A&K Custom PC

An Online Computer Store Design Report Version 2.0

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Design Report	Date 04/25/2023
1st Draft	

Revision History

Date	Version	Description	Author
04/25/2023	2.0	Detailed Design, System Screens, Memos	Anthony Yang
04/25/2023	2.0	Introduction, Use Cases, Entire System	Kristina Ilyovska

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Design Report

1. Introduction

The purpose of this document is to present the design of A&K Custom PC webstore through various diagrams. In addition, demonstrate major GUI screens and a sample prototype of Customer depositing money into their account.

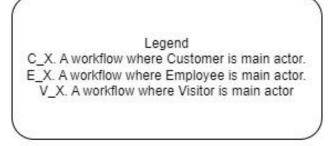


Figure 1. Collaboration Class Diagram Legend.

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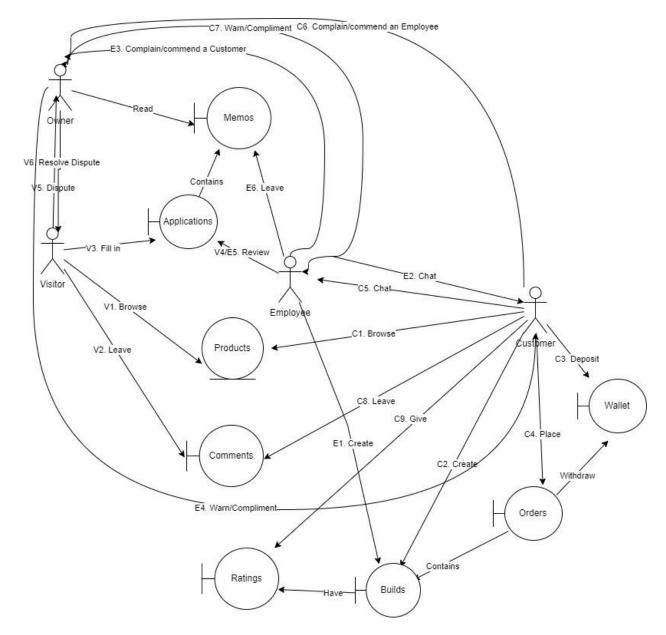


Figure 2. Collaboration Class Diagram.

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2. Use Cases

2.1 Use Case Scenarios

a. Visitor Use Cases

1. Browse products

Description: The Visitor can freely browse the available products without having an account.

Normal Scenario: The Visitor opens the webstore and browses products.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Visitor

connection drops.

2. Comment on products

Description: The Visitor can freely comment on all products without having an account.

Normal Scenario: The Visitor leaves a comment on a product.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Visitor

connection drops while the communication is in progress.

3. Sign up for account

Description: The Visitor can sign up for an account and be converted to a Customer. This feature is reviewed in greater detail <u>below</u>.

Normal Scenario: The Visitor fills out the application form by providing their email, chosen password, username and name to create a new account. They wait for an approval or denial decision.

Exceptional Scenario: The Visitor application may be rejected by an Store Employee and no account will be created.

4. Communicate with Store Owner to dispute account signup rejection

Description: The Visitor can dispute a decision that rejects their account creation with the Store Owner. This feature is reviewed in greater detail <u>below</u>.

Normal Scenario: The Visitor contacts the Store Owner to dispute the rejection decision on their account application. The Store Owner decision is final, either the Store Owner overrides the Store Employee decision and creates a new account for the Visitor, or the Store Owner rejects the application.

Exceptional Scenario: The Store Owner always provides a decision when contacted. No exceptional scenario.

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b. Customer Use Cases

1. Sign in

Description: The Customer can sign in their existing account.

Normal Scenario: The Customer enters their email or username and password in the form to sign in.

Exceptional Scenario: If the Customer has entered the wrong information, they are prompted to retry logging in.

2. Sign out

Description: The Customer can sign out of their existing account.

Normal Scenario: The Customer selects the sign out option from the menu and no longer has access to the Customer dashboard and functionality.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Customer connection drops while the communication is in progress.

3. Deposit money

Description: The Customer can deposit money in their store account to use for purchases.

Normal Scenario: Customer adds their bank information and selects an amount to deposit into their account. The amount is deposited in the account.

Exceptional Scenario: If there is not enough money in the account or the Customer's bank declined the transaction, an error is returned to the Customer and no money is deposited in the account.

4. Make a purchase

Description: The Customer can make a purchase. This feature is reviewed in greater detail <u>below</u>.

Normal Scenario: The Customer can select a build or product and purchase them. The price of the purchase is subtracted from their wallet.

Exceptional Scenario: If the Customer does not have enough money in their wallet, the transaction is denied. One warning is issued to the Customer for reckless behavior. Any Customer account receiving 3 warnings will be suspended.

5. Build a computer

Description: The Customer can build a computer.

Normal Scenario: The Customer can add different products to a Build and create a new Build. The system checks if all the components of the Build are compatible and alerts the Customer in the case they are not.

Exceptional Scenario: If not all components of the Build are compatible, then the

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Customer is alerted that the Build is unfeasible and must be modified.

6. Save build

Description: The Customer can save a build.

Normal Scenario: Once the Customer has created or edited a build, they are prompted to save it and asked to display it publicly on the website.

Exceptional Scenario: There is no exceptional scenario, the Build is checked, all components are compatible. An error is displayed if the Customer connection drops while the SAVE is in progress.

7. Rate build after purchase

Description: The Customer can rate a build after they have purchased it.

Normal Scenario: The Customer can rate a Build after they have purchased it. Based on the rating, the Customer that created the Build can receive a Compliment or a Warning. Complement is received when a Build has 3 best ratings and 0 worst ones. Warning is received when a Build has 3 worst ratings and 0 best ones.

Exceptional Scenario: Any Customer account receiving 3 warnings will be suspended. An error is displayed if the Customer connection drops while the rating is in progress.

8. Chat with Store Employee about concerns with the purchase

Description: The Customer can contact a Store Employee and chat with them directly about any concerns with their purchase.

Normal Scenario: The Customer can contact a Store Employee. The Store Employee can continue the conversation by sending messages to the Customer.

Exceptional Scenario: No exceptional scenario. An error is displayed if the connection drops while the communication is in progress.

9. Compliment or complain about an Store Employee

Description: The Customer can compliment or complain about an interaction with a Store Employee or a build that the Store Employee has created.

Normal Scenario: The Customer can contact a Store Employee with concerns about their purchase. After the interaction, the Customer can compliment or complain about the interaction with a Store Employee to the Store Owner.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Customer connection drops while the communication is in progress.

10. Browse products

Description: The Customer can freely browse the available products without having an account.

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Normal Scenario: The Customer opens the webstore and browses products.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Customer connection drops.

11. Comment on products

Description: The Customer can comment on all products.

Normal Scenario: The Customer leaves a comment on a product.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Customer

connection drops.

c. Store Employee Use Cases

1. Build a computer

Description: The Store Employee can create computer builds. Similarly to the Customer, they can create builds, change them and save them.

Normal Scenario: The Store Employee can add different products to a Build and create a new Build. The system checks if all the components of the Build are compatible and alerts the Store Employee in the case they are not.

Exceptional Scenario: If not all components of the Build are compatible, then the Store Employee is alerted that the Build is unfeasible and must be modified.

2. Compliment or complain about a Customer

Description: The Store Employee can compliment or complain about an interaction with a Customer.

Normal Scenario: A Customer can contact a Store Employee about a purchase. After the interaction, the Store Employee can compliment or complain about the interaction with a Customer to the Store Owner.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Store Employee connection drops while the communication is in progress.

3. Chat with Customer

Description: The Store Employee can chat with a Customer. They have a way to interact directly with each other.

Normal Scenario: The Customer can contact a Store Employee. The Store Employee can continue the conversation by sending messages to the Customer.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Store Employee connection drops while the communication is in progress.

4. Process Signup application

Description: The Store Employee reviews a Visitor account sign up application and issues

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a decision whether or not the Visitor can be converted to a Customer. The Store Employee can leave notes on their decision. This feature is reviewed in greater detail below.

Normal Scenario: The Store Employee reviews a Visitor signup application. They can approve it and an account for the Visitor is created, they become a Customer. They can deny it, add a memo that the Store Owner can review in cases of contestation. **Exceptional Scenario:** No exceptional scenario. An error is displayed if the Store Employee connection drops while they save their decision for the application or are leaving a memo.

5. Add memo to application

Description: The Store Employee leaves memos on denied account signup applications for the Store Owner to review.

Normal Scenario: The Store Employee can leave a memo for the denied account signup application for the Store Owner to review in the case a Visitor contests the decision. **Exceptional Scenario:** No exceptional scenario. An error is displayed if the Store Employee connection drops while they are leaving a memo.

d. Store Owner Use Cases

Issue a warning or give a compliment to a Customer if referred by an Store Employee
 Description: The Store Owner can give warnings or compliments to a Customer. More
 details below.

Normal Scenario: The Store Owner can give warnings or compliments to a Customer if they are referred by a Store Employee at their discretion on a case-by-case basis. **Exceptional Scenario:** Any Customer account receiving 3 warnings will be suspended.

Issue a warning or give a compliment to a Store Employee if referred by a Customer
 Description: The Store Owner can give warnings or compliments to a Store Employee.
 More details <u>below</u>.

Normal Scenario: The Store Owner can give warnings or compliments to a Store Employee if they are referred by a Customer at their discretion on a case-by-case basis. **Exceptional Scenario:** No exceptional scenario. An error is displayed if the Store Owner connection drops while they are giving compliments or warnings to the Store Employee.

3. Communicate with Visitor in case of signup rejection

Description: The Store Owner can communicate with a Visitor when the Visitor initiates an account signup rejection.

Normal Scenario: The Store Owner can review Visitor signup application rejections and overwrite the Store Employee decision or uphold it.

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Exceptional Scenario: No exceptional scenario. An error is displayed if the Store Owner connection drops while they are saving their decision.

4. Review notes Store Employee left

Description: The Store Owner can review notes that the Store Employee has left on signup decisions.

Normal Scenario: The Store Owner can access and review the notes that a Store Employee has left.

Exceptional Scenario: Store Owner overwrites the Store Employee decision and an account is created.

e. Sign Up Use Cases

1. Visitor signs up for an account

Description: The Visitor can sign up for an account and be converted to a Customer. **Normal Scenario:** The Visitor fills out the application form by providing their email, chosen password, username and name to create a new account. They wait for an approval or denial decision.

Exceptional Scenario: The Visitor application may be rejected by a Store Employee and no account will be created.

2. Store Employee approves Visitor signup application

Description: The Store Employee can approve a Visitor signup application and convert the Visitor to a Customer.

Normal Scenario: The Store Employee approves a Visitor signup application and creates a new account for the Visitor. The Visitor is converted to a Customer. They have access to Customer functionality in the webstore.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Store Employee connection drops while they are saving their decision.

3. Store Employee denies Visitor signup application

Description: The Store Employee can deny a Visitor signup application.

Normal Scenario: The Store Employee can deny a Visitor their signup application. They leave a memo explaining their decision. No account is created.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Store Employee connection drops while they are saving their decision.

4. Store Employee leaves notes on denied signup applications

Description: The Store Employee can leave notes for the Store Owner to review when they deny a Visitor signup application.

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Normal Scenario: If the Store Employee denies a Visitor signup application, they must leave a note explaining why they denied it. The memo can be reviewed by the Store Owner.

Exceptional Scenario: No exceptional scenario. An error is displayed if the Store Employee connection drops while they are saving their decision.

5. Visitor disputes denied signup application with Store Owner

Description: The Visitor can file a dispute with the Store Owner if their signup application was denied by the Store Employee.

Normal Scenario: The Visitor contacts the Store Owner to find out why they were denied an account. The Visitor can contest the decision. The Store Owner decision is final.

Exceptional Scenario: Store Owner overwrites the Store Employee decision and an account is created.

f. Make a Purchase Use Cases

1. Customer makes a purchase

Description: The Customer can purchase a computer build they have created or an already existing computer build.

Normal Scenario: The Customer purchases a Build by adding it to their cart. Money is subtracted from their wallet.

Exceptional Scenario: If the Customer does not have enough money in their wallet, the transaction is denied. 1 warning is issued to the Customer for reckless behavior. Any Customer account receiving 3 warnings will be suspended.

2. Customer can rate a build after purchase

Description: The Customer can rate a build after they have purchased it.

Normal Scenario: The Customer can rate a Build after they have purchased it. Based on the rating, the Customer that created the Build can receive a Compliment or a Warning. Complement is received when a Build has 3 best ratings and 0 worst ones. Warning is received when a Build has 3 worst ratings and 0 best ones.

Exceptional Scenario: Any Customer account receiving 3 warnings will be suspended. An error is displayed if the Customer connection drops while the rating is in progress.

3. Customer can chat with Store Employee about concerns with the purchase **Description:** The Customer can contact a Store Employee and chat with them directly about any concerns with their purchase.

Normal Scenario: The Customer can contact a Store Employee. The Store Employee can continue the conversation by sending messages to the Customer.

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Exceptional Scenario: No exceptional scenario. An error is displayed if the connection drops while the communication is in progress.

- 4. Store Owner can issue warnings or compliments to Customer Description: The Store Owner issues warnings or compliments to the Customer when they are reported by the Store Employee following a conversation.
 Normal Scenario: The Store Owner can give warnings or compliments to a Customer if they are referred by a Store Employee at their discretion on a case-by-case basis.
 Exceptional Scenario: Any Customer account receiving 3 warnings will be suspended.
- 5. Store Owner can issue warnings or compliments to Store Employee *Description:* The Store Owner issues warnings or compliments to the Store Employee when they are reported by the Customer following a conversation. *Normal Scenario:* The Store Owner can give warnings or compliments to a Store Employee if they are referred by a Customer at their discretion on a case-by-case basis. *Exceptional Scenario:* No exceptional scenario. An error is displayed if the Store Owner connection drops while they are giving compliments or warnings to the Store Employee.

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2.2 Sequence Class Diagram

a. Visitor

Below is the sequence diagram that shows all use cases in which the Visitor is the main actor.

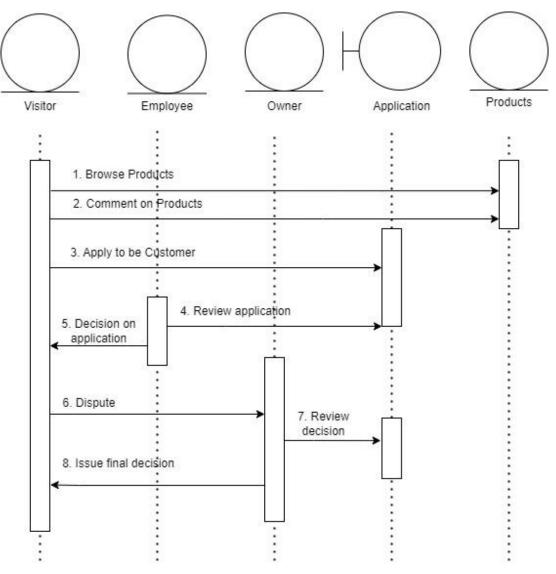


Figure 3. Visitor Use Case Sequence Diagram.

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b. Customer

Below is the sequence diagram that shows all use cases in which the Customer is the main actor.

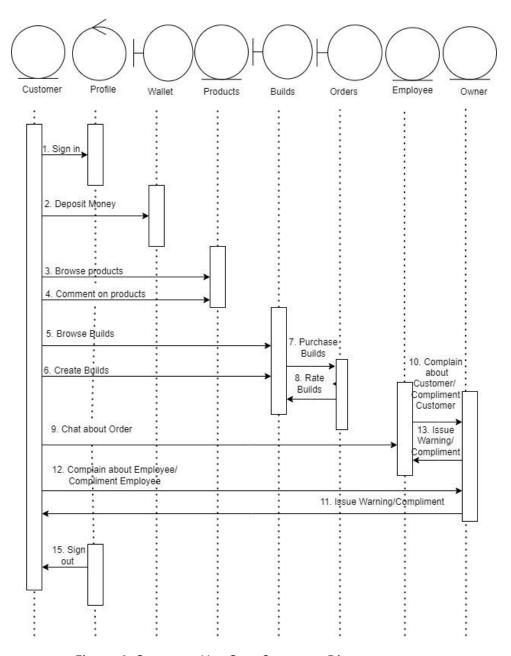


Figure 4. Customer Use Case Sequence Diagram.

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c. Store Employee

Below is the sequence diagram that shows all use cases in which the Store Employee is the main actor.

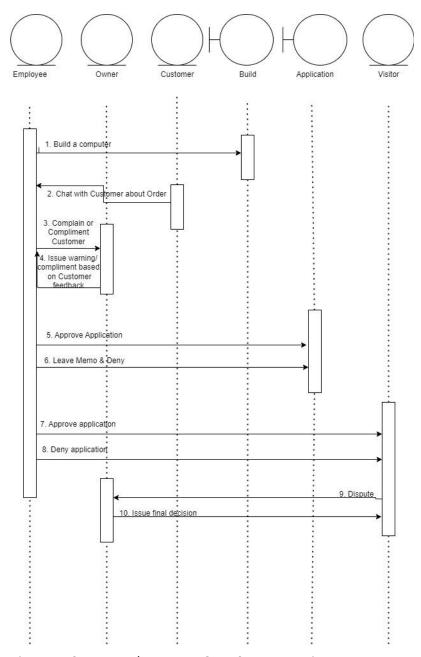


Figure 5. Store Employee Use Case Sequence Diagram.

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d. Store Owner

Below is the sequence diagram that shows all use cases in which the Store Owner is the main actor.

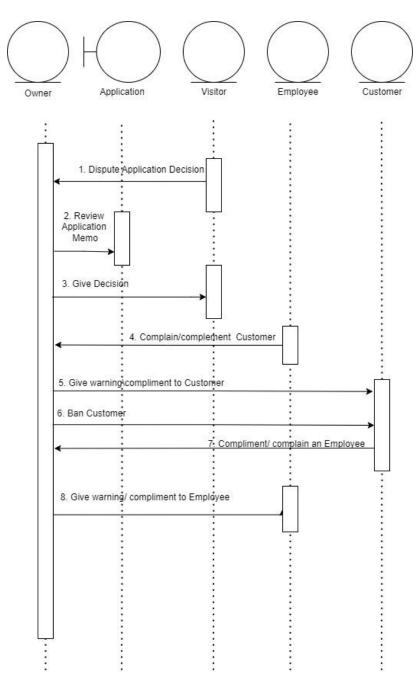


Figure 6. Store Owner Use Case Sequence Diagram.

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2.3 Petri-Nets

a. Sign Up for an Account

Below is the Petri net diagram that shows the Signup for an Account workflow.

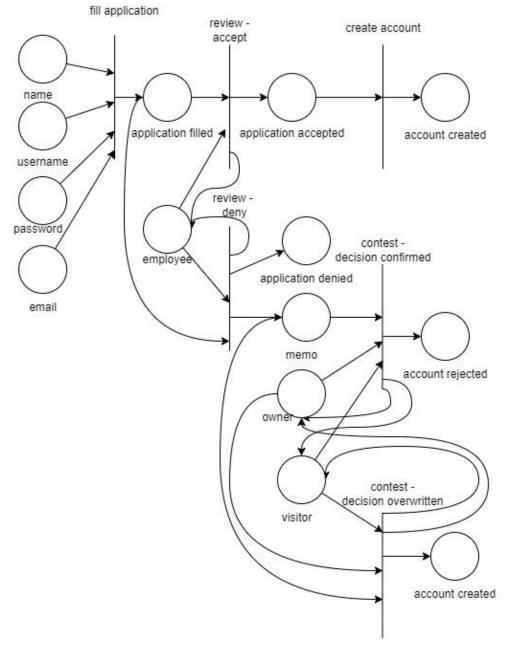


Figure 7. Sign Up Use Case Petri Net.

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b. Customer Builds a Computer

Below is the Petri net that shows how a Customer can build a computer on the website. The "PURCHASE" Petri net is expanded on later in the document.

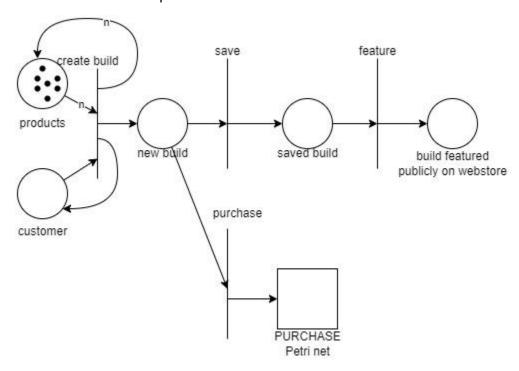


Figure 8. Customer Build Computer Use Case Petri Net.

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c. Make a Purchase

Below is the Petri net that shows the workflow of how a Customer purchases a computer build on the webstore.

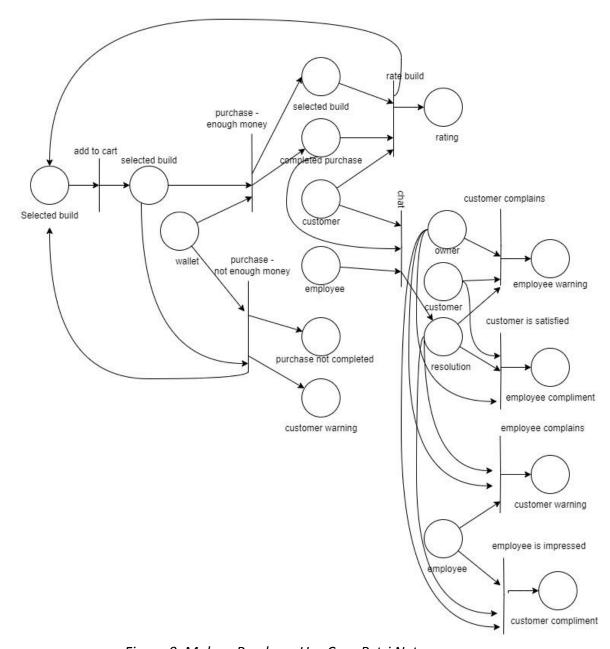


Figure 9. Make a Purchase Use Case Petri Net.

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3. Entire System

The E-R diagram below shows the relationships between different classes in the website design. The classes are as follow:

Users

- Customers extends Users, those are the users that can access Customer functionality.
- Store Employees extend Users, those are all the users that can access Store Employee functionality.
- Store Store Owners extend Store Employees (which extend Users), those are the users that can access Store Store Owner functionality.
- Visitors extend Users. Visitors are a type of User, a transient class that awaits to be converted to Customer.
- Warned Users extends Users, those are all the users that have warnings.
- Complimented Users extends Users, those are all the users that have compliments.
- Complaint Users extend Users, those are all the users that have complaints against them.

Products

 This is a separate class that contains information for specific Products on the website.

Builds

 This is a separate class that contains information about the specific custom Builds that are created by Customer or Store Employee.

Orders

 This is a separate class that contains information about purchased Builds or standalone Products.

Comments

 This is an entity that contains the information for Comments left on specific Build.

Rating

This is an entity that contains the information for Ratings left on specific Build.

Application

This is an entity that contains the information relating to an Application that a
 Visitor created. It contains the personal information of the Visitor that will be

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stored in a Customer account if they are converted to a Customer. It is accessible by the Store Employee, so that they can leave their decision and memo there. It is accessible to the Store Owner for review.

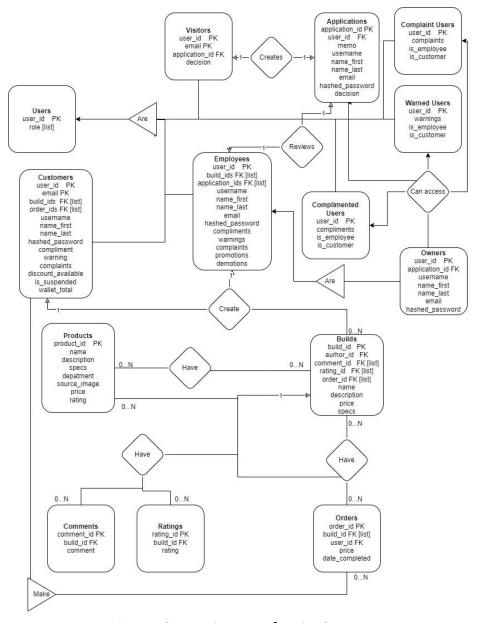


Figure 10. E-R Diagram of Entire System.

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4. Detailed Design

Browse Builds: This function allows Visitors and Customers to browse available builds.

```
define browseBuilds():
    builds = getBuilds(firebaseID)
    return builds
```

Sign Up: This function allows Visitors to sign up for an account and be converted to Customer.

```
define signUp(name_first, name_last, email, hashed_password):

if (name_first == "" | name_last == "" | email == "" | hashed_password == ""):
    return "Empty field(s)"

status = createNewUser(name_first, name_last, email, hashed_password)

if (status == "error"):
    return "Error occurred"

return redirect("/SignUpConfirmationPage")
```

Process Sign Up Application: This function allows Store Employees to approve or deny visitor sign up applications.

```
define processApplication(user_id, application_id):

    displayApplication(application_id)

    if (approveButton.isClicked()):
        user_id.decision = "Approved"

    else:
        user_id.decision = "Denied"
        memo = input("Why reject the application?")
        addMemo(user_id, application_id, memo)
```

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Dispute Application Choice: This function allows Visitors to dispute their denied applications with the Store Owner.

```
define disputeApplication(user_id, decision, memo):

   if (user_id.decision == "Denied"):

        displayMemo(memo)

        print("Do you want to dispute your application?")

        if (disputeButton.isClicked()):
            disputeReason = input("Why dispute your application?")
            addReason(user_id, disputeReason)
```

Sign In: This function allows Customers, Store Employees and Store Owners to sign into their accounts which they will be redirected to their respective pages.

```
define signIn(email, hashed_password):
    if (email == "" | | hashed_password == "")
        return "Empty field(s)"

status = loginUser(email, hashed_password)

if (status == "error"):
        return "Error occurred"

switch(user_id.role):
        case "Customer":
            return redirect("/CustomerPage")
        case "Employee":
            return redirect("/EmployeePage")
        case "Owner":
        return redirect("/OwnerPage")
```

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Sign Out: This function allows Customers, Store Employees and Store Owners to sign out of their accounts which they will be redirected to the home page.

```
define signOut(user_id):
    status = signoutUser(user_id)
    if (status == "error"):
        return "Error occurred"
    return redirect("/HomePage")
```

Comment on Products: This function allows Visitors and Customers to comment on products.

```
define commentProducts(user_id, product_id, comment, submitButtonClicked)

if (submitButtonClicked = True):
    addComment(user_id, product_id, comment)
```

Deposit Money: This function allows Customers to deposit money in their store account.

```
define depositMoney(user_id, bank_information, amount, wallet_total)

bankCheck = verifyBank(bank_information)

if (bankCheck == "Invalid"):
    return "Invalid bank information"

if (amount < 0):
    return "Amount needs to be greater than 0"

status = addMoney(user_id, bank_information, amount, wallet_total)

if (status == "error")
    return "Cannot add money to wallet. Please try again later or contact your bank."</pre>
```

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```
return redirect("/CustomerPage")
```

Create a Build: This function allows Customers and Store Employees to create their own customized builds, while ensuring that the components satisfy the hardware constraint.

```
define createBuild(user_id, products_selected[])

build = new Build()
is_compatible = True
for product in products_selected:
    if (not is_compatible):
        return "Invalid build, please change component {product}"

is_compatible = checkCompatibility(build, product)

build = addProduct(product)

saveBuild(build)

return redirect("/BuildPage")
```

Make a Purchase: This function allows Customers to make purchases of products and builds.

```
define purchase(user_id, product_id, build_id, price, wallet_total, discount_available)

if (price > wallet_total):
    return giveWarningSystem(user_id, "Purchase exceeded available money")

if (discount_available = "Yes"):
    price *= 0.9

updateWallet(price, wallet_total)
addOrder(user_id, product_id, build_id, price)
clearCart(user_id)

return redirect("/OrderConfirmationPage")
```

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Rate Build After Purchase: This function allows Customers to rate the builds they've purchased.

Give Warning (System): This function allows the system to give warning(s) to Customers and Store Employees based on different reasons.

Give Warning (Store Owner): This function allows the Store Owner to modify warning(s) to Customers and Store Employees based on complaints.

```
define giveWarningOwner(user_id, complaint):

viewComplaint(complaint)

print("Do you want to issue less/more warnings?")
```

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```
if(addWarningButton.isClicked()):
    warningAmount = input("How many warnings to issue (up to 3)?")
    updateWarning(user_id, warningAmount)
```

Give Compliment (System): This function allows the system to give compliment(s) to Customers and Store Employees based on different reasons.

Give Compliment (Store Owner): This function allows the Store Owner to modify compliment(s) to Customers and Store Employees based on compliments.

```
define giveComplimentOwner(user_id, compliment):
    viewCompliment(compliment)

print("Do you want to issue less/more compliments?")

if(addComplimentButton.isClicked()):
    complimentAmount = input("How many compliments to issue (up to 3)?")
    updateCompliment(user_id, complimentAmount)
```

Penalize Customers and Store Employees (System): This function allows the system to automatically penalize Customers and Store Employees for having many warnings.

```
define penalize(user_id, is_employee, is_customer, warnings, demotions)

if (is_customer == True and warnings == 3):
```

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```
suspendCustomer(user_id)

if(is_employee == True and warnings == 3):
    demoteEmployee(user_id)

if(is_employee == True and demotions == 2):
    fireEmployee(user_id)
```

Reward Customers and Store Employees (System): This function allows the system to automatically reward Customers and Store Employees for having many compliments.

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5. System Screens

Below are screenshots of major GUI screens of the system.

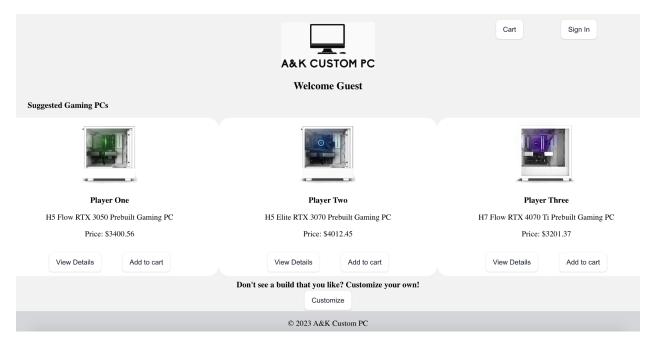


Figure 11. Home Page

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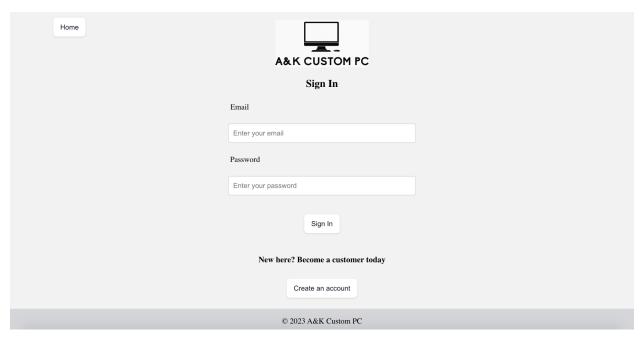


Figure 12. Sign In Page

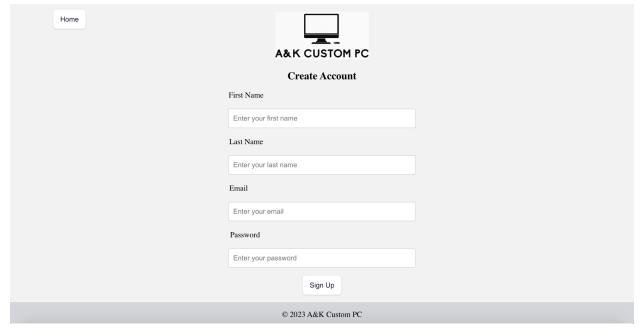


Figure 13. Sign Up Page

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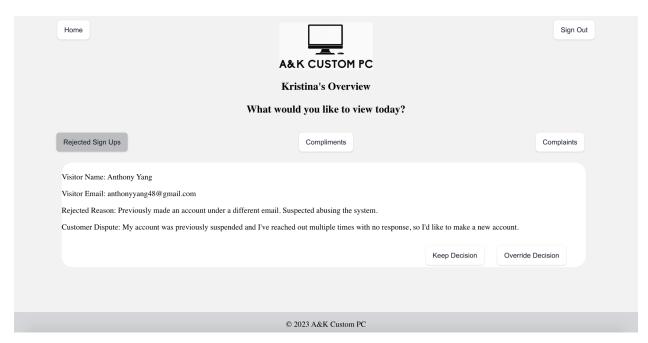


Figure 14. Store Owner's Page

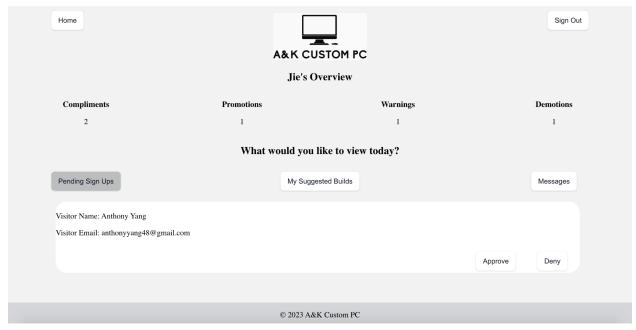


Figure 15. Store Employee's Page

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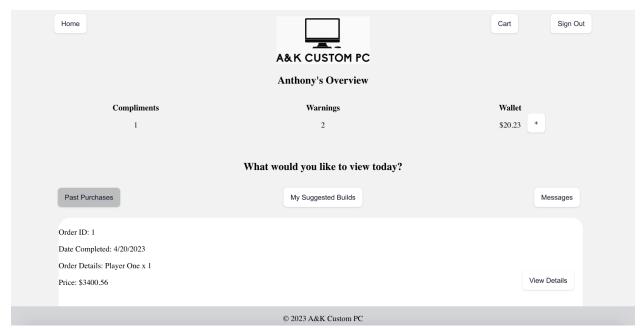
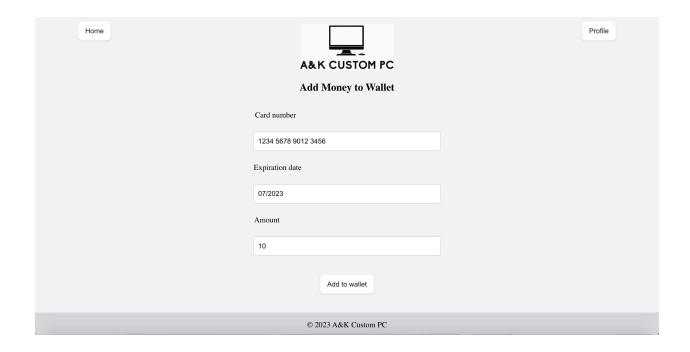


Figure 16. Customer's Page

Below are screenshots demonstrating the normal and exceptional scenarios of depositing money into account which is accessed by pressing on the + button next to the wallet amount.



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Figure 17. Deposit money into account feature.

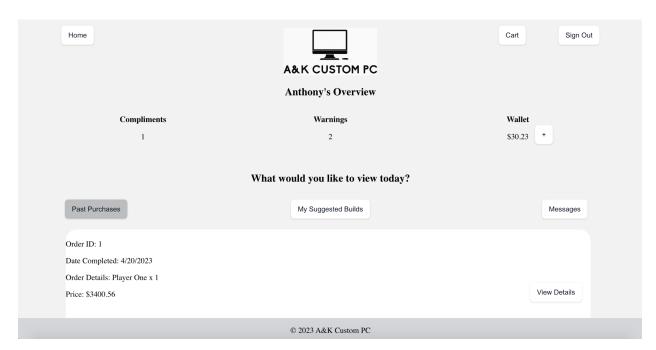


Figure 18. Normal Scenario: Money deposited into account.

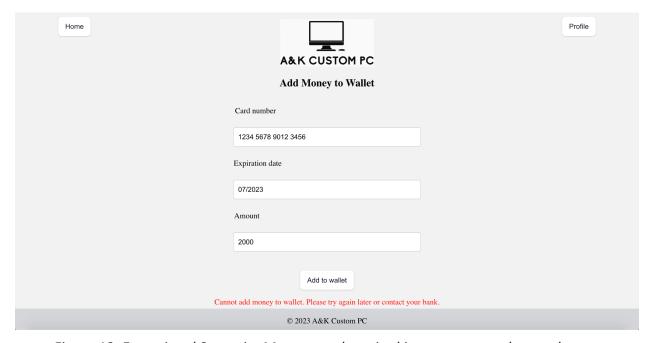


Figure 19. Exceptional Scenario: Money not deposited into account and error shown.

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6. Memos of Group Meetings

After the project specification was released, we had an initial meeting where we went over the system demands and broke them down into specific requirements. Then, we translated the requirements into user stories and maintained them in Jira Scrum board. We also discussed potential frontend and backend technologies to develop the system.

During our second meeting, we reviewed the sections for the Software Requirements Specification Report and divided the work evenly between the two of us. We decided to use ReactJS and Firebase to develop the system. After finalizing the technologies, we set up our GitHub repository and the React environment. We also briefly discussed the information that we need to store in Firebase and where they'll be stored. Then, we implemented the layout of a few screens based on the mid-fidelity prototype in Figma without any features implemented.

In our third meeting, similar to our second meeting, we reviewed the sections of the Design Report and divided the work evenly. We continued our discussion of the database design which we finalized based on numerous discussions in our E-R diagram. We also continued to implement more screens and started implementing features including the feature demoed the System Screens section. At this point, we have no concerns of teamwork as we enjoy working with each other and contribute equally.

7. GitHub Repo

https://github.com/lyloster/csc322-webstore