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VIRTUAL CAMPUS WALKTHROUGH APP FOR AEMILIANUM COLLEGE INC.

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Abstract

The Virtual Campus Walkthrough App for Aemilianum College Inc. aims to revolutionize the way prospective students, current students, faculty, and visitors interact with the college campus. This innovative application leverages advanced virtual reality (VR) and augmented reality (AR) technologies to provide an immersive and interactive experience of the college's physical environment. The primary goal is to enhance user engagement by offering a detailed and realistic virtual tour of the campus. This digital initiative aligns with the college's commitment to embracing technological advancements to improve educational and operational experiences.

The development of the Virtual Campus Walkthrough App was driven by the need to offer a solution that addresses the challenges posed by geographical limitations and the ongoing global health crises. By providing a virtual alternative to traditional campus tours, Aemilianum College Inc. ensures that potential students from various locations can explore the campus without the need for physical presence. This not only broadens the reach of the college's marketing efforts but also supports inclusivity and accessibility for all interested parties. The app incorporates detailed 3D modeling and high-definition panoramic views, creating an engaging and realistic representation of the campus environment.

Key features of the app include interactive maps, guided tours, and information hotspots that provide users with detailed descriptions and multimedia content related to specific locations on campus. Users can navigate through different sections of the campus at their own pace, accessing information about academic programs, student services, and campus life. The app also includes a feedback mechanism that allows users to share their experiences and suggestions, ensuring continuous improvement and user satisfaction. This interactive approach not only enhances user experience but also aids in making informed decisions about enrollment and campus engagement.

The Virtual Campus Walkthrough App for Aemilianum College Inc. represents a significant advancement in how educational institutions can leverage technology to enhance user experience and engagement. By offering a comprehensive and immersive virtual tour of the campus, the app addresses key challenges related to accessibility and

inclusivity, while also supporting the college's marketing and operational objectives. The project's success highlights the importance of integrating cutting-edge technologies in educational settings and sets a precedent for future initiatives aimed at improving campus experiences through digital solutions.

Introduction

In today's technology-driven world, educational institutions are increasingly embracing innovation to create engaging and accessible learning experiences. Aemilianum College Inc. recognizes this shift and seeks to position itself at the forefront. However, geographical limitations can hinder the ability to showcase its unique offerings to a wider audience.

This research proposes a solution: the development of a virtual campus walkthrough app for Aemilianum College Inc. This interactive experience will transcend geographical boundaries, allowing prospective students, parents, and the local community to explore the college virtually.

Globally, it contributes to the conversation on tech-driven education, showcasing Aemilianum College Inc.'s commitment to modernizing its approach and attracting a global audience. This is further supported by Chaparro, J. (2024) in his LinkedIn article "Reimagining Education in a Tech-Driven World: A Growth Mindset Approach," which states that a future where tech empowers every student to bridge the gap between academia and the demands of the workforce and life. It states that technology in academia should both deliver content and develop both personal and professional competencies.

It aligns with the Philippines' national goals of educational accessibility and inclusivity to protect and promote the right of every Filipino citizen to quality education that will enable each learner to realize their full potential and meaningfully take part in nation-building, as stated by Llego, M. in TeacherPH. This ensures that Aemilianum College Inc. remains competitive in the national educational landscape.

Locally, it strengthens the college's ties with the Sorsogon community, serving as a virtual gateway and fostering local pride. This study delves into the design and development of the Virtual Campus Walkthrough App of Aemilianum College Inc., focusing on creating a seamless, interactive, and user-friendly experience for online users. It goes beyond simply showcasing technology; it signifies Aemilianum College Inc.'s dedication to embracing innovative educational paradigms and contributing to the global conversation on the convergence of education and technology.

Specific Objectives

Specifically, this study aims to:

1. design and develop a virtual campus walkthrough app for Aemilianum College Incorporated with the following features:
    1.1. module for virtual campus walkthrough for the ACI campus
        1.1.1. begins with the entrance of the campus, and leads through the

areas and locations scanned within the campus
1.2. module for 360-degree panoramic images view.
1.2.1. needs internet connection
1.3. module for web application for virtual campus walkthrough

2. Evaluate the system with acceptable industry model using ISO25010 in terms of:
2.1. Functionality
2.2. Usability
2.3. Compatibility
2.4. Portability

Scope and Delimitation

This study focuses on developing a virtual campus walkthrough app for Aemilianum College Incorporated. The system involves gathering data on the campus map, capturing 360-degree images of selected areas within the college, and arranging these images to create an interactive walkthrough presented in a web app.

The delimitation of this study is location-based, as the walkthrough will only follow the general pathways within the college campus, including hallways and staircases, with the exception of the interior of the gymnasium and the chapel. This study is exclusively for Aemilianum College Incorporated and will not present any other information apart from the 360-degree panoramic images included in the walkthrough.

Significance of the Study

The following will be benefited by this study:

Aemilianum College Inc. The study provides a modern and immersive way for stockholders, prospective students, and parents, to explore the campus remotely.

Administrator, Director, and Registrar. The study provides prospective students and their parents a detailed and interactive virtual tour of the campus, fostering informed decision-making.

College Marketing Team. The study can be a marketing tool to promote Aemilianum College Incorporated to a wider audience.

Faculty. The study showcases academic departments, laboratories, classrooms, and other facilities and resources to existing and prospective students and faculty members.

Parents. The study allows them to view the campus environment and facilities without the need for physical visits. This also helps parents make decisions about their child's education.

Students. The study allows them to use an interactive platform to familiarize themselves with the campus.

Researchers. This study allows the researchers to contribute to the integration of virtual tours in education, as well as to

showcase their knowledge and skills in virtual technology and app development.

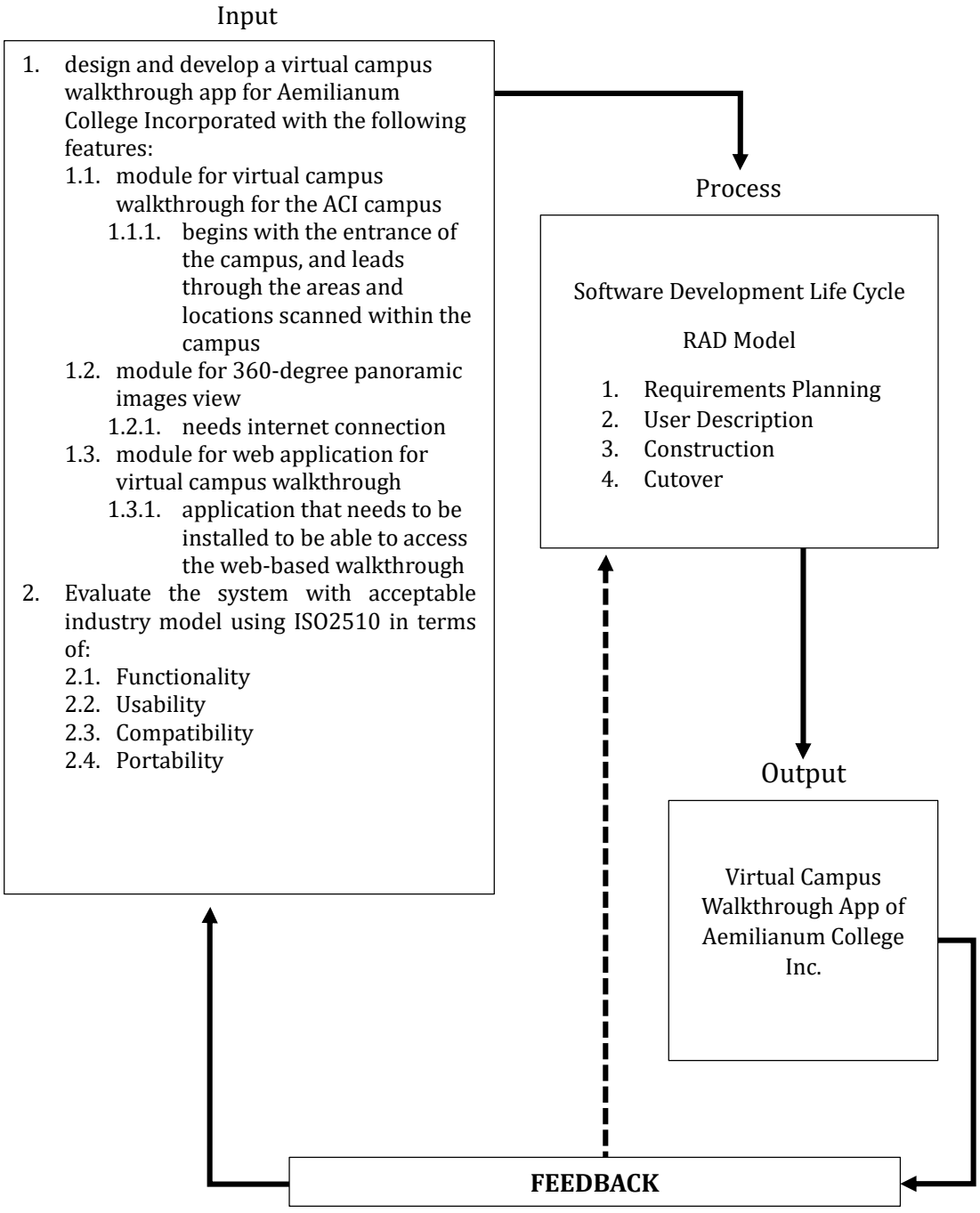

Figure 1. – Conceptual Paradigm

Requirements Planning

In this phase, the researchers gathered information about creating 360-degree maps and the tools required to make the project possible. The researchers tried various methods, ranging from free applications that require more than 50 images to be stitched together to create one 360-degree image, to checking the market for actual 360-degree action cameras that are used solely for creating such images.

For the software to be used, the researchers tried various ways to create the map. The researchers have researched ways to create the map manually using programming and photo-editing software. The researchers also tried multiple software and applications that are used to create virtual maps, mostly for architectural purposes, ranging from free to licensed.

The researchers have decided on using a second-hand Insta360 One X2 camera bought online, combined with a 2-foot monopod mounted on a 4-foot tripod to take the images. For the creation of the map, the 3sixty Web Tour Maker was installed into the researchers' device.

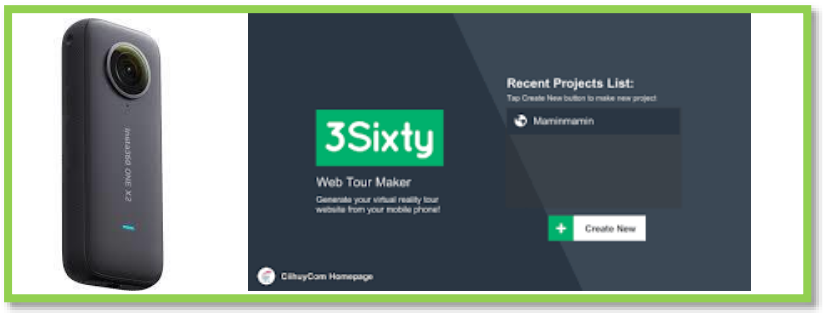

Figure 4. 1 - The researchers used an Insta360 One X2 and 3sixty Web Tour Maker

Insta360's ONE X2 is an innovative action camera that offers both dual-lens and single-lens functionalities. When operating in the 360 Cam Mode, it utilizes its dual lenses to record 360-degree videos at a stunning 5.7K resolution, seamlessly merging the footage internally. By employing the associated app available for iOS and Android devices, users can explore within the video to choose and share their desired viewpoints directly on social media platforms. The camera's ability to record in every direction ensures that no moment is left uncaptured.

3sixty Web Tour Maker allows you to upload panoramic images and enhance them with interactive hotspots, facilitating seamless transitions between scenes for an engaging virtual tour experience. The hotspots can be customized with various functionalities, including transitioning to a different panorama, linking to a website, showcasing an image, and more.

Figure 4. 2 - Map of ACI posted in the Main Building

The researchers also conceptualized their strategy and plans regarding the development of their project using diagrams and charts.

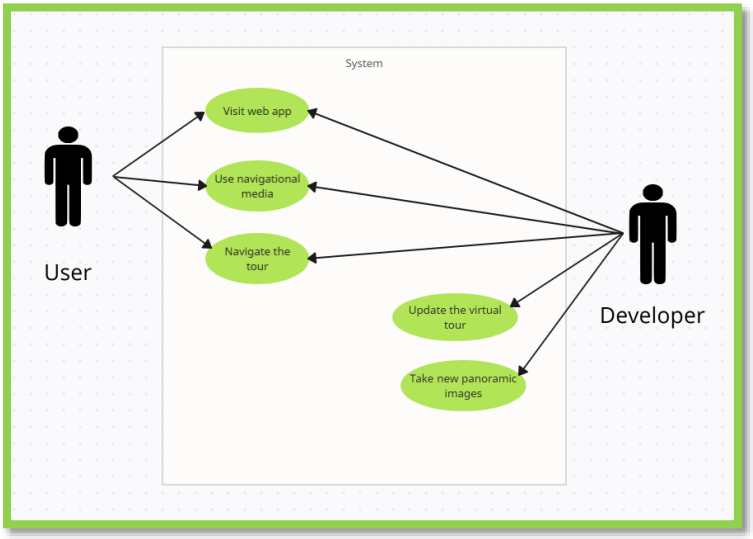

Figure 4. 3 - Use Case Diagram of Proposed System

The use-case diagram above shows that the user can access the web app through a link. They can also navigate the tour using navigational media like buttons and links. The developer or the researchers can do everything that the user can do, with the additional features of updating the virtual tour with new images, adding new locations, or by adding new routes and navigational medias.

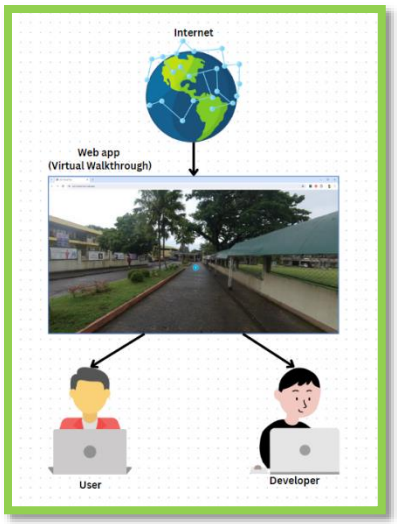

Figure 4. 4 - System Layout of the Proposed System

The system layout above shows how the web app will be hosted online. Given the link, it can only be accessed using an internet connection and both the user and the developer.

User Description

In this phase, the researchers consulted their adviser and showed their adviser the prototype for the map. The prototype was simply a 360 scan of one of the locations. The image served as proof that the researchers were now capable of taking 360-degree pictures. The researchers have also been advised at this point to only take images of paths and not of the interior of the rooms within the campus.

Figure 4. 5 - A 360-degree picture of the treehouse inside the ACI campus

With this recommendation in mind, the researchers' plans were adjusted and redefined before they moved on to the construction phase.

Construction

In this phase, the researchers visited Aemilianum College Inc. within the span of 3 weeks in order to complete taking the 500+ pictures for the entire campus. With every week, the researcher assigned to take the pictures upload the images taken to Google Drive and share it to the researcher responsible for stitching the images together to create a map that delivers the walkthrough experience.

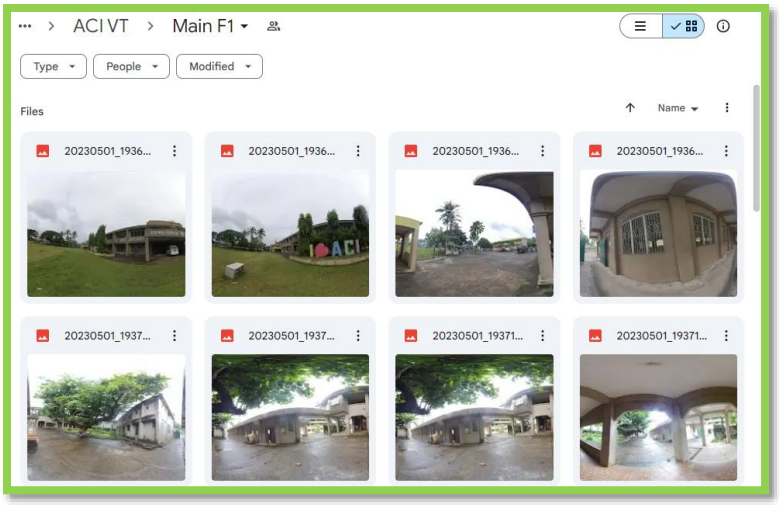

Figure 4. 6 - Panoramic images stored in Google Drive - Entrance to Main Building

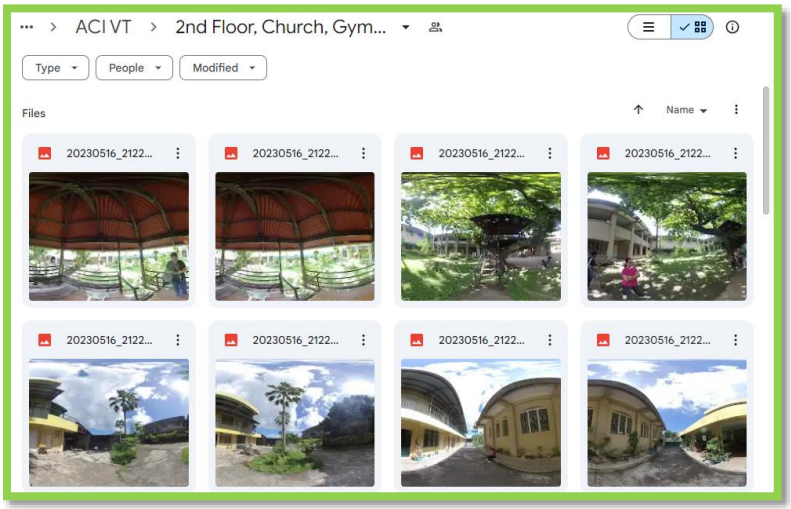

Figure 4. 7 - Panoramic images stored in Google Drive - 2nd Floor, Church, Gymnasium

The virtual tour was created following a walkthrough style which enables the user to follow a student's path starting from the gates. The tour features arrows which enable the user to select their next location relative to their current location. The user can go through the pathway, the hallways, and even up and down stairways.

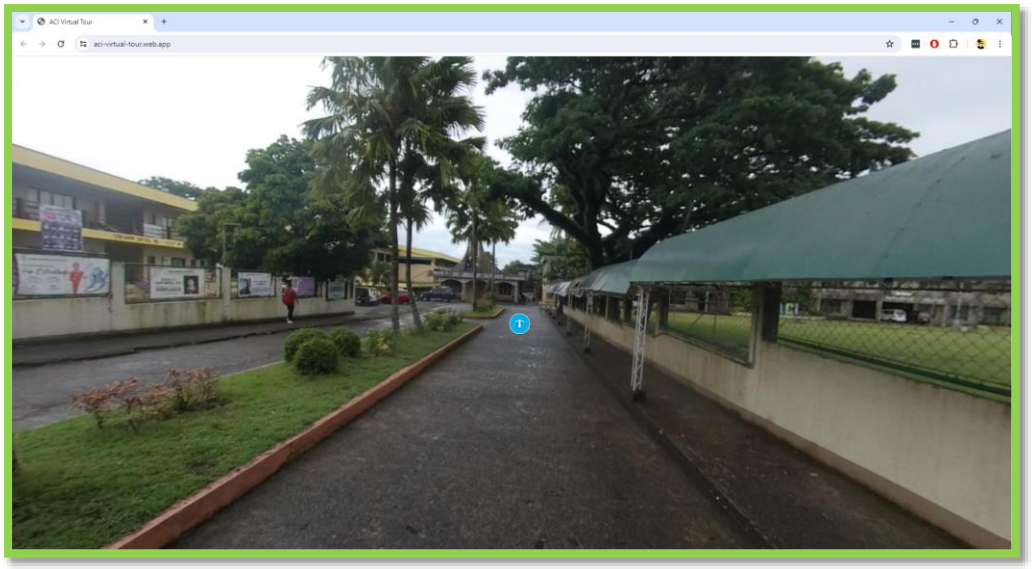

Figure 4. 8 - Start of the tour. Main Gate.

Figure 4. 9 - Blue arrows for selecting if you want to head to the Gymnasium, the Chapel, or the Main Building

Cutover

In this phase, final testing took place. The researchers also added additional locations and views that were not available in the first version of the tour. These locations included the interior of the gymnasium, the interior of the chapel, the exterior of the dorms, and a top view of the ACI quadrangle from the ACI Highschool wing.

These changes improved the tour-like quality of the project and added to the promotional use of the virtual tour for ACI.

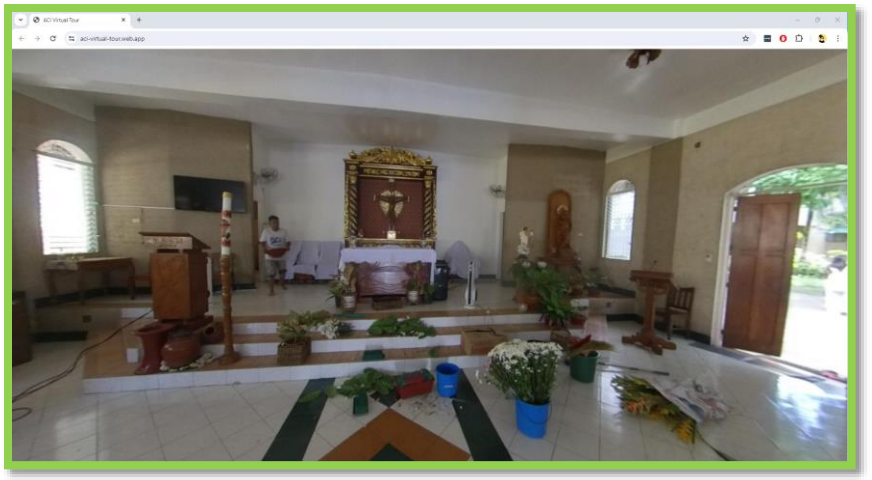

Figure 4. 10 - Chapel interior

Figure 4. 11 - Gymnasium interior

Figure 4. 12 - ACI quadrangle

Findings

1. The clarity of panoramic images can be quite sensitive to the camera's condition. Subtle issues like a smudge or a minor scratch on the lens might affect the overall appearance of the final image.
2. The way shots are angled can be quite significant. For a smooth visual flow, it's generally advisable to carefully consider how each image aligns with the next.
3. It's often beneficial to pay attention to consistency, especially with lighting. Differences in illumination between shots tend to stand out and could potentially distract from the intended visual narrative.
4. Web applications typically rely on internet connectivity, and their effectiveness might be limited if the connection is slow. Users might find that such apps don't perform as well under these conditions.

Conclusions

Based on the findings and information discussed previously, the researchers derived the following conclusions:

1. The project to create a virtual tour app for Aemilianum College Inc. was completed successfully, offering an interactive guide from the entrance to various significant spots on the campus.
2. The condition of the camera gear is vital; even small issues can greatly impact the panoramic shots that are crucial for the immersive aspect of the virtual tour.
3. Detailed focus on how the camera is angled and the coordination of shots is key to a smooth and visually engaging experience throughout the virtual tour.
4. It's essential to have consistent lighting in all pictures/images to maintain a uniform visual tale and avoid any elements that could interfere with the user's experience.
5. The functionality of the web application relies on stable and strong internet service, underscoring the need for dependable connectivity to ensure top performance, especially for apps that offer virtual tours.

Recommendations

Based on the conclusions, the following suggestions are offered by the researchers:

1. For the future researchers, use better equipment and take the panoramic images carefully. Keep the consistency of images and proper positioning of the camera in mind.
2. For the future researchers, add a menu that enables the users to return to a specific area since the current system relies in real-world navigation and to go to a different location requires manually retracing steps as is in real life.
3. For future researchers, utilize labels in the locations. Indicate the names of different areas, buildings, locations, and rooms.

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