**INTRODUCTION :**

 IBM Cloud Foundry is a cloud computing platform that allows developers to deploy and run applications. It provides a scalable and secure environment for running applications. To create an E-commerce project using IBM Cloud Foundry, you can follow the steps below:

1. First, you need to create an IBM Cloud account if you don’t have one already. [You can sign up for a free account](https://cloud.ibm.com/docs/cloud-foundry-public?topic=cloud-foundry-public-getting-started-node)
2. Next, you need to install the Cloud Foundry CLI on your local machine .
3. After that, you can create an E-commerce application on IBM Cloud Foundry by following the instructions provided in this Github repository .The repository contains a sample E-commerce application that you can use as a starting point.
4. [Once you have created your application, you can deploy it on IBM Cloud Foundry by following the instructions provided in the same Github repository](https://github.com/sabarishwarcse/project_sabari).

**DESIGN THINKING :**

**1. Platform Design** - A design thinking approach that involves making design choices regarding the infrastructural capabilities and governance mechanisms employed by a platform. The design choices are made within the framework of the market within which the platform operates, the interactions that market participants engage in, and the incentives needed to attract participation.

To create a platform design, you can follow the following steps:

1. **Empathize**: Understand the needs of your target audience and identify their pain points.
2. **Define**: Define the problem statement based on your understanding of your target audience.
3. **Ideate**: Brainstorm ideas for your platform design.
4. **Prototype**: Create a prototype of your platform design.
5. **Test**: Test your prototype with your target audience and gather feedback.

[There are several tools available that can help you with each stage of the design thinking process](https://platformthinkinglabs.com/materials/the-three-design-elements-for-designing-platforms/) . Some of these tools include:

1. **Hotjar**: A product experience insights platform that helps you empathize with your users and design products that resonate.
2. **UserZoom**: A cloud-based UX research platform for conducting live user interviews, card sorting, tree testing, and other user research activities remotely.
3. **EnjoyHQ**: A user research repository that helps you organize, analyze, and share customer feedback.
4. **Miro**: A collaborative online whiteboard platform that helps you ideate and visualize your ideas.
5. **Figma**: A cloud-based design tool that helps you create prototypes and collaborate with your team.

**2. Product Showcase** - A design thinking approach that involves presenting a product in an engaging and informative way to potential customers. [The goal of a product showcase is to highlight the unique features and benefits of the product and to persuade customers to make a purchase](https://online.hbs.edu/blog/post/design-thinking-examples) .

To create a product showcase, you can follow the following steps:

1. **Define your target audience**: Identify the group of people who are most likely to be interested in your product.
2. **Identify the key features and benefits of your product**: Determine what makes your product unique and how it can benefit your target audience.
3. **Choose the right format for your showcase**: Decide on the format that best suits your product and target audience. Some popular formats include videos, infographics, and live demonstrations.
4. **Create a compelling narrative**: Develop a story that showcases your product in an engaging and informative way.
5. **Highlight the unique features and benefits of your product**: Use visuals and other elements to highlight the key features and benefits of your product.
6. **Include a call-to-action**: Encourage customers to take action by including a clear call-to-action.

[There are several tools available that can help you create a compelling product showcase 2](https://dribbble.com/resources/product-design-case-study)[3](https://u-next.com/blogs/design-innovation-strategy/design-thinking-examples/)[4](https://voltagecontrol.com/blog/8-great-design-thinking-examples/). Some of these tools include:

1. [**Canva**: A graphic design platform that allows you to create professional-looking designs for your product showcase](https://dribbble.com/resources/product-design-case-study) .
2. [**Powtoon**: A video creation platform that allows you to create animated videos for your product showcase](https://u-next.com/blogs/design-innovation-strategy/design-thinking-examples/) .
3. [**Prezi**: A presentation software that allows you to create interactive presentations for your product showcase](https://voltagecontrol.com/blog/8-great-design-thinking-examples/) .

**3. User Authentication** - A design thinking approach that involves creating a secure and user-friendly system for verifying the identity of users. [The goal of user authentication is to ensure that only authorized users can access a system or application](https://cybersecurity.ieee.org/blog/2016/06/02/design-best-practices-for-an-authentication-system/) .

To create a user authentication system using design thinking, you can follow the following steps:

1. **Empathize**: Understand the needs of your target audience and identify their pain points related to user authentication.
2. **Define**: Define the problem statement based on your understanding of your target audience.
3. **Ideate**: Brainstorm ideas for your user authentication system.
4. **Prototype**: Create a prototype of your user authentication system.
5. **Test**: Test your prototype with your target audience and gather feedback.

There are several best practices that you can follow when designing a user authentication system.

1. **Use strong passwords**: Encourage users to create strong passwords that are difficult to guess.
2. **Implement two-factor authentication**: Use two-factor authentication to provide an additional layer of security.
3. **Limit login attempts**: Limit the number of login attempts to prevent brute-force attacks.
4. **Encrypt sensitive data**: Encrypt sensitive data such as passwords and personal information to prevent unauthorized access.
5. **Provide feedback to users**: Provide feedback to users when they enter incorrect login credentials or encounter other errors.

[There are several tools available that can help you create a secure and user-friendly user authentication system](https://cybersecurity.ieee.org/blog/2016/06/02/design-best-practices-for-an-authentication-system/) . Some of these tools include:

1. [**Auth0**: A platform that provides secure authentication and authorization solutions for applications](https://cybersecurity.ieee.org/blog/2016/06/02/design-best-practices-for-an-authentication-system/) .
2. [**Okta**: A cloud-based identity management platform that provides secure access to applications and data](https://www.codecademy.com/resources/blog/what-is-design-thinking-process-examples/) .
3. [**Firebase Authentication**: A service provided by Google that provides secure authentication for web and mobile applications](https://www.interaction-design.org/literature/article/stage-1-in-the-design-thinking-process-empathise-with-your-users) .

**4. Shopping and Cart Checkout** – A design thinking approach that involves creating an intuitive and user-friendly system for customers to add items to their cart, review their order, and complete the purchase. [The goal of shopping and cart checkout is to provide a seamless and enjoyable experience for customers while ensuring that they can easily find the products they want and complete the purchase process](https://www.goinflow.com/blog/ecommerce-cart-checkout-design/) .

To create a shopping and cart checkout system using design thinking, you can follow the following steps:

1. **Empathize**: Understand the needs of your target audience and identify their pain points related to shopping and cart checkout.
2. **Define**: Define the problem statement based on your understanding of your target audience.
3. **Ideate**: Brainstorm ideas for your shopping and cart checkout system.
4. **Prototype**: Create a prototype of your shopping and cart checkout system.
5. **Test**: Test your prototype with your target audience and gather feedback.

[There are several best practices that you can follow when designing a shopping and cart checkout system](https://www.goinflow.com/blog/ecommerce-cart-checkout-design/) :

1. **Make it easy to add items to the cart**: Provide clear calls-to-action that allow customers to easily add items to their cart.
2. **Provide clear product information**: Display product information such as price, availability, and shipping information in a clear and concise manner.
3. **Make it easy to review the order**: Provide customers with an easy way to review their order before completing the purchase.
4. **Provide multiple payment options**: Offer multiple payment options such as credit card, PayPal, or Apple Pay to make it easy for customers to complete the purchase.
5. **Make it easy to track the order**: Provide customers with an easy way to track their order after completing the purchase.

[There are several tools available that can help you create a user-friendly shopping and cart checkout system](https://www.goinflow.com/blog/ecommerce-cart-checkout-design/)  . Some of these tools include:

1. [**Shopify**: A cloud-based e-commerce platform that provides a complete solution for creating an online store](https://mdbootstrap.com/docs/standard/extended/shopping-carts/) .
2. [**WooCommerce**: A free WordPress plugin that allows you to create an online store on your WordPress website](https://fireart.studio/blog/best-practices-for-shopping-cart-page-design/) .
3. **Magento**: An open-source e-commerce platform that provides a flexible and scalable solution for creating an online store .

**5. Payment Integration** – A design thinking approach that involves integrating a payment gateway into a website or application. [The goal of payment integration is to provide a seamless and secure payment experience for customers while ensuring that the payment process is efficient and reliable](https://www.mckinsey.com/industries/financial-services/our-insights/banking-matters/building-a-successful-payments-system) .

To create a payment integration system using design thinking, you can follow the following steps:

1. **Empathize**: Understand the needs of your target audience and identify their pain points related to payment integration.
2. **Define**: Define the problem statement based on your understanding of your target audience.
3. **Ideate**: Brainstorm ideas for your payment integration system.
4. **Prototype**: Create a prototype of your payment integration system.
5. **Test**: Test your prototype with your target audience and gather feedback.

[There are several best practices that you can follow when designing a payment integration system](https://www.mckinsey.com/industries/financial-services/our-insights/banking-matters/building-a-successful-payments-system) :

1. **Choose the right payment gateway**: Choose a payment gateway that meets the needs of your business and integrates well with your website or application.
2. **Ensure security**: Ensure that your payment integration system is secure and complies with industry standards such as PCI DSS.
3. **Provide multiple payment options**: Offer multiple payment options such as credit card, PayPal, or Apple Pay to make it easy for customers to complete the purchase.
4. **Make it easy to use**: Make the payment process as simple and intuitive as possible to reduce cart abandonment rates.
5. **Provide clear feedback**: Provide customers with clear feedback on the status of their transaction.

[There are several tools available that can help you create a secure and user-friendly payment integration system](https://stripe.com/resources/more/how-to-integrate-a-payment-gateway-into-a-website) . Some of these tools include:

1. [**Stripe**: A platform that provides secure payment processing solutions for businesses of all sizes 2](https://stripe.com/resources/more/how-to-integrate-a-payment-gateway-into-a-website).
2. [**PayPal**: A popular online payment system that allows businesses to accept payments from customers around the world 3](https://devoxsoftware.com/blog/the-2022-manual-to-payment-system-architecture/).
3. **Braintree**: A platform that provides scalable and secure payment solutions for businesses of all sizes.

**6. User Experience -** A design thinking approach that involves creating a positive and meaningful experience for users when they interact with a product or service. [The goal of user experience design is to ensure that users can easily and efficiently accomplish their goals while enjoying the process](https://www.interaction-design.org/literature/topics/design-thinking) .

To create a user experience using design thinking, you can follow the following steps:

1. **Empathize**: Understand the needs of your target audience and identify their pain points related to the product or service.
2. **Define**: Define the problem statement based on your understanding of your target audience.
3. **Ideate**: Brainstorm ideas for improving the user experience.
4. **Prototype**: Create a prototype of your design.
5. **Test**: Test your prototype with your target audience and gather feedback.

[There are several best practices that you can follow when designing a user experience](https://www.interaction-design.org/literature/topics/design-thinking) :

1. **Understand your users**: Conduct research to understand the needs and pain points of your target audience.
2. **Design for usability**: Ensure that your product or service is easy to use and navigate.
3. **Provide clear feedback**: Provide users with clear feedback on their actions and the status of their tasks.
4. **Design for accessibility**: Ensure that your product or service is accessible to users with disabilities.
5. **Design for scalability**: Ensure that your product or service can scale to meet the needs of a growing user base.

[There are several tools available that can help you create a positive user experience](https://www.interaction-design.org/literature/topics/design-thinking) . Some of these tools include:

1. [**Adobe XD**: A user experience design tool that allows you to create wireframes, prototypes, and designs for web and mobile applications 1](https://www.interaction-design.org/literature/topics/design-thinking).
2. [**Figma**: A cloud-based design tool that allows you to collaborate with your team and create designs for web and mobile applications 2](https://www.forbes.com/sites/forbesagencycouncil/2020/08/07/seven-ways-design-thinking-enhances-customer-experience/).
3. [**Sketch**: A vector graphics editor that allows you to create designs for web and mobile applications 3](https://ux.stackexchange.com/questions/87029/user-experience-design-vs-design-thinking-whats-really-the-difference).