Appendix A

Automation Characteristics of UE Methods, Chapter 2

The following sections discuss automation characteristics for WIMP and Web interfaces separately. This information was aggregated and presented in Section 2.3.

A.1 Automation Characteristics of WIMP UE Methods

Tables A.1 and A.2 summarize automation characteristics for the 75 UE methods surveyed for WIMP interfaces. Table A.3 provides descriptions of all method types, and Table A.4 summarizes the number of non-automated and automated capture, analysis, and critique methods surveyed. Four software tools provide automation support for multiple method types: DRUM - performance measurement and log file analysis; AMME - log file analysis and petri net modeling; KALDI - performance measurement, log file analysis, and remote testing; and UsAGE - performance measurement and log file analysis.

Method Class / Method Type	**Automation Type**			
	None	**Capture**	**Analysis**	**Critique**
Testing				
Thinking-aloud Protocol	F (1)			
Question-asking Protocol	F (1)			
Shadowing Method	F (1)			
Coaching Method	F (1)			
Teaching Method	F (1)			
Co-discovery Learning	F (1)			
Performance Measurement	F (1)	F (4)		
Log File Analysis			IFM (10)*	
Retrospective Testing	F (1)			
Remote Testing		IF (2)		
Inspection				
Guideline Review	IF (2)		(3)	M (5)†
Cognitive Walkthrough	IF (2)	F (1)		
Pluralistic Walkthrough	IF (1)			
Heuristic Evaluation	IF (1)			
Perspective-based Inspection	IF (1)			
Feature Inspection	IF (1)			
Formal Usability Inspection	F (1)			
Consistency Inspection	IF (1)			
Standards Inspection	IF (1)			
Inquiry				
Contextual Inquiry	IF (1)			
Field Observation	IF (1)			
Focus Groups	IF (1)			
Interviews	IF (1)			
Surveys	IF (1)			
Questionnaires	IF (1)	IF (2)		
Self-reporting Logs	IF (1)			
Screen Snapshots	IF (1)			
User Feedback	IF (1)			

Table A.1: Automation support for 75 WIMP UE methods (Table 1 of 2). A number in parentheses indicates the number of UE methods surveyed for a particular method type and automation type. The effort level for each method is represented as: minimal (blank), formal (F), informal (I) and model (M). The * for the IFM entry indicates that either formal or informal interface use is required. In addition, a model may be used in the analysis. The † indicates that methods may or may not require a model.

Method Class / Method Type	Automation Type: None	Capture	Analsis	Critique
Analytical Modeling				
GOMS Analysis	M (4)		M (2)	
UIDE Analysis			M (2)	
Cognitive Task Analysis			M (1)	
Task-environment Analysis	M (1)			
Knowledge Analysis	M (2)			
Design Analysis	M (2)			
Programmable User Models			M (1)	
Simulation				
Information Proc. Modeling			M (8)	
Petri Net Modeling			FM (1)	
Genetic Algorithm Modeling		(1)		

Table A.2: Automation support for 75 WIMP UE methods (Table 2 of 2). A number in parentheses indicates the number of UE methods surveyed for a particular method type and automation type. The effort level for each method is represented as: minimal (blank), formal (F), informal (I) and model (M).

A.2 Automation Characteristics of Web UE Methods

Table A.5 summarizes automation characteristics for the 58 UE methods surveyed for Web interfaces. Table A.6 provides descriptions of all method types, and Table A.7 summarizes the number of non-automated and automated capture, analysis, and critique methods surveyed. Three software tools provide automation support for multiple method types: Dome Tree visualization - log file analysis and information scent modeling; WebVIP - performance measurement and remote testing; and WebQuilt - performance measurement, remote testing, and log file analysis.

Method Class Method Type	**Description**
Testing	
Thinking-aloud Protocol	user talks during test
Question-asking Protocol	tester asks user questions
Shadowing Method	expert explains user actions to tester
Coaching Method	user can ask an expert questions
Teaching Method	expert user teaches novice user
Co-discovery Learning	two users collaborate
Performance Measurement	tester or software records usage data during test
Log File Analysis	tester analyzes usage data
Retrospective Testing	tester reviews videotape with user
Remote Testing	tester and user are not co-located during test
Inspection	
Guideline Review	expert checks guideline conformance
Cognitive Walkthrough	expert simulates user's problem solving
Pluralistic Walkthrough	multiple people conduct cognitive walkthrough
Heuristic Evaluation	expert identifies heuristic violations
Perspective-based Inspection	expert conducts narrowly focused heuristic evaluation
Feature Inspection	expert evaluates product features
Formal Usability Inspection	experts conduct formal heuristic evaluation
Consistency Inspection	expert checks consistency across products
Standards Inspection	expert checks for standards compliance
Inquiry	
Contextual Inquiry	interviewer questions users in their environment
Field Observation	interviewer observes system use in user's environment
Focus Groups	multiple users participate in a discussion session
Interviews	one user participates in a discussion session
Surveys	interviewer asks user specific questions
Questionnaires	user provides answers to specific questions
Self-reporting Logs	user records UI operations
Screen Snapshots	user captures UI screens
User Feedback	user submits comments
Analytical Modeling	
GOMS Analysis	predict execution and learning time
UIDE Analysis	conduct GOMS analysis within a UIDE
Cognitive Task Analysis	predict usability problems
Task-environment Analysis	assess mapping of user's goals into UI tasks
Knowledge Analysis	predict learnability
Design Analysis	assess design complexity
Programmable User Models	write program that acts like a user
Simulation	
Information Proc. Modeling	mimic user interaction
Petri Net Modeling	mimic user interaction from usage data
Genetic Algorithm Modeling	mimic novice user interaction

Table A.3: Descriptions of the WIMP UE method types depicted in Table A.1.

Methods Surveyed	Automation Type			
	None	Capture	Analysis	Critique
Total	30	5	8	1
Percent	68%	11%	18%	2%

Table A.4: Summary of WIMP UE methods surveyed for each automation type.

Method Class / Method Type	Automation Type			
	None	Capture	Analysis	Critique
Testing				
Thinking-aloud Protocol	F (1)			
Question-asking Protocol	F (1)			
Shadowing Method	F (1)			
Coaching Method	F (1)			
Teaching Method	F (1)			
Co-discovery Learning	F (1)			
Performance Measurement	F (1)	F (4)		
Log File Analysis			IFM (10)	
Retrospective Testing	F (1)			
Remote Testing		IF (3)		
Inspection				
Guideline Review	IF (4)		(5)	(6)
Cognitive Walkthrough	IF (2)			
Pluralistic Walkthrough	IF (1)			
Heuristic Evaluation	IF (1)			
Perspective-based Inspection	IF (1)			
Feature Inspection	IF (1)			
Formal Usability Inspection	F (1)			
Consistency Inspection	IF (1)			
Standards Inspection	IF (1)			
Inquiry				
Contextual Inquiry	IF (1)			
Field Observation	IF (1)			
Focus Groups	IF (1)			
Interviews	IF (1)			
Surveys	IF (1)			
Questionnaires	IF (1)	IF (1)		
Self-reporting Logs	IF (1)			
Screen Snapshots	IF (1)			
User Feedback	IF (1)			
Analytical Modeling				
No Methods Surveyed				
Simulation				
Information Proc. Modeling			M (1)	
Information Scent Modeling		M (1)		

Table A.5: Automation support for 58 Web UE methods. A number in parentheses indicates the number of UE methods surveyed for a particular method type and automation type. The effort level for each method is represented as: minimal (blank), formal (F), informal (I) and model (M).

Method Class Method Type	**Description**
Testing	
Thinking-aloud Protocol	user talks during test
Question-asking Protocol	tester asks user questions
Shadowing Method	expert explains user actions to tester
Coaching Method	user can ask an expert questions
Teaching Method	expert user teaches novice user
Co-discovery Learning	two users collaborate
Performance Measurement	tester or software records usage data during test
Log File Analysis	tester analyzes usage data
Retrospective Testing	tester reviews videotape with user
Remote Testing	tester and user are not co-located during test
Inspection	
Guideline Review	expert checks guideline conformance
Cognitive Walkthrough	expert simulates user's problem solving
Pluralistic Walkthrough	multiple people conduct cognitive walkthrough
Heuristic Evaluation	expert identifies heuristic violations
Perspective-based Inspection	expert conducts narrowly focused heuristic evaluation
Feature Inspection	expert evaluates product features
Formal Usability Inspection	experts conduct formal heuristic evaluation
Consistency Inspection	expert checks consistency across products
Standards Inspection	expert checks for standards compliance
Inquiry	
Contextual Inquiry	interviewer questions users in their environment
Field Observation	interviewer observes system use in user's environment
Focus Groups	multiple users participate in a discussion session
Interviews	one user participates in a discussion session
Surveys	interviewer asks user specific questions
Questionnaires	user provides answers to specific questions
Self-reporting Logs	user records UI operations
Screen Snapshots	user captures UI screens
User Feedback	user submits comments
Analytical Modeling	
No Methods Surveyed	
Simulation	
Information Proc. Modeling	mimic user interaction
Information Scent Modeling	mimic Web site navigation

Table A.6: Descriptions of the Web UE method types discussed in Table A.5.

Methods Surveyed	**Automation Type**			
	None	**Capture**	**Analysis**	**Critique**
Total	26	5	4	1
Percent	72%	14%	11%	3%

Table A.7: Summary of Web UE methods surveyed for each automation type.