

Temi Robot for School Outreach

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Project Overview

The Temi Robot for School Outreach project aims to enhance student engagement during school promotional events by utilizing the advanced capabilities of the Temi robot. The primary goal is to develop a module that enables Temi to interact dynamically with students—guiding them through events, answering questions, and conducting quizzes.

Background:

The use of robots in education and promotional events has gained traction, offering an engaging and innovative way to connect with audiences. The Temi robot, with its speech recognition, display, and mobility, is well-suited for these purposes. This project builds upon Temi's existing functions while integrating new features to create a seamless, interactive experience tailored specifically to school outreach programs.

Objectives:

- Develop an interactive quiz system to engage users.
- Ensure seamless Bluetooth connectivity to external devices (e.g., chocolate dispensers).
- Implement a ChatGPT plug-in for real-time conversational interactions.
- Create an SDK to simplify Temi's role as a tour guide, offering customizable navigation and speech functions.

Methods:

The project followed an agile methodology, with each phase—research, development, testing, and documentation—completed systematically over five months. Regular iterations enabled continuous testing and feedback integration, ensuring smooth functionality across all systems while meeting the project's objectives.

Project Management Tools

To manage the complexity of this multi-phase project, several project management tools were employed:

Gantt Charts: Used to schedule various project phases and track progress, ensuring timely execution and visualizing overlapping tasks.

Risk Management Plan: A detailed risk analysis was conducted to prioritize potential issues such as Bluetooth failures or ChatGPT integration problems. This guided the implementation of mitigation strategies to minimize disruptions.

Work Breakdown Structure (WBS):

The project was broken down into manageable tasks using a WBS, which ensured clear deliverables for each phase and helped distribute workload efficiently.

Documentation and Logging Tools:

Daily log reports, along with the development of a user handbook, maintained focus on the project's progress. These tools also helped adjust timelines as necessary, consolidated information, and proactively addressed potential roadblocks to keep the project on track.

Application of Quality Management Tools

Throughout the project, quality management was crucial to ensure the successful implementation of each system. Key quality tools applied include:

Checklists: Project goals were split into sub-goals to ensure each had a robust system for performance. This helped guarantee that all subsystems functioned as intended and were thoroughly tested.

Quality Metrics: Benchmarks such as 5 frames per second for camera output and a 90% user satisfaction rate were established and tracked to maintain project standards.

Testing Cycles: Regular user testing of the quiz system and SDK provided valuable feedback to refine and enhance the overall user experience.

Lessons Learned: Comprehensive testing and iterative development proved essential. Early testing often highlighted system oversights, enabling timely corrections.

Conclusions

The Temi Robot for School Outreach project has made significant progress, developing an interactive quiz system, a basic SDK for tour guides, and an emotional detection feature. A user handbook is also in development to assist future developers.

Contributions: I was responsible for the end-to-end development, including the quiz app, Bluetooth integration, and the SDK kit. I also played a key role in risk management, mitigating potential technical and functional risks. The project offered valuable lessons in quality management, with rigorous testing ensuring the success of each component. This project contributes to the broader goal of integrating robotics into education outreach in a meaningful and impactful way.

Project Presentation

Temi Robot for School Outreach

By Caleb Ebert



Host Organization Overview

Nanyang Polytechnic (NYP)

- **Location:** Singapore
- **Established:** 1992
- **Education:** 37 full-time diploma courses & CET options
- **Mission:**
- Empowering learners for work & life
- Co-creating with industry for growth

Vision:

- The Innovative Polytechnic
- **Values:**
- Nurturing, Integrity, Can-Do Spirit, Innovation, Teamwork
- **Strategic Goals:**
- **Future-Ready Learners:** Competency-based learning, Life skills
- **Value with Industry:** Strategic collaboration
- **Sustainability:** Living lab for environmental sustainability
- **Engaging People:** Staff well-being, Capability development

Project Overview

Temi Robot for School Outreach

- **Objective:** Create an interactive experience for students during promotional events.
- **Key Features:**
 - Interactive quiz system
 - Bluetooth connectivity for devices
 - ChatGPT integration for real-time interaction
 - Customizable SDK for navigation and speech

Project Aims and Goals

- **Engagement:** Foster student interaction through quizzes and activities.
- **Integration:** Seamless connection to external devices and ChatGPT.
- **User Experience:** Enhance the usability of the Temi robot as a tour guide.

Methods & Processes

- **Agile Methodology:**
 - Research, development, testing, documentation
- **Iterative Development:**
 - Continuous testing and feedback integration
- **Quality Management Tools:**
 - Checklists, quality metrics, testing cycles, lessons learned

Project Outcomes & Achievements

- Development of the interactive quiz system.
- Successful integration of Bluetooth connectivity.
- Implementation of ChatGPT for real-time interaction.
- Completion of the SDK for customizable navigation and speech.

Personal Contribution

- **My Contribution**
- **Role:** [Your Role]
- **Tasks:**
 - Involved in the development of the interactive quiz system.
 - Assisted with Bluetooth integration and ChatGPT plug-in.
 - Collaborated with team members for user testing and feedback.
- **Impact:** Contributed to creating a dynamic and engaging user experience for students.

Conclusion

- **Reflection:** The project has enhanced my skills in project management and technology integration.
- **Next Steps:**
 - Final testing and adjustments.
 - Preparation for deployment during school outreach events.