



# Compliance with ITC Guidelines on Computer-Based and Internet Delivered Testing

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## INTERNATIONAL TEST COMMISSION

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## Tool Suite - *tools4talents*

Since 2001 humanlogix has developed modern, high-performance online tools to support Human Resources selection, evaluation and development. The tool suite consists of different online tools to identify behavioural patterns and match them with the company's needs and cultural settings.

Humanlogix tools4talents was validated and proofed by the scientific community and in real business practice. It was one of the winning online applications 2005 rated by Austrian authorities.

### ITC Guidelines on Computer-Based and Internet Delivered Testing

"Over the past few years the International Test Commission (ITC) has adopted a policy of promoting good practice in testing issues where international coordination of effort is most important. In recent years substantial and rapid developments have occurred in the provision of stand-alone and Internet-delivered computer based testing. These developments raise a number of issues in relation to standards of administration, security of the tests and test results and control over the testing process. Therefore, as the market for such testing increases and as the technological sophistication of the products increases issues associated with ensuring those developing, distributing, using and taking such tests and assessment tools follow good practice will increase in importance. In response to this, the ITC Council decided to invest in a program of research, consultation, and conferences designed to develop internationally agreed guidelines specifically aimed at computer/Internet based testing." <sup>1</sup>

### Testing *humanlogix tools4talents* along the ITC Guidelines

With the following table humanlogix is aiming to give full transparency on to what degree the tools4talents comply with the International Guidelines on Computer-Based an Internet Delivered Testing of the International Test Commission.

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<sup>1</sup> ITC Test Commission: ITC Guidelines on Computer-Based and Internet Delivered Testing, ITC-G-CB-20140617, 1. July 2005, page 7



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## 1 Give due regard to technological issues in Computer-based (CBT) and Internet Testing

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### 1.1 Give consideration to hardware and software requirements

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**1. Provide a clear description of the minimum hardware and software requirements of the CBT. For Internet testing specify browsers which will support the test.**

Browsers are specified as follows:

- Internet Explorer from version 10
- Opera from version 23
- Mozilla Firefox from version 27
- Google Chrome from version 36
- Safari from version 5.1.7

Furthermore an automatic browser-check is implemented which links user with ancient browsers to update their browser version on <http://browsehappyp.com/?locale=en>

**2. Conduct adequate usability testing of the system requirements using the appropriate delivery platforms to ensure consistency of appearance and delivery.**

Usability tests have been conducted in Switzerland, Austria, Germany, Vietnam, China

**3. Use appropriate technological features to enhance usability and follow established graphical user interface (GUI) design standards. For example, complex graphics and interactive features may reduce software running speed or increase download time. Items should be designed to fit the test purpose and objectives of assessment, and advanced multimedia features should be used only where justified by validity.**

Humanlogix was honoured in 2005 by the jury of the Austrian State Prize out of 240 nominations awards in different categories. In the category "Knowledge and Education" the award winner were:

The Austrian State Prize in Multimedia is one of the most important awards for multimedia solutions in Austria.

(<http://www.multimedia-staatspreis.at/>)

Criteria for the awards are:

- Customer benefit
- User friendliness
- Usability
- Creativity
- Innovation
- Information
- Integration pf Multimedia Tools
- Security

**4. Design the system to accommodate likely advances in technology.**

The software is developed in PHP and MySQL. The software is adaptable to different languages, behavioural dimensions and thus different numbers of micro cases. Tools4talents use open source technology to avoid additional licence costs for the user.

**5. Design the Internet-delivered testing system to take account of the possibility of fluctuations in demand at different times.**

Hosting of the software ensures high accessibility:

Server: Dell Power Edge Pro Liant

RAM: 32 GB , 1 x 8-Cores

Harddisk: 1000 GB , Raid 10

Monitoring: external Monitoring CPU, HD and additional independent monitoring of the website itself.

Operating System: Ubuntu LTS

Bandwidth: 50 MBit guaranteed, 500 MBit for load peaks

Daily Full backup (optional Snapshot-Backup)

Traffic: unlimited

**6. Ensure applications of technology advances are tested, documented, and explained to users.**

User documentation is embedded in the invitation mail and in the test-environment.

**7. Minimise the number of updates and version changes that are issued.**

Last version change has been made in 2013. Smaller updates are made automatically without overhead fur the users.

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<b>8. Take account of the widely differing connection speeds that apply globally.</b>	Speed issues have only been reported from China due to internet restrictions. This will be resolved in 2016 with a dedicated hosting partner in mainland China.
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## 1.2 Take account of the robustness of the CBT/ Internet test

<b>1. Test the system to confirm that it is sufficiently robust and capable of dealing with likely system failures and user error.</b>	System tests have been conducted widely and system robustness has been proven. Possible use errors have been eliminated with intuitive user guidance.
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**2. Ensure that the CBT/Internet test is as 'fail-safe' as possible in order to minimise problems arising while the test-taker is responding. Where possible and appropriate:**

- <b>treat upper and lower case fonts as equivalent,</b>	Hx profiler only requires decisions by clicking the appropriate checkbox. There is no input of text.
- <b>prevent operation of keys or controls that have no function in the test,</b>	Besides amending name and function no text input is required. Test can be done with mouse or touchscreen only.
- <b>eliminate auto-repeat functions of keys,</b>	No key functions required
- <b>prevent a test-taker from exiting the test by accident,</b>	Test can be exited at any time. All data is saved automatically to prevent data loss at any time.
- <b>provide timely and helpful error feedback,</b>	Automatic errors feedback is implemented: If candidate decides too often with "I totally agree..." an error feedback is provided.
- <b>follow GUI standards regarding features such as colour, layout, and design, and</b>	Software has been designed with a modern and state-of-the-art GUI.
- <b>if standardization is not important, allow the user multiple ways to navigate through the system, or allow the user to modify the interface to their liking.</b>	According to the story board of the assessment there are not multiple ways to navigate through the test.

<b>3. When the CBT/Internet test is timed, design the system to respond promptly so that commands have an immediate effect on the screen (e.g., GUI design standards would indicate no more than a 2 second delay onscreen).</b>	GUI standards are met. The assessment gives a time indication not to spend more than 2 minutes within one micro case. Nevertheless speed is no evaluation criterion.
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<b>4. When the CBT/Internet test is timed, design features so that the time required to move between questions and for the system to record the answer is not part of the timed element (e.g., the test software should deduct these times from the timing of the test or the timing clock should stop during access transitions)</b>	Timer is only activated from the moment a micro-case is opened until the last decision related to this micro case has been taken.
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<b>5. For Internet testing, minimise the impact of hang-ups, lost Internet connections and slow downloading (e.g., the system should ensure that no information is lost when the Internet connection is lost).</b>	By saving every micro-case individually the maximum risk of data loss in case the internet connection is lost is that single micro-case.
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**6. Provide documentation that specifies what to do in the event of routine problems with hardware and /or software.**

The invitation mail providing the user name and password gives useful information about screen resolution. Nevertheless screen resolution is also tested by the test giving the choice of changing screen resolution or "continue anyway". Automatic browser checks avoid routine problems of outdated browser versions.

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### 1.3 Consider human factors issues in the presentation of material via computer or the Internet

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**1. Design systems to follow GUI design standards that have been established by groups such as Human Factors International, including but not limited to:**

- ensuring screens have adequate resolution and colour,
- using consistent screen locations and colour for instructional text and prompts,
- using consistent screen design, layout and colours,
- differentiating between test items and test instructions,
- displaying only relevant information on-screen and ensuring the screen is not overfilled,
- placing critical information at the start of the text,
- providing instruction screens with clear fonts and avoiding distracting logos/images,
- allowing test-takers to review or return to the instruction screen(s) where appropriate, and
- ensuring representation of status change of display entities (e.g., dimming, highlighting) is consistent in appearance, and logical and meaningful.

Humanlogix was honoured in 2005 by the jury of the Austrian State Prize out of 240 nominations awards in different categories. In the category "Knowledge and Education" the award winner were:

- A) Austrian Media Library (Österreichische Mediathek) with their project [www.staatsvertrag.at](http://www.staatsvertrag.at),
- B) Humanlogix AG /massive Art GmbH with the project Human Logix 2.0 [www.humanlogix.com](http://www.humanlogix.com)
- C) Red Bull GmbH / Sony DADC Austria AG with their project Red Bull Pilots Program

The Austrian State Prize in Multimedia is one of the most important awards for multimedia solutions in Austria. (<https://www.ffg.at/staatspreis-multimedia-und-e-business-2015>)

Criteria for the awards are:

- Customer benefit
- User friendliness
- Usability
- Creativity
- Innovation
- Information
- Integration of Multimedia Tools
- Security

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**2. Display test name, item number, and test prompts or directions at the same location on the screen for each test page**

The micro-cases are designed very clearly distinguishing situational description (section 1) from behavioural options to be judged (section 2) from evaluation of qualification, experience and interest (section 3). There is a navigation line showing the current micro-case plus an option to move backwards to see old micro-cases.

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**3. Produce non-alarming, clear and concise error messages that inform how to proceed. Following an error alert, allow the test-taker to correct any errors and continue the test in the most efficient manner possible.**

Automatic errors feedback is implemented: If candidate decides too often with "I totally agree..." an error feedback is provided. By changing the decision the test can be continued efficiently.

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## 1.4 Consider reasonable adjustments to the technical features of the test for candidates with disabilities

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**1. Design CBT/Internet tests with hardware /software (e.g., response format) that facilitates the participation of test-takers with disabilities and special needs.**

As the test requires mainly decisions by clicking a checkbox and avoiding extensive text input it can be used also for candidates with limited physical abilities.

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**2. Design CBT/Internet tests with hardware and software that can be modified to allow for appropriate test accommodations (e.g., increased font size).**

Technical possibilities and ways how to scale screen resolution are already described in the first invitation mail.

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## 1.5 Provide help, information, and practice items within the CBT/Internet test

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**1. Provide clear, accurate, and appropriate technical support documentation in both electronic and paper formats.**

The test was designed in a way that needs least possible support. The invitation mail and the macro-case give essential technical advice. Furthermore there is a first level technical support that can be addressed by e-Mail.

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**2. Ensure that such documentation is written at an appropriate level for its target audience.**

All texts have been validated by local test candidates representing the target audience.

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**3. Provide clear instructions on how to load and set up the testing system. For Internet testing, information should be provided on how to log test-takers on and off the system.**

There is no download process required. A direct login into the test area is provided with an individual username and password.

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**4. Provide sufficient and easily available on-screen instructions and help for test-takers. This should include, at a minimum information about the test (number of items, timing, and types of items) and the testing procedure (how to navigate through the system and how to exit).**

This information is delivered standardised within the invitation mail.

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**5. Where appropriate, develop tutorials or practice tests/items that provide test-takers the opportunity to familiarise themselves with the CBT/Internet test.**

On [www.humanlogix.com](http://www.humanlogix.com) a demo-version of the test is available to get familiarized with the test.

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## 2 Attend to quality issues in CBT and Internet testing

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### 2.1 Ensure knowledge, competence and appropriate use of CBT/Internet testing

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**1. Document the constructs that are intended to be measured and investigate whether CBT/Internet mode of delivery is appropriate in terms of content and technical adequacy to access the relevant constructs.**

Humanlogix provides a comprehensive documentation with the «hx whitepaper» that can be downloaded from the website [www.humanlogix.com](http://www.humanlogix.com) in English and Chinese. All constructs are described within a behavioural model. The underlying method of a Situational Judgement Test is discussed extensively within the whitepaper and has proven to be adequate to evaluate the behavioural constructs. .



<b>2. Ensure all those involved in test design and development (item writers, psychometricians, software developers etc.) have sufficient knowledge and competence to develop CBT/Internet tests.</b>	Humanlogix has developed tools4talents with a broad range of partners on scientific and practice level. The development partners are listed in the "hx-whitepaper".
<b>3. Remain current on recent advances in CBT/Internet testing, including advances in computer hardware and software technologies and capabilities.</b>	Thanks to a tight and long cooperation between humanlogix and massiveart ( <a href="http://www.massiveart.com/de/">http://www.massiveart.com/de/</a> ), one of Austrian leading webdesign agencies, state-of-the-art technologies and capabilities are secured. With founder and president Prof. Dr. S. Wörwag humanlogix enjoys a strong foothold in the scientific community.
<b>4. Adhere to legal, professional, and ethical mandates and guidelines related to CBT/Internet testing.</b>	Humanlogix adheres to legal, professional and ethical standards applying for Internet Testing.
<b>5. It is important that during the development of items and tests, the content is protected, through the use of agreements as well as sound security procedures.</b>	All data is stored and protected on a dedicated server hosted by massiveart. Given the individual licence keys, a sophisticated user-management and SSL standards, a very high level of security can be assured.

## 2.2 Consider the psychometric qualities of the CBT/Internet test

<b>1. Document and disseminate information on the validity, reliability, and fairness of the CBT/Internet testing process.</b>	The "hx whitepaper" provides a detailed description of: <ul style="list-style-type: none"><li>a) Content validity</li><li>b) Criterion validity</li><li>c) Face validity</li><li>d) Predictive validity</li><li>e) Construct validity</li><li>f) Reliability</li><li>g) Fairness</li><li>h) Consistency</li></ul>
<b>2. Ensure that current psychometric standards (test reliability, validity, etc.) apply even though the way in which the tests are developed and delivered may differ</b>	See above
<b>3. Take care that the CBT/Internet test does not require knowledge, skills, or abilities (e.g. computer skills) that are irrelevant to or might impede the test-taker's ability to perform the test.</b>	Humanlogix tools4talents do not require knowledge, skills or abilities any more than can be expected from the target group at minimum. As the profiler only describes dominant behaviour and situational decisions and does not test skills, performance or the ability to choose best answers, the method has a very high acceptance in practice.
<b>4. Describe the theoretical and practical applications of algorithms used in test-item selection and/or controlling item or test order (as in adaptive testing).</b>	As <i>humanlogix tools4talents</i> are evaluating behavioural tendency and not knowledge, the candidate is asked not to select the right or appropriate answer but to judge four evenly feasible options according to what the candidate would most likely do. Individual scores are used in a descriptive way to be related to predefined attributes (text constructs). Candidates may score their level of agreement on a three-point Likert Scale (disagree, partially agree, totally agree), presenting easy to understand categories with equivalent "distances". By forcing the candidate to choose one option as best choice and by limiting the category "partial agreement"





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	to two per situation, the risk of a central tendency bias is reduced.
<b>5. Where test-item content changes, retest and evaluate the changes.</b>	All content changes (version change 2013) have been tested and evaluated by the target group.
<b>2.3 Where the CBT/Internet test has been developed from a paper and pencil version, ensure that there is evidence of equivalence</b>	Humanlogix profiler was not adopted from an existing paper and pencil version.
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<b>2.4 Score and analyse CBT/Internet testing results accurately</b>	
<b>1. Ensure the accuracy of rules/ algorithms underlying the scoring of the CBT/Internet test.</b>	The main intention of humanlogix profiler is to produce valid information about dominant behaviour and situational decisions of a candidate in real life. The behavioural model contains 10 dimensions with four attributes each. The micro-cases refer to these dimensions giving four options to judge in every case. The options are based on a representative textual description of every single attribute in the given situation. This way humanlogix profiler can prove a high equivalence between the options and the underlying text constructs of every attribute. For every dimension the candidate will judge 6 micro-cases, which provide a good quantitative sample to identify dominant attributes.
<b>2. Provide appropriate documentation of the use and validity of scoring rules.</b>	Many Situational judgement tests (SJTs) present scenarios drawn from a work context and ask respondents to select the most appropriate response from among a range of options. One of the weak points when using Situations Judgement Tests is the scoring of answers (Strahan, Fogarty, Machin, 2005). Unlike many other SJT, humanlogix is not defining correct or appropriate answers via expert judgment (team of experts decides the best answer to each question), target scoring (test author determines the correct answer) or consensual scoring (score is allocated to each option according to the percentage of people choosing that option). As <i>humanlogix tools4talents</i> are evaluating behavioural tendency and not knowledge, the candidate is asked not to select the right or appropriate answer but to judge all four options according to what the candidate would most likely do. Individual scores are used in a descriptive way to be related to predefined attributes (text constructs). Candidates may score their level of agreement on a three-point Likert Scale (disagree, partially agree, totally agree), presenting easy to understand categories with equivalent "distances". By forcing the candidate to choose one option as best choice and by limiting the category "partial agreement" to two per situation, the risk of a central tendency bias is reduced.
<b>3. Where reports classify test respondents into categories, such as 'Introverted type' or 'High sales potential', provide information in the test manual that specifies the accuracy of the classification system used to generate computer- based test interpretations (CBTI).</b>	Humanlogix profiler does not classify candidates into categories but gives a sophisticated insight into what is called a behavioural fingerprint. Thus there are no classes but individuals with their individual behavioural settings that can be used to match predefined requirements.

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**4. Describe the rationale for CBTI statements and how statements are derived from particular scores or score patterns.**

Human behaviour is a mixture of diverse and sometimes also contradictory behavioural attributes, which might be chosen more or less significantly in certain situations. Thus *humanlogix tools4talents* are able to distinguish the probability of four different attributes in every behavioural dimension. These attributes will be evaluated within six different situations assigned to one behavioural dimension. The variety of each six situations gives a valid insight into individual strategies. All behavioural attributes are different in terms of attitude and styles rather than better or worse behaviour (avoiding the problem of social desirability). The important question is: to what extent are they suitable to match a job profile or a task in a certain situation? Therefore the behavioural pattern will only give a description of the candidate's choice of behavioural options in daily work and, when using the matching function, relative to predefined job requirements. Another emphasis lies on risks of exaggerations when using a behavioural attribute in a dominant way. Unlike other tests, giving a percentage, to what extent a candidate might average on a scale of one behavioural dimension or average in a class, *humanlogix tools4talents* subdivide one behavioural dimension into four attributes, showing the significance of every attribute chosen throughout six cases. This takes into account that behaviour is neither an average nor a one-dimensional manifestation but always a mixture of more or less decisive attributes.

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**5. When test data are hand-entered into a computer, devise procedures to allow for data to be checked for accuracy.**

Every Micro Case has a short description, embedded in the overall storyboard (Macro Case), immersing the candidate in his role and the case. The situational descriptions may be tasks to fulfil, complaints to handle, problems to solve, actions to be planned etc. Every Micro Case gives a suggestion of four options for dealing with the situation. All four options are feasible but differ in the way in which they tackle a situation. Thus there are no right or false answers. Humanlogix is constructed in a way that gives no incentive to fake job proficiency since the different options to choose are all feasible and can lead to success. Furthermore as humanlogix evaluates every behavioural dimension and thus every item in six situations, the candidate's answers can be analysed with regard to behavioural consistency identifying inconsistent or randomized data entry.

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## 2.5 Interpret results appropriately and provide appropriate feedback

**1. Illustrate potential limitations of the computer-based test interpretations (CBTI) specific to the current CBT/Internet test.**

The "hx whitepaper" provides a comprehensive description and discussion of pro's and limitations of the method in use: One of the biggest advantages of Situational Judgement Tests designed close to work life is that it can act as a "realistic job preview", giving useful information on a) whether a candidate can meet the behavioural expectations and thus will be able to "do the job" and b) how he will do the job, giving evidence about basic attitudes and behavioural strategies. Hence it is a useful selection instrument in recruitment situations. Research also shows it decreases early abandonment of the job due to unsuitability. Furthermore, candidates tend to like Situational Judgement Tests as they can see the relevance of the process to the job.

However, it must be said that candidates with a lot of previous experience are favoured, as they might have experienced corresponding situations in real work life and might have learned, which strategy suits them best to manage a situation.



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	<p>Humanlogix has addressed that phenomenon by avoiding best answers, as they might not work anyway in every context. Instead <i>humanlogix tools4talents</i> suggest to match the candidate's answers (individual profile) with a predefined profile expressing the company's values, culture and the specific job expectations. Furthermore individual experience is taken into account by asking the candidate in every case about his/her qualification, experience and interest. Nonetheless the influence of experience may not be overestimated. McDaniel and Nguyen have shown that job experience only has a small correlation with Situational Judgement Tests.</p>
<p><b>2. Design and embed individual CBTI report templates for all stakeholders in the testing process.</b></p>	<p>The individual reports (behavioural patterns) are instantly available for the candidate and other roles that have been defined previously. The reports help in getting a differentiated view of a candidate, of dominant behavioural patterns and strategies, showing how someone would react in certain situations to certain problems. According to different areas of interest the reports can be chosen/printed on different levels (Behavioural Overview, Behavioural Pattern, Cockpit-Views, Reports on Experience, Qualification and Interests, Task-Analysis, Matching).</p>
<p><b>3. Illustrate how to obtain these various reports and what is contained within each report. In particular consider the:</b></p> <ul style="list-style-type: none"><li>- <b>media (e.g., text, graphics, etc.),</b></li><li>- <b>complexity of the report,</b></li><li>- <b>report structure,</b></li><li>- <b>purposes of testing,</b></li><li>- <b>degree of modifiability,</b></li><li>- <b>style and tone of report, and</b></li><li>- <b>intended recipients.</b></li></ul>	<p>The <b>Behavioural Overview</b> shows in every behavioural dimension the most significant attributes the candidate has shown in the test. The behavioural overview is a reduction of complexity leading you to the most significant descriptions on what attributes you can expect from a along the behavioural dimensions chosen. Visually easy to understand humanlogix provides the same information you would obtain from a candidate, knowing him or her over weeks within a work context.</p> <p>The <b>Cockpit-View</b> gives a comprehensive overview of all behavioural dimensions. This helps to learn more about a candidate by comparing combinations of behavioural attributes.</p> <p>The <b>Behavioural Pattern</b> is a detailed view on behavioural dimensions, able to distinguish the probability of four different attributes in every behavioural dimension. These attributes will be evaluated within six different situations assigned to one behavioural dimension. The variety of each six situations gives a valid insight into individual strategies.</p> <p>The <b>Reports on Experience, Qualification and Interest</b> describe the candidate's self-perception in different functions and help to complete the picture of a candidate given by a formal CV.</p> <p>The <b>Task-Report</b> describes behavioural inconsistencies and variation with an in-depth analysis of different behavioural attitudes according to different tasks. By this, additional information can be derived for functions, in which certain tasks are predominant.</p> <p>The <b>Matching-Report</b> gives a comparison of the candidate's behavioural attributes relative to predefined job requirements.</p> <p>All reports include easy to understand graphics and helpful text descriptions. They can be printed as a whole report or in sections according to the individual needs. In case there are predefined job requirements, the report can be matched against these requirements and thus customized to specific job roles.</p>
<p><b>4. Provide appropriate guidance on giving feedback, including necessary</b></p>	<p>The aim of humanlogix is to provide only high quality assessment results. Therefore humanlogix offers trainings and</p>



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**training requirements for interpreting the CBTI.**

support for clients and human resource professionals using *humanlogix tools4talents*. Humanlogix will also conduct assessment or development centres. In addition humanlogix supports the definition of corporate competency and behavioural models and job requirements according to corporate values und specific job profiles. A simple licencing model allows ordering between 1 and an unlimited amount of licences at a time.

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## 2.6 Consider equality of access for all groups

**1. Document the methods used to enhance psychometric fairness and equality of access.**

Hx "whitepaper" provides a detailed discussion of the method used. Past experiences with humanlogix profiler have proved very high face validity (candidate's perception of how valid a measure is based on simple visual inspection). As the profiler only describes dominant behaviour and situational decisions and does not test skills, performance or the ability to choose best answers, the method has a very high acceptance in practice. The micro-case method as such and the chosen situations have been proved to be close to life, interesting and stimulating. Only few reactions showed that the amount of 60 micro-cases and the time of two hours required in the full version were more than the candidate had expected. Direct access to personal results was perceived to be transparent and fair and increased credibility and acceptance in the eyes of the candidates.

**2. Assess Differential Item Functioning (DIF) and, where DIF might be a problem for one or more groups, identify where this problem occurs and attempt to modify the test to overcome such problems.**

DIF has been addressed by choosing a macro-case and thus a situational setting in which all candidates have equal experience and understanding giving no advantage to certain groups (i.e. gender, age, culture). Therefore hx "Management and Leadership" was designed in the field of hospitality management in which all candidates have an intuitive understanding of (normally as customers) and thus on average most candidates will have about the same imagination as to what is needed to satisfy guests and the same lack of technical expertise or knowledge proficiency in the case. There is no need for the candidate to be familiar with the hotel business or tourism industry. Furthermore, the idea is to evaluate natural behaviour, what the candidate thinks would be the best solution in the described situation. As many situations need urgent and quick solutions – just like in real life – natural and spontaneous behaviour is elicited.

**3. When developing CBT/Internet tests that may be used internationally, take into account the fact that countries differ in their access to computer technology or the Internet.**

This issue was raised within China, as the access-rate from European servers was insufficient (only three entry gateways, Great Firewall). Meanwhile humanlogix is planning to set up a server inside China and to apply for an ICP license.

**4. For tests that are to be used internationally:**

- **avoid the use of language, drawings, content, graphics (etc.,) that are country or culture specific.**
- **where culture specific tests may be more suitable than culturally-neutral ones, ensure that there is construct equivalence across the different forms**

The Chinese version of *humanlogix tools4talents* was translated with local experts in Human Resource Management, Banking and Finance and Consulting Industries. The constructs proved to be equivalent in relevance and meaning. Thus *humanlogix tools4talents* are culturally-neutral tests. Cultural differences can be differentiated when defining the requirements for the matching function: Cultural and even company specific values and requirements are subject to specific settings of job roles.

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<p><b>5. If developing adapted versions of an Internet test for use in specific countries ensure the equivalence of the adapted version and that the adaptation conforms to the ITC Guidelines on Test Adaptation</b></p>	<p>Besides proper text adaptations (translations) no adaption of the hx method or tool were needed.</p>
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### 3 Provide appropriate levels of control over CBT and Internet testing

#### 3.1 Detail the level of control over the test conditions

<p><b>1. Document the hardware, software, and procedural requirements for administration of a CBT/Internet test.</b></p>	<p>User documentation is delivered with invitation mail and when entering the test (macro-case). As until now humanlogix is handling the user-management and administration, no detailed administration documentation was needed so far. This will be developed when required.</p>
<p><b>2. Provide a description of the test-taking conditions required for appropriate BBT/Internet test administration.</b></p>	<p>The test-taking conditions are described in the invitation mail.</p>
<p><b>3. Design the CBT/Internet test to be compatible with country-specific health and safety, legal, and union regulations and rules (e.g., time on task).</b></p>	<p>The time required is about one to two hours to work through the cases, depending on the version chosen. Once started the default time to accomplish the test is 24 hours. Thus there is enough time to interrupt the test for a break and to continue at the candidate's convenience.</p>

#### 3.2 Detail the appropriate control over the supervision of the testing

<p><b>1. Document the level of supervision required for the CBT/Internet test.</b></p> <ul style="list-style-type: none"> <li>- <b>Open mode - No direct human supervision required</b></li> <li>- <b>Controlled mode - Although no direct human supervision is required, the test is made available only to known test-takers</b></li> <li>- <b>Supervised mode - Test users are required to log on a candidate and confirm that the testing was administered and completed correctly</b></li> <li>- <b>Managed mode - A high level of human supervision and control over test-taking conditions is required (as in a dedicated test centre)</b></li> </ul>	<p><i>humanlogix tools4talents</i> work under controlled mode, meaning that the candidate is given an individual username and password to login in individually anytime/anywhere. The user administration can define roles such as coach or administrator that receive an automatic mail as soon as the test is completed. For interpretation or matching purposes they get read-only access to the printed report and the matching function.</p>
<p><b>2. Provide documentation for the testing scenarios for which the CBT/Internet test has been designed.</b></p>	<p>Hx "whitepaper" gives a documentation of the testing scenarios and the underlying behavioural models:          Not only in terms of validity is it important that the cases reflect realistic situations which are embedded in a storyboard with a macro-case, describing the overall context of the assessment. The macro case is exciting, letting candidates immerse themselves in a realistic story:          A) The candidate is a Management Associate of the SWISS ASIA BANK (<i>hx-profiler Banking</i>). In this role the candidate will participate in a talent development program: He will be attached to branches and various departments throughout the</p>



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bank. The goal of these attachments is to gain critical experience in the bank's main functions in preparation for placement in future key roles.

B) In the "*hx-profiler Management and Leadership*" the scope of tasks is much broader, as the candidate will have to lead "THE SWISS MOUNTAIN LODGE" through an interim period of change to secure the economic survival of the hotel, meaning that the candidate will have to take tactical and strategic decisions, solve operational problems and build the base for sustainable growth. Issues and problems are to be expected in marketing, finance, organisation and in human resources. There is no need for the candidate to be familiar with the hotel business or with Switzerland and its tourism industry. On the contrary, the approach has been to choose a context where participants have an intuitive understanding of it (normally as customers) and thus, on average, most candidates will have about the same imagination as to what is needed to satisfy guests, and the same lack of technical expertise or knowledge proficiency in the case.

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### 3.3 Give due consideration to controlling prior practice and item exposure

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**1. For high-stakes Internet-based tests, use software that tries to equate item exposure rates for items drawn from item banks.**

*humanlogix tools4talents* are not working as Computer Adaptive Testing (CAT) and thus is not using item banks. This means that by repeating the test the candidate would face the same situations and behavioural options. As there are no correct or false answers there will be no motivation to learn the best answer.

**2. Limit pilot testing of items on live tests, to minimize unnecessary exposure.**

Pilot testing was limited to test-groups and development partners. The risk of item exposure is small due to the complexity of micro-cases, the number of 240 judged options and the lack of correct / wrong answers.

**3. Make sure item banks are sufficiently large to permit making multiple parallel forms secure and to manage item exposure rates in adaptive testing.**

*humanlogix tools4talents* are not working as Computer Adaptive Testing (CAT) and thus is not using item banks.

**4. When parallel forms of a test are created, undertake appropriate psychometric analysis to document their equivalence.**

Both *hx profilers* "Banking and Finance" and "Management and Leadership" are not parallel designed or equivalent test constructions.

**5. Contemplate delivery strategies that deter memorization of test content (e.g. by generation of unique tests for each candidate from item banks; or by use of computer adaptive testing).**

The risk of memorization of items is very small due to the complexity of micro-cases, the number of 240 judged options and the lack of correct / wrong answers.

**6. Control exposure of fixed forms in geographies where cheating is more prevalent by restricted administration to supervised or managed modes.**

*humanlogix tools4talents* are constructed in a way that give no incentive to fake job proficiency since the different options to choose are all feasible and can lead to success. With the model of middle-attributes and wing-attributes *humanlogix tools4talents* give an easy to understand model of behavioural traits. Its major advantage to other models is that all attributes are equally valuable, reducing the risk of social desirability. Thus there is no test breaking with the intention of giving the right answers, as there are simply no right answers. Right or wrong can only be judged in terms of suitability for a job.

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### 3.4 Give consideration to control over test-taker's authenticity and cheating

**1. Design features within the system (e.g., the facility for passwords and username access) that enables test publishers/users to have a level of control over access to various parts of the assessment system.**

*humanlogix tools4talents* use a sophisticated user management with secured username and password access. A role-model for accessibility distinguishes contacts, candidate, coaches, client administrators and system administrators. Thus there is an optimum of control over access related to the allocated roles.

## 4 Make appropriate provision for security and safeguarding privacy in CBT and Internet testing

### 4.1 Take account of the security of test materials

**1. Design features into the CBT/Internet system that minimise the risk of test items, scoring keys, and interpretation algorithms being illegitimately printed, downloaded, copied, or sent electronically to another computer. For example, software can be developed that controls browser function by disabling access to menu selections (such as copy, paste).**

The candidates are asked to print and save their report as pdf-files. Within the test there are no specific security measures to prevent copying of the situational descriptions. On the other hand there is no security risk as the relation of each situational setting and the 240 options to behavioural attributes, tasks, functions and situations is very complex and restricted to humanlogix developers only. Thus there is no way to copy the test algorithm or scoring keys.

**2. Design features into the system (e.g., firewalls) that protects the CBT/Internet test system and associated databases from illegal hacking and computer viruses.**

Hx application and data are stored on a dedicated virtual server with automatic backup and additional snapshot backup, including a firewall (webports: 80, SSL Port 443), IP, restricted SSH Port.

### 4.2 Consider the security of test-taker's data transferred over the Internet

**1. When designing an Internet test, build in features that safeguard test-taker data and maintain the security of test material transferred over the Internet.**

Hx application and data are stored on a dedicated virtual server with automatic backup and additional snapshot backup, including a firewall (webports: 80, SSL Port 443), IP, restricted SSH Port.

**2. Make use of proxy servers, where appropriate, and embed transactions within secure socket layers.**

See above

**3. Design data management systems to enable users to access, check, and/or delete data from the server in accordance with local data protection and privacy legislation.**

User can access, check and print their individual reports with their own username and password. They may not change or delete their test results once they have been accomplished. Although data security is ensured individual clients may also apply for a non-personalised license.

**4. Design features that ensure regular and frequent backups of all collected data and that allow for recovery of data when problems emerge.**

Hx application and data are stored on a dedicated virtual server with automatic backup and additional snapshot backup.

### 4.3 Maintain the confidentiality of test-taker results

**1. Design features to allow secure storage of CBT/Internet test data on computer, disks or server.**

Test candidates are asked to save their individual test reports on their own hardware or to print a PDF-file.



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**2. Maintain the integrity of CBT/Internet test data by providing technology that does not allow unauthorised altering of information and that can detect unauthorised changes to information.**

For none of the existing roles is it possible to alter entered and saved test data. The webservers are well protected to prevent unauthorised access to the application or data.

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**3. Devise encryption devices and password protection that restrict access to test data.**

Hx application uses SSL and restricted SSH port. Individual access is limited with username and password only.

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St.Gallen, 06.03.2016