer solutions to maintain a positive and fair environment. . If the issue persists, the team will escalate the matter to the TA and then to the instructor if necessary. A performance improvement plan may be implemented to help the member improve their contributions. In the case if there is still no improvement, the team may consider reassigning tasks or redistributing workload to ensure the project's success. The team will document any actions taken to address the issue and ensure that all members are aware of the expectations and consequences of not contributing their fair share. In order to maintain equitable work and fairshare, the team member might be subject to disciplinary action such as removal from the group or grade adjustment.

Team Building

We plan on building a harmonious team by organizing regular team-building activities, such as team lunches once every month and celebrating birthdays or special occassions. To recogonise good work, we will be giving a team medal to the best contributor every other week and celebrating small wins together.

Decision Making

Decisions will be made collaboratively, with all team members having an equal say in the decision-making process. The team will strive to reach consensus on major decisions, but if consensus cannot be reached, a majority vote will be used to make the final decision. In case of a tie, the team supervisor will have the deciding vote.