

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.

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1 INTRODUCTION

1.1 NAME AND DESCRIPTION OF THE SKILL COMPETITION

1.1.1 The name of the skill competition is

IT Software Solutions for Business

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

The rapid pace of globalization over the past decade has been largely driven by developments in Information and Communication Technology (ICT). IT specialists are increasingly in great demand in several areas, one of which is providing software solutions for businesses.

The development of software solutions to improve business productivity encompasses many different skills and disciplines. Key to these is an awareness of the fast changing nature of the industry and the ability to keep up with the rapid pace of change.

IT software solution professionals always work closely with clients to modify existing systems or create new systems. They may modify “off the shelf” software and integrate it into the existing systems. They often work as part of a team of software professionals responsible for the requirement specification, system analysis and design, construction, testing, training, and implementation, as well as maintenance of a business software system.

The tasks performed by IT software solution professionals include but are not limited to the following:

- Review current system and present ideas for improvement, including cost benefit analysis
- Analyse and specify user requirements
- Produce detailed specifications for new systems or for modifications to existing systems
- Develop software systems and test the software solution thoroughly
- Integrate several systems and software to meet industry requirement
- Prepare user training materials, train users, and present the software solution to users
- Install, implement, and maintain the software system

IT software solutions professionals can be employed in large, medium, and small enterprises as software engineers, in consulting firms as consultants, and in software houses as contractors.

They can operate in a wide variety of roles including in a development role to tailor-make or customize software solutions, in a supporting role to operate systems, in a business analyst role to provide solutions to simplify and automate routine office and business activities, as well as in a training role to train users in using the application software.

1.1.3 Number of Competitors per team

IT Software Solutions for Business 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 – Competition Rules
- WSI – WorldSkills Standards Specification framework
- WSI – WorldSkills Assessment Strategy
- WSI Online resources as indicated in this document
- WorldSkills Health, Safety, and Environment Policy and Regulations

2 THE WORLDSKILLS STANDARDS SPECIFICATION (WSSS)

2.1 GENERAL NOTES ON THE WSSS

The WSSS specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSSS).

The skill competition is intended to reflect international best practice as described by the WSSS, and to the extent that it is able to. The Standards Specification 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 Standards Specification 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 Specification. This is often referred to as the “weighting”. The sum of all the percentage marks is 100.

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

The Marking Scheme and Test Project will follow the allocation of marks within the Standards Specification to the extent practically possible. A variation of five percent is allowed, provided that this does not distort the weightings assigned by the Standards Specification.

2.2 WORLDSKILLS STANDARDS SPECIFICATION

| SECTION | | RELATIVE IMPORTANCE (%) |
|---------|---|-------------------------|
| 1 | Work organization and management | 10 |
| | <p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The principles and practices that enable productive team work • How to take initiatives and be enterprising in order to identify, analyse, and evaluate information from a variety of sources • How to design a proper flow of the system that is designed and provide proper notification when needed • How to prepare proper documentation on how to use the system that they build • How to properly prepare the list of requirements by the client and complete the full delivery of system • How to include the company standard (style guide) into the system. | |
| | <p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Plan each day's production schedule according to available time and take into account time limitations and deadlines • Apply research techniques and skills to keep up-to-date with the latest industry guidelines • Review own performance against the expectations and needs of the client and organization • Design a proper system flow with notifications when needed • Prepare a good system documentation on how to use, install and run the system • Prepare the complete system to be delivered and in line with client's requirement. • Prepare and implement the style guide to the whole delivered system. • Able to implement the company standard (style guide) to the whole system. | |
| 2 | Communication and interpersonal skills | 5 |
| | <p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The importance of listening skills • The necessity of using discretion and confidentiality when dealing with clients • The importance of resolving misunderstandings and conflicting demands • The importance of establishing and maintaining customer confidence and productive working relationships • The value of written and oral communication skills • How to provide a proper and understandable documentation of the software solution • How to provide a proper report and communicate the findings, issues and other problems along the way, during the system development and implementation. • Need to know, read, and understand basic IT English (to minimize time for translation) | |

| | | |
|----------|---|-----------|
| | <p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Use literacy skills to: <ul style="list-style-type: none"> • Follow documented instructions from a supplied guide • Interpret workplace instructions and other technical documents • Interpret and understand systems specification documents • Keep up-to-date with latest industry guidelines • Use oral communication skills to: <ul style="list-style-type: none"> • Discuss and offer suggestions regarding a system specification • Keep client updated regarding system progress • Negotiate with client regarding project budget and timeline • Gather and confirm client requirements • Present the proposed and final software solution • Use written communications skills to: <ul style="list-style-type: none"> • Document a software system (e.g. technical document, user guide) • Keep client updated regarding system progress • Confirm that the created application meets the original specifications and obtain user sign-off for completed system • Use team communication skills to: <ul style="list-style-type: none"> • Collaborate with others to develop the required outcomes • Work well in group problem solving • Use project management skills to: <ul style="list-style-type: none"> • Prioritize and schedule tasks • Allocate resources to tasks | |
| 3 | Problem solving, innovation, and creativity | 10 |
| | <p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The common types of problem and requirements which may occur within software development • The common types of problem and requirements which may occur within a business organization • Diagnostic approaches and suitable system or software to problem solving • Trends and developments in the industry including new platforms, languages, conventions, and technical skills • The use of latest technology to be applied in software scenario which requires the ability to demonstrate and provide an over-arching business solution to a problem • How to set-up, develop, and integrate into designed solution the latest technology and hardware that will drive a better business solution. | |

| | | |
|----------|--|-----------|
| | <p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Use analytical skills to: <ul style="list-style-type: none"> • Synthesize complex or diverse information • Determine the functional and non-functional requirements of the specification • Use investigation and learning skills to: <ul style="list-style-type: none"> • Understand user requirements (e.g. result of interviews, questionnaire, document search and analysis, joint application design, and observation) • Research encountered problems independently • Use problem-solving skills to: <ul style="list-style-type: none"> • Identify and resolve problems in a timely manner • Gather and analyse information skilfully • Develop alternatives using the latest technology to support better business solution. • Select the most appropriate alternative to produce the required solution. Some technology may integrate some hardware in the solution. | |
| 4 | Analysing and designing software solutions | 25 |
| | <p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The importance of considering all possible options and deriving the best solution based on sound analytical judgment and the client's best interests • The importance of using system analysis and design methodologies (e.g. Unified Modelling Language, Model-View-Control (MVC) software framework, Design Patterns) • The need to be up to date with new technologies and able to make a judgment about the appropriateness of adopting them • The importance of optimization of system design with an emphasis on modularity and reusability • Build data warehouse and required for business intelligence/ executive dashboard • Proper interface and layering for mobile solution | |

| | | |
|----------|---|-----------|
| | <p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Analyse systems using: <ul style="list-style-type: none"> • Use Case modelling and analysis (e.g. Use Case Diagram, Use Case Description, Actor Description, Use Case Package) • Structural modelling and analysis (e.g. Object, Class, Domain Class Diagram) • Dynamic modelling and analysis (e.g. Sequence Diagram, Collaboration Diagram, State Diagram, Activity Diagram) • Data modelling tools and techniques (e.g. Entity Relationship Diagram, Normalization, Data Dictionary) • Design systems using: <ul style="list-style-type: none"> • Class Diagram, Sequence Diagram, State Diagram, Activity Diagram • Object design and package • Relational or object database design and data flow diagrams • Human-computer interface design/user experience • Security and controls design • Multi-tier application design | |
| 5 | Developing software solutions | 50 |
| | <p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The importance of considering all possible options and deriving the best solution to meet the user requirements and the client's best interests • The importance of using system development methodologies (e.g. object-oriented technology) • The importance of considering all normal and abnormal scenarios, and exception handlings • The importance of following standards (e.g. code convention, style guide, user interface designs, managing directories, and files) • The importance of accurate and consistent version control • Using existing code as a basis for analysis and modifications • The importance of selecting the most appropriate development tool from those provided | |

| | | |
|--|--|------------|
| | <p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Use database management system to construct, store, and manage the required data structure and datasets for a system • Use the appropriate software development environments and tools provided to modify existing codes and write new codes of a client-server based software solution • Use the latest software development tools and environments to create or modify a mobile solution, using a physical mobile device according to client requirements • Use latest software development environment and tools to write or modify new codes for system integration using web enabled solutions, web services or through single sign one integration (e.g. using active directory), or an API • Evaluate and integrate appropriate libraries and frameworks into a software solution • Build and maintain multi-tier applications | |
| | 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 Specification. The Test Project is the assessment vehicle for the skill competition, and also follows the Standards Specification. The CIS enables the timely and accurate recording of marks, and has expanding supportive capacity.

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

Prior to submission for approval to WSI, the Marking Scheme and Test Project will liaise with the WSI Skill Advisors in order 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 standards that represent the skill. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards Specification.

By reflecting the weightings in the Standards Specification, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill 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 Specification, if there is no practicable alternative.

The Marking Scheme and Test Project may be developed by one person, or several, or by all Experts. The detailed and final Marking Scheme and Test Project must be approved by the whole Expert Jury prior to submission for independent quality assurance. The exception to this process is for those skill competitions which use an independent designer for the development of the Marking Scheme and Test Project. Please see the Rules for further details.

Experts and independent designers are required to submit their Marking Schemes and Test Projects for comment and provisional approval well in advance of completion, in order to avoid disappointment or setbacks at a late stage. They are also advised to work with the CIS Team at this intermediate stage, in order to take full advantage of the possibilities of the CIS.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition using the CIS standard spreadsheet or other agreed methods.

4.2 ASSESSMENT CRITERIA

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived in conjunction with the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards Specification; in others they may be totally 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 Specification.

Assessment Criteria are created by the person(s) developing the Marking Scheme, who are free to define 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). It is advisable not to specify either the Assessment Criteria, or the allocation of marks, or the assessment methods, within this Technical Description.

The Mark Summary Form generated by the CIS will comprise a list of the Assessment 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) specified 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, or instructions for how the marks are to be awarded. Aspects are assessed either by measurement or 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 skill in the Standards Specification. 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)

| | 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 | 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, in all circumstances. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (See 4.6.)

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)
- 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, with a fourth to coordinate the marking and acting as a judge to prevent compatriot marking.

The mark allocation for Judgement Marking will be set with a minimum of 10% and maximum of 30%.

4.7 ASSESSMENT AND MARKING USING MEASUREMENT

Three Experts will be used to assess each aspect. 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.

4.8 THE USE OF MEASUREMENT AND JUDGEMENT

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

4.9 COMPLETION OF SKILL ASSESSMENT SPECIFICATION

Marking groups will be formed in accordance with the Competition Rules.

The skill assessment criteria developed by the Independent Designer are clear concise aspect specifications which explain exactly how and why a particular mark is awarded.

There can be three different types of measurement criteria in the Test Project. The table below shows an explanation of the three types:

| TYPE | EXAMPLE | MAX. MARKS | CORRECT | NOT CORRECT |
|---|---|------------|---------|-------------|
| Full marks or zero marks | The pie chart shows data labels as percentages | 0.20 | 0.20 | 0 |
| Deduct from full marks on a predetermined sliding scale | Report is formatted as specified (deduct 0.1 mark for each error) | 0.5 | 0.5 | 0 – 0.4 |
| Add to zero marks on a predetermined progressive scale | Solver criteria specified correctly (add 0.1 mark for each criterion) | 1.0 | 1.0 | 0.0 – 0.9 |

4.10 ASSESSMENT PROCEDURES

Each Expert will perform as a member of a marking team of the Test Project.

Experts will be divided into marking teams allocating equal measurement and judgement marking where possible. The composition of the marking teams will be decided by the CE and DCE with the aim of having a balance of new and experienced Experts in each.

Experts will be divided into different cultural groups for judgement marking where possible.

The Independent Designer will provide the marking criteria. Experts will discuss these marking criteria upon arrival at the Competition.

The Experts will agree on the final marking scheme at the Competition. Judgement marks should not exceed 20 %.

5 THE TEST PROJECT

5.1 GENERAL NOTES

Sections 3 and 0 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 skills in each section of the WSSS.

The purpose of the Test Project is to provide full, balanced and authentic opportunities for assessment and marking across the Standards Specification, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme and Standards Specification 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 Specification, or affect the balance of marks within the Standards Specification other than in the circumstances indicated by Section 2.

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.

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 Specification. Section 2.1 refers.

5.2 FORMAT/STRUCTURE OF THE TEST PROJECT

The Test Project will be in the form of a case study that will represent typical functions that might be asked of a software developer who is highly competent in the skills described. The scenario will be presented as a project with clearly defined deliverables. These deliverables will be grouped to enable a modular approach whereby discrete tasks can be completed in a session. The Competitors will select the appropriate component(s) of the software for the task.

Common data files will be provided in English only and only English versions of the software will be provided.

5.3 TEST PROJECT DESIGN REQUIREMENTS

The Test Project must be based on the scenario agreed by the Experts at the previous WorldSkills Competition and as such the next Competition is based on Event/Logistics Management. The problems set should not require any in-depth knowledge of the industry. It is recommended that sponsorship/support be sought from a representative within the Competition Organizer. Ideally the project would be one that addresses an actual need for a charitable or other not-for-profit organization in the Host Country, so that the expenses (material and effort) are not wasted.

This scenario shall include an extensive simulation of workplace activities related to IT and shall be composed of a variety of forms of information gathering, processing and distribution. The project should be designed so that at the end of a Competition session, that session's work can be marked.

Where work carries over from one session to another, the Competitor's work will be backed up for marking at the end of each session. For example, the project might require development of a database – table definitions, data imports, form, and query and report construction. The project might specify a certain number of deliverables to be completed in the first session of the day. At the break, the solutions to those deliverables would be backed-up and marked. Any work done to those deliverables after the break would not be marked.

5.4 TEST PROJECT 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 Who develops the Test Project or modules

An Independent Designer, ideally in consultation with an industry partner, develops the Test Project/modules. The stakeholders of the organization for whom the Test Project will be developed, would be consulted.

The independent writer will provide the following services:

- Prepare the details of the scenario of the case study of the Test Project;
- Specify and document the deliverables of the system to be developed;
- Provide the test data;
- Provide sample solutions;
- Provide marking criteria in accordance with the specifications of the Technical Description and the WSI CIS marking system.

All registered Experts in the Competition are invited to submit an “Expression of Interest” for nominating an individual or organization to be the Independent Designer. All nominations are to be emailed to the WSI Director of Skills Competitions. WSI will review all nominations and select the most appropriate applicant.

The independent writer will only communicate with the Director of Skills Competitions and will have no contact with the Project Liaison Team and the Experts.

The document provided by the independent writer is expected to have standard language verified with a native English speaker to ensure similar understanding of terminology related to technical and general aspects.

5.4.2 How and where is the Test Project or modules developed

An Independent Designer prepares the Test Project/modules.

Each Expert is expected to submit a sample reference to enable the Independent Designer to better understand the Test Project requirements. The submission will be done through the Discussion Forum within a timeframe that will be stipulated by the Chief Expert. Each Expert will also submit the report and review about the Test Project, marking and data files used in Sao Paulo as a sample reference as well.

A “Project Liaison Team” (PLT) will be formed at least eight months before the Competition. This team will comprise the Chief Expert, the Deputy Chief Expert and three other Experts who have had experience of at least one previous International Competition. These three Experts will be selected by the Skill Management Team (SMT) which will endeavour to ensure representation of a cross-section of participating Members. The role of the Project Liaison Team will be to assist the Independent Designer by answering questions relating to the Competition and procedures only. The Project Liaison Team will have no knowledge of the contents of the Test Project. The Independent Designer will only communicate with the Project Liaison Team via the WSI Director of Skills Competitions.

Ideally the Independent Designer, or a representative, will present the Test Project to the Experts. This could be in person or via electronic means.

Each Expert at the Competition should perform as a member of a marking team for the Test Project. The SMT will determine the composition of the marking teams. The SMT will determine the proportion of marks each assessment team is responsible for. The Chief Expert and Deputy Chief Expert may or may not be involved in the marking.

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

| TIME | ACTIVITY |
|--|---|
| Within two (2) months after the last Competition | Each Expert must submit a review of that Competition's Test Project, including marking guide. |
| Twelve (12) months before the Competition | Expression of Interest to write Test Project open to Experts. |
| Nine (9) months before the Competition | The Project Liaison Team is formed. |
| Three (3) months before the Competition | The Test Project is developed and sent to the Director of Skills Competitions for filing until the Competition. |
| Two (2) months before the Competition | The Style Guidelines and project overview are circulated to the Competitors on the website. If required, the VM image that will be available at the competition is circulated by the Workshop Manager. As part of VM image, also include the logic scheme of the network and how the system will run during the competition (server, collection of competition result, etc) |
| At the Competition | The Test Project is revealed to the Experts. Experts are required to advise their Competitors immediately about the Test Project. |

5.5 TEST PROJECT VALIDATION

The Test Project will be validated by the Experts at the Competition. Each marking team will be responsible for validation of the components of the Test Project that they will mark. They will ensure that:

- The Test Project sample solutions provided by the Independent Designer are a valid representation of the stated requirements;
- The marking schemes are appropriately developed;
- The Test Project meets the Technical Description;
- An accurate list of required data files for each session is available;
- Each marking team will present and explain what is required from the project assigned to each team including the marking criteria.

5.6 TEST PROJECT SELECTION

The Independent Designer will provide the Test Project to the Director of Skills Competitions three months prior to the Competition.

5.7 TEST PROJECT CIRCULATION

The Test Project is circulated via the website as follows:

The Test Project is not circulated prior to the Competition.

It is recommended that external neutral translators are engaged to translate the Test Project and marking scheme into languages required by Experts and their Competitors so that translated versions are available on the first preparation day prior to the Competition. No translation of Test Projects or marking schemes should be necessary after arrival at the Competition. The official translator and the Experts from each country/region must evaluate that this translation is in line with the English version upon arriving at the Competition (Test Project, marking scheme and style guidelines).

Style guidelines and project overview shall be circulated two months before the Competition.

The Test Project will be revealed to the Experts on the first preparation day prior to the Competition. At that stage, Experts must contact their Competitors and inform them of the Test Project.

5.8 TEST PROJECT COORDINATION (PREPARATION FOR COMPETITION)

Coordination of the Test Project will be undertaken by the Skill Competition Manager in conjunction with the Project Liaison Team and the Director of Skills Competitions.

5.9 TEST PROJECT CHANGE AT THE COMPETITION

No changes will be made to the Test Project developed by the independent writer prior to the Competition with the exception of amendments to technical errors in the Test Project document.

5.10 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.

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 skill specific Discussion Forum (<http://forums.worldskills.org>). Skill related decisions and communication are only valid if they take place on the forum. The Skill Competition Manager (or an Expert nominated by the Skill Competition Manager) will be the moderator for this Forum. Refer to 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
- Marking Schemes
- Test Projects
- 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 during the Competition is defined in the Skill Management Plan that is created by the Skill Management Team led by the Skill Competition Manager. The Skill Management Team comprises the Skill Competition Manager, Chief Expert and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalized at the Competition by agreement of the Experts. The Skill Management Plan can be viewed in the Expert Centre (www.worldskills.org/expertcentre).

7 SKILL-SPECIFIC SAFETY REQUIREMENTS

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

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 Competition Manager on behalf of the Experts for the next Competition. The Competition Organizer will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items. Items supplied by the Competition Organizer are shown in a separate column.

At each Competition, the Skill Competition Manager must review, audit, and update the Infrastructure List in partnership with the Technical Observer in preparation for the next Competition. The Skill Competition Manager must advise the Director of Skills Competitions of any requests for increases in space and/or equipment.

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 COMPETITOR'S TOOLBOX

Competitors are not required to bring any tools.

8.3 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY COMPETITORS IN THEIR TOOLBOX

Competitors are not required to bring any tools.

8.4 MATERIALS, EQUIPMENT, AND TOOLS SUPPLIED BY EXPERTS

Not applicable.

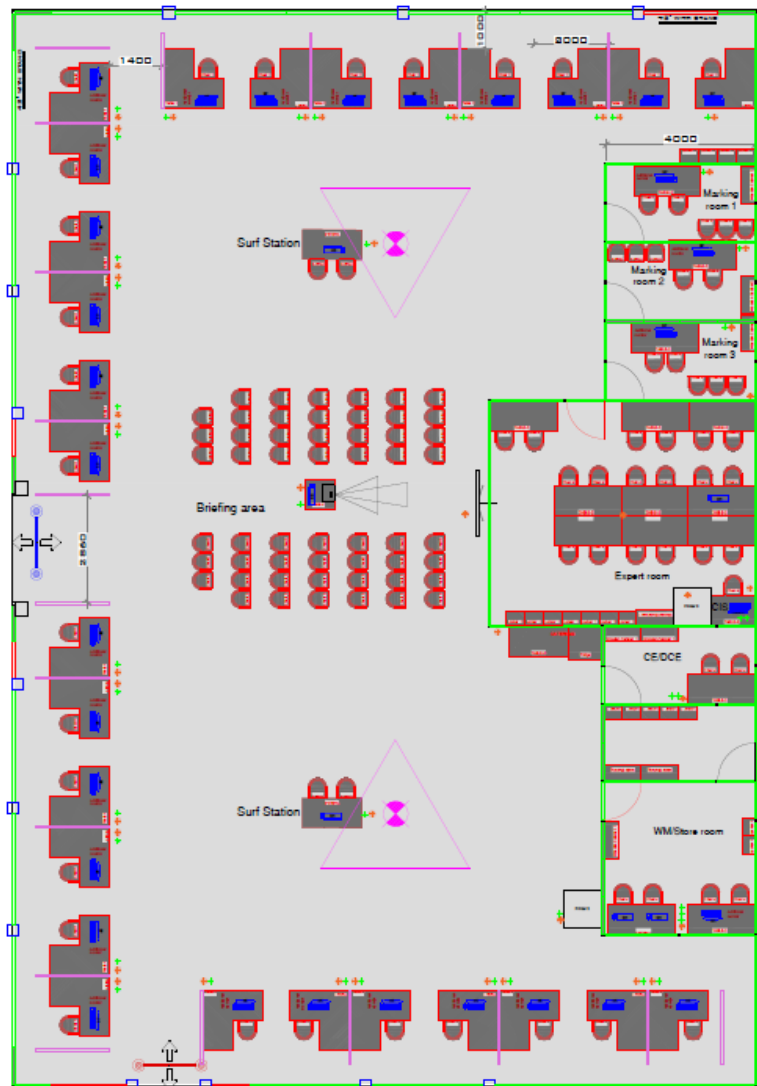
8.5 MATERIALS AND EQUIPMENT PROHIBITED IN THE SKILL AREA

- The Competitors may use ear protection;
- The Competitor may not bring:
 - Additional software;
 - Any portable communications devices such as mobile phones or smart watches;
 - Portable digital devices (Tablet, PDAs, etc.);
 - External storage devices (memory sticks, flash drives, etc.);
- Equipment must not have any access to the internal memory storage devices. The Competition Organizer will ensure that these are disabled;
- The Experts hold the right to disallow certain equipment brought into the Competition;
- The Competitors may be allowed Internet access in the Competition area. This will be on designated computers and will be limited to one 15-minute block per Competitor per session on a first come, first served basis. This time will be included in the competition time.

8.6 PROPOSED WORKSHOP AND WORKSTATION LAYOUTS

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

Example workshop layout:



- The design should consider the privacy of each Competitor but must also recognize the need for ease of supervision by the Experts. It must be readily apparent should a Competitor have a need to call an Expert. The height of the walls between two Competitors should be no higher than 120 cm;
- The design should consider the requirements for maximizing sustainability;
- There should be at least four separate and secure marking rooms, if possible, for Experts with adequate space (possible for five Experts to sit in a line) to accommodate a marking team. Each marking team is provided with the room key to secure the marking process;
- There should be secure rooms for the CE and DCE to enable them to manage the skill;
- A well-equipped Competitor briefing area is required. This must have a projector, screen, and PA system with an easy to use computer, audio, video, and other capabilities.

9 SKILL-SPECIFIC RULES

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 work flow, and documentation management and distribution.

| TOPIC/TASK | SKILL-SPECIFIC RULE |
|---|---|
| Use of technology – personal laptops, tablets and mobile phones | <ul style="list-style-type: none"> Experts and Interpreters are allowed to use personal laptops, tablets or mobile phones in the room for Experts, except when there are documents relevant to the competition in the room. |
| Use of technology – personal photo and video taking devices | <ul style="list-style-type: none"> Experts and Interpreters are allowed to use personal photo and video taking devices in the Room for Experts, except when there are documents relevant to the competition in the Room. Competitors, Experts, and Interpreters are allowed to use personal photo and video taking devices in the workshop at the conclusion of the competition only. |
| Listening to music while competing | <ul style="list-style-type: none"> On Familiarization Day Competitors will be allowed to supply a memory stick containing a maximum of 30 songs. All music will be collated, verified, and shared amongst all Competitors. |
| Keyboard and Mouse | <ul style="list-style-type: none"> Competitors may use their own keyboards and mouse but these must be approved by the SCM and WM. |
| Software (language) | <ul style="list-style-type: none"> Competitors can only use the software in English. |
| Health, Safety, and Environment | <ul style="list-style-type: none"> Refer to the WorldSkills Health, Safety, and Environment policy and guidelines document. |
| Familiarization | <ul style="list-style-type: none"> The data and project created by the Competitor during familiarization will be deleted and the machine will be formatted back to the original. On the first day of competition (C1), Competitors will be given 30 minutes to work and prepare the environment needed for competition. |

10 VISITOR AND MEDIA ENGAGEMENT

To maximize visitor and media engagement the following ideas will be considered:

- Display screens;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles;
- Career opportunities;
- Daily reporting of competition status.

11 SUSTAINABILITY

This skill will focus on the sustainable practices below:

- Recycling;
- Use of 'green' materials;
- Use of completed Test Projects after the Competition;
- Use of a pdf writer rather than printing.

12 REFERENCES FOR INDUSTRY CONSULTATION

WorldSkills is committed to ensuring that the WorldSkills Standards Specifications 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 Standards Specification 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/)

This WSSS (Section 2) appears to be a junior version of *ICT Help Desk Manager*:
<http://data.europa.eu/esco/occupation/1242d99a-47f1-4a62-b884-33746db8a6ca>.

Adjacent occupations can also be explored through this link.

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Standards Specification in place for WorldSkills Kazan 2019.

| ORGANIZATION | CONTACT NAME |
|----------------|---------------------------------|
| 1C Company | Boris Nuraliev, Founder and CEO |
| APKIT (Russia) | Name not supplied |