

Introduction

As the technology speed up, more and more people use mobile device. Those device are strong enough to handle almost everything that only PC can do before. It very popular because so many brand has to produced many mobile devices with lot of types and models to hit the market. People now have easy access to mobile device at large scale of price and quality.

The mobile use grow make market of mobile application grow. With the help of application, users can do almost everything easily and quickly. This open a new way of software development.

This report will explain the process of developing a prototype for a mobile game to help the new student can learn more and explore more about area around the company. Make them feel our company is a good place to study. Also give them some tip about problem they will encounter when learning here.

Literature review

Designing a game that allows new staff understand about area round our company though a quiz. Giving the necessary information about the chosen topic by those game. Game should run on mobile , tablet across the platform.

1 Cognitive Psychology

Introduction

“Cognitive psychology is the scientific study of mental process such as attention, language use, memory, perception, problem solving, creativity, thinking”- Wikipedia.

Cognitive psychology is focuses on the mental processes of people. How people get and process information. It has been used in many areas: Artificial Intelligence, Developmental Psychology, Linguistics.

Mobile, tablet and Human Interaction

Mobile device with all the advantage has a lot of user right now. To make people use application, developer has to help user use their app easy and effectively. That mean the study of user interaction with mobile devices is very important. Programer has to learn about it to able to provide best experience for user.

Why Cognitive Psychology affect people

Identity user is important. And we also need to understand people. By doing that we can learn to be their common characteristics, their interests or issues which lead to better service for each kind of user. To provide the best user experience, we have studied in reality, usage habits of users to design products. When users are satisfied with the quality of products or services, they willing to pay money to continue to use those.

Design for small screen problem

This app run on phone and tablet that have small screen. So the app must be responsive to the size of screen to make sure user can read the content easily. Also

the interaction on mobile device is different from computer. User must touch the screen and make action like tap, sweep...

Cognitive Process and Frameworks

Cognitive Process

Attention

Attention is a mental process focused the awareness on available information. It acts as a filter for input data received from the environment and distributed data to other mental processes. It allows the human brain focus at most one or two important information process, avoid the brain overload.

In prototype:

- + Not use so much hot color to make user lost attention

- + Not have much content in one screen

Memory

Memory is the most important thing of human. Memory helps us to be able to store the information received from the environment and all process of thinking and living.

Memory create personality, decide what we act and what we think.

Memory is divided into two types is short-term memory (also called working memory) and long-term memory. In the study, cognitive psychologists focus on working memory.

In prototype:

- + have a list of question with answer. After finish user can know if they right or wrong

- + have a picture with every question to help user remember information easily

Learning

Learning is the process of understanding the system. Also use memory to process.

In prototype:

- + the way system work is very simple, easy to learn

Decision-making

Everyone has to think about what to do, what option are and what the outcome of an action. They need to consider more perspective, combine information and find the outcome of a decision.

In prototype:

- + each question in prototype has muti answer. One of them is right.

Cognitive Framework

Cognitive framework include: Internal Cognition, External Cognition and Distributed Cognition.

Internal Cognition is the process of defining mental models. To understand how to use the system, use needs to learn about system. All of this base on experience of user.

External Cognition is the process combining cognition process with external information such as multimedia, the internet etc... This approach can help people perform cognition process (attention, learning ...). This process can reduce memory load by combine with external information.

Distributed Cognition is a hybrid approach to study and analyze the processes of the physical environment and social perspective.

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Data Gathering

Data gathering is a process of collecting information from the target group of people or another source (what people interact with) for research or study. Some methods used to gathering the data are Interview, Questionnaire, Observation, Naturalistic.

Interview 1

Interview is one of the best ways to gather information accurately and fully. Because in a meeting between researchers and the interviewer, interviewer will answer a lot of questions prepared by the researchers. That allow them to understand people very well and make good decision based on information interview given. There are 3 main type of interview: Unstructured, Structured, and Semi-structure.

Unstructured

It's mean there are no prepair from the researcher. He can ask everything he feel like he need to know without limitation. It like a small talk when only topic matter. In this way, researcher can acquire a large area or knowledge and also very detailed information.

Structured

It's mean everything is prepared before the interview. Researchers will ask fixed questions with all of the interviewees. This approach help a lot when researchers need to get information from large number of people so they only have short time per interview and they can gather exact information they want and not waste time in another topic.

Semi-structure

Some of the question are prepared and researcher can also ask non-prepared to get some more information from some interesting people.

Advantages:

- Can cover wide range of topics
- Flexible method, easy to change to current adapt situation
- Can apply to all ages

- Can obtain lot of information

Disadvantages:

- Need time and money to prepare for the interview.
- Training a good interviewer also take time and money.
- Some interviewees may provide wrong or not helpful information.
- Only cover a group of interview

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Questionnaire

Questionnaires is a method use some data collection tool such as survey, feedback to gather information. The questions used in this method is short and focus on the specific topic, can also provide fixed answer to choose. This method used a lot in finding new trend or idea of people.

Advantages:

- Can collect large among of information because anyone can do a survey.
- Low cost
- The questions used is short so more questions can be ask in one survey, increase information can be collect.
- Less time consuming than Interview method

Disadvantages:

- Many wrong or unnecessary information may be collected because any participants can join to answer the questions.
- Participants may not understand the questions and give a random answer
- Not everyone willing to answer

Observation

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Observation is a method gather information when observed the normal behaviour of participants. The researchers avoid any action affecting participants behaviour and only observed them. Participants may not know they have been observed

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Advantages:

- Researchers can observe the participant in real life situation.
- Information collected is more reliable than other method.

Disadvantages:

- Most people do hate being watched by someone else.

- 1
- Time-consuming to observe one person to collect exactly information researcher want.
 - With the same behaviour, different person may make different conclusion so reduce the consistency of information.
 - The observer may miss some good info if not careful.

Conclusion

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To make this prototype i use interview method and according to the collected information, i have some information to design the prototype:

- The design should be simple, easy to use and learn.
- The content must be clearly. Image should be use more and reduce the number of text.
- The animation should be smooth (menubar in prototype).
- Use less hot color, it make people lost focus

Multimedia Content

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Multimedia Contents is a combination of many types of content such as: text, audio, images, animation, video. Multimedia content can divide into two categories is static media like text, image and dynamic media like audio, gif, video.

Multimedia type

- Text: basic type of media that people can read.
- Image: basicly picture of something that give user immediately overview of an object
- Audio: media type that user can hear
- Video

Media supported

In this prototype i mainly use image and text for simple contact.

Text can provide a lot of information in a small area so user don't have to scroll so much.

Image can quickly describe anything without using so much text. People not like to read so much.

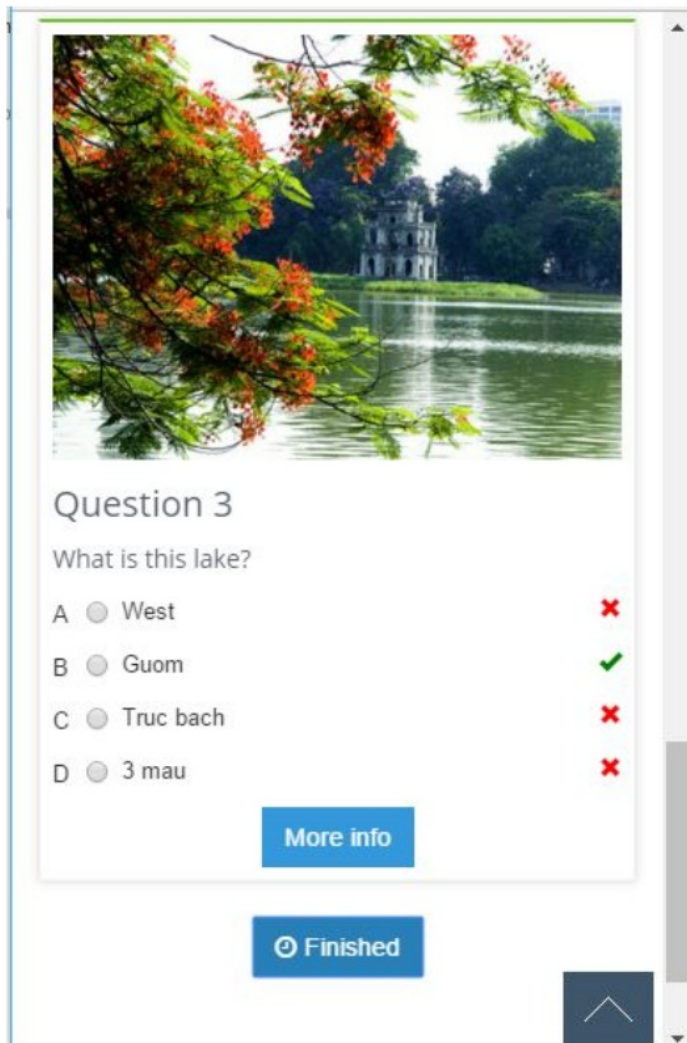
Design Principles

1 Visibility

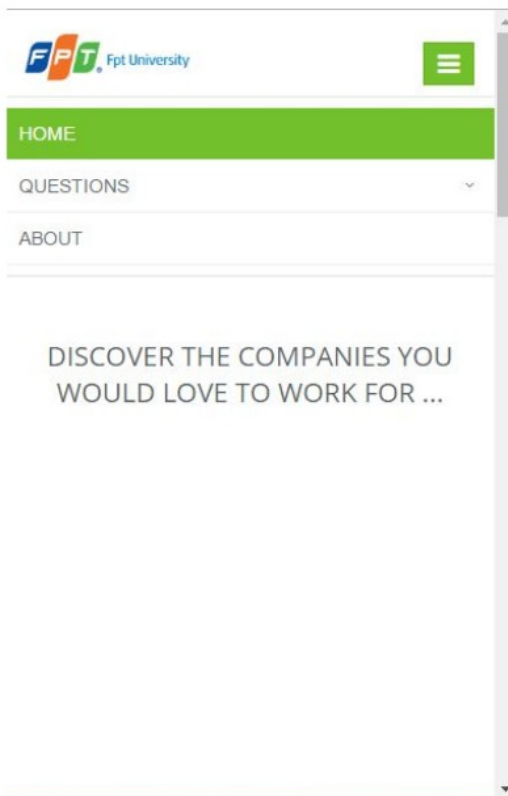
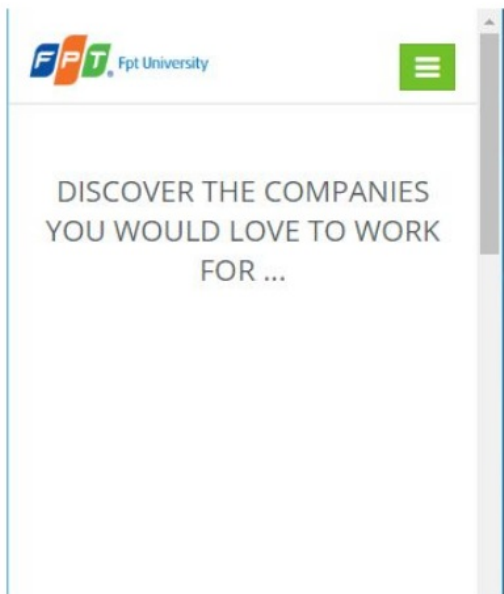
In design, visibility is a very important part. Most of the interaction of the human with anything process after observed. Give user clear vision makes them easy to interact with the apps. Also a lot of people use an app because "it's cute", "it clear" etc...

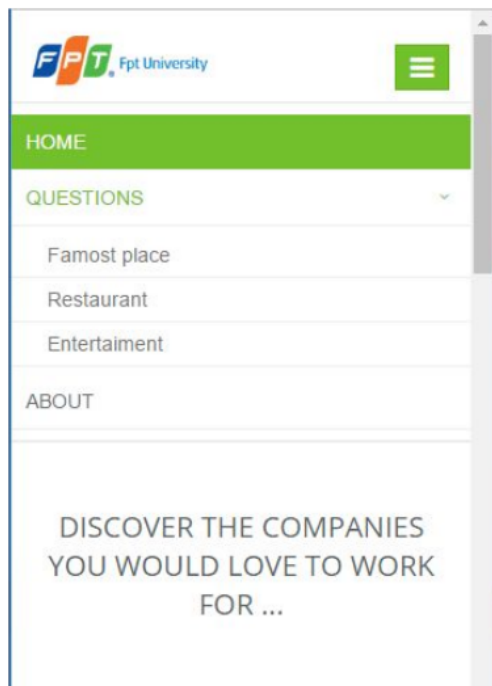
Some basic interaction design:

1. Click and tap: People will try to click and tap anything that seems like can be interact. So use the common UI like button, text field or something difference like color/underline word, icon and 3D design will lead to more action.



2. Touch and gesture: Touch screen has no hover but have the advantage of multiple touches. But do not obstruct user view when they are touching a thing.
3. Drag and drop: Need to indicate what object can or can't be drag and where it can or can't be a drag to. Smooth movement when drag.
4. Show and hide: Indicate where more content available. Hidden content should be divine to multi-place if it is too long.
In app menu show hide for example





1 Consistency

Consistency UI design make the application easy to understand and use. Component with similar behavior will have same appearance, Also difference component have different interface. This design effect even smallest part such as font, color, size, shape.

In prototype: Button have same color and model, answer of quiz is all the same type.

Learnability

1 Every user need to learns to application. User can learn about the application during interact with it and remember what they have done. So learnability describes the ability of user can or can not learn about an application. Learnability has an important role in increase user experience. If the application is easy to use, user also can remember all functionalities of the application much easier. They will quit if can not find out how to use in short time.

1 To improve the learnability of an application, it should only display enough of information to the user, avoid unnecessary information may cause user reduce the focus. The long action should take step-by-step so the user can easier remember each step of action, reduce the complexity of remembering the long action.

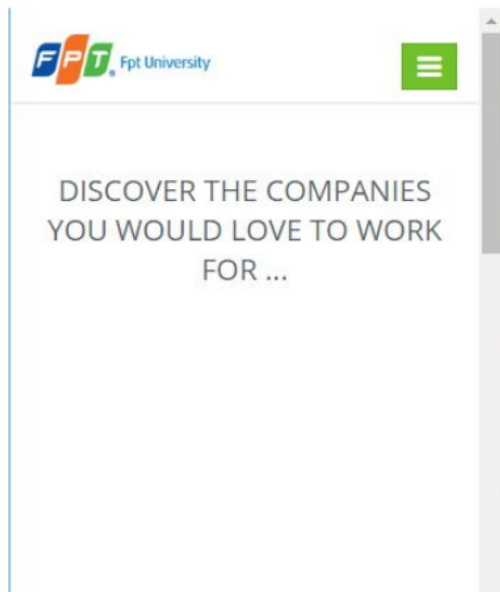
Predictability

Predictability is the ability to guess the behaviour of next action in long process, it only archived if the process is understandable. This principle helps users easier to remember the process, increase the speed of complete one task speed up when using apps.

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Designers should reduce the complexity. Besides that, use metaphor also helps a lot. Icon is one type of metaphor. It can use to self-describe the action of a button. Also simple and clear sentence can make application easier to predict.

In prototype: Menu button is common



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Feedback

During interaction with the applications, users need to know about the result of the task they perform. Feedback is used to display the consequence of that task back to the user. This is an important part of the interactive design because it can help the user feel interact. The feedback can display immediately when receiving the result from any actions.

In prototype, everything you touch will respond

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Methodologies

There are several methodology for development process: Joint Application Development(JAD), Rapid Application Development, Agile and Dynamic System Development Method (DSDM).

Dynamic System Development Method is used in the process to develop this prototype because it focuses on information systems projects with tight schedules and budgets.

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DSDM provide five phase in it's life cycle:

- Feasibility study: define problems and technical feasibility may face meeting the requirements.
- Foundations: analyze requirements, business logic, and process.
- Exploration: define functionalities of the system.
- Engineering: design and review prototype
- Deployment: make client approve the design.

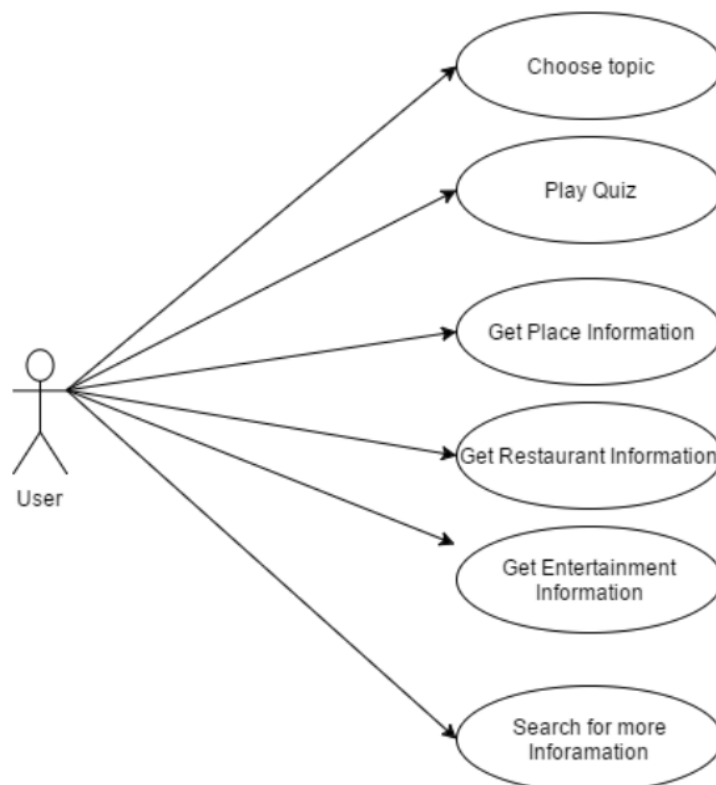
Advantages of using DSDM

- Suitable for the scope of the project.
- Focus on frequent delivery, also delivery on time.
- Testing is integrated in DSDM cycle, lower the chance of fixing bug at the end of project.
- Low cost

Task Analysis

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Use case model



Description of use case

UC ID and Name	UC01 – Choose topic		
Created by	Viet Anh	Date created	October 10, 2016
Primary Actor	User	Secondary Actor	User
Trigger	After see homepage		
Description	Users can choose what topic they interest to play quiz		
Precondition	n/a		
Post condition	Display quiz question and multiple choice answer		
Normal flow	1. Touch on the menu or some section at homepage 2. Touch on one topic		
Alternative flow	n/a		
Exception	n/a		
Priority	high		
Frequency of use	high		

UC ID and Name	UC02 – Play quiz		
Created by	Viet Anh	Date created	October 10, 2016
Primary Actor	User	Secondary Actor	User
Trigger	After user choose one topic		
Description	User can answer of the question provided by the quiz of a topic		
Precondition	n/a		
Post condition	Display result and information of topic		
Normal flow	1. Touch to choose an answer 2. Display result page content information of topic 3. Touch next question to move to next question		
Alternative flow	n/a		
Exception	n/a		
Priority	high		
Frequency of use	high		

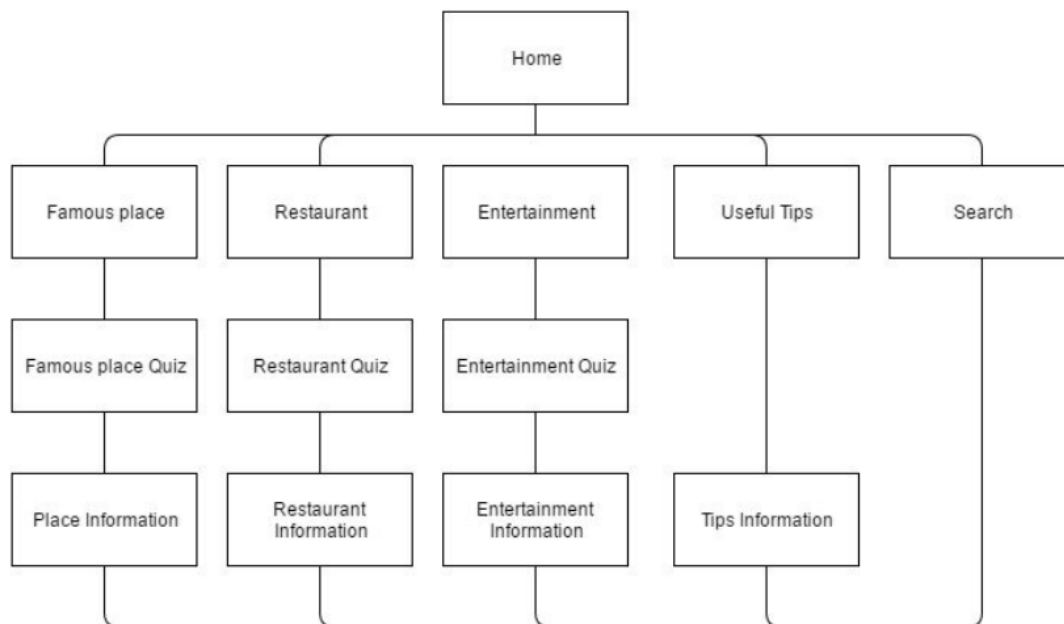
UC ID and Name	UC03 – View place information		
Created by	Viet Anh	Date created	October 10, 2016
Primary Actor	User	Secondary Actor	User
Trigger	After answer a question about famous place topic		
Description	Users can learn more about one place by additional information provided by application		
Precondition	n/a		
Post condition	none		
Normal flow	1. Touch on “Place” on the menu or section at homepage 2. Touch on one topic		

	3. Touch to choose an answer 4. Display information of that place
Alternative flow	n/a
Exception	n/a
Priority	high
Frequency of use	high

UC ID and Name	UC04 – View Entertainment information		
Created by	Viet Anh	Date created	October 10, 2016
Primary Actor	User	Secondary Actor	User
Trigger	After answer a question of Entertainment quiz		
Description	Users can learn more about way and place for Entertainment		
Precondition	n/a		
Post condition	Display where user can Entertain		
Normal flow	1. Touch on “Entertainment ” on the menu or some section at homepage 2. Touch on one topic 3. Touch to choose an answer 4. Display information of that place		
Alternative flow	n/a		
Exception	n/a		
Priority	high		
Frequency of use	high		

UC ID and Name	UC05 – View restaurant information		
Created by	Tien Thanh	Date created	October 10, 2016
Primary Actor	User	Secondary Actor	User
Trigger	After answer a question of restaurant quiz		
Description	Users can find information of restaurant they choose from topic with time open, price and some additional information		
Precondition	n/a		
Post condition	Display an info page of restaurant with open time, address, price and additional information		
Normal flow	1. Touch on “restaurant ” on the menu or some section at homepage 2. Touch on one restaurant 3. Touch to choose an answer 4. Display information of restaurant		
Alternative flow	n/a		
Exception	n/a		
Priority	high		
Frequency of use	high		

Navigation Diagram



1 Testing and Evaluation

Test results

ID	01
Test Case	Display homepage
Precondition	none
Input test data	none
Execute Step	Start application
Expected Result	Homepage displayed
Actual Result	Homepage displayed

ID	02
Test Case	Menu bar hidden by default

Precondition	Application started
Input test data	none
Execute Step	Start application
Expected Result	Menu bar hidden
Actual Result	Menu bar hidden

ID	03
Test Case	Show/hide menu bar
Precondition	Application started
Input test data	none
Execute Step	Touch on menu icon to show menu bar. Touch on menu icon again to hide menu bar
Expected Result	Menu show/hide when touch on menu icon
Actual Result	Menu show/hide when touch on menu icon

ID	04
Test Case	Category Places is displayed by default
Precondition	Application started
Input test data	none
Execute Step	none
Expected Result	Famous Places button is highlighted and all place are in the tab
Actual Result	All place are show and Famous place button is highlighted

ID	05
Test Case	Other tab show all topic
Precondition	Application started
Input test data	none
Execute Step	Touch on Restaurant, Entertainment

Expected Result	1 All topic belongs to those tab it are showed
Actual Result	All topic belongs to those tab it are showed

1 ID	06
Test Case	Display quiz for a topic
Precondition	Application started
Input test data	none
Execute Step	Touch on a topic in homepage
Expected Result	Quiz question with image and multiple choice answers is displayed
Actual Result	Quiz question with image and multiple choice answers is displayed

1 ID	07
Test Case	Display information page after answer a question
Precondition	Application started
Input test data	none
Execute Step	Touch on a topic in homepage Touch on one of four answers to answer the question
Expected Result	Display the information of answer with images and detail information
Actual Result	Information page is displayed

Evaluation

I'm using heuristic evaluation because it design to 1 identify usability problems in the user interface design

5 = Great

4 = Good

3 = Normal

2 = Not good

1 = Bad

N/A = Not

No	Name	1	2	3	4	5	N/A
1	Application is easy to use				x		
2	Design is simple				x		
3	The colour used is good				x		
5	Image and information display clearly					x	
6	The content are interest				x		
7	The quiz is fun		x				
8	The application are suite for foreign			x			
9	User can quickly find information					x	

Conclusions and future work

The prototype developed meet requirements is suitable for potential students, help them building knowledge about the Institution's location. However, the prototype still can be improved in future such as:

- Enhance user interface design after took feedback from users.
- More type of game to make user have some for fun..
- Update more information.

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FINAL GRADE

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GENERAL COMMENTS

Instructor

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