



HCI Project Report

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Course: CSIT 335 - Intro to Human Computer Interaction

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Project Proposal Phase

Name of Product

- The name of the product is: EZPC Builder
- The name originated around the idea of a computer building website. The ‘EZ’ terminology comes from the word ‘easy’. ‘PC’ comes from the abbreviation known as personal computer. When combined together, it provides a unique way of describing ‘easy computer’. Adding the word ‘Builder’ in the end signifies that the title is about ‘easy computer builder’.



Original Proposed Logo.



Final Proposed Logo.

Problem Statement

- The problem I am trying to solve is that I am trying to create a website where any person with access to the internet that has or doesn't have knowledge of computers, can construct their own custom computer with a simple yet informative user interface and have the option to be shipped as built or not.
- Many PC builder websites have very confusing interfaces that deter people with no knowledge about computers to build a custom computer for themselves. These PC builder websites offer no extra alternatives such as computerized assistants or short information blurbs to keep users on track of what they are doing.
- Because of this lack of information, the average consumer would rather purchase a mainstream laptop or computer that might cost much more money than the true cost based on their needs.
- PC builder websites generally provide the parts linking to many resellers (such as Amazon and Newegg). But they do not sell the parts themselves. EZPC is here to eliminate that and provide their own inventory of computer component parts.

Target Audience

- I believe that my target audience would be anyone that has some slight understanding about technology and about computers. The reason I believe this is because I would want my website to be informative but I also believe that the information I provide, even when simplified, will still not convince someone that is completely clueless about computers to get one on their own without assistance. But someone that has purchased a new phone or laptop in the past by themselves with limited knowledge about computers will most definitely feel comfortable using this website. So the age requirement would be between 13 to 60 years of age. The user group also still has to understand English as well as live in the United States. Website will still not support any other businesses as of this moment.

Project Requirements Phase

User Interviews

- User Interview #1 Description:
- I have interviewed a 20 year old undergraduate female attending Montclair State University. She majors in computer science which is perfect for my website as she could provide some input from a person who has fairly good computer skills. This person also built a personal gaming computer for herself in late 2017. I asked her questions about her experience building computers and how difficult it is to build a computer. She mentioned websites like PCPartPicker that are used to generate the total price and show the compatibility between each part. Discussion about this website was important for me to understand what my website can improve on that websites like PCPartPicker don't have.
- User Interview #1:
- Have you ever built a personal computer or a computer for someone else?
 - Yes I have, I built myself a desktop computer that I use to play games and do schoolwork.
 - How did you figure out your computer part setup? What websites did you go to?
 - Initially, I did quite a bit of research when looking for the specific parts I wanted for my computer. I used websites such as Twitter and Youtube to find more information. When I found all the parts I needed and googled through Amazon or Newegg to find the prices. I used the website PCPartPicker to check if my parts were compatible all together.
 - Did you know about PCPartPicker before you began your research for parts?
 - Yes I did.
 - Did you have any knowledge about various computer parts before you began your journey in building your computer? How long did it take you to learn?
 - Yes I did and also it took me a couple days to get a general idea.
 - What is the purpose of PCPartPicker's compatibility feature?
 - It basically showed whether the parts I had selected for my computer were compatible and didn't have any issues. It wasn't too specific.
 - Was there anything that you wished that PCPartPicker had shown or provided more about their compatibility?
 - On PCPartPicker, they only provide a compatibility box and wattage accumulated when selecting certain parts. It may have been nice if they added some graphs or percentages to explain exactly how compatible the parts are to each other.
 - Do you think that PCPartPicker should be used by anyone that doesn't have an idea about computer parts and assembling computers?
 - No I don't think so.

- How come?
 - Because PCPartPicker doesn't provide enough information on their website about the parts. Their interface is quite nice to use but it will still be confusing for anyone without computer knowledge.
- What type of information would you have wanted to see from them?
 - For certain products like memory or storage, it would be nice to see a small explanation or scale to show why I would need certain amounts of gigabytes in memory and storage to get an easy idea of how much I need.

➤ User Interview #2 Description:

- I have interviewed an 18 year old undergraduate female attending Rutgers University. This student does not major in anything and is currently undecided. She owns a laptop such as a Macbook and likes to browse and listen to music on it daily. This person knows a little bit about computer parts but not enough to be able to build her own computer on her own. She keeps up-to-date with Apple products and new releases. However, since she likes to customize and hold unique things that serve a purpose to her as well as use electronics on a daily, she would be a great fit to determine readability, interactivity, and simplicity for my website.

➤ User Interview #2:

- Have you ever built a personal computer or a computer for someone else?
 - No I have not.
- How do you feel about a website that helps build a custom computer for you? Would you do it?
 - It sounds nice to be able to build a custom computer but I feel like I would get lost or confused.
- What would make you confused about it?
 - Well these computer parts have specific details to them and I wouldn't understand which ones to choose for myself.
- Would it help if there was a way for you to answer a question like in psychology tests to get a recommendation on which part best fits your needs?
 - Most definitely yeah!
- When browsing to purchase electronics, which stores do you usually go to?
 - I usually go to stores like Apple to browse different phones and laptops. They make it very simple to browse their products and select what I want to purchase.
- Do you ever check the description of the product and the parts that it has?
 - Yes I do.
- What do those descriptions usually have?
 - In terms of iPhones, it usually provides simplified percentages and text to describe how much faster it is than its previous models which is nice.
- What if we added descriptions about what each computer component does?
 - I think it would definitely help.
- For a lot of computer builders, they would have to assemble the parts on their own. Would you want to assemble your computer parts by yourself?
 - I don't know for sure. I would like to try but it would also be nice if there was an option to have it already built.

User Requirements Analysis

➤ User #1 Discussion:

- This user is the first person I have interviewed to formulate my tasks about my EZPC Builder website. When I explained about the compatibility score based on what she said to me about how there needed to provide more explanation to compatibility, she thought it was a great idea! When I brought up the idea about memory and storage, she liked it but she believed that the idea could spread to various other computer components. She said that if I had a CPU or a GPU, I can show a graph to show how powerful those components are out of all the inventory components my website will hold (Like if the CPU was average, weak, or strong). Since she also had computer experience, she believed that it would deter her from using my website if she just wanted to browse for a single specific part. I proposed that there could be a store section where she can view parts on her own without going through the computer building interface. She also stated how websites like PCPartPicker didn't provide accurate pricing and provided links to websites such as Amazon and Newegg that she potentially felt worried buying from since scamming with computer components was a frequent thing. I explained that my website will hold inventory of their computer products and an easy and secure place to checkout.

➤ User #2 Discussion:

- This user is the second person I have interviewed to formulate my tasks about my EZPC Builder website. Based on my interview with her, I formulated tasks such as designing an interactive computer building interface with buttons to press and select different components similar to PCPartPicker. I told her that for each component that the user goes through in my website, they will be given a brief description of what the component does and also possibly provide pictures and analogies to real world things to give her an idea. She said that it would definitely help as long as the descriptions are simplified and easy to understand. She also said that she wouldn't know how much to trust my website based on the information I provide about the components. She felt that it just wouldn't be enough and proposed that there could be a section where people post reviews, questions, and comments about the components that she selects so that she can read what other people have experienced. She also said that the idea of answering questions to get recommendations is a good idea, but there needs to be some visualizations while answering those questions as well as an option for where they can message an assistant to help them with the question.

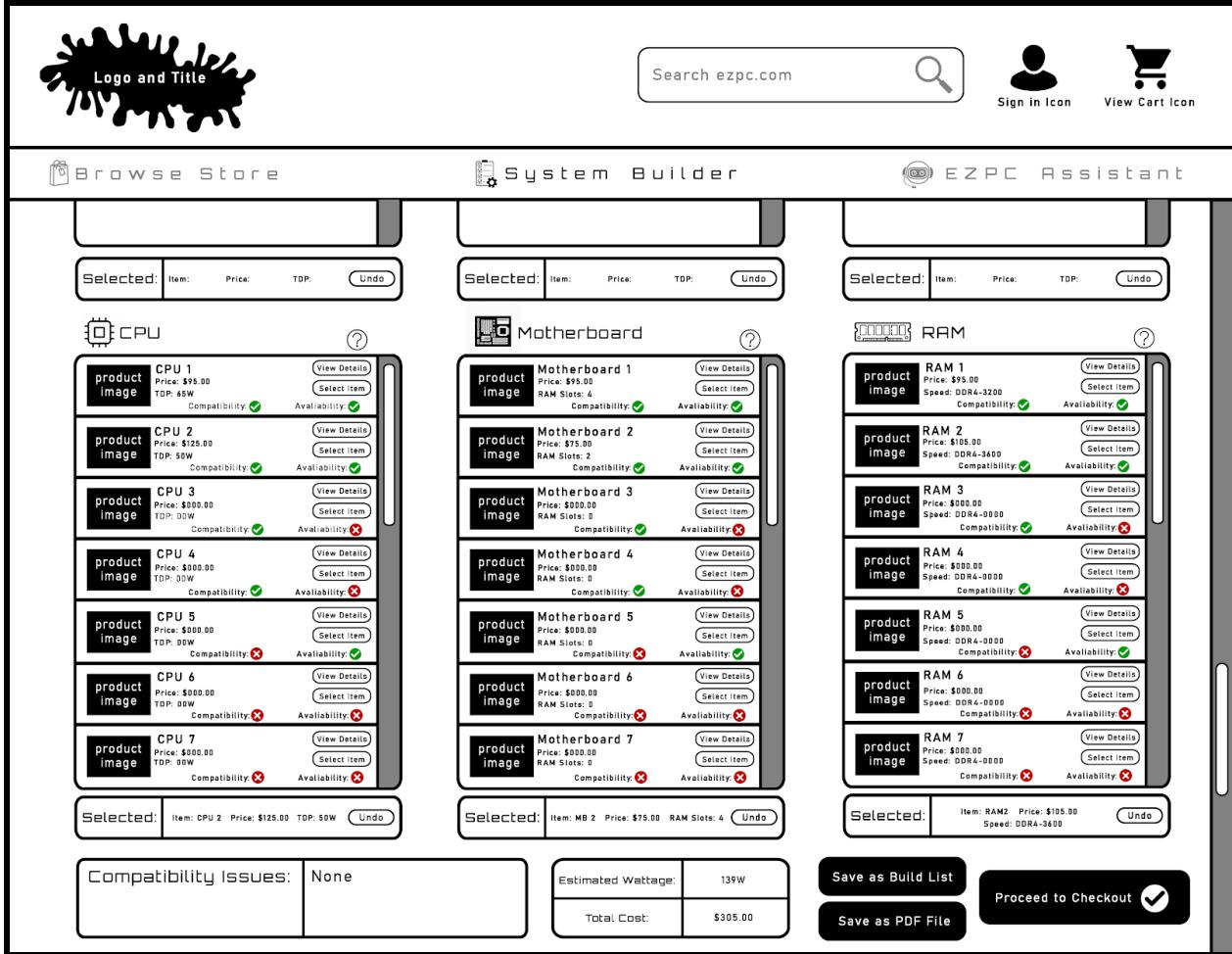
➤ Based on the discussions held between the two users that were interviewed, **a total of 12 tasks have been created**. These are the following tasks:

- Design an interactable computer building interface for where users can visualize the computer components that they need to look for.
- Design a questionnaire format (similar to psychology tests) where the user will be asked various questions about what he plans on using this computer for. The questions answered will convert into recommended parts that the user should get.
- During the questionnaire, in case the user gets confused with the question, he can message a customer service agent that can help answer their concerns.
- Design a store page for users who do not want to build an entire system with the computer building interface and the questionnaire interface.
- Automatically cancel out computer parts that are not compatible with the current parts you have selected to avoid confusion.
- Provide a comment section for each computer part and a review system where people get to vote up or down out of five stars to give an idea of how good that computer part is to future buyers. Users tagged as ‘Verified’ or ‘Computer Expert’ will have their comments moved to the top.
- Describe the purpose of the computer parts (eg. purpose of CPU, GPU, Memory) with simplified descriptions, analogies, comparisons to real world objects or situations for a very simple and easy understanding.
- Show a visualized graph of how strong or weak (big or small in memory) the component is out of all the inventory components sold on the website.
- Provide additional descriptions and details such as the year released and the company that created the component.
- Provide the user with an option to save their computer builds by creating a build list (similar to Amazon) or saving your build into a PDF.
- Provide users with the option of having their custom computer parts already pre-built for them for their convenience. This can be provided in the hassle-free checkout process.
- Provide users searching for specific computer parts with a list of available parts, how many parts, and the last part purchased time and date.

Project Prototyping Phase

Low-Fidelity Prototypes

➤ Low-Fidelity Sketch #1:

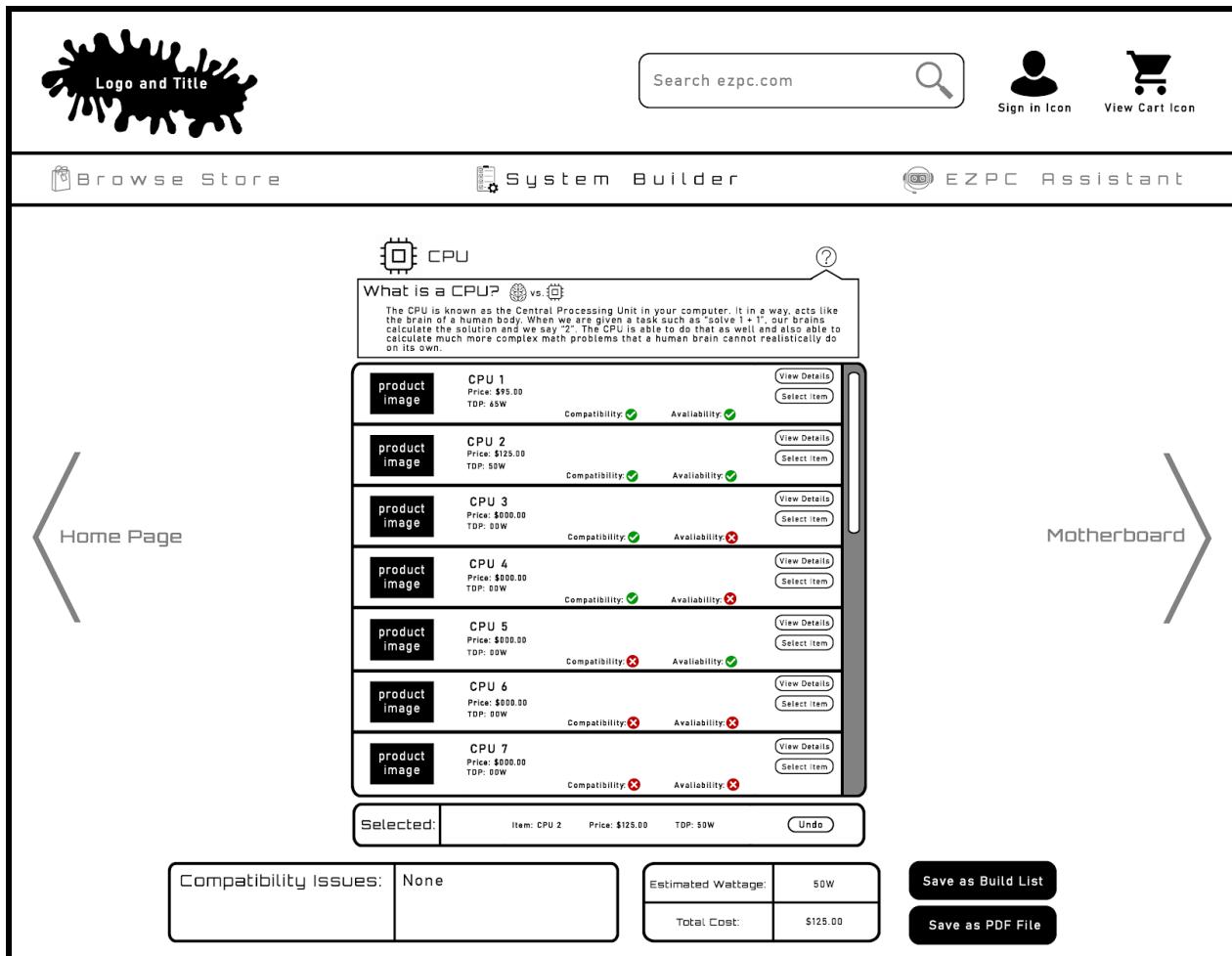


This low-fidelity prototype describes the structure of the System Builder Page of the EZPC website. We see that each component is split into its own containers in a single page.

➤ Low-Fidelity Prototype #1 Description:

- Looking at the **first prototype**, we can see that we have a logo and title placement to the top left corner of the web page. If we look towards the right, we see a search bar where a user can input something which will respond to keywords shown in user comments and products. We also see a sign in icon where users can sign into the website to view their build lists. We also see a cart icon where a user can see what computer components they have in their cart. Looking down, we see three clickable links such as “Browse Store”, “System Builder”, and “EZPC Assistant”. When we click on “Browse Store”, it will redirect us to the store page. If we click on “System Builder”, it will redirect us to the system builder web application where the user can build his computer. Lastly, we have the “EZPC Assistant” where a user can click on it to complete a questionnaire to get results on recommended parts rather than going to the store or using the system builder. As we can see though, “EZPC Assistant” and “Browse Store” are grayed out and “System Builder” isn’t because we are currently viewing the low-fidelity prototype version of the system builder web page.

➤ Low-Fidelity Sketch #2:

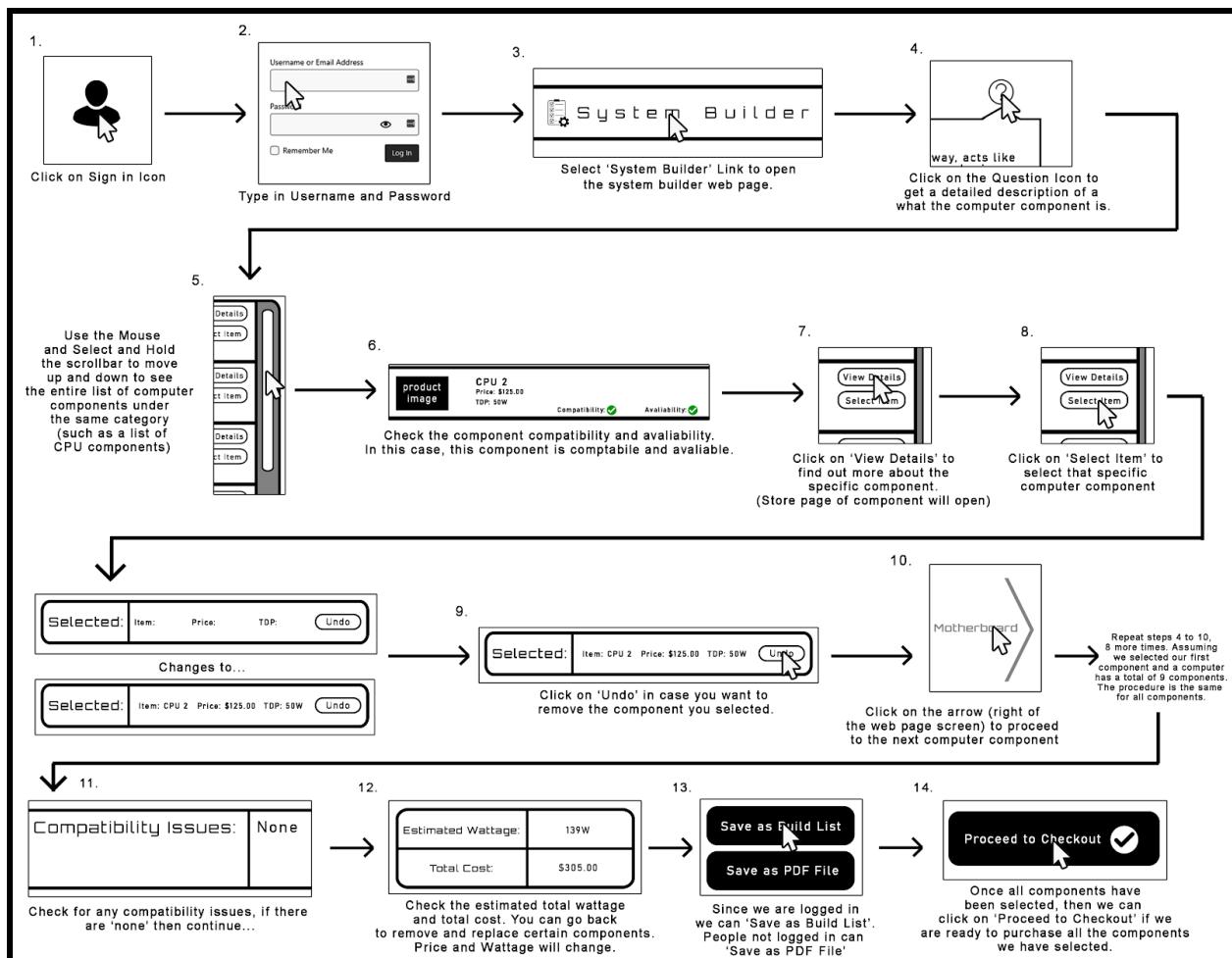


This low-fidelity prototype describes the structure of the System Builder Page of the EZPC website. We see that each component has its own page and arrows to redirect to other component pages.

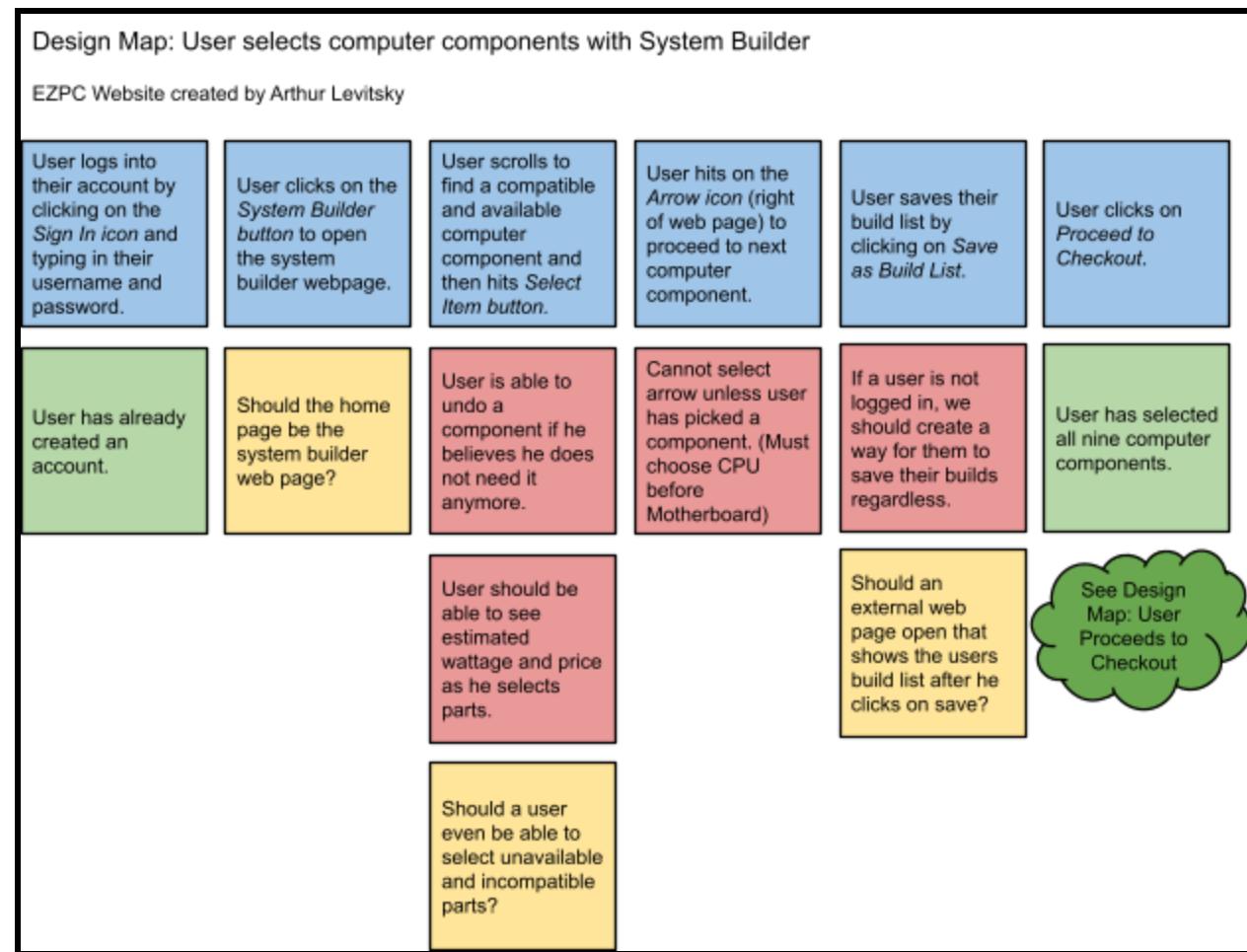
➤ Low-Fidelity Prototype #2 Description:

- The second prototype holds similarities with the first prototype based on the header layout and functionalities as well as “Compatibility Issues” box, “Estimated Wattage” box, “Total Cost” box, “Save as Build List” button, and “Save as PDF File” button .
- Where they differ is the way the system builder web page is organized for the user. In the first prototype, we see that the user will be viewing all the computer components in a single page. The first prototype features scrollbars where the user can scroll down to see all the computer components they need to select to build a computer. Within those computer component boxes, we see more scrollbars that feature products inside relative to the computer components (CPU will have CPU components only inside its box). Right next to the titles of each computer component we have a question mark icon. Once you click on this icon, it will open a new webpage which will show you the details about that certain component. The **second prototype** shows only one computer component box and gray arrows pointing towards the right and left of the web screen. Once the user selects a component, he can click on “Motherboard” arrow to go to a similar computer component layout that only features Motherboards. Once a user selects a motherboard, he can click on the arrow again and move on through the list of computer components in a linear fashion. Also, unlike the question mark icon in the first prototype, when you click on the icon in the second prototype, it will show a small drop down text that will explain directly in the page rather than having to redirect you.

Storyboard (System Builder Page):

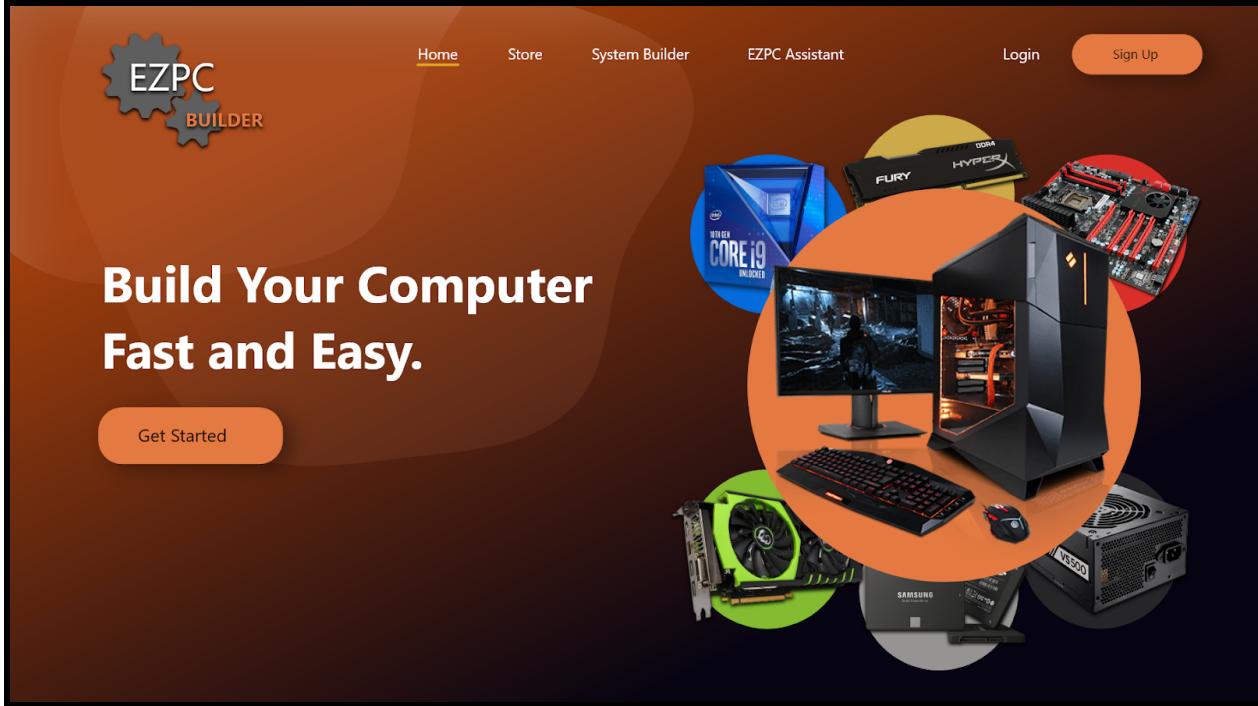


User Experience Map:



Digital Prototypes

➤ EZPC Home Page (Landing Page):



- When users enter the home page, they will be greeted with a simplistic interface that will be easy to navigate around. As you can see, we have our logo on the top left and right on the top of the screen we have a selection bar where users can select 'Home, Store, System Builder, and EZPC Assistant'. To the top right corner, we have the Login and Signup buttons. Right below we have a visual that grabs the attention of the user as well as the 'Get Started' Button that sends the user to the *System Builder* page.

➤ EZPC CPU Page (Component Page):

The screenshot shows the EZPC CPU Component Page. At the top, there are navigation links: Home, Store, System Builder (which is underlined), EZPC Assistant, Login, and Sign Up. On the left, there's a 'Home' button and a large 'CPU' icon. On the right, there's a 'Motherboard' button and a help icon. The main content area displays a list of CPUs with their details and compatibility status:

Product	Price	TDP	Compatibility	Availability	Action
Intel Core i7-10700K	\$320.20	125W	✓	✓	Select Item
Intel Core i5-10400F	\$150.99	65W	✓	✓	Select Item
Intel Core i9-10900K	\$644.49	125W	✓	✗	Select Item
AMD Ryzen 7 3700X	\$309.99	65W	✓	✓	Select Item
AMD Ryzen 5 5600X	\$229.99	65W	✓	✓	Select Item

Below the table are filter buttons for SELECTED, ITEM:, PRICE:, TDP:, Undo, and compatibility filters for COMPATIBILITY, WATTAGE, and TOTAL.

➤ EZPC Motherboard Page (Component Page):

The screenshot shows the EZPC Motherboard Component Page. The layout is identical to the CPU page, with navigation links at the top: Home, Store, System Builder (underlined), EZPC Assistant, Login, and Sign Up. On the left is a 'CPU' button and a 'Motherboard' icon. On the right is a 'CPU Cooler' button and a help icon. The main content area displays a list of motherboards with their details and compatibility status:

Product	Price	RAM Slots	Compatibility	Availability	Action
ASUS ROG STRIX Z490-E	\$299.99	4	✓	✓	Select Item
MSI B450 TOMAHAWK	\$124.99	4	✗	✓	Select Item
NZXT N7 Z490	\$229.99	4	✓	✗	Select Item
ASUS ROG STRIX Z490-E	\$299.99	4	✓	✓	Select Item
MSI B450 TOMAHAWK	\$124.99	4	✗	✓	Select Item

Below the table are filter buttons for SELECTED, ITEM:, PRICE:, RAM Slots:, Undo, and compatibility filters for COMPATIBILITY, WATTAGE, and TOTAL.

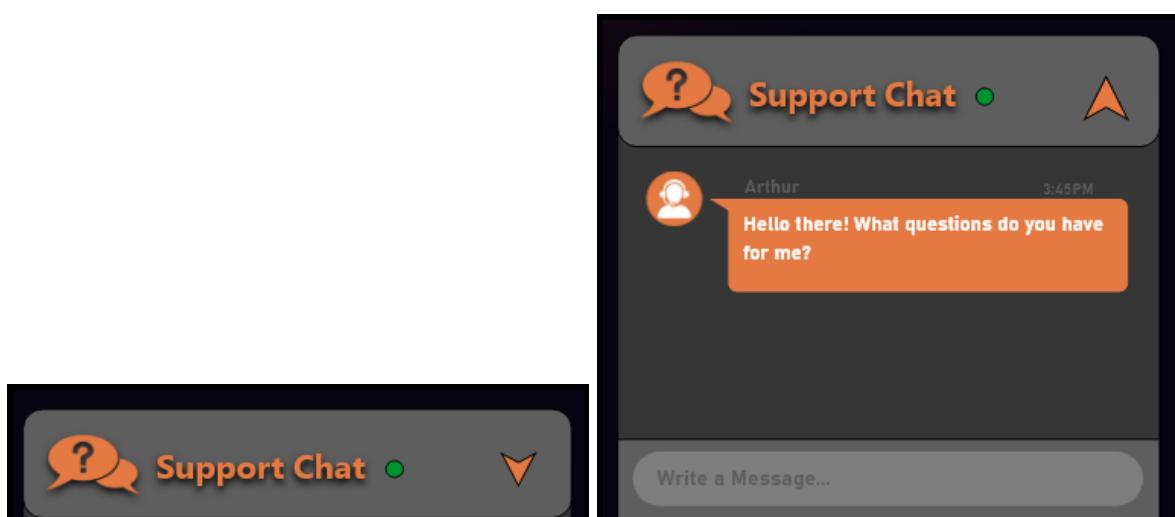
➤ EZPC CPU Cooler Page (Component Page):

The screenshot shows the EZPC System Builder interface for selecting a CPU cooler. The main content area displays five product cards:

- Cooler Master Hyper 212X**: Price \$72.65, Compatibility ✓, Availability ✓. Select Item button.
- Deepcool GAMMAXX 400**: Price \$22.99, Compatibility ✗, Availability ✗. Select Item button.
- Corsair H100 PRO**: Price \$139.99, Compatibility ✗, Availability ✗. Select Item button.
- Cooler Master Hyper 212X**: Price \$72.65, Compatibility ✓, Availability ✓. Select Item button.
- Deepcool GAMMAXX 400**: Price \$22.99, Compatibility ✗, Availability ✗. Select Item button.

Below the cards are filters for **SELECTED**, **ITEM:**, **PRICE:**, and **Noise Level:**. At the bottom are buttons for **Undo**, **COMPATIBILITY**, **WATTAGE** (195W), **TOTAL** (\$619.40), and a **Support Chat** icon.

- As you can see, all three of these component pages are relatively similar to each other. Here are the features that they all share:
 - Support Chat.
 - For the support chat, many websites use this feature where you can open a small tab that will allow you to speak to customer service representatives.

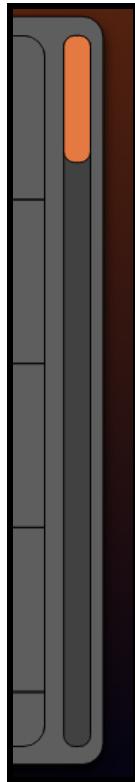


Initial State (Before Clicking the Arrow)

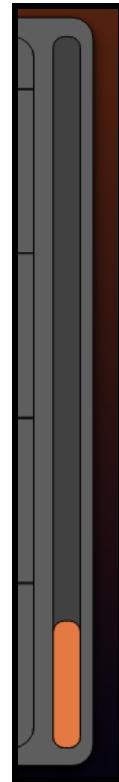
End State (When Clicked on the Arrow)

- Scrolling through components.

- When going through each component page, you can scroll down to see all the components listed. This is created to keep the page organized and easy to use for the user.



Initial State (Before Scrolling Down)



End State (After Scrolling Down)

■ Selecting items.

- When a user selects an item, the Undo button in the selected container becomes orange and the selected item in the selected column becomes gray.

	Product: Intel Core i7-10700K Price: \$320.20 TDP: 125W	Compatibility:   Availability: 	Select Item
	Product: Intel Core i5-10400F Price: \$150.99 TDP: 65W	Compatibility:   Availability: 	Select Item
	Product: Intel Core i9-10900K Price: \$464.49 TDP: 125W	Compatibility:   Availability: 	Select Item
	Product: AMD Ryzen 7 3700X Price: \$309.99 TDP: 65W	Compatibility:   Availability: 	Select Item
	Product: AMD Ryzen 5 5600X	 	
SELECTED	ITEM:	PRICE:	TDP:
			Undo

Initial State (What the user sees when he hasn't selected an item)

The screenshot shows a list of processor options with their details, compatibility status, availability status, and selection buttons.

Processor	Product	Price	TDP	Compatibility	Availability	Action
Intel	Intel Core i7-10700K	\$320.20	125W	✓	✓	Select Item (Gray)
Intel	Intel Core i5-10400F	\$150.99	65W	✓	✓	Select Item (Orange)
Intel	Intel Core i9-10900K	\$464.49	125W	✓	✗	Select Item (Gray)
AMD	AMD Ryzen 7 3700X	\$309.99	65W	✓	✓	Select Item (Orange)
AMD	AMD Ryzen 5 5600X	\$269.99	65W	✓	✓	Select Item (Gray)

Selected Item: Intel Core i7-10700K | **Price:** \$320.20 | **TDP:** 125W | **Undo**

End State (What the user sees after they have selected an item, notice the undo button is orange and the select button for the first item is gray)

- Moving between page to page.
 - Once a user selects a component for each component page, they will be able to continue to the next component pages with the arrows at the side of the pages.

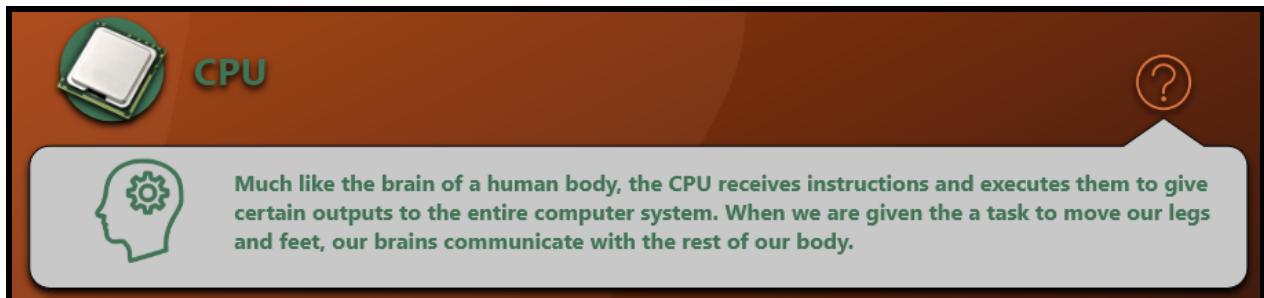


Selectable State (When the user selects a component, they will be able to access the next component pages).

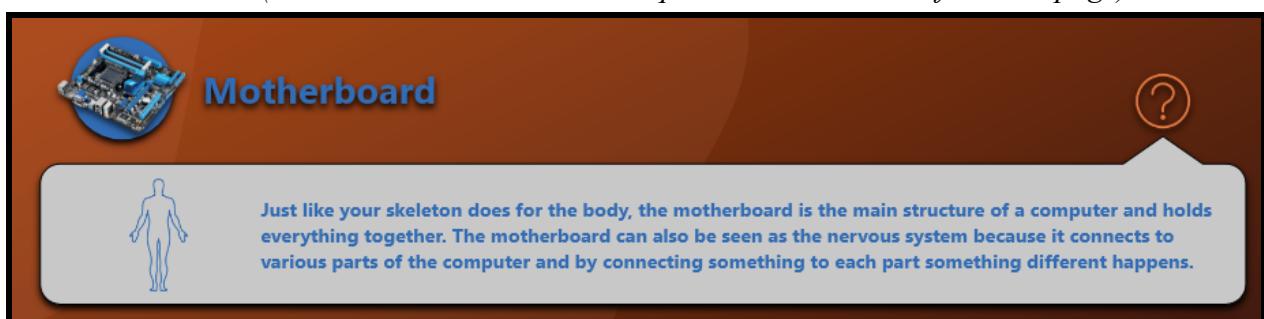
- However, there are also numerous features that these pages differ from each other. Here are the features that are different for each:

- Question Mark Bubbles

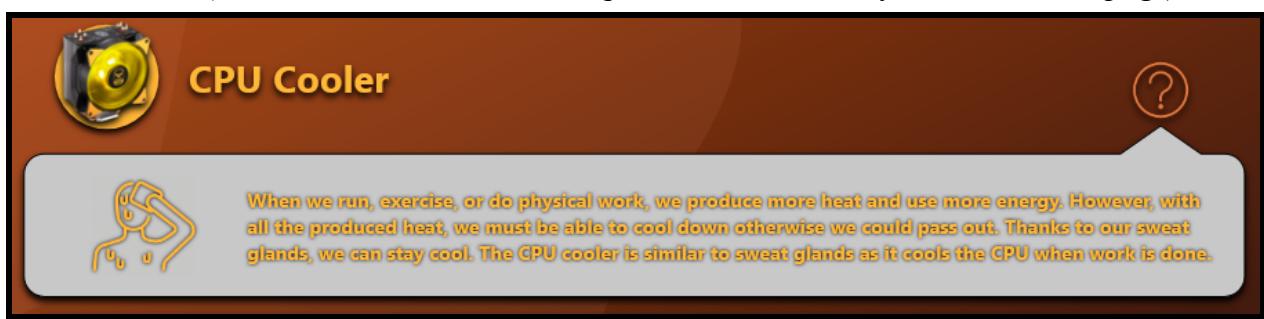
- Users will be able to click on this icon to read more about the component that they are looking at. The information needs to be concise and supportive with analogies for the average user to be able to get an idea. Each component page has its own unique information blurb.



End State. (When user has clicked on the question mark bubble for CPU page)



End State. (When user has clicked on the question mark bubble for Motherboard page)



End State. (When user has clicked on the question mark bubble for CPU Cooler page)

- Components Showcased
 - Each component page has different components than other component pages.

	Product: Intel Core i7-10700K Price: \$320.20 TDP: 125W	Compatibility:  Availability: 	Select Item
	Product: Intel Core i5-10400F Price: \$150.99 TDP: 65W	Compatibility:  Availability: 	Select Item
	Product: Intel Core i9-10900K Price: \$464.49 TDP: 125W	Compatibility:  Availability: 	Select Item
	Product: AMD Ryzen 7 3700X Price: \$309.99 TDP: 65W	Compatibility:  Availability: 	Select Item
	Product: AMD Ryzen 5 5600X		

Products displayed for CPU component page.

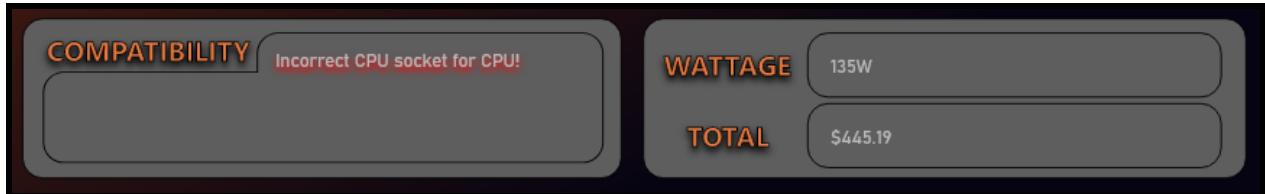
	Product: Asus ROG STRIX Z490-E Price: \$299.99 RAM Slots: 4	Compatibility:   Availability: 	Select Item
	Product: MSI B450 TOMAHAWK Price: \$124.99 RAM Slots: 4	Compatibility:   Availability: 	Select Item
	Product: NZXT N7 Z490 Price: \$229.99 RAM Slots: 4	Compatibility:   Availability: 	Select Item
	Product: Asus ROG STRIX Z490-E Price: \$299.99 RAM Slots: 4	Compatibility:   Availability: 	Select Item
	Product: MSI B450 TOMAHAWK Price: \$124.99 RAM Slots: 4	Compatibility:   Availability: 	Select Item

Products displayed for Motherboard component page.

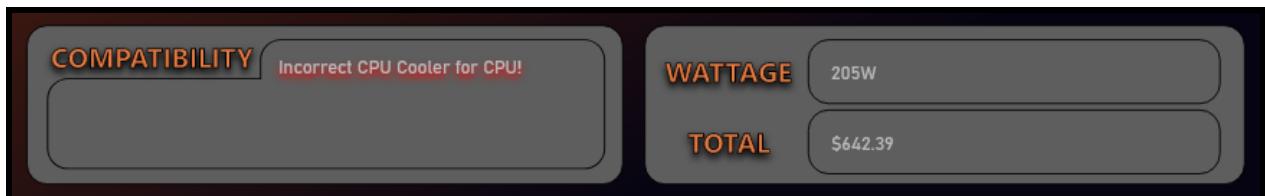
	Product: Cooler Master Hyper 212X Price: \$72.65 Noise Level: 9 - 36 dB	Compatibility:   Availability: 	Select Item
	Product: Deepcool GAMMAXX 400 Price: \$22.99 Noise Level: 27.8 dB	Compatibility:   Availability: 	Select Item
	Product: Corsair H100i PRO Price: \$139.99 Noise Level: 37 dB	Compatibility:   Availability: 	Select Item
	Product: Cooler Master Hyper 212X Price: \$72.65 Noise Level: 9 - 36 dB	Compatibility:   Availability: 	Select Item
	Product: Deepcool GAMMAXX 400 Price: \$22.99 Noise Level: 27.8 dB	Compatibility:   Availability: 	Select Item

Products displayed for CPU cooler component page.

- Compatibility, Wattage, and Total
 - Each component page has different compatibility messages than other component pages. Also the wattage and total will increase for each page.



When selecting the wrong Motherboard, this compatibility message will pop up and the current wattage and total.



When selecting the wrong CPU cooler, this compatibility message will pop up (notice it is different from the message shown in the Motherboard page). Also the wattage and total has been updated as well.



For all the component pages, each component displayed will have different compatibility and availability. (Will all depend on components selected and current stock)

➤ EZPC Build Review Page:

The screenshot shows the EZPC Builder website's 'Build Review' section. At the top, there are navigation links: Home, Store, System Builder (which is underlined in orange), EZPC Assistant, Login, and Sign Up. On the left, there are icons for Power Supply and a large orange arrow pointing right labeled 'Checkout'. On the right, there is a 'Support Chat' button with a question mark icon.

The main content area displays a build configuration with three sections: CPU, Motherboard, and CPU Cooler. Each section includes a product image, the brand logo, and specific details like Product, Price, and RAM Slots.

- CPU:** Intel Core i7-10700K, \$320.20, TDP: 125W
- Motherboard:** ASUS ROG STRIX Z490-E, \$299.99, RAM Slots: 4
- CPU Cooler:** Cooler Master Hyper 212X, \$72.45

At the bottom, there are buttons for 'WATTAGE' (405W), 'TOTAL' (\$4974.34), 'Save as Build List', and 'Save as PDF'.

A prominent orange bar at the bottom of the page displays the text "EZPC BL - #131328".

- Similar in style to the components pages, we also have some features which makes this page unique. They are:
 - Build List Unique ID
 - For each build list that a user creates, (logged or not logged in), there will be a unique ID created for it. If the user is logged in, the ID will be saved, otherwise it will be discarded.



The current build list number is #131328

- The Build List itself
 - The user will be able to scroll through to see all the components that they have selected.



Initial State (Build List Scrolled up)



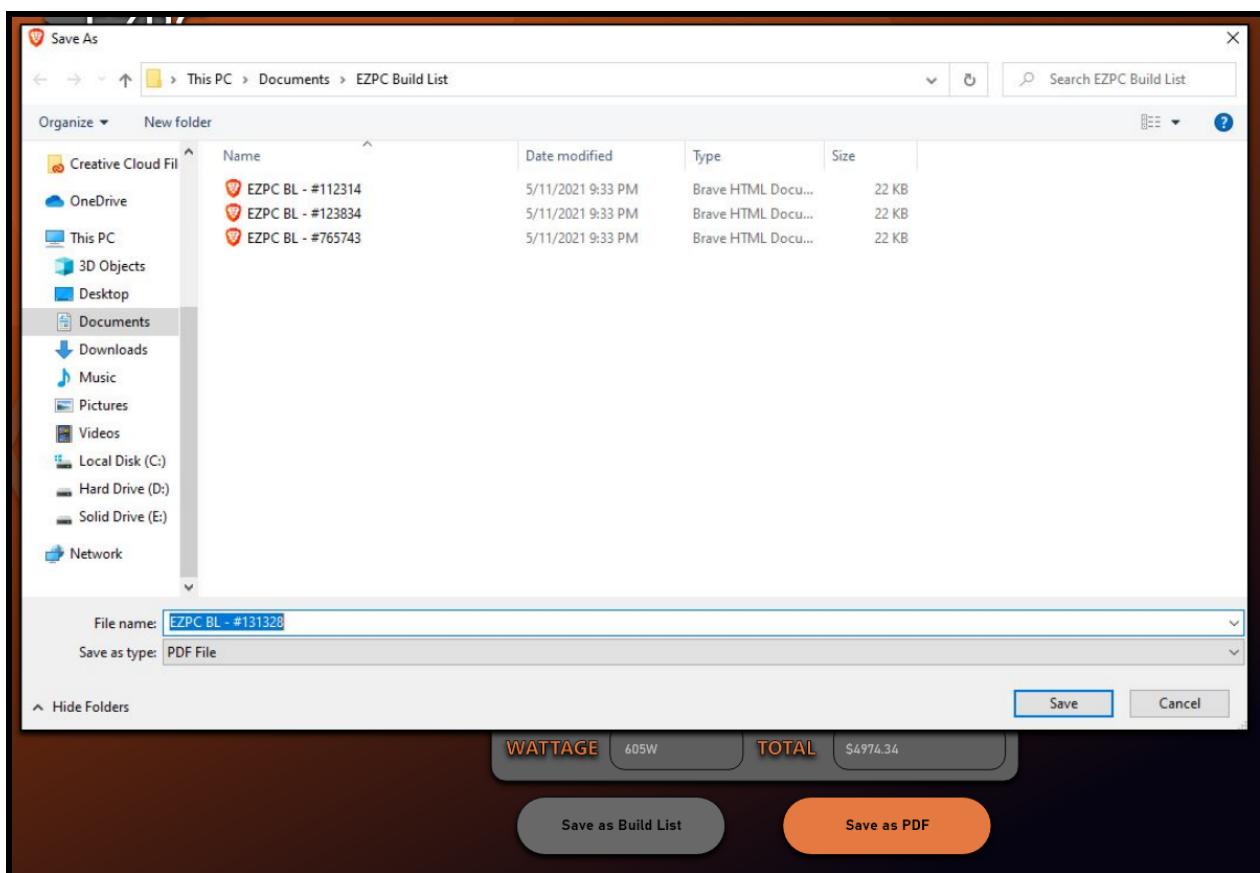
End State (Build List Scrolled Down)

■ Save as PDF

- The user, if not logged in, will be able to save their build list as a PDF document. This gives the user flexibility from having to create an account for the website (unless they would want special deals and coupons).



Initial State (Functional Save as PDF button.)



End State (After clicking on the Save as PDF button)

Current Issues and Moving Forward

- Open Issues:
 - I noticed the difficulty of implementing an algorithm that would check for compatibility between each computer component. A lot of programming would be required.
 - The small question bubbles for each computer component might not be enough information for the average user.
 - A lot of specific questions would need to be in place if the user would choose the 'EZPC Assistant' route (which will be modeled like a psychology test). If there isn't enough questions, the accuracy will be low for determining the computer based on the wants and needs of the user.
 - How many customer support agents should be hired?
- Moving Forward:
 - I would most definitely hire a software engineering team. It is important we have an organized team with multiple people working on creating the best possible algorithms for detecting issues selected between components. In order for this to work, money would be required for such a website to exist.
 - In the future, when the user is going through each component such as in the CPU section or the Motherboard section, they will be able to click on the icons (Intel, AMD, Asus, etc.) and it will bring them to the product details of that specific component. In that page, we might be able to add some more specific information about what a CPU does.
 - Would be required to hire psychologists or possibly conduct paid interviews with employees from real life stores such as Microcenter or Best Buy. This will help us since we can ask questions about what type of questions they ask customers when they choose a computer. Those types of questions will help build our accurate EZPC Assistant system.
 - Based on the traffic that the website obtains, we would be required to fluctuate in the number of customer support agents we have. The reason is because most of these agents would operate in the customer support chats for users. In the future, there may be an additional feature to that chat where customers can get into a voice call with the customer support agents.