TECHNICAL DESCRIPTION

IT Software Solutions for Business

TD09 v3.1 – WSC2011

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

The Technical Description consists of the following:

Effective 21.07.10

Liam Corcoran
Technical Committee Chair

1. INTRODUCTION

1.1 Name and description of skill

1.1.1 The name of the skill is Information Technology Software Solutions for Business.

1.1.2 Description of skill

The rapid pace of globalisation over the past decade has been largely driven by developments in Information Communication Technology (ICT). IT specialists are increasingly in great demand in several areas, one of which is in providing solutions for business.
These professionals are not merely users of Microsoft Office; they are power users who have an intricate knowledge of each of the applications in the suite. Their skills may be used in a plethora of ways across a multitude of industries, cultures and languages.
Microsoft Office is by far the most widely-used suite of office applications throughout the world, therefore making Software Solutions professionals highly-employable members of the IT community. There are thousands of businesses that are undoubtedly in need of better training in the use of these office applications, and will often benefit greatly from having customised solutions developed for them that suit their individual needs.

What do IT Software Solutions professionals do?

- Develop solutions to businesses' problems
- Use Microsoft Office as a framework to build software solutions
- Analyse business requirements in order to create well-fitting solutions
- Use problem-solving skills and in-depth technical knowledge to build those solutions
- Use communication skills to document their creations in an easy-to-understand way
- Use communication and sales skills to present their solutions to clients

Where do IT Software Solutions professionals work?

IT Software Solutions professionals are employed throughout the following:

- Large enterprises
- Medium-sized businesses
- Small businesses
- As freelancers

They can operate in a wide variety of roles including:

- In a support role
- In a training role
- In a development role
  - providing customisation and automation
  - developing totally customised software solutions to a business' requirements

1.2 Scope of application

1.2.1 Every Expert and Competitor must know this Technical Description.

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

1.3 Associated documents

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

- WSI - Competition Rules
- WSI - Competition Manual
- WSI - Online resources as indicated in this document
- Host Country - Health and Safety regulations

2. COMPETENCY AND SCOPE OF WORK

The Competition is a demonstration and assessment of the competencies associated with this skill. The Test Project consists of practical work only.

2.1 Competency specification

Using the Microsoft Office suite, the competitors will be required to produce an integrated software system to add functionality, streamline processes and reduce errors for a business organisation. The competitors will work independently and produce the system over the four days of competition according to the specifications given in the project material. The ability to access, store and use files across a network is assumed.

Database

Competitors will be expected to use the full functionality of Microsoft Access. Database design skills will be required.

Build a database

Competitors must know and understand:

- The importance of using industry-accepted conventions for the naming of database objects
- The need for standardisation in the naming of fields
- How to ensure data integrity
- How to avoid data redundancy
- How to produce an ERD (entity-relationship diagram)

Competitors must be able to:

- Set up tables with correct fields, keys and data types
- Apply table and field properties (validation rules, input masks, lookups etc)
- Import data from a variety of sources and in a variety of formats
- Designate primary and foreign keys
- Set up correct relationships between tables

Design and use forms

Competitors must know and understand:

- How to create a form to a specified design and layout
- How decrease user error through appropriate controls and error handling routines

Competitors must be able to:

- Create forms and sub forms for a range of uses
- Control data entry through forms
- Set up appropriate controls in forms
- Add a command button to a form
- Control record navigation in a form
- Set form properties.

Query a database
Competitors must know and understand:
- How to design and execute queries to generate results as specified

Competitors must be able to:
- Filter & search records
- Construct and use select, parameter and action queries
- Add a calculated field to a query
- Perform calculations on a record grouping

Design and use reports
Competitors must know and understand:
- How to design and produce reports to generate results as specified

Competitors must be able to:
- Produce and modify reports (simple, grouped, summary and sub reports) following a stated layout and format
- Create and use pivot tables and charts
- Derive values from various sources in reports
- Set report properties
- Use calculated fields in reports
- Format a report for printing

Share data across applications
Competitors must know and understand:
- How to extract and use data from other applications that may be in differing file formats
- How to output data from Access to other applications

Competitors must be able to:
- Import and export data according to specifications
- Integrate data with external sources

Customise and automate processes
Competitors must know and understand:
- How to create and design the interface to suit client requirements as specified
- Provide the user with options for simple execution of complex processes

Competitors must be able to:
- Automate loading and display of objects
- Design and create login screens
- Create and use macros to automate processes
- Customise the Access environment

Spreadsheets
Competitors will be expected to use the full functionality of Microsoft Excel; however competitors will not be expected to have in-depth knowledge or expertise in any particular field (eg. financial, engineering, statistical, mathematical, etc.)

Construct a spreadsheet
Competitors must know and understand:
- The power of a well-designed and well-constructed spreadsheet to improve business productivity and aid decision making with its powerful data analysis and reporting functions

Competitors should be able to:
- Use formulas as required
- Create, modify and format spreadsheets using the full range of Excel's formatting features including conditional formatting

- Use a variety of built-in functions (statistical, mathematical, text, logical, financial, date and time).

Use Design and Analysis tools
Competitors must know and understand:
- How to design and use analysis tools in Excel

Competitors should be able to:
- Construct a model to undertake What If Analysis using Goal Seek / Solver / Scenario Manager
- Analyse Data Using PivotTables and PivotCharts

Use Data and Table functions
Competitors must know and understand:
- How to manage and analyse data through using table capabilities

Competitors should be able to:
- Define and apply data filters
- Use the sub-totalling feature
- Query spreadsheet data
- Set up and apply validation rules to spreadsheet data
- Make use of the outlining feature in Excel

Share data across applications
Competitors must know and understand:
- How to extract and use data from other applications that may be in differing file formats
- How to output data from Excel to other applications

Competitors must be able to:
- Import and export data according to specifications
- Integrate data with external sources
- Publish a worksheet to the Web
- Import data from the Web
- Create a web query
- Structure workbooks with XML
- Develop XML maps
- Import and export XML data

Printing Spreadsheets
Competitors must know and understand:
- How to set up worksheets and workbooks for printing

Competitors must be able to:
- Set printing options to output a chart, worksheet, workbook, PivotTable report according to specifications

Charts and Graphs
Competitors must know and understand:
- How to present spreadsheet data in various graphical formats

Competitors must be able to:
- Create, modify and format the full range of charts according to specifications
- Create dynamic charts
- Create and use PivotTables and PivotCharts

Customise and automate processes

Competitors must know and understand:

- How to create and design the interface to suit client requirements as specified
- Provide the user with options for simple execution of complex processes
- Customise layouts

Competitors must be able to:

- Automate loading and display of objects
- Create and use macros to automate processes
- Hide/unhide/freeze rows and columns
- Set up templates with appropriate protection
- Customise the Excel environment
- Customise an Excel worksheet
- Enhance worksheets using themes
- Work with comments
- Access external resources using hyperlinks
- Use web-based research tools

Use graphical objects

Competitors must know and understand:

- How to enhance visual appeal using graphic objects

Competitors must be able to:

- Insert graphics
- Modify graphic objects
- Emphasise an area of a worksheet
- Illustrate workflow using SmartArt graphics
- Format graphic objects
- Change the order of layered graphic objects
- Group graphic objects
- Organise graphic objects

Use multiple workbooks

Competitors must know and understand:

- How to work with multiple workbooks

Competitors must be able to:

- Create a workspace
- Consolidate data
- Link cells in different workbooks
- Edit links

Use auditing features

Competitors must know and understand:

- The importance of controlling data accuracy through auditing

Competitors must be able to:

- Trace cells
- Troubleshoot errors in formulas
- Troubleshoot invalid data and formulas
- Watch and evaluate formulas
- Create a data list outline

Collaboration

Competitors must know and understand:

- How to share, analyse and communicate business information and data through Excel

Competitors must be able to:

- Protect files
- Share a workbook
- Set revision tracking
- Review tracked revisions
- Merge workbooks
- Administer digital signatures
- Restrict document access

Word Processing

Competitors will be expected to use the full functionality of Microsoft Word. Built-in spell check and thesaurus functions will not be tested

Create a document

Competitors must know and understand:

- How to design, create and modify a range of business documents

Competitors must be able to:

- Apply the full range of text, paragraph, page and document formatting
- Create, edit and format tables
- Create and modify charts
- Draw and modify graphical objects
- Apply multimedia capabilities to a document

Mail merge

Competitors must know and understand:

- How to generate mass-mailing documents

Competitors must be able to:

- Set up a main document
- Connect the document to a data source
- Refine the list of recipients by sorting and filtering data
- Apply conditions and rules

Referencing

Competitors must know and understand:

- How to set up and apply the referencing features of Microsoft Word

Competitors must be able to:

- Set up and use indexes, cross-references, captions, tables of contents, bibliography
- Set up and use footnotes and endnotes
- Use fields and calculations in documents
- Create, manage, revise, and distribute long documents and forms.
- Prepare documents for printing or for publishing electronically

Share data across applications
Competitors must know and understand:
- How to extract and use data from other applications that may be in differing file formats
- How to output data from Word to other applications

Competitors must be able to:
- Import and export data according to specifications
- Integrate data with external sources
- Publish a document to the Web
- Create, use and manage XML schemas and structures
- Make use of the collaborative features of Microsoft Word

Customise and automate processes
Competitors must know and understand:
- How to create and design the interface to suit client requirements as specified
- Provide the user with options for simple execution of complex processes
- Provide a custom layout using a template
- How to exploit the full potential of Word forms

Competitors must be able to:
- Automate the loading and display of objects
- Create and use macros to automate processes
- Provide user interactivity by means of forms and fields
- Protect forms and set user permissions in forms
- Create, edit and apply themes to documents
- Create, modify and use templates

Presentations
Competitors will be expected to use the full functionality of Microsoft PowerPoint. Drawing and modifying of graphical objects will be limited to the capabilities of PowerPoint; no drawing packages will be used in the Test Project

Create a presentation
Competitors must know and understand:
- How to design, create and modify a presentation according to given specifications

Competitors must be able to:
- Create and modify slides using a variety of layouts and formats
- Use text effects
- Include tables and charts in a presentation
- Import data (text, spreadsheet, charts, etc)
- Hide/unhide slides

Add special effects to presentations
Competitors must know and understand:
- How to add special effects to presentations according to given specifications

Competitors must be able to:
- Add multimedia elements
- Customise slide component animation
- Insert media files (movie, sound)

Add graphical objects to a presentation

Competitors must know and understand:

- How to create, format and apply graphical objects to a presentation according to given specifications

Competitors must be able to:

- Insert Clip Art and pictures
- Draw shapes
- Insert WordArt
- Create and modify diagrams
- Modify and work with objects
  - Change object orientation
  - Format objects
  - Group and ungroup objects
  - Arrange objects

Customise and automate processes

Competitors must know and understand:

- How to create and design the interface to suit client requirements as specified
- Provide the user with options for simple execution of complex processes
- Customise a Design Template

Competitors must be able to:

- Automate loading and display of objects
- Create and use macros to automate processes
- Create, modify and use templates
- Set up a slide master
- Customise slide layouts
- Create custom themes
- Customise bullets
- Add common slide information
- Modify the notes master
- Modify the handout master

Prepare a presentation for delivery

Competitors must know and understand:

- The importance of professionalism in preparing a slide show for delivery according to given specifications

Competitors must be able to:

- Spell check
- Arrange slides
- Add transitions
- Apply animation effects
- Execute other programs during a slideshow
- Create speaker notes
- Print a presentation
- Package a presentation
- Set up a custom show
- Annotate a presentation
- Create a presenter-independent slide show
- Set up and apply automatic timings to a slideshow

Collaborate on a Presentation
Competitors must know and understand:
- How to share slide content

Competitors must be able to:
- Publish slides to a slide library
- Share a presentation.

2.2 Theoretical knowledge

2.2.1 Theoretical knowledge is required but not tested explicitly.

2.2.2 Knowledge of rules and regulations is not examined.

2.3 Practical work

IT Software Solutions for Business requires the competitors to demonstrate that they are advanced users of the various components of the Microsoft Office suite. The many features of Microsoft Word, Excel, Access and PowerPoint will be comprehensively tested by means of an integrated case study which will require the competitors to add functionality, streamline processes and reduce errors for a business organisation.

Competitors may expect to solve a series of problems in a given business scenario using Microsoft Office. The tasks set for each session will be stand-alone; if a part of a project depends on an earlier part then the competitors will be given that part. The competitors will work independently.

Competitors will be provided with data in various formats and will need to apply data analysis skills to determine the best methods to extract and collate this data in order to build the required system. Design skills will be required.

Competitors should have general business knowledge (e.g. knowledge of how to set out common business documents such as letters), as well as the use of Information Technology within a business/commercial environment (e.g. order processing, payroll). Mathematical and logical processing skills are key skills in the IT area, and these will be tested throughout the competition. The ability to access, store and use files across a network is assumed.

The competitors will be required to automate and customise elements within the applications. The competitors will have no components that rely on programming skills, although some may wish to make use of VBA. A working solution that fulfils the specified requirements is what is needed and the competitor has the freedom to use any features of the Office suite to achieve this. Clean, professional development practices should be adhered to, promoting ease of use, minimising user error and demonstrating thorough testing.

The competitors may be required to produce user documentation to explain the system they have produced. This could be in the form of a tutorial. They could also be required to give a presentation to explain the system.

“Overdrive” is a surprise speed-based stand-alone challenge. A typical demand in the IT profession is that someone might expect to be interrupted with an urgent request. At some time on two of the days of competition, the competitors will be set a problem that must be solved within an hour. This will ideally be a task of a visual nature which will attract spectators to the competition site.

3. THE TEST PROJECT

3.1 Format / structure of the Test Project

The Test Project will be in the form of a case study that will represent typical functions that might be asked of an IT professional who is highly competent in the area of Microsoft Office. The scenario will be presented as a project with clearly defined deliverables. These deliverables will be grouped to enable a modular approach whereby discrete tasks can be completed in a session. The competitors will select the appropriate software for the task.

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

Two “Overdrives” will form part of the Test Project. An “Overdrive” is a type of speed challenge and represents the situation in an IT workplace where a worker will be interrupted with an urgent request. The timing of the “Overdrive” will be a surprise to the Competitors. The task should take one hour and should be something with visual appeal to attract spectators (for example a PowerPoint presentation).

3.2 Test Project design requirements

The Test Project must be based on the scenario agreed by the Experts at the previous WorldSkills Competition. The next competition is based on the business aspects of UK football (soccer). The industry writer of the project will prepare the details of the scenario and provide data files, assessment criteria, and solutions. The problems set should be ones that are pertinent to the business side of football, and not require any in-depth knowledge of the sport.

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

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

3.3 Test Project development

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

3.3.1 Who develops the Test Project / modules

The Test Project / modules are developed by an independent External Project Writer. This will include the “Overdrive” challenges.

3.3.2 How and where is the Test Project / modules developed

The Test Project / modules are prepared by an External Project Writer. A “Project Liaison Team” will be formed at least eight months before the Competition. This team will comprise the Chief Expert, the Deputy Chief Expert and three other Experts who have had experience of at least one previous International Competition. These three Experts will be selected by the SMT who will endeavour to ensure representation of a cross-section of participating members. The role of the Project Liaison Team will be to assist the External Writer by answering questions relating to the Competition and procedures only. The Project Liaison Team will have no knowledge of the contents of the Test Project. The External Writer will only communicate with the Project Liaison Team via the WSI Technical Director.

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

3.3.3 When is the Test Project developed

The Test Project is developed by three months before the current Competition.

3.4 Test Project marking scheme

Each Test Project must be accompanied by a marking scheme proposal based on the assessment criteria defined in Section 5.

3.4.1 The marking scheme proposal is developed by the person(s) developing the Test Project. The detailed and final marking scheme is discussed and agreed by all Experts at the Competition.

3.4.2 Marking schemes should be entered into the CIS prior to the Competition.

3.5 Test Project validation

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

- The project can be completed in the specified time
- The marking schemes are appropriately developed
- The Test Project meets the Technical Description

3.6 Test Project selection

The Test Project will be provided by an External Project Writer, three months prior to the Competition.

3.7 Test Project circulation

The Test Project is not circulated prior to the Competition.

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

3.8 Test Project coordination (preparation for Competition)

Coordination of the Test Project will be undertaken by SMT in conjunction with the Project Liaison Team and WSI Technical Director.

3.9 Test Project change at the Competition

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

3.10 Material or manufacturer specifications

Not applicable.

4. SKILL MANAGEMENT AND COMMUNICATION

4.1 Discussion Forum

Prior to the Competition, all discussion, communication, collaboration and decision making regarding the skill must take place on the skill-specific Discussion Forum (http://www.worldskills.org/forums). All 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 moderator for this forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

4.2 Competitor information

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

This information includes:

- Competition Rules
- Technical Descriptions
- Other Competition-related information

4.3 Test Projects

Test Projects will be not be circulated.

4.4 Day-to-day management

The day-to-day management 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 finalised at the Competition (agreed by Experts and submitted to the Chair/Vice Chair of the Technical Committee). The Chief Expert is to regularly share updates of the Skill Management Plan via the Forum.

5. ASSESSMENT

This section describes how the Experts will assess the Test Project / modules. It also specifies the assessment specifications and procedures and requirements for marking.

5.1 Assessment criteria

This section defines the assessment criteria and the number of marks (subjective and objective) awarded. The total number of marks for all assessment criteria must be 100.

Note: Due to the extensive audit of the Technical Description for the 2011 Competition assessment can comprise 90% objective and 10% subjective, or may be100% objective. This decision will be made by vote of the Experts at the Competition. 50%+1 must be in agreement. Assessment will be completed over the duration of the competition time.

Section	Criterion	Marks		
		Subjective (if applicable)	Objective	Total
A	Database design and construction	0	20	20
B	Spreadsheet modelling	0	20	20
C	Document design and production	0	20	20
D	Presentations	0	10	10
E	System professionalism / completeness	10	0	10
F	"Overdrives"(2)	0	15	15
G	Presentation of project	0	5	5
	Total =	**10**	**90**	**100**

5.2 Subjective marking

Scores are awarded on a scale of 1 to 10.

5.3 Skill assessment specification

There will be 4 marking groups. 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 objective criteria in the Test Project. The table below shows an explanation of the three types.

Type	Example	Maximum Points	Correct	Not Correct
Full points or Zero points	The pie chart shows data labels as percentages	0.20	0.20	0
Deduct from full points 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 point on a predetermined progressive scale	Solver criteria specified correctly (add 0.1 mark for each criterion)	1.0	1.0	0.1 – 0.9

5.4 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 objective and subjective 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 subjective marking where possible.

The External Project Writer 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 and whether to allow a mix of subjective / objective marking or to adopt 100% objective marks.

6. SKILL-SPECIFIC SAFETY REQUIREMENTS

Refer to Host Country Health & Safety documentation for Host Country regulations.

7. MATERIALS & EQUIPMENT

7.1 Infrastructure List

The Infrastructure List lists all equipment, materials and facilities provided by the Host Country.

The Infrastructure List is online (http://www.worldskills.org/infrastructure/).

The Infrastructure List specifies the items & quantities requested by the Experts for the next Competition. The Host Country will progressively update the Infrastructure List specifying the actual quantity, type, brand/model of the items. Host Country supplied items are shown in a separate column.

At each Competition, the Experts must review and update the Infrastructure List in preparation for the next Competition. Experts must advise the Technical Director 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.

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

Not applicable.

7.3 Materials, equipment and tools supplied by Experts

Not applicable.

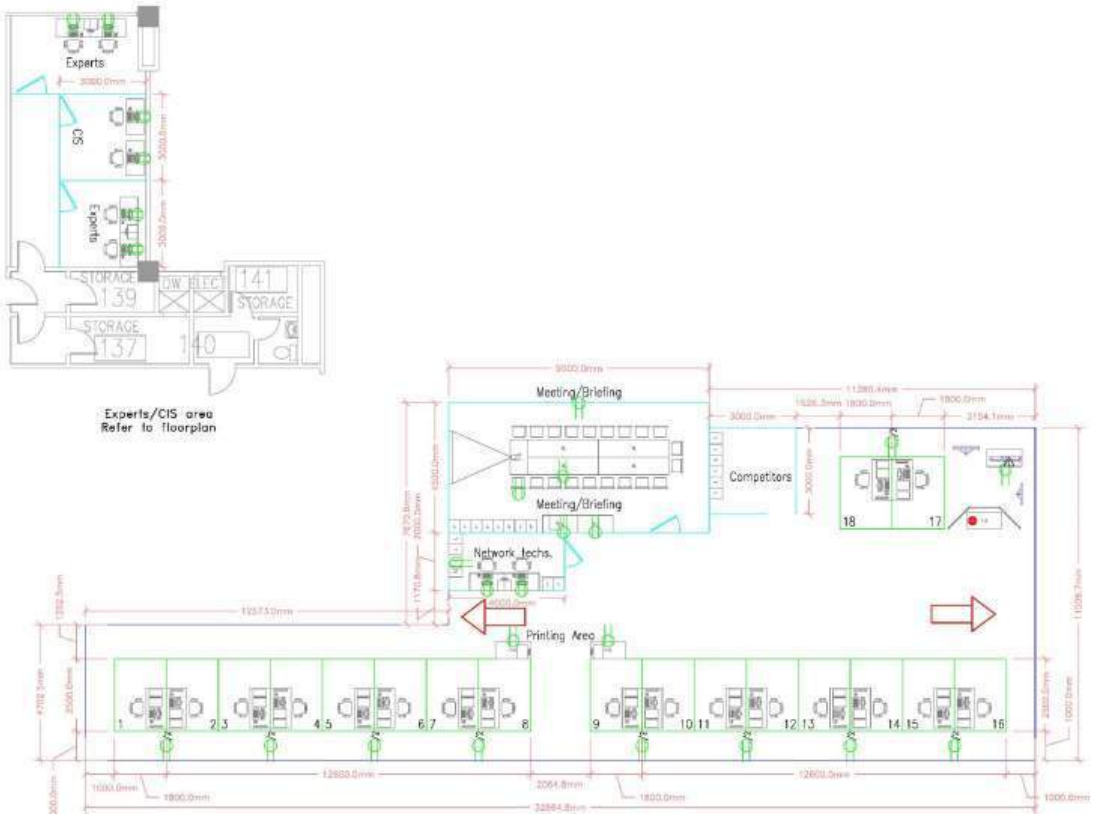
7.4 Materials & equipment prohibited in the skill area

- The Competitors may use ear protection
- The Competitor may not listen to music
- The Competitor may not bring:
  - additional software
  - mobile phones
  - PDAs
  - external storage devices (memory sticks, flash drives etc)
- Equipment must not have any access to the internal memory storage devices. The Host Member will ensure that these are disabled.
- The Experts hold the right to disallow certain equipment brought into the Competition.

7.5 Sample workshop layouts

Workshop layouts from Calgary are available at:
http://www.worldskills.org/index.php?option=com_halls&Itemid=540

Workshop layout from previous Competition:



8. MARKETING THE SKILL TO VISITORS AND MEDIA

8.1 Maximising visitor and media engagement

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

8.2 Sustainability

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