

Usability Testing for Building Performance Simulation Tools

Authors:Kevin TAPSOBAE-Mail:Kevin.tapsoba@epfedu.frSupervisor:Prof. Dr. Shady ATTIAAddress:Building Design Lab (SBD)
Quartier Polytech 1
Allee de la Decouverte 9
4000 Liege, Belgium
www.sbd.ulg.ac.be
Tel: +32 43.66.91.55
Fax: +32 43.66.29.09

ABSTRACT

The tools for building performance simulations are numerous and sometimes lack assistance during the design phases.

- People who use them sometimes lack information about these programs to better choose them.
- It is in this specific context that our study takes all its importance.

KEYWORDS

Usability, usability testing, usability attribute, software program, user experience, human computer interaction, software, gaming, simulation Tools, building performance

PROBLEM

• Construction performance simulation tools are sometimes

METHODOLOGY

1. The simple test is a basic test that is essentially performed in the laboratory. It may test the performance qualities of the software.

2. The Medium Test consists of two parts:

At first it performs the simple test, then it performs a satisfaction test. The satisfaction test is mainly a feedback from users of the software who give their opinion on the usability of the software.

3. The Advanced Test is a Test that consists of three parts

RESULTS

Categorization Diagram

Time task

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
Participant 1	300	147	213	10	123	147
Participant 2	256	75	231	12	145	185
Participant 3	152	48	256	284	301	169
Participant 4	124	300	254	200	299	147
Participant 5	89	234	23	300	244	160
Participant 6	96	165	21	145	245	132
Participant 7	22	84	36	130	111	42
Participant 8	230	65	156	102	333	132
Participant 9	360	85	198	123	222	220
Participant 10	40	189	187	154	102	125
Participant 11	156	145	30	25	145	148
Participant 12	245	123	10	261	11	789
Participant 13	268	213	121	274	14	165
Participant 14	85	258	456	258	12	147
Participant 15	201	265	258	265	16	145
Participant 16	14	254	300	254	60	123
Participant 17	35	412	147	320	35	75
Participant 18	11	256	132	456	200	100
Participant 19	156	85	45	214	32	99
Participant 20	300	64	56	236	10	33
NB(COUNT)	20	20	20	20	20	20
Standard deviation	108,20205	98,453983	117,88643	113,74083	110,62645	153,77094
Mean	157	173,35	156,5	201,15	133	164,15
Median	154	156	151,5	225	117	146
90% Confidence Interval	39,796764	36,21142	43,358683	41,833929	40,688457	56,557022
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difficult to use.

• There is not really a usability test model today for testing software.

• The main instrument for evaluating software performance and satisfaction is the usability test.

• Usability tests are intended to facilitate the choice of simulation tools and their future designs.

OBJECTIVE/HYPOTESIS

- Improve and validate the support quality of building simulation software for decision making during the design phase
- Literature Review
- Identify key parameters of usability.

AUDIENCE

Architect; Engineers; Software Developer

RESEARCH QUESTION

Are Usability Tests for Building performance Simulation Tools Existing?

ORIGINALITY

Our Categorization Diagram who propose to users a choice in function of the test that they wanted to realise.

	Usability Performance Metrics	
Performance Metric • The time it takes to perform each task. • The amount of effort to perform each. • The number of errors committed. • Learnability • Report the Frequency of successful	Satisfaction Metric The User says or Thinks about his interaction with the product. The users might Report(That it was easy to use; that it was confusing; or that it exceeded hid expectations). Self-Reported metrics. System Usability Scale	Behaviour and Physiological Metric • Use new technology (sensor, headphones etc) to analyse the physical behaviour of a software user. • Behaviour Qualitative. • Behaviour Qualitative. • Attitude Qualitative. • Attitude Quantitative.
: Simple Test	: Medium Test	: Advanced Test
Lab Test	Lab Test	Lab Test
Self-Reported	Self-Reported	Self-Reported
Comparaison Test	Comparaison Test	Comparaison Test

Criteria an sub-criteria

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Performance	A1	Heliability	All	Maturity	The capability of the software product to avoid failure as a result of faults in the software
					The capability of the software product to maintain a specified level of performance in cases of software
			A.12	Fault Tolerance	taults or of intringement of its specified interface.
					The capability of the software product to re-establish a specified level of performance and recover the
			A.13	Recoverability	data directly affected in the case of a failure
					The capability of the software product to adhere to standards, conventions or regulations relating to
			A.14	Reliability compliance	reliability.
					The capability of the software product to be diagnosed for deficiencies or causes of failures in the
	A.2	Maintenability	A21	Analysability	software, or for the parts to be modified to be identified.
			A22	Changeability	The capability of the software product to enable a specified modification to be implemented
			A23	Stability	The capability of the software product to avoid unexpected effects from modifications of the software.
			A24	Testability	The capability of the software product to enable modified software to be validated.
			A25	Maintenability compliance	The capability of the software product to adhere to standards or conventions relating to maintainability.
					The capability of the software product to provide an appropriate set of functions for specified tasks and
	A.3	Functionality	A.3.1	Suitability	user objectives
			A.3.2	Interoperability	The capability of the software product to interact with one or more specified systems.
					The capability of the software product to protect information and data so that unauthorised persons or
					systems cannot read or modify them and authorised persons or systems are not denied access to
			A33	Security	them.
					The capability of the software product to adhere to standards, conventions or regulations in laws and
			A.3.4	Functionality Compliance	similar prescriptions relating to functionality.
					The capability of the software product to be adapted for different specified environments without
	A.4	Portability	A4.1	Adaptability	applying actions or means other than those provided for this purpose for the software considered.
			A42	Installability	The capability of the software product to be installed in a specified environment.
				,	The capability of the software product to co-exist with other independent software in a common
			A43	Co-existence	environment sharing common resources.
					The capability of the software product to be used in place of another specified software product for the
			A44	Replaceability	same purpose in the same environment.
			A4.5	Portability compliance	The capability of the software product to adhere to standards or conventions relating to portability.
	A5	Usability	A.5.1	Understandability	The capability of the software product to enable the user to understand whether the software is suitabl
			A5.2	Learnability	The capability of the software product to enable the user to learn its application
			A53	Operability	The capability of the software product to enable the user to operate and control it.
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Comprohensive usehility								
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scale								
Comprehensive Usability Scale								
	Disagree						Agree	
1. Do you think that maturity is important in a Building performance simulation tools?		1	2	3	4	5		
2. The importance of Fault tolerance fault is it important for you?		1	2	3	4	5		
3. Recoverability is it a usability criteria for you ?		1	2	3	4	5		
4.Reliability compliance is it important for you ?		1	2	3	4	5		
5.How important are you to Analysability of your software?		1	2	3	4	5		
6.How important are you to changeability of your software?		1	2	3	4	5		
7.How important are you to Stability of your software?		1	2	3	4	5		
8. The stability of your software is it a usability criteria for you?		1	2	3	4	5		
9. The maintenability compliance is it important for you?		1	2	3	4	5		
10.How important are you to suitability accuracy ?		1	2	3	4	5		
11.How important are you to interoperability of your software?		1	2	3	4	5		
12. The security of your building performance simulation tools is it important?		1	2	3	4	5		

CONCLUSION

This work allowed me to exploit a new field that I did not know and which is unknown or unknown by people

The importance of this work is that it can allow the audience to easily choose their software because now a tool exists to compare and choose the best.

Our own questions of system usability scale

We wanted to do a survey to have users experience

Resources

- Attia, S., & Andersen, M. (2013). Measuring the Usability, Efficiency and Effectiveness of CAAD Tools and Applications.
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