SAU DIGITAL INTERACTIVE KIOSKS

PROFESSIONAL INTRODUCTION

ZHEN ZE ONG

Senior @ SAU

Education

| Degree	Institution	Location	GPA	Year
Computer Science: Cyber Security and Privacy Option, Bachelor of Science, Minor in Mathematics	Southern Arkansas University	Magnolia, Arkansas, United States	4.00	2024

Work Experience

Position	Institution	Location	Year
Peer Tutor	Southern Arkansas University	Magnolia, Arkansas, United States	2022-Present

- Support peers to help them master their course material
- Effectively communicate academic ideas to peers

Position	Institution	Location	Year
Research Assistant	Southern Arkansas University	Magnolia, Arkansas, United States	2022-Present

- Assist in ViT (vision transformers) object detection research projects
- Utilize Python and its libraries (Tensorflow, Keras, PyTorch, CUDA)

Position	Institution	Location	Year
Application Development Intern	J.B. Hunt Transport Services Inc.	Lowell, Arkansas, United States	2024

- Updated and maintain a shipment application
- Cleanup EUM calls in SpringBoot framework
- Remove and replace legacy code with modern APIs

PROBLEM DOCUMENTATION

From a recent survey given to SAU students, 63% of respondents said that they recalled 2-5 times where they were **unable to locate an area on campus**. 87% of respondents had used the SAU website map before but **only 23% found it easy and effective to use**. School events and announcements are primarily sent out by email or through printed posters. 63% of respondents said that **they do not read every email**, but only the ones that catch their eye.

Being unable to locate a building or service can be frustrating and confusing to people who are unfamiliar with SAU's campus. It can lead to a negative experience to visitors and potential future SAU students. Having email as one of the only sources of campus information can be detrimental to student engagement in SAU events and activities.

Do you think the SAU website campus map is effective? 13 ⓘ
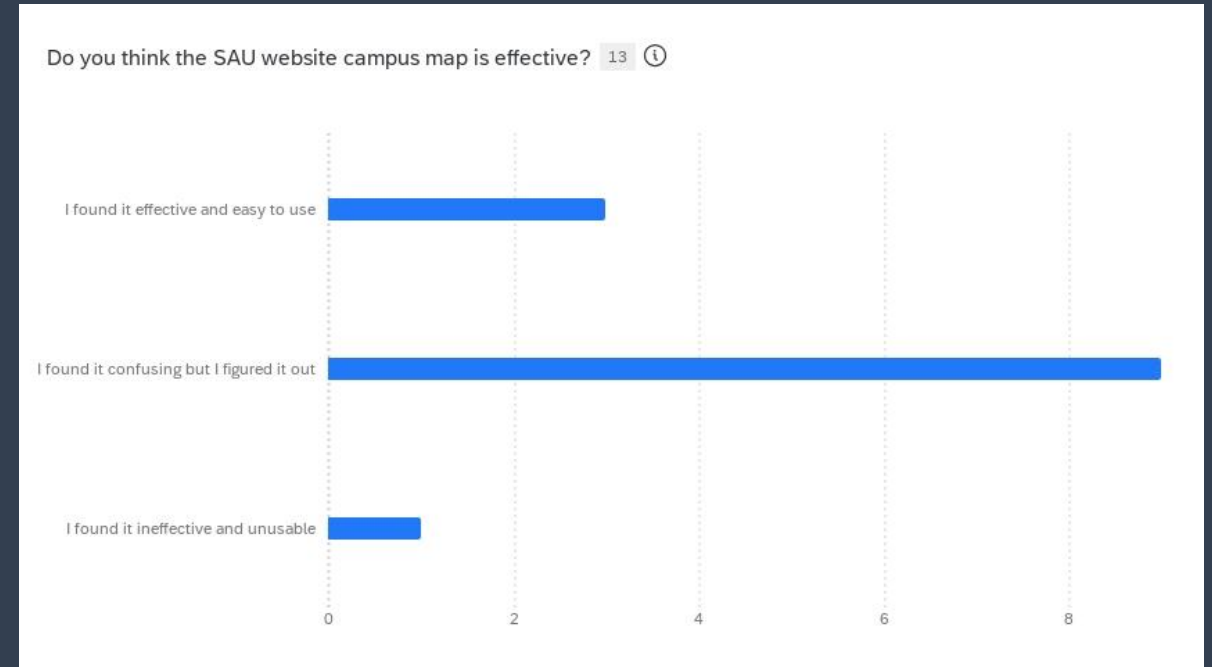
Results of a 2024 survey taken by SAU students/staff

Only 23% of users found the SAU website campus map easy to use!

SOLUTION PLAN

SOLUTION: DIGITAL INTERACTIVE KIOSKS IN HOTSPOTS ON CAMPUS
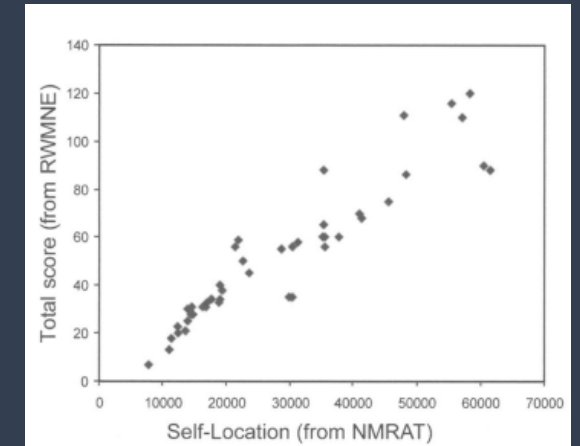
Powerful wayfinding tool

Drive SAU event participation

These kiosks can provide an easy-to-access interactive map that allows users to filter locations such as academic buildings or on-campus dining services. Studies show that giving an individual a visual representation of their current location can greatly **benefit them in physically locating their destination**.

The kiosks can also advertise current SAU events or announcements, which can **increase student participation** in those activities. Having them in campus hotspots like Reynolds, Overstreet, or the Magale Library would make them more available to users and discourage vandalism.

A 2007 research using the Navigational Map Reading Ability Test (NMRAT) and the Real-World Map Navigation Exercise (RWMNE) shows that wayfinding tools like a campus map can include several methods and strategies that aid a person's spatial and cognitive capabilities to increase its effectiveness as a tool. (Lobben, 2007)

Graph showing a linear relationship between self-location and map navigation abilities

1. There is **a linear relationship between the ability to recognize where one is currently on a map and overall map reading capabilities.**

2. Giving a reader **a visual reference to their current location** on a map can greatly increase the map's effectiveness.

Table 1. Value in Self-Service and Personal Service Channels		
	Self-Service Channel	**Personal Service Channel**
The Value-Proposition *what the firm offers*	Reduced number of cues leads to efficiency of information exchange (e.g., Choudhury and Karahanna 2008)	Rich in relational information, high in social context cues (e.g., Cyr et al. 2007)
	Automated responses lead to accessibility and flexibility (e.g., Wallace et al. 2004)	Human feedback; immediate and individualized attention (e.g., Venkatesan et al. 2007)
	Few personal touches or social cues (e.g., Cyr et al. 2007; Davis et al. 2011)	Highly personalized interactions (e.g., Barnes et al. 2000)
The Value-in-Context *when the customer can benefit*	Tasks are unambiguous and repetitive; service is not complex or new (e.g., Campbell et al. 2011; Kumar and Telang 2012; Selnes and Hansen 2001)	Tasks are equivocal and ambiguous; service is complex, critical or new (e.g., Selnes and Hansen 2001; Vickery et al. 2004)
	Customers have expertise, self-efficiency, and motivation to use self-service channels (e.g., Beuningen et al. 2009)	Customers do not have the skills, motivation, and abilities to deliver service or solve a task alone/via technology (e.g., Meuter et al. 2005)
	Customers enjoy "doing it themselves" and wish to be in control (e.g., Campbell et al. 2011; Davis et al. 2011; Lusch et al. 2007)	Customers enjoy human interaction, need to gain trust, overcome anxiety (e.g., Chan et al. 2010; Dabholkar 1996)

Multiple factors must be considered to maximize a self-service system's value

A kiosk system can reduce the workload of SAU administrators and save time during queries and transactions. However, if relied on too heavily for self-service, can lead to disengagement of users. A sufficient amount of brainstorming and research is needed to maximize its value. The focus should be on an **"...active customer experience management rather than a (reactive) relationship management"** (Scherer et al., 2015).

For the system maintenance, staff and/or IT should regularly monitor the kiosks to ensure functionality and prevent misuse by users.

SHORT-TERM OBJECTIVES

In the first phase of this system, the kiosk hardware will be initially installed in three campus hotspots: Reynolds, Overstreet, and the Magale Library. These locations have **the most traffic, maximizing the system usage.**

The main functions, wayfinding and information software, should be the focus of the system at this stage. The wayfinding software should include **an interactive campus map with a search functionality** that can locate buildings, offices, and rooms on SAU. The information software can be integrated with the SAU email announcements, **displaying relevant SAU events and activities**. The available hours of SAU facilities can also be displayed.

We aim to achieve **20-30 daily interactions across the system** within the first month of the system installation. If this goal is reached within the first six months, the system can be expanded to other areas.

- Install interactive digital kiosks
- Set up wayfinding/information software for SAU locations and events.
- Achieve 20-30 student/faculty kiosk interactions per day.

- Analyze anonymous kiosk interaction data

- Expand the system to other locations based on usage data.

- Upgrade the system to provide more advanced services.

LONG-TERM OBJECTIVES

User usage **data can be collected and utilized to enhance SAU campus life**. It is important for the data collection to be designed to be completely anonymous to protect the privacy of students and faculty alike. Data like which locations are searched the most and what events interest users more are examples that can be analyzed to improve the SAU experience.

The initial usage of the first three kiosks will determine the need for **expansion to other areas**. Buildings like the Bruce Center, Harton Theatre, and Mulerider Activity Center are possible areas to install more kiosks that will attract a high traffic of users. However, more hardware will likely bring an increase to maintenance cost.

The system's software can also be further upgraded to provide more services. They can include **fee payments, saving of class schedules, and other advanced services**.

TIMELINE

If initiated at the start of 2025, we can expect to **fully deploy the kiosk system to SAU's public by April (month 4)**, and decide whether to expand and upgrade it by October (month 10). The timeframe for planning and securing of the kiosk units should take at least 2 months to ensure proper decisions are made. Afterwards, installation and API integration through vendor services should take no longer than a two weeks, unless other complications arise. System should be tested vigorously before a full deployment to guarantee its functionality and security for its users. After deployment, the system usage should be monitored and **after 6 months, the data can be analyzed to determine the potential expansion and/or upgrade of the kiosk system**.

	2025 Q1			2025 Q2			2025 Q3			2025 Q4		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Plan and secure kiosk units and software from vendors	████	████										
Installation and API integration			██									
Test functionality and security			██									
Full deployment to SAU students, staff, and visitors				█								
Monitor usage				████	████	████	████	████	████	████	████	████
Determine how system should be expanded										█		
Upgrade/expand system										████	████	████

BUDGET

Option #1 (Separate vendors)

The cheaper option is to purchase kiosks and their software separately, which can amount to **$13,500.00 for the installations of three kiosk units and a full software system**. Wayfinding kiosks unit can range from $1,000 to $6,000, based on their quality and size. Outdoor kiosks are costly, but are weatherproof and resilient to damage. An indoor, waterproof kiosk that would suit the needs of SAU would cost between $2,500 to $3,500. Software will vary from $2000 to $4000, depending on the vendor and features and options selected. An annual maintenance cost should be allocated to ensure the system is up-to-date and functioning as intended in order to minimize security risks.

Kiosk (3 initial units)	$3,000 x 3
Software (API and system setup)	$3,000
Annual maintenance	$1,500 per year
Total	**$13,500 ($1,500/year after 1st year)**

Budget for option #1

Option #2 (Complete system from one vendor)

An alternative to purchasing and installing hardware and software separately is to purchase a complete package from a company like Advanced Kiosks. The full system **starts at $14,778.00**, a much costlier investment, but it comes with several benefits like security, 24/7 technical support, and product warranty (Advanced Kiosks, 2023). The system can be further customized to better suit the campus' needs, but will likely increase the cost accordingly.

Funding from SAU budget

As the system can alleviate SAU administrative staff's workload, the **funding can be taken out of the administrative or technology budget**. If the school opts for much more advanced kiosks (up to $15,000 per unit) it will allow for users to process fee payments and plan class schedules. This **heavy investment is a viable option that will cut down administrative work greatly** and allow for staff to redirect their resources elsewhere. The system is also meant to improve the campus life experience for SAU students, so it can also be taken from the **student affairs budget**.

Sponsorships

Sponsorships from local businesses and companies is also a viable way of funding the system. Possible sponsors who have sponsored SAU in other departments are Chicken Express, Bodcaw Bank, Farmers Bank & Trust. Local business can also sponsor the system for some advertising on the kiosk announcements. This also encourages SAU students and staff to support local businesses and restaurants.

SUSTAINABILITY

The kiosk system is hardware and software, so **proper maintenance to both components is required**. However, it requires a significantly lower annual cost once it is initially set up. This cost can be taken from the previously mentioned administrative budget, or through sponsorships of local businesses. To discourage vandalism or misuse of the kiosks, **they should be located in open areas that are well monitored**. Purchasing waterproof kiosks can help avoid accidental liquid spills by users. They should be **cleaned regularly** by cleaning staff.

EVALUATION STRATEGY

The number of kiosk interactions should be tracked. The **target number of interactions is 20-30 per day**, or 600-900 per month. A similar, unbiased **survey** should be sent out by month 10 to evaluate any significant change.

Based on these factors, the school can decide whether the kiosk system should be expanded and further developed to provide more services.

- Track kiosk interactions
- Use survey to determine effectiveness
- Decide on system expansion/upgrade

CALL TO ACTION

Request the approval of the SAU administration to **allocate $13,500 from administrative budgets or sponsorships** for the planning, installation, and maintenance of three initial digital kiosks in Reynolds, Overstreet, and Magale Library. **IT leadership should be notified of the project** and invited to provide their knowledge and opinion during the system's planning and installation process. **Make contracts with vendors** once planning is complete.

- Allocate $13,500.00 for project
- Communicate with vendors
- Work with IT during entire process

References

Advanced Kiosks. (2023). *School Spirit Interactive Kiosk*. Advanced Kiosks. Retrieved October 7, 2024, from https://advancedkiosks.com/wp-content/uploads/2023/05/School-Spirit-Brochure-051623.pdf

Litsey, R., Hidalgo, S., Daniel, K., Barnett, J., Kim, A., Jones, S., & Ketner, K. (2015). Interactive Kiosk at the Texas Tech University Libraries. Journal of Access Services, 12(1–2), 31–41. https://doi.org/10.1080/15367967.2015.1020381

Lobben, A. K. (2007, March). Navigational Map Reading: Predicting Performance and Identifying Relative Influence of Map-Related Abilities. *Annals of the Association of American Geographers*, *97*(1), 64-85. JSTOR. https://www.jstor.org/stable/4620238

Sarmiento, J. R., Capio, A. F., Sison, J. A., Nabua, C. J., & Guadana, R. R. (2021). Ask Billy: An informative kiosk in a University. 2021 1st International Conference in Information and Computing Research (iCORE), 3, 72–77. https://doi.org/10.1109/icore54267.2021.00032

Scherer, A., Wünderlich, N. V., & Wangenheim, F. v. (2015, March). The Value of Self-Service. *MIS Quarterly*, *39*(1), 177-200. JSTOR. https://www.jstor.org/stable/26628346