worldskills Europe

Technical Description

IT Software Solutions for Business

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 decades has been largely driven by developments in Information and Communication Technology (ICT). IT specialists are increasingly in 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 represent a wide spectrum of software developers as computer programmers, computer systems designers, analysts, and full stack developers. They 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, writing algorithms, system analysis and design, construction, testing, training, and implementation, as well as maintenance of a business software system. Their work is often more oriented towards the backend.

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
- Provide solutions according to the specific requirements of each enterprise
- Implement or program all kinds of software systems based on specifications and designs by using programming languages, tools, and platforms
- Work in testing environments, assessing products, checking for quality and accuracy, or creating tests scripts
- Prepare user training materials, train users, and present the software solution to users
- Install, implement, and maintain software systems.

IT software solutions professionals can be employed in large, medium, and small enterprises, mostly in the following ESCO occupations:

- ICT consultant
- ICT system developer
- System configurator
- Software developer
- ICT application developer
- Software analyst
- ICT test analyst

1.2 The content, relevance and significance of this document

This document incorporates a Role Description and Occupational Standards which follow the principles and some or all of the content of the WorldSkills Occupational Standards. In doing so WSE acknowledges WorldSkills International's (WSI's) copyright. WSE also acknowledges WSI's intellectual property rights regarding 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:

- WSE – Competition Rules
- WSI – WorldSkills Occupational Standard framework
- WSE – WorldSkills Europe Assessment Strategy
- WSE – Online resources as referenced in this document
- WSE – Code of Ethics and Conduct
- Host Country – Health and Safety regulations

2 The Occupational Standards

2.1 General notes regarding WSOS / WSEOS

Where appropriate WSE has utilised some, or all, of the WorldSkills International Occupational Standards (WSOS) for those Skills Competitions that naturally align between the two international competitions. Where the Skill is exclusive to the EuroSkills Competition, WorldSkills Europe has developed its own Occupational Standards (WSEOS) using the same principles and framework to that used for the development of the WSOS. For the purposes of this document the use of the words “Occupational Standards” will refer to both WSOS and WSEOS.

The Occupational Standards 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. Helpfully, for the global consultation on the WSOS in 2014-2021, around 50 percent of responses came from European industry and business.

Each Skill Competition is intended to reflect international best practice as described by the Occupational Standards, and to the extent that it is able to. The Occupational Standards 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 not be separate tests of knowledge and understanding.

The Occupational Standards are 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 Occupational Standards. 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 Occupational Standards. They will reflect the Occupational Standards 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 Occupational Standards to the extent practically possible. A variation of five percent is allowed, provided that this does not distort the weightings assigned by the Occupational Standards.

2.2 Occupational Standards

Section		Relative importance (%)
1	**Work organization and self-management**	**5**
	The individual needs to know and understand: • The principles and practices that enable productive work • The principles and practices of organizing session’s work in an efficient and productive manner • How to research, evaluate, and apply new trends in the industry • The importance of accurate and consistent version control	

Section		Relative importance (%)
	The individual shall be able to: • Plan each day's production schedule according to available time and take into account time limitations and deadlines • Use GIT version control to support software development process • Apply research techniques and skills to keep up-to-date with the latest industry guidelines • Review own performance against the expectations and needs of clients and organizations	
2	**Communication and interpersonal skills**	**5**
	The individual needs to know and understand: • 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 client's confidence and productive working relationships • The value of written and oral communication skills • The importance of thoroughly documenting developed solutions	
	The individual shall be able to: Use literacy skills to: • Follow documented instructions from supplied guides • 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: • Discuss and offer suggestions regarding system specifications • Keep clients updated regarding systems' progress • Negotiate with clients regarding project budgets and timelines • Gather and confirm clients' requirements • Present proposed and final software solutions Use written communications skills to: • Documents and demonstrates solutions by developing documentation, flowcharts, layouts, diagrams, charts, code comments and clear code. • Keep clients updated regarding systems' progress • Confirm that created applications meet original specifications and obtain user sign-off for completed systems Use team communication skills to: • Collaborate with others to develop required outcomes • Contribute to group problem solving	

Section		Relative importance (%)
	Use project management skills to: • Prioritize and schedule tasks • Allocate resources to tasks	
3	**Problem solving**	**10**
	The individual needs to know and understand: • The common types of problems which may occur within software development • The common types of problem which may occur within a business organization • Diagnostic approaches to problem solving • Trends and developments in the industry including new platforms, languages, conventions, and technical skills	
	The individual shall be able to: • Use analytical skills to: ◦ Synthesize complex or diverse information ◦ Determine the functional and non-functional requirements of specifications • Use investigation and learning skills to: ◦ Obtain user requirements (e.g. interviews, questionnaire, document search and analysis, joint application design, and observation) ◦ Research encountered problems independently • Use problem-solving skills to: ◦ Identify and resolve problems in a timely manner ◦ Gather and analyse information skilfully ◦ Develop alternatives for decision making, select the most appropriate alternatives and produce the required solutions ◦ Develop business logic and computational algorithms for specific tasks	
4	**Analysis and design of software solutions**	**25**
	The individual needs to know and understand: • The importance of considering all possible options and deriving the best solution based on sound analytical judgment and clients' 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 judgements about the appropriateness of adopting them • The importance of optimizing systems design with an emphasis on modularity and reusability	

Section		Relative importance (%)
	• The importance of the full software development life cycle, including coding standards, code reviews, source control management, build processes, testing, and operations	
	The individual shall be able to: • Analyse systems using: ◦ 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, C4 model) ◦ 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: ◦ Class Diagram, Sequence Diagram, State Diagram, Activity Diagram ◦ Object design and package ◦ Relational or object database design ◦ Human-computer interface design ◦ Security and controls design ◦ Multi-tier application design	
5	**Development of software solutions**	**45**
	The individual needs to know and understand: • The importance of considering all possible options and deriving the best solutions to meet user requirements and clients' best interests • The importance of using system development methodologies (e.g. object-oriented paradigm) • 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 use of existing codes as a basis for analysis and modifications • The importance of selecting the most appropriate development tools from the available options	
	The individual shall be able to: • Develop software solutions by studying information needs, conferring with users, and studying systems flow, data usage, and work processes • Use database management systems to construct, store and manage the data for the required systems	

Section		Relative importance (%)
	• Use modern software development environments and tools to modify existing codes and write new codes of client-server-based software solutions • Evaluate and integrate appropriate libraries and frameworks into the software solutions • Build multi-tier applications • Construct desktop, web and/or native mobile components of client-server-based systems	
6	**Testing software solutions**	**10**
	The individual needs to know and understand: • Troubleshooting methods for common software applications problems • The importance of thoroughly tested solutions • The importance of documenting testing	
	The individual shall be able to: • Plan testing activities (e.g. unit testing, volume testing, integration testing, acceptance testing, etc.) • Design test cases with data and check results of test cases • Debug and handle errors • Report on test processes • The implementation of black and white box testing	
	Total	**100**

3 The assessment approach & principles

3.1 General guidance

Note: this Section and Section 4 summarize a great deal of new information and guidance regarding assessment. Please refer to the Competition Rules for greater detail.

The Competition Committee (CC) establishes the principles and techniques to which assessment at the EuroSkills Competition must conform.

Expert assessment practice lies at the heart of the EuroSkills 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 EuroSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the EuroSkills Competition falls into two broad types: measurement and judgement. All assessments will be governed by explicit benchmarks, referenced to best practice in industry and business.

The Marking Scheme must include these benchmarks and follow the weightings within the Occupational Standards. The Test Project is the assessment vehicle for the Skill Competition, and also follows the Occupational Standards. 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 Technical Description and the principles for assessment as set out in the WSE Assessment Strategy. They will be agreed by the Experts and submitted to WSE for approval together, in order to demonstrate their quality and conformity with the Occupational Standards.

Prior to submission for approval to WSE, the Marking Scheme and Test Project will be reviewed by the WSE 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 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 Assessment overview

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

Marking groups are formed in accordance with the Competition Rules.

The skill assessment criteria developed by the Independent Test Project 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
		1.0	1.0	0.0 – 0.9

Add to zero marks on a predetermined progressive scale	Solver criteria specified correctly (add 0.1 mark for each criterion)			

In the development of marking, one should focus on appreciating the Competitor's work and not punishing what the Competitor miss to do. The approach should refer at least 50% using the "Add to zero marks on a predetermined progressive scale".

Each Expert at the Competition can perform as a member of a marking team for the Test Project (given all mandatory preparedness has been done). The Chief Expert and the Deputy Chief Expert will determine the composition of the marking teams. The Chief Expert and the Deputy Chief Expert will determine the proportion of marks each assessment team is responsible for. The Chief Expert and the Deputy Chief Expert may or may not be involved in the marking.

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

The Independent Test Project Designer may be involved in the marking.

4.10 Skill Assessment Procedures - Mark distribution

This section defines the assessment criteria and the number of marks (judgement and measurement) awarded. The total number of marks for all assessment criteria must be 100. The table below is advisory only for the development of the Test Project and Marking Scheme.

Sub Criterion	Example	Judgement	Measurement	Sum
A	Session1 - Database Administration Software	5	15	20
B	Session2 - Mobile Interface and API Connection	3	12	15
C	Session3 - Algorithm Engineering/Data Analyzing	5	20	25
D	Session4 - API Programming	3	15	18
E	Session5 - Testing and Prototype Presentation	10	14	22
	Test Project in sum	26	74	100

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 skills in each section of the Occupational Standards.

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

The Test Project will not cover areas outside the Occupational Standards, or affect the balance of marks within the Occupational Standards other than in the circumstances indicated by Section 2.1.

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 the EuroSkills Competition's 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 Standard Specification. Section 2.1 refers.

5.2 Format/ structure of the Test Project

The Test Project/modules are 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 Test Project must have separately assessed modules, which are generally represented by a separate session.
- The scenario is presented as a project with clearly defined deliverables. These deliverables are 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.
- All deliverables (where applicable) must be conformed to the industrial standard. That means they must include readme or documentation files and must be given as copy deployments or similar solutions e.g., using installation programs as usually in customer environments.
- Common data files are provided in English only and only an English version of the software is provided.

5.3 Test Project design requirements

The Test Project should not require any in-depth knowledge of the selected industry.

The Test Project should be designed so that at the end of each competition session, that session's work can be marked.

Where work carries over from one session to another, the Competitor's work is backed up for marking at the end of each session. For example, the Test Project might require development of a database – table definitions, data imports, and query construction. The Test 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.

The expected output result is balanced across these following contents. This should be a guideline for the construction of the competition sessions:

- Database administration
- API Programming for Mobile and Desktop Frontends
- Testing
- System Engineering
- Data Analyzing
- Algorithm Engineering
- Administration Tools

Marks will be allocated according to the WorldSkills Occupational Standards in section 3.

The result of the project is possible equally to be solved using reference technology and framework (the related additional libraries are listed in the Infrastructure List):

- C# and ASP.NET (.NET Framework and Core)

Some baseline development environments will cover:

- Visual Studio with MAUI/Xamarin
- Android Studio with Java and Kotlin (native android app development)

Some of the proposed databases management systems are as follows:

- MS SQL Server

The software versions to be used at the Competition will be listed in the Infrastructure List following discussion between the Skill Competition Manager and Workshop Manager at Competition Preparation Week.

The Test Project design team will provide the following services:

- Prepare 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 CIS marking system;
- Provide the style guide and project overview;
- Provide the required network infrastructure and the provide the network guide (in co-ordination with the Workshop Manager)

The finalized version must be made available to all experts at least one (1) month prior to the Competition.

The network guide should be distributed one month prior to the Competition.

5.4 Test Project development

The Test Project MUST be submitted using the templates provided by WSE. Use the Word template for text documents and DWG template for drawings. Please contact jordy.degroot@worldskillseurope.org for guidance.

If the Test Project is designed by an Independent Test Project designer, then the Test Project must be designed in accordance with the WSE Independent Test Project Guide v1.1.

If your Skill wishes to have an Independent Test Project designer, you must ensure that WorldSkills Europe is made aware of this, so that it can be assured that there is proper funding in place, or that the Independent Test Project designer is aware that he/she will do this task free of charge.

5.4.1 Who develops the Test Projects or modules

The Test Project / modules are developed under the supervision of:

- Independent Test Project designer

5.4.2 How and where is the Test Projects or modules developed

The Test Project or modules are developed in the following manner:

- The Test Project is developed by an Independent Test Project designer

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

TIME	ACTIVITY
At the previous Competition	Experts submit their review of the passed Test Project and suggest changes
9 months prior to the Competition	Independent Test Project Designers (ITPD) are expected to attend a meeting with the Chief Expert (CE), Deputy Chief Expert (DCE), and their Skill Advisor to discuss critical aspects such as Technical Description, Test Project design, the creation of the Marking Scheme and other essential elements. Post the initial meeting, the Chief Expert limits direct communication with ITPDs until the Test Project is released.
9 to 4 months prior to the Competition	The ITPDs start to develop the Test Project in accordance with the Technical Description, EuroSkills Occupational Standards, and the Infrastructure List.
8 months prior the competition	The Infrastructure List will be confirmed at the Competition Preparation Meeting by the CE and the DCE.
4 months prior to the Competition	ITPDs finalize the Test Project design, and industry representatives validate it. Photographic evidence of the physical prototype is submitted for review.
At the Competition	The Test Project and Marking Scheme are presented to Experts.

5.5 Test Project validation

On C-2 all experts will validate the Test Project and Marking Scheme in order to ensure that the Test Project can be completed within the material, equipment, knowledge, and time constraints of Competitors.

5.6 Test Project selection

- Test Project is designed by an Independent Test Project designer, therefore there is no selection process

5.7 Test Project circulation

Please note that if a Test Project is known by the Chief- and/or Deputy Chief Experts, and/or any of the other Experts, it must be shared via the forums before the start of the Competition. This also means that this Test Project is subject to a 30% change before the start of the Competition.

The Test Project is circulated via the website as follows:

- Not circulated

5.8 Test Project coordination (preparation for competition)

Coordination of the Test Project will be undertaken by:

- Chief Expert and Workshop Manager

5.9 Test Project change at the competition

The Test Project is developed by the Independent Test Project designer/ Third party, Therefore 30% change is not applicable to this Skill.

5.10 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitors to complete the Test Project will be supplied by the Host Organization and are available via the forums. 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.

Not applicable.

5.11 Software specifications

Software specifications especially versions of frameworks will be announced to all experts as early as possible after the Competition Preparation Meeting (8 months before the comnpetition in the forum).

6 Skill management and communication

6.1 Discussion forum

Prior to the EuroSkills Competition, all discussion, communication, collaboration, and decision making regarding the Skill Competition must take place on the skill specific Discussion Forum, which can be reached via www.worldskillseurope.org. Skill related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) 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 WorldSkills Europe website www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

The information includes:

- Competition Rules
- Technical Descriptions
- Test Projects
- Infrastructure List
- EuroSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

6.4 Day-To-Day management

The day-to-day management of the Skill Competition during the EuroSkills Competition is defined in the Skill Management Plan that is created by the Skill Management Team led by the Chief Expert. The Skill Management Team comprises the Jury President, 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 at www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

7 Skill specific safety requirements

7.1 Requirements

Refer to Host Country/Region Health and Safety documentation for Host Country/Region regulations. This document will be shared via the forums. One overall Health and Safety document will be published, as well as Skill specific safety requirements.

8 Materials and equipment

8.1 Infrastructure List

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

The Infrastructure Lists will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

The Infrastructure List specifies the items and quantities requested by the Experts for the next Competition. The Host Organization will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items.

At each Competition, the Experts must advise the Competition Manager 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.

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

WorldSkills Europe aims to minimize the sending of toolboxes as much as possible. We therefor ask you to keep this in mind when writing the section below. Please be advised that competitors should bring as little as possible and what they do bring **MUST** be true hand tools. Only items are allowed that would significantly affect their ability to perform the task and deliver the Test Project to a high standard.

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 in their toolbox

Competitors are not allowed to bring any materials, equipment and tools to the Competition. The only exceptions are a keyboard, a mouse, and/or their headphones. Any piece of equipment brought by a Competitor must be wired and not have any storage and/or any kind of network communication capabilities (Bluetooth, wireless or other).

8.4 Materials, equipment and tools supplied by the Experts

Experts are not allowed to bring any materials, equipment, and tools.

8.5 Materials, equipment and tools 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.

The Competitor may definitely 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 is on designated computers and is limited to one 10-minute block per Competitor per session on a first come, first served basis. This time is to be included in the competition time. The Competitor cannot make any notes while using the Internet.

8.6 Workshop Layout

Workshop layouts from previous competitions are available by contacting the Competition and IT Coordinator at: jordy.degroot@worldskillseurope.org. New Workshop Layouts will be communicated via the forums when completed.

Please be advised that you will have the opportunity to discuss your Workshop Layout proposal with the Host Organization during the Skills Development Workshop (SDW) and the Competition Preparation Meetings (CPM).

For workshop layout development, please refer to the forums.

9 Skill-specific rules

9.1 Introduction

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 Personal laptops – USB – memory sticks – mobile phones

- The Competitors are not allowed to use personal laptops, tablets, memory sticks, USB devices, or mobile phones in the workshop area.
- The Experts are allowed to use personal laptops, tablets, or mobile phones in the Experts room, except when there are documents or discussions relevant to the competition in the room.
- The use of personal laptops and other communication devices while marking is prohibited.
- None of these restrictions do not apply to the members of the SMT along with the WM.

9.3 Personal photo cameras – video taking devices

- The Competitors are not allowed to use personal photo, audio, and video taking devices in the Skill area during the competition.
- Experts are allowed to use personal photo, audio, and video taking devices in the Experts room, except when there are documents or discussions relevant to the competition in the room.
- Competitors and Experts are allowed to use personal photo, audio, and video taking devices in the Skill area at the conclusion of each competition day only.
- WM, CE, and DCE are exempt from these rules.

9.4 Communication between compatriot experts and competitors

- Communication between compatriot Experts and Competitors may not take place in the Skill area. The only exceptions are designated compatriot Expert-Competitor open communication time slots before each session. Compatriot Expert and Competitor are allowed to just talk to each other during the lunch.

9.5 Other

10 Visitor and media engagement

10.1 Engagement

Following is a list of possible ways to maximize visitor and media engagement, within the remit of the Competition Rules:

- Display screens;
- Test Project descriptions;
- Enhanced understanding of Competitor activity;
- Competitor profiles;
- Career opportunities;
- Daily reporting of competition status;
- Speed programming is an optional session that may be held on the last day of the competition, after the fifth session. This session is for fun and visitor engagement, and does not require an independent test project designer or marking scheme. Participants will receive certificates, medals, and prizes from Skill IT Software Solutions for Business.

11 Sustainability

11.1 Sustainability

This Skill Competition will focus on the sustainable practices below:

- Recycling;
- Use of “green” materials;
- Let Competitors use a PDF rather than printing, if such need arises in the Test Project.