Mobile application development

移动应用开发

Lecture 04:

How to design an effective app _1

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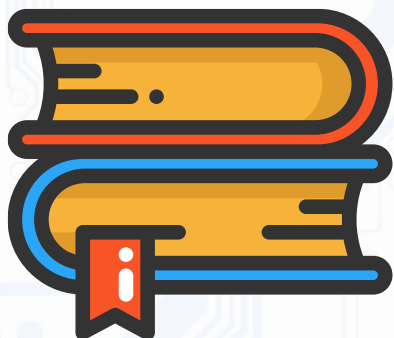**university of science and technology, China**

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Autumn _2021

MOBILE APPLICATION DEVELOPMENT

LECTURE 04: How to design an effective app _1

App Inventor

Help me to have the better lecture:

1. some student report the problems to use the mooc I will update the ppt on this link but please check the mooc also: https://github.com/drajm/Mobile-development

   Please check the MOOC also it will check by university

2. I will answer your question but Pleas try to ask your relevant question in lecture time some student ask 1 am and expected answer.Even if you want we can confirm one day with the specific time for your question

3.Just send your task on MOOC the receive task in WeChat will be delete.

4.Consider the task assignment time and format after that time the system will not permit to send.

5.Please remember most of your final mark will be carried by task
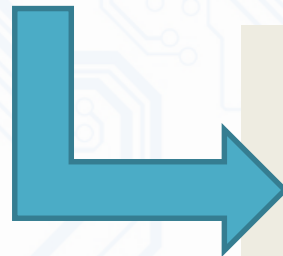
For task
- Just MOOC
- Just PPT with the format
- Just task

- Students who want to work on a project in image processing or robotic I can give them some research task and if they can finish we can have some project.

- For this project I can just select maximum 4 student and between this 4 , two student will be select
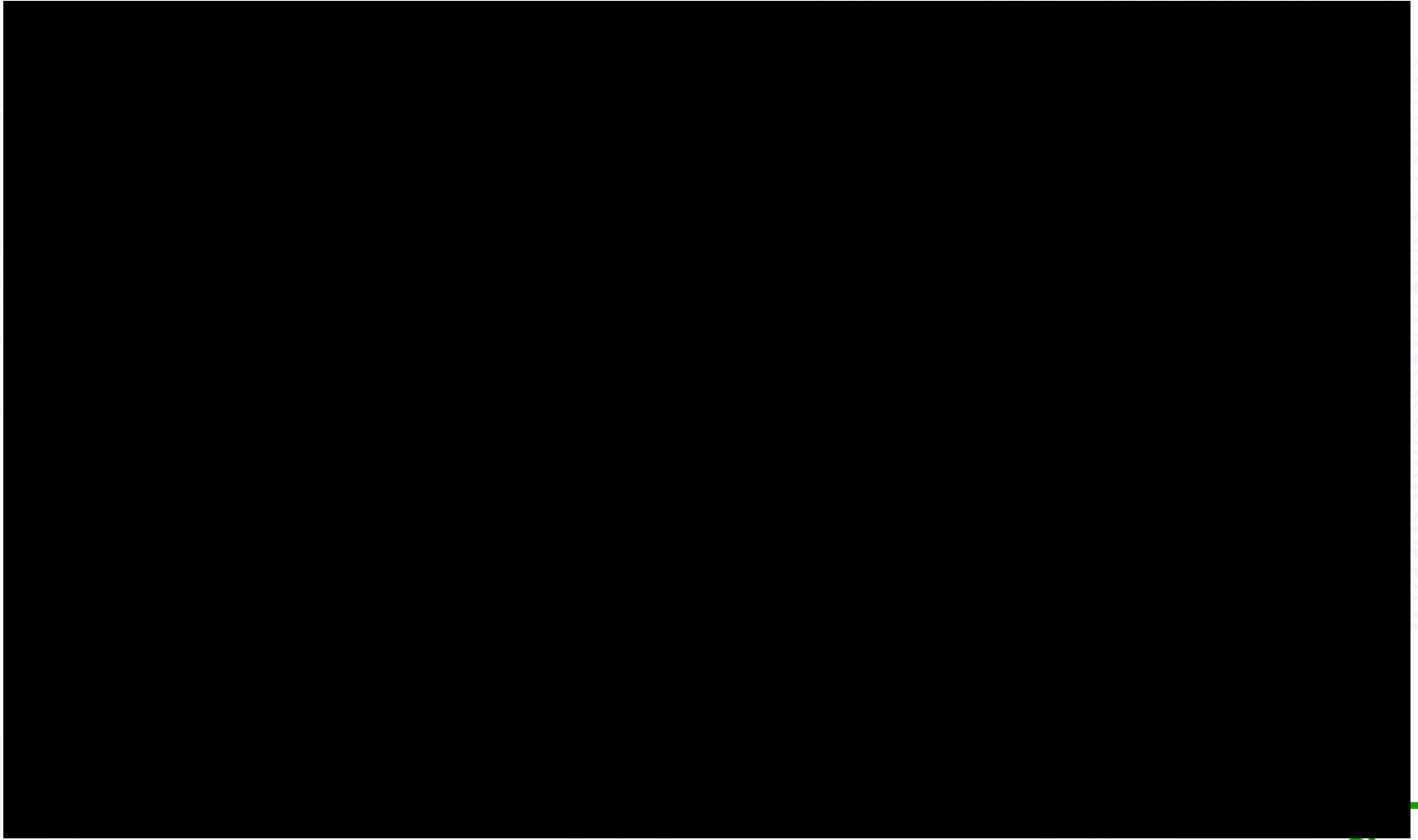
Lecture outline:

We will review 3 point of and step which introduce by experts

1. Concept development
2. Outlining the app
3. Design considerations and platforms
4. Budget development
5. Programming
6. Graphic design
7. Submission, approval and updates
8. Common pitfalls

App Inventor

Concept development

- **Identify the purpose of the application ("app").**

- What will the app do?

  – Specify the minimum functionality. Will the app perform a specific task and/or deliver information?

  – Most apps do one thing and do it well.

  – Avoid overly complex functionality.

Example:

- The "The Plant Doctor" app provides interactive diagnosis for plant health problems.

- Users submit text and photographs to assist the diagnosis.

Concept development

- **Identify the intended users of the app.**

Who will use the app?

- What is the target audience?
- Is the app free or for payment?

Example: Users of "The Plant Doctor" app include: Farmers,gardeners, homeowners, landscape professionals, County Agents, plant quarantine workers, professionals, and scientists. To date, users reside in 40 foreign countries and in41 states in the USA.

Concept development

Different types of audiences

- Children

- Adults

- Various levels of education

- Various levels of expertise

- Types of devices: Android versus iPhone

- Nationalities: Language, translations

- Your app and its design should *appeal to* and *serve* your target audiences: appearance, colors, functions, tasks

App Inventor

Concept development

Specify the device(s) to which the app will be delivered

- – Web app vs Native app
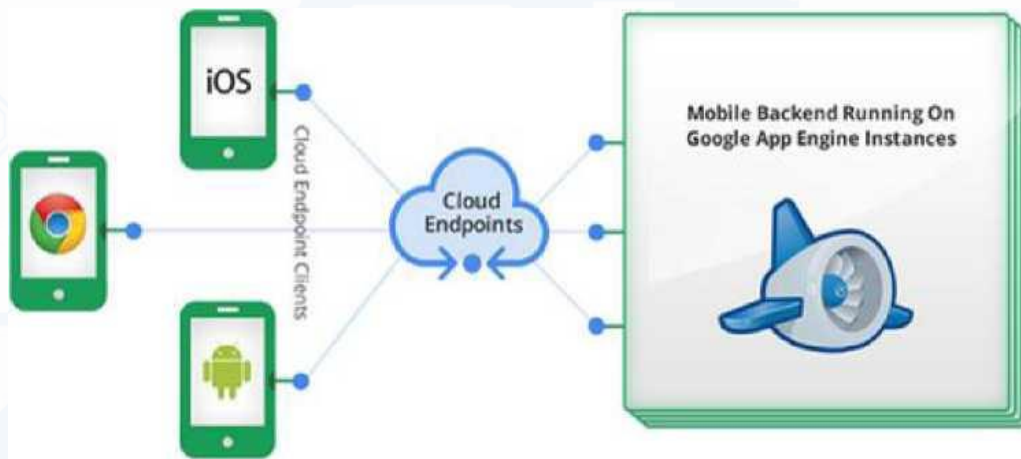
- – Phones vs Tablets

- – iPhone vs Android

- The choices determine the programming language and coding

App Inventor

Google Cloud Platform

- Build APIs with Google Cloud Endpoints

API

Application
Programming
Interface

- **In a multi-platform, multi-client and multi-screen world, it's often important to think about building APIs first and using a shared backend to connect to client applications later.**

- **Google Cloud Endpoints provides developers with a simple way to create, expose and consume APIs served from App Engine. Read more or get started**

Concept development

Memory and space considerations

- App size is limited only by the space available on a device.

- There is no recommended size for apps.

Concept development

Name the app:

- The app name should accurately reflect the function of the app.

- The app name should be unique, if possible, and not replicate the names of other apps.

App Inventor

Outlining a draft of the app

- Create a draft step chart: Identify each thing the app will do, in a stepwise fashion.

- Create a draft page chart: Sketch and compose the appearance of various pages.

- Specify the graphics and navigation buttons needed for the app functions

- Specify the outputs and calls

App Inventor

Design considerations

- Design the app for fingers (not for a mouse)
  - 44 x 44 pixels for buttons
  - 6 buttons maximum per width of screen (smart phone)

- TEXT INPUT: People do not like to type, so keep typing at a minimum

- TEXT OUTPUT: People generally do not like to read, so keep text at a minimum unless your app is designed primarily to deliver information in text format

App Inventor

Budget development

- **How much will it cost to develop the app?**

1. Personal vs. contract development

2. By hour or by project development. Costs per hour vary among countries ($15-20 for India: $50-60 for USA; $100 for USA technical)

- Example:

"The Plant Doctor" app development and deployment cost 80 hours (at the US rate) for each platform (iOS and Android), for a total cost of $9,600.00 ($4,800.00 for each platform).

App Inventor

Programming

- **Self-programmed versus Contracted programming**
- (note: people without programming experience should probably not try to build an app)

  - Apple (iTunes): programming language = iOS

  - Google (Android): programming language = Java

- **Before budget development:** Prepare detailed requirement documents (what the app does). Prepare a detailed use case document (describe each functionality of the app)

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Programming

- **We contracted the following companies for the development of "The Plant Doctor" app.**

- **App development company:**

- Adelante Consulting (Canada)
  www.adelante.ca

- 1 (647) 501-3737

- **Graphics design company:**

- AQUASoft (Romania), normally only does large jobs
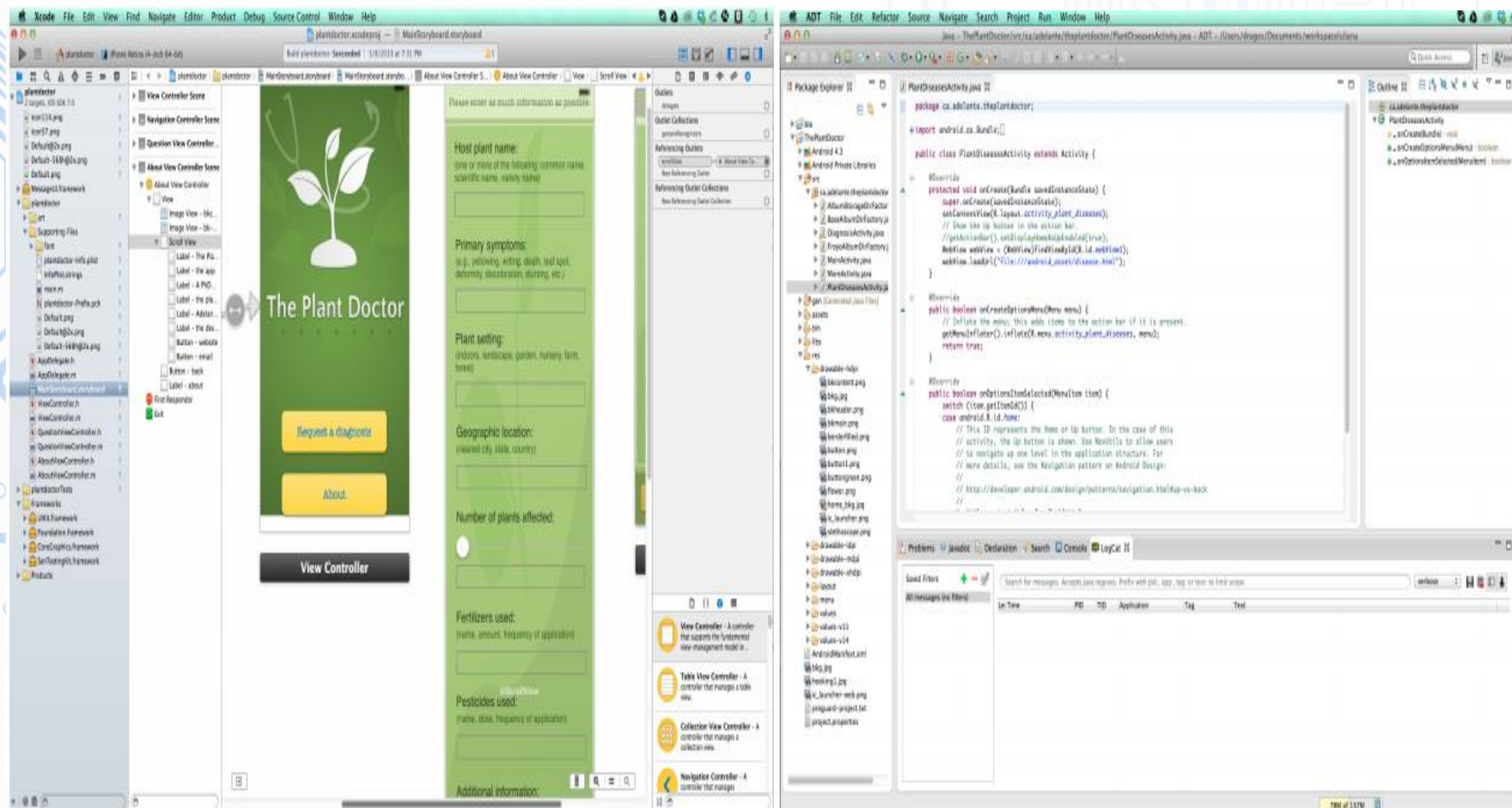 http://aquasoft.ro/

App Inventor

Programming

Sample pages from the Apple Developers programming software environment appear on the following screens.

- Remember: Developing an app is writing a program using a specific programming language suited for a particular device.

- Therefore, a developer should be familiar with the software and the programming language.

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Programming

Graphic design

Appearance of the app is very important and should be a high priority, with sufficient budget provided for graphics.

Graphic design is best done professionally.

- Costs:
  - Romania = $200 to $300 per screen
    USA = $500 per screen

- One can expect much higher costs for the unique design of multiple screens. The cost for "The Plant Doctor" graphics design was $300.

Graphic design
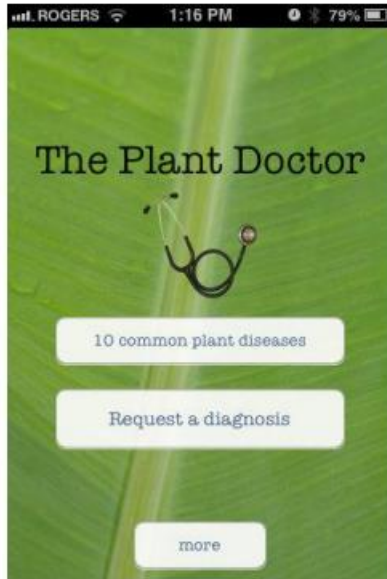
- **Considerations in graphics design:**

Colors and color theme (background, buttons)
- Art
- Text (size, color, font)
- Layout
- Balance
- Layering

Graphic design

Before professional design

After professional design

Before professional design


After professional design

Submission and approval

- **The app submission process varies by platform**

- Apple: checks for no crashes; the app does what is says it will do; and minimum information content may be needed

- Developer accounts:

- Apple: Developer's license = $100/year
  Google: Developer's license = $20/year

- <u>Note</u>: For the for-sale apps, payment to Apple or Google is 30% of your profit. Free apps do not incur this charge.
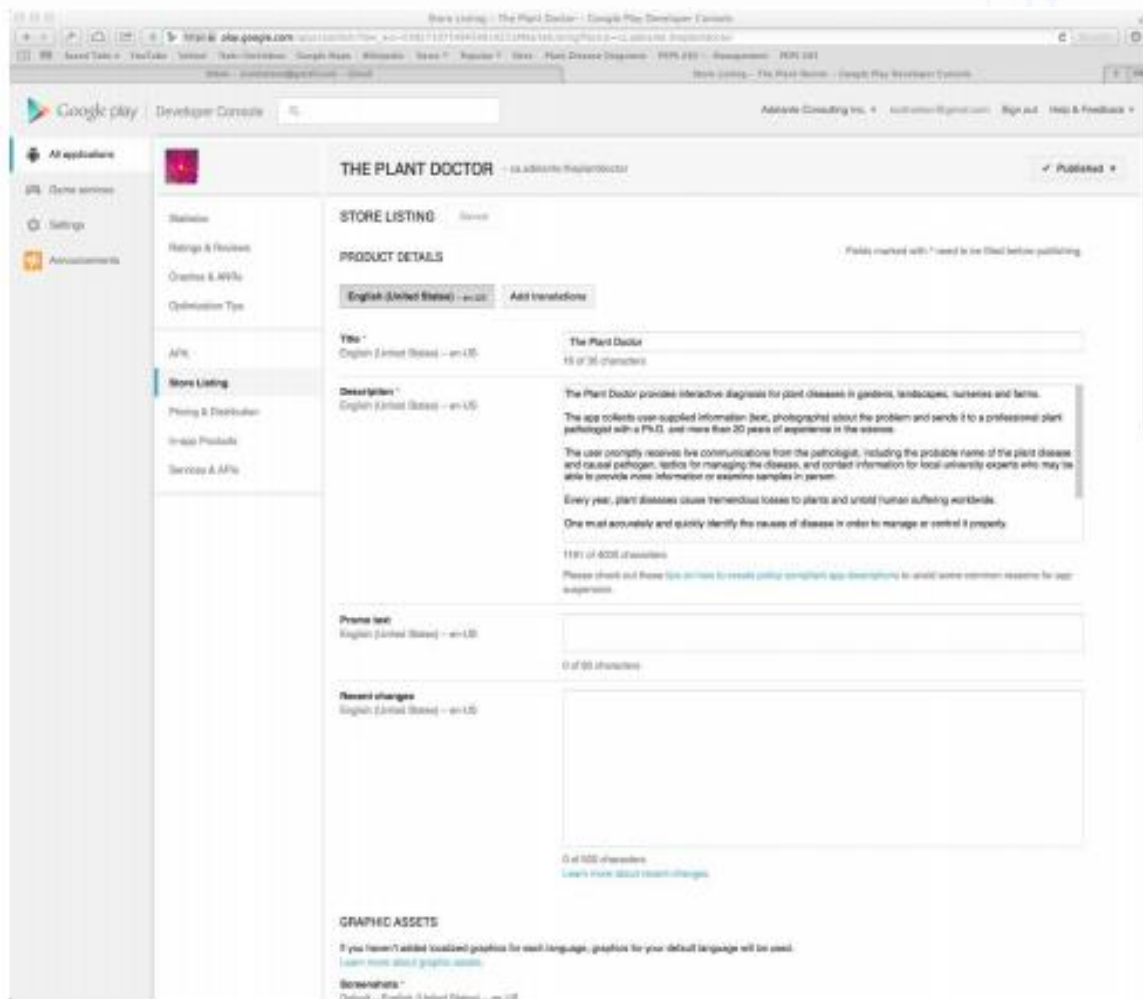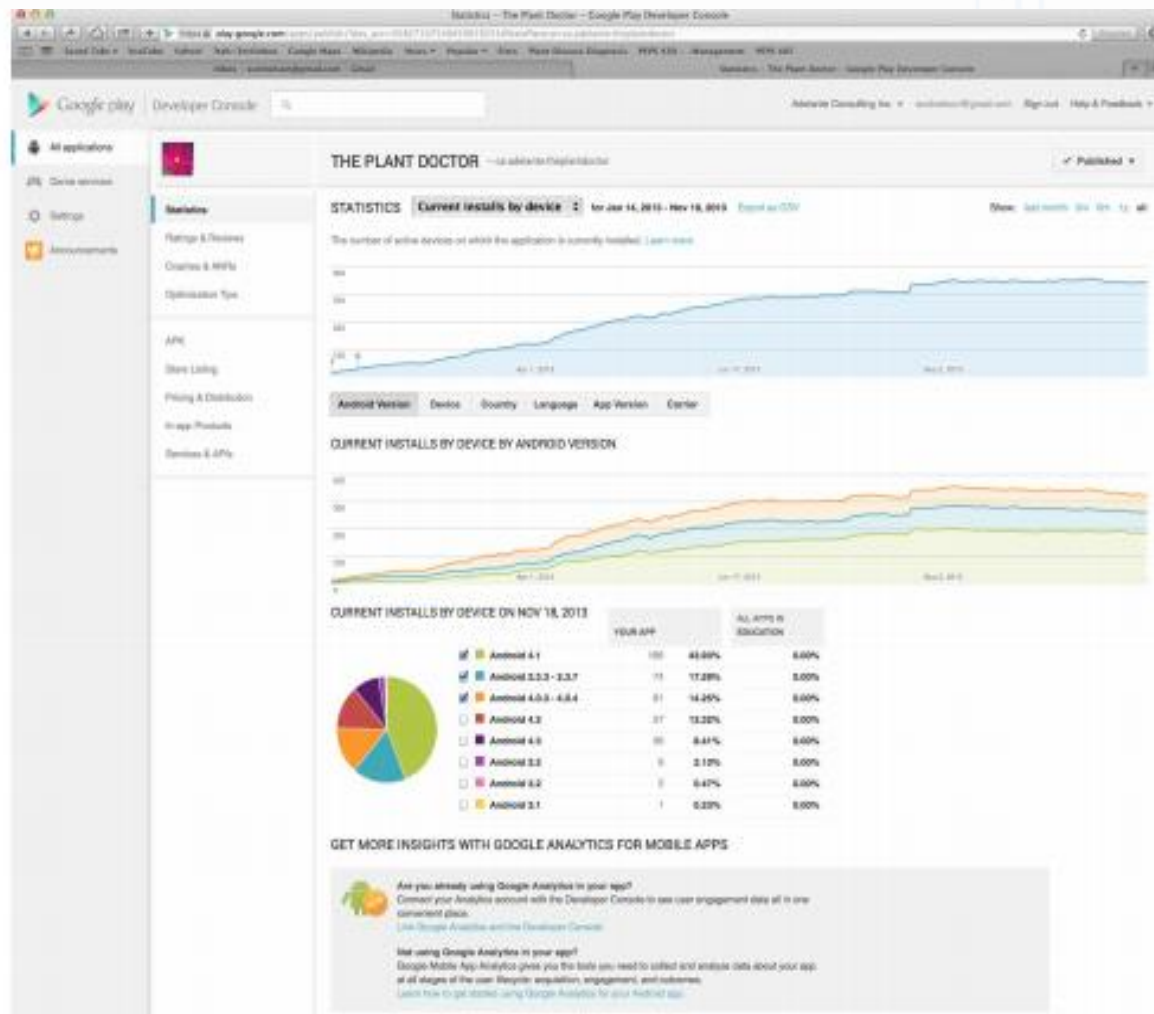
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Google
developer console
(Android)
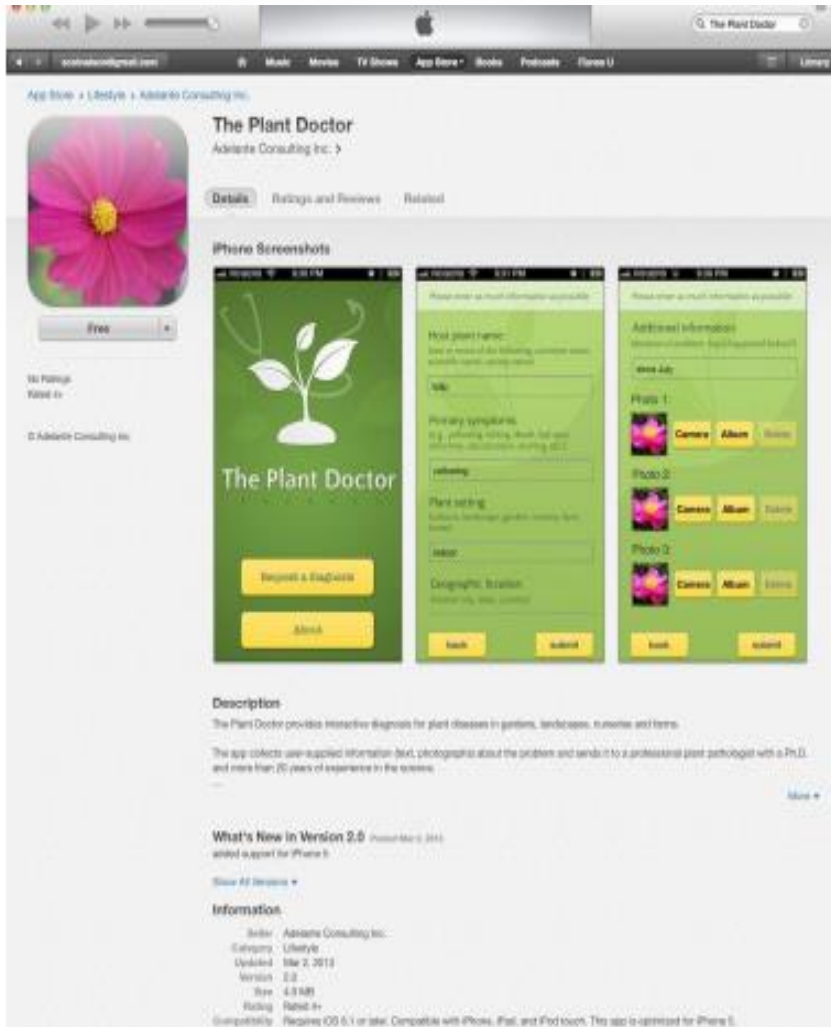
Google
developer console
(Android)

App description and download page at the iTunes store for "The Plant Doctor" app

Submission and approval

- Updates for apps may be required as new versions of phones emerge onto the market.

- The new phones may have updated or newer versions of software which require app updates.

- App developers should prepare for this eventuality.

- Example: "The Plant Doctor" had to be updated for use on iPhone 5.

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# Common pitfalls

1. Do not build an app without having the intended device nor without having experience using the device (the environments, menus and appearance
    differ among devices)

2. Have a very clear idea of what the app will do

3. Develop the flow of processes clearly and precisely

4. Ensure that your budget is sufficient to completely fund the development of the app
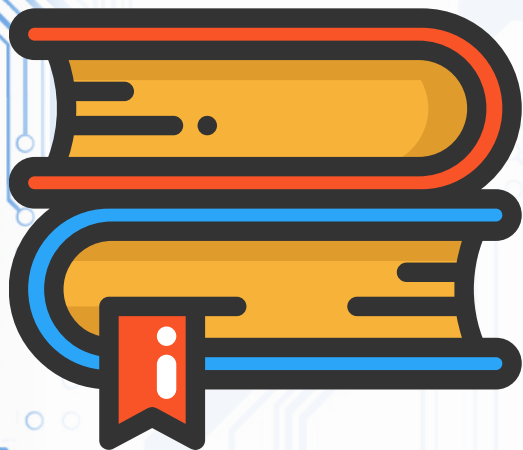
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LECTURE 04: **How to design an effective app _2**

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How to design an app:

[Chris Paish](),
https://99designs.com.au/blog/web-digital/how-to-design-an-app/

How to design an app:

- **Getting started**
  - Set the goal of your app
  - Make a plan
  - Research your niche and competitors
- **Design and development**
  - Create a wireframe
  - Get your app designed
    - Options for getting your app designed
    - App design tips: What to look out for during the app design process
  - Collect feedback on your design
  - Get your app developed
- **Testing and launch**
  - Test your app with a focus group
  - Launch a beta version
  - Launch your app

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How to design an app:

03 Testing and launch
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https://99designs.com.au/blog/web-digital/how-to-design-an-app/

How to design an app: Getting started

1.Set the goal of your app

Pen and paper are a good place to start. Try to think about why you are designing an app and what you're setting out to accomplish.

thinking and prepare the answers to the following questions:

1.What is the underlying goal of your app? What exactly do you want it to do?
2.How will you make your app appeal to users?
3.What are you setting out to do? What's the problem you want to help people solve with your app?
4.Why would people want to use your app instead of one of your competitors? How does it set itself apart?

• Setting clear goals for your app and writing them down will give you a reference to come back to throughout the entire process.
• If you ever forget the answer to one of these questions, having them jotted down will be a great reference to keep you on track and on course for app world domination.

How to design an app:

2. Make a plan

- Think about the answers to your questions in the first step.

- Now take that information and sketch out an outline of your project scope.

- During this stage you can delve a little deeper into how your app is going to make money (ads, in-app purchases, etc), what you need your app to do and sketch out a path of where you will take your ideas, and how you will get them working within your app.

- Think of this stage as drawing a visible road map of your app, what its functions are, who it's for, and a mini step-by-step guide as to how you can get it there.
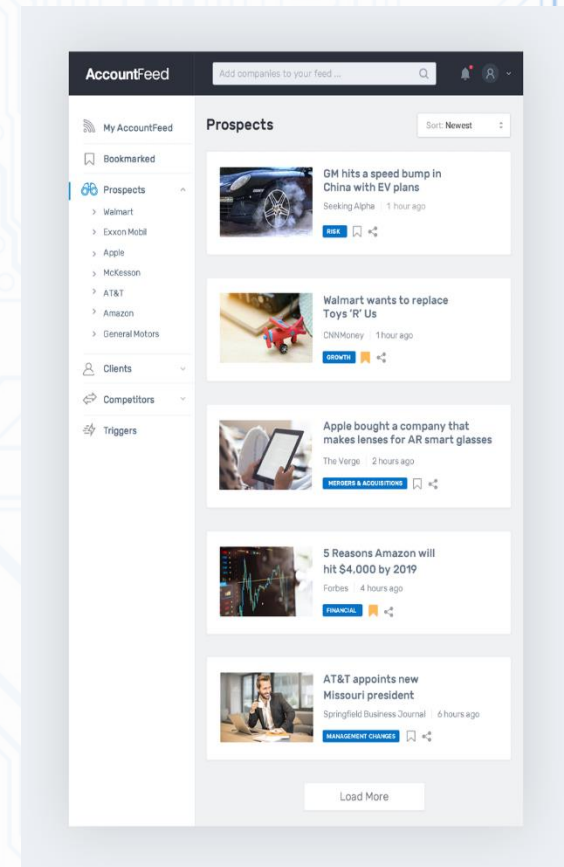
How to design an app:
3. Research your niche and competitors

you may put your pen down now and turn to the world wide web.

- Research is an integral step in the process of app design.
- It's important to understand the niche market of your app, and to get an idea of what you're up against.

- The app world is an extremely diverse and competitive arena, so you will definitely want to make sure your one of a kind idea is exactly that.
- Don't be intimidated by what you see out there. Just because there are many apps similar to what you're going for doesn't mean yours won't be the one to trump them all.

- Researching your competitors will show you what's missing from their apps, and give you better ideas as to what to incorporate into your own.

- Try to pay attention to reviews
  - what do users currently like about the apps already out there?
  - What do they dislike, and how could you solve this problem?

- During this step you can also refer back to your written and sketched notes, modify what you have down and further get an idea of how to get ahead.

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How to design an app:

Design and development

01 Getting started

- Set the goal of your app
- Make a plan
- Research your niche and competitors

02 Design and development

- Create a wireframe
- Get your app designed
  - Options for getting your app designed
  - App design tips: What to look out for during the app design process
- Collect feedback on your design
- Get your app developed

https://99designs.com.au/blog/web-digital/how-to-design-an-app/

How to design an app: Design and development

Create a wireframe

- Your wireframe is a draft for your app's visual architecture.

- You'll take your goals and visual sketches one step further and create a basic "blueprint" of how your app is going to look, and how it's going to function.

- You can do this very simply on paper first, but digital wireframes make things easier, especially once your wireframes are becoming more complex and detailed.

- How do you go about doing this? Your wireframe is the chance to take your vision and put it into the confines of a mobile screen.

- Don't worry, you don't need to make any specific design choices yet. This step is about coming up with the workflows and overall structure of your app.

The previous steps helped to give you an idea of what you want your app to do. Your wireframe is a more detailed and specific outline of how things are going to work and what pages and functions are needed.
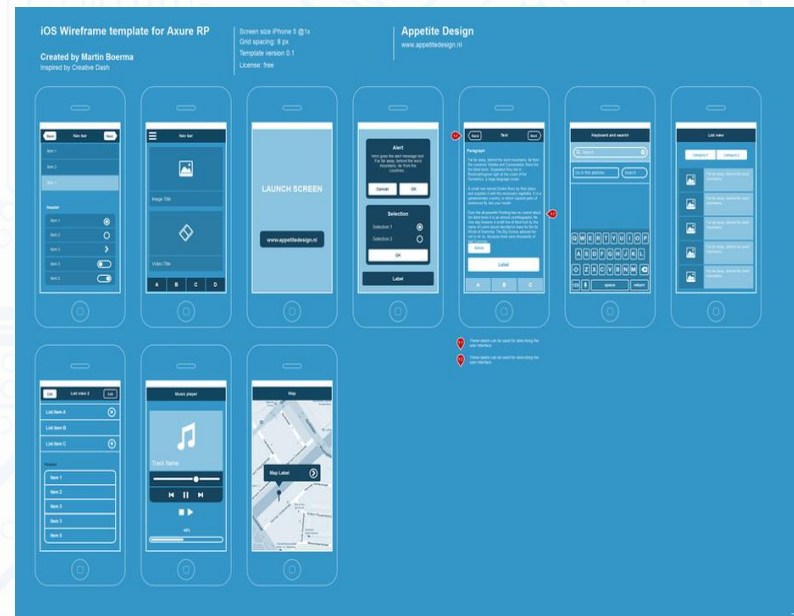
How to design an app:Design and development

- There's a plethora of easy to use wireframing tools out there that you can use to create your wireframes.

- See which one works best for you, and start to bring your app design to life.

- Here are a few wireframing tools you can use:
  - Axure
  - Pidoco
  - iPlotz

- Once you have your wireframe laid out, you'll have a good overview over what pages you'll need and how your app's going to work.
- To test if your wireframes are solid, you can create a click-through model using a tool like Invision.
- This will enable you to click through the screens you've planned and helps you test if the navigation you've set up makes sense.
- Show your wireframes to your colleagues and friends and collect their feedback on the structure and navigation of your app. See if your testers find it intuitive and if all the screens and elements make sense to them.
- If you find any snags in your navigation or want to rearrange screens and layout, you can simply adjust your wireframes and test again. Keep going back and forth until you're satisfied with your wireframes.

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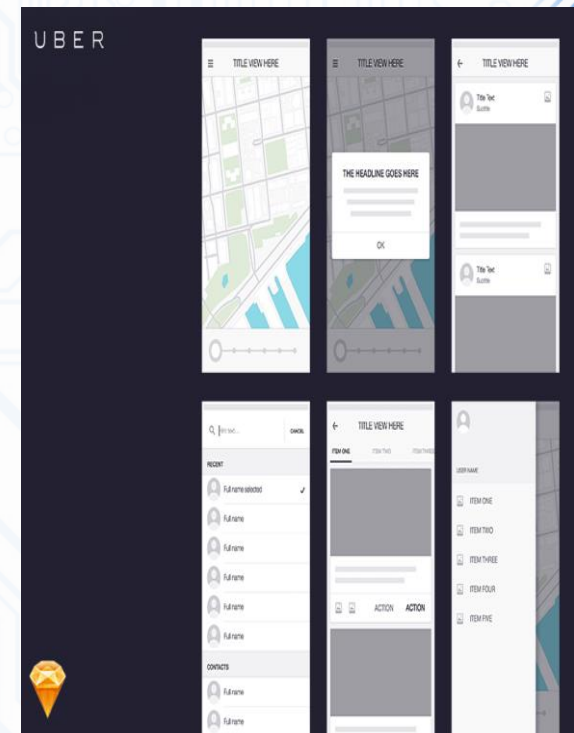
How to design an app:
Design and development

5. Get your app designed

- Think about the actual design of your app and create good-looking,

- This is a super important step because it's what will leave a permanent impression on your users, so don't rush or skimp when it comes to your app design.

- A great looking, professional, beautiful design is what can make your app a raging success.

- What colours, fonts and design elements you should use is a big decision, so we'll talk more about this in the design tips section below.

- When it comes to deciding how to get your app designed you've got several different options.

- You might consider designing you app yourself, but unless you're a graphic designer we wouldn't recommend that. Better to rely on a professional to be sure you'll get a great result.
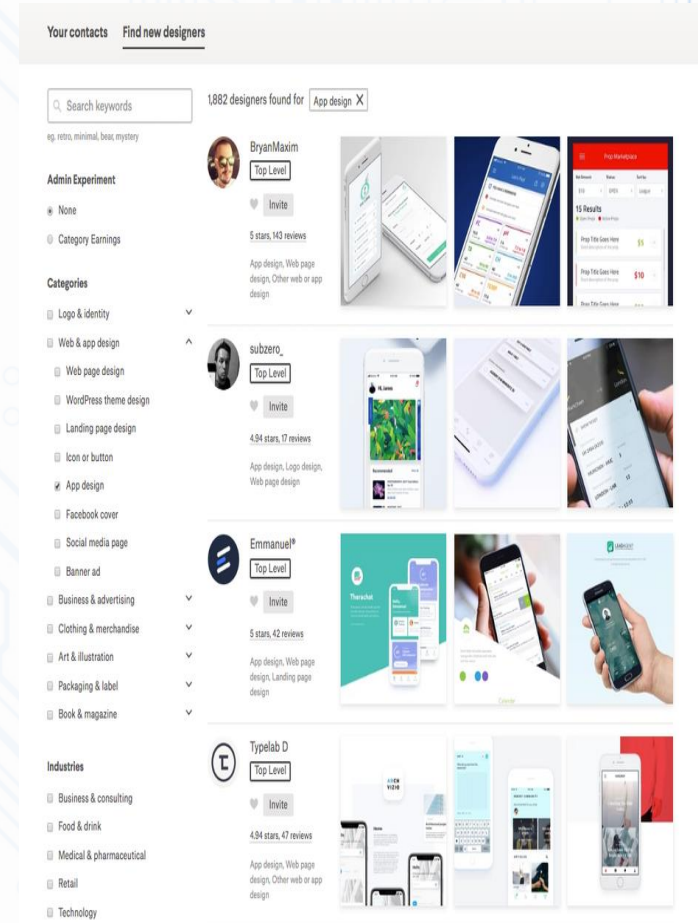
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How to design an app:
Work directly with a designer

- If you already have a vision of what your app should look like and you know what you want and need, the easiest way is to work with a designer 1-to-1.

- You can either hire a local freelancer or
  —if you don't have any connections to designers yet
  —look at different designer portfolios online.

Run an app design contest

- Start a contest by filling out a brief and let designers know what you need.

- If you are unsure about what look you want for your app and you're looking for suggestions, a great option is to run an app design contest.

- *You write a brief and designers from around the world read it and send you their ideas for your app. You can give feedback to refine the designs, and ultimately choose your favorite as the winner.*

App design brief

Fill out the brief so the designers know what you're looking for.

Language

What language will you write your brief in?

English

Tip: Submit a brief in English for the highest participation.

Background information

Select your industry

- Select industry -

Briefly describe what your app does

E.g. The app allows our customers to browse and purchase anvils on their mobile phone.

App Inventor

Run an app design contest

Use an app builder

- Another method of design is to use an app builder.
- Much like a web builder, app builders allow you to save a bit of money compared to hiring a full designer, but you'll need to be more hands-on and there will be restraints as to what you can do.
- 'Keep in mind if you want complex design and have specific needs, this may be out of depth for a builder.

Hire an agency

- Your final choice is the complete package, where you can lean back and let someone else take care of everything: hire an agency to build your app from scratch—including the design. This is a great choice if your project is really complex and needs a lot of expertise in different areas.
- Make the effort to reach out to some of them and get quotes and ideas to see if they are a good fit for what you want done. This will undoubtedly be your most expensive option, but if you want things done a specific way and have the resources to make it happen, it's a tough option to beat.
- No matter which option you choose, be sure to give feedback and keep an eye on whether the design actually fits your brand and communicates the style and look you where going for from the start.
- Don't lose sight of the goals you set in the beginning and reflect on whether the final design really says what you want it to say.
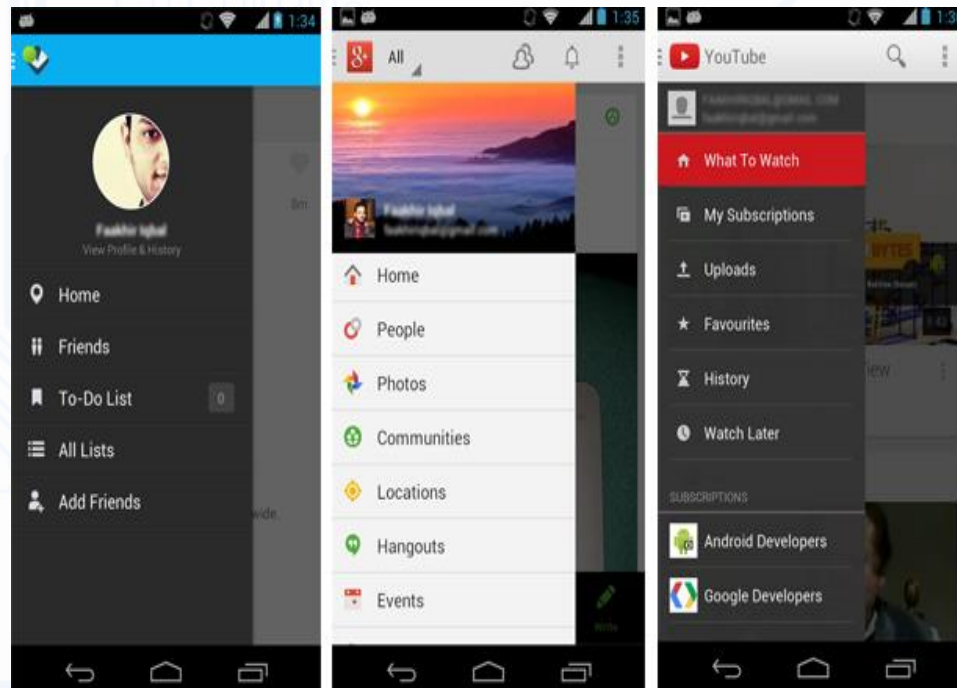
App design tips:
What to look out for during the app design process

Some key tips to keep in mind when it comes to designing your app:

Make it easy to navigate:

- An amazing app is nothing without easy navigation, so design with this in mind to ensure a seamless and enjoyable experience for your users.

How to design an app:

- When designing for Android, make the navigation drawer easy to find to provide a seamless experience for your users.

- Ensure the navigation drawer or tab bar is clearly visible to the user.

- A user won't be able to navigate your app if they have no idea how to do so, so keep things visible to ensure they know where to go.

- Remember to stick with a layout that is familiar to your users, so they'll know intuitively how to navigate through your app.

- *Another important tip: Make it finger-friendly. If buttons and links are too small for people to click on with their fingers, they will have a hard time navigating through your app.*

App Inventor

Design for simplicity:

- *Keep things minimal for a modern look and make generous use of whitespace. That allows your users to focus on what matters most.*

- *Again, using familiar symbols and phrases can help to keep it simple and easy to use.*

- **Designing for simplicity means designing with the goal of making the user experience as enjoyable and easy as possible.**

- Too much information presented on screen at once or simply too much going on, and your user is likely to become overwhelmed and abandon the app.
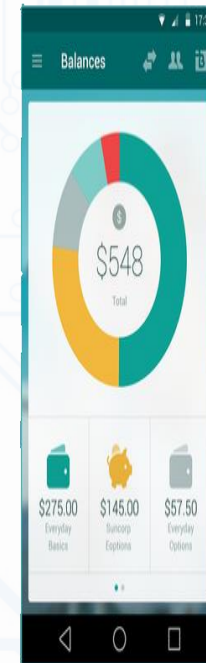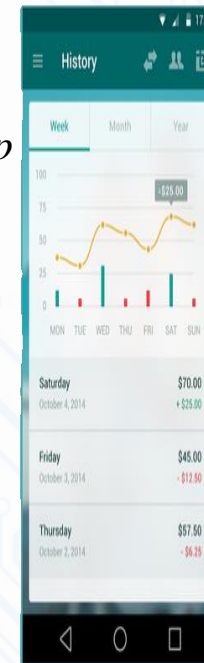
Design for simplicity:

Pick colors and fonts mindfully:

- Color psychology has a huge impact, so don't underestimate their effect. Similarly, your choice of fonts is going to influence the look and feel of your app.

- Make sure to think about the hidden meanings these design elements communicate and pick them carefully.

- *Also remember: you don't want to mix too many different colors and fonts for a consistent and professional look.*

- If you have brand guidelines with specific color and fonts, be sure to stick with them in your app design, so your app becomes a seamless extension of your brand.

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Design for simplicity:

Think about visual hierarchy and weight:

- Visual weight is the size and impact of different on-screen elements compared to others.

- Use visual weight to ensure the most important aspects of your design stand out.

- A clear visual hierarchy will help your users with orientation, so make sure that the hierarchy you establish for pages and sub-pages as well as headlines and sub-headlines is always consistent.

App Inventor

Design for simplicity:

Be consistent:

- Designing for consistency in your app makes it easily recognizable and keeps it looking sleek.

- Here's the thing with colors and fonts and all those other design elements:

  – they can only be effective and leave a positive branding effect if you are consistent.

  – This goes for other graphics, navigation and your content as well.

App Inventor

Design for simplicity:

- Your app should have visual consistency (design elements such as colors, buttons, and labels), functional consistency (your app should function similarly through all elements), and external consistency (any other outlets such as website, sister apps should look similar to your new app).

- Being consistent throughout your app will make you look professional and you'll better allow your users to develop a relationship with your app and your brand.

App Inventor

6. Collect feedback on your design

- Now that you have picture-perfect, it's time to call in your friends, family, and even enemies (if you have any) and test the design of your app.

- A rendered click-through model will make this easy and will give your testers a real feel of what the app will be like.

- It's important to note that this is not your finished app, and there will be more testing later.

- This is essentially a test of the layout, navigation, look and feel, while functionality will come later.
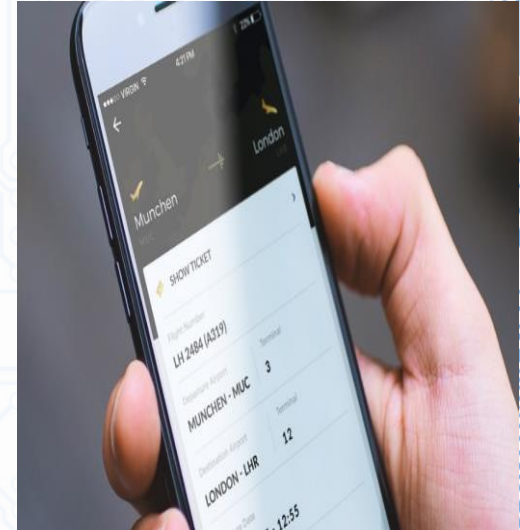
- The more people you get to sample your app design, the more feedback you'll have, and thus a better idea of what's working well and what needs improvement.

- Constructive criticism will be your friend here, so don't be afraid to dig a little deeper with your samplers and find out exactly what they think.
  - Is it too crowded?
  - Too bland?
  - Make note of any comments your testers might have.

- If you've got a rendered click-through model, have a look over the shoulder of your samplers (but make sure your breath is nice and fresh first).

- This helps to show you how they are navigating your app and gives you a point of view consumer experience.

- Once you've got all the feedback you need and have a good understanding of what's working for you and what requires improvement, you can go back and ask your designer to make the necessary adjustments.

7. Get your app developed

- Now it's time to hand over your design to your developer or development team.

- They will code the functional side of your app and make sure it actually does what it's supposed to do.

- Most likely they will go back and forth with you and your designer to adjust the design to make everything work smoothly and to figure out any issues they run into during the development process.

  - Take a look back at the goal of your app you decided upon when it all started.

  - Have you solved a common problem, brought enjoyment to people with a fun creation, or simplified people's lives in some way?

  - Chances are you probably have, and you've really nailed it with your stellar design.
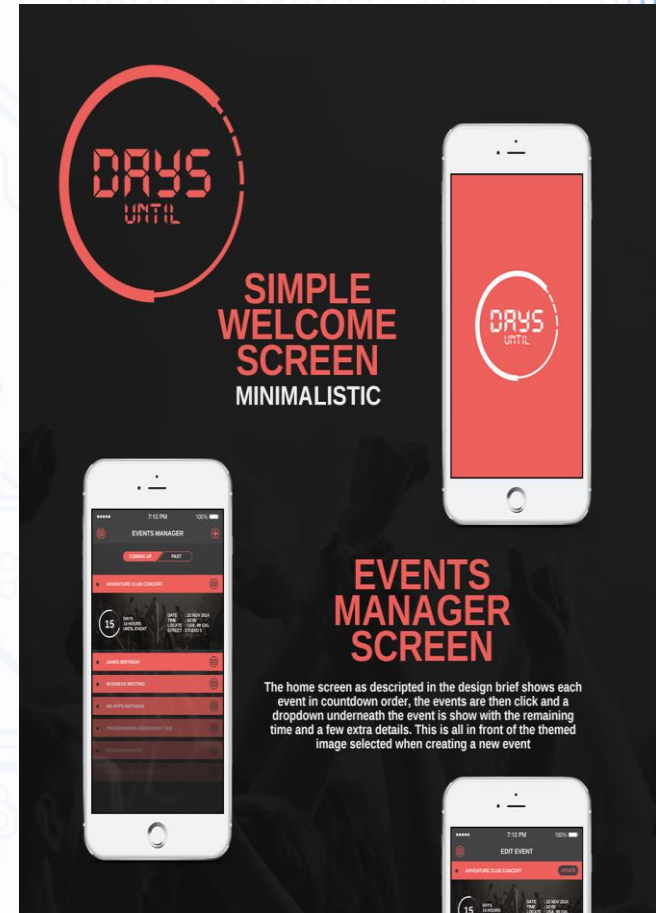
Testing and launch

App Inventor

8. Test your app with a focus group

- Now we have a fully functioning app to put to the test, so you'll want to make sure it's exactly that before you set it for release.

- At this point every aspect of the app needs to be functioning properly and visually appealing.

- Try to get all the final feedback you can before deciding on your final outcome.

- If you're working with a designer and developer, take the constructive criticism you have and put them to work on making the final adjustments towards the completed product.

App Inventor

# Testing and launch

9. Launch a beta version

- Beta testing means launching a beta version of your app and making it available to early-adopters on a small scale. This way, you can view how your app runs in a live environment and check how users respond to it.

- TestFlight is an IOS specific program to control Beta testing of apps.

- The final feedback you gather here will allow you to apply the finishing touches to your app.

- Let your users know that you would appreciate their feedback, and use it to adjust things based on what you see and the comments you receive.

- Once you've got the feedback you need and a clear analysis of how your app looks and functions in a live environment, the finish line will appear and you're ready to reveal your masterpiece to the world.

10. Launch your app

- At last, Android doesn't require review before you launch your app. This means you simply have to upload your app file onto the Google Play store (as with your beta) and people can begin instantly downloading your app.

- IOS is slightly different in that they will review your app before it can go live.

- Now that your app is available to the masses, don't stop there.

- Keep improving and updating your app regularly to give your users the best experience.
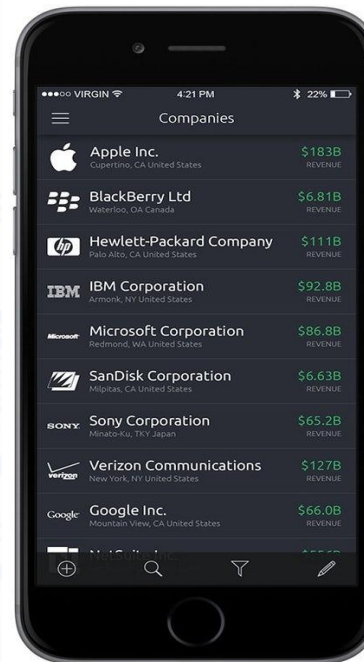
Are you ready to take the app world by storm?

- The app design process may seem complex, but if you follow this guide and break it up into small manageable steps, it will get much easier.

江西理工大學 信息工程学院
JIANGXI UNIVERSITY OF SCIENCE AND TECHNOLOGY SCHOOL OF INFORMATION ENGINEERING

App Inventor

Student Task_4

1. **How to calculate the price of APP**
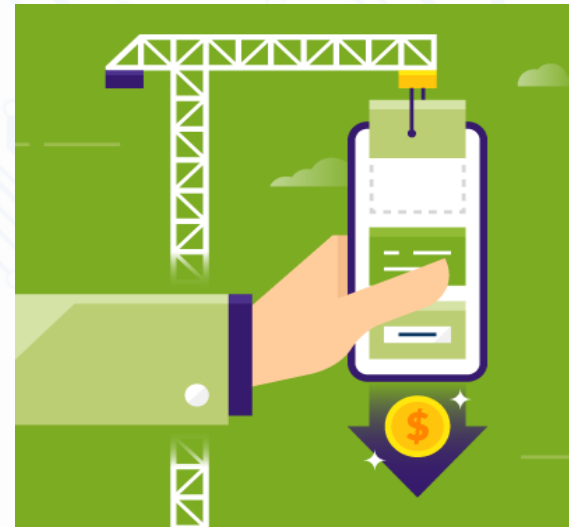
   Proof with the example
   Analyses based on one real app with the features and part of real app

2. **Summarizes the clip 2 in the main point**
(some thing like presentation) We need the key point and aspect

For task
– **Just MOOC**
– **Just PPT with the format**
– **Just task**

App Inventor

Reference

- **Teaching with AppInventor** http://appinventor.mit.edu/explore/teach.html
  AppInventor Tutorials:
  http://appinventor.mit.edu/explore/ai2/tutorials.html
- **Sounds** http://www.soundbible.com
- **App Inventor:** http://appinventor.googlelabs.com/
- **Appinventor.org:** http://www.appinventor.org/
- **Wolber, Abelson et al. text:** http://www.appinventor.org/text2011
- **Group:** http://groups.google.com/group/app-inventor-instructors
- **Wolber course:** http://appinventor.org/course-in-a-box
- **Morelli course:** http://turing.cs.trincoll.edu/~ram/cpsc110/

- Presntation by Dr. Scot Nelson,University of Hawaii at Manoa,Dept, of Plant & Environmental Protection Sciences

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App Inventor

"BE HUMBLE. BE HUNGRY. AND ALWAYS BE THE HARDEST WORKER IN THE ROOM."
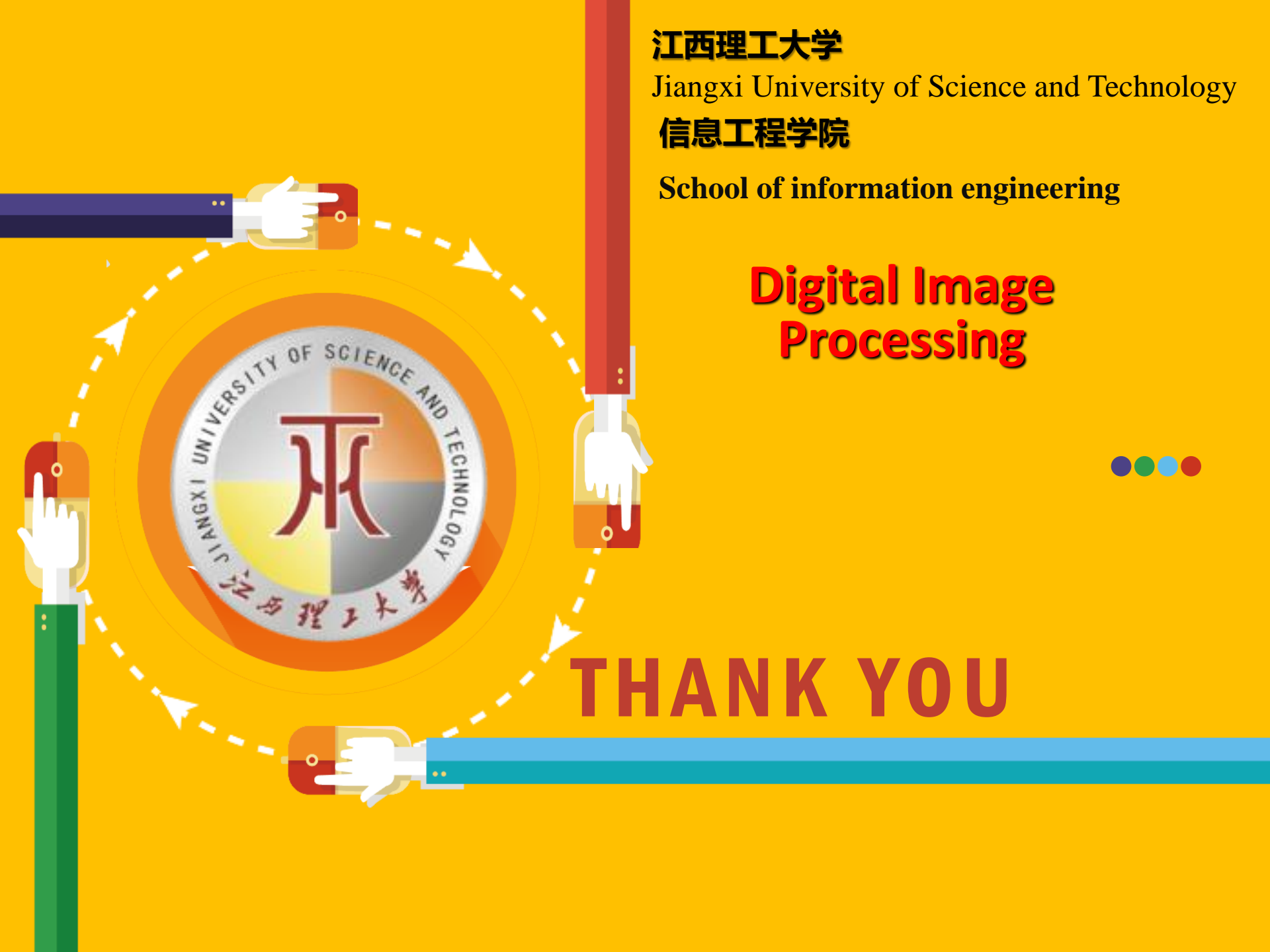
"The beauty of research is that you never know where it's going to lead."

RICHARD ROBERTS
Nobel Prize in Physiology or Medicine 1993