A "Appendix A"

The standard version of System Usability Scale (SUS) used in the study (see Fig. 10)

	The System Usability Scale Standard Version	Strongly Disagree				Strongly Agree
		1	**2**	**3**	**4**	**5**
1	I think that I would like to use this system frequently.	O	O	O	O	O
2	I found the system unnecessarily complex.	O	O	O	O	O
3	I thought the system was easy to use.	O	O	O	O	O
4	I think that I would need the support of a technical person to be able to use this system.	O	O	O	O	O
5	I found the various functions in this system were well integrated.	O	O	O	O	O
6	I thought there was too much inconsistency in this system.	O	O	O	O	O
7	I would imagine that most people would learn to use this system very quickly.	O	O	O	O	O
8	I found the system very awkward to use.	O	O	O	O	O
9	I felt very confident using the system.	O	O	O	O	O
10	I needed to learn a lot of things before I could get going with this system.	O	O	O	O	O

Fig. 10 The standard version of System Usability Scale (SUS) used in the study

B "Appendix B"

TASK LIST

Name: recognize emotion
Description: starting from emotion element, the user has ability to capture basic /dimensional emotions.
He/she is capable to define new emotion recognition provider in real-time settings.
Objective: *capture "basic emotion"*
Feedback: 4 steps – easy; Max time interval: 120 (second)

Name: create a simple relationship
Description: starting from element according to the task's requirements, the user has to know how to create a relationship between two or more elements correctly.
Objective: *create a relationship between emotion and person*
Feedback: 5 steps – easy; Max time interval: 180 (second)

Name: add context element
Description: starting from context element, user has to understand what the meaning of context. The context represents variables that may change when the same operation executed repeatedly (e.g., Watch a TV ⟶time, location, companion). He/she has to add contextual attributes.
Objective: *add context element, then add its attributes (Time, Location, Companion) with related values (Weekend, Living room, Partner) respectively.*
Feedback: 8 steps – medium; Max time interval: 300 (second)

Name: create a complex relationship with specific context.
Description: starting from context element, user has to understand how to create other elements depending on the suggested scenario. Other

elements such as "Thing" (e.g., TV), "Capability" of a person that includes optional attributes: pre- and post-condition which represent any condition must be fulfilled before the "Operation" being executed (e.g., sunny weather).

Objective: *Add new modelling elements according to the context "Watch a TV on Sunday at living room", and then connect each element with a suitable connector.*

In this task,

- The precondition of "Capability" is "the television must be on".
- "Watch" is represented as an operation that includes attribute: star-time, end-time and whether if the "Operation" is executed or not.

Feedback: 17 steps – hard; Max time interval: 600 (second)

For further feedback, comments and suggestions, please write below:

....

....

....

C "Appendix C"

Table 2 Times (in seconds) for 10 participants and 4 tasks

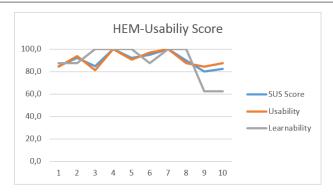|	T1	T2	T3	T4
P1	71	97	248	463
P2	106	88	211	576
P3	81	115	197	492
P4	84	124	217	489
P5	98	92	287	519
P6	91	116	200	528
P7	84	89	214	496
P8	75	74	213	525
P9	98	126	217	600
P10	101	140	300	600
Mean:	88.9	106.1	230.4	528.8
Std Dev:	11.7	21.0	36.1	48.1
N:	10	10	10	10

Fig. 11 SUS score with relevant Subscales

References

ADOxx® (2021a) Adoxx definition language (adl). URL `https://www.adoxx.org/live/adoxx-development-languages-syntax-support`, last accessed April 2021

ADOxx® (2021b) Adoxx metamodelling platform. URL `https://www.adoxx.org/live/home`, last accessed July 2021

Alberti A (2013) Internet of things : Perspectives , challenges and opportunities

Antunes G, Bakhshandeh M, Mayer R, Borbinha J, Caetano A (2014) Using ontologies for enterprise architecture integration and analysis. Complex Syst Informatics Model Q 1:1–23

Bangor A, Kortum PT, Miller JT (2008) An empirical evaluation of the system usability scale. International Journal of Human–Computer Interaction 24:574 – 594

Blackburn M, Denno PO (2015) Using semantic web technologies for integrating domain specific modeling and analytical tools. In: Complex Adaptive Systems

Brooke J (1996) Sus: A quick and dirty usability scale, in usability evaluation in industry. p 189–194

Brooke J (2013) Sus: a retrospective. Journal of Usability Studies archive 8:29–40

C Khoonnaret SAN (2017) Face characteristic detection system using ontology and supervised learning. International Journal of the Computer, the Internet and Management 25:62–69

Chatzigiannakis I, Hasemann H, Karnstedt M, Kleine O, Kröller A, Leggieri M, Pfisterer D, Römer K, Truong C (2012) True self-configuration for the iot. 2012 3rd IEEE International Conference on the Internet of Things pp 9–15

Cho H, Gray J, Syriani E (2012) Creating visual domain-specific modeling languages from end-user demonstration. 2012 4th International Workshop on Modeling in Software Engineering (MISE) pp 22–28

Dey A (2001) Understanding and using context. Personal and Ubiquitous Computing 5:4–7

Domaradzka E, Fajkowska M (2018) Cognitive emotion regulation strategies in anxiety and depression understood as types of personality. Frontiers in Psychology 9

Ekman P (1992) An argument for basic emotions. Cognition & Emotion 6:169–200

Elkobaisi MR, Mayr H, Shekhovtsov V (2020) Conceptual human emotion modeling (hem). In: ER

Filestack (2019) Comparing image tagging services: Google vision, microsoft cognitive services, amazon rekognition and clarifai. URL `https://blog.filestack.com/thoughts-and-knowledge/comparing-google-vision-microsoft-cognitive-amazon-rekognition-clarifai`, last accessed: April 25 (2019)

Francisco V, Gervás P, Peinado F (2007) Ontological reasoning to configure emotional voice synthesis. In: RR

Frank U (2011) Some guidelines for the conception of domain-specific modelling languages. In: EMISA

Froumentin M (2004) Extensible multimodal annotation markup language (emma): invited talk

García-Rojas A, Vexo F, Thalmann D, Raouzaiou A, Karpouzis K, Kollias S, Moccozet L, Magnenat-Thalmann N (2006) Emotional face expression profiles supported by virtual human ontology. Computer Animation and Virtual Worlds 17

Gross J (2002) Emotion regulation: affective, cognitive, and social consequences. Psychophysiology 39 3:281–91

Kim J, André E (2008) Emotion recognition based on physiological changes in music listening. IEEE Transactions on Pattern Analysis and Machine Intelligence 30:2067–2083

Kirakowski J (1994) The use of questionnaire methods for usability assessment

Kleppe A (2008) Software language engineering: Creating domain-specific languages using metamodels

Liao C, Lin PH, Quinlan D, Zhao Y, Shen X (2015) Enhancing domain specific language implementations through ontology. Proceedings of the 5th International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing

Machot FA, Elkobaisi MR, Kyamakya K (2020) Zero-shot human activity recognition using non-visual sensors. Sensors (Basel, Switzerland) 20

Marriott A, Stallo J (2002) Vhml – uncertainties and problems . a discussion

Mayr H, Machot FA, Michael J, Morak G, Ranasinghe S, Shekhovtsov V, Steinberger C (2016) Hcm-l: Domain-specific modeling for active and assisted living. In: Domain-Specific Conceptual Modeling

McLellan S, Muddimer A, Peres S (2012) The effect of experience on system usability scale ratings. Journal of Usability Studies archive 7:56–67

Mehrabian A, Russell J (1974) An approach to environmental psychology

Michael J, Mayr H (2015) Creating a domain specific modelling method for ambient assistance. 2015 Fifteenth International Conference on Advances in ICT for Emerging Regions (ICTer) pp 119–124

Michael J, Steinberger C, Shekhovtsov V, Machot FA, Ranasinghe S, Morak G (2018) The hbms story - past and future of an active assistance approach. Enterp Model Inf Syst Archit Int J Concept Model 13:345–370

OMG® (2021) Object management group: Meta object facility (MOF)^{TM}specification. URL https://www.omg.org/mof, last accessed July 2021

P Baggia MB P Bagshaw (2010) Speech synthesis markup language (ssml) version 1.1, world wide web consortium, recommendation rec-speechsynthesis11-20100907

Perera C, Zaslavsky A, Christen P, Georgakopoulos D (2014) Context aware computing for the internet of things: A survey. IEEE Communications Surveys & Tutorials 16:414–454

Prendinger H, Ishizuka M (2004) Life-like characters - tools, affective functions, and applications. In: Life-like characters

Sam K, Chatwin C (2012) Ontology-based text-mining model for social network analysis. 2012 IEEE International Conference on Management of Innovation & Technology (ICMIT) pp 226–231

Sauro J, Lewis JR (2012) Quantifying the user experience: Practical statistics for user research

Schröder M (2006) First suggestions for an emotion annotation and representation language

Schröder M, Baggia P, Burkhardt F, Pelachaud C, Peter C, Zovato E (2011) Emotion markup language (emotionml) 1.0. w3c last call working draft

Sykora M, Jackson T, O'Brien A, Elayan S (2013) Emotive ontology: extracting fine-grained emotions from terse, informal messages

Terkaj W, Pedrielli G, Sacco M (2012) Virtual factory data model

Tullis T, Albert W (2013) Measuring the user experience, second edition: Collecting, analyzing, and presenting usability metrics

Tullis T, Stetson JN (2004) A comparison of questionnaires for assessing website usability

Walter T, Parreiras FS, Staab S (2012) An ontology-based framework for domain-specific modeling. Software & Systems Modeling 13:83–108

Zarrin B, Baumeister H (2018) An integrated framework to specify domain-specific modeling languages. In: MODELSWARD