

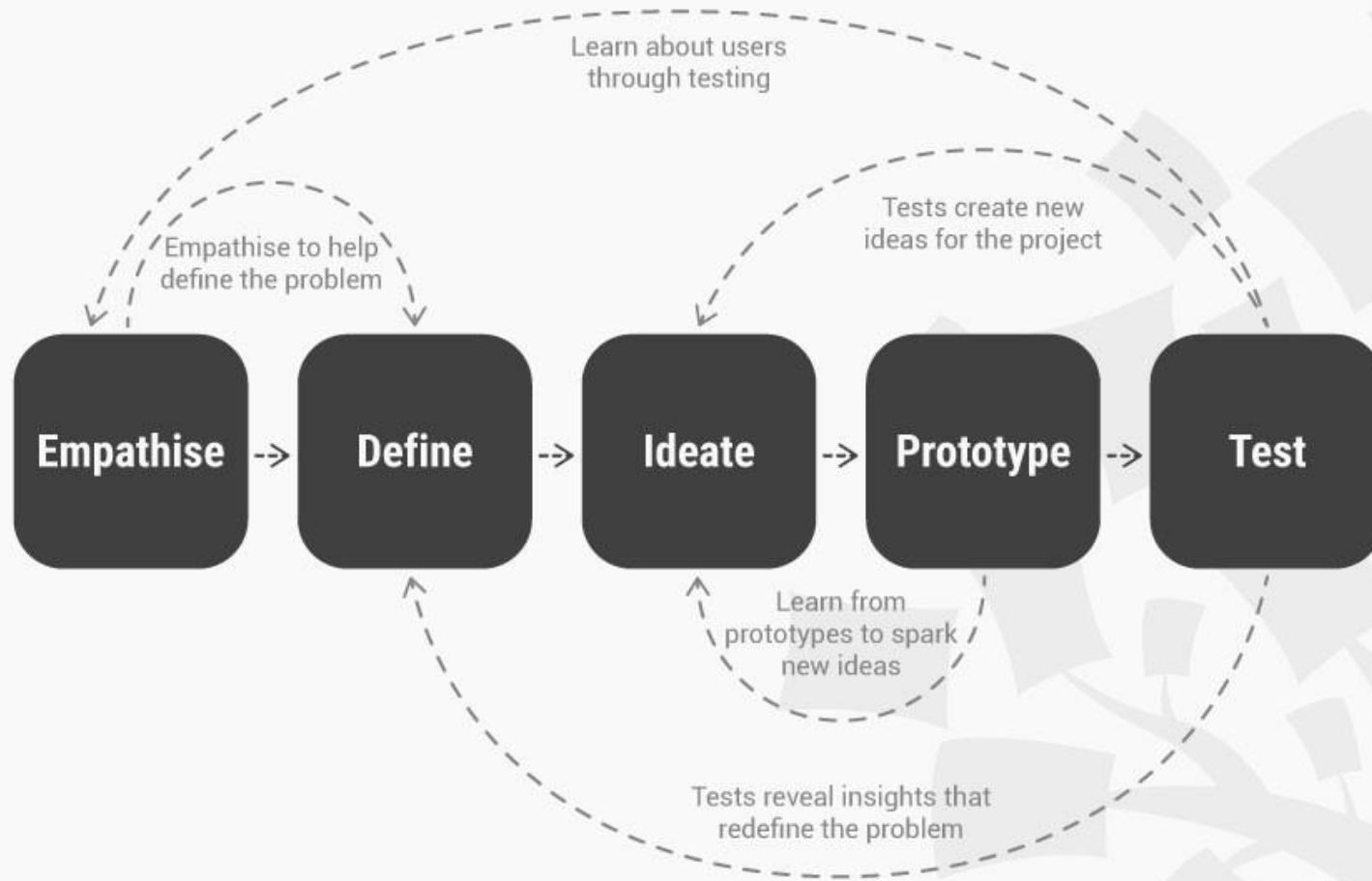
Prototyping the Pilot execution

Module 5

Prototype

- Prototyping offers designers the opportunity:
 - to bring their ideas to life
 - test the practicability of the current design
 - and to potentially investigate how a sample of users think and feel about a product.

DESIGN THINKING: A NON-LINEAR PROCESS



Prototype

“They slow us down to speed us up. By taking the time to prototype our ideas, we avoid costly mistakes such as becoming too complex too early and sticking with a weak idea for too long.”

BY

- Tim Brown, CEO of the international design and innovation firm IDEO

Types of Prototyping

- Two separate categories:
 - Low-fidelity prototyping
 - High-fidelity prototyping.

Low-Fidelity Prototyping

- Low-fidelity prototyping involves the use of basic models or examples of the product being tested.
- Prototype designed using
 - such as wood, paper, or metal for a plastic product.

Examples of low-fidelity prototypes:

- Storyboarding.
- Sketching
- Card sorting.

Pros of Low-Fidelity Prototyping

- Quick and inexpensive.
- Possible to make instant changes and test new iterations.
- Disposable/throw-away.
- Enables the designer to gain an overall view of the product using minimal time and effort, as opposed to focusing on the finer details over the course of slow, incremental changes.
- Available to all; regardless of ability and experience, we are able to produce rudimentary versions of products in order to test users or canvas the opinions of stakeholders.
- Encourages and fosters design thinking.

Cons of Low-Fidelity Prototyping

- An inherent lack of realism.
- Depending on your product, the production of low-fi prototypes may not be appropriate for your intended users

High-Fidelity Prototyping

- High-fidelity prototypes are prototypes that look and operate closer to the finished product.
- For example, a 3D plastic model with movable parts (allowing users to manipulate and interact with a device in the same manner as the final design)

Pros of High-Fidelity Prototyping

- Engaging: the stakeholders can instantly see their vision realized and will be able to judge how well it meets their expectations, wants and needs.
- User testing involving high-fi prototypes will allow the evaluators to gather information with a high level of validity and applicability. The closer the prototype is to the finished product, the more confidence the design team will have in how people will respond to, interact with and perceive the design.

Cons of High-Fidelity Prototyping

- take much longer to produce than low-fi prototypes.
- When testing prototypes, test users are more inclined to focus and comment on superficial characteristics, as opposed to the content
- Software prototypes may give test users a false impression of how good the finished article may be.
- Making changes to prototypes can take a long time, thus delaying the entire project in the process.

Balancing

- Due to the pros and cons of low-fi and high-fi prototyping, it should be no surprise that low-fi prototyping is the usual option during the early stages of a Design Thinking project, while high-fi prototyping is used during the later stages, when the test questions are more refined.

Guidelines for Prototyping

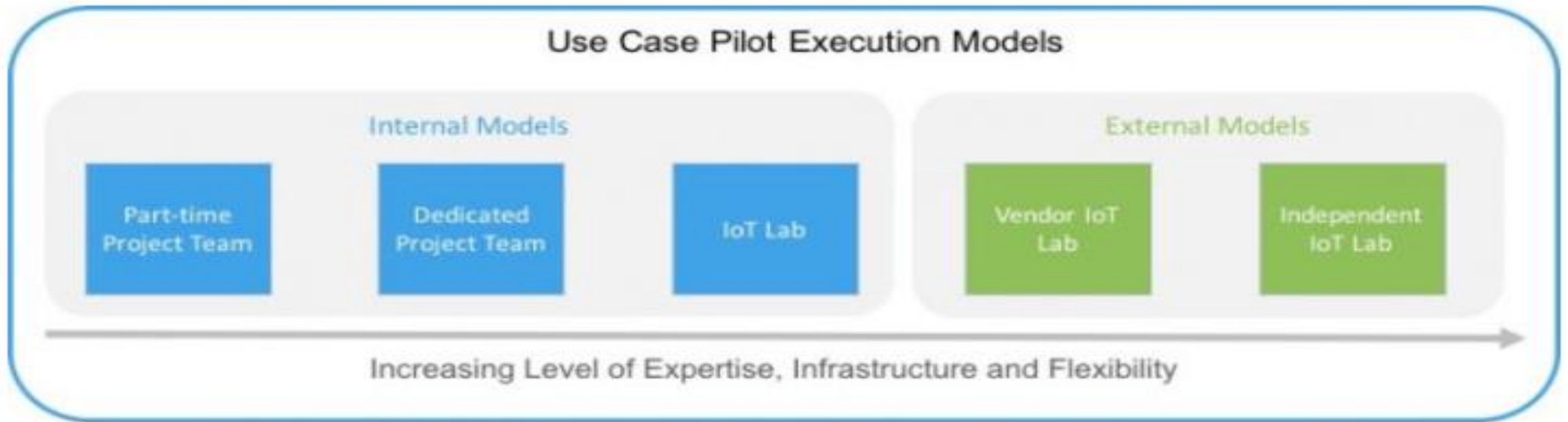
- **Just start building**
 - Creating a prototype will help you to think about your idea in a concrete manner, and potentially allow you to gain insights into ways you can improve your idea.

Guidelines for Prototyping

- **Don't spend too much time**
 - Prototyping is all about speed; the longer you spend building your prototype may delay the process
- **Remember what you're testing for**
- **Build with the user in mind**
 - Test the prototype against your expected user behaviours and user needs. Then, learn from the gaps in expectations and realities, and improve your ideas.

IoT Pilot Project Execution





IoT platform vendor (e.g. Microsoft, IBM, GE, etc.) who has a lab to help your organization build out use cases.

Start with the following six criteria to help you assess and evaluate your options:

- Cost to Pilot IoT Use Cases
- Availability of Dedicated Resources
- Access to IoT Expertise
- Access to IoT Infrastructure/Tools
- Flexibility to Assess Multiple Vendors
- Speed and Agility to Pilot Use Cases

Criteria	Internal Part-Time Project Team	Internal Dedicated Project Team	Internal IoT Lab	Vendor IoT Lab	Independent IoT Lab
1 Cost to Pilot Use Cases	Low	Medium	High	Medium	Medium
2 Availability of Dedicated Resources	Low	High	High	High	High
3 Access to IoT Expertise/SME Network	Low	Medium	Medium	High	High
4 Access to IoT Infrastructure/Tools	Low	Low	Medium	High	High
5 Flexibility to Assess Multiple Vendors	High	High	High	Low	High
6 Speed & Agility to Pilot Use Cases	Low	Medium	High	High	High

How to Design IoT Apps: UX/UI Design for IoT Mobile Apps

- IoT design plays an important if not a key role for the development of a truly successful product.

Objective :

- **The challenges of UX/UI design for IoT applications**
- **Best practice tips on a great design for IoT mobile apps**
- **Applications: the ways to design and build a great IoT mobile app**

Challenges of UX/UI design for IoT applications

- Creating UI/UX design for IoT mobile applications is particularly **delicate**.
- **Poor UX can kill** even the most useful product.
- **Reviews on App Store** with people saying they are ready to switch to the other product because the app is “awful, slow and laggy” are a proof.

Design challenges in IoT directly related to mobile applications development

1. IoT systems are multicomponent, can comprise several devices with different interfaces for various purposes and end-users.

- Designing for such systems requires a coherent approach to ensure the experience on:
 - devices
 - web portals
 - wearables
 - and mobile apps is consistent.

2. IoT evolves fast.

These dynamics should also reflect in the capabilities of IoT mobile apps to scale up and adjust on demand.

3. IoT still brings fundamentally new experiences and capabilities both for people and businesses.

One of the biggest challenges in IoT design development is to make these **new experiences feel familiar and easy to learn.**

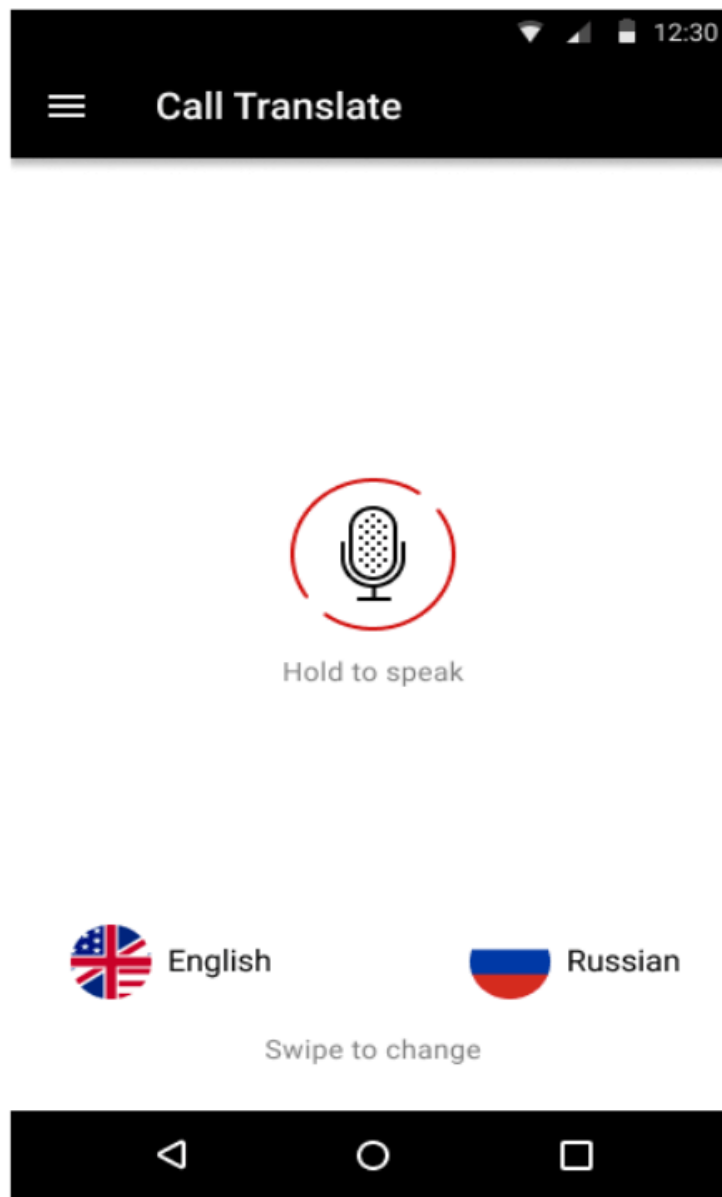
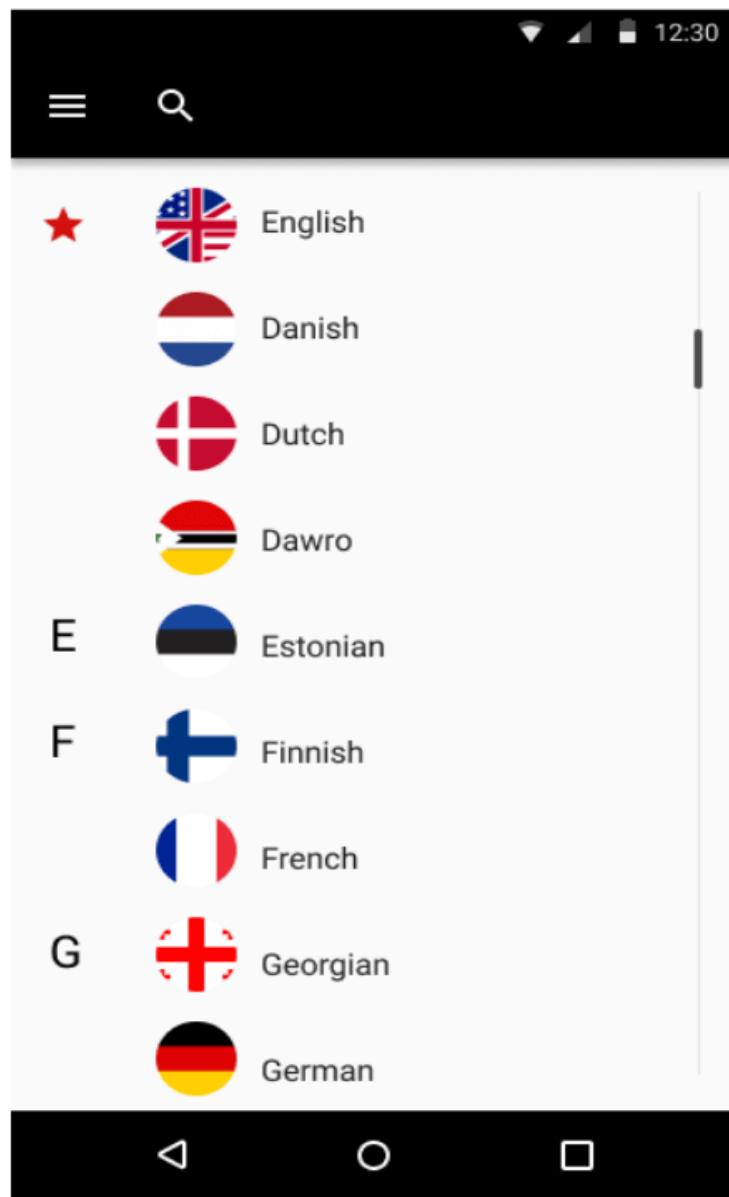
6 tips to create great design for IoT mobile apps

1. Personalize user experience;

When creating the design for IoT applications with multiple groups of end-users, it's **important to personalize user experience and functionality of the app to their requirements and expectations.**

Acouva app

- *Acouva app is a good example of personalized user experience on mobile.*
- *One of the two mobile apps for wearable earbuds, Acouva chat app allows users to **choose their language and translates all the messages, both text and audio, into the user's language of choice.***
- *The app supports a great variety of languages and enables a two-way synchronous translation on the go.*



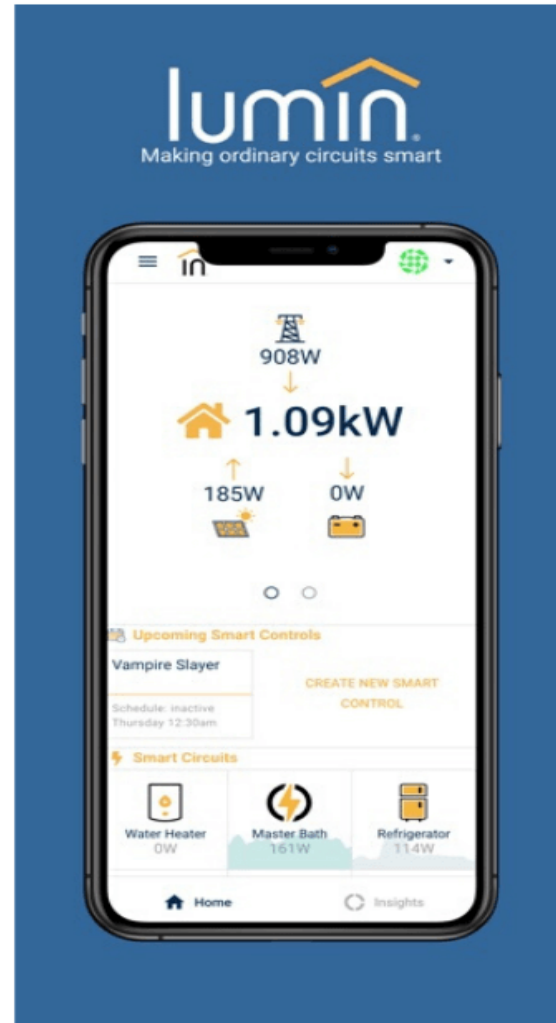
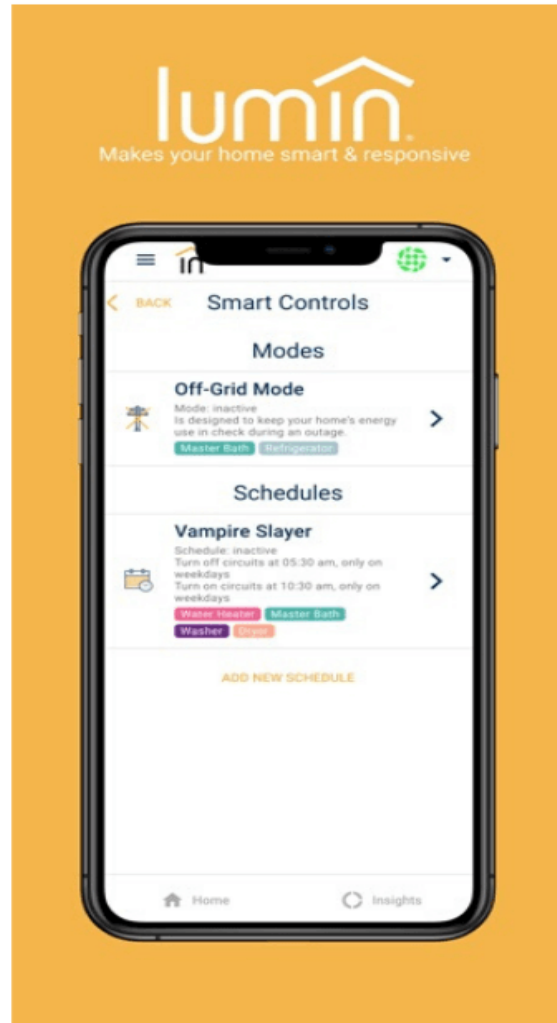
2. Enable remote Control

- Adding a mobile app to an IoT system can be the easiest way to enable remote control for end-users.
- Enabling **adequate remote control and system configuration can not only make the user's life simpler** and provide fast access to necessary functions.
- **A user-friendly and convenient interface** in an app can significantly reduce the learning curve when installing and setting a new device.

Lumin

- The responsive home energy manager that enhances your energy storage system in big ways.





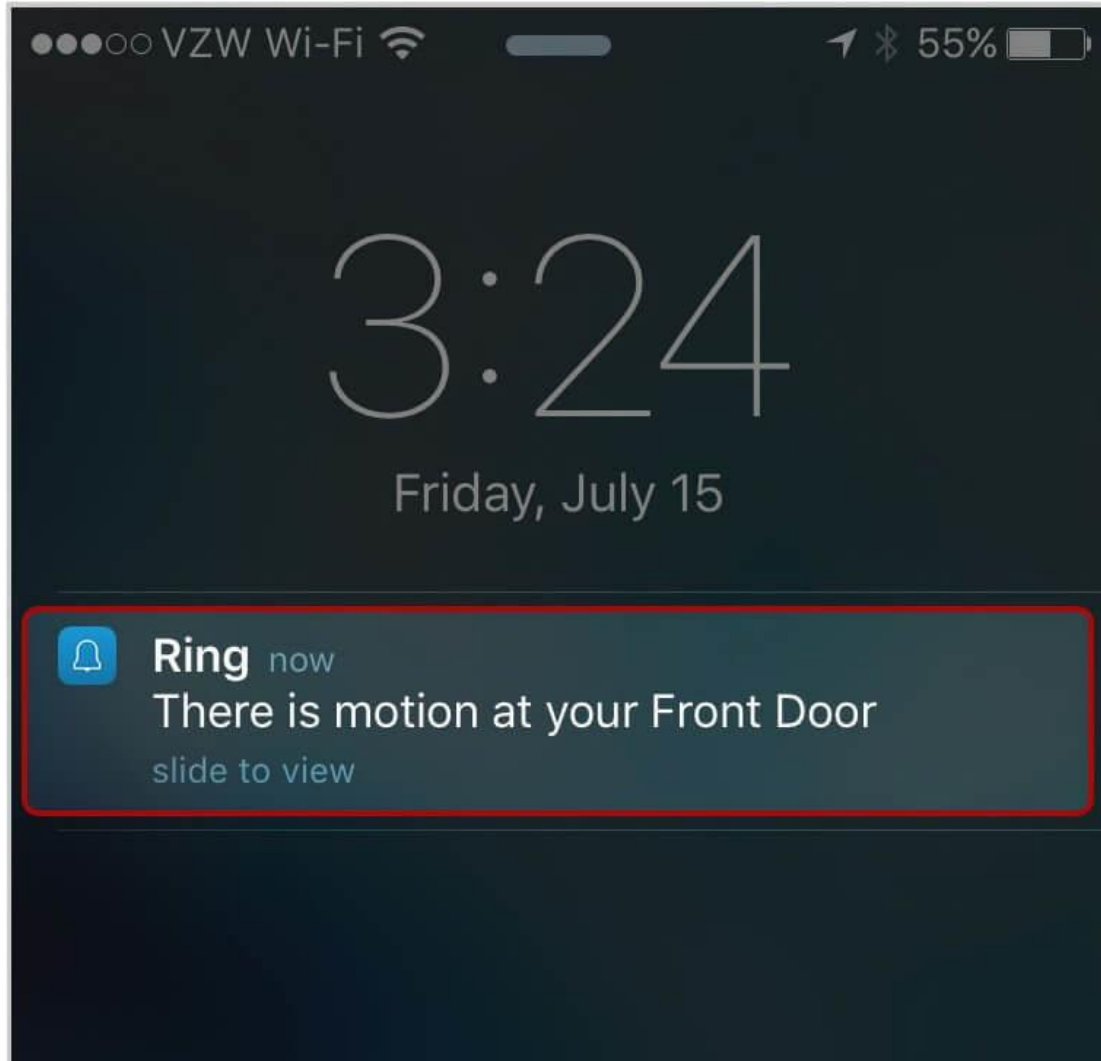
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3. Make push notifications and alerts smart

- There's a **thin line between useful and annoying** when it comes to push notifications and alerts.
- Several **untimely pings** are enough to make a user turn them off completely.
- Mobile **notifications triggered by some events allow users to quickly respond to these events.**
- Designers should make sure all notifications are indeed important, otherwise, a user will start **ignoring** them.

- Context also plays an important role in making design decisions for notifications and alerts.
- Depending on such factors as location, time of the day, personal schedule, notifications from some systems can be muted or, on the contrary, amplified.

- For example, an app for an **electric car should not wake an owner up at night to notify** that the car is fully charged as scheduled,
- but **a security camera app** should be pushy to make sure the owner of the house is alerted about the **breach any time of the day.**

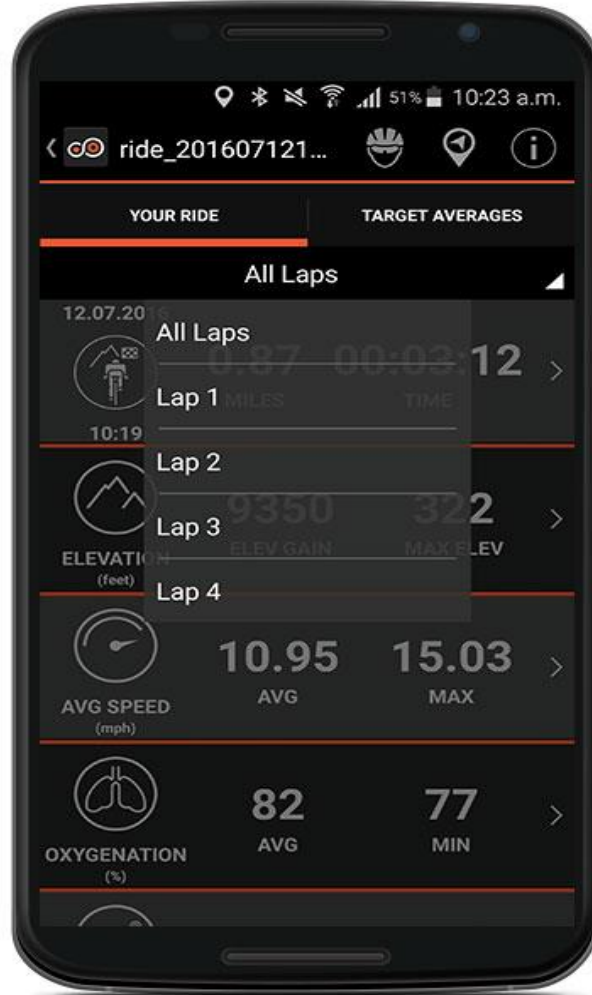


← Motion Alert

4. Tailor data visualization and dashboards

- IoT systems are **largely data-heavy**.
- when it comes to smartphones, we have to deal with limited screen space and, therefore, need to make important design choices **on how to organize dashboards and optimize IoT data visualization**.

- When designing UX and UI for IoT app, it's important to figure out an **efficient data representation model, create a set of useful filters, features to drill reports and swiftly move** from one view to the next one to get necessary details on the spot.

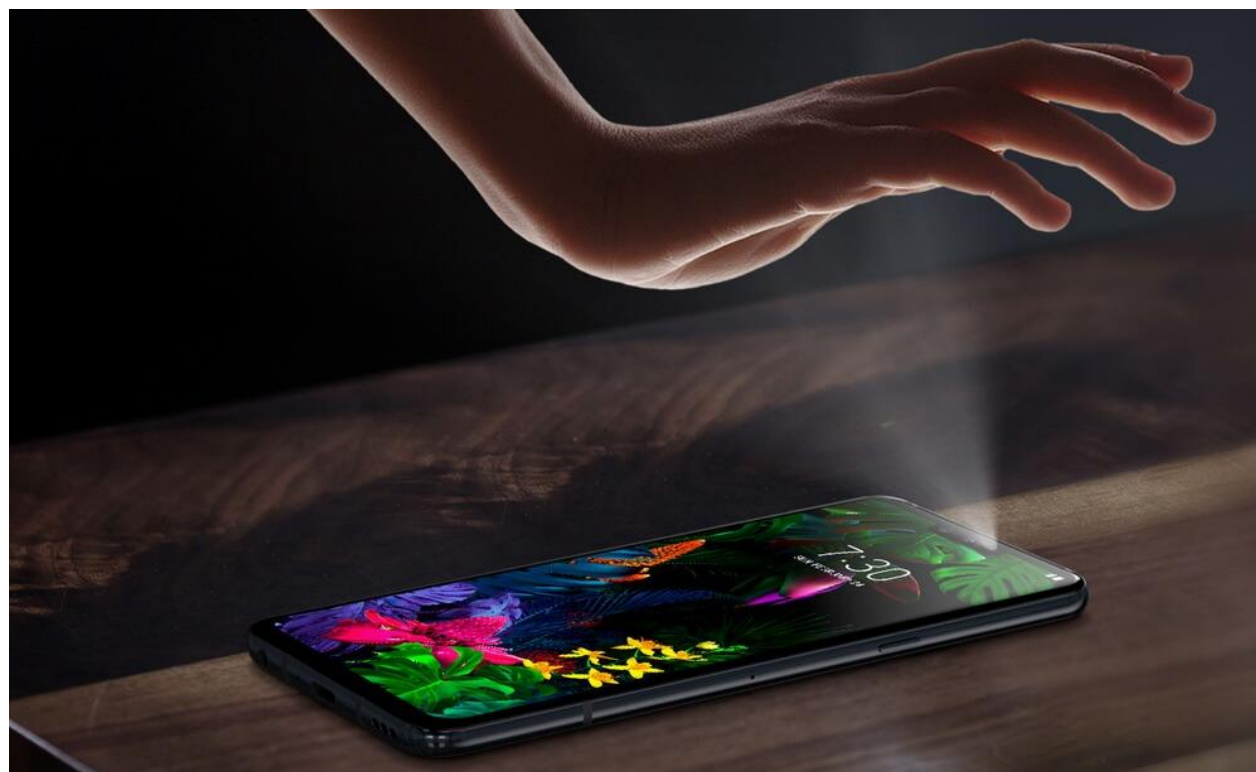


5. Make the most of phone capabilities

- Today's smartphones are extremely **advanced in terms of “feeling” and responding to the environment due to embedded sensors** and native feature.
- When building a custom IoT design for mobile apps it's worth taking a **wide variety of smartphone capabilities** into consideration and make the best of them.

- **Using voice interface, NFC or RFID readers or location data,** designers can feasibly enhance the capabilities of their applications and change the ways apps communicate with IoT devices and users.

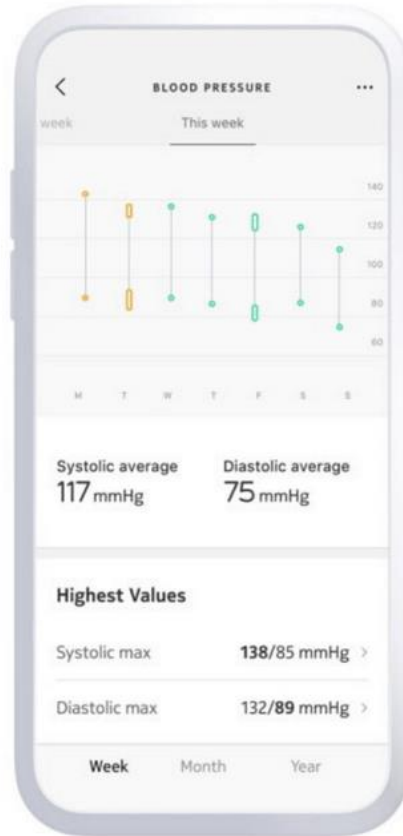
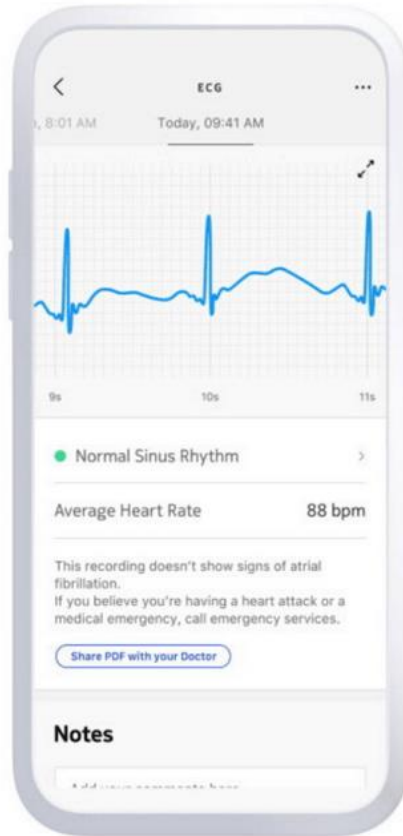
Gesture Control



6. Consider scalability

- IoT is a fast-developing and growing sector.
- **Google**-owned giant in the smart home market.
- **Nest**, for example, started with selling smart thermostats.

- For a company like Nest, it's important to decide how to scale up end-user tools accordingly and create clever IoT application design models for different sets of devices.
- At the same time, it's important to work out a smart interface able to adjust to the growing number of devices and reveal features depending on the unique kit of devices a user has.



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Applications

- healthcare and wellness,
- Energy
- smart home
- education
- retail
- logistics
- publishing,

UX/UI App Development

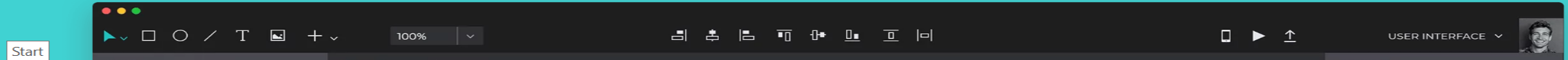
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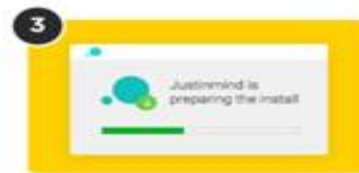
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1
Open the Justinmind.exe file from the downloads list at the bottom left corner of this window.

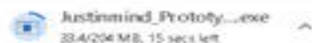


2
If asked "Do you want to allow this app to make changes on your device?" click "Yes".



3
Follow the installer instructions. Justinmind will open automatically when it's done.

Waiting for www.google.com



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Browser tabs: Me, VTL, Prof, Web, DES, Des, Tho, Sim, App, Uns, Uns, Uns

Browser address bar: justinmind.com/thank-you-win

Navigation: Product, Examples, Free resources, Pricing, Download Free

1 Justinmind_Pro...exe

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Are you i

2 Setup - Justinmind 9.5.2

JUST MIND

Collaborate on your prototypes

Completing the Justinmind Setup Wizard

Setup has finished installing Justinmind on your computer. The application may be launched by selecting the installed icons.

Click Finish to exit Setup.

Run Justinmind

3 Justinmind is preparing the install

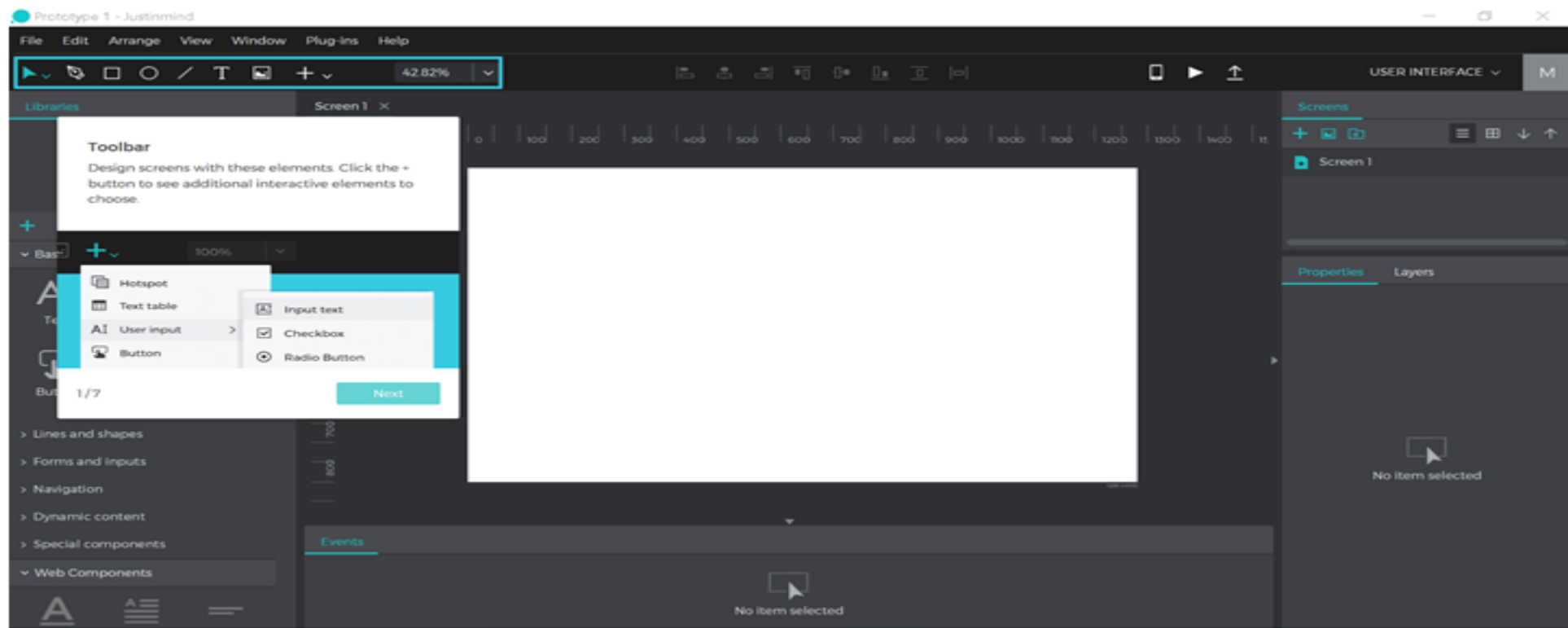
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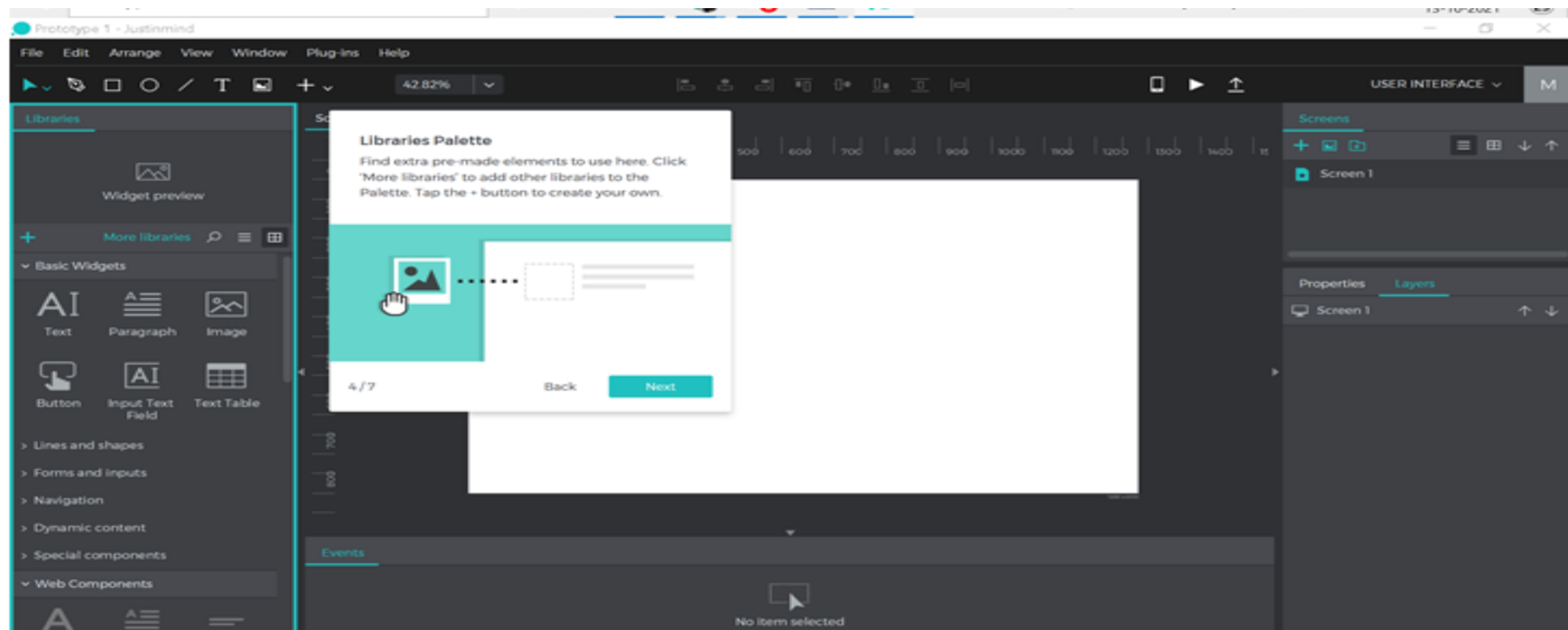
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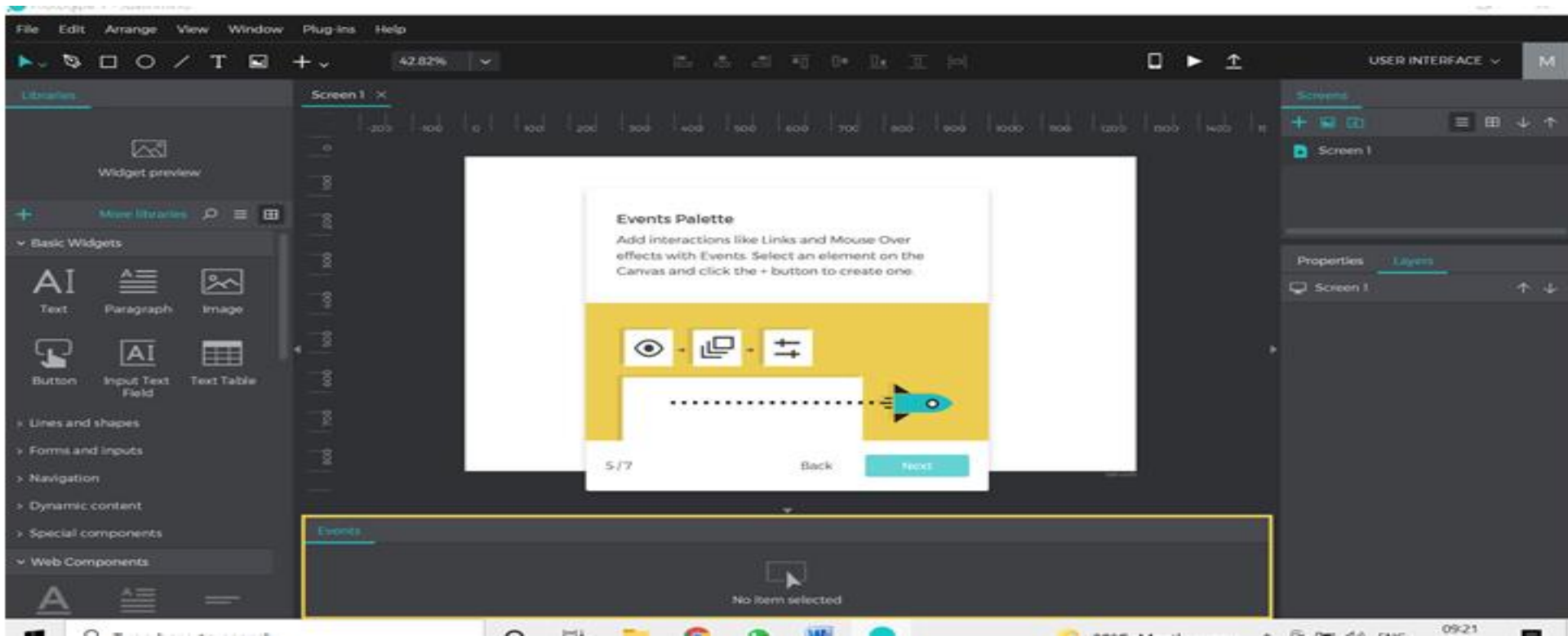
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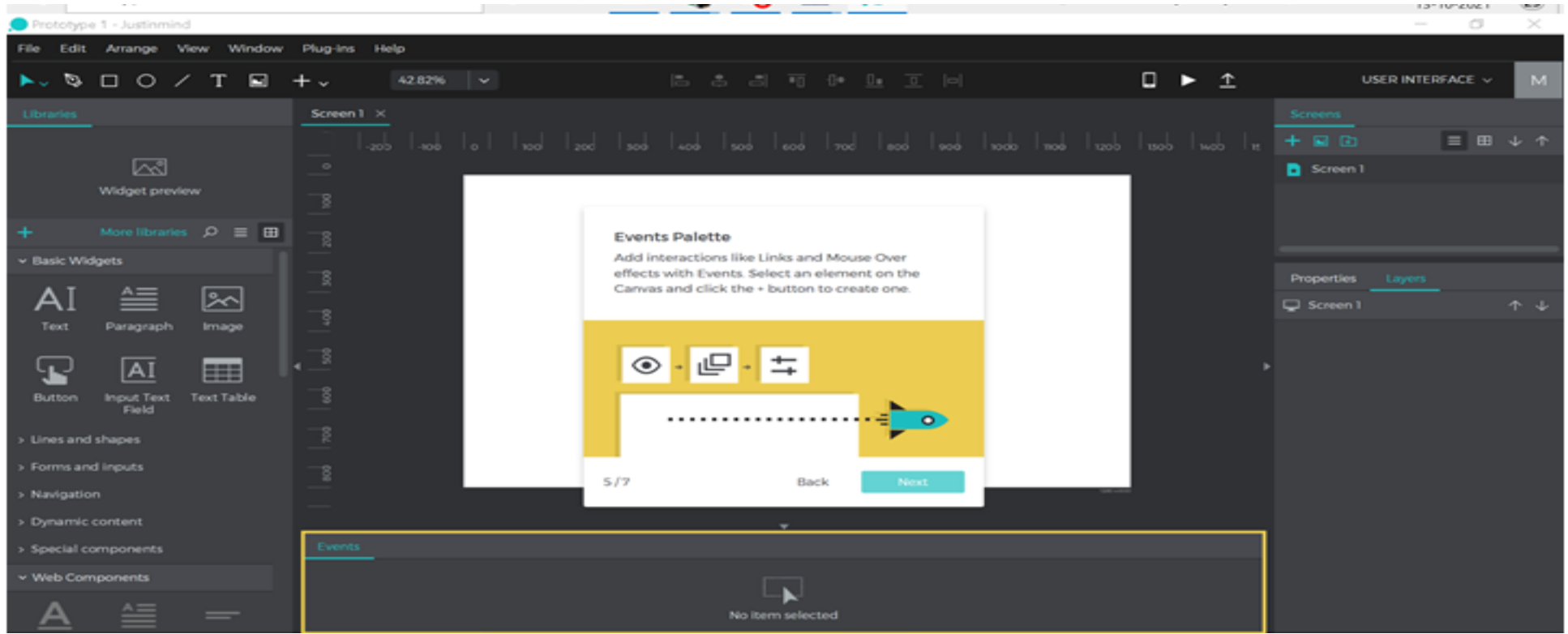
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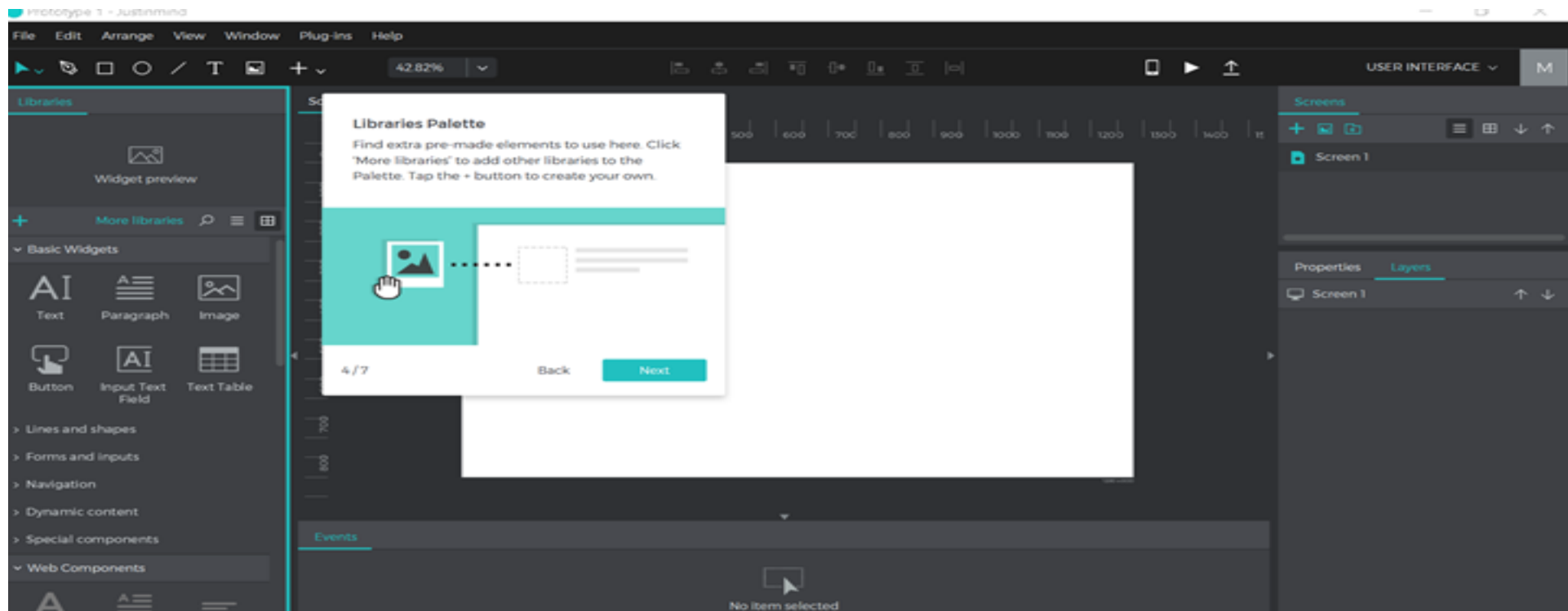
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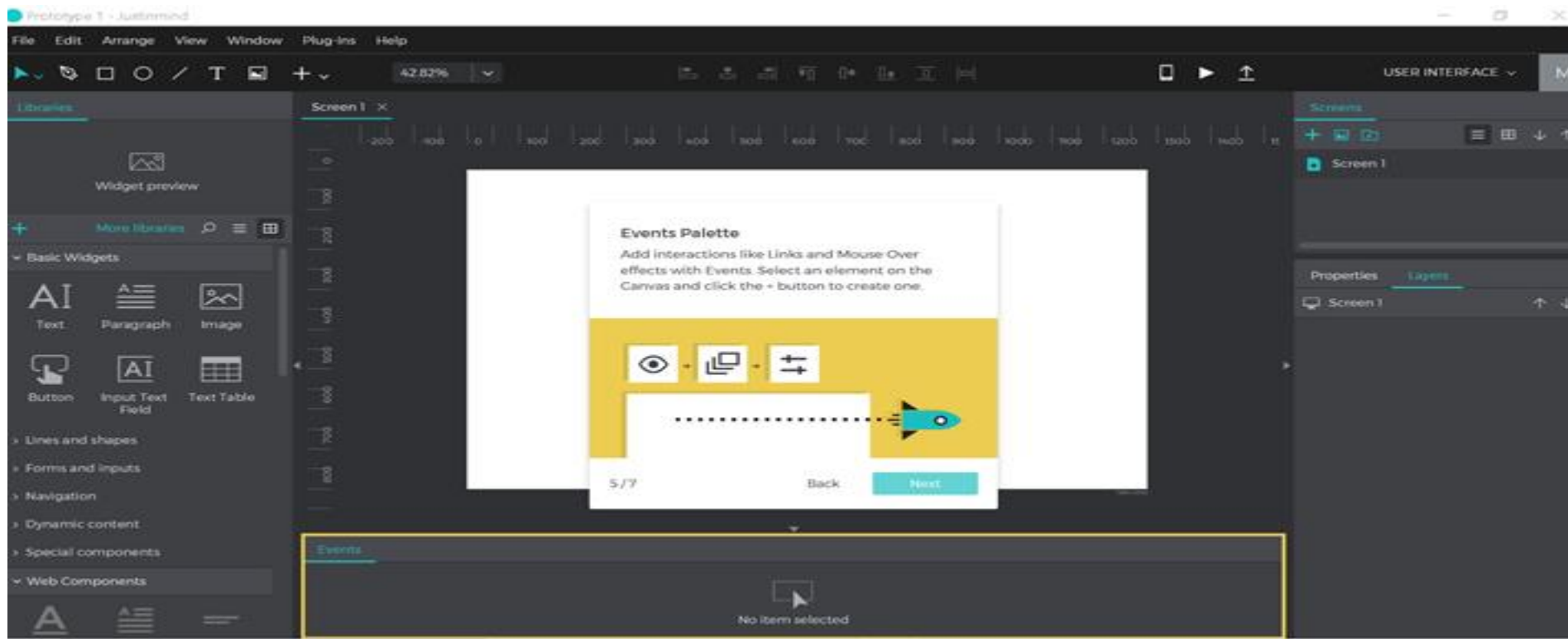


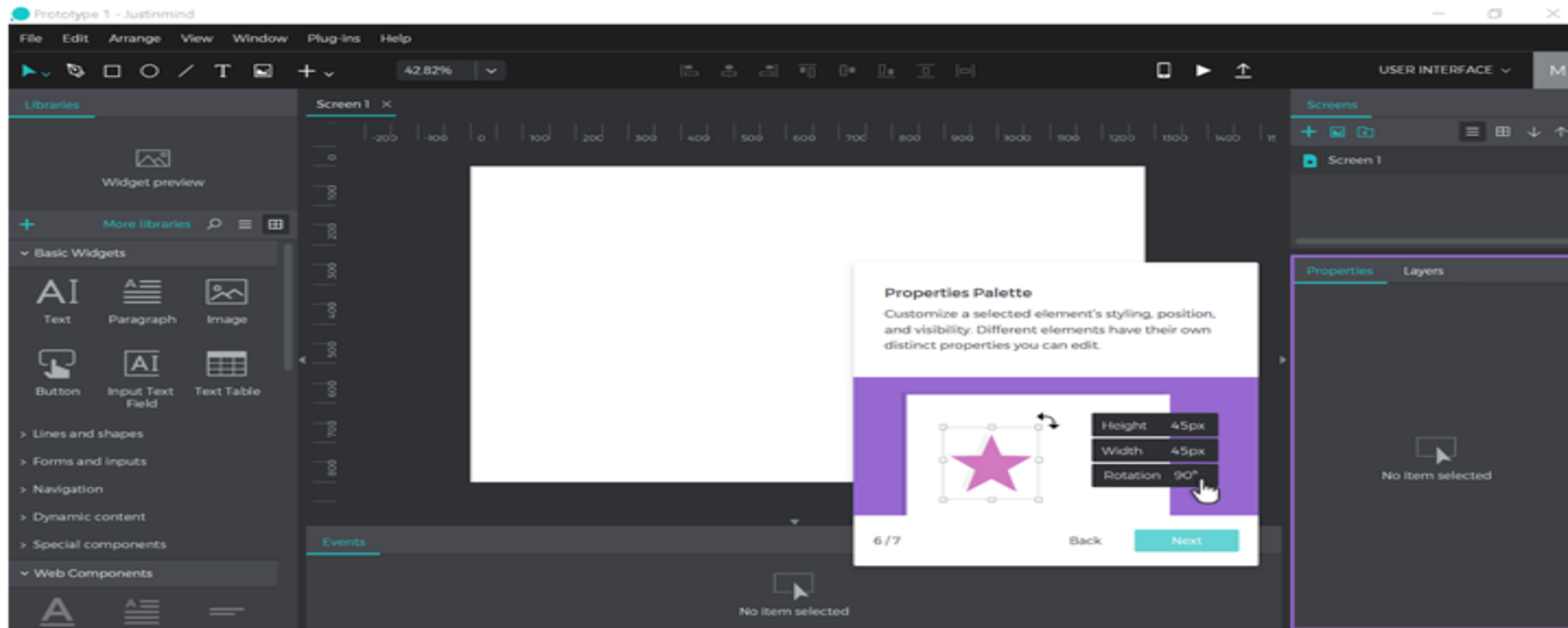


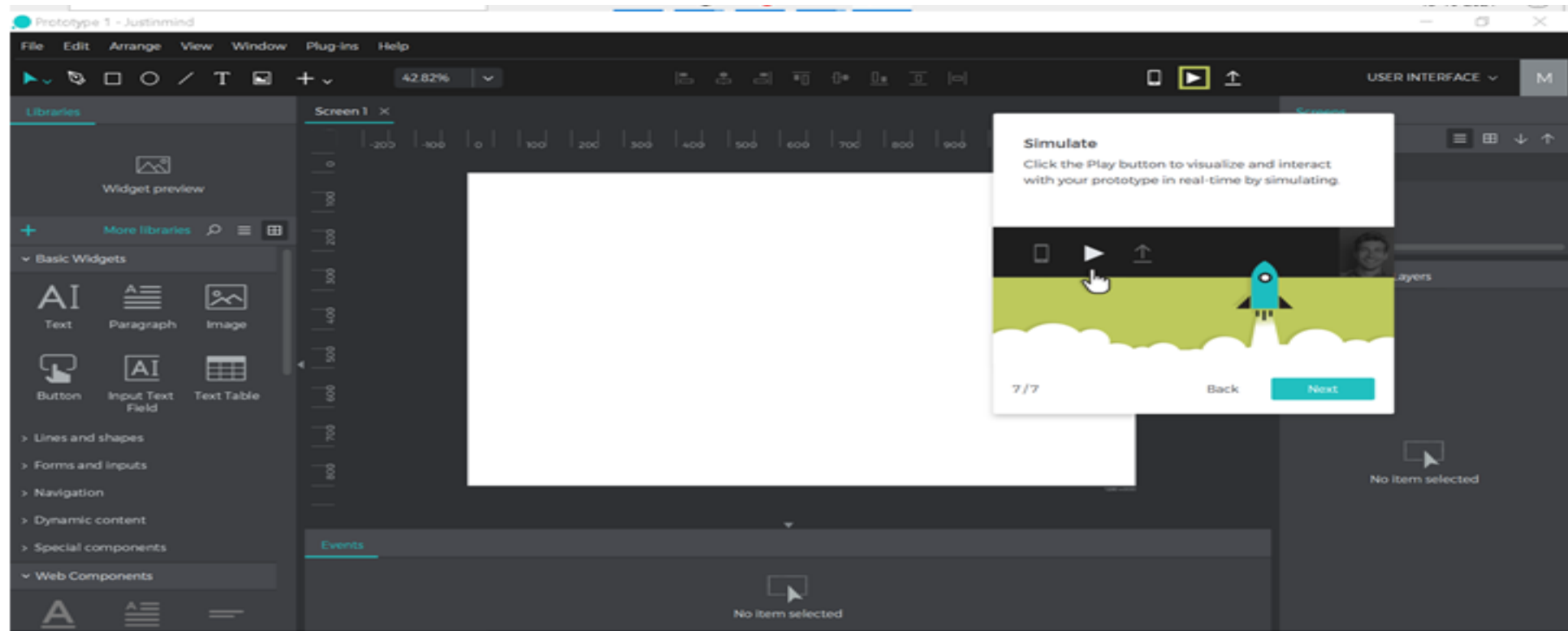


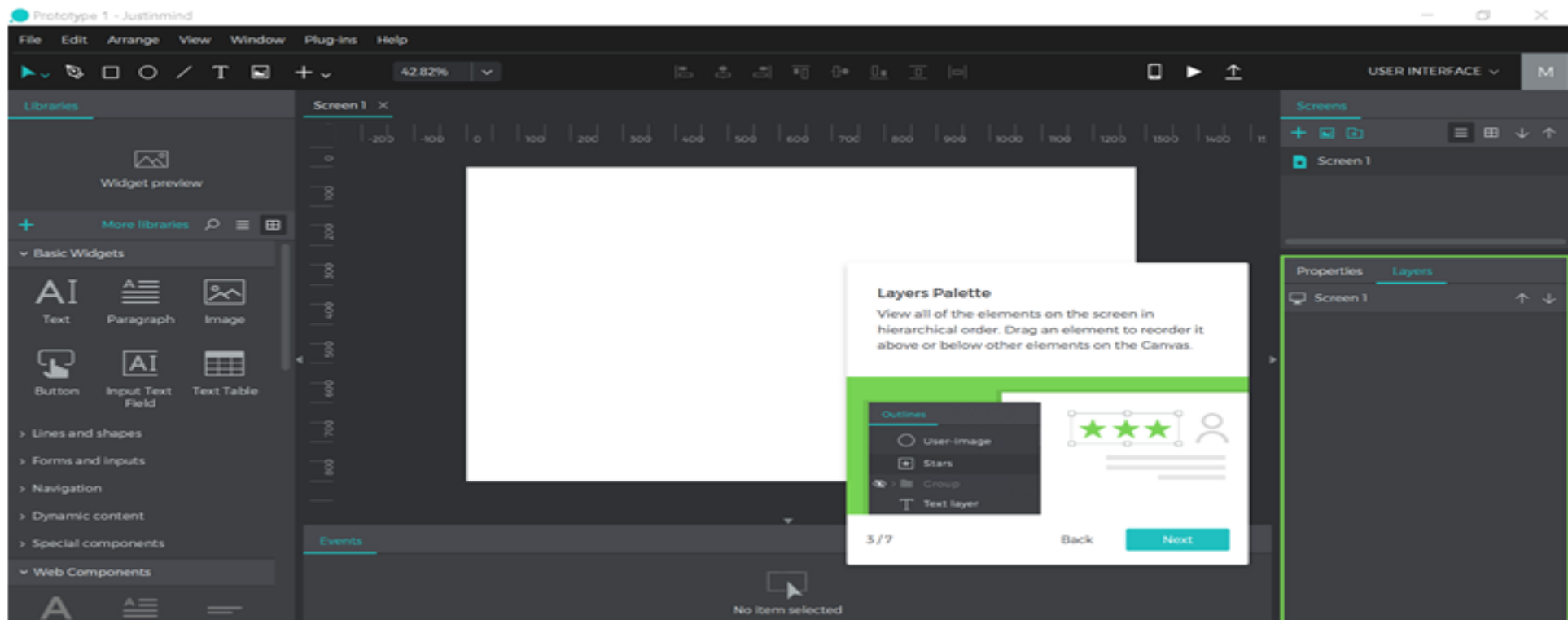












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Material UI

New library Manage libraries

Material UI

Play with components from Material UI library, or add a new Storybook library - your company's or choose something from the public design systems.

Simply click "Material UI" in the bottom left corner and then choose "+New Library".

Previous step OK

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Create a prototype

Desktop



Web 1280 ▾

Mobile



iPhone 11 Pro ▾

Tablet



iPad 9.7" ▾

Other Devices



Surface Pro 3 ▾

Open a prototype...

Open a shared prototype...

- New from Template
- New from Figma
- New from Sketch
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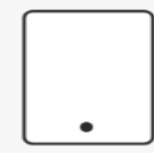


Web 1280 ▾

Mobile

- iPhone 11 Pro
- iPhone 8 Plus
- iPhone 8
- Android
- Pixel 2
- Pixel 2 XL
- Pixel 3
- Pixel 3 XL
- Galaxy S10e
- Galaxy S10
- Galaxy S10+
- Custom

Tablet



iPad 9.7" ▾

Other Devices



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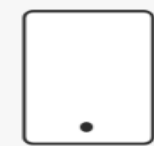
Mobile

iPhone 11 Pro ▾

375 x 812 px

New Prototype

Tablet









iPad 9.7" ▾




Other Devices



Surface Pro 3 ▾

- Web 1280
- Web 1366
- Web 1920
- Web Tablet
- Web Mobile
- Desktop
- Desktop HD
- Apple TV
- Custom

-  New from Template
-  New from Figma
-  New from Sketch
-  New from Adobe XD
-  New from Illustrator
-  New from images

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Create a prototype

Desktop



Web 1280 ▾

Mobile

Galaxy S10 ▾

360 x 760 px

New Prototype

Tablet



iPad 9.7" ▾

Other Devices



Surface Pro 3 ▾

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Libraries

Widget preview

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Basic Widgets

- Text
- Paragraph
- Image
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- Input Text Field
- Text Table

Lines and shapes

Forms and inputs

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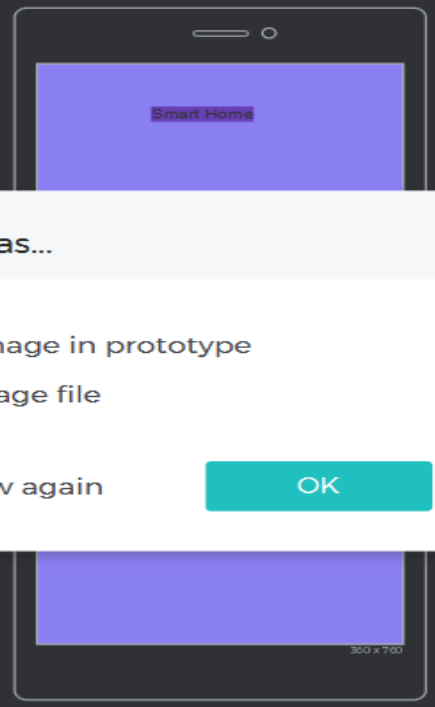
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Smart Home

300 x 700

Add image as...

- Include image in prototype
- Link to image file
- Don't show again

OK Cancel

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+ Add event



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-  Tap >
-  Keyboard >
-  Gesture >
-  on Page Load
-  on Page Unload
-  on Window Resize
-  on Scroll
-  on Variable Change

-  on Tap
-  on Toggle
-  on Drag Start
-  on Drag
-  On Drag End
-  on Tap Hold

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







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New event

ON TAP

-  Navigate to
-  Change style
-  Show hidden element
-  Hide element
-  Set active panel
-  Set value to an element
-  Select value of an element
-  Pause sequence of events
-  Move element
-  Resize element
-  Rotate element
-  Insert element into container
-  Data Master action
-  Set focus on Input Field
-  Scroll to element
-  Enable / Disable input
-  Paginate Data Grid/Data List
-  Play audio file
-  Change cursor

New event

ON TAP

NAVIGATE TO

Select the target for your link

- Screen
- Previous screen
- URL
- Scenario

+ [Icons]

★ Screen 1

New screen

Name	<input type="text" value="player1"/>
Type	<input type="text" value="Mobile"/>
Device	<input type="text" value="Galaxy S10"/>
Orientation	<input type="text" value="Portrait"/>

OK Cancel

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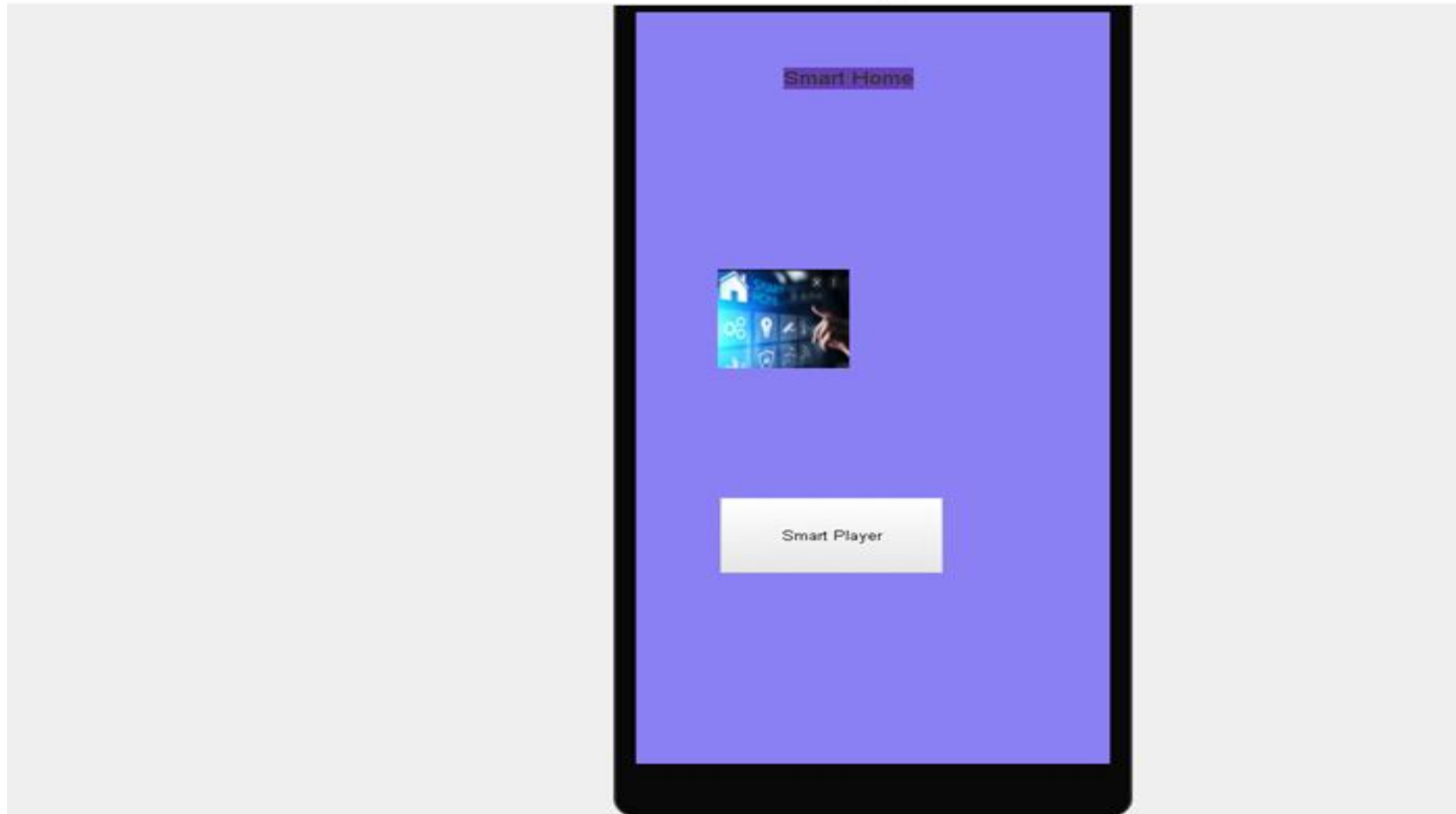
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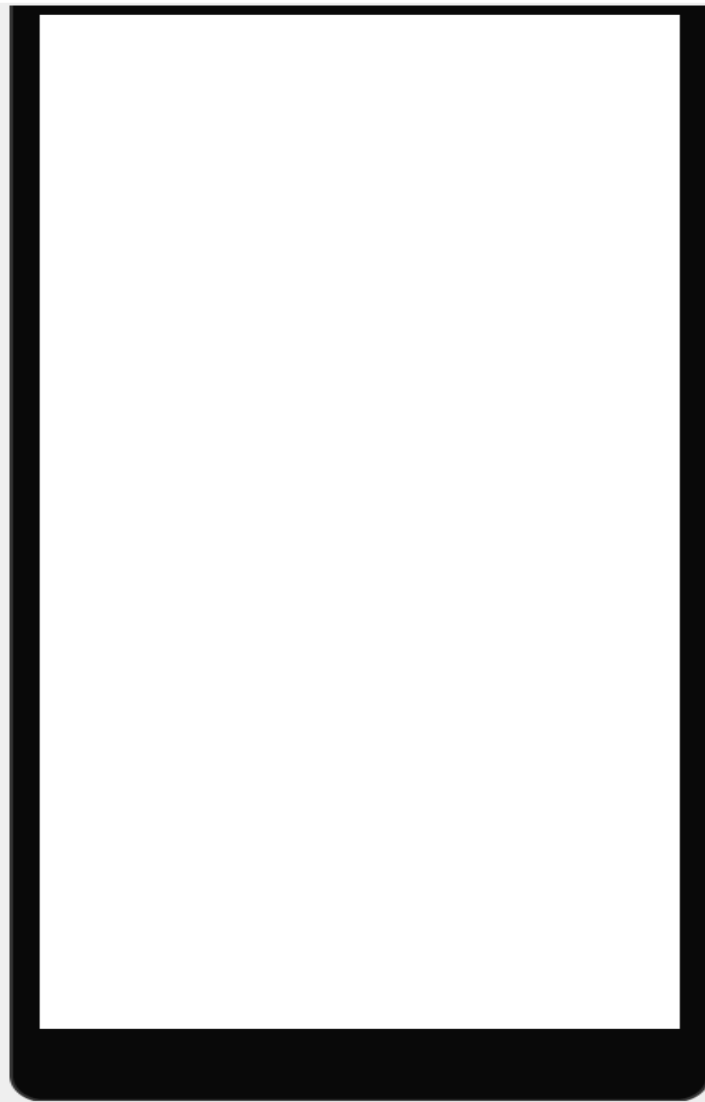
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 - Interaction 1
 - add condition
 - Do

SS

type 1 / Screen 1





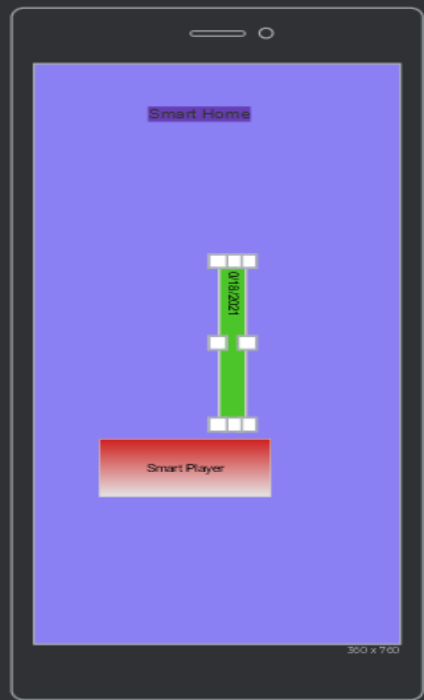


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- Image
- Text Table
- Radio Button
- List Box
- Multi Select List

Screen 1



Screens

- Screen 1
- player1

Properties

Date (Date)

AV 0

Background



Border



Rotation

Opacity

Round

Shadow

Events



+
Add event

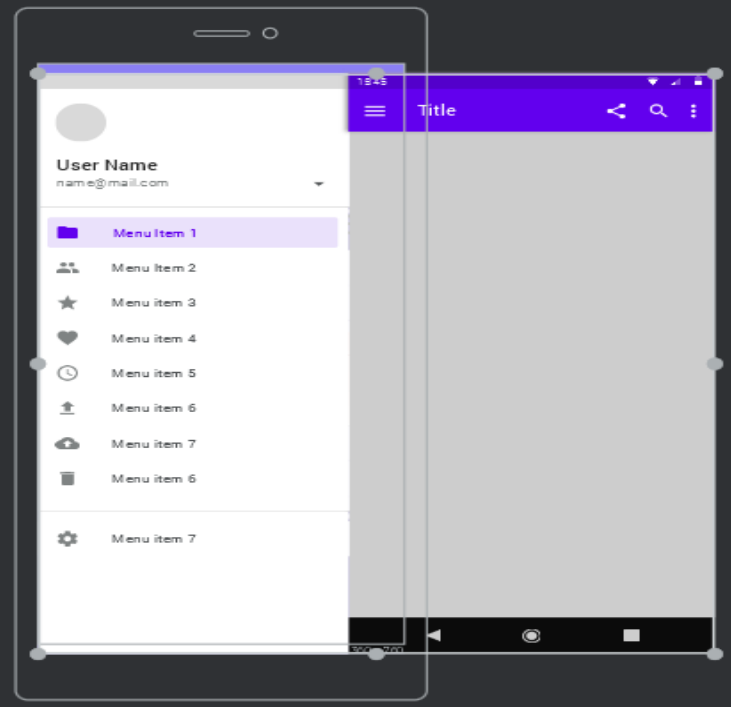
Libraries

Widget preview

More libraries

- Dynamic Panel
- Summary
- Index
- Data List
- Data Grid
- Special components
- Android Components
 - Button
 - Input
 - Text area
 - Empty screen
 - List items screen
 - Navigation drawer
- Screen examples

Screen 1



Events

Select an item that accepts events

Reference

- <https://www.digiteum.com/design-iot-apps-ux-ui-mobile-apps>

- Produce Recognition System with Computer Vision for Retail
- <https://www.youtube.com/watch?v=3RV417uY38o>
- WorldClock Development Story
- <https://www.youtube.com/watch?v=E4jB7KCeUgQ&feature=youtu.be>

Reference

- <https://www.interaction-design.org/literature/article/stage-4-in-the-design-thinking-process-prototype>