China International Skills Competition 2017

IT Software Solutions for Business

Technical Description

Written by the Technical Group of IT Software Solutions for Business

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IT Software Solutions for Business

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The great demand for IT specialists has been driven by the rapid development of IT industry, one of whose roles is to provide software solutions for business. The development of software solutions consists of 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 solutions specialists often work closely with clients to modify existing systems or build 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 specialists include but not limited to the following:

- Review current system and present ideas for improvement, including cost benefit analysis
- Analyze and specify user requirements
- Produce detailed specifications
- Develop software system for the required solution and test the software solution thoroughly
- Prepare user training materials, train users, and present software solution to users
- Install, implement and maintain the software system

IT software solutions specialists can be enrolled in large, medium and small enterprises as software engineer, in consulting firms as consultant, and in software houses as contractor.

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

1.2 THE APPLICATION SCOPE OF THIS DOCUMENT

- The competition committee, team of judges and Test Project developing team must know and understand this Technical Description and follow its guidance.
- Experts and competitors must know and understand this document.

1.3 ASSOCIATED DOCUMENTS

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

- Competition Rules for China International Skills Competition 2017
- The specified online resources by the Competition Committee of China International Skills Competition 2017
- The specified Health and Safety regulations by the Competition Committee of China International Skills Competition 2017；
- The Technical Description for IT Software Solutions for Business of the 44th Worldskills Competition

2. THE NATIONAL SKILLS STANDARDS SPECIFICATION (NSSS)

2.1 GENERAL NOTES ON THE NSSS

The Standards Specification is a guidance 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 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. 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 SKILLS STANDARDS SPECIFICATION

SECTION		RELEVANCE IMPORTANCE (%)
1	**Work organization and management**	**5**
	The individual needs to know and understand： ● The principles and practices that enable productive team work ● The principles and behavior of systems ● The aspects of systems that contribute to sustainable products, strategies and practices ● How to identify, analyze and evaluate information from a variety of sources	
	The individual should be able to: ● Plan each day's production schedule according to available time and	

	take into account time limitations and deadlines ● Use a computer or device and a range of software packages ● 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	
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 customer confidence and productive working relationships ● The value of written and oral communication skills	
	The individual should be able to: Use literacy skills to: ● Follow documented instructions from a supplied guide ● Interpret workplace instructions and other technical documents ● Keep up-to-date with latest industry guidelines Use oral communication skills to： ● 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 communication skills to： ● 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： ● Collaborate with others to develop the required outcomes	

	● Work well in group problem solving ● Use project management skills to： ● Prioritize and schedule tasks ● Allocate resources to tasks	
3	**Problem solving, innovation and creativity**	**5**
	The individual needs to know and understand： ● The common types of problem which may occur within software development ● The common types of problems which may occur within business organization ● Diagnostic approaches to problem solving ● Trends and developments in the industry including new platforms, languages, conventions and technical skills	
	The individual should be able to： Use analytical skills to： ● Synthesize complex or diverse information ● Determine the functional and non-functional requirements of the specification 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 analyze information skillfully ● Develop alternatives for decision making, select the most appropriate alternative and produce the required solution	
4	**Analyzing and designing software solutions**	**30**
	The individual needs to know and understand： ● The importance of deriving the best solution based on the client's best interests ● The importance of using system analysis and design methodologies （e.g. Unified Modelling Language） ● The need to make a judgment about the appropriateness of adopting new technologies	

	● The importance of optimization of system design	
	The individual should be able to： Analyze systems using： ● Use case modelling and analysis ● Structural modelling and analysis ● Dynamic modelling and analysis ● Data modelling tools and techniques 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	**Developing software solutions**	**40**
	The individual needs to know and understand： ● The importance of deriving the best solutions to meet the client's best interests ● The importance of using system development methodologies ● 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	
	The individual should be able to： ● Use database management system (MSSQL Server) to construct, store and manage the data for the required system（MySQL or SQL Server） ● Use the latest software development environment and tools to modify existing codes and write new codes for a client-server based software solution （.Net or Java） ● Evaluate and integrate appropriate libraries and frameworks into the software solution	

	● Build multi-tier applications ● Construct a web enabled/mobile interface for client-server based system	
6	**Testing software solutions**	**10**
	The individual needs to know and understand： ● Troubleshoot common software applications problems ● The importance of thoroughly tested solutions ● The importance of documenting testing	
	The individual should be able to： ● Plan testing activities（e.g. unit testing, volume testing, integration testing and acceptance testing） ● Design test cases and check results of test cases ● Debug and handle errors ● Report on the test process	
7	**Documenting software solutions**	**5**
	The individual needs to know and understand： ● The importance of thoroughly documenting developed solutions	
	The individual should be able to： Produce professional quality： ● User documentation ● Technical documentation	

3 THE ASSESSMENT STRATEGY AND SPECIFICATION

3.1 GENERAL GUIDANCE

Assessment is governed by the Assessment Strategy. The Strategy establishes the principles and techniques to which assessment must conform. Assessment at the national competition falls into two broad types: measurement and judgment. These are referred to as objective and subjective, respectively. 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.

4. THE MARKING SCHEME

4.1 GENERAL GUIDANCE

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 Standard 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 outlined Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

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 must reflect the weightings in the Standards Specification.

Assessment Criteria are created by the persons 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 A 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) 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 Aspects marked by both measurement and judgement, in which case there is a marking form for each.

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 and a reference to the section of the skill as set out in 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 skill in the Standards Specification.

4.5 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
- 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 acting as a judge where required to prevent compatriot assessment.

4.6 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.

4.7 THE USE OF MEASUREMENT AND JUDGEMENT

The table below is advisory only for the development of the Test Project and Marking Scheme.

SECTION	CRITERION	MARKS		
		JUDGEMENT	**MEASUREMENT**	**TOTAL**
A	System Analysis and Design（Use Case Diagram， Entity Relationship Diagram，Database Design， Object Design，Interface Design, and Security & Control Design）	0	20-35	20-35
B	Software Development (Database Construction and Programming) and Testing (Test Plan, Case & Data, Debug and Exception Handling)	0	45-70	45-70
C	Development Standards（Naming Convention， File Management，Adherence to Style Guide, and Consistent User Interface）	0	3-5	3-5
D	System Documentation（Technical Documentation and User Documentation）	0	5	5
E	Presentation of Solution（PowerPoint Presentation）	5	0	5
Total		5	95	100

4.8 COMPLETION OF SKILL ASSESSMENT SPECIFICATION

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

The skill assessment criteria developed by the external writer 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

4.9 SKILL 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 Jury President 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 Experts that write Test Project 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.

Judgment marks should not exceed 5 %.

5. THE TEST PROJECT

5.1 GENERAL NOTES

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 and balanced 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.

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.

5.2 FORMAT/STRUCTURE OF THE TEST PROJECT

The Test Project will be in the form of a case study which, specifically speaking, is a skill competition management system. This system consists of two parts: public system and private system. The public system allows the public to learn about Worldskills Competition, China Skills Competition and related information about Shanghai; the private system allows a competitor to view his/her specific skill competition and results, allows a coordinator to manage the sponsorship, allows an administrator to register and manage competitors and results, and allows Jury President to view results. It is a software solution based on client—server framework.

This Test Project is about matters that the professionals of IT Software Solutions for Business often encounter in daily work. It 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 Test Project will be an evaluation on competitors' general capability from the five perspectives of system analysis and design, system development and test, development standards, system documentation and presentation of software solution. The Test Project will be divided into 4 sessions within 2 days. Each session will be evenly allocated to each half day of the two days with 2.5 hours for each session. Explicitly defined deliverables must be given for each session in order to ensure that the deliverables for each session can be completed independently.

The Test Project and Common data files will be allowed in English only and only English versions of the software will be allowed.

5.3 TEST PROJECT DESIGN REQUIREMENTS

According to the requirements of the 44th Worldskills Competition, the Test Project should be based on the practical problems in Event/Logistics of an industry. The problem set should not require any in—depth knowledge of the industry. The Test Project should include an extensive simulation of workplace activities related to IT and should be composed of a variety of forms of information gathering, processing.

The Test Project should be conducted from one session to another where the competitors can carry out their work for each session independently. At the end of each session, deliverables representing the competitors' skill competence should be submitted for marking.

Basic environment and test data should be provided in the Test Project to help competitors complete the competition.

5.4 TEST PROJECT DEVELOPMENT

The Test Project/modules are developed by a technical team of experts ideally in consultation with an industry partner.

The technical team of experts 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 Competition CIS marking system.

5.5 TEST PROJECT OUTLINE

5.5.1 SCENARIO

China National Selection Competition for the 45th Worldskills Competition will be held in Shanghai in August, 2018. According to the requirements of the Competition Organizer, you need to develop some modules of the Competition Management System to help the organizer manage this event. This system is composed of a desktop application and a mobile based application.

5.5.2 ROLES

The system will be used by a variety of different types of users, including: Public (not logged into the system), Competitors, Coordinators, Administrators and Judgers. The system will act as both a public system (e.g. allowing people to learn about Worldskills Competition, China Skills Competition and Shanghai) and a private system (e.g. allowing competitors to view skills to participate in, results; allowing coordinators to manage volunteers and sponsorship; allowing administrators to manage events, skills and competitors; allowing judgers to view results).

5.5.3 SKILLS STANDARDS

Not all the aspects in the Skills Standards will be assessed during the competition.

1、Work organization and management

Competitors must understand the requirements of Test Project, prioritize the deliverables and make appropriate schedules to complete them. They will

develop the system in accordance with the specification given by “the client (i.e. TP)”.

2、Communication and interpersonal skills

Competitors’ Literacy skills will be tested through the interpretation of TP.

Competitors’ Written communications skills will be tested through the following aspects: 1) PowerPoint Presentation; 2) Test case.

Competitors’ Team communication skills are not to be tested in the competition for this time.

For Oral communication skills, in Session 3, each competitor will be called separately by the marking group to present current development of the system to “the Client”.

For Project management skills, competitors need to manage their time on their own to complete the development tasks within the given time.

3、Problem solving, innovation, and creativity

Competitors need to use their own creativity and innovation skills to handle arising problems on their own.

4、Analyzing and designing software solutions

Competitors need to analyze and interpret the diagrams below:

（1）Entity Relationship Diagram;

（2）Use Case Diagram.

In terms of system design, competitors need to draw Entity Relationship Diagram (ERD) to design database, and design forms as well as security and controls.

5、Developing software solutions

Competitors need to design and develop the system by using the software provided in the Infrastructure List (IL). Take into account validation and

exception handling, follow specific naming convention and ensure the consistency between forms.

6、Testing software solutions

Competitors need to write test cases to test their system and make records.

7、Documenting software solutions

This part will be tested through the following aspects:

（1）The final presentation,

（2）Codes comments

5.5.4 Judgement Assessment

Judgement Assessment will be used in assessing the PowerPoint Presentations of competitors, mainly including:

(1) Whether is the flow of the system correct or not? (Whether a user can successfully operate the whole software application---all the buttons/links etc.)

(2) Whether the forms of the application is clean, consistent, tidy and attractive?

5.5.5 Development Platform

This system is composed of a desktop application and a mobile based application. You need to develop the system based on .Net/Java platform and MSSQL/MYSQL database of English version.

5.5.6 Language

Unless otherwise stated, please use English for all your developments and designs. For example, texts on forms, feedback and prompt information, comments etc. All the deliverables are in English.

5.6 TEST PROJECT CHANGE AT THE COMPETITON

No changes will be made to the Test Project with the exception of amendments to technical errors in the Test Project document.

5.7 COMPETITION PROGRAM

Refer to the table below for the detailed competition program:

Competition Program

DATE	TIME	CONTENTS	ORGANIZER	NOTES
June 5	Whole Day	Registration of competitors, team leaders, coaches, experts and other related personnel.	Meeting Affair Team	
June 6	9:00—12:00	Pre-Competition Technical Training Meeting	Expert Team	
	14:30—16:00	(1) Training to competitors for Competition Rules, Health and Safety Regulations; (2) Draws by competitors	Competition Committee, Expert Team	Make draws to decide the workstations
	16:00—18:00	(1) Workshop Manager checks competitors' keyboards and make installments; (2) Familiarization to the competition area and workshops by competitors; (3) Lock the competition area.	Competition Committee, Expert Team	Familiarization to competition equipment and software by competitors
June 7	8:00—8:30	Opening Ceremony	Competition Committee, Expert Team, Meeting Affair Team	
	8:30—8:45	Experts and competitors enter the competition area and make preparation.		1、Only one expert for each competition team is allowed to enter the competition area. 2、Only 15 minutes are allowed for the oral communication between experts and competitors. *No* paper, pen or any other tools are allowed. After that,
	8:45—9:00	Experts and competitors communicate.		
	9:00—11:30	The 1st Session		
	11:30—12:00	Save and seal the competitors' work of the 1st session and related files, and lock the competition area.		
	12:00—13:00	Lunch		
	13:00—13:15	Experts and competitors enter the competition area after checking-out and make preparation.		
	13:15—13:30	Experts and competitors communicate.		
	13:30—16:00	The 2nd Session		
	16:00—16:30	Save and seal the competitors' work of the 2nd session and related files, and lock the competition area.		
	9:00—11:30	Experts discuss the marking criteria of the 1st session.		
	13:30—17:00	Experts mark the competitors' deliverables		

DATE	TIME	CONTENTS	ORGANIZER	NOTES
	19:00—22:00	Experts mark the competitors' deliverables	Competition Committee, Experts Team, Meeting Affair Team	experts should leave the competition area immediately.
June 8	8:30—8:45	Experts and competitors arrive at the competition area and prepare.		
	8:45—9:00	Experts and competitors communicate.		
	9:00—11:30	The 3rd Session		
	11:30—12:00	Save and seal the competitors' work of the 3rd session and related files, and lock the competition area.		
	12:00—13:00	Lunch		
	13:00—13:15	Experts and competitors arrive at the competition area and prepare.		
	13:15—13:30	Experts and competitors read the test project and communicate.		
	13:30—16:00	The 4th Session		
	16:00—16:30	Save and seal the competitors' work of the 4th session and related files, and lock the competition area.		
	9:00—11:30	Experts mark the competitors' deliverables		
	13:30—17:00	Experts mark the competitors' deliverables		
	19:00-22:00	Experts mark the competitors' deliverables. The marking should be done before 22:00.		
June 9	9:00—21:00	The Competition Committee validates the results. Closing Ceremony.	Competition Committee	

6. COMPETITION SPECIFICATION

6.1 EXPERT & COMPETITORS

6.1.1 CHIEF EXPERT & DEPUTY CHIEF EXPERT

Chief expert and deputy chief expert are appointed by 2017 China International Skills Competition Committee.

6.1.2 CRITERIA FOR EXPERT

Each team shall select one qualified expert to be responsible for judging and marking. The expert can apply for not joining the judge group and abandoning the related rights. Once an expert is confirmed as a judge, it is not allowed to change or quit.

There are 2 technical supporting staff in the competition. Based on the requirements of this skill competition and following the principles of fairness and integrity, the technical supporting staff shall be responsible for matters like answering the technical questions under the permission of the CE. The technical supporting staff is not participating in the marking of the competitors' work.

In order to ensure the smooth development of the competition and marking, and finish the marking of the competitors' work on time, the competition organizer propose 1-3 experts to participate in the marking of the competitors' work.

6.1.3 REQUIREMENTS FOR COMPETITORS

Age Limit: The competitor must be born no earlier than January 1st, 1995.

Competency: The competitor must have solid professional knowledge and operating skills. The competitor must have high morality and maintain physical and mental health, and have high learning and comprehension competency with good physical and psychological quality and strain capacity.

6.2 COMPETITION RULES

（1）The competitor decides his/her workstation position and number by drawing under the guidance of the CE and with his/her own valid certificates.

（2）The competitor can only participate in the competition with his/her own valid certificates. Other than those, the competitor is not allowed to bring anything else into the competition area.

（3）The competitor should arrive at the competition zone 30 minutes before the beginning of the competition and enter the competition area after check. The competitor who is late for 30 minutes or more is not allowed to enter and will be regarded as renunciation.

（4）The competitor must work out tasks of each session alone. Without permission of the CE, No contact is allowed between the competitor and other competitors or the compatriot experts and coaches, or individual expert from other team.

（5）The competitor must save their work frequently during the competition and to the specified directory in order to guarantee the safety of data. Marks that are beyond the requirements of the Test Project are not allowed to appear in the deliverables.

（6）The competitor is not allowed to make changes to their equipment or any malfunction during the competition. In case such equipment malfunction appears, in any circumstance, report to the CE for solution.

（7）In case the competition is interrupted due to the equipment malfunction which is not caused by the competitor himself/herself, the time lost for this interruption will not be counted into the official competition time of that competitor. After the malfunction is repaired, the lost time can be added based on the actual time used to tackle the problem(s).

（8）The competitor is not allowed to use devices like mobile phones, cameras as well as storage devices like USB flash disks during the competition. Without permission, the competitor is not allowed to borrow tools from others. Any misconduct which brings unfair advantages to the competitor or affects the normal competition order will be punished according to the seriousness levels from deducting marks to canceling the competition qualification.

（9）In case the competitor or his/her team member(s) violates the competition rules, and some advantages are gained which might have affected the competition results, that competitor will be punished according to the seriousness levels from deducting marks to canceling the competition qualification.

（10）The competitor is allowed to drink water or go to the bathroom, but the time used will be counted into the competition time.

（11）The start and end of the competition should be based on the word command of the CE. At the end of each session, the competitor should submit their work of that session to the server and leave the competition area.

6.3 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	• 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	• 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	• 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	• Competitors may use their own keyboards and mouse but these must be approved by CE and WM.

Software (language)	• Competitors can only use the software in English.
Health, Safety, and Environment	• Refer to the WorldSkills Health, Safety, and Environment policy and guidelines document.

6.4 SUPERVISION AND ARBITRATION

The Supervision and Arbitration Team should be established by the Committee to accept the questions from competitors, competition teams and experts, and be responsible for supervising fairness and arbitrating disputes.

7. COMPETITION AREA

7.1 REQUIREMENTS OF COMPETITION AREA

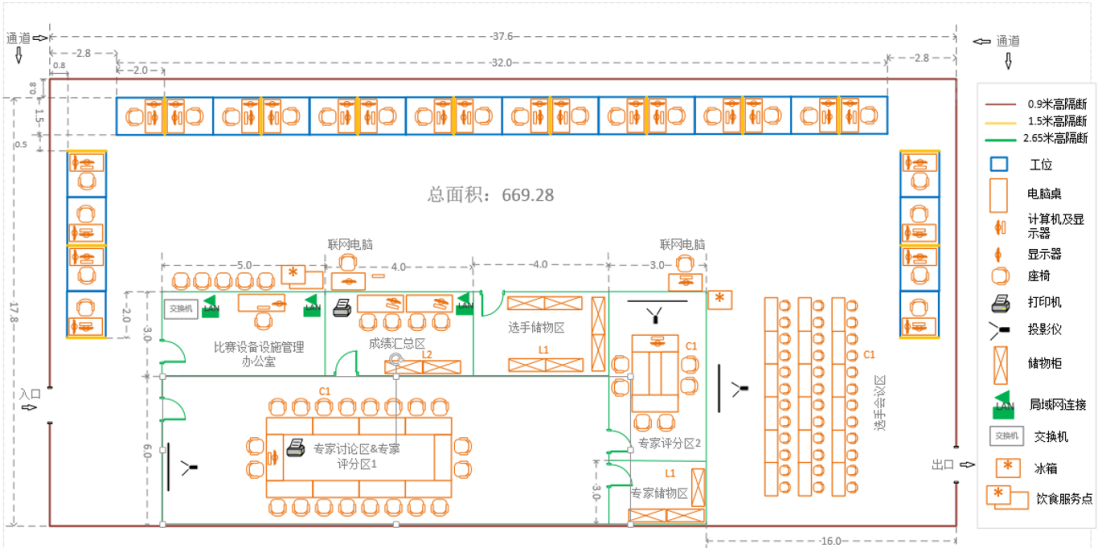
The competition will be carried out in the competition area designated by the Competition Committee.

（1）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 120cm.

（2）A well-equipped competitor briefing area is required. This must have a projector, screen, and PA system with an ease to use computer, audio, video and other capabilities.

（3）Explicit indicators and identification are required at the competition site. Each competition workstation should have explicit number and a set of well-equipped competition facilities.

（4） Refer to the workshop and workstation layouts of the 43rd Worldskills Competition below for the design of the actual layouts:



7.2 THE EQUIPMENT AND FACILITY AT THE COMPETITION AREA

Instructions of the actual software and hardware environments：

（1）Hardware Configuration of the Competitor Computer:

Intel(R) Core(TM) i7-6700 @3.4GHz (or higher) Processor; RAM Memory-16GB (or higher); HD 256GB(SSD)+1TB(HHD)(or higher); Video Memory 1GB; Discrete Graphics Card-512MHz in Frequency (or higher); DVD-ROM; USB3.0 Connection; Monitor-LCD 22’’（2 in number）

（2）Hardware Configuration of the Server

Intel(R) Core(TM) i7-6700 @3.4GHz (or higher) Processor; RAM Memory-16GB (or higher); HD 512GB (SSD)+2TB(HHD)(or higher); Video Memory 1GB, Discrete Graphics Card-512MHz in Frequency (or higher); DVD CD-R， USB3.0 port，Monitor-LCD 22’’

（3）General Software Configuration

1. OS: Windows 10

2. JAVA:

JDK 8

NetBeans 8.1

Eclipse Neon (4.6.0)

WindowBuilder Pro

e(fx)clipse

3. dotNET:

.NET Framework 4.6

Visual Studio 2015 (Professional 2015 update 3)

4. Databases:

Microsoft SQL Server Express 2014

JDBC Connector

SQL Server Management Studio

MySQL 5.7

JDBC / .NET Connector

Workbench

5. Design:

Microsoft Visio Professional 2016

6. Others:

Adobe Reader DC

LibreOffice 5.1

MS Office 2016 (WD,EXL, PPT)

Inno Setup 5.5.8

Notepad++ 7.3.1

Sublime Text 3 (Build 3126)

Xamarin

Android Studio 2.2.3

（4）Environment

The competitor computer is not allowed to connect with Internet or other public network at the competition site. It can only connect with the server set up at the competition site to save the competitor's work.

（5）Provided Materials

- Writing paper
- Highlighter, Signing pen, Pencil and Eraser
- Passwords for competitors to get access to related files.

（6）Personal Tools Allowed

- The models of Personal Keyboard(s) and Mouse(s) to be carried which do not have the function of storage and programming must be reported to the workshop manager for verification 2 weeks before the Competition.

7.3 THE PROHIBITED MATERIALS AND EQUIPMENT

- The competitors are allowed to use ear-protection.

- The competitors are NOT allowed to bring:
  - Additional software;
  - Any portable communication equipment, like mobile phones or smart watches;
  - Portable electronic equipment (tablets, PDA, etc.);
  - External storage equipment (memory sticks, flash memory);
- It is prohibited to connect any equipment with the internal storage equipment. The competition organizer shall make sure that this rule is implemented as required.
- The experts have the right to disallow some equipment to enter the competition area.

8. SECURITY REQUIREMENTS

Special Security Team should be set up by the Competition Organizer to guarantee the health and safety during the Competition, whose duties mainly include: ensuring the security of the competition site, participants' accommodation area, transportation and the surrounding; making emergency plans; supervising the use of electricity and related safety issues; supervising the safety and hygiene issues of participants; analyze and tackle emergency etc..

（1）Deploy all-time security staff and equip related security facilities at the competition site, and arrange specially-assigned people to work on site and tackle emergency timely.

（2）Medical stations should be established around the competition site and equipped with professional medical staff to tackle injury and disease issues during the competition.

（3）Arrange food and drinks which meet food safety requirements to ensure the food safety during the competition.

（4）Pay special attention to the electricity use and related security issues at the competition site to ensure the 100% safety of participants.

9. REQUIREMENTS FOR THE OPEN OF THE COMPETITION AREA

9.1 VISIT AND MEDIA ENGAGEMENT

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

- Display screens;
- Test Project descriptions;
- Competitor profiles;

9.2 REQUIREMENTS FOR THE PUBLIC

- Other than designated judges and work staff, others who want to enter the competition site must have permission of the Committee or be accompanied by related people of the Committee with required labels.
- Those who are allowed to enter the competition site can only view the competition within the specified area.
- Those who are allowed to enter the competition site must abide by the competition rules and are not allowed to talk with the competitors or interfere with the competition.
- Smoking is prohibited at the competition area.

9.3 REQUIREMENTS FOR MEDIA PUBLICITY

- The Organizer should invite the Press, Network media and Television media to involve in the publicity of the competition to raise the popularity as far as possible.
- The journalists can only enter the competition site with the permission of the Committee and required labels.
- The journalists who enter the competition site must abide by the competition rules and are not allowed to talk with the competitors or interfere with the competition.

10. SUSTAINABILITY

- Abidance by the Environmental Protection Act of China at the Competition;
- Use of ‘green’ materials;
- Use of a soft copy rather than printing;
- All waste at the competition should be classified and disposed, and be recycled as far as possible.

11. OTHER

The Competition will arrange 1 technical interpreter and 2 assistant interpreters. The technical interpreter will follow the arrangement of the CE and be responsible for the interpretation and translation for questions arising during the competition. The assistant interpreters will follow the arrangement of the CE and be responsible for all the interpretation and translation for questions raised by all the experts. The technical interpreter and assistant interpreters will follow the arrangement of the CE and wait for order in the designated area.

In order to fully show the competitors' abilities of language use and communication with client, when there appear the same competition results for the work of competitors, then the rankings shall be decided by the competitors' PPT developments and the presentation scores.