

**University of Arkansas – CSCE Department  
Capstone I – Final Proposal – Fall 2021**

**Walmart Tech Bar Scheduler**

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**Abstract**

Walmart’s currently designed IT (Information Technology) portal named “MyTech” is great for solving technology issues small enough to be done through instructions online. However, there are times when issues arise that are so complicated that an expert in the field must inspect the hardware physically. To solve this problem Walmart has implemented “Tech Bars” in many locations at which associates can bring their hardware with issues and tech support technicians can fix those issues. Our aim is to improve their Tech Bars by creating an end-to-end Tech Bar scheduler Web Application for Walmart associates and tech support technicians. This will allow associates to get into a queue at a Tech Bar location of their choosing and allow tech support technicians to remove associates from the queue when a resolution is reached.

Our approach to this is creating a web application that allows associates to sign in, find the nearest Tech Bar to their location, join the queue at that location, and see when they will be able to be helped by an IT professional at that Tech Bar. Technicians will be able to sign in, edit the Tech Bar locations, operating hours, current status, as well as the current cue with the ability to add or remove associates. This web application has a large significance because it will improve the efficiency of Walmart’s Tech Bars. By allowing online check-in, associates will know where they are in the queue and can thereupon know when to arrive at their chosen tech bar. This will alleviate the problem of a physically backed up line at a tech bar’s location and save the time of both technicians and associates.

**1.0 Problem**

Walmart is creating and improving an IT portal named “MyTech.” This web application will allow associates to bring any tech related needs to it and fix them. This web application does not address when associates need to go to one of Walmart’s physical Tech Bars. A Walmart Tech Bar is a walk-up desk at which associates can bring their physical technology that is having issues and tech support technicians can perform diagnostics on that device and solves issues that could not be solved by their traditional IT portal.

Physical tech bars have an issue that is not prominent in digital ones, physical lines. If an associate of Walmart is working and needs to go to a tech bar to fix an issue but there are others there with the same problem they will have to wait and waste time that could be used doing more productive tasks. For a company like Walmart with over 2 million associates the possible time wasted on associates waiting in a physical queue is huge. There is also the possibility of an associate showing up to a tech bar that is closed which would waste the time of that associate greatly. The MyTech portal will help absolve this issue by giving more detailed and clear solutions to tech support issues, but there will always be the need for certain issues to be solved by tech support technicians in person.

This problem also affects the technicians themselves. Without a digital check-in for their Tech Bars, technicians cannot be prepared for the issues that are going to be brought to them. This can also waste time because every person that comes up to the tech bar will have to have their problems assessed first while a digital check-in can allow that step to be done before hand. This can improve the overall experience of the technicians and implementing a digital check-in would improve both the associate experience and technician experience simultaneously.

## 2.0 Objective

The goal of this project is to create an end-to-end Tech Bar scheduler web application for Walmart associates and tech support technicians. This web application will be accessible through the MyTech platform but starting out will be an entirely separate application. This application will greatly help both associates and technicians by making the process of scheduling a mobile process saving the time of associates who will no longer need to wait in a physical line and the time of the technicians who will be prepared for every associate who arrives at their tech bar. Most of this web application will be designed by the Capstone group with UI/UX input from the Walmart team. Within this wide aim we also have minor goals that the web application should have implemented.

Within the web application associates should be able to see Walmart Tech Bar locations. These locations will have information associated with them telling the associate the Tech Bar's business hours and the real time status that being whether it is closed, busy, or open. This will ensure that associates do not go to a tech bar that is closed, and it also allows the associate to choose to go to a Tech Bar at a less busy time if their technology issue is not pertinent. This will also help technicians because in the case of an emergency or an event that causes the Tech Bar to close temporarily during normal business hours, they can communicate that to the associates and make sure that no one will go there during those times.

Once finding a Tech Bar in the desired location that is also open, the web application should allow associates to enter a queue for that location. When an associate enters the queue, a technician will be able to see that and be prepared for that associate's arrival. The queue will also allow associates to see what position they are in line and an estimated wait time for when they will arrive at the front of the queue. The structure of the queue will be simple and easy to follow. This will allow the queue to be connected to a database in which an associate can only add themselves to, but technicians have more control and abilities over the database.

Also in the database will be Tech Bar locations. Technicians will have control over information relevant to the Tech Bar that they are stationed in. If a technician moves location, they will be able use the web application to reflect that change. When at a location and signed in a technician can control the business hours of it and whether it is closed, open or busy. This degree of control allows technicians to ensure that they do not get overwhelmed by an influx of requests, and it will allow technicians to show when the Tech Bar will reopen if they close it for a temporary period.

Along with their Tech Bar, technicians also will have control over the queue. When an associate arrives at a Tech Bar after they are done waiting in the queue, the technician, based on the issue, will show the estimated time to resolve the issue and the queue will thereafter be updated to reflect that prediction. Once an issue is resolved the technician will be able to remove

the associate corresponded with that issue from the queue. They can also view the entire queue to help make predictions on queue time.

To ensure that the only technicians have an elevated level of control over the queue, we will be implementing a password protected system for the technician side of the web application. Technicians will be the only people in control of the applicable queue at their location so that no associate is taken out of a queue for any reason other than their issue being resolved. Overall, this makes sure that our web application has checks in place for the raised level of security provided.

Along with the main goals described, there are other optional goals to improve user experience in the case that the base project completes sooner than projected. The first step in this is to use an associate's locational data to recommend Tech Bars near their location. Doing this step would improve the user experience because using the web application without this would have the user input their own location or zip code and use that to give them Tech Bar locations.

Our next optional goal is to implement a mobile view of the web application. Since many associates will have to travel to their closest Tech Bar, those users will most likely be checking into the queue and checking their place in the queue from a mobile device. Since our inceptive web application will not be designed for specifically mobile devices, using a browser on a phone to access it will not be perfected and the user experience could suffer due to it. Supporting a mobile integration would improve the user experience greatly.

Another optional goal designed to improve user experience is support for dark mode. A lot of people prefer a dark mode on their devices because the brighter colors of usual web design can be irritating to the eyes. Many Walmart associates would also likely prefer a dark mode of our web application so if we have time to implement one it would be a good addition.

Our last optional goal for this project is giving the associates the ability to reschedule their tech bar appointment for a different time or location. This would be a quality-of-life improvement for associates because commonly when making appointments another obligation may halt them from being able to travel to the tech bar. They also could end up closer to a different Tech Bar before the appointment and changing it to that one would be preferable. To solve this problem, we would prefer to implement the ability for associates to change the time and location of their appointment.

## **3.0 Background**

### **3.1 Key Concepts**

To build the implementation of the MyTech web application we will be using Ruby on Rails on the backend. This framework will allow mainstreamed communication with the PostgreSQL object-relational database which will allow the web app to be a better candidate for scalability and efficiency in the future. For the frontend we will be using React and JavaScript for web elements the user will see or interact with. Also, to be used are GraphQL and Apollo integration within the react framework which will be used to handle API requests. Other notable key components include HTML/CSS to give structure to and support the style of the system. These all will be used in tangent to make the user experience seamless and accessible for all users.

### 3.2 Related Work

Check-in systems similar to what we are building are prominent across the country. Stores like AT&T and Chick-Fil-A use them, and many even display the current queue on monitors around the store. Applying those similar systems' ideas to ours however would not work because they are far too specific for the place they are applied to. When looking at open-source or proprietary systems similar to ours we run into the opposite problem. Those systems are far too general to perform the tasks needed for this project.

One such system where that issue prevails is the Kinetic Tech Bar [1]. This system has similar features to the ones we are tasked with implementing. Those include advanced appointment scheduling, in-person servicing, and a view of the user's position in the queue. The problem supplied above is also applicable to this system. Kinetic Tech Bar is far too broad of a system to be applied to Walmart's Tech Bars. This is because while it does have many of the same features that we will implement, there is an equal amount that it does not. One example of this is the control that tech support technicians have over the system. While the Kinetic Tech Bar does allow technicians to manipulate the queue, it does not allow them to manipulate any data related to their own Tech Bar. It is crucial in our system that the associates will know whether the Tech Bar they are trying to schedule an appointment for is open at the time of the appointment, but the Kinetic Tech Bar has no such implementation. This system also has many features that would be useless to what we are building such as data aggregation.

Another system similar to ours is KASPA [2]. KASPA is a system that allows users to request a tech repair, drop it off in a locker unlocked using a corporate ID card, and then go back to that locker sometime later to pick up the fixed tech. Similar to Kinetic Tech Bar, KASPA has many features similar to our system but also a lot of differences. With KASPA when you have tech problems you can open the system and view the closest Tech Bar to you which is a feature we hope to implement in our system. The main problem that arises with KASPA is that when you drop your technology off it will take a day or longer for it to be returned. For a company like Walmart, having associates unable to work a day or more would lose them a lot of money and significantly reduce efficiency especially with the substantial number of associates that they employ. One part of KASPA that we could use is their touchless system. While we are still amidst a global pandemic touchless methods of contact are preferred to physical. Implementing a way to make our system support touchless delivery would be greatly beneficial.

Lastly the Vizitor [3] application also shares similarities with our application. Vizitor is an application designed for meetings that allows users to check-in to a meeting before it, check-in when there physically, and notifies the host of the meeting when they arrive. This application has similar features such as digital check-in, but since it is designed specifically for meetings it is harder to apply to our system. This system has the problem of not having location features. Without this it could leave the user confused as to where to go for their meeting. Our system solves this problem by having location support, and it gives the associates the location of the Tech Bar they are going to.

Overall, there are many systems in existence that share similarities with the web application we are implementing but none of them are good enough to help Walmart with exactly what it needs.

## **4.0 Design**

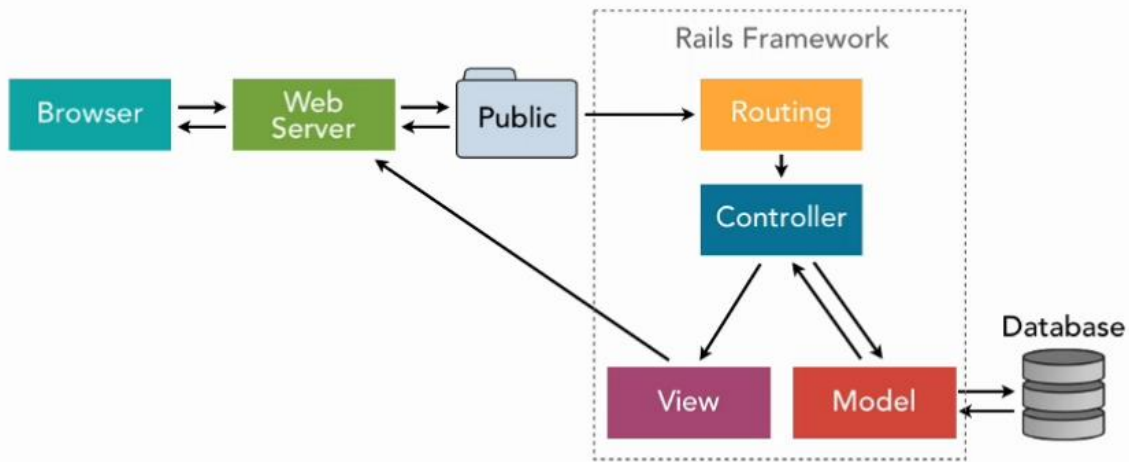
### **4.1 Requirements and/or Use Cases and/or Design Goals**

- Create an end-to-end Tech Bar scheduler web application for Walmart associates and tech support technicians.
- Associates should be able to see all Tech Bar locations, their business hours and real time status (open, closed, busy, etc.)
- Associates should also be able to get in queue at Tech Bar locations of their choice.
- Tech Support technicians should be able to configure Tech Bar locations, their business hours and status.
- Tech Support technicians should be able to view the queue and remove associates from it with a resolution.
- Ability to configure or change Tech Bar information and remove associates from queue should be password protected.
- Optional: The web application should get the associates' current location and recommend the nearest Tech Bar.
- Optional: The web application should have mobile responsiveness.
- Optional: The web application should have support for a dark mode.
- Optional The web application should allow associates to reschedule Tech Bar appointments.

### **4.2 High Level Architecture**

When the user enters “MyTech” they will see an option to enter the Tech Bar Scheduler web application. Once entering the web application, the associates will be able to see all Tech Bar locations. They’ll have the ability to select the Tech Bar location and view its business hours and real time status (open, closed, busy, etc.) Once the associate selects the Tech Bar location, they will be able to be queued at the Tech Bar location of their choice. On the Tech Support technician side, they would be able to configure the Tech Bar location, their business hours, and their status. When an associate is added to the queue, the Tech Bar technician will be able to view the queue and notify the associate when the Tech Bar is ready for the associate to visit the Tech Bar. After the associate visits the Tech Bar, the technician will be able to go to the queue and remove the associate from the queue with a resolution attached. Any configurations and queue modifications will be password protected.

# Rails architecture



## 4.3 Risks

Risk	Risk Reduction
A malicious user getting into the technician side of the application and causing issues with the database.	Our password system will be single-sign-on and encrypted to ensure that only authorized technicians can access their side of the application. Passwords can be changed in the case of a breach in security, and an admin will be able to remove compromised users.
A Tech Bar experiences an unforeseen event such as a fire or power outage closing it.	Technicians will be able to change the status of their Tech Bar at any time, and one of those statuses will be “Temporarily Closed” for events like these. This web application will also be accessible through a mobile device so in the case of a power outage the status can still be changed.
An associate having to suddenly cancel their appointment due to an event.	Our application will support the cancelling, changing of location, and rescheduling of the appointment.
An associate is unable to find where to access the Tech Bar check-in system	The webpage will be an embedded link in the MyTech tech support system, so if the associate knows how to navigate there then they will be able to find our system.
The queue has built up so large that the technician needs to stop taking people into the queue	A status for the Tech Bar labeled “Currently Busy” will be implemented for when events like this occur.
An associate’s tech issue is much larger than expected and	Technicians are given the ability to add estimated time to the queue at any point to minimize this problem.

will take more time than expected.	
Associates not knowing how to correctly diagnose their technical problem on check-in	Our check-in system will be designed to be as easy to use as possible for non-technical users, including drop down menus and suggestions.
Technicians resolve the issues of associates at top of queue much faster than expected.	The web application will notify users when they are getting close to their scheduled time or when they are getting close to the front of the queue.

**4.4 Tasks –**

1. Work with our Walmart sponsors to review the requirements of the project and revise them until we have a full understanding of what we need to implement, and they understand what to expect from us.
2. Prepare a project plan similar to this proposal but specifically for our Walmart sponsors based on their guidelines.
3. Design a Wireframe mockup for the Associate’s view of the system.
4. Design a Wireframe mockup for the Technician’s view of the system including the login screen.
5. Create the database backend
6. Create the web application frontend
7. Verify Ruby seeds relational database backend with frontend inputs.
8. Final testing
9. Write source code documentation and user guide
10. Final Deliverable

**4.5 Schedule –**

Tasks	Dates
1. Work with our Walmart sponsors to review the requirements of the project and revise them until we have a full understanding of what we need to implement, and they understand what to expect from us.	11/18-1/15
2. Prepare a project plan similar to this proposal but specifically for our Walmart sponsors based on their guidelines.	1/18-2/1
3. Design a Wireframe mockup for the Associate’s view of the system. This will include the view of the queue.	2/1-2/15
4. Design a Wireframe mockup for the Technician’s view of the system including the login screen.	2/15-3/1

5. Create the database backend	3/1-3/8
6. Create the web application frontend	3/8-3/15
7. Verify Ruby seeds relational database backend with frontend inputs	3/15-3/29
8. Final testing	3/29-4/15
9. Write source code documentation and user guide	4/15-5/2
10. Final Deliverable	5/2 - 5/5

#### 4.6 Deliverables –

- Design Document: Holds a listing of each major feature of the website.
- Database scheme and initial data: The DB schema for the database holding mainly data for the users, agents, and tickets that are sent in and completed.
- Web site deliverable: working framework for web application
- Final project and report

#### 5.0 Key Personnel

Ben Hodges – Hodges is a senior Computer Science major in the Computer Science and Computer Engineering Department at the University of Arkansas. He has completed relevant courses. Mobile Programming is also a course enrolled in and could help if any ports would be necessary. He also has experience developing software in groups in hackathons and in a software development course.

Cole Alvarado – Alvarado is a senior Computer Science major in the Computer Science and Computer Engineering Department at the University of Arkansas. Relevant experience includes two summers as a software intern at Cerner Corporation as well as currently working for the University of Arkansas Athletics IT department which will supply valuable information on how this website can be best organized for both the customers and the agents.

Joe Tam - Tam is a senior Computer Science major in the Computer Science and Computer Engineering Department at the University of Arkansas. He is currently enrolled in Information Retrieval which is about the creation of a search engine which should be beneficial for this project.

Austin Dixon - Dixon is a senior Computer Engineering major in the Computer Science and



Computer Engineering Department at the University of Arkansas. Relevant experience includes working as an infrastructure intern at Tyson Foods in which he oversaw the creation of databases and front-end table accessibility which will prove highly informative during this project.

Sebastian Vivo - Vivo is a senior Computer Science major in the Computer Science and Computer Engineering Department at the University of Arkansas. Vivo's experience with Pharmatech Industries will prove useful when thinking of all different issues that may arise for the multiple departments within a corporation. Having participated in multiple competitions as part of diverse teams and accomplishing various diverse achievements shall also facilitate the development process.

**Sarah Friesell, Industry champion** – Sarah is a Senior Technical Project Manager at Walmart.

## **6.0 Facilities and Equipment**

No equipment or facilities needed other than the hardware we already own.

## **7.0 References**

[1] Kinetic Tech Bar

<https://www.kineticdata.com/kinetic-data-tech-bar>

[2] KASPA

<https://www.ktsl.com/kaspa/>

[3] Vizitor

<https://www.vizitorapp.com/>