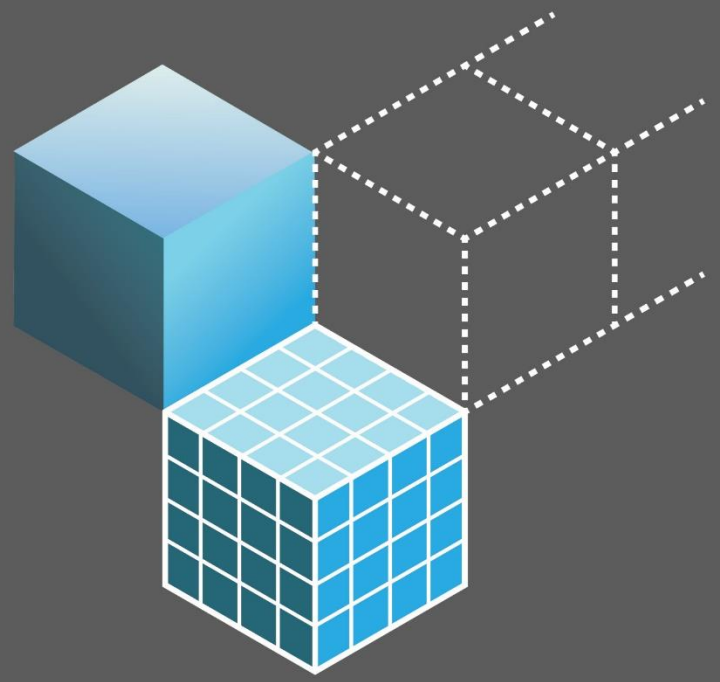

PROJECT

VIRTUAL PRODUCT DEVELOPMENT

USERINTERFACE DESIGN & SIMULATION

Fjodor van Slooten

TODAY

- Introduction
- Interaction design
- Prototyping Userinterfaces
  - Intro to Axure and Figma
- Practice

Do Axure tutorial
Work on prototype for project

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Benedetta Cervone
Student assistant

vanslooten.com/uidessim

SCHEDULE

	Date	Subjects
✓	1	April 29th	Create a paper prototype of a Userinterface and perform a heuristic evaluation
>	2	May 6th	Build an interactive prototype (Axure, Figma) 1
	3	May 27th	Build an interactive prototype (Axure, Figma) 2; Integrate the prototype into a website and conduct online usability tests
	4	June 10th	Questionnaire on tool(s) & info on essay

INTERACTION DESIGN

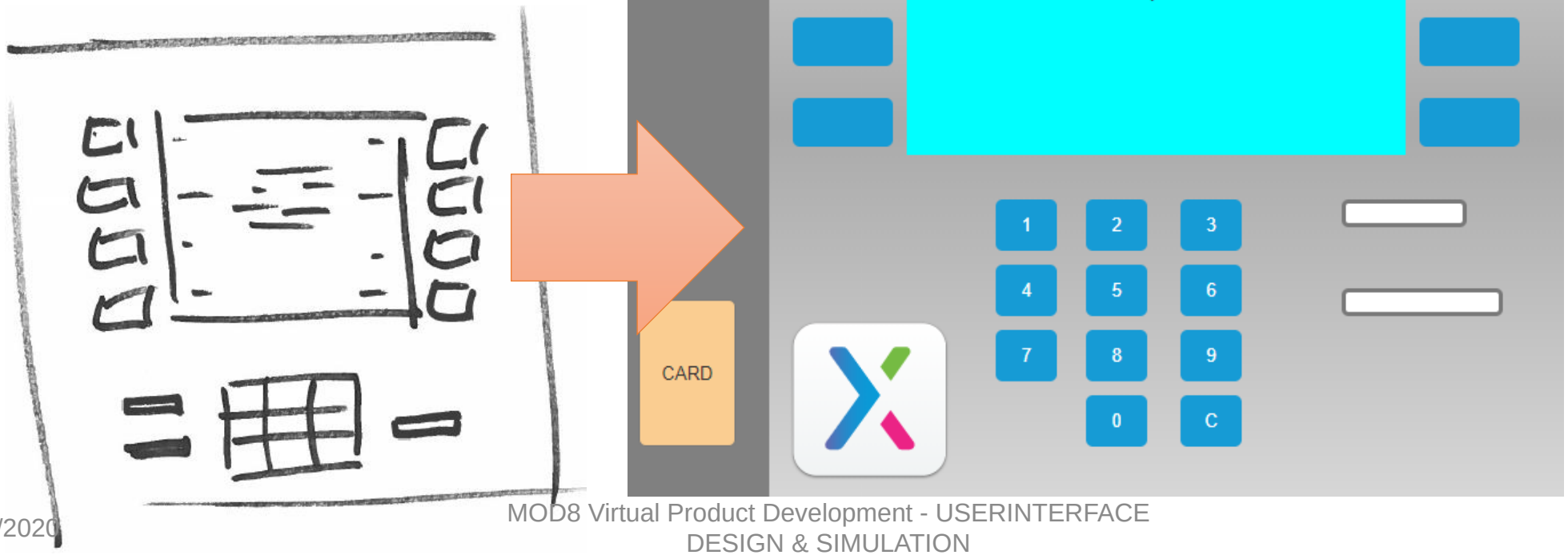
- Think, plan, design…. then build!

- What should be tested?
- What must be demonstrated? To whom?
- What tasks will be performed (with the prototype)
- Dynamic vs. static test
- Level of realism
- Desired interaction & animation
- Graphic presentation

Design a userinterface prototype

Even if it is *'just a prototype'*, you'll have to design that too!

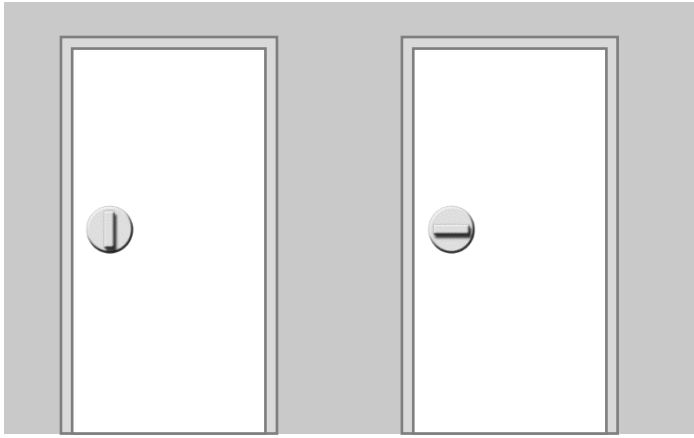
- Sketch
- Setup layout
- Flowchart, paper prototype



INTERACTION DESIGN

Analysis > synthesis: from *what?* to *how?*

Which door is locked?



Desired functionality is (almost) known

- Think how the system will be/looks like for end-users (=‘design space’)
- Capture ‘design space’ in conceptual model
- Conceptual model: “a high-level description of how a system is organized and operates.” *
- ‘Sketch’ structure of interface
  - Contains assumptions about how a user will ‘understand’ (comprehend) interface

* Johnson and Henderson, 2002, p. 26

Conceptual model

- Research common mental models. Use these in your design.
- **Verify** whether the user understands the conceptual model!

Designer vs. User

Conceptual model

Paper form

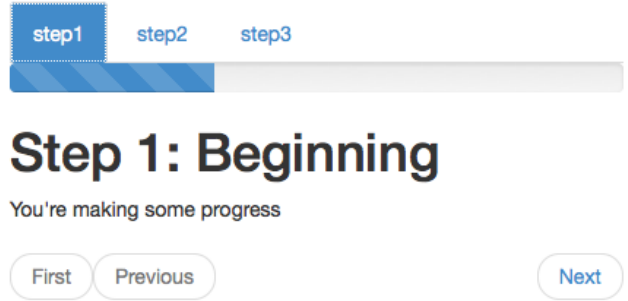


Relations: all steps are visible

Building blocks of a conceptual model:

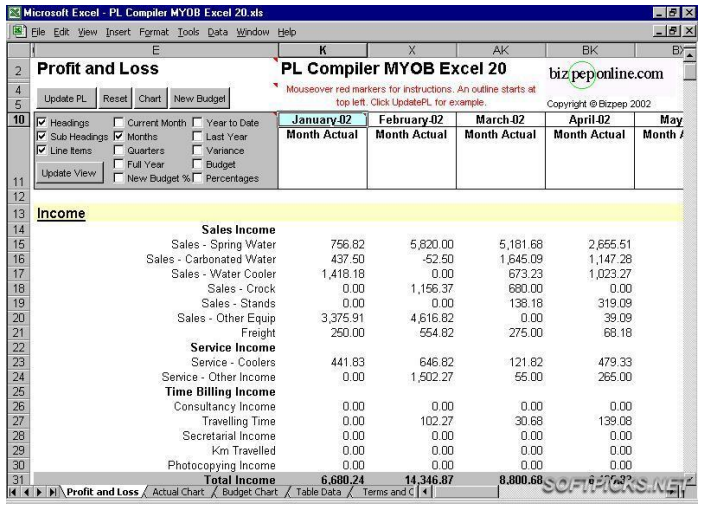
- Metaphors & analogies
- Relations between various elements
- Recurring operating mechanisms

Digital form



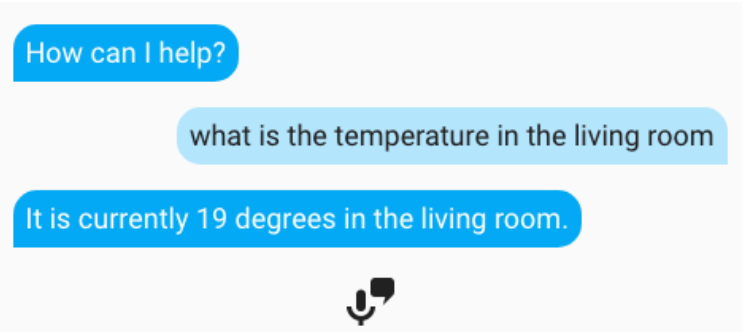
Conceptual model must be easy to learn

Familiar elements: ‘dropdown lists’, input fields:



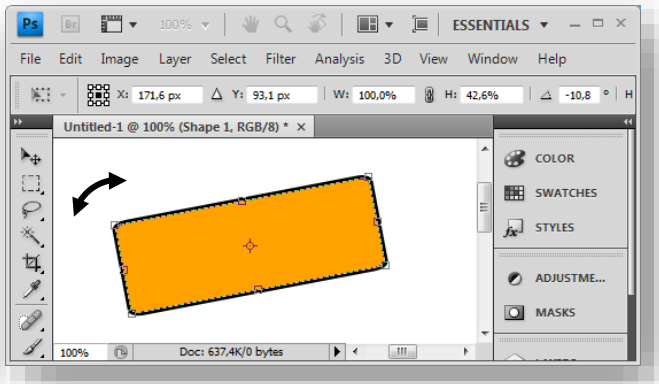
Interaction types

- **Instructing** (typing/voice commands, function keys)
- **Conversing** (ask input, dialog, menu driven choices)
- **Manipulating** (interacting with objects/mouse)
- **Exploring** (move through a virtual space)



A system can use multiple types

Chapter 12



Instructing

- Typing commands
- Function keys
- Select options (with mouse)

☺Fast and efficient

☹User needs training

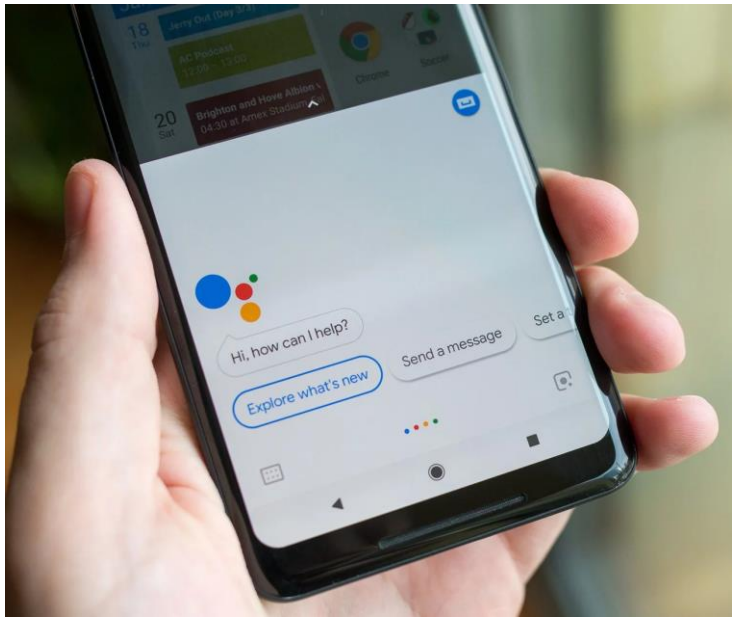
⇨Suitable for frequent and repetitive functions, like: select, pay, deliver

Conversing

- ‘Dialog’ possible between system and user
- Usually based on questions
- 2-way communication (in contrary to *instructing* interaction)
- Search engine, virtual assistant, help- & support system
- Could utilize speech recognition

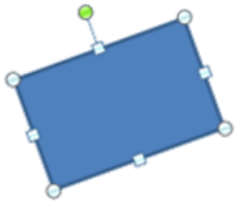
☺Easy to use for inexperienced users

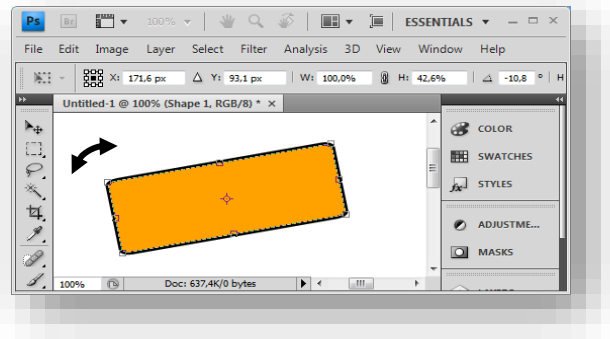
☹Suggested intelligence often disappoints



chatbots.org

Manipulating





- Interacting with objects/mouse/gestures
- Manipulate objects by selecting, drag (&drop), open, etc.
- Control with physical objects (mouse, point, pencil, handle)

☺Stimulates explore & enjoy

☺Easier to remember than commands

☺Gives sense of “I am in control”

☹User needs some knowledge/hints

⇨ Use *affordances* as hint for manipulation

Form follows function: control options of a product *match* (desired) functions

- Objects to be used for manipulation must always be visible
- Un-do is important: it should always be possible to revert an operation immediately

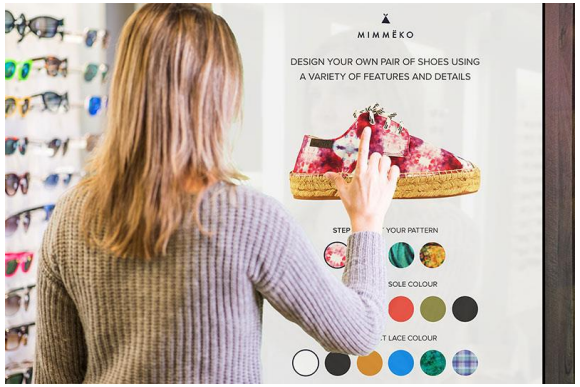
Exploring

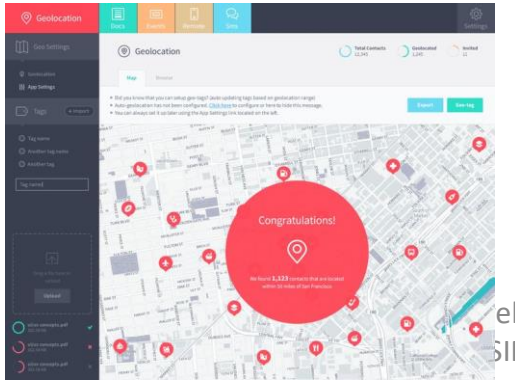
- Move through lots of variants, maps, (virtual) space
- Can be combination of maps, or VR, and real-world (eg. heads-up display/augmented reality)
- Supports active exploration

☺Makes it possible to give a real sense of environment, eg. before going to ‘the real place’

☹Interface can be complex to build (yourself)

⇨Good for training or reconnaissance





System complexity

In early stage gain insight in:

- Technology (choices)
- Concept of interaction
- Structure of navigation (eg. menu)
- User friendliness
- Costs

Key tech issues:

- Display technology
- Resolution
- Energy supply
- Processing power
- Memory capacity
- Sensor technology

Example: segment display vs. full color touch screen

Direct access

- Key functions should be available for all types of users, without having to adapt/barriers
- Users sometimes process information in ways not meant/foreseen by the designer

Usability

Depends on:

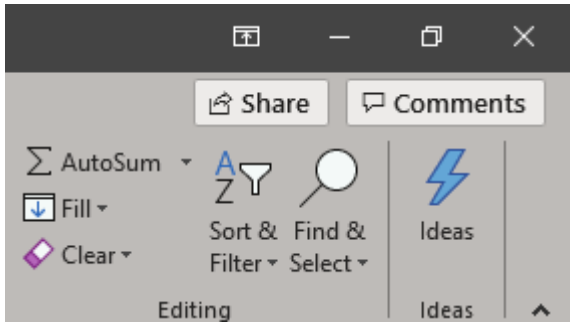
- *Application*
- *Environment*
- *Users*
- *Safety*

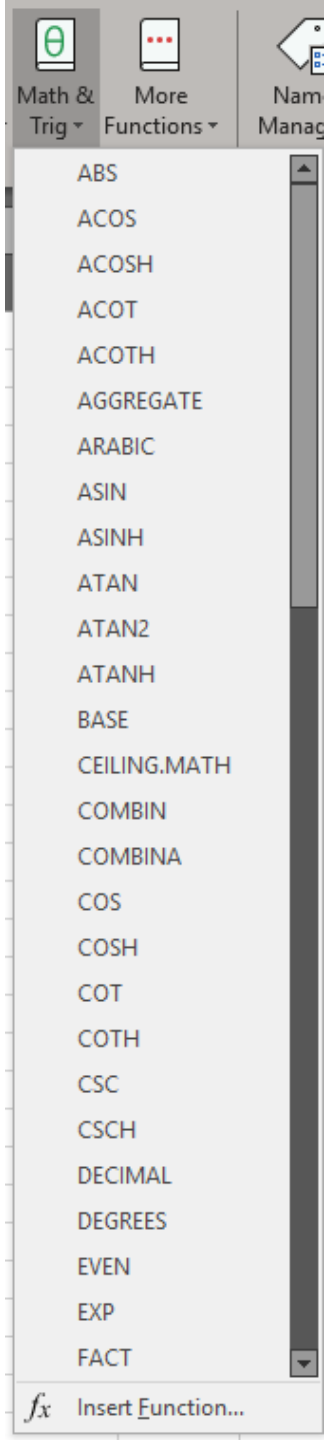
⇨ Decide whether speed of use is relevant

⇨ *Speed* of use might conflict with *ease* of use

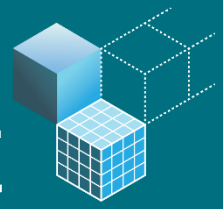
80/20-rule

- 80% of use actions originates from
- 20% of the offered functions
- 80% of failures originates from 20% of the components
- Max. 20% of functions is used most frequent
  - Take this into account when designing: make these functions stand-out
  - Direct access to frequently used functions (eg. trough short-cuts)





Conceptual model & *project* assignment



- Explore different conceptual models which might be applicable
- Verify whether users understand these models (eg. using paper prototypes, heuristic evaluation, …)
- Estimate which physical component each concept needs (display, control elements, camera, etc.)
- In the digital explanation explain why you choose that conceptual model (deliverable of design rationale for project)

Tips:
Refine (iterate) on basis of experience and requirement specification
In your team, discuss which model is the most likely candidate

PROTOTYPING

Is an *aid* while designing:

- Means of communication (team, client, stakeholders)
- Platform to experiment (feasibility, functionality)
- Test platform (usability)
- Development strategy (prevents having high costs because revisions have to be made in later stages of development)

Use (simple) physical representations of the design (in progress)

Chapter 8

Prototypes ⟺ User-testing

Chapter 8, 10

Low-fidelity prototypes
- Storyboard
- Flow-chart
- Paper prototype

Explore
- Analyse desired functionality
- Find possible usage

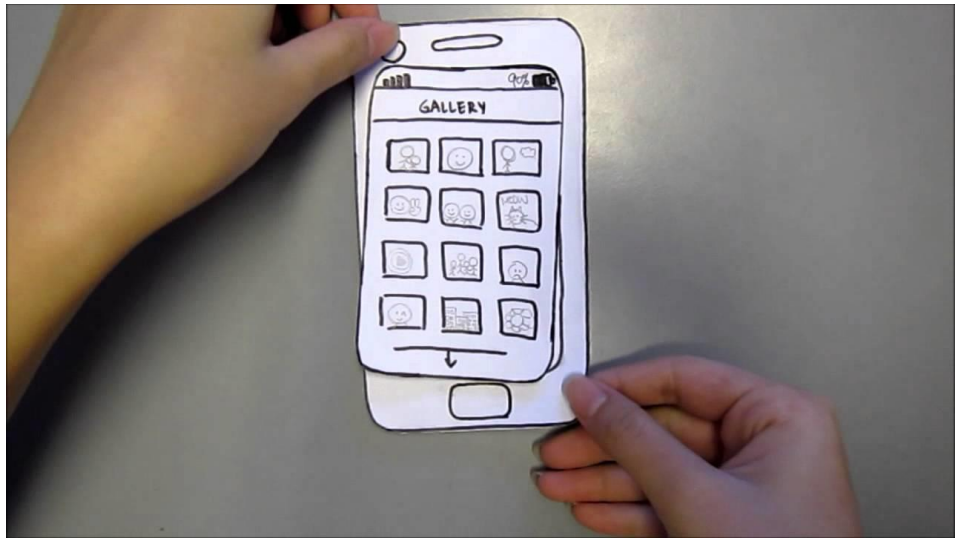
Mid-fidelity prototypes
- (linear) demo

Design
- Makes simple usability tests possible
- Emphasis on conceptual design

High-fidelity prototypes
- Interactive simulation
- Mock-up
- Hardware prototype

Detailing
- Full usability tests
- Foundation for design proposal
- Convince stakeholders
- Pre-production series for introduction to market/key customers

Low-fidelity prototypes



Storyboard, flowchart, paper prototype, wireframe

⇨ First phase design process

☺ Simple, cheap, quick

☺ Proof-of-principle

☺ Provokes reactions (does not look final)

☺ Generates input for requirements

☹ Not interactive

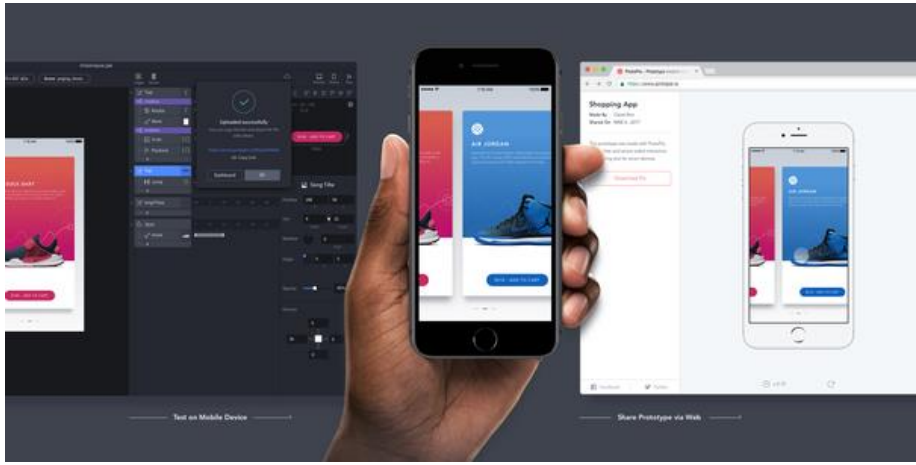
☹ Difficult to use further in process (*design* > *development*)

High-fidelity prototypes

Realistic simulation

⇨ Present final design, hand-over to developer/manufacturer

- Excellent ‘look & feel’
- Emphasis on functionality and usability



☺ Is means of specification for further development

☺ Provides stakeholders with good insight of complexity

☹ Lots of effort to implement

☹ Design changes at high costs

Choose a prototyping tool

Axure, Figma, Sketch, XD, …???

Figma, Sketch, XD: design-oriented

- How to choose the right prototyping tool
- Figma vs. Sketch vs. Axure - a Task-Based Review

Axure vs Figma? Popular tools, flexible, short learning curve, can be used for both apps and websites, free (for students), easy to add interaction

Things you can do in Axure (which are difficult in other prototyping tools)

- build a working keypad
- build a shopping cart (which does not do dummy stuff, but actually works)
- ... other advanced interaction

Need advanced interactive prototyping? Use Axure. Otherwise, 'click-trough' style prototype build with for instance XD or Figma can be sufficient.

Tools

- Sketch (Mac only)
- InVision (Online, free with limitations)
- Figma (Online, free with limitations)
- Axure (license is on Canvas)
- Adobe XD (free)

AXURE

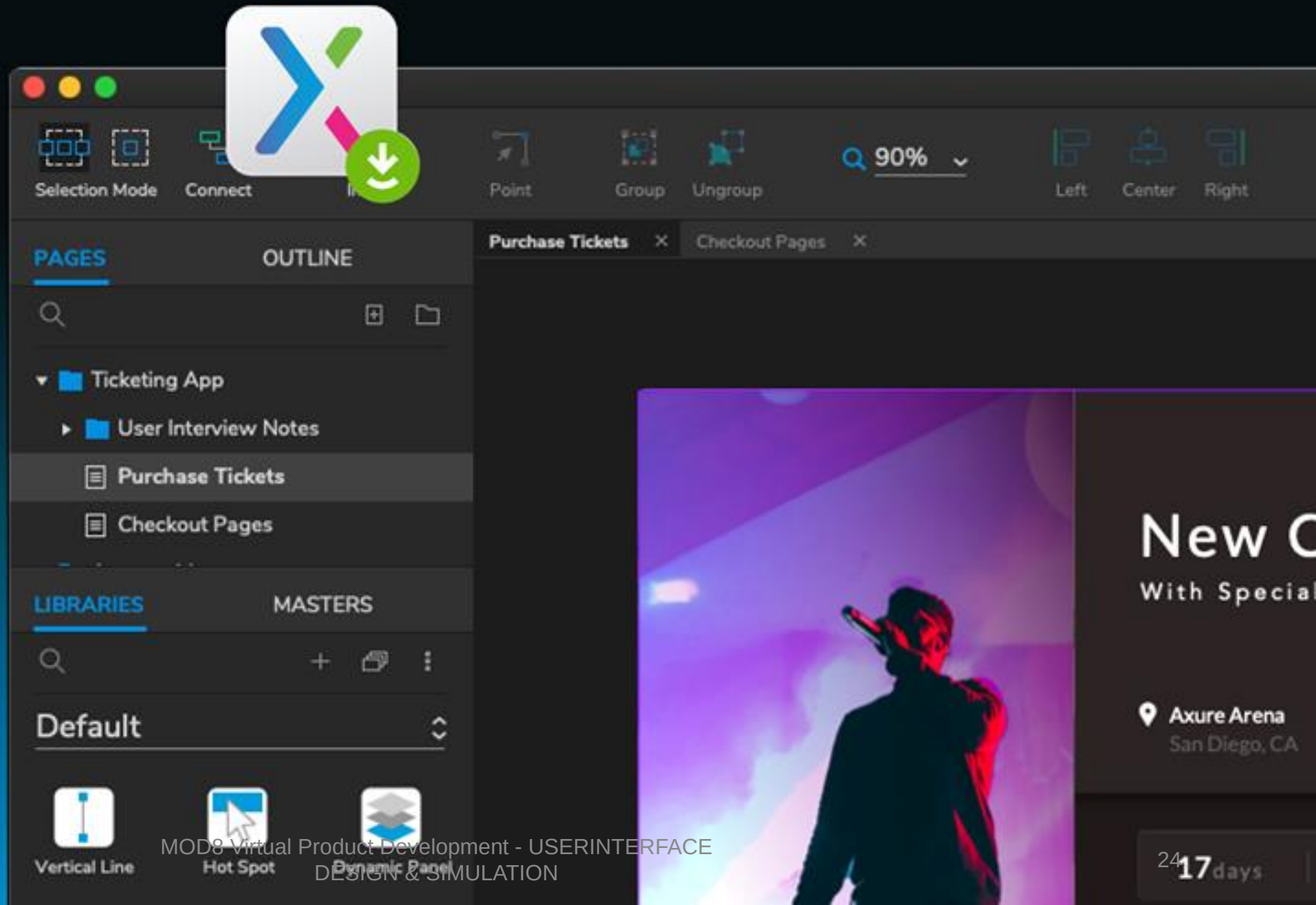
Use Axure to create:

Interactive prototypes, mockups, wireframes, flowcharts, web designs…

Share prototypes via your *own website*, or on *Axure Share*

License available on Canvas

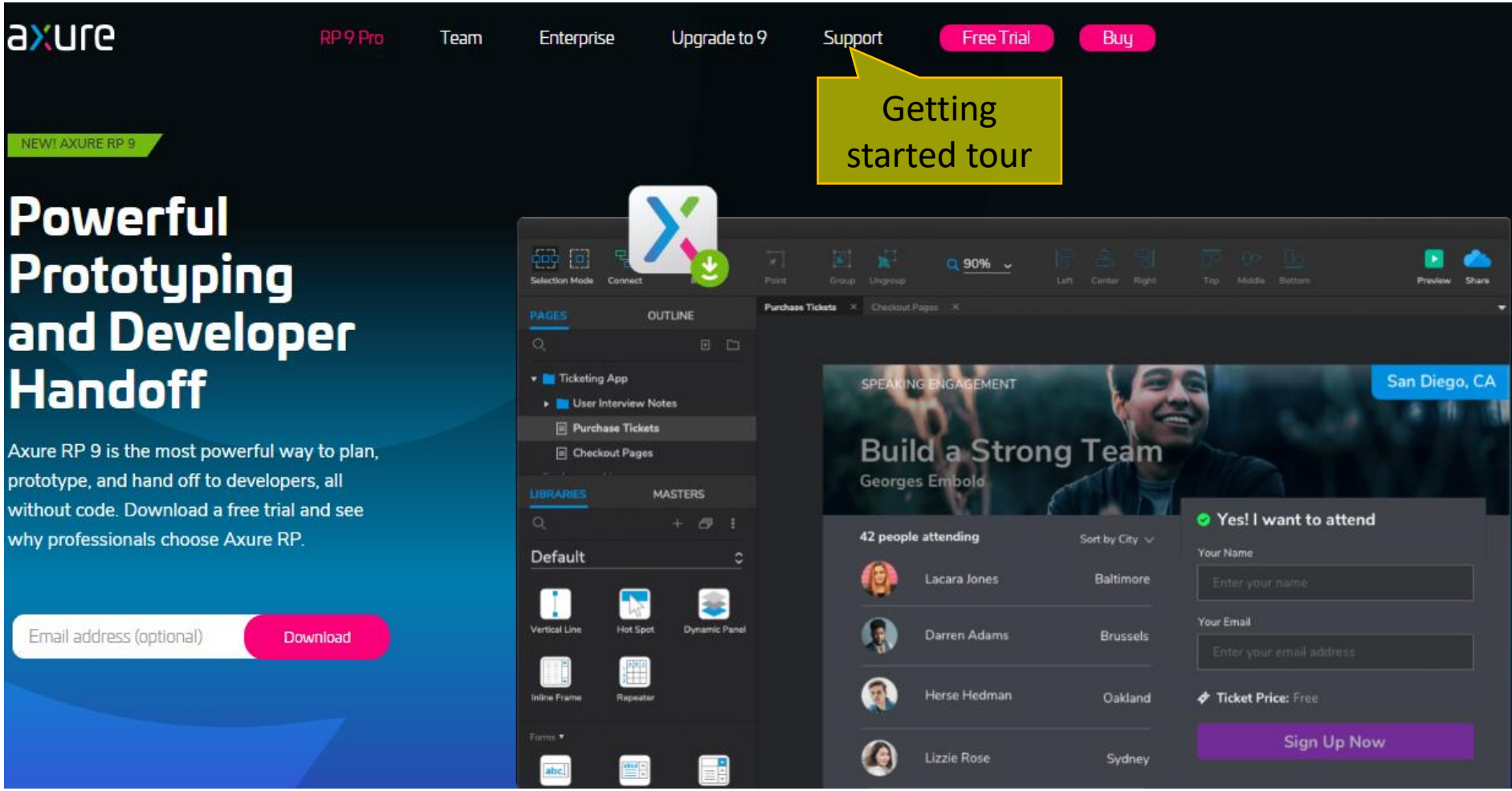
axure.com



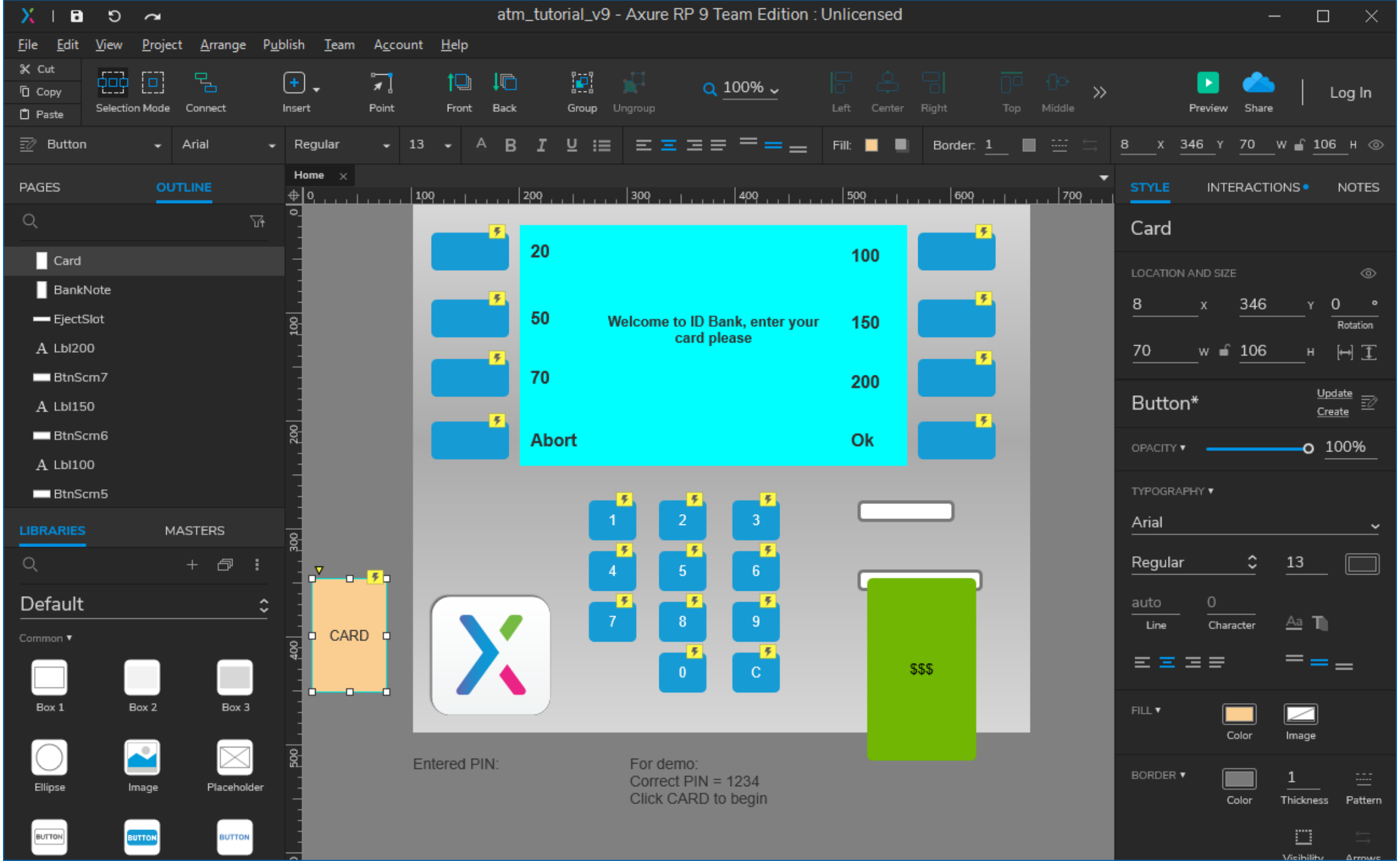
Learn Axure

Easy to learn:

- Tutorials on axure.com/support
- Learn @ Tutorialspoint
- Practice tutorial with this lecture



Tip: take the **getting started tour** via *Help > Welcome Screen*, or via *Support* on site

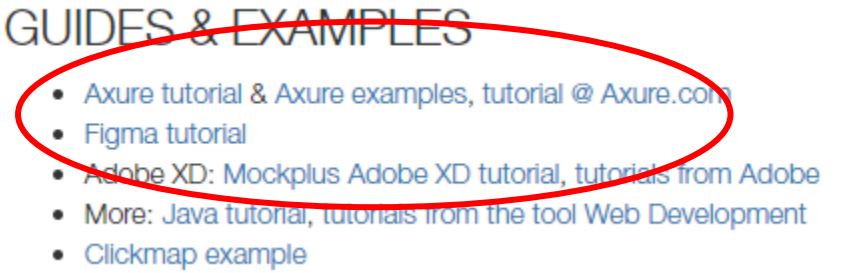

atm_tutorial_v9 - Axure RP 9 Team Edition : Unlicensed
File Edit View Project Arrange Publish Team Account Help
Cut Copy Paste
Selection Mode Connect Insert Point Front Back Group Ungroup 100% Left Center Right Top Middle Preview Share Log In
Button Arial Regular 13 Fill: Border: 1 8 X 346 Y 70 W 106 H
PAGES OUTLINE
Card
BankNote
EjectSlot
Lbl200
BtnScrn7
Lbl150
BtnScrn6
Lbl100
BtnScrn5
LIBRARIES MASTERS
Default
Common
Box 1 Box 2 Box 3
Ellipse Image Placeholder
Home
20 100
50 150
70 200
Abort Ok
Welcome to ID Bank, enter your card please
1 2 3
4 5 6
7 8 9
0 C
CARD
$$$
Entered PIN:
For demo:
Correct PIN = 1234
Click CARD to begin
STYLE INTERACTIONS NOTES
Card
LOCATION AND SIZE
8 X 346 Y 0 Rotation
70 W 106 H
Button*
Update
Create
OPACITY 100%
TYPOGRAPHY
Arial
Regular 13
auto Line 0 Character
FILL Color Image
BORDER Color 1 Thickness Pattern
Visibility Arrows

Design mobile (web) apps

- Tutorials:
  - Getting started
  - Swiping
- Responsive design with Adaptive views
  - Axure: Adaptive views
  - “Creating Responsive Prototypes With Adaptive Views In Axure”

Dynamic panels

Hide, Show, Swap, & Move Content



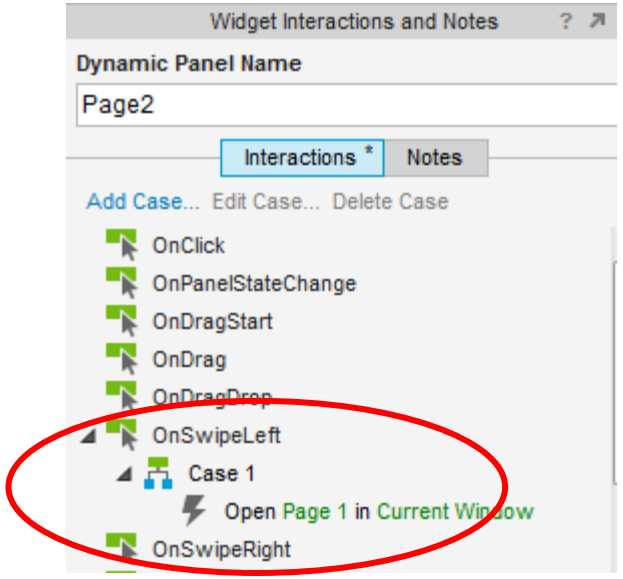
- Container for other widgets in layers, or "states“
- Useful when a portion of prototype has several different possible contents, eg. image slideshow, rotating carousel
- Add one (or more) states, put elements you want to join in a state
- Support drag&drop, swipe

vanslooten.com/uidessim

Drag example: slider-tutorial

docs.axure.com/axure-rp/reference/dynamic-panels

Swipe navigation



- A **dynamic panel** has swipe and drag & drop events
- Put a page in a dynamic panel to have swipe navigation between pages
- Example: use **OnSwipeLeft** to go to a page left of the current page
- **swipe_nav.rp**

Swiping Slideshow Tutorial

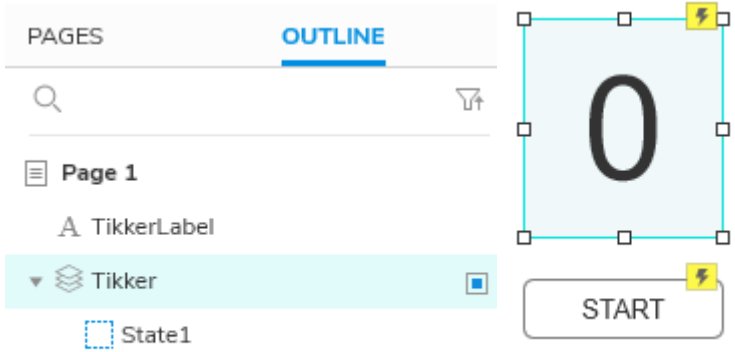
GUIDES & EXAMPLES

- Axure: tutorial & Axure examples, tutorial @ Axure.com
- Figma tutorials
- Adobe XD: Mockplus Adobe XD tutorial, tutorials from Adobe
- More: Java tutorial, tutorials from the tool Web Development
- Clickmap example

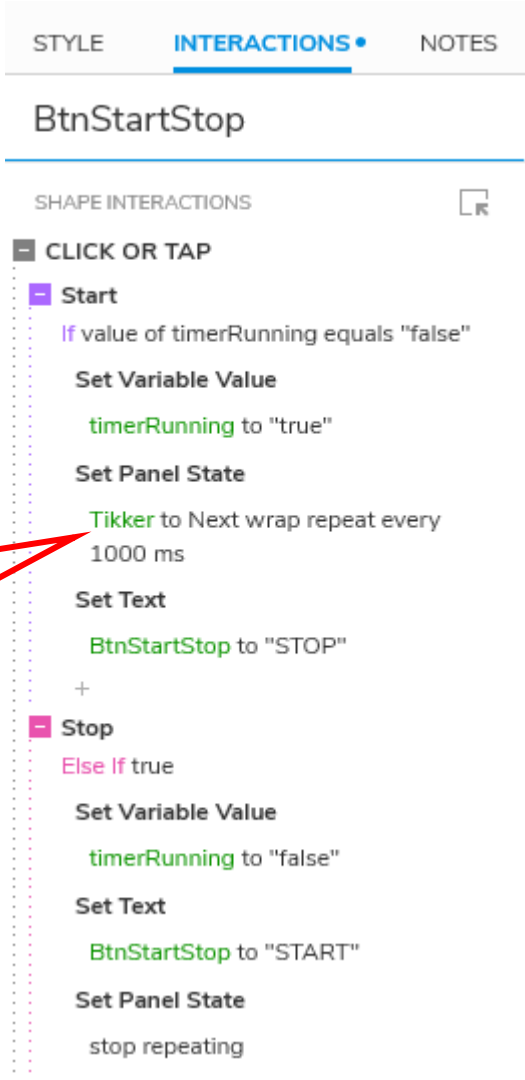
Dynamic Panel

Use a Timer or stopwatch

- Have a dynamic panel change it's *state*
- **timer.rp**
- **basic_stopwatch.rp**
- **clock.rp**



Start changing state, repeat every second



Timer tutorial

GUIDES & EXAMPLES

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- Figma tutorials
- Adobe XD: Mockplus Adobe XD tutorial, tutorials from Adobe
- More: Java tutorial, tutorials from the tool Web Development
- Clickmap example

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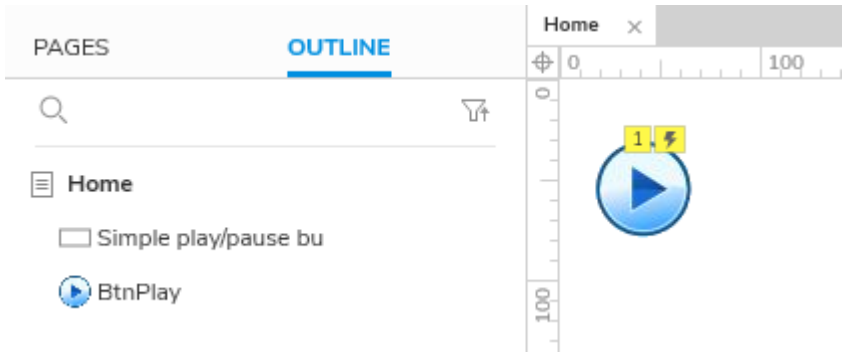
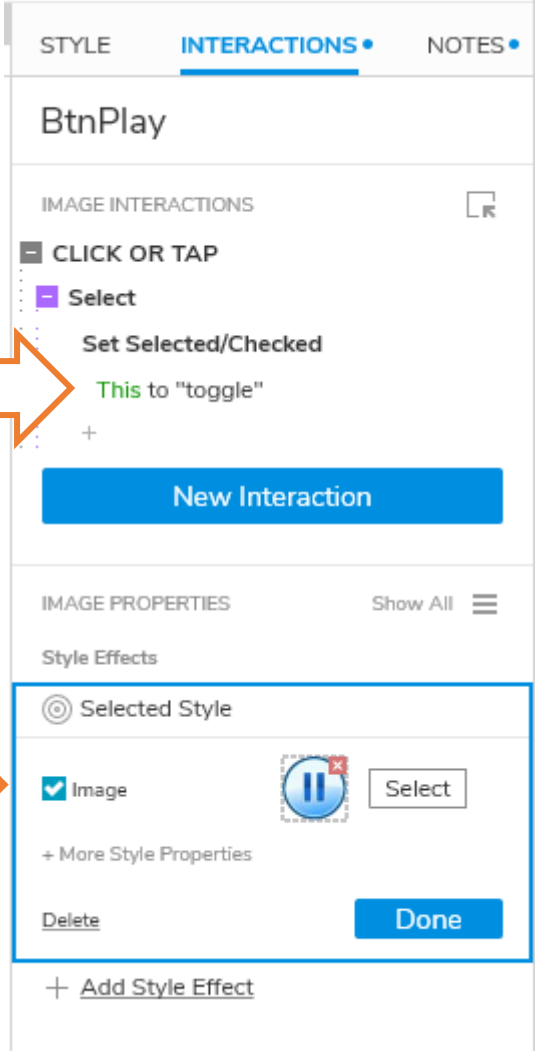
Design your own buttons

… and other shapes

add interactions…



OnClick: **toggle** between *selected* and *not selected*

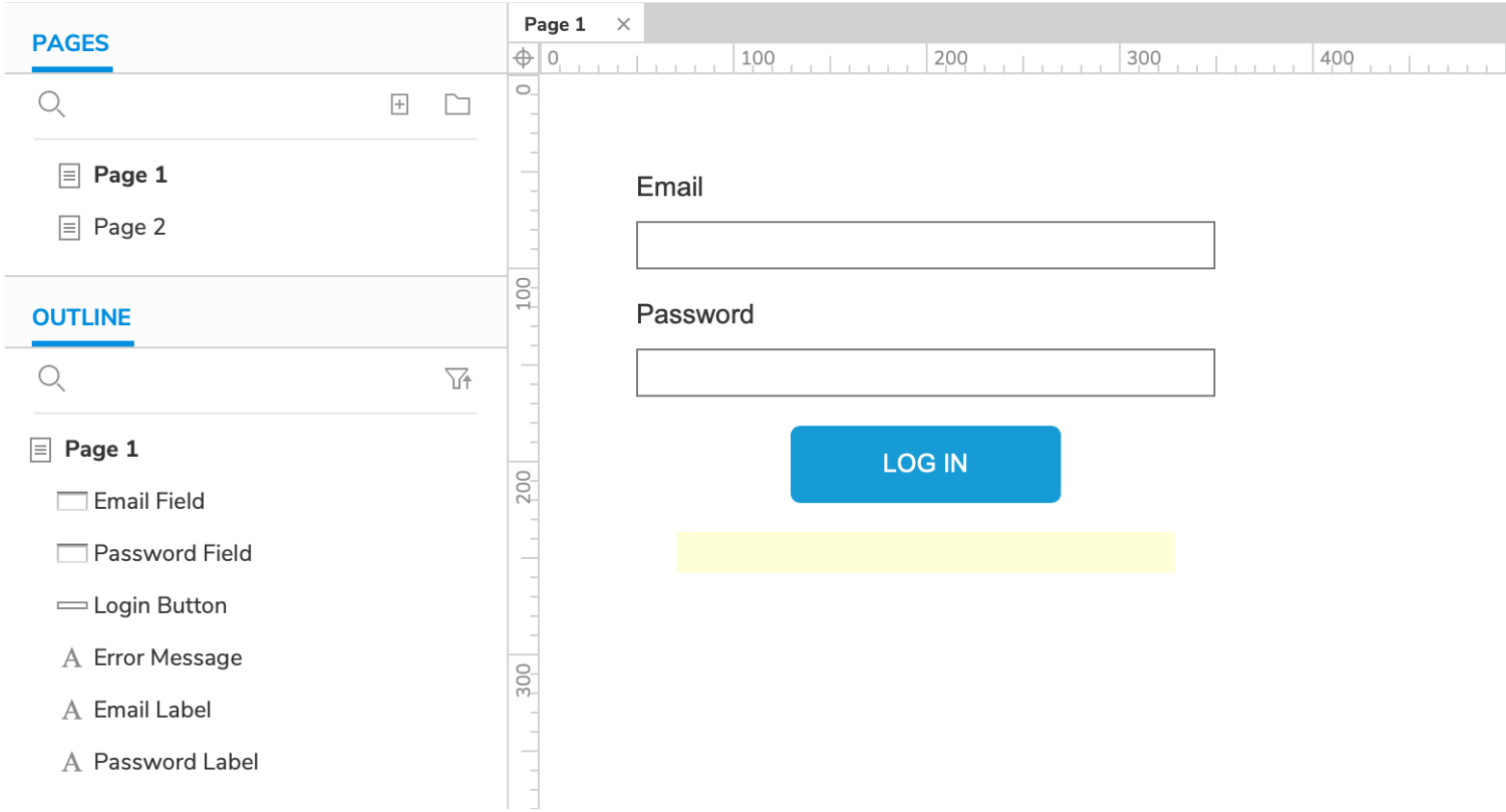


Add “selected” image

See example **play_pause_button.rp**

FORM VALIDATION

- Use required fields
- Check for proper values (valid e-mail address?)

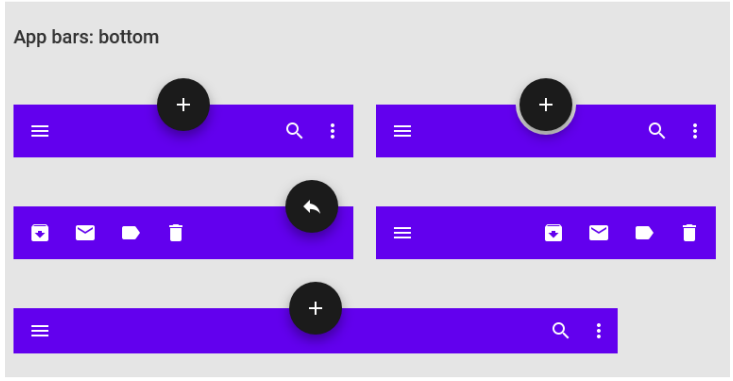


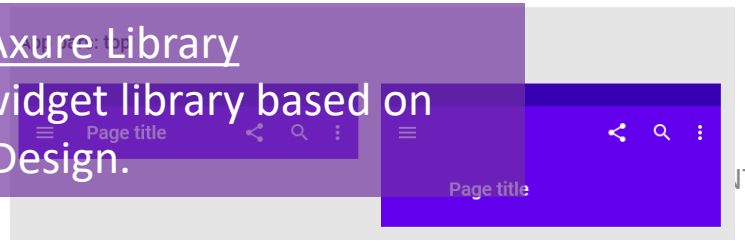
Example: a login form that verifies the user

WIDGET LIBRARIES

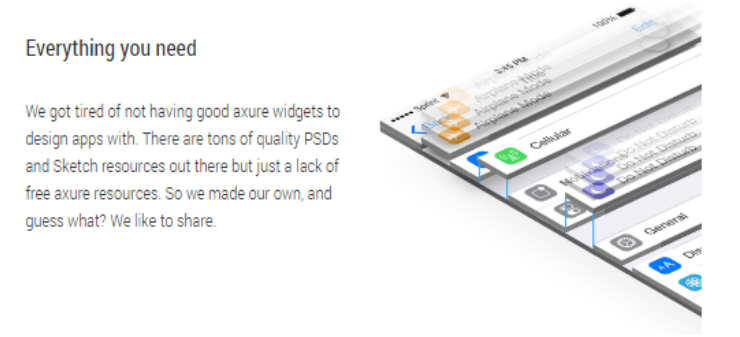
- [UXtooltime.com - extensive free Axure widgets to design Android & iOS apps]
- [More widget-libraries]

Material Design



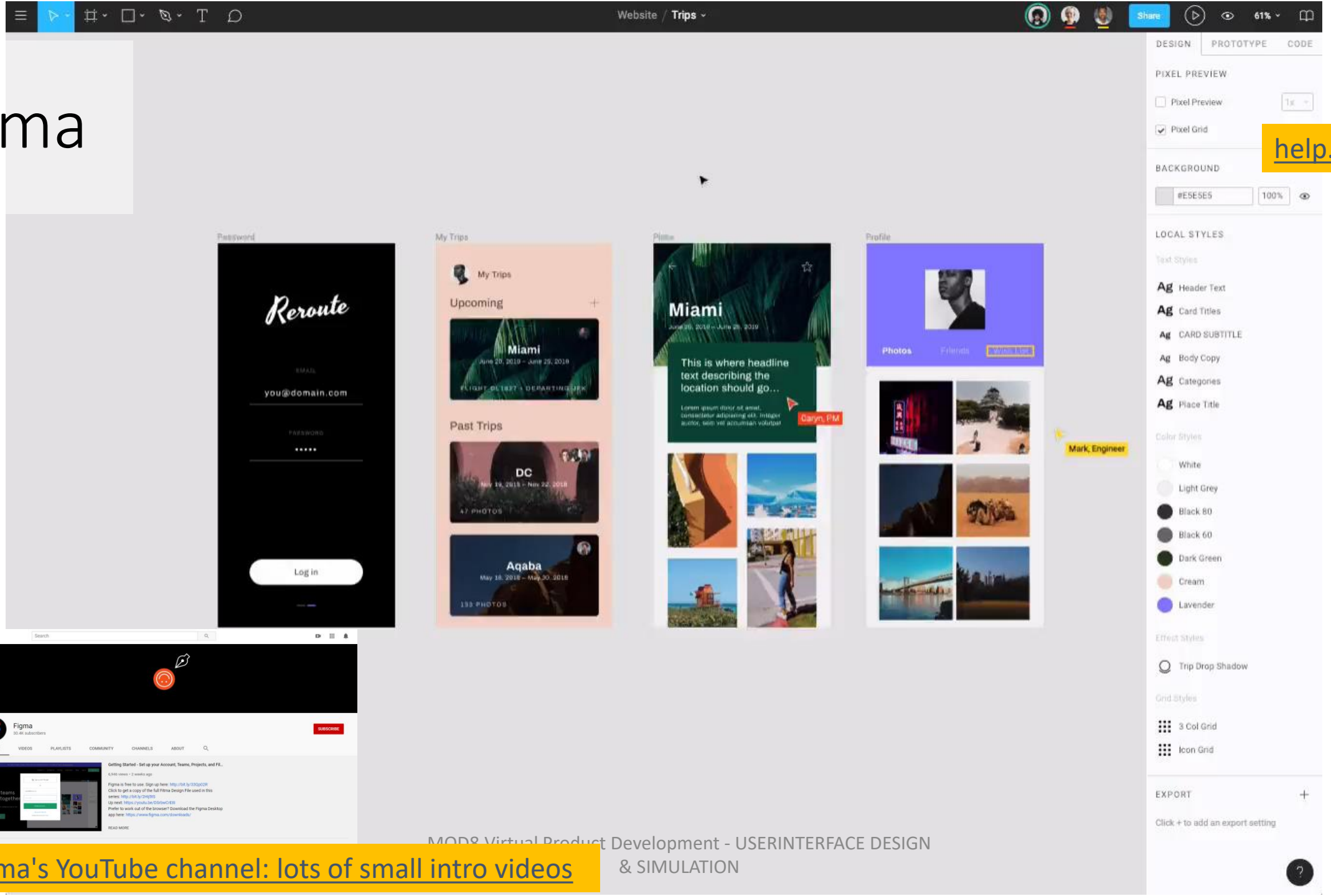


[Material Design Axure Library]
This is an Axure widget library based on Google Material Design.



Figma

Quickly prototype Apps, websites...



help.figma.com

Figma's YouTube channel: lots of small intro videos

Figma: design

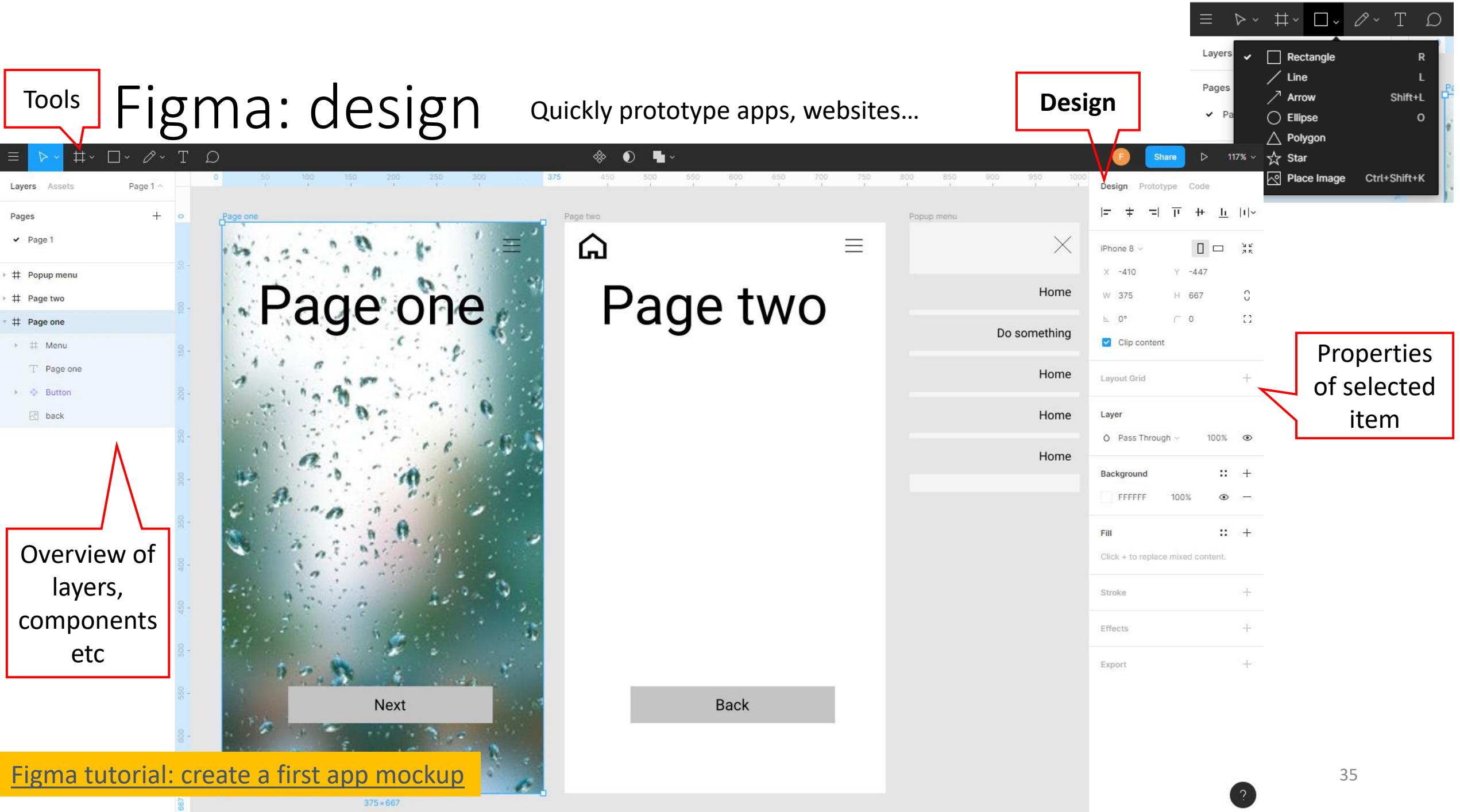
Quickly prototype apps, websites…

Tools

Design

Overview of layers, components etc

Properties of selected item

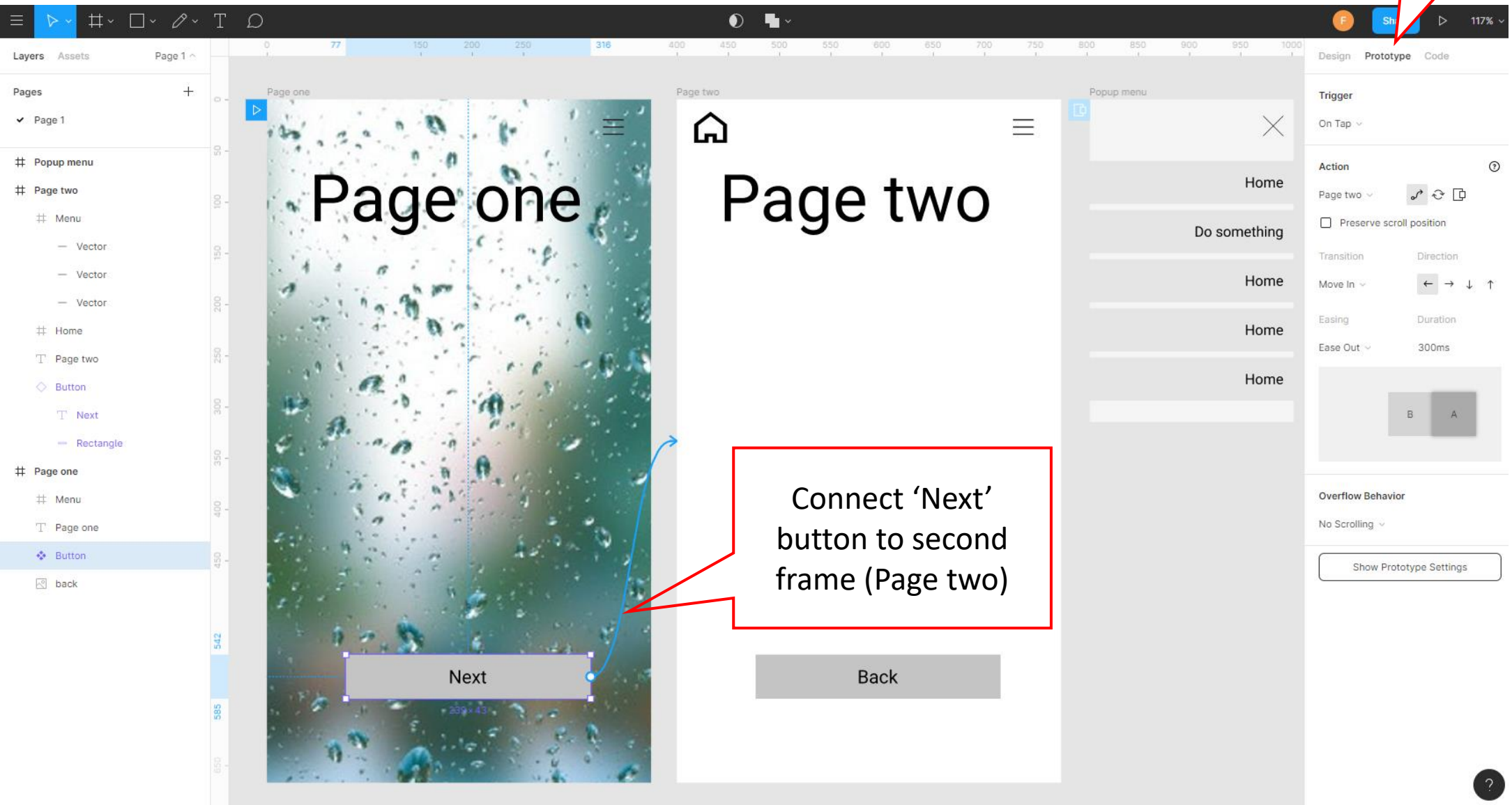


[Figma tutorial: create a first app mockup]

[Figma tutorial: create a first app mockup]

Figma: prototype

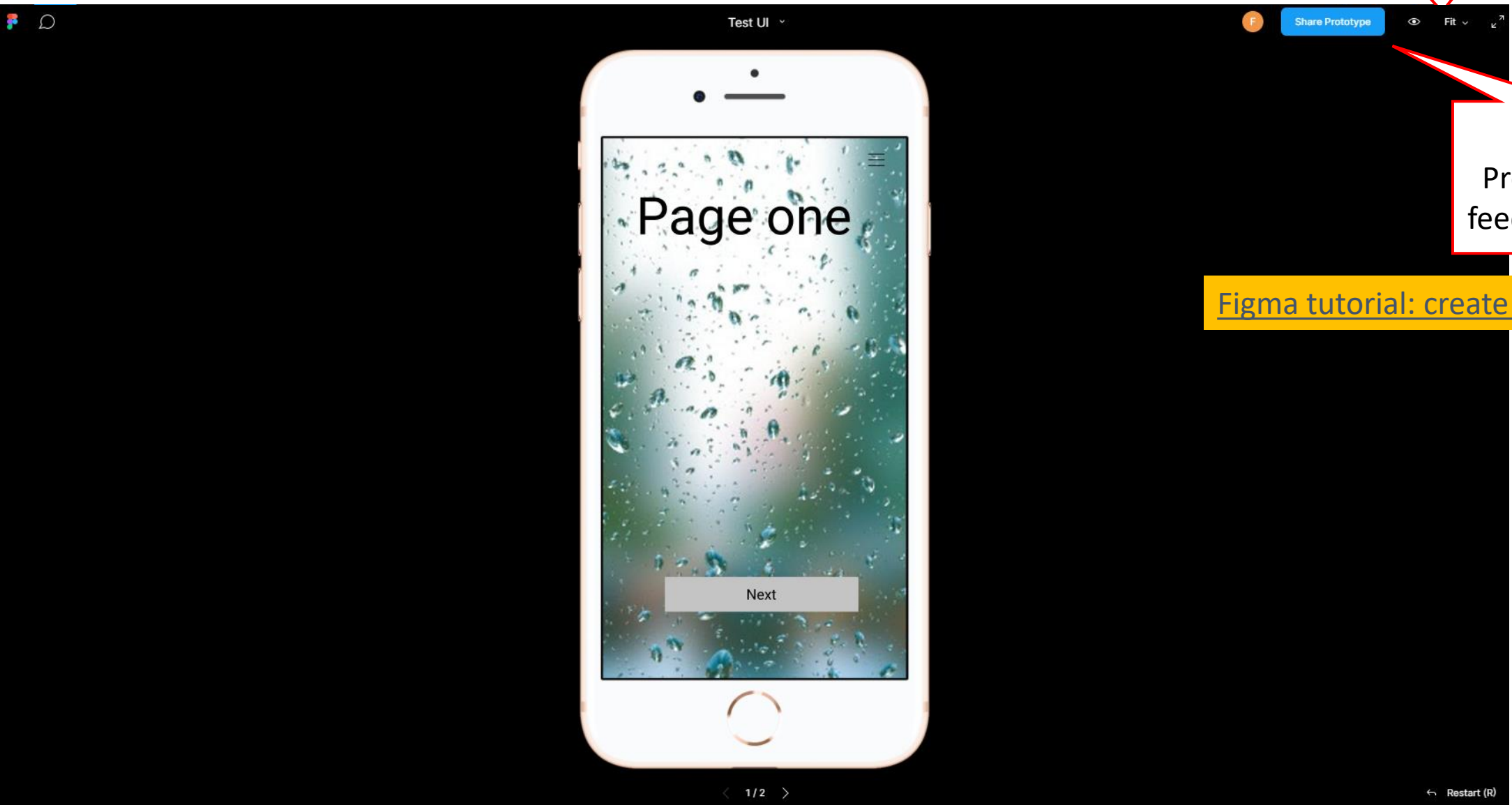
Add interaction



Figma: play prototype

And share…

Press Play ▷ to test Prototype

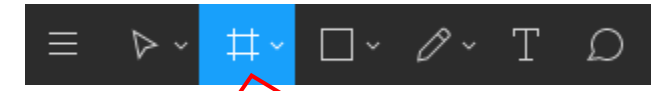


And Share Prototype to get feedback/evaluate

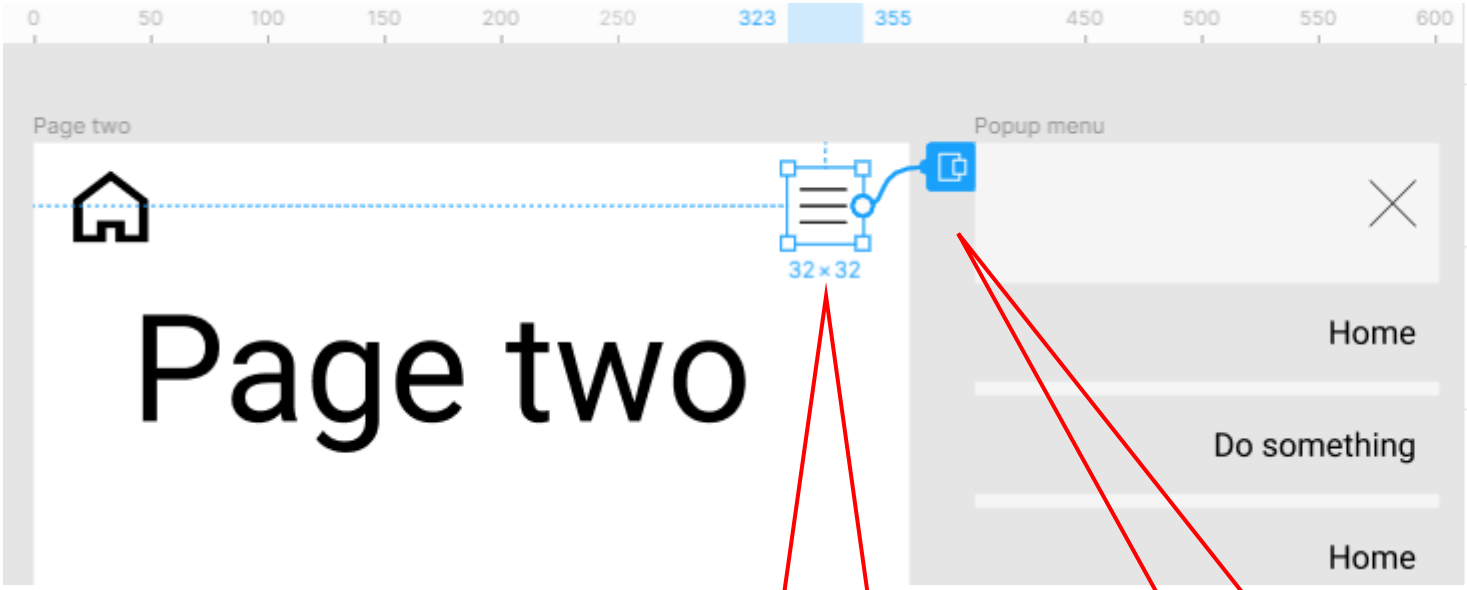
Figma tutorial: create a first app mockup

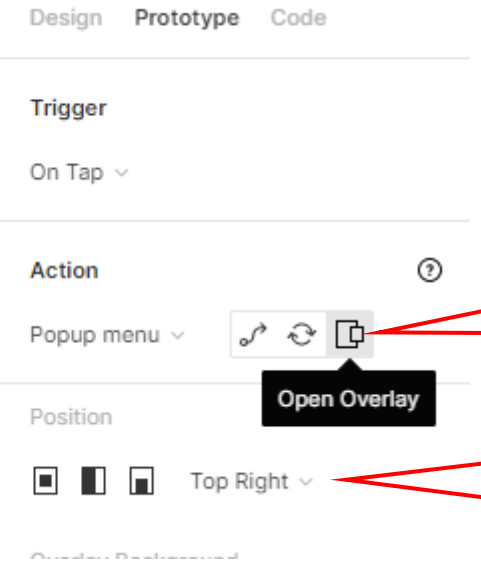
Example: menu

Figma: frames can be used as overlays



Draw a frame





Open as overlay

At top right position

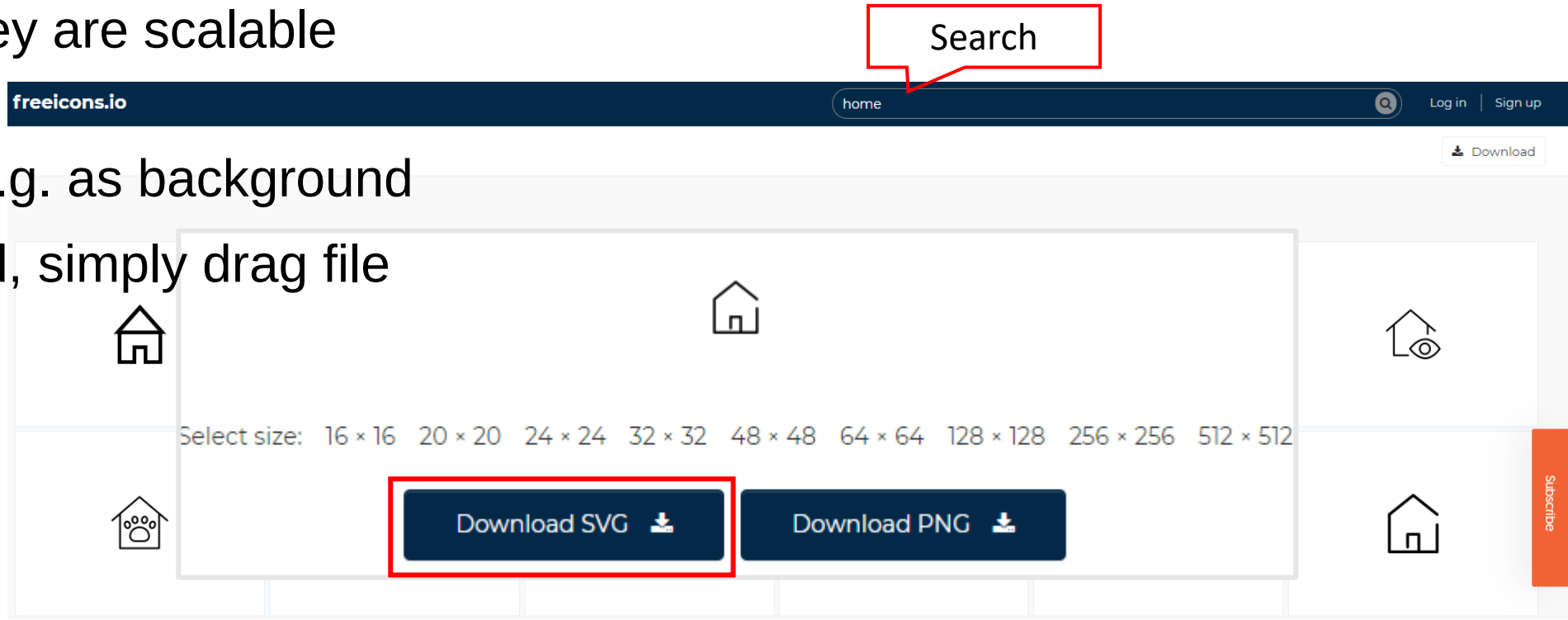
When we click hamburger menu

Open Popup menu

[Figma tutorial: create a first app mockup]

Figma: Use images and icons

- Use SVG images as icons
- Advantage: they are scalable (vector based)
- Use images, e.g. as background
- After download, simply drag file into Figma

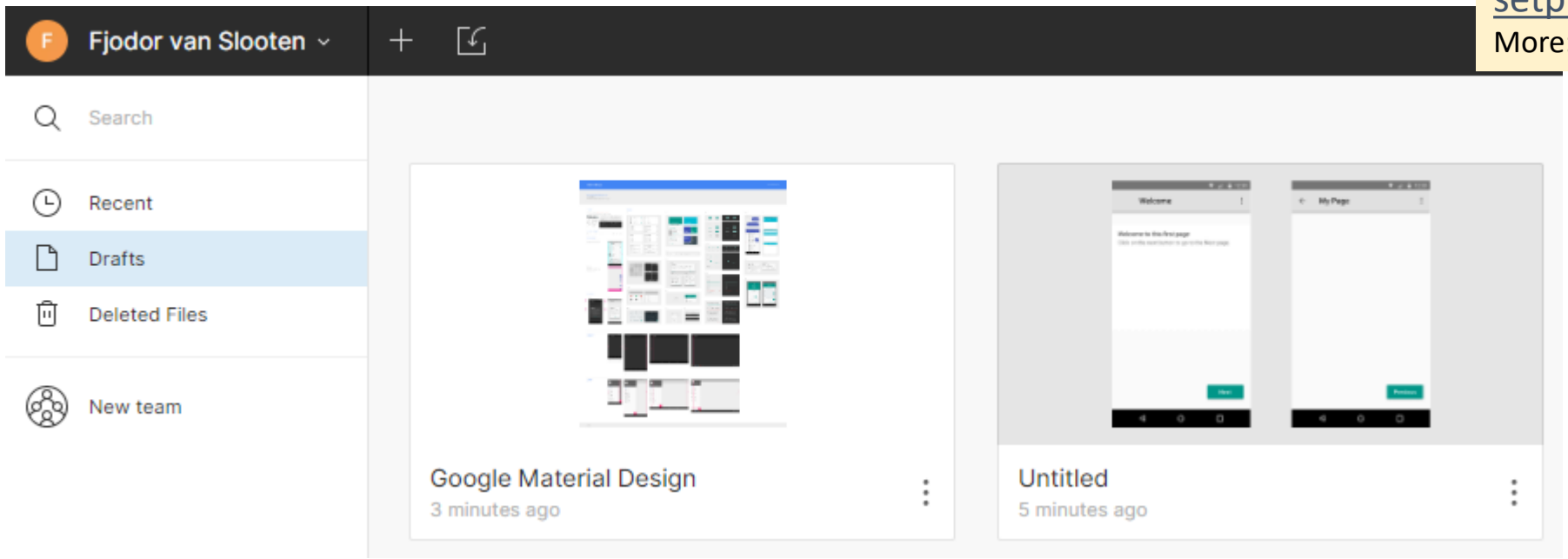


freeicons.io

help.figma.com/article/81-import

Figma: Use a library

figmaresources.com
setproduct.com ($)
More: google “free figma templates”



Example: use the “Google Material Design” kit from ui-kit.co

1. Download the kit (.fig file)
2. Go to *files* screen (Menu > Back to Files)
3. Import the file using the import icon in the top bar
4. Open it in a new tab
5. *Copy-paste* the components you need into your sketch (in the other tab)

Figma: test on your phone

- Mirror App: view/test prototype on your phone (Android and iOS)

https://help.figma.com/article/90-figma-mirror

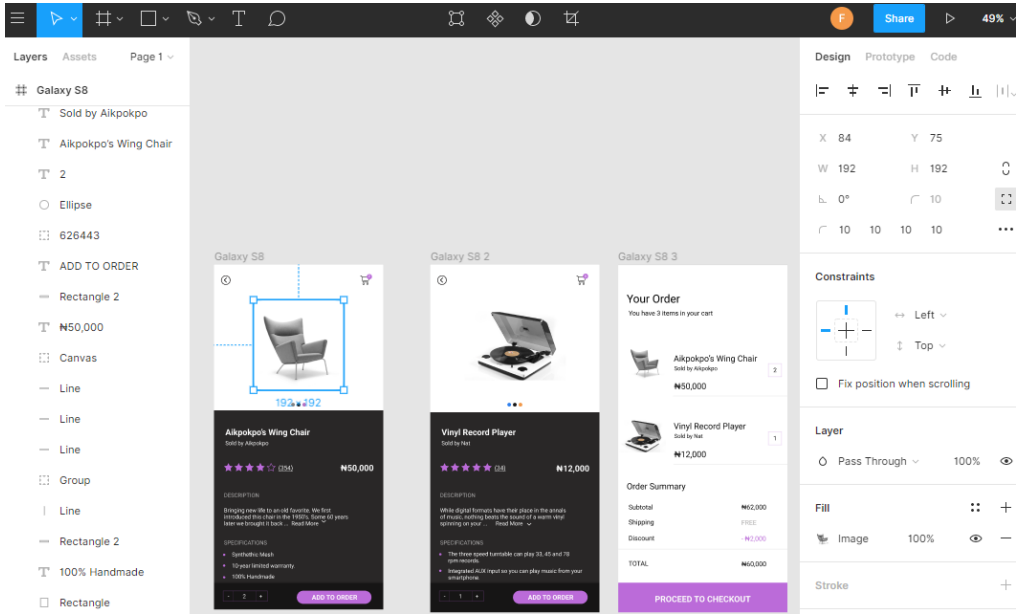
TUTORIAL

GUIDES & EXAMPLES

- Axure tutorial & Axure examples, tutorial @ Axure.com
- Figma tutorial
- Adobe XD: Mockplus Adobe XD tutorial, tutorials from Adobe
- More: Java tutorial, tutorials from the tool Web Development
- Clickmap example

"Practice building an interactive prototype"

Use tutorial to practice prototyping with **Figma**



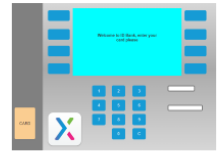
Use tutorial to gain experience with **Axure**

Axure tutorial: prototype an ATM

This tutorial is written for Axure RP version 8. A new version for Axure 9 will be available soon. But most of the things will work in Axure 9.

A trial version of Axure can be downloaded via axure.com/download. A permanent license can be obtained from the teacher. The Java version of this tutorial can be found here.

Axure is a tool to create interactive prototypes of for instance applications or websites. Check out docs.axure.com/tutorials to quickly learn how it works. We created as an example, a simple prototype of an ATM. The result, the interactive demo, is available here to try:



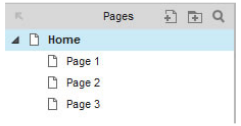
The focus of this tutorial is to achieve interaction, rather than design or ergonomics. No knowledge of Axure is required to follow this tutorial. This tutorial however does not cover all possibilities. On axure.com/learn you can learn more if needed. If anything is unclear in this tutorial, you can have a look at the end-result.

Start

When Axure is started or when you create a new document, a homepage plus three pages are created:

For this prototype, we use only one page, so you can remove page 1-3 (select and press Delete). We will start preparing the Home page.

If you need some guidance when drawing shapes, you can turn on the grid: Choose Arrange > Grid and Guides > Show Grid. There you will also find the grid settings. Through 'Create Guides' you may set columns to help you with layout. Eg. choose a layout of 960 pixels wide by 12 columns.



vanslooten.com/uidessim

DO [THIS WEEK]

- Plan your steps and decide which tool(s) to use
- What should be tested?
- What must be demonstrated? To whom?
- What tasks will be performed (with the prototype)
- Dynamic vs. static test
- Level of realism
- Desired interaction & animation
- Graphic presentation

- Next session (May 27th):
  - Use Axure/Figma to realize interactive prototype for project

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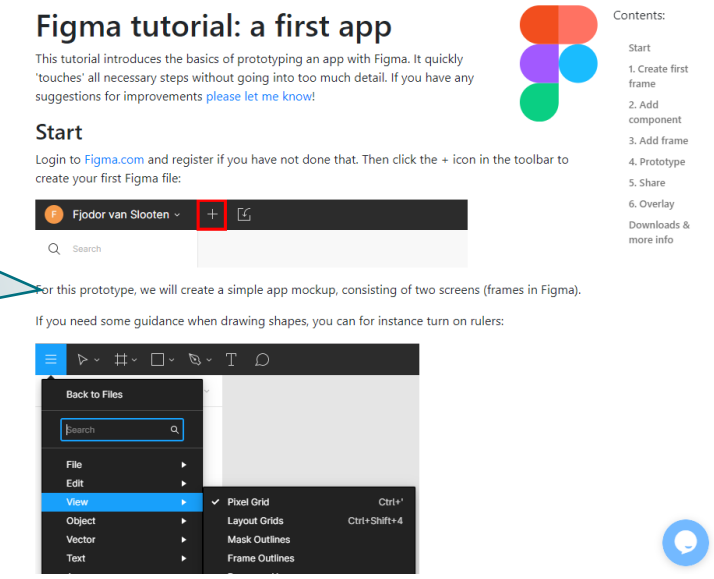
QUESTIONS?
/WHAT'S NEXT

- How to ask questions:
- During lecture hours:
  - Use chat on website
  - Make appointment for video chat (using website chat or email)
- Outside lecture hours: email
- Next step: share with your project group & with teacher
  - This & next week: Learn a prototyping tool
  - (After that) Apply/use for project



Chat is available on tutorial pages also

Use chat on website