

Technical Description

EuroSkills Gdańsk 2023
Web Development (17)

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1 Introduction

1.1 Name and description of the Skill Competition

1.1.1 The name of the Skills Competition is

Web Development

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

Web development encompasses many different skills and disciplines in the production and maintenance of websites. The skills required of a web developer are diverse, often to the point it is difficult for a developer to excel in all aspects. As a result, a team may cover the web development process, with each member of the team having their own strengths, specialties, and role in the development process.

Web development involves implementing specific solutions by using web technologies that follow the business rules and objectives outlined by the client. Web developers establish a professional relationship with their clients, interacting with them to develop a deep understanding of the requirements, and convert these into a web application. Creativity and communication skills, coupled with research techniques and a grasp of the target audiences, markets and trends, will ensure final client satisfaction.

Having completed the website content strategies, system architecture planning, user interface design and user experience design, the web developer then integrates the website with third party tools and platforms. During the development process web developers implement the design, use their programming skills in order to create dynamic functionalities, test, and debug the website using a variety of devices.

All these skills may apply equally to the re-design or an upgrade of an existing website.

A web developer has many employment opportunities. These can range from being a self-employed freelancer, or an entrepreneur, to being employed by advertising agencies and web development companies as well as many different other types of organizations. Web developer positions may be broad in scope or specialize in an area such as user interface design, digital user experience design, front-end development, back-end development as well as client and project management. Whichever role a web developer chooses to specialize in, they will need to have access to ICT facilities, open-source libraries, and frameworks.

High performing web developers may have broad or specialist web-related skills. They must understand technical techniques, have solid user interface design skills, programming skills, and take personal responsibility for being constantly at the forefront of trends and web technologies. They must also be responsive to clients and can work in structured and unstructured teams and groups. These qualities enable the web developer to contribute and take advantage of this rapidly developing aspect of modern communications technology.

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
- Host Country – Health and Safety regulations

2 The Standards Specification

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:	
<ul style="list-style-type: none"> Principles and practices that enable productive teamwork The principles and behaviour of web systems and applications The aspects of systems that contribute to sustainable products, strategies, and practices How to take initiatives and be enterprising to identify, analyse and evaluate information from a variety of sources How to identify multiple solutions to a problem and offer them as options against time, budget, and other constraints. How to use existing available tools and resources to create proper solutions to a problem or requirement Why proper documentation is necessary and how it is created and maintained 	
The individual shall be able to:	
<ul style="list-style-type: none"> Create a working schedule considering time limitations and deadlines Select the most appropriate devices, tools, and software for the actual task Apply research techniques and skills to keep up to date with the latest industry standards and guidelines Include images, fonts, and other resources in the correct file format and size when deploying the project Use GIT version control system Deploy the web application to a server environment Connect to server through SSH to operate server-side libraries and frameworks Adapt a given server configuration accordingly Utilise collections of codes and software packages which capture frequently used routines to help programmers simplify their work Create and maintain a proper documentation for your project 	
2 Communication and interpersonal skills	5
The individual needs to know and understand:	
<ul style="list-style-type: none"> How to solve communication problems including identifying the problem, research, analysis, solution generating, prototyping, user testing, and outcome evaluation 	

SECTION	RELATIVE IMPORTANCE %
<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Read and understand specifications documents • Deliver a product that responds to client requirements and specification • Gather, analyse, and evaluate information • Interpret standards and requirements • Match client requirements to work needed to produce the right outcome • Present a concept to meet business requirements 	
3 Design Implementation	25
<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The recommendations for making ICT content and applications more accessible to a wider range of people, including standards such as Web Content Accessibility Guidelines (WCAG) • Positioning and layout methods • Design implementation • Usability and interaction design • Cross browser compatibility • Multi device compatibility • Search Engine Optimization (SEO) and performance optimization • How to embed and integrate animations, audio-, and video-files where it is needed 	
<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Create code that conforms and validates to the WCAG standards • Create accessible and usable websites for variety of devices and screen resolutions • Use CSS or other external files to modify the appearance of the website • Use CSS pre/post-processors • Create and update web interfaces for user experience and to assist with search engine performance • Use CSS to develop animations and interactions to the user interface 	
4 Front-End Development	25
<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • The JavaScript programming language • How to integrate libraries, frameworks, and other systems or features with JavaScript • Use JavaScript pre/post processors and task running workflow • How to debug front-end (JavaScript, CSS, HTML) errors 	

SECTION	RELATIVE IMPORTANCE %
<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Create website animations and functionalities to assist in context explanations and adding visual appeal • Create and update JavaScript code to enhance a websites functionality, usability, and aesthetics • Manipulate data and custom media with JavaScript • Create modular and reusable JavaScript code • Use of open-source JavaScript libraries and frameworks • Manipulate graphical elements using JavaScript • Use front-end development tools such as the developer tools to debug application issues 	
5 Back-End Development	40
<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • One of the following backend development technologies: <ul style="list-style-type: none"> • Object-oriented PHP • Node.js/Express.js • Open-Source server side libraries and frameworks • How to design and implement databases using MySQL • How to manage data exchange (consume and provide) between server and client systems (REST API) • Software design patterns, e.g. Model View Controller Pattern (MVC) • Web application security according to OWASP guidelines • How to create and use application testing with unit testing • How to debug backend PHP errors in the application • How to utilize modern debugging tools such as xDebug, GreyLog, or smiliar; • How to debug server misconfiguration such as wrong file permissions, database connections, etc. • How to debug complicated SQL errors 	
<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Manipulate data making use of programming skills • Create REST API endpoints according to the requirements or the provided specification • Protect against security exploits • Integrate with existing code with Application Programming Interfaces (APIs), libraries, and frameworks • Create or maintain a database to support the system requirements • Create code that is modular and reusable • Detect if issue is caused by logical issue in code implementation or server misconfiguration • Enable error reporting in the chosen programming language 	

SECTION	RELATIVE IMPORTANCE %
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 EuroSkills Competition, in that it ties assessment to the standards that represent the skills to be tested. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Occupational Standards.

By reflecting the weightings in the Occupational Standards, 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 Occupational Standards, 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 Test Project designer for the development of the Marking Scheme and Test Project.

In addition, Experts are encouraged 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 the complete and approved 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.

In the interests of fairness and transparency, all experts should have the same knowledge of the Marking Scheme at any given time. If an expert, including the chief expert and deputy chief expert, is assigned some information on the Marking Scheme, it should be shared with the other experts without delay.

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 Occupational Standards; 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 must reflect the weightings in the Occupational Standards.

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).

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 of assessment 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 EuroSkills marking form.

Each marking form (Sub Criterion) has a specified day on which it will be marked.

Each marking form (Sub Criterion) contains Aspects to be assessed and marked by measurement or judgement. Some Sub Criteria have assessment by both measurement and judgement, in which case there is a separate marking form for each method

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 and appear on the appropriate marking form.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it, the benchmarks, and a reference to the section of the Standards Specification.

The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of 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).

CRITERIA											TOTAL MARKS PER SECTION
		A	B	C	D	E	F	G	H	I	
OCCUPATIONAL STANDARDS SPECIFICATION SECTIONS	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
TOTAL MARKS PER CRITERION											100

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 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 rigor 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, 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. Assessment and marking by measurement

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

For both measurement and judgement there will be three Experts in the assessment team.

Good practice in assessment comprises measurement and judgement applied both specifically and broadly. The final proportions of measurement and judgment, whether specific or broad, will be determined by the standards, their weightings and the nature of the Test Project.

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

- ☐ Test Project assessed at end of Competition
- ☒ Test Project with separately assessed modules
- ☐ Test Project assessed in stages
- ☐ Series of standalone modules
- ☐ Other

If other, please specify here:

5.3 Test Project design requirements

The main goal is to have an external Test Project developer. The person/team should provide the following information within the framework of the Standards Specification:

- Test Project description,
- Marking Scheme for CIS and a printout without the points for the Experts
- the necessary assets for the Competitors to complete their work
- automated Testcases for the front-end and/or back-end

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:

- ☐ All Experts
- ☐ Some Experts
- ☒ Nominated Experts
- ☒ Independent Test Project designer/ Third party
- ☐ Chief Expert, Deputy Chief Expert

Add information if needed:

We have two possible scenarios, from which we prefer Scenario A:

- Scenario A: An external developer creates the Test Project and all necessary material (see 5.3)
- Scenario B: The Test Project is created by nominated Experts

5.4.2 How and where is the Test Projects or modules developed

The Test Project or modules are developed:

- ☐ Jointly on the Discussion Forum
- ☐ Independent Test Project designer
- ☒ Other:

Scenario A: The external developer creates the Test Project after a briefing from CE and DCE.

Scenario B: The Test Project will be created by nominated Experts on the Discussion Forum

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

TIME	ACTIVITY
7 months prior to the Competition	<p>Scenario A: CE will contact external developers/WorldSkills experts to initiate the creation of the test project.</p> <p>Scenario B: The Test Project development will be initiated on the forum by CE.</p>
3 months prior to the Competition	<p>Scenario A: A guideline/outline for each module will be sent to CE by the external developer and then they are circulated to all Experts on the EuroSkills forum.</p> <p>Scenario B: The nominated lead experts send the Test Projects to CE and then they are circulated to all experts on the EuroSkills forum.</p>
At the Competition	<p>Scenario A: On C-3 or C-2 the external enterprise/WorldSkills experts present their Test Project to all experts.</p> <p>Scenario B: If the TP was developed by all experts, the module lead experts present their groups module to all other experts.</p>

5.5 Test Project validation

The final Test Project modules will be validated by the respective module group prior to the Competition. The Chief Expert and Deputy Chief Expert will aid module groups in the validation of each module. Validation by module groups will ensure that:

- The project can be completed in the specified time
- The project can be completed with the provided material/media files
- The marking schemes are appropriately developed, and all aspects marked are clearly identifiable in the written Test Project instructions
- The Test Project meets the EuroSkills Standards Specification

5.6 Test Project selection

- ☐ By vote of Experts at the previous Competition
- ☐ By vote of Experts on the Discussion Forums
- ☐ By vote of Experts at the upcoming Competition
- ☐ By random draw by the Competition Director, three months before the current Competition
- ☐ Test Project is designed by an Independent Test Project designer, therefore there is no selection process

☒ Other, please specify below:

Scenario A: The Test Project is developed by an external Developer and therefore no selection is necessary.

Scenario B: The Test Project is developed by nominated Experts and therefore a vote on the Discussion Forum is performed.

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:

☐ Submitted to the Secretariat for circulation **XX** months before the current Competition

☐ Not circulated

☒ Other, please specify below:

Scenario A: The Test Project is developed by an external developer and not circulated. Therefore no change is needed.

Scenario B: The Test Project is developed by nominated Experts and therefore a 30% change needs to happen.

5.8 Test Project coordination (preparation for competition)

Coordination of the Test Project will be undertaken by:

☐ Skill Management Team

☐ Chief Expert

☒ Chief Expert and Deputy Chief Expert

☐ Chief Expert and Workshop Manager

☐ Chief Expert with selected Experts

☐ Chief Expert with Competition Organizer

☐ All Experts

☐ Other, please specify below:

5.9 Test Project change at the competition

Scenario A: Not applicable

Scenario B: Every expert comes up with a change proposal and then all Experts vote and agree on a 30% change to the Test Projects

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.

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
- Marking Schemes
- Test Projects
- Infrastructure List
- Health and Safety documentation
- Other Competition-related information
- List of material that can be used to build templates and not been provided by the host

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

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 therefore 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.

Since the Competitors are only using a keyboard and a mouse, there is no need for a dedicated toolbox.

8.3 Materials, equipment and tools supplied by Competitors in their toolbox

Competitors may bring the following items:

- Mouse with mousepad
- A maximum of one USB keyboard in the Competitors desired language. Note: If the keyboard brought by the Competitor does not work then a standard keyboard will be provided by the Competition Organizer
- Language file for Microsoft OS or Ubuntu Linux to make the keyboard work correctly
- Headset and extension cable

Any device brought in by the Competitor may not have any internal memory storage. Assigned Experts and Workshop Manager have the right to disallow certain equipment brought by Competitors.

Backup equipment is allowed in case of failure but should always be kept inside the Competitors locker.

8.4 Materials, equipment and tools supplied by the Experts

During the competition Competitors may have access to a limited number of Internet resources as required for each individual module. Not all modules will make use of Internet resources. Except for these Internet resources, Competitors will not have access to the Internet from the Competitor workstations.

Common Internet workstations will be set up which Competitors can make use of. The assigned number of sessions and allotted time will be stated in the Test Project module. Competitor Internet workstation sessions are not to be used consecutively; a minimum of one session must separate the use of the Internet workstation. During the time on the Internet workstation, Competitors are only allowed to surf the web. Competitors are not allowed to chat or communicate with others. Assigned Experts will supervise the Internet workstation when it is in used by a Competitor. Any notes must be written on the assigned space in the official Test Project module description. Notes may be taken between the Competitors workstation and the Internet workstation.

An Expert can upload music for their Competitor to a system 1 month prior to the competition. A maximum of 100MB per competitor is allowed. All music files will be verified by assigned experts then shared on a dedicated system accessible by all competitors.

8.5 Materials, equipment and tools prohibited in the Skill area

The Skill area is the area outside the experts room within the Workshop Area.

- Extra software
- Mobile phones
- Tablet devices
- Smart watches
- Photography/Video devices
- USB Drives
- Any device brought into the workshop may not have any internal memory storage devices

The Chief Expert, Deputy Chief Expert and Workshop Manager have the right to disallow equipment brought by Competitors

8.6 Proposed workshop and workstation

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 Competition Preparation Meetings (CPM).

For workshop layout development, please refer to the forums.

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 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.

9.1.1 Personal laptops – USB – memory sticks– mobile phones

Chief Expert, Deputy Chief Expert, and Experts are allowed to bring personal laptops, USB/memory sticks, and mobile phones into the Expert meeting room. All devices are allowed to be taken outside of the meeting room at the end of each day.

Competitors are not allowed to bring personal laptops, USB/memory sticks, and mobile phones 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.

9.1.2 Personal photo cameras – video taking devices

Chief Expert, Deputy Chief Expert, and Experts 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 C3.
- Note that cameras, laptops, or any other electronic devices may be allowed on the afternoon of C3 with approval from the SMT because there usually is a Test Project that tests communication and organization skills, where Competitors team up into groups. A change to this rule for C3 only is at the discretion of the SMT and should be documented.

9.1.3 Communication between compatriot experts and competitors

According to the official Competition Rules

10 Visitor and media engagement

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

- If possible two mirrored monitors displayed for the public to view the competitors' screens
- Display screens and a laptop showing a PowerPoint presentation on what competitors are currently working on.
- Enhanced understanding of Competitor activity
- Career opportunities
- People's Choice awards
- Display screens showing the results of on-going speed challenges

11 Sustainability

This Skill Competition will focus on the sustainable practices below:

- Recycling – No printing for Competitor workstations
- Use of completed Test Projects after Competition
- Limit the amount of software to be installed on Competitor workstations
- Open-Source software
- No marking sheets, experts mark by computer straight into the CIS
- No toolboxes except what the competitors bring in their own luggage

12 Appendix

12.1 Skill Assessment Procedures

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

Technologies such as frameworks will be selected / finalised in the Discussion Forum at the CPM. All technologies must have a minimum of three Experts who have a high-level understanding of the technology.