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FAST-TRACK PROCEDURE

Common Industry Format for Usability Test Reports

Format commun d'industrie pour des rapports d'essais de rentabilité

ICS 35.080

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This draft International Standard is submitted for JTC 1 national body vote under the Fast-Track Procedure.

In accordance with Resolution 30 of the JTC 1 Berlin Plenary 1993, the proposer of this document recommends assignment of ISO/IEC 23025 to JTC 1/SC 07.

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1 Any P-member and any Category A liaison organization of ISO/IEC JTC 1 may propose that an existing standard from any source be submitted directly for vote as a DIS. The criteria for proposing an existing standard for the fast-track procedure are a matter for each proposer to decide.

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2.1 To settle the copyright and/or trade mark situation with the proposer, so that the proposed text can be freely copied and distributed within JTC 1 without restriction.

2.2 To assess in consultation with the JTC 1 secretariat which SC is competent for the subject covered by the proposed standard and to ascertain that there is no evident contradiction with other International Standards.

2.3 To distribute the text of the proposed standard as a DIS. In case of particularly bulky documents the ITTF may demand the necessary number of copies from the proposer.

3 The period for combined DIS voting shall be six months. In order to be accepted the DIS must be supported by 75 % of the votes cast (abstention is not counted as a vote) and by two-thirds of the P-members voting of JTC 1.

4 At the end of the voting period, the comments received, whether editorial only or technical, will be dealt with by a working group appointed by the secretariat of the relevant SC.

5 If, after the deliberations of this WG, the requirements of 3 above are met, the amended text shall be sent to the ITTF by the secretariat of the relevant SC for publication as an International Standard.

If it is impossible to agree to a text meeting the above requirements, the proposal has failed and the procedure is terminated.

In either case the WG shall prepare a full report which will be circulated by the ITTF.

6 If the proposed standard is accepted and published, its maintenance will be handled by JTC 1.

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American National Standard

for Information Technology –

Common Industry Format for Usability Test Reports

ANSI NCITS 354-2001



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American National Standard
for Information Technology –

Common Industry Format for Usability Test Reports

Secretariat

Information Technology Industry Council

Approved November 30, 2001

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Foreword (This foreword is not part of ANSI NCITS 354-2001.)

Usability of software is a key factor in predicting successful deployment of that software. Software manufacturers subject software to usability testing at various stages in a product's development; some companies that purchase software also test products for usability before making purchasing decisions. Testing often involves (1) subjects who are representative of the target population of users of the software, (2) representative tasks, and (3) measures of efficiency, effectiveness and subjective satisfaction. When this type of experimental situation exists, the testing is termed summative, i.e., the results can be expressed as statistically meaningful measures of central tendency (e.g., mean or median) and variability (e.g., standard deviation). The Common Industry Format (CIF) for Usability Test Reports is intended for use by usability professionals to report the results of summative usability testing.

The CIF standardizes the types of information that are captured about testing with users. The level of detail allows the same or another organization to replicate the test procedure. The major variables are user demographics, task descriptions, context of the test, including the equipment used, the environment in which the test is conducted, and the protocol by which the subjects and the test administrator(s) interact, as well as the particular metrics chosen to code the findings of the study.

The CIF is intended to replace the proprietary formats employed by companies that perform usability testing, both vendors and purchasers of software. Until now there has been no standard format for reporting usability testing results. Advantages of using a standardized reporting format include (1) a reduction in training time for usability staff since an individual only needs to learn to use one form regardless of how many companies he works for and (2) a enhanced potential for increased communication between vendors and purchasing organizations since readers of CIF-compliant reports will share a common language and expectations.

Other areas in which a reporting format similar to the CIF could be useful include: hardware testing, testing adherence to accessibility guidelines, and testing using formative methods. In addition, a related format could be used as a requirements document. Such extensions are currently under consideration by the authors of the CIF.

The CIF was created by the Industry USability Reporting (IUSR) Project (www.nist.gov/iusr). Representatives from industry, government, and academia are participants in the project. The members contributed report formats in use in their organizations. Consensus on the required and recommended elements of the CIF was derived through a series of workshops, e-mail discussions and teleconferences over a period of 3 years. During this time there were review periods followed by documented discussions to assure consensus.

Requests for interpretation, suggestions for improvement or addenda, or defect reports are welcome. They should be sent to the National Committee for Information Technology Standards (NCITS), ITI, 1250 Eye Street, NW, Suite 200, Washington, DC 20005.

This standard was processed and approved for submittal to ANSI by National Committee for Information Technology Standardization (NCITS). Committee approval of this standard does not necessarily imply that all committee members voted for approval. At the time it approved this standard, NCITS had the following members:

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Introduction

The purpose of this technical specification is to facilitate incorporation of usability as part of the procurement decision-making process for interactive software products. The purpose of the report is to ensure that the product meets usability goals. Examples of decisions include purchasing, upgrading and automating. It provides a common format for human factors engineers and usability professionals in supplier companies to report the methods and results of usability tests to customer organizations.

Audience

The Common Industry Format (CIF) is meant to be used by usability professionals within supplier organizations to generate reports that can be used by customer organizations in the CIF report. The CIF is also meant to be used by customer organizations to verify that a particular report is CIF-compliant. The Usability Test Report itself is intended for two types of readers:

- Human factors or other usability professionals in customer organizations who are evaluating both the technical merit of usability tests and the usability of the products.

- Other technical professionals and managers who are using the test results to make business decisions.

The CIF may also be used within a single organization any time that a formal usability test report needs to be generated

The report is in two main sections, an Executive Summary and a main body. The main body contains the Methods and Results sections and is aimed at the first audience. These sections (1) describe the test methodology and results in sufficient technical detail to allow replication by another organization if the test is repeated, and (2) support application of test data to questions about the product's expected costs and benefits. Understanding and interpreting these sections will require technical background in human factors or usability engineering for optimal use. The second audience is directed to the Introduction, which provides summary information for non-usability professionals and managers. The Introduction may also be of general interest to other computing professionals. Decision makers without usability engineering expertise may find the information in the main body to be useful but should rely on expert interpretation when necessary.

Organization

Section 1 describes the scope of this specification and the conformance criteria. Section 3 provides definitions of the terms used throughout the document. Section 4 is the main description of the specification.

Additional Information

Annex A provides a checklist that can be used to ensure inclusion of required and recommended information. A glossary is provided in Annex B to define terminology used in the report format description. A Word template for report production can be found at: http://www.ncits.org/ref-docs/CIF/CIF_template.dot. A printed version of the template can be found in Annex C.

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American National Standard
for Information Technology –

Common Industry Format for Usability Test Reports

1 Scope

This technical specification can be used to report the results of a test of usability as defined in ISO 9241-11: effectiveness, efficiency and satisfaction in a specified context of use. Metrics for other more-detailed usability requirements can be found in ISO/IEC 9126 parts 2 and 3.

This technical specification is intended to be used by:

- usability professionals within supplier organizations to generate reports that can be used by customer organizations
- customer organizations to verify that a particular report conforms to this technical specification
- human factors or other usability professionals in customer organizations who are evaluating both the technical merit of usability tests and the usability of the products
- other technical professionals and managers in the customer organization who are using the test results to make business decisions about product suitability and purchase.

The Executive Summary and Product Details in 4.2 and 4.3 provide summary information for nonusability professionals and managers.

Subsections 4.4 and 4.5 describe the test methodology and results in technical detail suitable for replication, and also support application of test data to questions about the product's expected costs and benefits. Understanding and interpreting these sections will require technical background in human factors or usability engineering for optimal use.

The report format assumes sound practice [1, 2] has been followed in the design and execution of the test. Test procedures which produce measures that summarize usability should be used, i.e., the test is summative in nature. Some usability evaluation methods, such as formative tests, are intended to identify problems rather than produce measures; the format is not structured to support the results of such testing methods.

1.1 Conformance

A usability test report conforms to this technical specification if it complies with all the requirements in this technical specification (stated as "shall"). The recommendations (stated as "should") should be implemented whenever appropriate.

This technical specification specifies the minimum information that should be provided. Additional information may be included. For example, if an organization finds that an additional list of observational data is useful, the list may be included even though it is not specified as part of a conformant CIF report.

2 Normative References

The following publications contain provisions which, through reference in the text, constitute provisions of this standard.

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[1] Rubin, J. (1994). *Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests*. New York: John Wiley and Sons, Inc.

[2] Dumas, J., and Redish, G. (1999). *A Practical Guide to Usability Testing.* UK: Intellect.

[3] Nielsen, J., and Landauer, T. K. (1993). A mathematical model of the finding of usability problems. In: *CHI '93. Conference Proceedings on Human Factors in Computing Systems*. New York: ACM, pp. 206–213.

[4] American Psychological Association. *Ethical Principles in the Conduct of Research with Human Participants*. 1982.

[5] Norman, D.A. (1983). Design rules based on analyses of human error. *Communications of the ACM*, 26(4), 254–258.

[6] Macleod, M., Bowden, R., Bevan, N. and Curson, I. (1997). The MUSiC Performance Measurement method. *Behaviour and Information Technology*, 16, 279–293.

[7] Lewis, J. R. (1991). Psychometric evaluation of an after-scenario questionnaire for computer usability studies: the ASQ. *SIGCHI Bulletin*, 23(1), 78–81.

[8] Lewis, J. R. (1995). IBM computer usability satisfaction questionnaires: Psychometric evaluation and instructions for use. *International Journal of Human-Computer Interaction*, 7, 57–78.

[9] Chin, J. P., Diehl, V. A., and Norman, K. (1988). Development of an instrument measuring user satisfaction of the human-computer interface. In: *CHI '88. Conference Proceedings on Human Factors in Computing Systems.* New York: ACM, pp. 213–218.

[10] Kirakowski, J. (1996). The software usability measurement inventory: Background and usage. In Jordan, P., Thomas, B., and Weerdmeester, B. (Eds.), *Usability Evaluation in Industry*. UK: Taylor and Francis, pp. 169–177.

[11] Brooke, J. (1996). SUS: A "quick and dirty" usability scale, In Jordan, P. W., Thomas, B. T., and Weerdmeester, B. A. (Eds.), *Usability Evaluation in Industry*. UK: Taylor and Francis, pp. 189–194.

2.1 Relationship to Existing Standards

This document is not formally related to standards-making efforts but has been informed by existing standards and is consistent with major portions of these documents but is more limited in scope.

ISO 9241-11(1998): *Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs) - Part 11: Guidance on Usability*

ISO/IEC 14598-5(1998): *Information Technology – Software Product Evaluation – Part 5: Process for Evaluators*

ISO 13407(1999): *Human-Centred Design Processes for Interactive Systems – Annex C*

ISO/IEC 9126-2(2001): *Software Engineering – Product Quality – Part 2: External Metrics*

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ISO/IEC 9126-3(2001): *Software Engineering – Product Quality – Part 3: Internal Metrics*

ISO/IEC 9126-4:(2001): *Software Engineering – Product Quality – Part 4: Quality in Use Metrics*

3 Definitions

For the purposes of this document, the following definitions apply. The source for these definitions is ISO 9241-11:1998.

3.1 usability: The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.

3.2 effectiveness: The accuracy and completeness with which users achieve specified goals.

3.3 efficiency: The resources expended in relation to the accuracy and completeness with which users achieve goals. Efficiency in the context of usability is related to 'productivity' rather than to its meaning in the context of software efficiency.

3.4 satisfaction: Freedom from discomfort, and positive attitudes towards the use of the product.

3.5 context of use: The users, tasks, equipment (hardware, software and materials), and the physical and social environments in which a product is used.

3.6 user: The person who interacts with the product.

3.7 user group: Subset of intended users who are differentiated from other intended users by factors such as age, culture or expertise that are likely to influence usability.

3.8 goal: An intended outcome of user interaction with a product. Specific goals relating to user interaction may be referred to as 'task goals'.

3.9 task: The activities required to achieve a goal.

NOTE 1: These activities can be physical or cognitive.

NOTE 2: Job responsibilities can determine goals and tasks.

4 Report Format

4.1 Title Page

The following information shall be provided:

- Identify report as: Common Industry Format for Usability Test Report v2.0 and contact information (i.e., 'Comments and questions about this format: iusr@nist.gov').
- Name the product and version that was tested.
- Who led the test.
- When the test was conducted.
- Date the report was prepared.

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- Who prepared the report.
- Customer Company Name.
- Customer Company contact person.
- Contact name(s) for questions and/or clarifications.
- Supplier phone number.
- Supplier e-mail address.
- Supplier mailing or postal address.

4.2 Executive Summary

This section provides a high level overview of the test. The intent of this section is to provide information for procurement decision-makers in customer organizations. These people may not read the technical body of this document. This section shall begin on a new page and end with a page break to facilitate its use as a stand-alone summary.

A high level overview of the test shall be provided that includes:

- Name and description of the product.
- Summary of method(s) including number(s) and type(s) of participants and tasks.
- Performance and satisfaction results expressed as mean scores or other suitable measure of central tendency.

The following information should be provided:

- Reason for and nature of the test.
- Tabular summary of performance results.
- If differences between values or products are claimed, the probability that the difference did not occur by chance.

4.3 Introduction

4.3.1 Full Product Description

The following information shall be provided:

- Formal product name and release or version.
- The parts of the product that were evaluated.
- The user population for which the product is intended.

The following information should be provided:

- Any groups with special needs that are supported by the product.

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– Brief description of the environment in which it should be used.

– The type of user work that is supported by the product.

4.3.2 Test Objectives

The following information shall be provided:

– The objectives for the test and any areas of specific interest.

NOTE: Possible objectives include testing user performance of work tasks and subjective satisfaction in using the product.

EXAMPLE: Possible objectives include testing whether a product meets specific success criteria.

– Functions and components with which the user directly and indirectly interacted.

The following information should be provided:

– Reason for focusing on a product subset, if the whole product was not tested.

4.4 Method

Sufficient information shall be provided to allow an independent tester to replicate the procedure used in testing.

4.4.1 Participants

The following information shall be provided:

– The total number of participants tested.

NOTE: In order to generate valid summative statistical analyses, it is necessary to test sufficient numbers of subjects. Eight or more subjects/cell (segment) are recommended for this purpose [3].

– Segmentation of user groups tested, if more than one.

– Key characteristics and capabilities of user group.

– How participants were selected; whether they had the essential characteristics.

– Differences between the participant sample and the user population.

EXAMPLE: Actual users might attend a training course whereas test subjects were untrained.

– Table of participants (row) by characteristics (columns), including demographics, professional experience, computing experience and special needs.

NOTE: Subjects with special needs might be individuals with physical or cognitive impairments.

The characteristics shall be complete enough so that an essentially similar group of participants can be recruited.

Characteristics should be chosen to be relevant to the product's usability; they should allow a customer to determine how similar the participants were to the customers' user population.

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– Description of any groups with special needs.

Participants should not be from the same organization as the testing or supplier organization.

EXAMPLE TABLE: The table below is an example; the characteristics that are shown are typical but might not necessarily cover every type of testing situation.

	Gender	Age	Education	Occupation / role	Professional Experience	Computer Experience	Product Experience
P1							
P2							
Pn							

For 'Gender', indicate male or female.

For 'Age', state the chronological age of the participant, or indicate membership in an age range (e.g., 25-45) or age category (e.g., under 18, over 65) if the exact age is not known.

For 'Education', state the number of years of completed formal education (e.g., in the US, a high-school graduate would have 12 years of education and a college graduate 16 years). In some instances, level of education might be stated as 'highest academic degree'.

For 'Occupation/role', describe the user's job role when using the product. Use the Role title if known.

For 'Professional experience', give the amount of time the user has been performing in the role.

For 'Computer experience', describe relevant background such as how much experience the user has with the platform or operating system, and/or the product domain. This may be more extensive than one column.

For 'Product experience', indicate the type and duration of any prior experience with the product or with similar products.

4.4.2 Context of Product Use in the Test

The following information shall be provided:

– Any important differences between the evaluated context and the expected context of use.

4.4.2.1 Tasks

The following information shall be provided:

– The task scenarios for testing.

– Why these tasks were selected.

EXAMPLES: The most frequent tasks, the most troublesome tasks.

– The source of these tasks.

EXAMPLES: Observation of customers using similar products, product marketing specifications, discussion with users or design team.

– Any task data given to the participants.

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EXAMPLE: Source materials for data entry.

– Completion or performance criteria established for each task.

4.4.2.2 Test Facility

The following information should be provided:

– The setting and type of space in which the evaluation was conducted.

EXAMPLES: Usability lab, cubicle office, meeting room, home office, home family room, manufacturing floor.

– Any relevant features or circumstances that could affect the results.

EXAMPLES: Video and audio recording equipment, one-way mirrors, or automatic data collection equipment.

4.4.2.3 Participant's Computing Environment

The following information shall provide enough information to replicate and validate the test, including:

– Computer configuration, including model, OS version, required libraries or settings.

– If used, browser name and version; relevant plug-in names and versions.

4.4.2.3.1 Display Devices

The following information shall be provided:

– If screen-based, screen size, resolution, and color setting.

– If print-based, the media size and print resolution.

– If visual interface elements (such as fonts) can vary in size, specify the size(s) used in the test.

4.4.2.3.2 Audio Devices

The following information should be provided:

– If used, the relevant settings or values for the audio bits (determining sound quality), volume, etc.

4.4.2.3.3 Input Devices

The following information should be provided:

– If used, the make and model of devices used in the test.

4.4.2.4 Test Administrator Tools

The following information shall be provided:

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– If a standard questionnaire (Section 4.4.4.3 contains a partial list) was used, describe or specify it here.

NOTE: Customized questionnaires are included in an appendix.

The following information should be provided:

– Any hardware or software used to control the test or to record data.

4.4.3 Experimental Design

The following information shall be provided:

– The logical design of the test.

– The independent variables and control variables.

– The measures for which data were recorded for each set of conditions.

4.4.3.1 Procedure

The following information shall be provided:

– Operational definitions of measures.

– Descriptions of independent variables or control variables.

– Time limits on tasks.

– Policies and procedures for interaction between tester(s) and subjects.

The following information should be provided:

– Sequence of events from greeting the participants to dismissing them.

– Details of nondisclosure agreements, form completion, warm-ups, pretask training, and debriefing.

– Verification that the participants knew and understood their rights as human subjects [4].

– Steps followed to execute the test sessions and record data.

– Number and roles of people who interacted with the participants during the test session.

– Whether other individuals were present in the test environment.

– Whether participants were paid or otherwise compensated.

4.4.3.2 Participant General Instructions

The following information shall be provided:

– Instructions given to the participants (here or in an Appendix).

– Instructions on how participants were to interact with any other persons present, including how they were to ask for assistance and interact with other participants, if applicable.

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4.4.3.3 Participant Task Instructions

The following information shall be provided:

- Task instruction summary.

4.4.4 Usability Metrics

As defined in 3.1, usability is measured by three types of metrics: effectiveness, efficiency, and satisfaction. The choice of measures depends on the goals of a particular study, characteristics of the users, the specific tasks, and context-dependent features; e.g., see Dumas and Redish [2].

The following information shall be provided:

- Metrics for effectiveness.
- Metrics for efficiency.
- Metrics for satisfaction.

Effectiveness and efficiency results shall be reported, even when they are difficult to interpret within the specified context of use. In this case, the report shall specify why the supplier does not consider the metrics meaningful.

> EXAMPLE: Suppose that the context of use for the product includes real time, open-ended interaction between close associates. In this case, Time-On-Task may not be meaningfully interpreted as a measure of efficiency, because for many users, time spent on this task is “time well spent”.

If it is necessary to provide participants with assists, efficiency and effectiveness metrics shall be provided for both unassisted and assisted conditions, and the number and type of assists shall be included as part of the test results.

4.4.4.1 Effectiveness

Effectiveness relates the goals of using the product to the accuracy and completeness with which these goals can be achieved. Common measures of effectiveness include percent task completion, frequency of errors, frequency of assists to the participant from the testers, and frequency of accesses to help or documentation by the participants during the tasks. It does not take account of how the task goals were achieved, only the extent to which they were achieved. Efficiency relates the level of effectiveness achieved to the quantity of resources expended.

4.4.4.1.1 Completion Rate

The completion rate is the percentage of participants who completely and correctly achieve each task goal. If goals can be partially achieved (e.g., by incomplete or suboptimum results), then it may also be useful to report the average goal achievement, scored on a scale of 0 to 100% based on specified criteria related to the value of a partial result. For example, a spell-checking task might involve identifying and correcting 10 spelling errors and the completion rate might be calculated based on the percent of errors corrected. Another method for calculating completion rate is weighting; e.g., spelling errors in the title page of the document are judged to be twice as important as errors in the main body of text. The rationale for choosing a particular method of partial goal analysis should be stated, if such results are included in the report.

The following information shall be provided:

- The percentage of participants who completely and correctly achieve each task goal.

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4.4.4.1.2 Errors

Errors are instances where test participants did not complete the task successfully, or had to attempt portions of the task more than once. Scoring of data should include classifying errors according to some taxonomy, such as in [5].

4.4.4.1.3 Assists

When participants cannot proceed on a task, the test administrator sometimes gives direct procedural help in order to allow the test to proceed. This type of tester intervention is called an *assist* for the purposes of this report. Although 'assist' measures might appear to be related more to learnability than effectiveness, assists have been integrated with effectiveness in this specification to comply with the three elements of usability defined in ISO 9241-11,

The following information shall be provided:

– The unassisted completion rate (i.e., the rate achieved without intervention from the testers) as well as the assisted rate (i.e., the rate achieved with tester intervention) where these two metrics differ.

For example, if a participant received an assist on Task A, that participant should not be included among those successfully completing the task when calculating the unassisted completion rate for that task. However, if the participant went on to successfully complete the task following the assist, he could be included in the assisted Task A completion rate. When assists are allowed or provided, the number and type of assists shall be included as part of the test results. When assists are allowed by the study design, the need for presenting the assisted completion rate is not meaningfully distinguishable from the unassisted rate. In such cases, only a single rate needs to be provided but the number and types of assists shall be included.

EXAMPLE: In an educational setting, students may be encouraged to seek assistance.

In some usability tests, participants are instructed to use support tools such as online help or documentation, which are part of the product, when they cannot complete tasks on their own. Accesses to product features that provide information and help are *not* considered assists for the purposes of this report. It may, however, be desirable to report the frequency of accesses to different product support features, especially if they factor into participants' ability to use products independently.

4.4.4.2 Efficiency

Efficiency relates the level of effectiveness achieved to the quantity of resources expended. Efficiency is generally assessed by the mean time taken to achieve the task. Efficiency may also relate to other resources (e.g., total cost of usage). A common measure of efficiency is time on task.

The following information shall be provided:

– The mean time taken to complete each task, together with the range and standard deviation of times across participants.

4.4.4.2.1 Completion Rate/Mean Time-On-Task

Completion Rate/Mean Time-On-Task is another measure of efficiency [5]. The relationship of success rate to time allows customers to compare fast error-prone interfaces (e.g., command lines with wildcards to delete files) to slow easy interfaces (e.g., using a mouse and keyboard to drag each file to the trash).

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4.4.4.3 Satisfaction

The following information shall be provided:

- One or more measures of user satisfaction.

Satisfaction describes a user's subjective response when using the product. User satisfaction may be an important correlate of motivation to use a product and may affect performance in some cases. Questionnaires to measure satisfaction and associated attitudes are commonly built using Likert and semantic differential scales.

A variety of instruments are available for measuring user satisfaction of software interactive products, and many companies create their own. Whether an external, standardized instrument is used or a customized instrument is created, subjective rating dimensions such as Satisfaction, Usefulness, and Ease of Use should be considered for inclusion, as these will be of general interest to customer organizations.

A number of questionnaires are available that are widely used. They include: ASQ [7], CUSI [8], PSSUQ [8], QUIS [9], SUMI [10], and SUS [11]). While each offers unique perspectives on subjective measures of product usability, most include measurements of Satisfaction, Usefulness, and Ease of Use. General information on questionnaire construction are addressed in Dumas and Redish [2].

Suppliers may choose to use validated published satisfaction measures or may submit satisfaction metrics they have developed themselves.

4.5 Results

4.5.1 Data Analysis

The following information shall be provided in sufficient detail to allow replication of the data scoring methods by another organization if the test is repeated:

- Data collection and scoring.

  EXAMPLE: How data was treated with respect to exclusion of outliers, categorization of error data, and criteria for scoring assisted or unassisted completion.

- Data reduction.

  EXAMPLE: How data was collapsed across tasks or task categories.

- Statistical analysis.

  EXAMPLE: Statistical procedures (e.g., transformation of the data) and tests (e.g., t-tests, F tests and statistical significance of differences between groups).

Scores that are reported as means shall include the standard deviation and optionally the standard error of the mean.

4.5.2 Presentation of the Results

The following information shall be provided:

- Tabular performance results per task or task group.

Various graphical formats are effective in describing usability data at a glance. Bar graphs are useful for describing subjective data such as that gleaned from Likert scales. A variety of plots can be used effectively to show comparisons of expert benchmark times for a product vs. the mean participant

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performance time. The data may be accompanied by a brief explanation of the results, but a detailed interpretation is discouraged in the body of the report. If necessary, a detailed interpretation may be included in an appendix.

4.5.2.1 Performance Results

A table of results may be presented for groups of related tasks (e.g., all program creation tasks in one group, all debugging tasks in another group) where this is more efficient and makes sense. If a unit task has subtasks, then the subtasks may be reported in summary form for the unit task. For example, if a unit task is to identify all the misspelled words on a page, then the results may be summarized as a percent of misspellings found.

The following information should be provided:

- Summary Table(s) of Performance Results across all tasks.
- Graphical Presentation of Performance Results.

Additional tables of metrics should be included if they are relevant to the product's design and a particular application area.

EXAMPLE TABLES

Task A

User #	Unassisted Task Effectiveness [(%)Complete]	Assisted Task Effectiveness [(%)Complete]	Task Time (min)	…	Errors	Assists
1						
2						
N						
Mean						
Standard Deviation						
Min						
Max						

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Summary

User #	Total Unassisted Task Effectiveness [(%)Complete]	Total Assisted Task Effectiveness [(%)Complete]	Total Task Time (min)	…	Total Errors	Total Assists
1						
2						
N						
Mean						
Standard Deviation						
Min						
Max						

4.5.2.2 Satisfaction Results

The following information shall be provided:

- Tabular Satisfaction Results.
- Summary table(s) of Satisfaction Results.
- Graphical presentation of Satisfaction Results.

EXAMPLE TABLE

Satisfaction

User #	Scale 1	Scale 2	Scale 3	…	Scale N
1					
2					
N					
Mean					
Standard Deviation					
Min					
Max					

4.6 Appendices

The following information shall be provided:

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- Custom questionnaires (Sections 4.4.2.4 and 4.4.4.3), if used.
- Participant general instructions (if not in the body of the report); see Section 4.4.3.2.
- Participant task instructions (Section 4.4.3.3).

The following information may be provided:

- Release Notes explaining or updating the test results.

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Annex A
(informative)

Checklist

Use the following checklist to assure that required elements (❖) are addressed in your CIF report. Recommended items are denoted with a '◆'. Report corrections and suggestions to iusr@nist.gov. This checklist is also available in Word97 format.	
Title Page	
◆ Enter Company Logo or Name	
❖ Identify report as: Common Industry Format for Usability Test Report v2.0	
❖ Name the product and version that was tested	
❖ Who led the test	
❖ When the test was conducted	
❖ Date the report was prepared	
❖ Who prepared the report	
❖ Customer Company Name	
❖ Customer Company contact person	
❖ Contact name(s) for questions and/or clarifications	
❖ Enter phone number	
❖ Enter e-mail address	
❖ Enter mailing or postal address	
Executive Summary	
❖ Provide a high level overview of the test	
❖ Name and describe the product	
❖ Summary of method(s) including number and type of participants and tasks	
❖ Results expressed as mean scores or other suitable measure of central tendency	
◆ Reason for and nature of the test	
◆ Tabular summary of performance results	
◆ If differences are claimed, the associated statistical probability	

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❖ Start on new page; end with page break	
Introduction	
Full Product Description	
❖ Formal product name and release or version	
❖ Describe what parts of the product were evaluated	
❖ The user population for which the product is intended	
◆ Any groups with special needs	
◆ Brief description of the environment in which it should be used	
◆ The type of user work that is supported by the product	
Test Objectives	
❖ State the objectives for the test and any areas of specific interest	
❖ Functions and components with which the user directly and indirectly interacted	
◆ Reason for focusing on a product subset	
Method	
Participants	
❖ The total number of participants tested	
❖ Segmentation of user groups tested, if more than one	
❖ Key characteristics and capabilities of user group	
❖ How participants were selected; whether they had the essential characteristics	
❖ Differences between the participant sample and the user population	
❖ Table of participant (row) characteristics (columns)	
◆ Description of groups with special needs	
Context of Product Use in the Test	
❖Any known differences between the evaluated context and the expected context of use	
Tasks	
❖ Describe the task scenarios for testing	
❖ Explain why these tasks were selected	

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❖ Describe the source of these tasks	
❖ Include any task data given to the participants	
❖ Completion or performance criteria established for each task	
Test Facility	
◆ Describe the setting, and type of space in which the evaluation was conducted	
◆ Detail any relevant features or circumstances which could affect the results	
Participant's Computing Environment	
❖ Computer configuration, including model, OS version, required libraries or settings	
❖ If used, browser name and version; relevant plug-in names and versions	
Display Devices	
❖ If screen-based, screen size, resolution, and color setting	
❖ If print-based, the media size and print resolution	
❖ If visual interface elements can vary in size, specify the size(s) used in the test	
Audio Devices	
◆ If used, specify relevant settings or values for the audio bits, volume, etc	
Manual Input Devices	
◆ If used, specify the make and model of devices used in the test	
Test Administrator Tools	
❖ If a questionnaire was used, describe or specify it here	
◆ Describe any hardware or software used to control the test or to record data	
Experimental Design	
❖ Describe the logical design of the test	
❖ Define independent variables and control variables	
❖ Describe the measures for which data were recorded	
Procedure	
❖Operational definitions of measures	
❖ Operational definitions of independent variables or control variables	

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❖Time limits on tasks	
❖Policies and procedures for interaction between tester(s) and subjects	
◆ Sequence of events from greeting the participants to dismissing them	
◆ Non-disclosure agreements, form completion, warm-ups, pre-task training, and debriefing	
◆ Verify that the participants knew and understood their rights as human subjects	
◆ Specify steps followed to execute the test sessions and record data	
◆ Number and roles of people who interacted with the participants during the test session	
◆ Specify if other individuals were present in the test environment	
◆ State whether participants were paid	
Participant General Instructions	
❖ Instructions given to the participants (here or in Appendix)	
❖ Instructions on how participants were to interact with any other persons present	
Participant Task Instructions	
❖ Task instruction summary	
Usability Metrics	
❖ Metrics for effectiveness	
❖ Metrics for efficiency	
❖ Metrics for satisfaction	
Results	
Data Analysis	
❖ Data Scoring	
❖ Data Reduction	
❖ Statistical Analysis	
Presentation of the Results	
Performance Results	
❖ Tabular Performance Results per task or task group	
❖ Summary Table(s) of Performance Results across all tasks	

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❖ Graphical Presentation of Performance Results	
Satisfaction Results	
❖ Tabular Satisfaction Results	
❖ Summary Table(s) of Satisfaction Results	
❖ Graphical Presentation of Satisfaction Results	
Appendices	
❖ Custom Questionnaires, if used	
❖ Participant General Instructions	
❖ Participant Task Instructions	
◆ Release Notes	

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Annex B
(informative)

Glossary

Automatic data collection equipment
Hardware and/or software for automatic collection of usability test data. Examples of such data collection include screen capture and video, audio, and keystroke recording, often with time stamping.

Configuration
The specific collection of hardware and software, including model and version numbers, that constitutes the computing environment on which the product was tested. The configuration includes the platform.

Customer
Organization considering the purchase of the product.

Debriefing
Post-test interview with a participant.

Experimental design
Plan for assigning experimental conditions to participants and the statistical analysis associated with the plan. Typically, this includes a specification of the independent variables, dependent variables, number of participants and sampling strategy, procedure for assigning participants to experimental conditions, and order in which test tasks are given.

Formative evaluation
A method of testing as part of an iterative design process. Often involves use of a thinking aloud procedure. (Contrast with Summative test.)

Independent variable
Variable manipulated by the tester to set up the test conditions. (Contrast with the dependent variable, which is a variable that is being measured by the study.)

EXAMPLE: If two systems are being compared with the same tasks, the independent variable is the system, and the dependent variable is the level of task performance or user satisfaction.

Likert scale
Rating scale designed to measure user attitudes or reactions by quantifying subjective information. It typically contains a set of favorable and unfavorable statements about the product, to which a respondent indicates his or her level of agreement or disagreement. A Likert questionnaire may have an odd or even number of points, is often numerically numbered, and typically has at least two anchors describing the extremes of the scale dimension. Example:

This product was easy to use.

Strongly disagree	Somewhat disagree	Slightly disagree	Neutral	Slightly agree	Somewhat agree	Strongly agree

I felt frustrated while using this product.

Strongly disagree	Somewhat disagree	Slightly disagree	Neutral	Slightly agree	Somewhat agree	Strongly agree

Mean
Arithmetic ‘average’ of a set of quantities. Specifically, the sum of the quantities divided by the number of quantities in the set.

Nondisclosure agreement
An agreement between the supplier and the customer, in which they recognize that their cooperation requires them to divulge some of their proprietary information to each other, and in which each agrees not to disclose any of the other’s proprietary information to anyone else.

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One-way mirror

Piece of glass that appears as a mirror from one side and a window from the other, depending on the lighting conditions. This device allows testers to observe a usability test without themselves being observed by or distracting the participants.

Participant

Person who participates in a usability test as a representative of the product's target user population. A participant performs the test tasks and follows other instructions given by the tester.

Platform

The kind(s) of computer (operating system and hardware) used for the testing. Examples of common platforms include Windows on COMPAQ, MacOS on Power Macintosh, UNIX on Sparc or HP/UX, Linux on Dell, and OS/2 on IBM. Novel devices such as PDAs can also be considered platforms.

Procurement decisionmaker

A person responsible for making decisions about which products to acquire for the customer organization.

Replication

The collection of two observations under identical test conditions. In this document, it is used to mean that the customer organization should be able to repeat the test described in the report with its own sample of participants.

Semantic differential

A rating scale designed to measure user attitudes or reactions by quantifying subjective information. It typically contains a set of bipolar adjective pairs (e.g., good/bad, easy/hard) that describe some characteristic of the product. A semantic differential questionnaire typically has a seven- to ten-point scale. Example:

This product was

easy to use	1	2	3	4	5	6	7	hard to use
frustrating	1	2	3	4	5	6	7	satisfying

Special needs

User needs for special hardware, software, or design features to accommodate disabilities in vision, hearing, speech, mobility, or cognition.

Standard deviation

The square root of the variance. Provides a measure of the variability of the distribution of measurements.

Standard error of the mean

Square root of (variance divided by sample size). Estimates the likely closeness of the sample mean to the population mean.

Statistically significant

Unlikely to have occurred by chance (i.e., likely to reflect real differences).

Summative test

A usability test of a completed product to determine how well it meets its usability objectives.

Supplier

The producer of a product being considered for purchase. Organization that provides a product to the customer

Source: ISO/IEC TR 15504-9:1998.

Task scenario

The presentation and description of a task as part of a realistic, very short story.

Taxonomy

The systematic classification of the objects in a field of study.

Test protocol

A list of the steps to be followed in the test.

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Tester / Test administrator

A person who designs and/or conducts a usability test. (The tester is not the person who interacts with the product to exercise task scenarios; that person is a test participant.)

Usability Professional/Specialist/Engineer

Person who engages in the practice of usability engineering/testing. Such practitioners know how to design and execute summative performance tests with human subjects and how to analyze the resulting data. Their training is usually an advanced degree in human factors, behavioral science, industrial engineering, human-computer interaction, industrial design, computer science, or a related field.

Validation

A determination of the validity of a measure such as a questionnaire or a usability test.

Variance

The sum of squared differences of a set of measurements from their mean, divided by the sample size. (See Standard Deviation)

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Annex C (informative) **– Report Template**

[Enter Company Logo or Name; may be omitted]

[1),2)]Common Industry Format for Usability Test Report v2.0

Comments and questions about this format: iusr@nist.gov

[❖ Name the product and version that was tested]

[❖ Who led the test]

[❖ When the test was conducted]

[❖ Date the report was prepared]

[❖ Who prepared the report]

For:

[❖ Customer Company Name]

[❖ Customer Company contact person]

Address inquiries to: [❖ Contact name(s) for questions and/or clarifications]

Phone: [❖ Enter supplier's phone number]

Email: [❖ Enter supplier's email address]

Address: [❖ Enter supplier's mailing or postal address]

[1)] Legend for use: Items prefixed with a ❖ are Required; items prefixed with a ◆ are recommended.

[2)] This template is Appendix C of the Common Industry Format v2.0 draft standard.

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Executive Summary

[❖ Provide a high level overview of the test]

[❖ Name and describe the product]

[❖ Summary of method(s) including number and type of participants and tasks]

[❖ Results expressed as mean scores or other suitable measure of central tendency]

[◆ Reason for and nature of the test]

[◆ Tabular summary of performance results]

[◆ If differences are claimed, the associated statistical probability.]

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Introduction

Full Product Description

[❖ Formal product name and release or version]

[❖ Describe what parts of the product were evaluated]

[❖ The user population for which the product is intended]

[◆ Any groups with special needs]

[◆ Brief description of the environment in which it should be used]

[◆ The type of user work that is supported by the product]

Test Objectives

[❖ State the objectives for the test and any areas of specific interest]

[❖ Functions and components with which the user directly and indirectly interacted]

[◆ Reason for focusing on a product subset]

Method

Participants

[❖ The total number of participants tested]

[❖ Segmentation of user groups tested, if more than one]

[❖ Key characteristics and capabilities of user group]

[❖ How participants were selected; whether they had the essential characteristics]

[❖ Differences between the participant sample and the user population]

[❖ **Table** of participants (row) and characteristics (columns)]

	Characteristic 1	**Characteristic 2**	**…**	**Characteristic N**
Participant 1				
Participant 2				
…				
Participant N				

[◆ Description of groups with special needs]

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Context of Product Use in the Test

[❖Any known differences between the evaluated context and the expected context of use]

Tasks

[❖ Describe the task scenarios for testing]

[❖ Explain why these tasks were selected]

[❖ Describe the source of these tasks]

[❖ Include any task data given to the participants]

[❖ Completion or performance criteria established for each task]

Test Facility

[◆ Describe the setting, and type of space in which the evaluation was conducted]

[◆ Detail any relevant features or circumstances which could affect the results]

Participant's Computing Environment

[❖ Computer configuration, including model, OS version, required libraries or settings]

[❖ If used, browser name and version; relevant plug-in names and versions]

Display Devices

[❖ If screen-based, screen size, resolution, and color setting]

[❖ If print-based, the media size and print resolution]

[❖ If visual interface elements can vary in size, specify the size(s) used in the test]

Audio Devices

[◆ If used, specify relevant settings or values for the audio bits, volume, etc]

Manual Input Devices

[◆ If used, specify the make and model of devices used in the test]

Test Administrator Tools

[❖ If a questionnaire was used, describe or specify it here]

[◆ Describe any hardware or software used to control the test or to record data]

Experimental Design

[❖ Describe the logical design of the test]

[❖ Define independent variables and control variables].

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[❖ Describe the measures for which data were recorded]

Procedure

[❖Operational definitions of measures]

[❖ Operational definitions of independent variables or control variables]

[❖Time limits on tasks]

[❖Policies and procedures for interaction between tester(s) and subjects]

[◆ Sequence of events from greeting the participants to dismissing them]

[◆ Non-disclosure agreements, form completion, warm-ups, pre-task training, and debriefing]

[◆ Verify that the participants knew and understood their rights as human subjects]

[◆ Specify steps followed to execute the test sessions and record data]

[◆ Number and roles of people who interacted with the participants during the test session]

[◆ Specify if other individuals were present in the test environment]

[◆ State whether participants were paid]

Participant General Instructions

[❖ Instructions given to the participants (here or in Appendix)]

[❖ Instructions on how participants were to interact with any other persons present]

Participant Task Instructions

[❖ Task instruction summary]

Usability Metrics

[❖ Metrics for effectiveness]

[❖ Metrics for efficiency]

[❖ Metrics for satisfaction]

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Results

Data Analysis

[❖ Data Scoring]

[❖ Data Reduction]

[❖ Statistical Analysis]

Presentation of the Results

Performance Results ❖

[❖ Tabular Performance Results per task or task group]

User #	Measure 1	Measure 2	…	Measure N
Participant 1				
Participant 2				
…				
Participant N				
Mean				
Standard Dev.				
Min				
Max				

[❖ Summary Table(s) of Performance Results across all tasks]

User #	Total Measure 1	Total Measure 2	…	Total Measure N
Participant 1				
Participant 2				
…				
Participant N				
Mean				
Standard Dev.				
Min				
Max				

[❖ Graphical Presentation of Performance Results]

Satisfaction Results

[❖ Tabular Satisfaction Results]

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User #	Scale 1	Scale 2	…	Scale N
Participant 1				
Participant 2				
…				
Participant N				
Mean				
Standard Dev.				
Min				
Max				

[❖ Summary Table(s) of Satisfaction Results]

[❖ Graphical Presentation of Satisfaction Results]

Appendices

[❖ Custom Questionnaires, if used]

[❖ Participant General Instructions]

[❖ Participant Task Instructions]

[◆ Release Notes]

Additional Information Sources:

Annex A – Checklist

This document is a checklist for the CIF.

Annex B – Glossary

This document contains a list of terms used in the CIF and definitions.

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