WorldSkills Malaysia (WSM)
University Challenge 2021

TECHNICAL DESCRIPTION

Mobile Applications Development

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1.0 ABOUT MOBILE APPLICATIONS DEVELOPMENT

Mobile Applications Development refers to applications development for mobile communication terminals. With the onset of the mass global information age, the market for these applications is booming, since “apps” are widely and increasingly used in people's work, life, and entertainment. The development of mobile applications is overtaking more traditional communication, improving the efficiency of work, and massively extending services and benefits for users. This is leading to new opportunities for employment and self-employment in organizations of all sizes, entrepreneurship and contracting. These roles especially appeal to young adults, due to their confidence and expertise with new technologies.

Depending on the Mobile Applications Developer’s relationship to clients and their needs, the role may be deep and highly specialized, or broad, across the entire applications development process. An employed Developer may have a tightly defined role within a large global company in the digital economy, such as Uber and Alibaba. By contrast, a self-employed contractor expects to have a wide range of development skills in close, short- or longer-term, relationship with a variety of clients and needs. Globally, the expertise in demand covers creativity, design, and technical skills, together with the traversal skills of work organization and management, communication and interpersonal skills, problem solving and innovation.

2.0 RECOMMENDED ENTRY REQUIREMENTS

Competitors need to develop applications for smartphones.
Competitors must not be older than 25 years old in the year of the competition.
Basic programming language knowledge.

3.0 COMPETITION FORMAT

This competition is an individual event.
All competitors will connect to competition within an online mode.
The Test Project for the competition is divided into 2 sessions (2 days) which contains Part 1 and Part 2.
The competitors may use any development tools.
Native app development tools .
Submission:

- User experience (UE) documentation – All main User Interface (UI) should be included
- App demo video recording (5 minutes duration)
- Program source code should be submitted through GitHub

4.0 TIME ALLOCATED

5 hours will be given to the competitor to complete the task for each day.
The question in Test Project consists of 2 parts. Duration including software development and submission:

	Development	Presentation	Q&A	**Total**
Day 1 (Part 1)	4 hours 45 minutes	5 minutes	5 minutes	4 hours 55 minutes
Day 2 (Part 2)	4 hours 45 minutes	5 minutes	5 minutes	4 hours 55 minutes

5.0 SCOPE OF WORK

Competitors must meet the following requirements:

Design
The individual needs to know and understand: • Characteristics and advantages of various development platforms (e.g. iOS, Android) • The behaviours of mobile application users • Impact of the features on mobile application products (e.g. size and various parameters) • Principles and applications of design thinking processes • The design methods of user interface (UI) • The design methods of user experience (UE/UX) • Principles and applications of framework design • The means of selecting “what works best” • Principles of navigation design • The principles and applications of version control • The design of test plans and procedures • A range of testing methods and tools (e.g. unit test, functional test, performance test, etc.) • Principle of good programming *The individual shall be able to:* • Choose the most suitable development platforms • Use UI design software such as Adobe XD, Sketch and Sigma • Conduct prototype and visual design on the application user interface (UI) • Use UI application specifications of iOS or Android systems • Produce user experience (UE) documentation for applications (MS Word or Powerpoint)

Development

The individual needs to know and understand:

- The good coding practices.
- Capability of mobile device sensors and hardware (e.g. cameras, GPS, gyroscopes, accelerometers, and Bluetooth)
- Visualized data presentation skills (e.g. pie charts, histograms, line graphs, etc.)

The individual shall be able to:

- Conduct integrated development with existing code using API (application programming interface)
- Create modular and reusable development codes
- Develop Android or iOS interface, and complete compatibility testing
- Use Android or iOS development language to implement application development in common design patterns
- Use high-performance programming and performance tuning on Android or iOS platform

Implementation

The individual needs to know and understand:

- Algorithms and data structures
- Mobile applications' fault-finding skills.
- Encryption, decryption, signature, etc. of data communication between user terminal and server

The individual shall be able to:

- Plan and implement frequent tests to ensure efficient development
- Debug the mobile applications to identify issues and write normalized codes to resolve the issues
- Complete interface and functional compatibility testing on different platforms and screen configuration (resolution and orientation)
- Simulate testing and troubleshooting of sensors on different devices

Overall Implementation

The individual needs to know and understand:
• Nature of the case given, identify aim and objective of the system
• The principle of problem solving
 	
The individual shall be able to:
• Complete all tests to verify functionality
• Bring together all aspects of the project
• Analyse and evaluate each stage of the project, relative to:
  ○ The client specification
  ○ The quality of the user experience
• Evaluate own performance relative to the given brief
• Review the future enhancement

Communication Skills
• Quality of presentation (verbal, non-verbal, presentation, flow) • Question & Answer

6.0 ASSESSMENT

Competitors will be assessed based on measurement (objective) marking. The marking scheme for the competition is as detailed as follows:

Criteria	Sub Criteria	Marks (%)
		Measurement
Design	UI	10
	UX	10
Development	Programming/algorithm/framework	10
	Data storage (i.e., file, cloud, local database)	10
	Hardware/Software/API	10
Implementation	Correctness (Follow API standard)	10
	Completion (%)	10
	Accuracy of output (error detection, input validation, and etc)	10
Overall Implementation	• Nature of business, aim and objective • Feasibility of solution(s)	10
Apps demo	• Demo • Q&A	10
	Total	**100**

7.0 NECESSARY CONDITIONS FOR ONLINE MODE COMPETITION

The competitor needs to be provided with all infrastructure which is important for control online event. Rules for the online format are listed below:

Allow online resources, but can't get help from others.
Competitors must acknowledge their resources (provide a Readme file/URL/Comments).

Infrastructural requirements:

Participants

- Full compliance with the infrastructure list below:
  i. Hardware:
     - Desktop computer/laptop
     - Microphone
     - Web camera – 2 units
  ii. Software:
     - Xcode
     - Android Studio
     - Postman
     - Figma
     - Safari
     - Google Chrome

- Stable data transmission channels and operability of all software at the competitor's workshop
- Compliance with the web camera setup in Figure 1. The cameras are located according to competitors face.

Organizer/Judge

- Online presentation platform (Zoom, Ms Teams)
- Git Hub link (Code submission)
- Mac computer

Video/audio surveillance requirements:

Competitor need to keep their web cameras turn on all the time during the competitions.

- Competitor need to use headphones and microphone to communicate during the competition with organizer or judges.
- Video recording and broadcasting shall take place from the moment the session starts.
- A video recording of the competitor's screen is required.

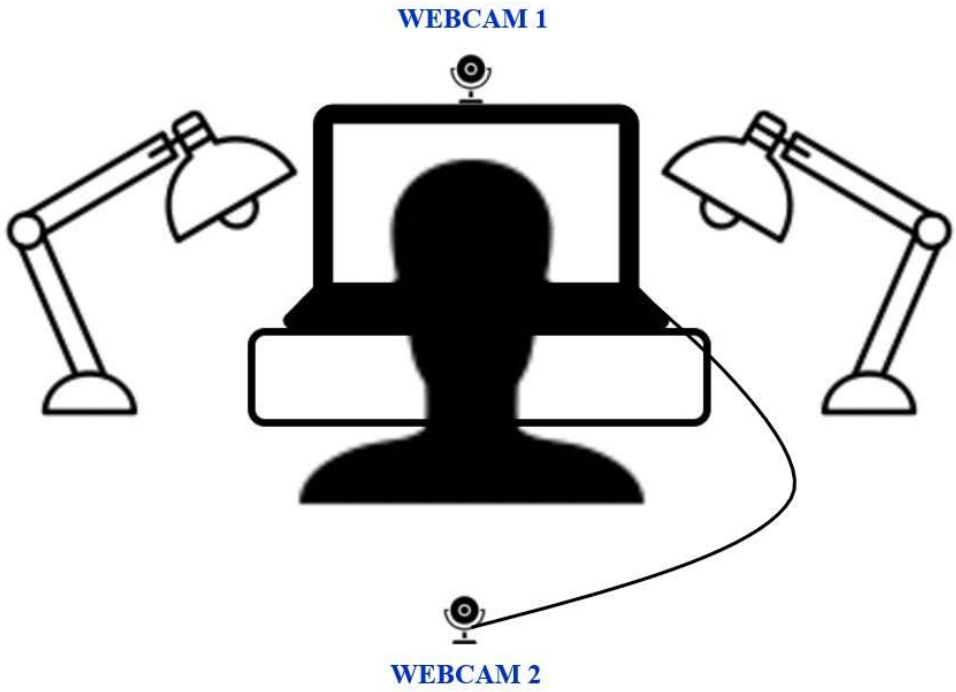

Figure 1: Web Camera Setup