NACCU Innovative Technology Award Submission

Nominate a NACCU institutional member for the NACCU Innovative Technology Award!

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Describe the challenge and/or the opportunity.

For over a decade, the University of Ottawa, Carleton University and Algonquin College have been distributing a student card and a U-Pass card to students. In Ottawa, the U-Pass program provides unlimited access to two transit agencies within the National Capital Region; OC Transpo and STO (Société de Transport en Outaouais).

The core challenge addressed by this project revolves around the complexity of managing separate systems for student identification and transit access (U-Pass) across multiple institutions in the same city, all while navigating various technological and operational hurdles. While our cards served separate functions, both relied on similar smart card technology, creating an opportunity to merge them into one unified campus card.
This dual-card system presented several challenges:

- **Eligibility differentiation**: Not all students are eligible for the U-Pass: only full-time students are eligible and part-time students are not, complicating the management and distribution of transit passes.

- **System limitations:** The old U-Pass system couldn't track changes in student status after cards were issued. If a student switched from full-time to part-time, they could still use the U-Pass until the next term, even though they were no longer eligible. The system relied on manual processes, like generating "hotlists," which were time-consuming and inefficient, allowing ineligible use to continue.

- **Fraudulent card sharing:** Students could exploit the system by reporting a U-Pass card as lost, paying a small fee for a replacement, and giving the old card to someone else. This misuse often went undetected until a "hotlist" was created and processed, leading to delays in identifying fraud.

- **Confusing U-Pass Renewal Process:** Full-time students had to renew their U-Pass each term by tapping their card at a kiosk. A green light confirmed renewal, but a red light meant an issue, often due to status changes or payment delays. Resolving these problems required visiting the Card Services Centre, causing confusion and inconvenience.

Figure 1: Student tapping their U-Pass to renew it at the start of term.

- **Multiple stakeholders**: Coordination between four institutions, three card providers, and two transit agencies in two different provinces introduced significant complexities, both in terms of project planning and execution. (Note; one smaller institution ~500 students is not a NACCU member).

- **Legacy systems and procedures**: Many institutions had to revise, or overhaul established processes to accommodate the new system, which risked operational disruption.

- **Technological complexity**: Integrating various systems — student information systems (SIS), legacy campus card technologies, and external transit provider infrastructure — posed technical risks that required careful planning and customization.

Despite these challenges, the project presented a significant opportunity to streamline processes, reduce redundancy, and improve the overall user experience. By merging the student ID and U-Pass functionalities into a single card, the initiative aimed to ease administrative burdens, cut logistical costs, and enhance service delivery. Furthermore, the project sought to improve student satisfaction by eliminating the need for multiple cards and manual reactivation procedures, while also enabling real-time data exchange between the student systems and city owned transit infrastructure.

Describe the concept of what is it that will be attempted/undertaken and what makes it innovative.

At a high level, the concept was simple; eliminate the need of distributing both a student card and U-Pass card. The primary goal of this project was to create a **unified campus card system** that integrated both student identification and transit access, thereby eliminating the need for students to carry multiple cards. By merging these functions into one card, the project aimed to simplify administrative processes, reduce costs, and improve the overall user experience for students.

To address the system limitations of not being able to monitor student eligibility for U-Pass after initial card distribution, a new backend system was developed by a third-party vendor that requires each institution to send new card activations and deactivations on a real-time basis. To facilitate this data sharing, an Application Programming Interface (API) was developed that allowed each institution to send calls to the API containing new or updated information at regular intervals through the day. This information is then relayed to the transit system so that new U-Pass cards work on the transit system much more quickly.

In addition to reducing the number of cards a student must carry around, this new system introduced other significant improvements to the former problematic U-Pass program, including:

- Blocks cards that are tapped on transit for students who have switched to part-time studies and are therefore ineligible for U-Pass, or were fraudulently given an old card from a friend.
- Eliminates tracking in real time and eliminates errors and the need for manual file uploads that were error prone and took significantly longer to update.
- Allows returning, full-time students to continue using their U-Pass without having to renew their card at a U-Pass kiosk at the start of every term, thereby reducing lineups and other hassles for students at the start of term.

What makes this solution innovative is its **customized approach**. Given the unique partnerships between the institutions and local transit agencies, there was no commercial-off-the-shelf solution that could address the specific needs of the program. This necessitated a **tailored integration** of existing campus card technologies with both internal institutional systems and the external infrastructure of transit providers (OC Transpo and Société de transport de l'Outaouais). The project also capitalized on automation and streamlined processes, helping to minimize manual labor and reduce logistical overhead.

Detail the steps taken to determine a solution based on the innovation being undertaken.

The approach to determining and implementing the solution was methodical and well-documented. The project unfolded in several stages:

1. **Initial Exploration (2019-2021)**: This phase involved a thorough assessment of the scope and feasibility of integrating the U-Pass onto campus cards. Key considerations included understanding the unique requirements and infrastructure of each institution, reviewing system architecture, and establishing project governance.

2. **Solution Ideation**: This stage focused on conceptualizing a technology-driven solution that would address existing pain points, particularly related to automation, card printing, and process simplification. The goal was to design a solution that would reduce administrative burdens and improve overall service.
3. **Technological Feasibility Assessment**: The feasibility of integrating existing campus card technologies with transit provider infrastructure was evaluated, focusing on compatibility and scalability.

4. **Stakeholder Engagement**: Close collaboration with both internal teams (e.g., IT, SIS) and external partners (e.g., OC Transpo, Société de transport de l'Outaouais) ensured alignment across all parties. Clear milestones and shared goals were established to maintain focus throughout the project.

5. **Pilot Testing and Refinement**: A pilot testing phase was conducted, incorporating feedback to ensure the solution was both reliable and user-friendly before full deployment.

6. **Implementation and Evaluation**: Following successful testing, the new system was rolled out, and the solution was evaluated against key performance metrics, including cost savings, operational efficiencies, and student satisfaction.

Provide information about the evaluation of the solution including measured results.

The project was not only completed on time but also delivered the anticipated benefits. Notable achievements include:

- **Reduction of administrative overhead**: The automation of U-Pass processes led to an estimated **400 hours** of labor saved at one institution.

- **Cost savings**: By eliminating the need for separate card distributions in winter and spring/summer semesters, logistical costs were reduced by an estimated **$50,000 annually**.

- **Seamless integration**: The solution's integration with both OC Transpo's system and the student information system allowed for **real-time data exchange**, improving accuracy, security, and the speed of service delivery.

- **Enhanced student experience**: Approximately **70,000 students** no longer needed to manually reactivate their U-Pass or visit recharge stations to obtain new cards, leading to improved convenience.

- **Fraud Prevention:** This has resulted in a significant step forward regarding fraud prevention, the ability to monitor real-time status updates and card blocking for ineligible users has and will continue resulting in decreased fraudulent card usage.

- **Environmental Impact**: By reducing the need for separate card distributions and eliminating redundant processes, the project significantly decreased the production of plastic cards and related printing materials. This reduction aligns with sustainability goals and minimizes the environmental footprint of campus operations.

Describe the next steps and conclusion.

The integration project has delivered substantial **operational efficiencies**, cost savings, and improved **student satisfaction**. The system's ability to seamlessly integrate existing technologies while creating a unified platform for students is a key innovation across an entire city with 70,000 students on the UPASS program, setting a benchmark for other institutions and cities in North America.

Looking ahead, the **next step** for the project is the deployment of **mobile credentials**, which will allow students to access their U-Pass and campus card functionalities directly via their smartphones. This expansion of the system will build on the back-end infrastructure already in place, ensuring that the solution is scalable for future innovations.

This project also serves as a proof of concept for future partnerships between Ontario universities and municipal transit systems, demonstrating the potential for seamless collaboration where compatible transit access hardware is in use. Discussions with neighboring municipalities and institutions are planned to explore broader adoption of the solution as we move towards mobile credentials.

This project serves as a proof of concept for future partnerships between Ontario universities and municipal transit systems, demonstrating the potential for seamless collaboration where compatible transit access hardware is in use, while also enhancing accessibility by reducing physical and logistical barriers for students. By eliminating the need for multiple cards and simplifying processes like U-Pass renewals, the system ensures a more inclusive experience, and the planned deployment of mobile credentials will further improve accessibility by accommodating diverse needs, such as those of students with disabilities, ensuring equitable access to both campus services and transit systems.

In conclusion, this project serves as a strong example of how collaboration between institutions and cities, innovation, and technological integration can streamline operations, reduce costs, and enhance the user experience. The successful implementation of the unified campus card and U-Pass solution has provided lasting value to students, institutions, the city of Ottawa and transit providers alike, and it sets the stage for future advancements in campus and transit systems.