



# Methods and tools of user experience evaluation research



Educational, Scientific and • of Ukraine Cultural Organization •



United Nations • Junior Academy of Sciences

## What is user experience?



User experience (UX) - the users' impressions of working with the interface of an application or site



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Learnability

Customization

# Methods for evaluating user experience

The method of evaluating user experience is a tool that is used to find out how the client perceives the company, its services, and its product.

Criteria Methods	Navigation
Laboratory research	+
User interviews	+
Concept check	+
Focus groups	+
A/B testing	+
Card sorting	+
Tree testing	+
Five-second test	-
Eye-tracking	-
Ethnographic research	-
Prototyping	+
Wireframing	+
User personas	-
User scenarios	-
User goals research	-
Intercept survey	-

Design	Learnability	Effectiveness	Memorability	Customization	Complex UX research	User behaviour research
-	+	+	+	+	-	+
+	-	-	-	+	-	-
+	+	+	-	-	-	+
-	+	+	+	+	-	-
+	+	+	-	-	-	-
-	-	-	-	-	-	-
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## **Tools for user experience** evaluation

UX evaluation tools are online services that help create a product or evaluate and improve the UX of existed product

The most used UX evaluation tools: UserZoom, Woopra, UserTesting, UXCam, MouseStats, Naview, UXPin, Balsamiq, Mockingbird

# 01

To fully research and assess the level of user experience of a web service, it is necessary to use not one, but several methods or tools

# 02

The methods and tools for evaluating user experience are not universal. Therefore, using a particular method or tool for evaluating UX, it cannot be said for sure that the user experience score will be accurate. Disadvantages of the well-known methods and tools of UX evaluation

## What is fuzzy logic?

Fuzzy logic- an approach to computing based on "degrees of truth" rather than the 9 usual "true or false" (1 or 0)



## General view of the FLIS in the MATLAB system





Navigation	Design	Learnability	
Effectiveness	Memoral	bility Customization	

## **Fuzzification Inference**

Membership function plots for the input fuzzy variable "Navigation"

Input variables



The table of the dependence of the fuzzy value of the Navigation attribute on its numeric value

Numeric	Linguistic
value	value
0-2.5	VL
2.6 - 4.5	L
4.6 - 6.5	Μ
6.6 - 8.5	Н
8.6 - 10	VH

Navigation = { VL (very low), L (low), *M* (medium), *H* (high), *VH* (very high)}.

## **Fuzzification Inference**

All possible linguistic values for Navigation attribute



## **Inference Engine**



### Mamdani Algorithm:

if x1 is A1 and (x2 is A2 or x3 is A3), then z is B1

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where x is the input data, and z is the output of the inference engine block

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The rule is added					Help	,	Close

## **Defuzzification Inference**



### Method of the centre of gravity:

$$y = \frac{\int_{min}^{max} x \cdot \mu(x) \cdot dx}{\int_{min}^{max} \mu(x) \cdot dx}$$

Membership function plots for the input fuzzy variable "User Experience"

## Graphical representation of the rulebase



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		Close	

## Graphical representation of the rulebase



## Comparison of the developed method with the well-known methods



Customization	Complex UX research	User behaviour research
+	+	-

## Approbation of the developed method





### **Very high level of UX**

https://diia.gov.ua

## Approbation of the developed method



### **High level of UX**

http://www.gymnasium-1.km.ua



## Approbation of the developed method



### Very low level of UX

https://userinyerface.com

