worldskills

Technical Description

Mobile Applications Development

WorldSkills International, by a resolution of the Competitions Committee and in accordance with the Constitution, the Standing Orders, and the Competition Rules, has adopted the following minimum requirements for this skill for the WorldSkills Competition.

The Technical Description consists of the following:

1 Introduction

1.1 Name and description of the skill competition

1.1.1 The name of the skill competition is

Mobile Applications Development

1.1.2 Description of the associated work role(s) or occupation(s)

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.

In summary, the scope and range of the mobile application development role, is to:

- Receive and analyse a brief for planning purposes
- Apply design thinking to create flow diagrams
- Within a test-driven development framework, create designs within the given parameters, and in consultation with the client
- Build the systems architecture, choosing the platform in keeping with the brief
- Select the required modules, and code the application, regularly testing for functionality
- Continuously test, modify and optimize the application for functionality, reliability, and optimization, relative to the user experience.

With the growing take-up of services on the go, using smart mobile terminals such as phones, tablets and watches, the role of Mobile Applications Developer offers both strong immediate work opportunities and a basis for involvement in the global evolution of applications development.

1.1.3 Number of Competitors per team

Mobile Applications Development is a single Competitor skill competition.

1.1.4 Age limit of Competitors

The Competitors must not be older than 22 years in the year of the Competition.

1.2 The relevance and significance of this document

This document contains information about the standards required to compete in this skill competition, and the assessment principles, methods, and procedures that govern the competition.

Every Expert and Competitor must know and understand this Technical Description.

In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 Associated documents

Since this Technical Description contains only skill-specific information it must be used in association with the following:

- WSI – Code of Ethics and Conduct
- WSI – Competition Rules
- WSI – WorldSkills Occupational Standards framework
- WSI – WorldSkills Assessment Strategy
- WSI online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations
- WorldSkills Standards and Assessment Guide (skill-specific)

2 The WorldSkills Occupational Standards (WSOS)

2.1 General notes on the WSOS

The WSOS specifies the knowledge, understanding, skills, and capabilities that underpin international best practice in technical and vocational performance. These are both specific to an occupational role and also transversal. Together they should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, to the extent that it can. The Standard is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards. This is often referred to as the “weighting”. The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills and capabilities that are set out in the WorldSkills Occupational Standards. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, if this does not distort the weightings assigned by the Standards.

2.2 WorldSkills Occupational Standards

Section		Relative importance (%)
1	**Work organization and management**	**8**
	The individual needs to know and understand: • Principles, regulations, and standards relating to safe working space and practices • The importance of personal integrity and ethical standards • Obligations to clients and users for the security of their data, information, and other types of property • The need for self-appraisal relative to work demands and expectations • Options for filling gaps in personal expertise relative to the work in hand • The nature of contracts and agreements, and the rights and obligations that accompany them	

Section		Relative importance (%)
	• The availability of the resources required to fulfil clients' requirements • Good practice in relation to the acquisition, use, storage and maintenance of equipment and materials • Techniques and options for work planning, scheduling, and prioritization • The importance of methodical work practice, including attention to detail, accuracy, and checking • The importance of continuing and proactive professional development	
	The individual shall be able to: • Organize and maintain a safe and efficient workspace • Maintain the integrity and confidentiality of systems, data, information and documents at all times • Acquire, use, maintain, and store all equipment and materials to ensure optimal and sustained performance • Read, appraise and clarify the rights and obligations tied to formal documentation of all kinds • Review opportunities, expectations and offers, relative to personal professional capacity, in order to make open, informed choices • Select, use and keep up to date selected measures for work planning, scheduling and prioritization • Check and ensure that all specific resources are available for the work in hand • Meet or enhance the satisfaction of clients and others through self-knowledge, expectation management, and personal efficiency and effectiveness Proactively grow personal expertise through research and professional development	
2	**Communication and interpersonal skills**	**7**
	The individual needs to know and understand: • Principles and applications of costing, budgeting and charging, relative to market factors • The importance of speaking, listening, and writing skills to communicate with clients, colleagues and others • Communication and behavioural techniques for preventing and, if necessary, resolving misunderstandings • The need for discretion and confidentiality when dealing with clients and others • The importance of establishing and maintaining productive working relationships with colleagues, and team members where relevant • Conventions and protocols for software documentation	

Section		Relative importance (%)
	• The principles and applications of record keeping and report writing in relation to the entire work process, from receiving a brief to completion and handover of the agreed work	
	The individual shall be able to: • Prepare for meetings with clients and associates • Gather, clarify, and confirm client requirements • Receive, clarify, and interpret briefs and specifications • Offer and discuss options and alternatives • Discuss time, costs and fees with client, to reach mutual acceptance • Document and sort out customer needs • Use project management skills and techniques to make the most of workplace organization and resources • Follow instructions from available guidance documentation • Record each stage of work development • Keep client regularly updated on progress • Present proposed and final software solutions • Prioritize and schedule tasks • Allocate resources to tasks	
3	**Sustainable Practice**	**5**
	The individual needs to know and understand: • How to write efficient code, reduce the energy consumption of computer programs, optimize algorithms and data structures, and reduce waste of resources • Impact of computer programming and digital technology on carbon emissions, recognizing data centre energy consumption and carbon footprint, etc. • Concepts and practices of green computing, including using renewable energy, improved data centre design and operations, and more • Concepts for accessibility in mobile applications development • How to protect the privacy and security of user data, comply with relevant privacy laws and regulations, and ensure the legal use of data • Concepts and methods of software life cycle management, including requirements analysis, design, development, testing, deployment, and maintenance, to ensure the sustainability and maintainability of software	
	The individual shall be able to: • Select and use tips for writing efficient code, including optimizing algorithms, avoiding double calculations, using memory and resources reasonably, etc.	

Section		Relative importance (%)
	• Apply the principles of sustainable software design, such as modularity, loose coupling, scalability, reusability and accessibility, so that the software can adapt to future changes in requirements • Apply the methods and tools of software testing and quality control to ensure the quality and stability of the software and reduce the cost of repairing bugs and defects • Use version control systems and collaboration tools so team members can develop and manage code collaboratively to improve work efficiency • Practise continuous integration and delivery, and improve software delivery speed and quality through automated testing and deployment processes	
4	**Initial planning, design, and test framework**	**25**
	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 and applications for flow diagrams • 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.) • Specifications for writing codes • Methods for writing detection program documentation	
	The individual shall be able to: • Choose the most suitable development platforms • Use UI design software such as Adobe XD, Sketch and Figma • 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 • Produce standardized documentation of applications’ brand image, following clients’ brand guidelines • Plan and design marketing solutions for mobile applications store • Plan test cases and design specifications for writing test reports	

Section		Relative importance (%)
5	**Systems architecture planning**	**15**
	The individual needs to know and understand: • Principles and applications for creating systems architecture • The interaction of platforms and systems architecture • Principles of cross platform and the basis of using Flutter • The basis for selecting modules provided by the web services • Mobile platform system mechanism (Android or iOS) • SDK architecture and its usage • Application code frameworks • Commonly used underlying libraries • Programme compatibility on various terminal devices • Web service, Socket, http(s) protocols • Database design, SQL(Structured Query Language) • RESTful API design, XML, and JSON data format • Architecture design, development, testing, performance tuning and other technologies, and the use of related tools • Basic principles and common design patterns of object-oriented design • Industry trends and developments, including new platforms, development languages, protocols, and technologies	
	The individual shall be able to: • Design the interface based on visual design drafts • Review, select and use open source libraries (such as using Gson OKHttp) • Develop corresponding functions according to the features of different mobile devices • Obtain the mobile terminal device's performance parameters from mobile applications • Implement visualized data statistical analysis and screening in mobile applications • Handle common issues caused by servers, databases, etc.	
6	**Implementation and product development**	**30**
	The individual needs to know and understand: • The coding specifications and importance of mobile application codes • Capability of smart terminals such as cameras, GPS, gyroscopes, accelerometers, and Bluetooth • Visualized data presentation skills (e.g. pie charts, histograms, line graphs, etc.) • Prompted issues from the system and intelligent terminals • Principle of 2D and 3D design of animation • Algorithms and data structures • Mobile applications' fault-finding skills.	

Section		Relative importance (%)
	• Encryption, decryption, signature, etc. of data communication between user terminal and server	
	The individual shall be able to: • Conduct integrated development with existing code using API (Application Programming Interface) • Realize user interaction effects, animation, and data interaction via programming • Create modular and reusable development codes • Develop application 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 • Apply the test cases, record test results and resolve issues • Plan and implement frequent tests to ensure efficient development • Record test results and resolve issues • 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 resolutions • Simulate testing and troubleshooting of sensors on different devices • Record test results • Implement automated tests of the standardized application programming interfaces • Conduct performance testing and performance tuning (APIs)	
7	**Final product tests, troubleshooting, and optimization**	**10**
	The individual needs to know and understand: • Principles and procedures for product reviews using a range of specialized measures and procedures • Principles and applications for evaluating efficiency and effectiveness • Principles and methods for personal performance review • Principles and techniques for continuous improvement and optimization	
	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's specification ◦ The quality of the user experience • Ring together test results to produce a final report	

Section		Relative importance (%)
	• Evaluate own performance relative to the given brief • Review the completed project in order to ask “how would I move this on?” “How would I take this to the next stage?” • Prepare and present proposals for optimization to line managers and/or clients	
	Total	**100**

3 The Assessment Strategy and Specification

3.1 General guidance

Assessment is governed by the WorldSkills Assessment Strategy. The Strategy establishes the principles and techniques to which WorldSkills assessment and marking must conform.

Expert assessment practice lies at the heart of the WorldSkills Competition. For this reason, it is the subject of continuing professional development and scrutiny. The growth of expertise in assessment will inform the future use and direction of the main assessment instruments used by the WorldSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the WorldSkills Competition falls into two broad types: Measurement and Judgement. For both types of assessment, the use of explicit benchmarks against which to assess each Aspect is essential to guarantee quality.

The Marking Scheme must follow the weightings within the Standards. The Test Project is the assessment vehicle for the skill competition, and therefore also follows the Standards. The CIS enables the timely and accurate recording of marks; its capacity for scrutiny, support, and feedback is continuously expanding.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed, developed, and verified through an iterative process, to ensure that both together optimize their relationship with the Standards and the Assessment Strategy. They will be agreed by the Experts and submitted to WSI for approval together, to demonstrate their quality and conformity with the Standards.

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors for quality assurance and to benefit from the capabilities of the CIS.

4 The Marking Scheme

4.1 General guidance

This section describes the role and place of the Marking Scheme, how the Experts will assess Competitors' work as demonstrated through the Test Project, and the procedures and requirements for marking.

The Marking Scheme is the pivotal instrument of the WorldSkills Competition, in that it ties assessment to the standard that represents each skill competition, which itself represents a global occupation. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards.

By reflecting the weightings in the Standards, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill competition and its assessment needs, it may initially be appropriate to develop the Marking Scheme in more detail as a guide for Test Project design. Alternatively, initial Test Project design can be based on the outline Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

Section 2.1 above indicates the extent to which the Marking Scheme and Test Project may diverge from the weightings given in the Standards, if there is no practicable alternative.

For integrity and fairness, the Marking Scheme and Test Project are increasingly designed and developed by one or more Independent Test Project Designer(s) with relevant expertise. In these instances, the Marking Scheme and Test Project are unseen by Experts until immediately before the start of the skill competition, or competition module. Where the detailed and final Marking Scheme and Test Project are designed by Experts, they must be approved by the whole Expert group prior to submission for independent validation and quality assurance. Please see the Competition Rules for further details.

Experts and Independent Test Project Designers are required to submit their Marking Schemes and Test Projects for review, verification, and validation well in advance of completion. They are also expected to work with their Skill Advisor, reviewers, and verifiers, throughout the design and development process, for quality assurance and in order to take full advantage of the CIS's features.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition. Skill Advisors actively facilitate this process.

4.2 Assessment Criteria

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived before, or in conjunction with, the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards; in others they may be different. There will normally be between five and nine Assessment Criteria. Whether or not the headings match, the Marking Scheme as a whole must reflect the weightings in the Standards.

Assessment Criteria are created by the person or people developing the Marking Scheme, who are free to define the Criteria that they consider most suited to the assessment and marking of the Test Project. Each Assessment Criterion is defined by a letter (A-I). **The Assessment Criteria, the allocation of marks, and the assessment methods, should not be set out within this Technical Description. This is because the Criteria, allocation of marks, and assessment**

methods all depend on the nature of the Marking Scheme and Test Project, which is decided after this Technical Description is published.

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria and Sub Criteria.

The marks allocated to each Criterion will be calculated by the CIS. These will be the cumulative sum of marks given to each Aspect within that Assessment Criterion.

4.3 Sub Criteria

Each Assessment Criterion is divided into one or more Sub Criteria. Each Sub Criterion becomes the heading for a WorldSkills marking form. Each marking form (Sub Criterion) contains Aspects to be assessed and marked by Measurement or Judgement, or both Measurement and Judgement.

Each marking form (Sub Criterion) specifies both the day on which it will be marked, and the identity of the marking team.

4.4 Aspects

Each Aspect defines, in detail, a single item to be assessed and marked, together with the marks, and detailed descriptors or instructions as a guide to marking. Each Aspect is assessed either by Measurement or by Judgement.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it. The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of the Standards. This will be displayed in the Mark Allocation Table of the CIS, in the following format, when the Marking Scheme is reviewed from C-8 weeks. (Section 4.1 refers.)

		CRITERIA								TOTAL MARKS PER SECTION	WSSS MARKS PER SECTION	VARIANCE
		A	B	C	D	E	F	G	H			
STANDARDS SPECIFICATION SECTION	1	5.00								5.00	5.00	0.00
	2		2.00					7.50		9.50	10.00	0.50
	3								11.00	11.00	10.00	1.00
	4			5.00						5.00	5.00	0.00
	5				10.00	10.00	10.00			30.00	30.00	0.00
	6		8.00	5.00				2.50	9.00	24.50	25.00	0.50
	7			10.00				5.00		15.00	15.00	0.00
TOTAL MARKS		5.00	10.00	20.00	10.00	10.00	10.00	15.00	20.00	100.00	100.00	2.00

4.5 Assessment and marking

There is to be one marking team for each Sub Criterion, whether it is assessed and marked by Judgement, Measurement, or both. The same marking team must assess and mark all Competitors. Where this is impracticable (for example where an action must be done by every Competitor simultaneously, and must be observed doing so), a second tier of assessment and marking will be put in place, with the approval of the Competitions Committee Management Team. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (Section 4.6 refers.)

4.6 Assessment and marking using Judgement

Judgement uses a scale of 0-3. To apply the scale with rigour and consistency, Judgement must be conducted using:

- benchmarks (criteria) for detailed guidance for each Aspect (in words, images, artefacts, or separate guidance notes). This is documented in the Standards and Assessment Guide.
- the 0-3 scale to indicate:
  - 0: performance below industry standard
  - 1: performance meets industry standard
  - 2: performance meets and, in specific respects, exceeds industry standard
  - 3: performance wholly exceeds industry standard and is judged as excellent

Three Experts will judge each Aspect, normally simultaneously, and record their scores. A fourth Expert coordinates and supervises the scoring, and checks their validity. They also act as a judge when required to prevent compatriot marking.

4.7 Assessment and marking using Measurement

Normally three Experts will be used to assess each Aspect, with a fourth Expert supervising. In some circumstances the team may organize itself as two pairs, for dual marking. Unless otherwise stated, only the maximum mark or zero will be awarded. Where they are used, the benchmarks for awarding partial marks will be clearly defined within the Aspect. To avoid errors in calculation or transmission, the CIS provides a large number of automated calculation options, the use of which is mandated.

4.8 The use of Measurement and Judgement

Decisions regarding the choice of criteria and assessment methods will be made during the design of the competition through the Marking Scheme and Test Project.

4.9 Skill assessment strategy and procedures

WorldSkills is committed to continuous improvement including reviewing past limitations and building on good practice. The following skill assessment strategy and procedures for this skill competition take this into account and explain how the marking process will be managed.

Each Aspect describes in detail one of the estimated indicators, as well as possible assessments or instructions for Judgement Marking.

The Marking Scheme lists in detail each aspect for which a mark is made, along with the number of marks assigned to it.

The amount of marks awarded for each Aspect should fall within the range of marks defined for each section of the WSOS. It is displayed in the CIS score distribution table, in the following format.

There is daily marking. Each sub criterion is marked on a daily basis. Subject to their expertise, the rules and quality requirements, there is a reasonable balance of marking by each Expert.

Each Test Project module will rigorously sample the relevant standards. The assessment criteria will largely or entirely follow the sections of the WorldSkills Occupational Standards.

The Test Project will include layout resources for making an application UI. When checking the work of the Competitors Experts should pay attention to the correspondence of the real application to the layouts that were provided as resources to the task. For example, if there are four elements

in the layout, the Experts should check the visual correspondence of the given elements and check the operability of each element.

5 The Test Project

5.1 General notes

Sections 3 and 4 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the applied knowledge, skills, and behaviours set out in each section of the WSOS.

The purpose of the Test Project is to provide full, balanced, and authentic opportunities for assessment and marking across the Standards, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme, and Standards will be a key indicator of quality, as will be its relationship with actual work performance.

The Test Project will not cover areas outside the Standards or affect the balance of marks within the Standards other than in the circumstances indicated by Section 2. This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standards. Section 2.1 refers.

The Test Project will enable knowledge and understanding to be assessed solely through their applications within practical work. The Test Project will not assess knowledge of WorldSkills rules and regulations.

Most Test Projects and Marking Schemes are now designed and developed independently of the Experts. They are designed and developed either by the Skill Competition Manager, or an Independent Test Project Designer, normally from C-12 months. They are subject to independent review, verification, and validation. (Section 4.1 refers.)

The information provided below will be subject to what is known at the time of completing this Technical Description, and the requirement for confidentiality.

Please refer to the current version of the Competition Rules for further details.

5.2 Format/structure of the Test Project

Each Aspect describes in detail one of the estimated indicators, as well as possible assessments or instructions for Judgement Marking.

The Marking Scheme lists in detail each aspect for which a mark is made, along with the number of marks assigned to it.

The amount of marks awarded for each Aspect should fall within the range of marks defined for each section of the WSOS. It is displayed in the CIS score distribution table, in the following format.

There is daily marking. Each sub criterion is marked on a daily basis. Subject to their expertise, the rules and quality requirements, there is a reasonable balance of marking by each Expert.

Each Test Project module will rigorously sample the relevant standards. The assessment criteria will largely or entirely follow the sections of the WorldSkills Occupational Standards.

The Test Project will include layout resources for making an application UI. When checking the work of the Competitors Experts should pay attention to the correspondence of the real application to the layouts that were provided as resources to the task. For example, if there are four elements in the layout, the Experts should check the visual correspondence of the given elements and check the operability of each element.

5.3 Test Project design requirements

Test Projects should reflect the purposes, structures, processes, and outcomes of the occupational role they are based on. They should aim to be a small-scale version of that role. Before focusing on practicalities, SMTs should show how the Test Project design will provide full, balanced, and authentic opportunities for assessment and marking across the Standards, as set out in Section 5.1.

Test Project modules are to be developed within the framework of the WorldSkills Occupational Standards. Topics can be entertainment, life, health, socializing, journalism, etc.

Module information:

Module	Assessment Devices	Time (hours)
Functionality	emulator or real device	5
Design	Adobe XD	5
Implement	emulator or real device	5
Development and Testing	emulator or real device	3

The four modules are developed under the same topic and based on an offline development system environment (which will be announced on the WorldSkills Discussion Forum at least one (1) month prior to the Competition).

Module A - Functionality

Competitors need to refer to Test Project to develop corresponding functions, e.g. fetching Restful API data, analysing data, using system functionality API and etc.

Module B - Design

Competitors need to refer to the wireframe, combining with the understanding of the design demand, to optimize the App interface, and the final output is XD file(s) with interactive functions.

Module C - Implement

Competitors need to refer to the given prototypes and video file(s) to produce the corresponding interface layout details, and corresponding interactive animation.

Module D - Development and Testing

Competitors need to develop the basic App functional logic, and write automated test scripts to run the App.

5.4 Test Project coordination and development

The Test Project MUST be submitted using the templates provided by WorldSkills International (www.worldskills.org/expertcentre). Use the Word template for text documents and DWG template for drawings.

5.4.1 Test Project coordination (preparation for Competition)

Coordination of the Test Project/modules will be undertaken by the Skill Competition Manager.

5.4.2 Who develops the Test Project/modules

The Test Project/modules are developed by an Independent Test Project Designer in collaboration with the Skill Competition Manager.

5.4.3 When is the Test Project developed

The Test Project/modules are developed according to the following timeline:

Time	Action
Ten (10) months prior to the Competition	The ITPD is identified and a Confidentiality Agreement between WSI and the ITPD is organized.
No later than one (1) month prior to the Competition	The Test Project documents are sent to the WorldSkills International Skills Competitions Administration Manager.
At the Competition on C-3.	The Test Project/modules are presented to the Experts without any technical information.
At the Competition every morning	The Test/Project modules are presented to Competitors.

5.5 Test Project initial review and verification

The purpose of a Test Project is to create a challenge for Competitors which authentically represents working life for an outstanding practitioner in an identified occupation. By doing this, the Test Project will apply the Marking Scheme and fully represent the WSOS. In this way it is unique in its context, purpose, activities, and expectations.

To support Test Project design and development, a rigorous quality assurance and design process is in place (Competition Rules sections 10.6-10.7 refer.) Once approved by WorldSkills, the Independent Test Project Designer (ITPD) is expected to identify one or more independent expert(s), and trusted individuals initially to review the Independent Test Project Designer's ideas and plans, and subsequently to verify the Test Project, prior to validation.

A Skill Advisor will ensure and coordinate this arrangement, to guarantee the timeliness and thoroughness of both initial review, and verification, based on the risk analysis that underpins Section 10.7 of the Competition Rules.

5.6 Test Project validation

The Skill Competition Manager coordinates the validation of the Test Project/modules and will ensure that it can be completed within the material, equipment, knowledge, and time constraints of Competitors.

5.7 Test Project circulation

The Test Project/modules are not circulated prior to the Competition. The Test Project/modules are presented to Experts on C-3 and to Competitors every morning of each Competition Day.

5.8 Test Project change

Due to the Test Project being developed by an Independent Test Project Designer (ITPD), there is no change required to be made to the Test Project/modules at the Competition. Exceptions are amendments to technical errors in the Test Project documents and according to infrastructure limitations.

5.9 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitor to complete the Test Project will be supplied by the Competition Organizer and are available from www.worldskills.org/infrastructure located in the Expert Centre. However, note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

6 Skill management and communication

6.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration, and decision making regarding the skill competition must take place on the WorldSkills skill-specific Discussion Forum. (http://forums.worldskills.org). Skill related decisions and communication are only valid if they take place on the WorldSkills Discussion Forum. The Chief Expert (or an Expert Lead appointed by the Skill Management Team) will be the moderator for this Discussion Forum. Refer to the Competition Rules for the timeline of communication and competition development requirements.

6.2 Competitor information

All information for registered Competitors is available from the Competitor Centre (www.worldskills.org/competitorcentre).

This information includes:

- Competition Rules
- Technical Descriptions
- Mark Summary Form (where applicable)
- Test Projects (where applicable)
- Infrastructure List
- WorldSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available from www.worldskills.org/testprojects and the Competitor Centre (www.worldskills.org/competitorcentre).

6.4 Day-to-day management

The day-to-day management of the skill competition during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team. The Skill Management Team comprises the Skill Competition Manager, Chief Expert, and the Expert Leads. The Skill Management Plan is progressively developed in the six (6) months prior to the Competition and finalized at the Competition. The Skill Management Plan can be viewed in the Expert Centre (www.worldskills.org/expertcentre).

6.5 General best practice procedures

General best practice procedures clearly delineate the difference between what is a best practice procedure and skill-specific rules (section 9). General best practice procedures are those where Experts and Competitors CANNOT be held accountable as a breach to the Competition Rules or skill-specific rules which would have a penalty applied as part of the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System. In some cases, general best practice procedures for Competitors may be reflected in the Marking Scheme.

Topic/task	Best practice procedure
Test Projects	• Uncirculated Test Projects are presented on C-3 by the Skill Competition Manager without the resources. • Translation process begins after Test Projects are presented to Experts on C-3. Translation need to be submitted to Skill Competition Manager and Chief Expert by 11:59 am, the day before each Test Project/ module begins. • Interpreter may use a laptop provided without Internet access to translate the Test Projects. • Interpreter or Expert cannot bring any device into or take out any note from the translation area.
Equipment	• The Experts and Workshop Manager have the right to disallow certain equipment brought by Competitors.
Equipment failure	• In the occurrence of equipment failure Competitors must notify Experts immediately by raising their hand. Experts will take note of the time that the Competitor is not able to make use of their equipment. Any time lost due to equipment failure is provided to the Competitor at the end of the standard module time. • Competitors raise their hands or by pressing the “beep” button to notify Experts if there is one installed. • No additional time is granted for work not saved prior to the equipment failure.
Competitors’ Internet workstation	• A common Internet workstation is setup which Competitors can make use of twice a day (eight sessions - over the four days of competition). A maximum of ten minutes is allocated to each session and any unused time cannot be re-allocated. Competitor Internet workstation sessions are not to be used consecutively; a minimum of one session must separate the use of the Internet workstation.
Music	• Competitors are allowed to provide no more than 20 un-edited songs (in MP3 format) prior to C-10, which are released by Experts as his/her representative in the Competition Forum. All music is collected and shared amongst all Competitors. The music files are placed together in each workstation prior to Familiarization Day.
Familiarization Day	• Prior to completing Familiarization all Competitors need to clean their respective computers removing all the files created/used to test the software. This includes the removal of all databases which have been created.
Marking	• Experts – All mark deductions must be accompanied by a short description as to why the mark was not awarded. This description can be made in the Results column.
Test Project questions	• Experts – All questions about the Test Project must be asked in the WorldSkills Discussion Forum prior to the day that the Test Project to be competed on. The Skill Competition Manager will then answer

Topic/task	Best practice procedure
	questions where required. No questions are answered unless the question has been asked within the WorldSkills Discussion Forum. • Competitors – All questions about the Test Project must be communicated through the Expert.
Module briefing	• Experts – No communication can be made with the Competitor during the module briefings. • Competitors – No questions can be asked about the Test Project during the module briefings. These questions should have already been asked by the Expert prior to the day that the module is being competed on.
Breaks	• Competitors - No extra time is given to Competitors who stop work during competition time to go to the bathroom or for those who break for a food and/or drink. When time is completed all Competitors must stop all work on their computer immediately.
Attending to a Competitor	• When a Competitor has a question two non-compatriot Experts must be present. The Competitor may call on their Interpreter if required but there should be no conversation only direct interpretation with no additional information.

7 Skill-specific safety requirements

7.1 Personal Protective Equipment

Refer to WorldSkills Health, Safety, and Environment Policy and Regulations for Host country or region regulations.

Task	Sturdy shoes with closed toe and heel
General PPE for safe areas	√

8 Materials and equipment

8.1 Infrastructure List

The Infrastructure List details all equipment, materials, and facilities provided by the Competition Organizer.

The Infrastructure List is available at www.worldskills.org/infrastructure.

The Infrastructure List specifies the items and quantities requested by the Skill Management Team for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

At each Competition, the Skill Management Team must review and update the Infrastructure List in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition for the upcoming WorldSkills Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

8.2 Competitors toolbox

Competitors are not allowed to send a toolbox to the Competition. All tools are provided by the Competition Organizer.

8.3 Materials, equipment, and tools supplied by Competitors

It is not applicable for the Mobile Applications Development skill competition for Competitors to bring materials, equipment, and tools to the Competition. However, Competitors are allowed to bring their own wired keyboard and wired mouse in the morning of Familiarization Day.

8.4 Materials, equipment, and tools supplied by Experts

Experts are required to supply their own Personal Protective Equipment as specified in section 7 skill-specific safety requirements.

Experts are responsible that Interpreters bring their PPE.

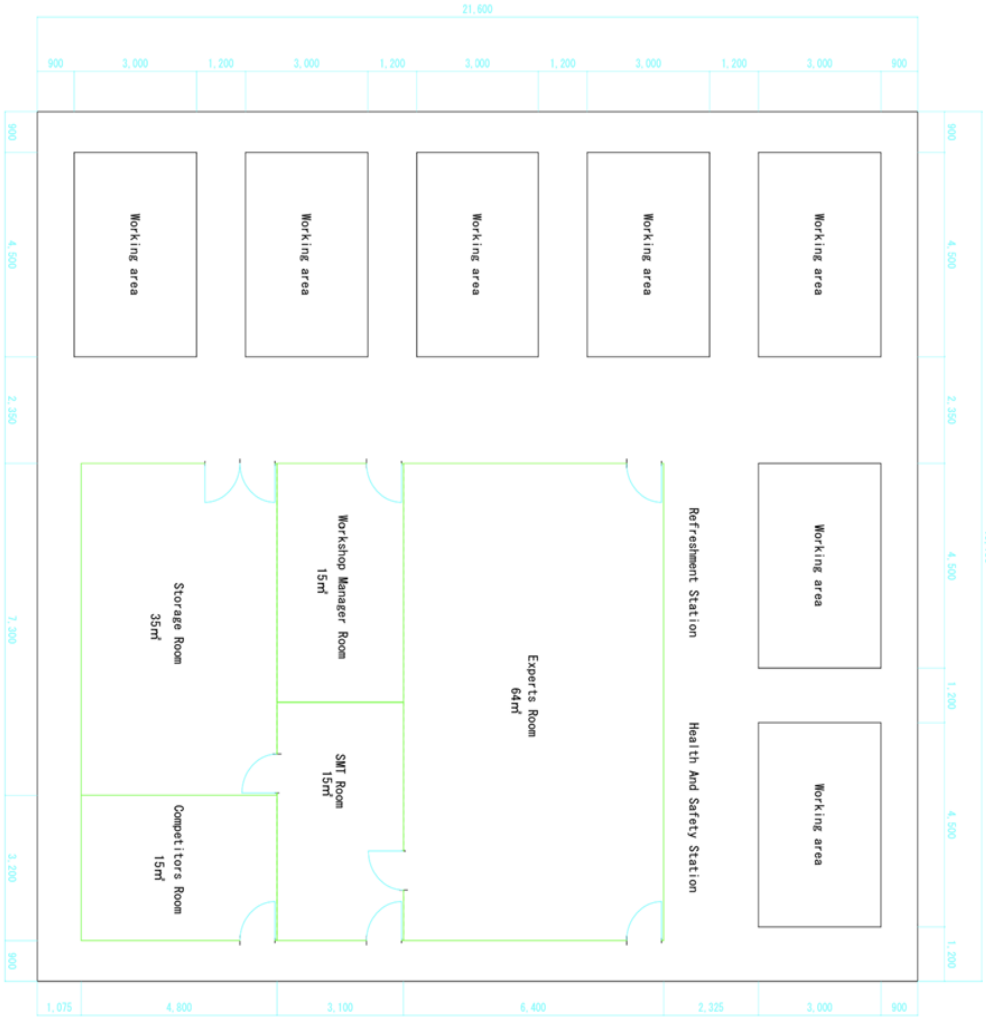
8.5 Materials and equipment prohibited in the skill area

Competitors and Experts are prohibited to bring any materials or equipment not listed in section 8.3 and section 8.4.

8.6 Proposed workshop and workstation layouts

Workshop layouts from previous competitions are available at www.worldskills.org/sitelayout.

Example workshop layout



9 Skill-specific rules

9.1 General notes

Skill-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from skill competition to skill competition. This includes but is not limited to personal IT equipment, data storage devices, Internet access, procedures and workflow, and documentation management and distribution. Breaches of these rules will be solved according to the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System.

9.2 Skill-specific rules

Topic/task	Skill-specific rules
Use of technology – USB, memory sticks	• Skill Competition Manager, Chief Expert, Experts, and Interpreters are allowed to bring USB/memory sticks into the Expert meeting room. USB/memory sticks are allowed to be taken outside of the meeting room at the end of each day. • Competitors are not allowed to bring USB/memory sticks into the workshop. If Competitors do bring them into the workshop, they should lock them in their locker. They can be removed at lunchtime or at the end of each day.
Use of technology – personal laptops	• Skill Competition Manager, Chief Expert, Experts, and Interpreters are allowed to bring laptops into the Expert meeting room. Laptops are allowed to be taken outside of the meeting room at the end of each day. • No laptops are allowed in the workshop. If Competitors do bring them into the workshop, they should lock them in their locker. They can be removed at lunchtime or at the end of each day.
Use of technology – personal cameras	• Skill Competition Manager, Chief Expert, Experts, and Interpreters are allowed to bring cameras into the Expert meeting room. Cameras are allowed to be taken outside of the meeting room at the end of each day. • No cameras are allowed in the workshop until the completion of competition on C4.
Use of technology – mobile devices	• Chief Expert, Experts, and Interpreters are not allowed to take any electronic devices to any Competitor workstations under any circumstances except with the approval of the Chief Expert and acknowledgement of the Skill Competition Manager. • Competitors must leave electronic devices (Including mobile phones) in their bags (switched off or on silent) within the lockers provided. • No electronic devices are to be brought to Competitors workstations under any circumstances unless with the approval of the Chief Expert. If Competitors do bring them into the workshop, they should lock them in their locker. They can be removed at lunchtime or at the end of each day.

Topic/task	Skill-specific rules
	• The Skill Competition Manger is exempt from this rule.
Source file/notes	• Skill Competition Manager, Chief Expert, Experts, Competitors, and Interpreters may not bring notes into the workshop under any circumstances. All notes made at the Competitor workstation must remain at the Competitor's desk at all times. The Skill Competition Manager will collect any notes each evening and lock them away for safe keeping and redistribute the following morning during preparation. No notes may be taken outside of the workshop. This is applicable for C-2 and C1 to C4.
Internal Storage	• All materials brought into the workshop by the Competitors must not have any internal memory storage devices.
Familiarization Day	• During Familiarization Day Competitors cannot use the available time to work on or solve any tasks related to the Competition.
Marking Rooms	• Chief Expert and Experts are not allowed to bring additional items in or out of the Marking Rooms unless approved by the Chief Expert or Skill Competition Manager. • Competitors are not allowed in the Marking Rooms.

10 Visitor and media engagement

10.1 Engagement methods

Following is a list of possible ways to maximize visitor and media engagement:

- Display screens;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles;
- Career opportunities;
- Daily reporting of competition status;
- A place for visitors where they can play with a programming language learning platform.

11 Sustainability

11.1 Sustainable practices

This skill competition will focus on the sustainable practices below:

- Recycling – no printing for Competitor workstations;
- No printing of Test Projects. Test Projects are provided within media files;
- Use of completed Test Projects after Competition;
- Limit the amount of software to be installed on Competitor workstations;
- Open source software.

12 References for industry consultation

12.1 General notes

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (http://www.ilo.org/public/english/bureau/stat/isco/isco08/)
- ESCO: (https://ec.europa.eu/esco/portal/home)
- O*NET OnLine (www.onetonline.org/)

12.2 References

This WSOS appears to relate closely to Computer Programmers: https://www.onetonline.org/link/summary/15-1251.00

and Mobile Application Developer:
http://data.europa.eu/esco/occupation/2ed56c3f-61d6-4f7e-9ef8-8849eb102e4c

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Lyon 2024.

There were no responses to the requests for feedback this cycle.

13 Appendix

13.1 Appendix information

Not applicable.