Wedge-IT



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Statement of Disclaimer

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Executive Summary

Three Engineering Design and Development students make up the team for Wedge-IT. Wedge-IT is a Point of Sale (POS) software targeted at golf clubs. Our software will integrate features that other POS companies have not yet implemented for the golf course setting for a completely new user experience. It will combine multiple features necessary to run restaurants, pro shops, membership services, and the course itself. Another key feature that our system will have is the ease of use for the older or less technologically advanced employees of our users. Investment into the system will be limited to time investment so at this point in time monetary investments will not be necessary. However, depending on the direction the project is steered the addition of a dedicated server will be necessary in order to support data collection and storage as well as system updates amongst multiple users. To set up a dedicated server it would require a dedicated cloud enabled hard drive. This would be obtainable through an electronics store such as Frye's Electronics.

Background

There are three hundred and twenty five million people in the U.S. and that number is constantly growing. When there is more people, there are more opportunities for business. The



golf industry benefits greatly from this as it is a sport for all ages, but how are courses supposed to beat the competition? How do they keep people there and attract more? Often what sets one club apart from another would be how technologically advanced they are. With forty four hundred clubs and courses in the U.S., competition is high and ditching the pen and paper is necessary. Although many clubs only need a basic inventory system, additional functions with sales, weather or even dining. While

Fig 1: Man golfing interviewing staff at Eagle Creek, Quail Creek, and West Chase golf courses, we have found that this is true and that customization would be nice too. Our point of

sales design is a combination of tee times, food, and service. Tee times are essential to all courses as they organize and run the course so you know who is where and can estimate how long they will be. Our tee



Fig 2: Golf course

times program includes the times themselves, bookings, keeps inventory and even conduct sales. While food is not a top priority and snacks are typically available, the integration of systems is much needed. Rather than running on two or three different programs,

we can offer a way to run it all on one. There is also a more advanced approach to the food and dining that could be done. Similar to restaurants, many courses would benefit from a floor plan view with tables in order to organize food. Additionally, the courses have told us they would appreciate an automated answering system if they are ever to be busy.

Competitive Analysis

There are multiple competing software systems used at local golf courses. For example, Quail Creek Golf Course uses AccuPOS for their store and restaurant. Westchase Golf Course uses Club Prophet Systems. Both of these products are working, useful software. However, they can be improved. There are features that can be added in order to make golf course management more seamless and easy for employees. Our goal is to create software that not only will replace these products, but improve upon them to make a productive environment for golf club employees. It will be tough for our product to enter the market because there is a good number of existing sales software. However, our product will gain market share using improved software features that are in great need, especially at small courses.

The Industry

The industry we will be competing in is the Point of Sales system (POS) industry. This industry includes all sales systems currently in use. the variety of sales systems ranges from strictly food, to private shops, to golf courses and businesses of the like. The major trend in the POS industry is the modernization of sales systems by going electronic, integrating multiple features, becoming simpler for all clients (including technologically stunted employees). We're taking advantage of the trends of the changing marketplace to create an electronic POS system that integrates features that are considered necessary and

some that are considered luxury with the base sales program that businesses are looking for in a POS system.

Club Prophet Systems

This software is used at Westchase Golf Course in Brownsburg. Unlike AccuPOS, it offers golf club specific features. It is advertised as an easy to use product. It includes features like online tee time booking, accounting and billing, and pro shop inventory and sales management. Because it has more

features, it is more complex and harder to use than more simple software. In addition,
Westchase employees stated that it doesn't get updated enough and the software is geared more towards large golf clubs than small ones. It isn't as customizable as it should be to accommodate small golf



Fig 3: Club Prophet Systems

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AccuPOS

This is the system used at Quail Creek Golf course. It is only used for their restaurant and the small number of items they sell on site, like golf balls and tees. It does not include necessary features for a golf course like tee time management. The main

Fig 4: AccuPOS

courses.

advantage, but also a key problem, is that this system is very simple. It also includes important things like membership management and an electronic timeclock for employees.

Design Criteria

The purpose of this project is to create a system to manage tee time, restaurant, and pro shop sales for the the customer.

The product must be able to handle:

- Tee time scheduling and pricing
 - Customer tee time purchase
- Tee time management (set aside for events, etc.)
- Weather info for quick access
 - o 5 day forecast with weather, temperature, and humidity
 - Hourly forecast for the current day showing forecasted temperature, weather, humidity
- Restaurant inventory management
 - Keep stock of items and automatically decrease as ordered
- Restaurant Billing
 - Bills assigned to table with ability to split by person and by percentages
- Table and wait staff management
 - Assign waiters zones or tables
- Electronic timeclock for employees
 - PIN code clock in/clock out system
- Pro shop inventory management
 - Add/remove stock automatically

Member billing

• Monthly, yearly, etc. billing for club memberships

Statistics view

- Show number of people in a day, number of groups, peak times and days
- Discounts and sales

• Gift cards

Aesthetics: The product will be functional first and good looking second. The main goal is to make it quick and easy to use, especially for less technologically literate people, and efficient.

Cost: normal POS systems cost ~\$55.00 for a one month trial period, afterwards, there will be a one time \$500 purchase for unlimited use.

Our product will have an additional fee for additional customization to specific golf courses - depends on amount of changes/additions

Ergonomics: The product should be usable on both touchscreen devices and mouse operated devices.

Operating environment: The software runs on a computer so it doesn't have a physical environment. However, for the best user comfort and optimal performance, we suggest a room temperature environment and humidity. This is roughly 68-70 degrees Fahrenheit and 40% humidity. The technical requirements for the computer will be very low.

Product Life: The goal is a bug free system, but updates will be made available to fix major issues as needed.

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The product doesn't need physical maintenance, but it may need updates to fix bugs and

add necessary features.

Legalities: Potential copyright infringement

Project Constraints:

• We are limited on time; there are about 20 weeks left in school to complete the project.

• The product can't have a file size that is too large.

• We aren't expert software engineers.

• We have to stay under \$300 while developing the product

The product must be user friendly, therefore the original design was made to be simple

and user friendly as possible. It should run smoothly when used with no kinks, however further

testing would have to be done. We wanted to keep it visually simple, however, our product is

customizable to the customers liking. So they should be able to adjust things however they'd like.

Because this is coded and needs someone to create it, cost can never truly be reduced unless

someone is willing to do the work for a lower price. Other than that, it's a set cost. Additionally,

we are able to avoid a manufacturing cost and have reduced materials cost. Technically, the

material cost would be for a computer to create the system. We will be using standard coding

engines (Python) to create our Point of Sales System. This will also allow for updates to be

integrated whenever a bug/issue is spotted within the system. There is no worry about constant

maintenance/ the wear and tear of parts. The cost to create the application is derived from the

average pay of an applications designer. If we were hiring, we would assume an hourly wage of

\$22. We believe it would take us 40 hours to finish and code our application. In total the maximum cost to create the application would hang around \$880.

Concept Planning and Creation

Our group created a table of required resources for the project. These are meant to help plan the creation of our product and ensure that we know what items we need in order to make an effective solution for the problem at hand.

Tools and Equipment

Item	Description	Quantity	Additional
Computer	Computer	1	1 1000000000000000000000000000000000000
Python	high-level programming language for general-purpose programming	1	Python is the language in which we will use to write our code. Not available to download at school.
Net Beans	Net Beans is an IDE, which is software used to make writing code easier	1	The application we will be using to write the python code. It is not available on the computers within the school, so we will have to use a personal laptop or develop from home.

Knowledge Needed

Item	Outside Knowledge?	Source	Notes
Python coding knowledge	Y	Internet resources Drew Wolf (software engineer at dxc) Rob Wilson (Network architect at IBM)	There are many websites that contain resources to learn and refine programming skills. Also, our parents have experience coding.

Table 1: Resource list

After planning our resources, we created a series of images to plan the design of the product. These images are also meant to represent the implementation of the various required features for the POS system. The application pathing concept is meant to show the general idea of how the user is intended to use the software. The inventory management concept is how the inventory screen was planned to look when the employee is editing the inventory of the pro shop.

Application Pathing

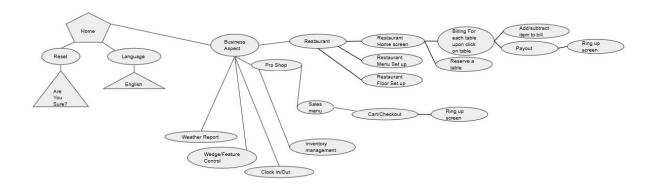


Fig 5: ^ Application pathing concept

Fig 6: Inventory management concept

Inventory Management



The Final Product

The final design of Wedge-IT is comprised of a dashboard, a employee management tab, two inventory tabs, a suppliers and customers tab, and a sales and sales reports tab. The idea was to keep the POS simple and manageable as well as requiring the least amount of data transfer possible in order to reduce cost for the customer. Pictured in figure 7, the homescreen for Wedge-IT POS.



Figure 7: Screen capture of Wedge-IT POS Home screen

The dashboard is designed to be easily read by the user as well as optimizing the information delivered by reporting the in system information without having to pull other forms of data from outside the system. Pictured in figure 8, the Dashboard for Wedge-IT POS.

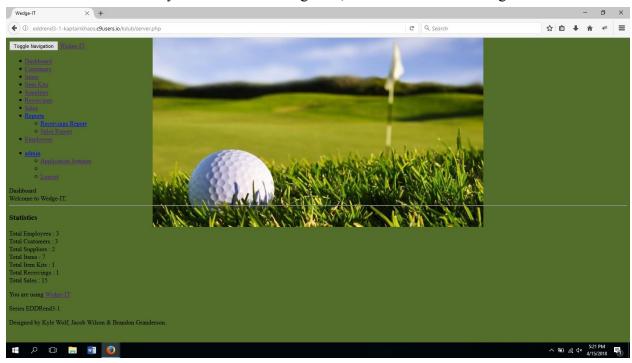


Figure 8: Screen capture of Wedge-IT POS Dashboard

The customers tab initially opens with a table of the customers that are currently in the system. Fig 9 is a screen capture of the table of customers.



Figure 9: Screen capture of Wedge-IT POS customer table

To add a new customer the New Customer button is clicked and a screen with text fields and a submit button is brought up for new customer entry. Fig 10 is a screen capture of the new customer entry application.

New Customer		20		3/3/4
Name *				1000
Email				W.
Phone Number				
Choose Avatar	Browse	No file selecte	ed.	N. Carlot
Address				
City				
State				
Zip				
Company Name				
Account #				
Submit				
You are using V	Vedge-IT			
Series EDDRen	d3-1			
Designed by Ky	le Wolf, Ja	acob Wilson &	Brandon G	randerson.

Figure 10: Screen capture of Wedge-IT POS new customer entry page

The item tab has a table for the items currently listed in the system. The table contains all of the pertinent information available about the item. Fig 11 is a screen capture of the item table.

List Ite								
Item I	D UPC/EAN/ISBN	Item Name	Size	Cost	Price Selling Price	Quantity	-	Avatar
1	102032	Golfball	standard	5.00	12.00	500	Inventory Edit Delete	a picture
2	28343	Granola Bar	standard	0.35	100	500	Inventory Edit Delete	a picture
3	03201	Drink	medium	0.00	July 1	500	Invertor Fort Delete	a pieture
4	055	Round of golf	18 holes	20.00	48.00	50 V	Delete	a picture
5	103	CheeseBurger	Large	1.20	4.00	200	Inventory Edit Delete	a picture
6	83	Golf Towel	one size	5.00	10.00	100	Inventory Edit Delete	a picture
7	3421	Golf Glove	large	2.00	5.00	600	Inventory Edit Delete	a picture

Figure 11: Screen capture of Wedge-IT POS inventory item page
The item tab allows for new inventory to be entered as well as current inventory to be edited or deleted. Fig 12 is a screen capture of the new item entry field.



Figure 12: Screen capture of Wedge-IT POS inventory item entry field

The suppliers tab lets the user see the available providers that service the place of business. This offers a table with their information. Fig 13 shows the table of providers.



Figure 13: Screen capture of Wedge-IT POS supplier table

The suppliers' tab new supplier button opens a screen for adding new suppliers. This screen gives the user a series of text fields that are able to be filled out to enter a new supplier. Fig 14is a screen capture of the new supplier entry screen.

New Supplier
Company Name *
Name
Email
Phone Number
Choose Avatar: Browse No file selected.
Address
City
State
Zip
Comments
Account#
Submit

Figure 14: Screen capture of Wedge-IT POS new supplier entry fields

The sales tab is for ringing up a customer with their items. A screen capture is below depicting the sales screen Fig 15 screen capture of the sales menu.

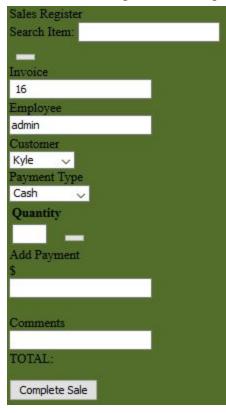


Figure 15: Screen capture of Wedge-IT POS sales entry field

The sales report tab offers a report of the sales made that day for the company to keep for their records. Fig 16 is a screen capture of the sales report tab.

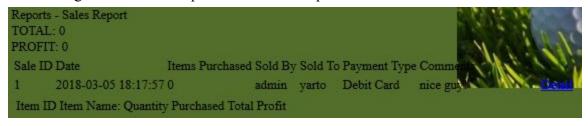


Figure 16: Screen capture of Wedge-IT POS sales report

The employees tab allows you to see the current employees and their information. There are buttons on there for editing deleting and adding a new employee. Fig 17 shows the table for employees.



Figure 17: Screen capture of Wedge-IT POS employee tab

Testing

We performed multiple tests to ensure that the final product is fully functional and in line with our expectations.

Test 1: Item Creation Test

Goal: The user will create an item that is sold in the golf shop and save it in the database

Initial Conditions: The Point of Sales application must to be open to the dashboard screen

Pass/Fail Criteria: The item needs to be properly saved in the database, with no errors

Procedure: Click the "Items" tab. Then click the "New Item" link. Input the necessary info into the form, including an identification number, item name, size, a description, an avatar for the item, supplier price of the item, selling price of the item, and quantity of items in stock. Then, click the "Submit" button. Return to the "Items" tab and view the table to ensure that the item was correctly saved in the database. Click the "Edit" link for the item and change some of the fields to ensure that items can be edited. Click the "Submit" button. Then, click the "Inventory"

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link for the item and input an amount to add along with a short comment. Click the "Submit"

button.

Results: This test was passed successfully without any problems from any of the people that ran

it.

Test 2: Supplier Creation Test

Goal: The user will create a supplier for the golf shop and save it in the database

Initial Conditions: The prototype needs to be open to the dashboard screen

Pass/Fail Criteria: The supplier needs to be properly saved in the database, with no errors

Procedure: Click the "Suppliers" tab. Then click the "New Supplier" link. Input the necessary

info into the form, including the company name, the contact name, company email, phone

number, an avatar for the company, their address, any comments about the company, and the

account number. Then, click the "Submit" button. Return to the "Suppliers" tab and view the

table to ensure that the item was correctly saved in the database. Click the "Edit" link for the

item and change some of the fields to ensure that items can be edited. Click the "Submit" button.

Then, click the "Inventory" link for the item and input an amount to add along with a short

comment. Click the "Submit" button.

Results: The supplier was created and successfully saved to the database.

Test 3: Language Test

Goal: The user will change the language of the application

Initial Conditions: The prototype needs to be open to the dashboard screen and logged in as an admin

Pass/Fail Criteria: The language of the application is successfully changed

Procedure: Click the "Application Settings" tab under the "admin" category. Select a language from the "Language" dropdown. Click the "Submit" button to change the language.

Results: The language can successfully be changed within Wedge-It.

Conclusion

The last two semesters of engineering have been a great educational experience. As the three of us started off the year with varying amounts of coding experience, we have all learned a lot about a variety of programming languages - from Python to PHP. Most importantly, we learned the importance of the design process to create a successful product. We can all say that inventing a new item is much more difficult than we thought at the beginning of the year. While our final prototype falls a bit short of our original expectations, we can all be proud of the functional capabilities of our design.

Appendix A: Referenced Patents

Source:

Brett, K. (2001). United States of America Patent No. 6,907,405.

Patent Number:

6,907,405

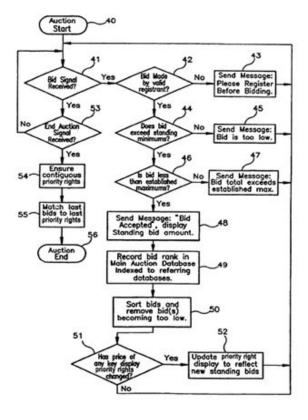
Patent Summary:

This patent is for a priority assigning system for things like tickets, and for our purposes, tee times.

Patent Critique:

The patent is a simple solution for automatically assigning tee times using automated priority setting.

Images/sketches:



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Craw, D., Darrow, & Darrow, B. (2009). United States of America Patent No. 7,634,426.

Patent Number:

7,634,426

Patent Summary:

A computerized tee time assigning system

Patent Critique:

This patent is a good implementation of a tee time reservation and assigning system. It implements networked computing in order to assign tee times at multiple golf courses. This system is designed to be used for multiple places at once.

No relevant images

Source:

Coleman, J. H., Davis, J. C., & Morgan, R. L. (1998). *United States of America Patent No.* 6,088,681.

Patent Number:

6,088,681

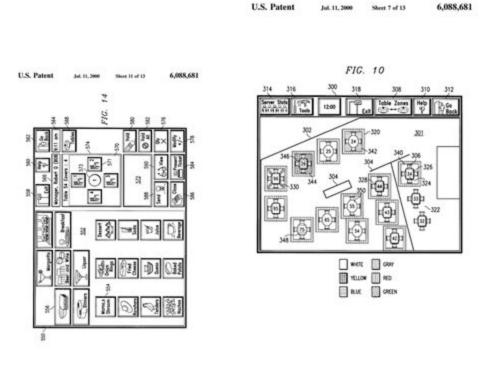
Patent Summary:

This patent is a restaurant management and inventory system. Employees can select items when serving them and the system will remove them from the inventory. There are also time estimate and money input features. In addition, there is a table management feature.

Patent Critique:

This patent is a great implementation of a point of sale system designed specifically for a restaurant. It combine a variety of necessary features into one program for use in a restaurant setting.

Images/sketches:



Source:

Wynn, S., Pearce, E., D'Amico, M., Dahl, E., & Conway, U. (1998). *United States of America Patent No.* 5,717,867.

Patent Number:

5,717,867

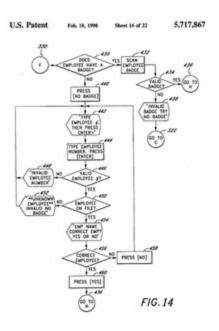
Patent Summary:

This is an electronic timeclock system for large companies with many different jobs and wages. It scans employee badges and records hours electronically to ensure that employees don't lie or make mistakes concerning their hours. It also generates payroll checks.

Patent Critique:

This is an effective standalone timeclock software with a variety of necessary features needed for employers. However, it seems to just have the basic features needed for this product.

Images/sketches:



Source:

McKeown, N. (2013). United States of America Patent No. 8,346,630.

Patent Number:

8,346,630

Patent Summary:

This is an inventory verification system. It assists large companies with large stock in verifying the number of inventory items in stock. It can be used in warehouses or stores for this purpose.

Patent Critique:

This system can be useful for assigning priority of physically inventorying important items. However, it appears to be very simple and robust.

Images/sketches:

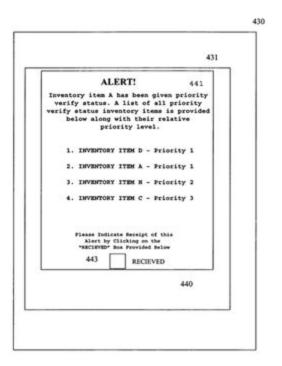


FIG. 4B

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20	111	C	e.

(United States Patent No. US 5715314 A, 1998)

Patent Number:

US 5715314 A

Patent Summary:

Patent of a network sales system, allows the computers to communicate within a network and allows multiple computers to share information within the same business.

Patent Critique:

This patent solves the problem of networking the computers within the business and allowing them to share information.

No relevant images

Appendix B: Research Summary

Artifact 1

National Club Association. (2010). Club Industry Trends and Economic Outlook. Washington DC: National Club Association.

Artifact Summary:

The US population is growing at a rapid rate, 4 million in 2007 which is the highest since the baby boom. The states with the highest projected population percentage by 2030 are Florida (179%) and Arizona (209%), which are the nation's best golfing/country club states. In addition, Arizona is the second fastest growing state.

Artifact Critique:

Interestingly, the millennials are reaching an age where the majority of country club members are joining earlier (30-39 years old). Also, of Generation X and Y, 70% of X shop online and 90% of Y own a computer. This shows that the need for internet and online software are needing to be integrated into country clubs. They need to become technologically savvy. Clubs must be prepared to deliver to a multicultural and multi-generational audience which includes programming, events, menu offering, etc.

Artifact 2

Capterra. (2017). Golf Course Software.

Artifact Summary:

In 20 of the top Golf Course Software Systems, none of them address table seating and tee times. Most of the software systems have tee times but no table seating. They may have "Food and Beverage", however that doesn't include the table seating software used in restaurants which is in need if a course or country club has any food and beverage related aspects.

Artifact Critique:

This validates our problem because none of these golf software systems address table seating integrated with tee times. Even systems with many feature don't have tee times and a seating systems. This source exposes the issue that these golf management systems lack the table seating.

Artifact 3

Jonas Club. (2017). *Club Management*. Retrieved from Jonas Club Sofware: http://www.jonasclub.com/Software-Solutions/Club-Management.aspx

Artifact Summary:

This is a golf club management software with features such as pro shop integration and tee time management.

Artifact Critique:

This software accomplishes some of the goals needed for the problem, but one thing it doesn't address is restaurant seating and bill organizatio

Artifact 4

Tri-Tech. (2017, 9 13). *Point of Sale Software*. Retrieved from Tri-technical Systems: http://golfpointofsalesoftware.com/?utm_source=Capterra

Artifact Summary:

This is a competing sales management system that shows technical errors which stop the system from performing all the tasks a golf course would require it to.

Artifact Critique:

This website shows that the software developed at the moment don't fulfill the needs of the golf courses.

Artifact 5

Golf Masters Software. (2017). *Golf Course Management Software Tools*. Retrieved from Golfnasters.com: http://www.golfmasterssoftware.com/products.htm

Artifact Summary:

There are many benefits and subject topic pertaining to the software. There is almost everything you can think of in the Golf master software: Tee Times, Inventory, Reporting, Accounting, Tournaments, Food and Service, Membership, and Point of Sale.

Artifact Critique:

Now the issue is within the Food and service. While it does well with keeping track of payment types, food, and drinks, it does not address a waiter/waitress with a table and the club member which can lead to confusion out on the floor.

Artifact 6

Shopify. (2017). Shopify POS. Retrieved from Shopify: https://www.shopify.com/pos

Artifact Summary:

Shopify is a highly customizable point of sale system that offers features such as mobile apps and an iphone powered credit card reader.

Artifact Critique:

How does the artifact provide validity, conflict, or the need for further research? What unique aspect does the artifact add to your overall research?

This software would be great for stores and online shops, but it falls short when applied to the problem. It doesn't offer necessary features for golf clubs like restaurant management and tee time assignment.

Artifact 7

ClubEssential. (2016, January 1). *Clubessential*. Retrieved from Clubessential: http://www.clubessential.com/

Artifact Summary:

This is the leading software in the golf sales management industry. They are leading because their business operates in producing sales management for any type of business.

Artifact Critique:

Their approach of not specializing in a singular type of sales management system takes away from their quality of each type of system.

Artifact 8

Reserve Interactive. (2017). *Reservations and Floor Management*. Retrieved from Reserve Interaction: http://www.reserveinteractive.com/dining-table-management/

Artifact Summary:

This is a restaurant table management software that uses a custom floor plan to seat customers. It can track many statistics to do with things like how long customers stay. It also features wait staff management and bill calculations.

Artifact Critique:

This resource solves one element of the problem statement, but leaves most of the other elements concerning golf course management unanswered.

Artifact 9

tee-on. (2017). tee-on. Retrieved from tee-on.com: https://www.tee-on.com/

Artifact Summary:

Tee-on.com is an online resource for viewing tee times at many golf courses.

Artifact Critique:

Tee-on doesn't service a large number of golf courses, especially in the US. Also, it is solely an application for viewing tee times online.

Artifact 10

Northstar. (2017). *ClubView*. Retrieved from Global Northstar: http://www.globalnorthstar.com/ClubView.php

Artifact Summary:

This is a program to help organize clubs. It has things like event notifications and POS access for all employees

Artifact Critique:

This artifact does not have all of the required features that a golf course management software would need.