

# Human Computer Interaction

## CS449 – CS549

Week 9

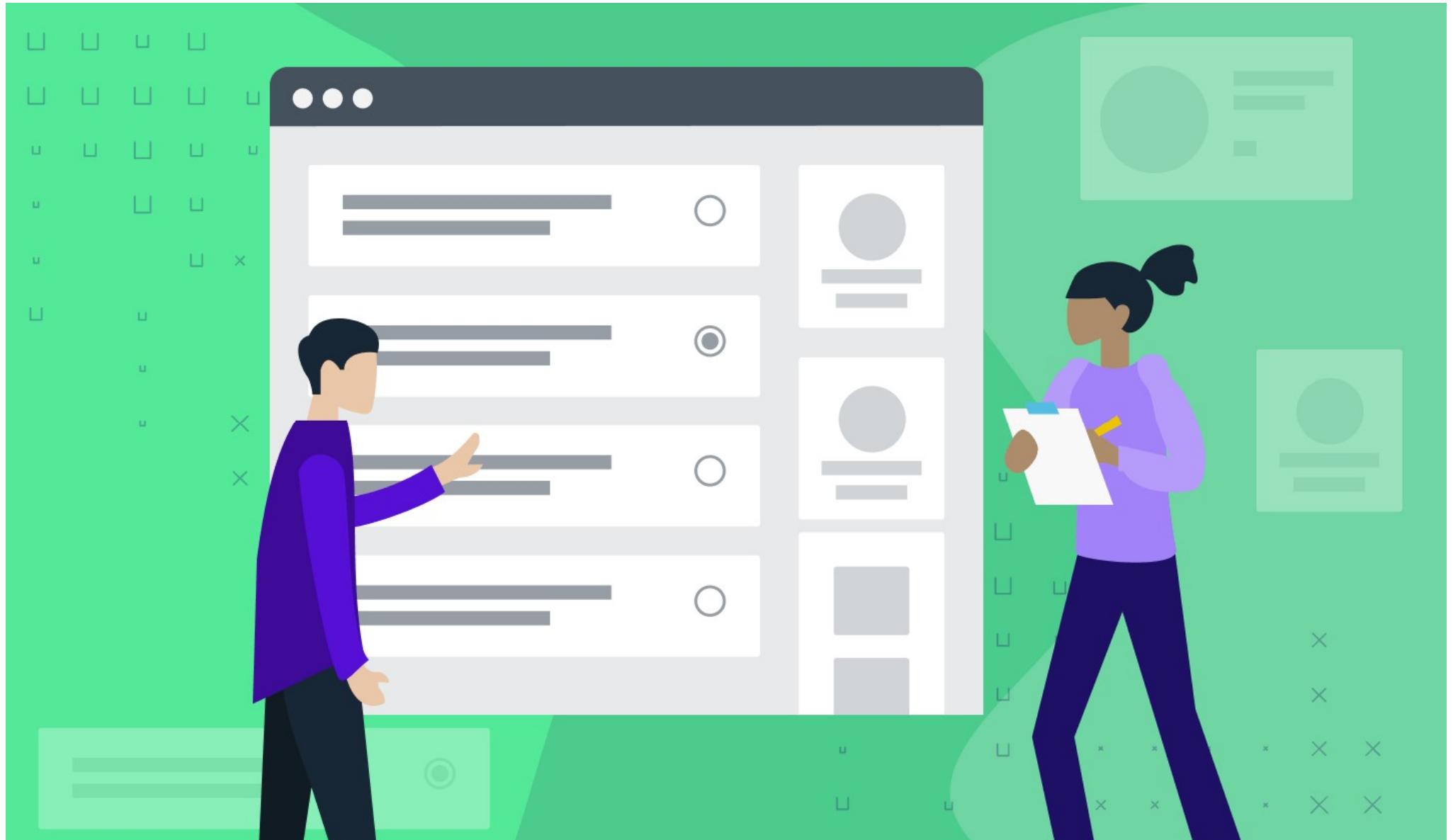
## Inspection/Expert Based Usability Evaluation Methods

KÜRSAT ÇAĞILTAY

# Today

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- Usability Evaluation Methods
- Inspection/Expert Based Evaluation
- Assignment-4



Poliyiklinik Defteri - Vers: 1.0.1 - Kullanıcı : ÖZLEM [REDACTED] Stok : M.ÇOCUK POLİKLİNİĞİ 1

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İsteyen Dr. : Uzm.Dr. ÖZLEM [REDACTED]  
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Açıklama : RETIKÜLOSIT SAYIMI

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Oluşturan : 1252

İcabet/Branş Nöb. yapıldı mı?  HAYIR  
Acil Durum veya Komplikasyon mu?  HAYIR



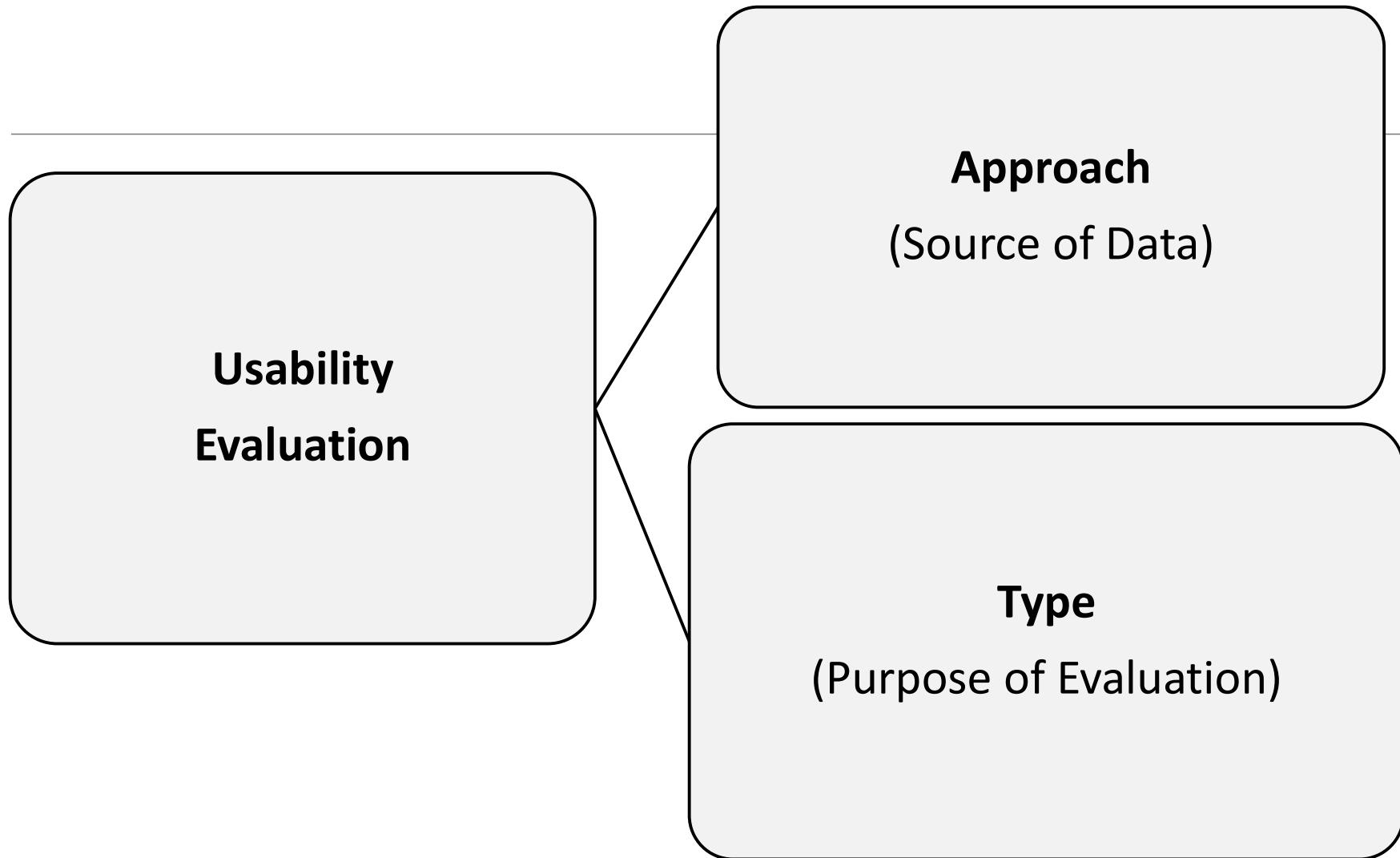
The Helionix Avionics Suite for the Airbus H135 Helicopter. Photo: Airbus Helicopters

# Framework for Usability Evaluation

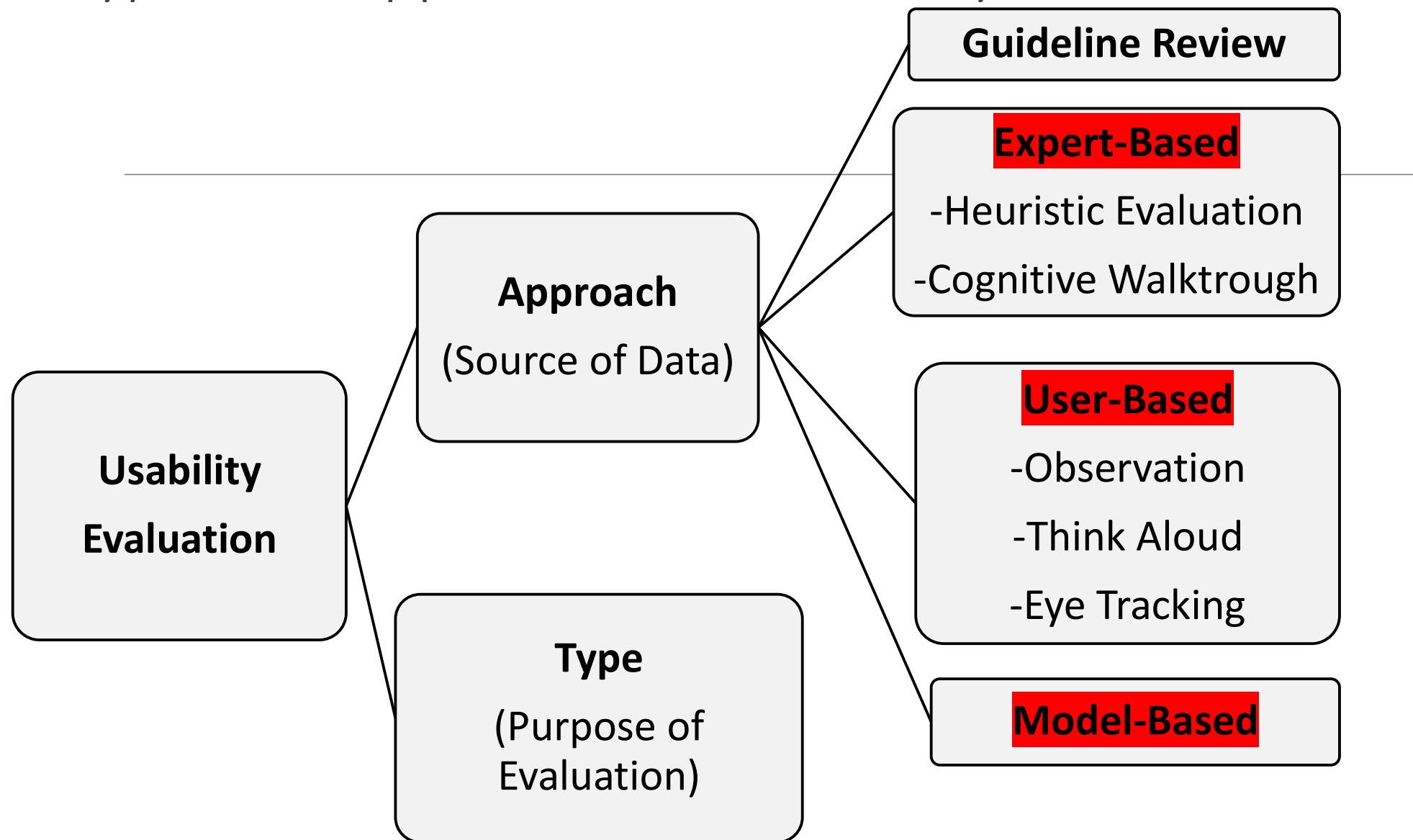
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- Approach and Type
  - Approach refers to source of data
    - User, Expert/Inspection, or Model Based
  - Type refers to purpose of evaluation
    - Diagnostic (Formative) or Metrication (Summative)
- Any evaluation method combines *approach* and *type*

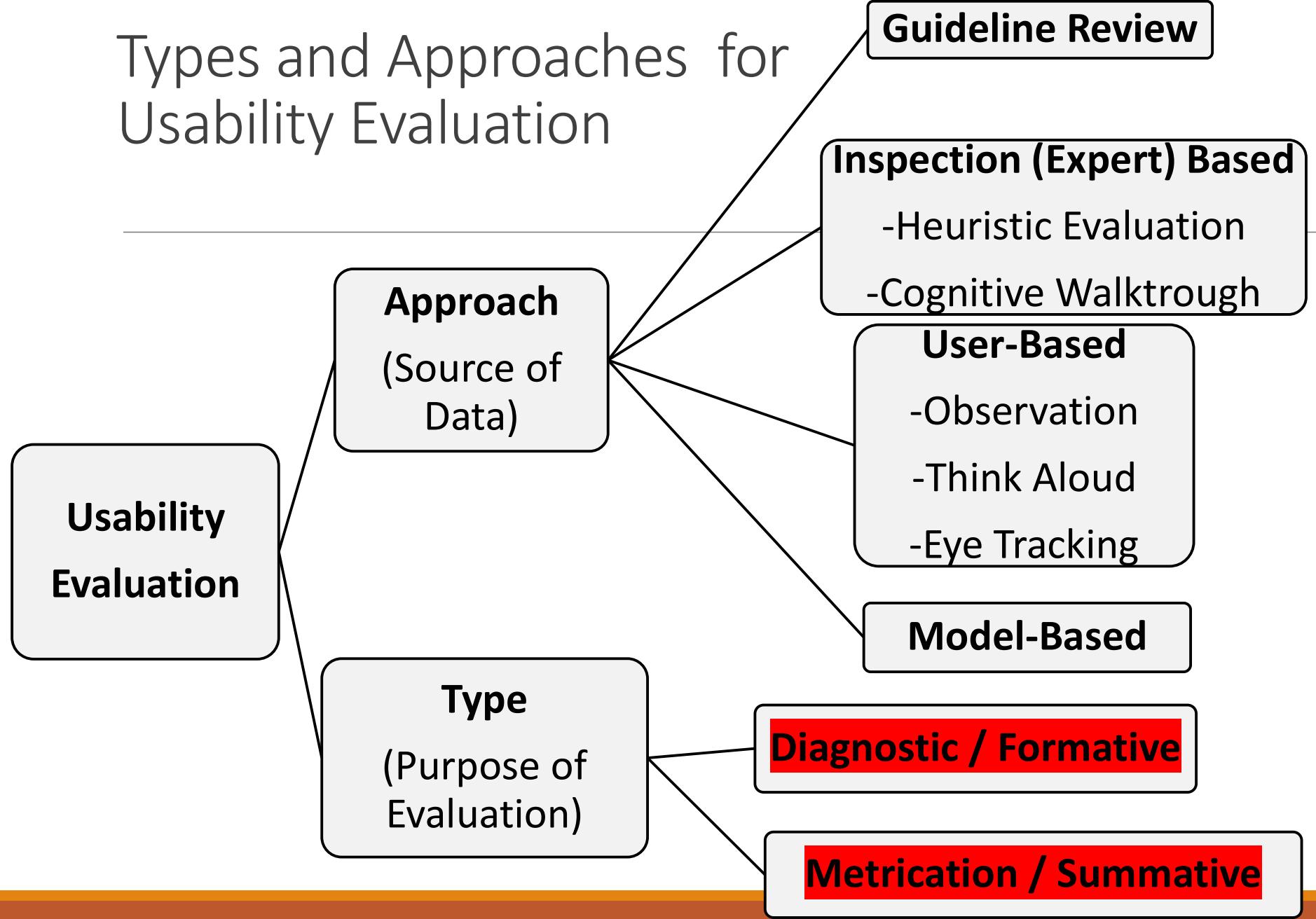
# Types and Approaches for Usability Evaluation



# Types and Approaches for Usability Evaluation



# Types and Approaches for Usability Evaluation



# Inspection/Expert-based Approaches

---

- Involves the evaluator (usability expert) using the system
- Use can be structured or casual
- Expert notes potential problems
- May employ pre-determined criteria
- Expert tries to see the interface from the point of view of the user

# 56 Inspection-Based Evaluations

*Gilbert Cockton, Alan Woolrych, Kasper Hornbæk, and Erik Frøkjær*

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# Usability Inspection/Expert Methods (UIMs)

- Expert inspection of an interface from user point of view
- UIMs are *analytical* evaluation methods, involve no end users, unlike empirical methods
- identify design features that may cause user difficulties.
- Resource requirement low: *discount* methods in HCI
- Alone cannot guarantee high quality evaluation.

# Types of Inspections/Expert Methods

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1. Heuristics \*\*\*
2. Cognitive Walkthrough
3. Heuristic Walkthrough
4. Pluralistic Cognitive Walkthrough

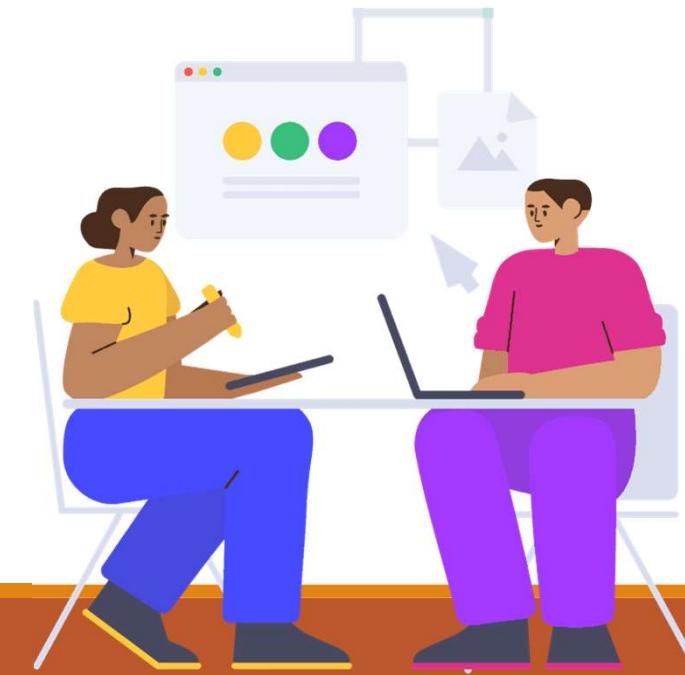
# 10 Usability Heuristics

-  Visibility of system status
-  Match between system and the real world
-  User control and freedom
-  Consistency and standards
-  Error prevention
-  Recognition rather than recall
-  Flexibility and efficiency of use
-  Aesthetic and minimalist design
-  Helps users recognise, diagnose, and recover from errors
-  Help and documentation

# Heuristics (rule of Thumb) Based

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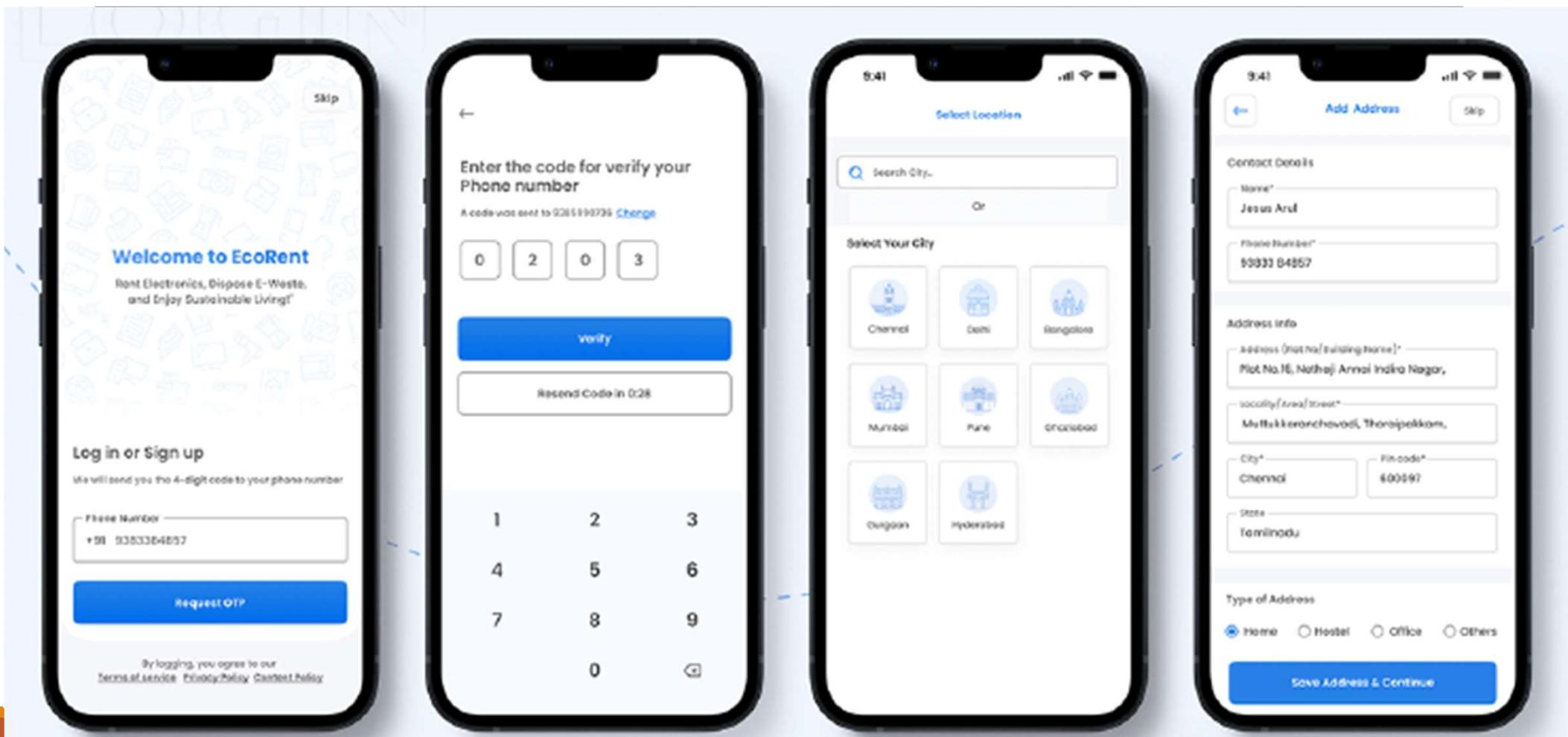
- Nielsen's 10 Heuristics
- Involves 1 or 2 evaluator (usability expert) using the system
- Expert(s) tries to see the interface from the point of view of the user
- Use can be structured or casual
- Expert notes potential problems
- May employ pre-determined criteria



# Typical Inspection/Expert -based Scenario

- Take guidelines and check interface against them
- Make min 2 passes through,
  - First for a screen-by-screen check of principles, to get a “feel” for the system, that is, both the general scope of the system and the flow of interaction.
  - Second for inter-screen flow, focus on specific elements of the user interface
- For best results involve multiple evaluators.

# e.g. Login Screen and Location



# First pass: Screen by screen

The image shows a composite of two screens. On the left is a mobile phone displaying a login or sign-up screen for 'EcoRent'. The screen includes fields for 'Phone Number' (containing '+91 9383384857') and a 'Request OTP' button. On the right is a list titled '10 Usability Heuristics' with corresponding icons:

10 Usability Heuristics	
Visibility of system status	Recognition rather than recall
Match between system and the real world	Flexibility and efficiency of use
User control and freedom	Aesthetic and minimalist design
Consistency and standards	Helps users recognise, diagnose, and recover from errors
Error prevention	Help and documentation

A large red arrow originates from the top edge of the phone's screen and points diagonally upwards towards the top-left corner of the heuristic list.

# First pass: Screen by screen

The image displays three mobile phone screens illustrating a user interface audit process. At the top, a white card titled "10 Usability Heuristics" lists ten principles with corresponding icons:

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Helps users recognise, diagnose, and recover from errors
- Help and documentation

A large red arrow points from this card down to the second phone screen.

The first phone screen shows a welcome message for "EcoRent" and a "Log in or Sign up" form. The second phone screen shows a verification code entry screen with a numeric keypad. The third phone screen shows a numeric keypad for entering a code.

# First pass: Screen by screen

The image displays three mobile phone screens illustrating user interface design, with a red arrow pointing from the top right towards the third screen.

- Screen 1: Welcome to EcoRent**

Welcome to EcoRent  
Rent Electronics, Dispose E-Waste,  
and Enjoy Sustainable Living!

Log in or Sign up  
We will send you the 4-digit code to your phone number

Phone Number: +91 985334857  
Request OTP

By logging, you agree to our  
Terms of Service | Privacy Policy | Contact Us
- Screen 2: Enter the code for verify your Phone number**

Enter the code for verify your Phone number  
A code was sent to 9285990736 Change

0 2 0 3

Verify Resend Code in 0:28

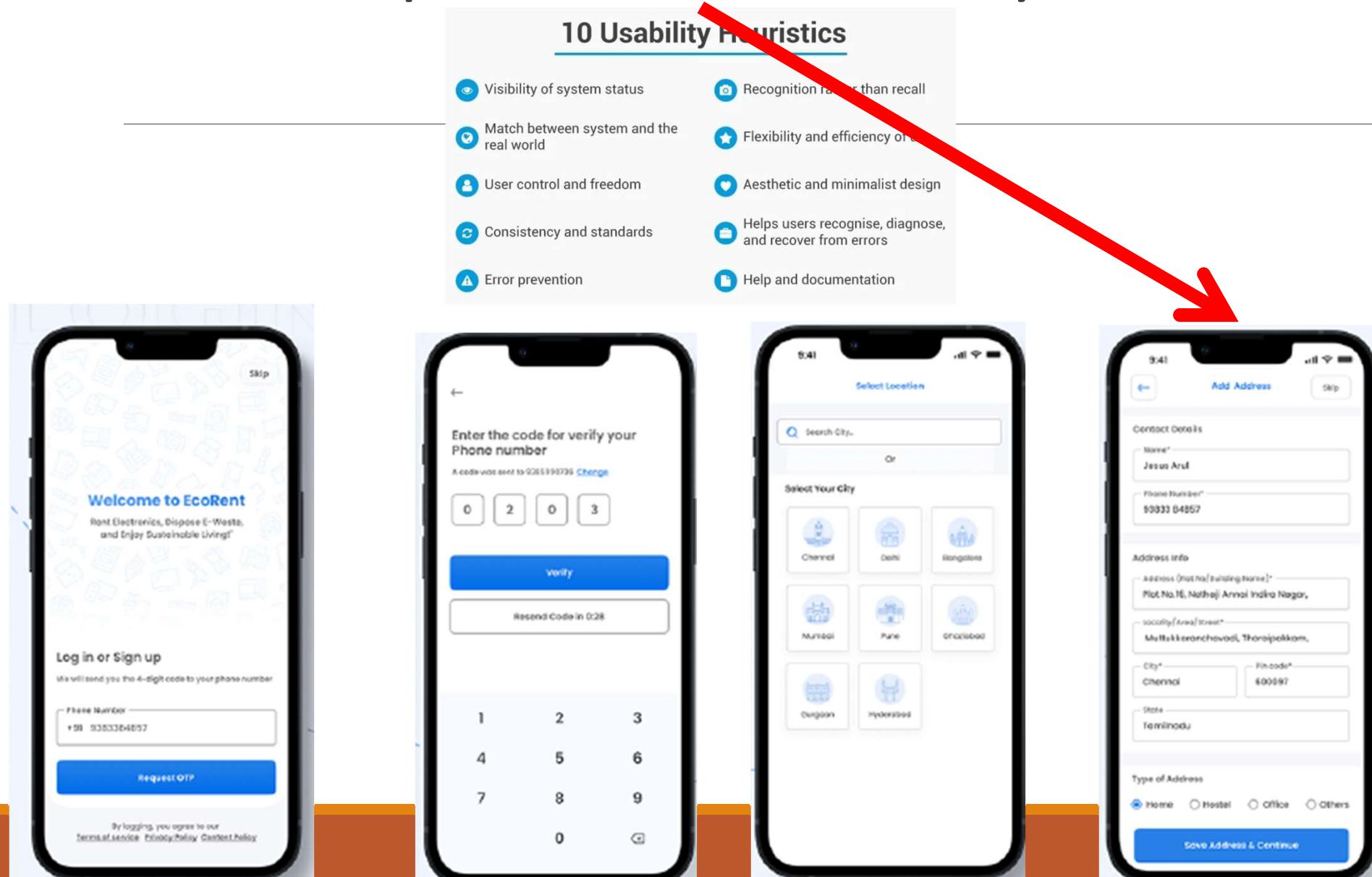
1 2 3  
4 5 6  
7 8 9  
0
- Screen 3: Select Location**

Select Location  
Search City...  
Or  
Select Your City

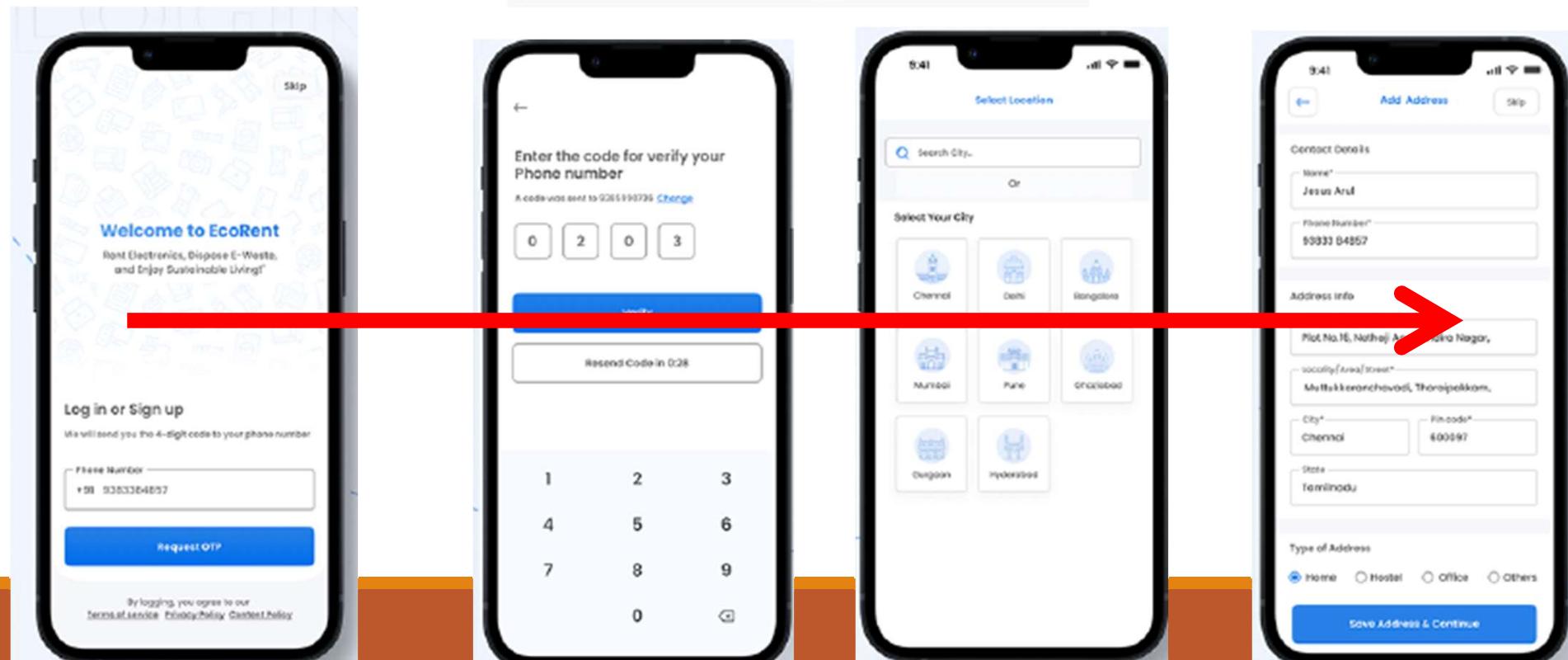
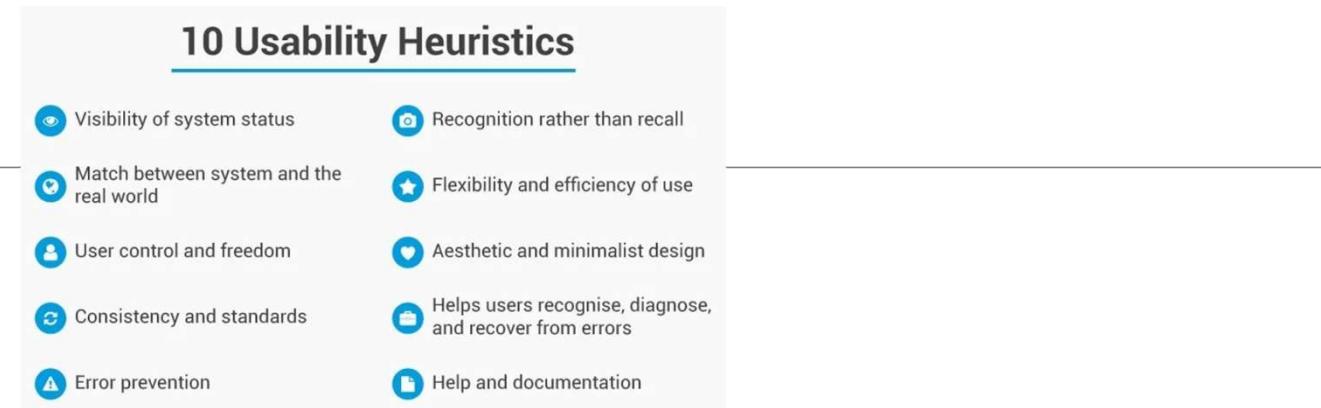
Chennai	Delhi	Mumbai
Mumbai	Pune	Gurgaon
Bangalore	Hyderabad	Delhi

A large red arrow points from the top right towards the third screen, highlighting the "Select Location" interface.

# First pass: Screen by screen



# Second pass: Inter Screen Flow



# 10 Usability Heuristics (Nielsen's)

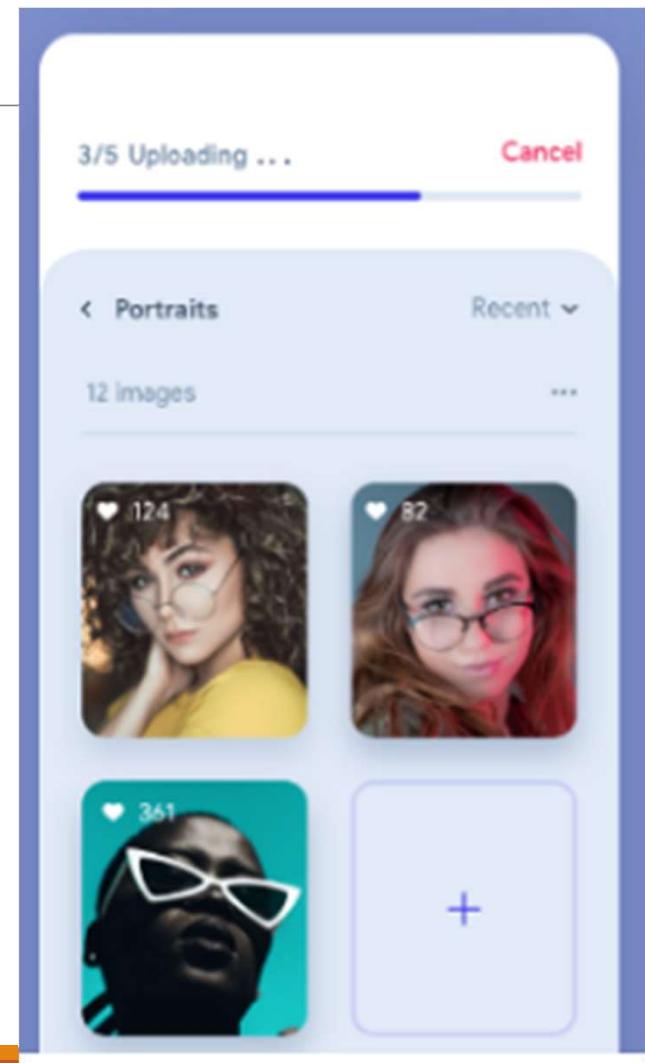
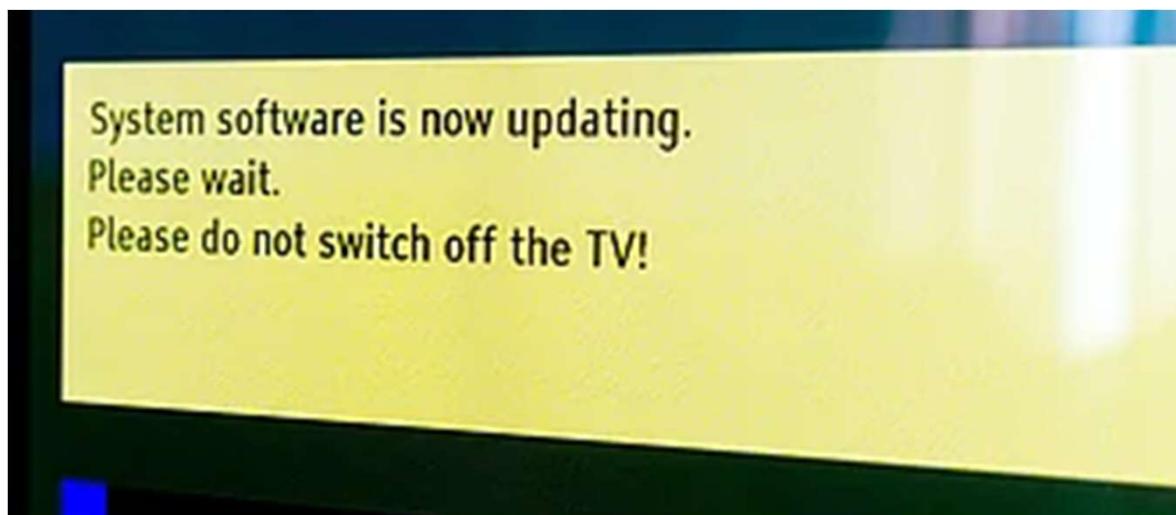
<https://www.nngroup.com/articles/ten-usability-heuristics/>

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1. Visibility of system status
2. Match between system and the real world. ...
3. User control and freedom. ...
4. Consistency and standards. ...
5. Error prevention. ...
6. Recognition rather than recall. ...
7. Flexibility and efficiency of use. ...
8. Aesthetic and minimalist design.
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

# 1 Visibility of system status

- Keep users informed about what is going on
- Communicate clearly
- Present fast feedback

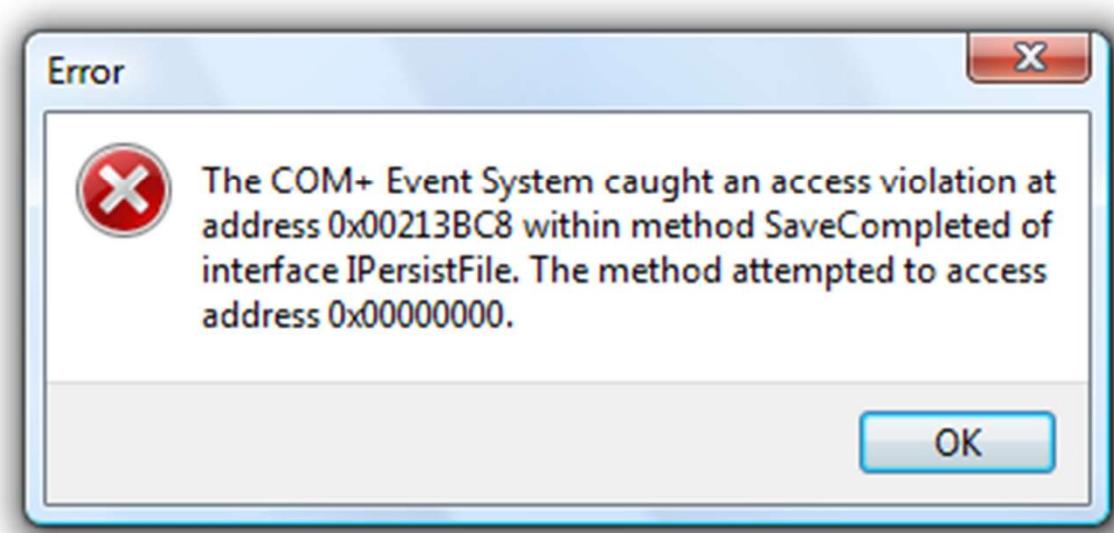


# 2-Match between system and the real world

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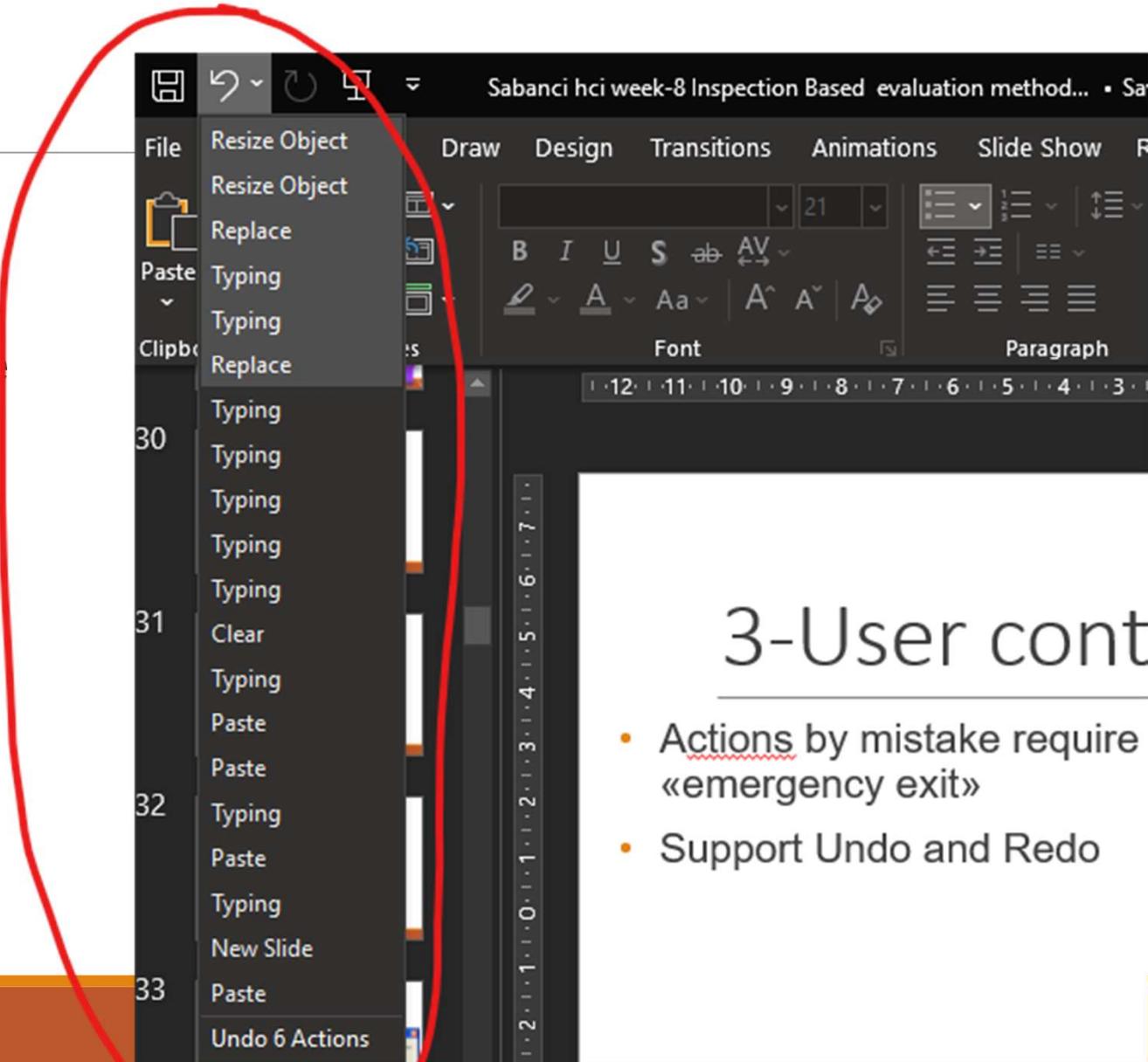
- The design should speak the users' language
- Use words, phrases, and concepts familiar to the user

## Alert Message to User



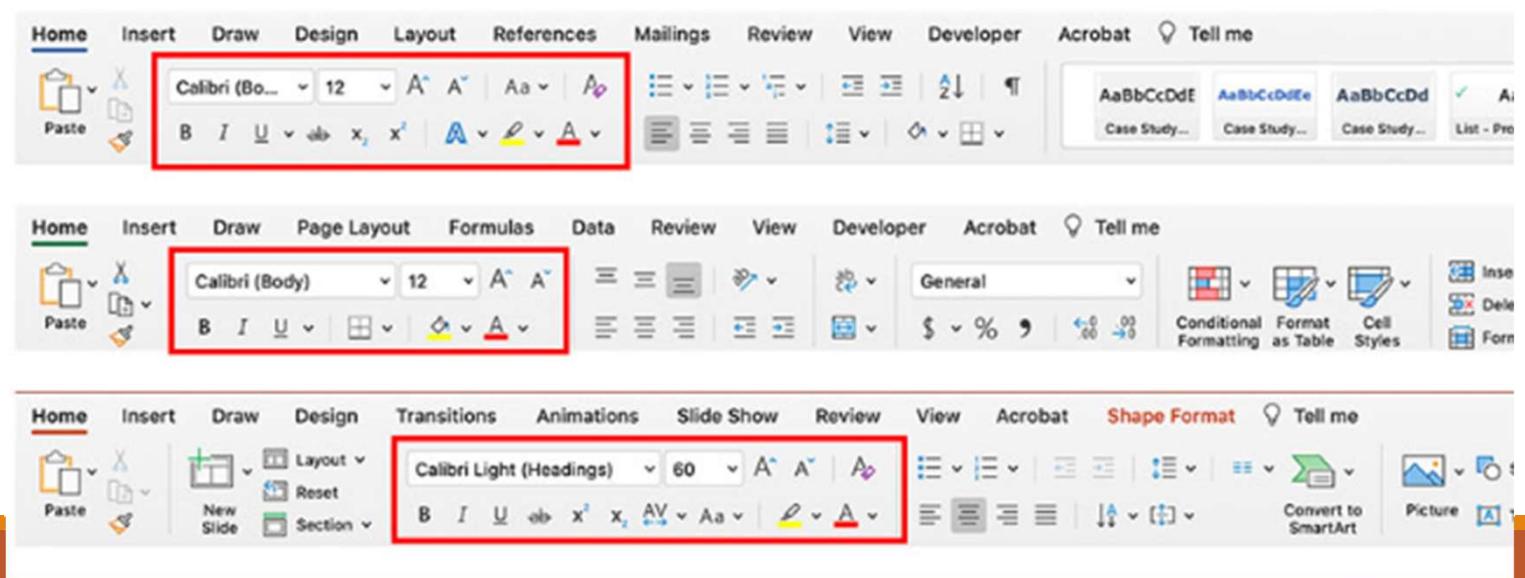
# 3-User control and freedom

- Actions by mistake require «emergency exit»
- Show a clear way to exit the current interaction, like a Cancel button
- Support Undo and Redo



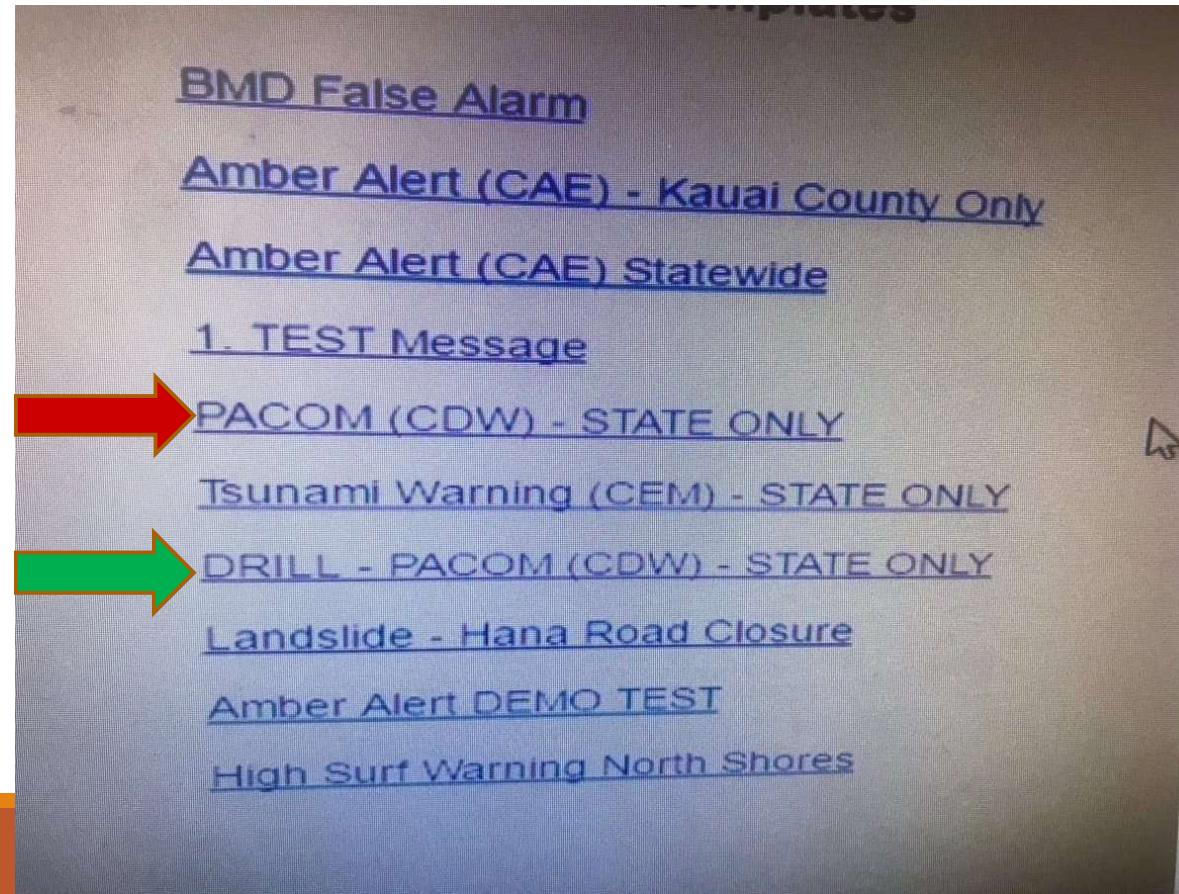
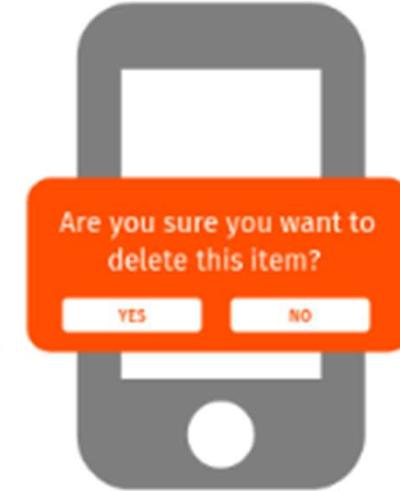
# 4-Consistency and standards

- consistency: internal and external.
- Maintain consistency within a single product or a family of products (internal consistency).
- Follow established industry conventions (external consistency)



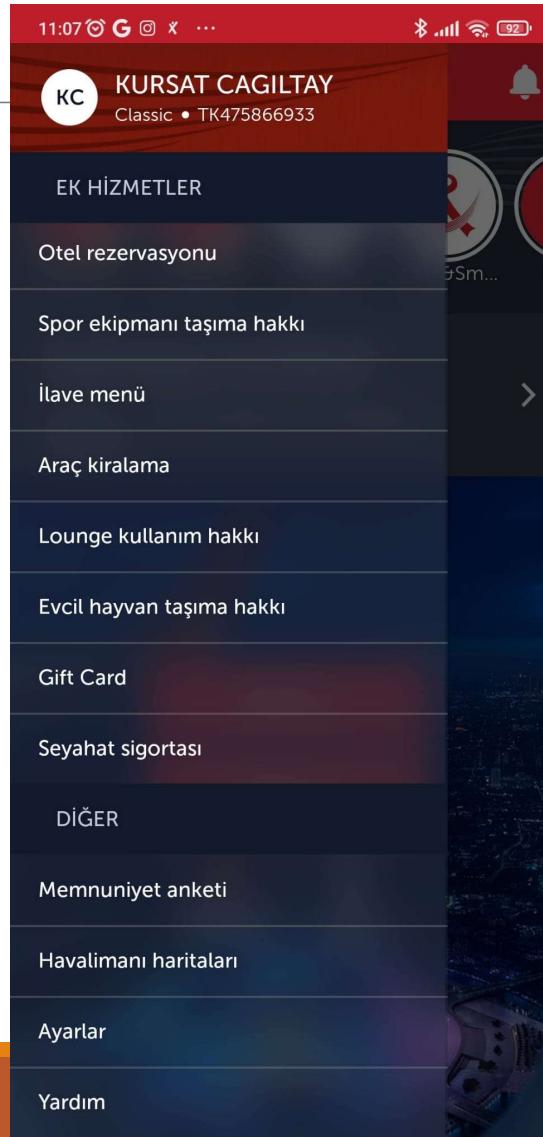
# 5-Error prevention

- Prevent high-cost errors first, then little frustrations.
- Slips vs Mistakes
- Avoid slips by providing helpful constraints and good defaults.
- Prevent mistakes by removing memory burdens, supporting undo, and warning your users.



# 6-Recognition rather than recall

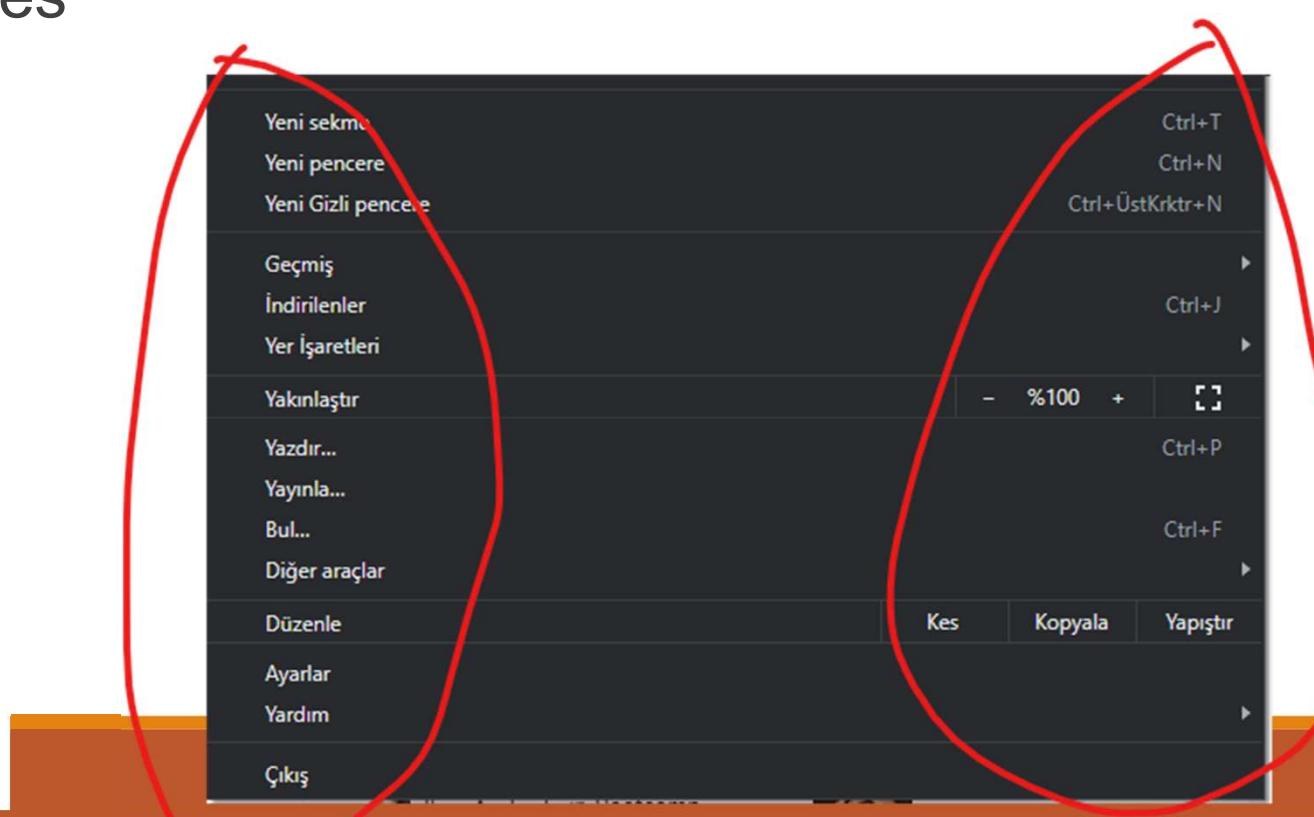
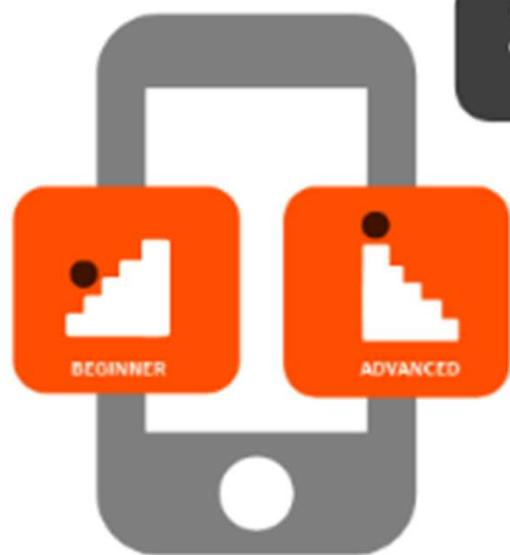
- Recognize information in the interface, rather than having to remember (“recall”) it.
- Offer help in context, instead of giving users a long tutorial to memorize.
- Reduce the information that users have to remember



Recognition  
rather than recall

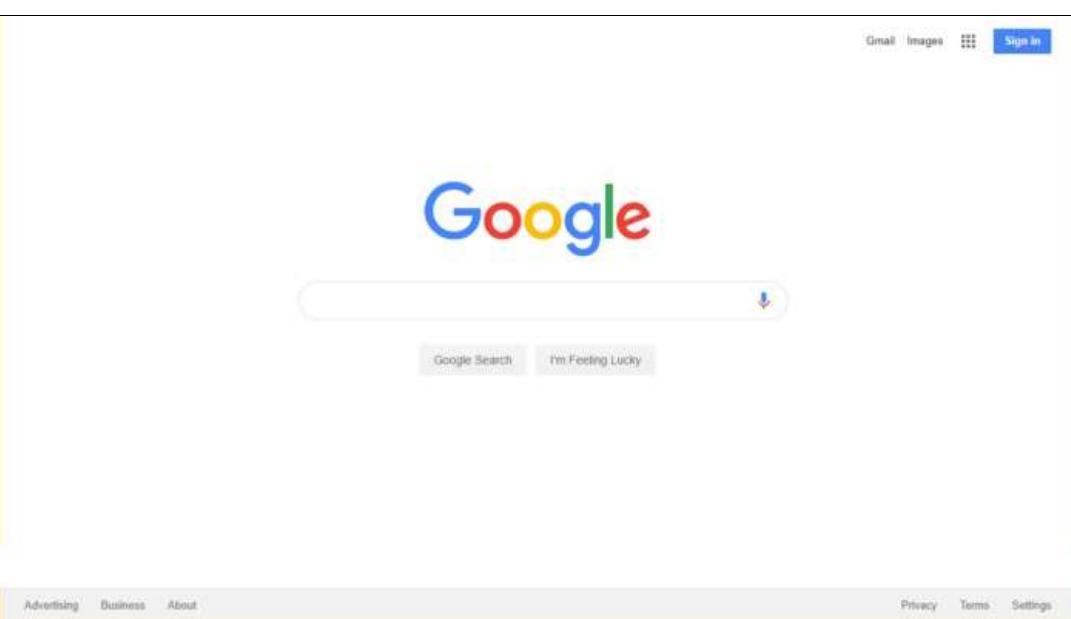
# 7-Flexibility and efficiency of use

- Allow users to tailor frequent actions
- Provide accelerators like keyboard shortcuts and touch gestures



# 8-Aesthetic and minimalist design

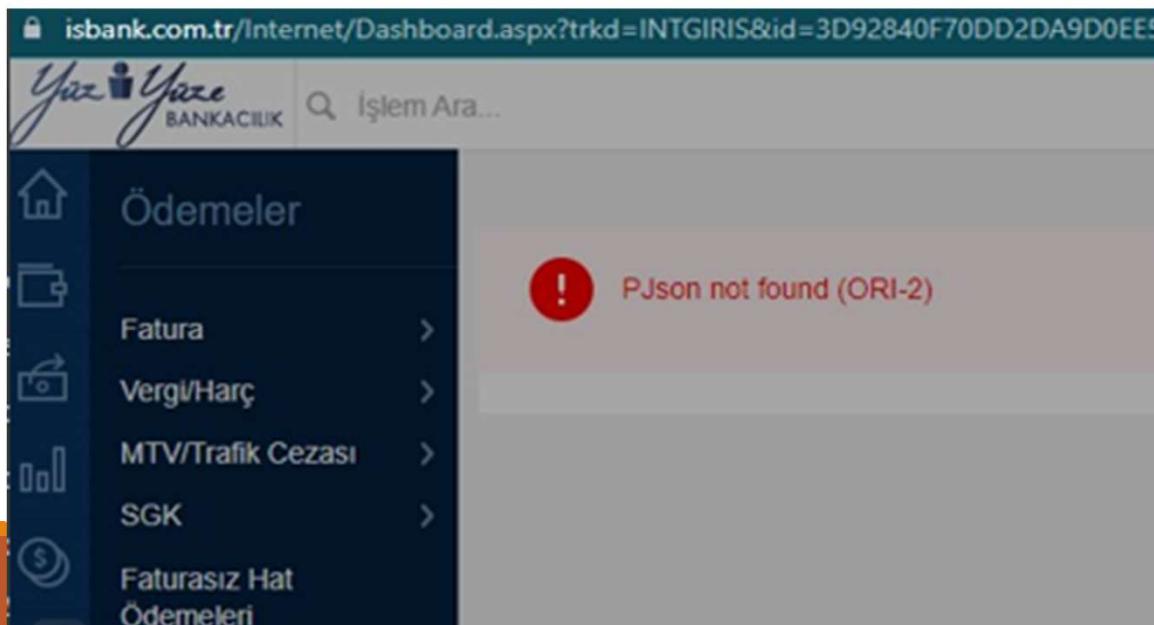
- keeping the content and visual design focused on the essentials
- Visuals support primary goals
- Don't distract users



The image displays the homepage of Babaskent University's website. It features a dark blue header with the university's name and a navigation menu. The main content area includes a large image of the university building, a 'People Search' bar, and sections for 'ALL ANNOUNCEMENTS' and 'ALL EVENTS'. The announcements list various opportunities like part-time jobs and study groups. The events section shows scheduled activities for different clubs, such as NBA exhibition and Hussein Chalayan's new exhibition. The footer contains emergency contact numbers for security and health.

# 9-Help users recognize, diagnose, and recover from errors

- plain language (no error codes),
- precisely indicate the problem,
- constructively suggest a solution



## Söylemekten utanıyoruz ama...

Firefox pencerelerinizi ve sekmezinizi kurtarma konusunda sorun yaşıyor. Bu da genelde daha yeni açılan bir sayfadan kaynaklanır.

Bunları yapmayı deneyebilirsiniz:

- Soruna neden olduğunu düşündüğünüz bir veya daha fazla sekmeyi kaldırma
- Tamamen yeni bir tarama oturumu başlatma



# 10-Help and documentation

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- Help documentation is easy to search.
- present it right at the moment that the user requires it.
- List concrete steps to be carried out.

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 Slackbot 3:51 AM  
I searched for that on our Help Center. Perhaps these articles will help:

- An introduction to Slackbot
- Improve company culture with Slack
- Getting started for workspace creators



# 10 Usability Heuristics : How?

<https://www.nngroup.com/articles/ten-usability-heuristics/>

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5. Error prevention. ...
6. Recognition rather than recall. ...
7. Flexibility and efficiency of use. ...
8. Aesthetic and minimalist design.
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

# Assignment-4

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- conducting heuristics/inspection-based usability testing
- You are the UX expert
- Summative testing of a location-based game – Gezdir
- Developed to play at Sabancı University campus
- Target group high school students visiting the campus
- Under development

**eyesoft**

E-Posta

kursat.cagiltay@sabanciuniv.edu

Şifre

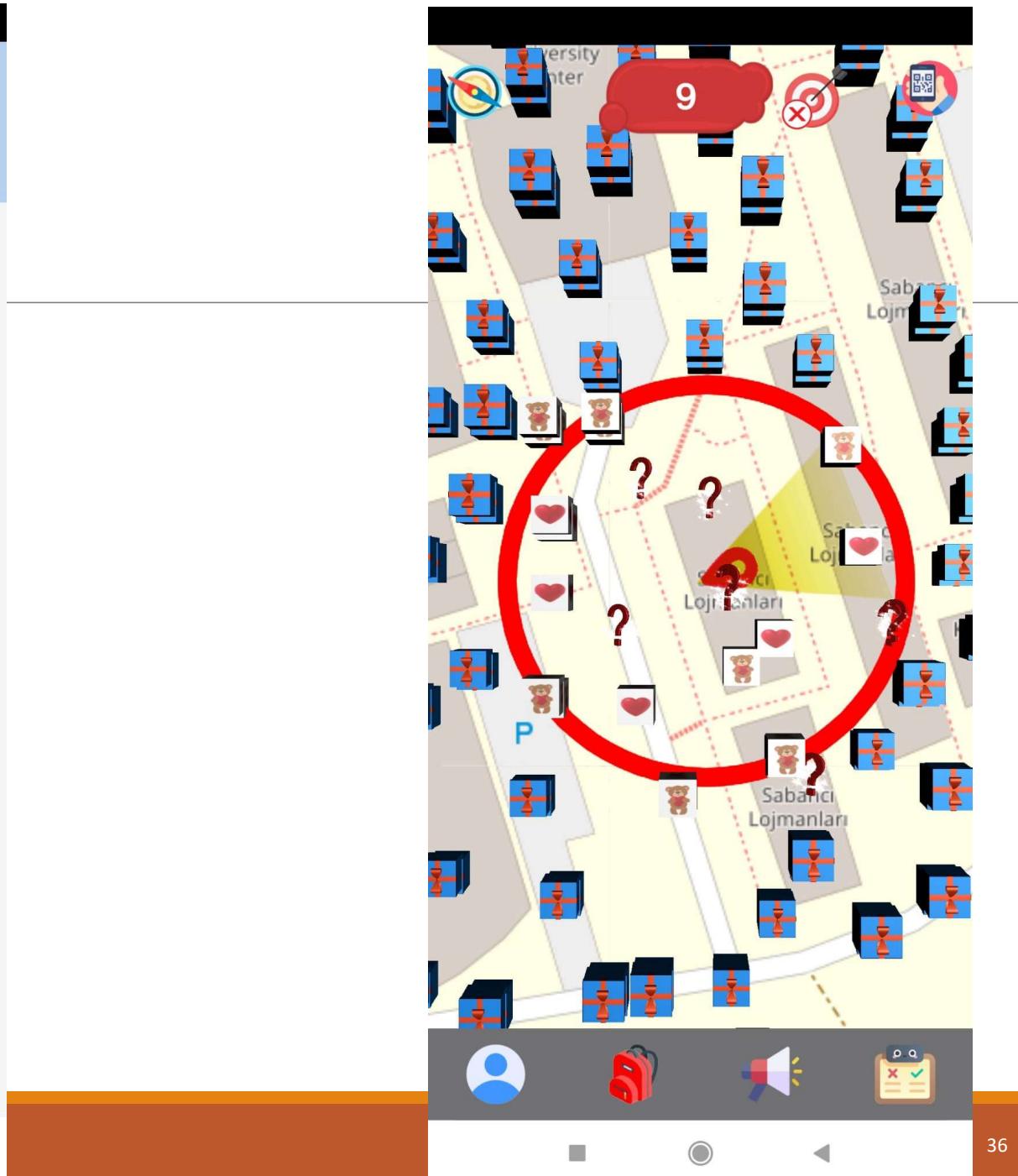
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Şifremi  
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Giriş Yap

Kayıt Ol



<https://www.nngroup.com/articles/usability-heuristics-applied-video-games/>

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## 10 Usability Heuristics Applied to Video Games

**Summary:** Following Jakob Nielsen's 10 heuristics for user-interface design will improve the user experience of video games.

# Assignment-4

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- Identify and explain usability problems of this game
  - rate how serious those problems are
  - propose a possible solution
- 
- December 12th Tuesday

# Types of Inspection/Expert Methods

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- Heuristics
- Cognitive Walkthrough
- Heuristic Walkthrough
- Pluralistic Cognitive Walkthrough

# Cognitive Walkthrough (CW)

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“Walk up and use systems” + task-based assessment. Based on four CW questions. Evaluators assess :

Q1- The user know what to do? Is it correct?

Q2-User notice that correct action is available/visible? recognize it?

Q3. User associate correct action with the effect to be achieved? visible, understand?

Q4. User sees that progress is made? Is there visible/understandable/feedback

# CW Procedure

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- Four questions, and walkthrough procedure, are main resources.
- If goal is set, the evaluator then breaks the “goal” down into the component task steps required to successfully achieve it.
- At each step, the evaluator asks questions. A negative response to any of the CW questions indicates a *possible* usability problem.
- To identify *probable* problems, evaluators must form success or failure judgments based on the cumulative impact of possible problems for a task.

# An Example CW Session



Task: User records and uploads a video

Action Sequence:

① User Presses Record

② User Presses Stop

③ User Presses Upload

Notes:

# Types of Inspection/Expert Methods

---

- Heuristics
- Cognitive Walkthrough
- Heuristic Walkthrough
- Pluralistic Cognitive Walkthrough

# Heuristic Walkthrough-HW

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- Hybrid approach that combines HE and CW.
- prioritized list of user tasks, frequent or critical ones
- HW provides more guidance on task selection than HE, CW,
- It has two phases: task-based and free-form:  
Evaluators
  - explore tasks using questions from CW.
  - freely explore system. Use thought provoking questions & heuristics.

# Types of Inspection/Expert Methods

---

- Heuristics
- Cognitive Walkthrough
- Heuristic Walkthrough
- Pluralistic Cognitive Walkthrough

# Pluralistic Walkthrough (PW) from IBM

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- PW, an administrator + a team of three diverse participants
  - a representative user,
  - a product developer, and
  - a usability specialist who pretend to be system users.



# Pluralistic Walkthrough (PW) from IBM

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- PW, an administrator + a team of three diverse participants
- They are given a set of screens and task descriptions.
- For each screen, the participant is asked to write down in as much detail the next action that the user would take to achieve the task.
- Once each participant has written down the next action, the screen is discussed, usability specialists and product developers talk (e.g., to explain the rationale of certain features).

# Knowledge resources for problem discovery and analysis

---

- **User** (knowledge of/beliefs / experience and abilities)
- **Task** (knowledge of what/how users want to do)
- **Domain** (domain knowledge of the system being evaluated)
- **Design** (knowledge and experience of interaction design principles)
- **Interaction** (knowledge of how humans interact with computers)
- **Technical** (knowledge of platform technologies)
- **Product** (information about the system and its capabilities)

# Advantages of Expert-based Evaluations

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- Can be quick
- Cheaper than user testing
- Can lead to diagnosis
- Can be employed at all stages of design
- No special facilities required

# Disadvantages of Expert-based Evaluations

---

- Who determines ‘expertise’
- Expertise in task is also important (Nielsen 1993 study)
- Experts disagree!
- Predicting user behavior is difficult



## Strategies to enhance the user experience

[Home](#) [People](#) [Services](#) [Publications](#) [Events](#) [About NN/g](#)

[NN/g Home](#) > [Services](#) > Design Reviews

# Design Reviews (Usability Inspections)

## Price:

**\$38,000** for a review of a website or intranet.

**\$73,000** for a competitive review of your website + 3 competitors.

## Method

Nielsen Norman Group provides an **independent expert** assessment of your user experience. Getting an independent review is important, because research shows that different people tend to identify different problems. The outside view is not just more objective; it's free of the

## ► How to Order

Please contact Nielsen Norman Group at [info@nngroup.com](mailto:info@nngroup.com) if you would like more information or are interested in this service.

# Xerox Heuristics



## Heuristic Evaluation - A System Checklist

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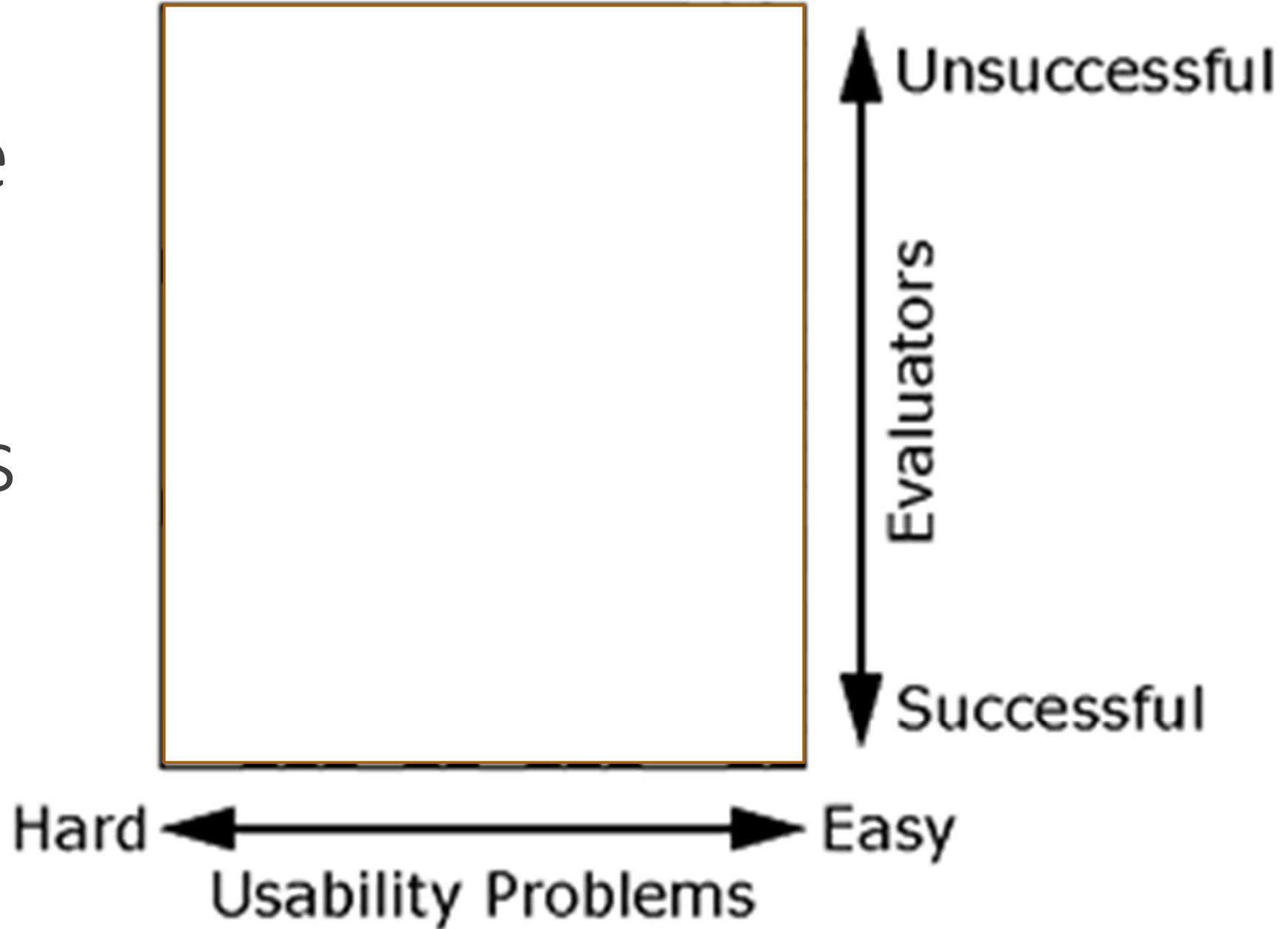
### 1. Visibility of System Status

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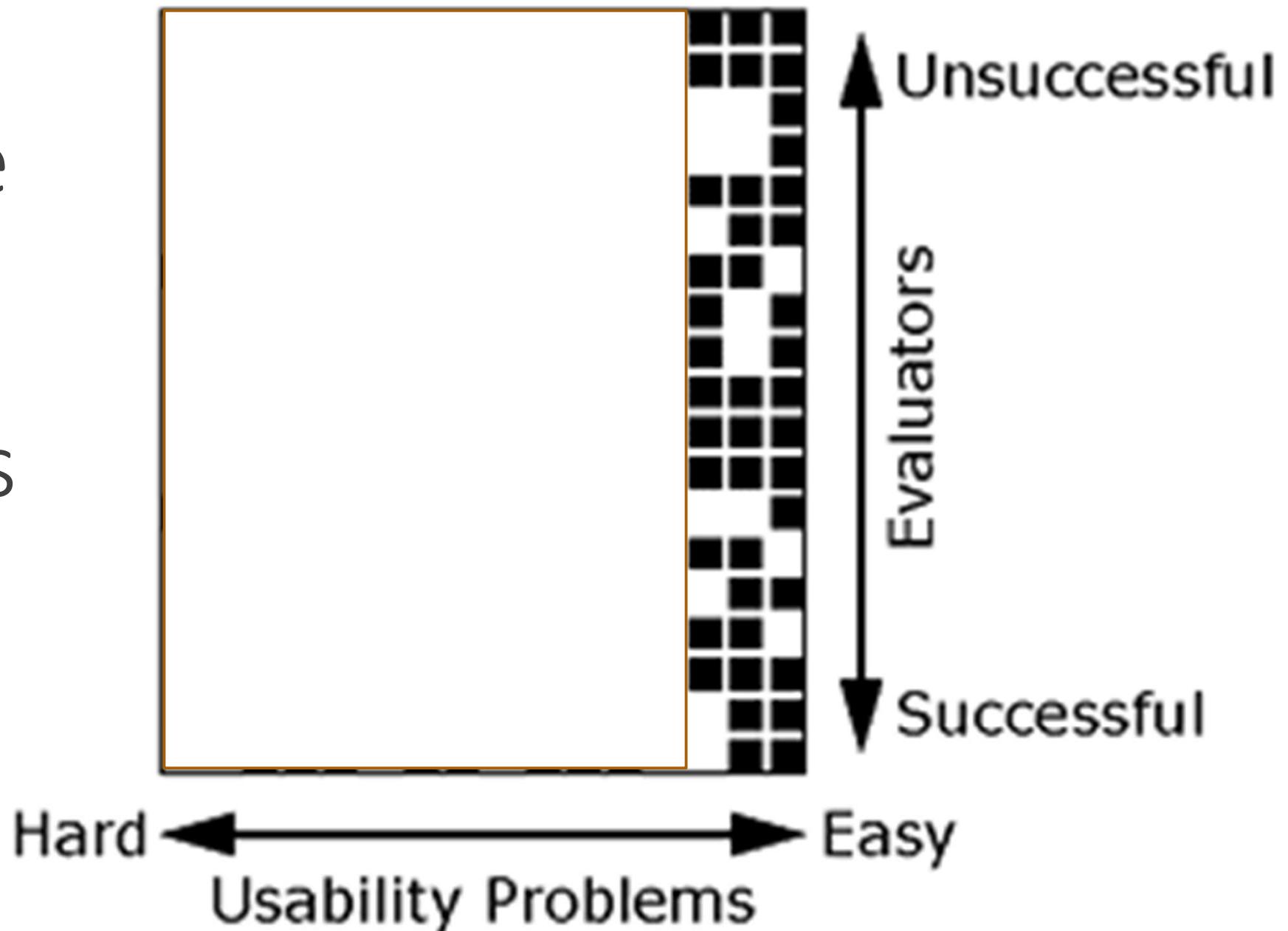
**The system should always keep user informed about what is going on, through appropriate feedback within reasonable time.**

#	Review Checklist	Yes	No	N/A	Comments
1.1	Does every display begin with a title or header that describes screen contents?	O	O	O	
1.2	Is there a consistent icon design scheme and stylistic treatment across the system?	O	O	O	
1.3	Is a single, selected icon clearly visible when surrounded by unselected icons?	O	O	O	
1.4	Do menu instructions, prompts, and error messages appear in the same place(s) on each menu?	O	O	O	
1.5	In multipage data entry screens, is each page labeled to show its relation to others?	O	O	O	
1.6	If overtype and insert mode are both available, is there a visible indication of which one the user is in?	O	O	O	
1.7	If pop-up windows are used to display error messages, do they allow the user to see the field in error?	O	O	O	

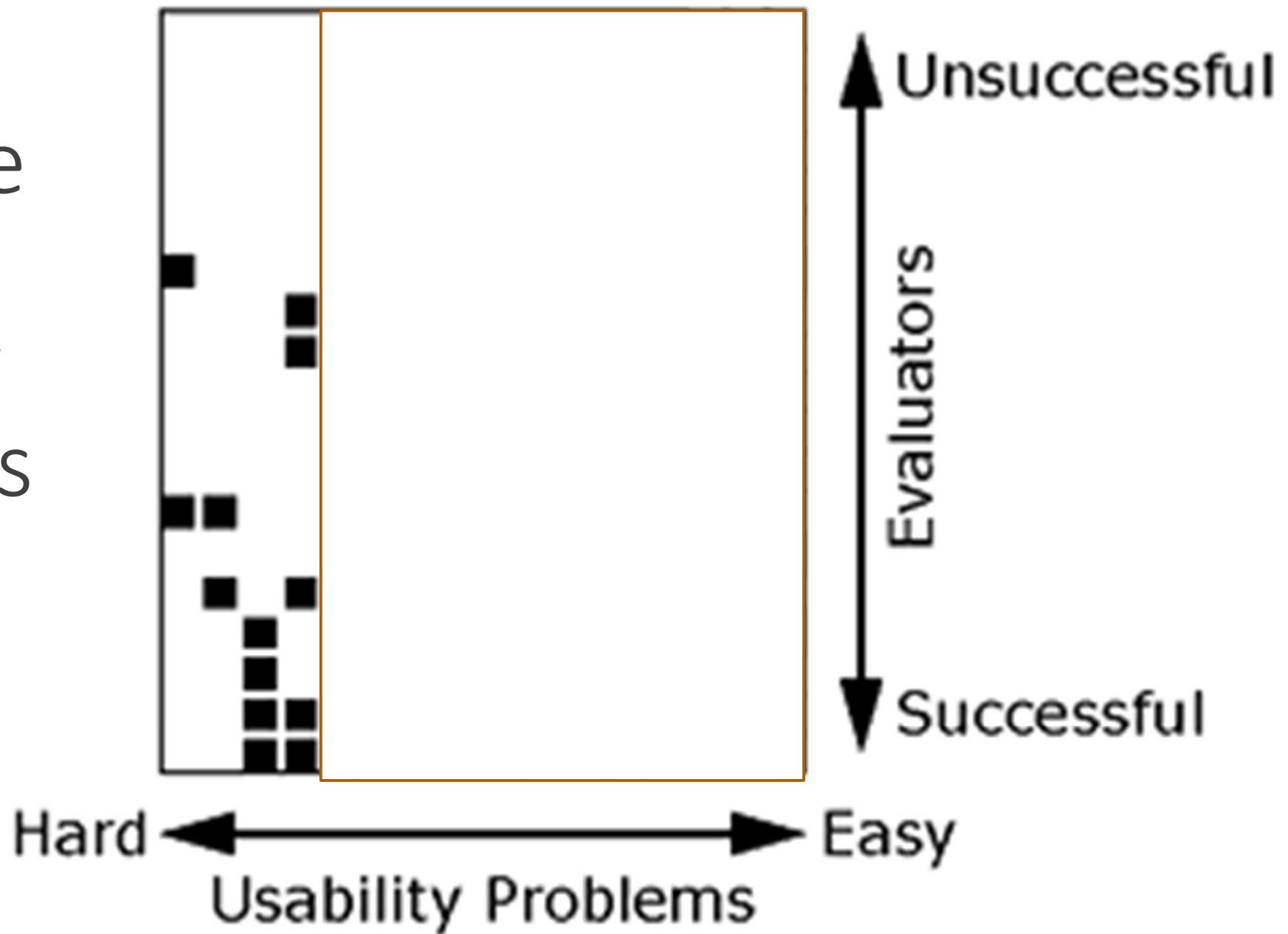
# Expertise vs Usability Problems



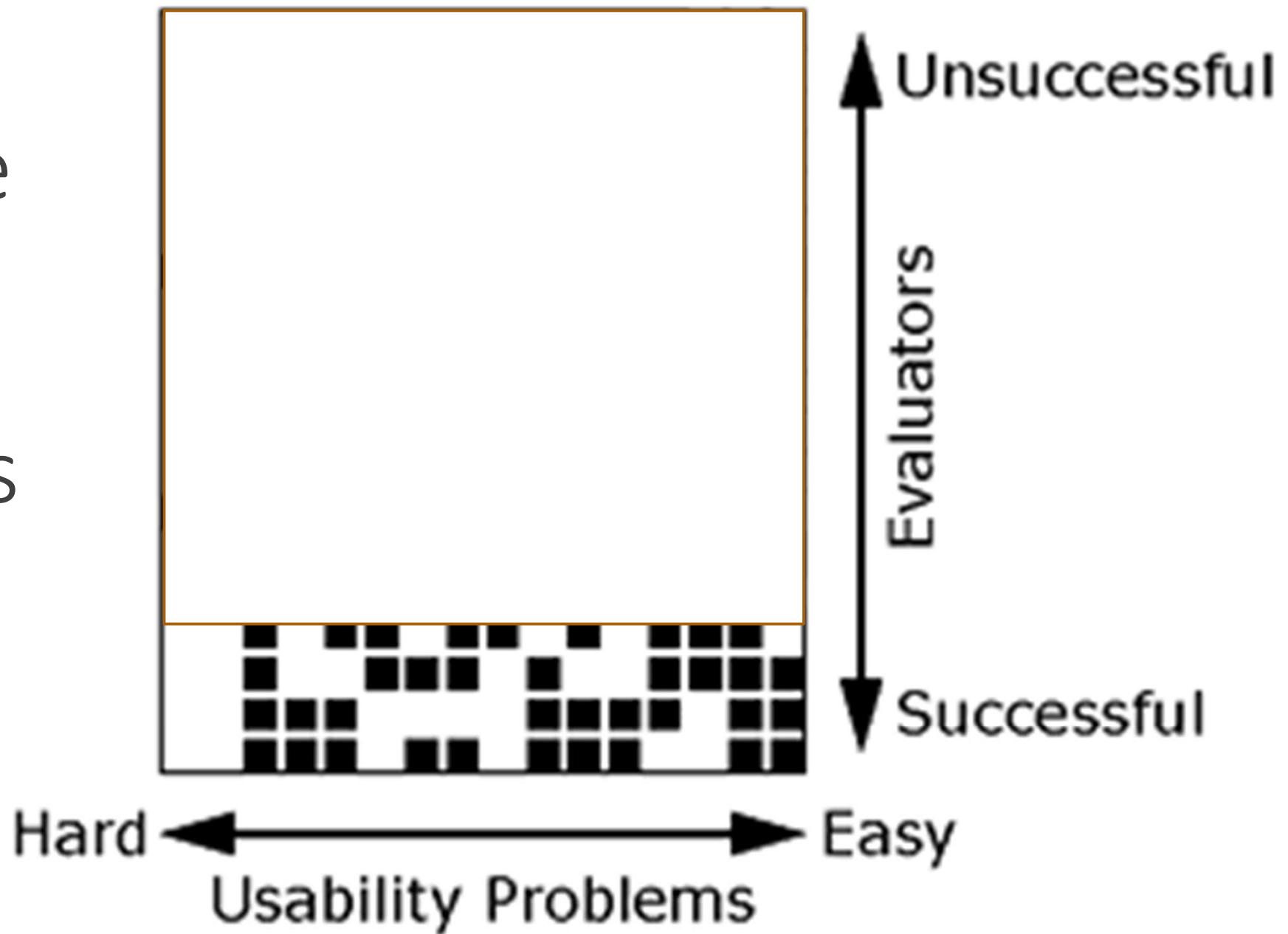
# Expertise vs Usability Problems



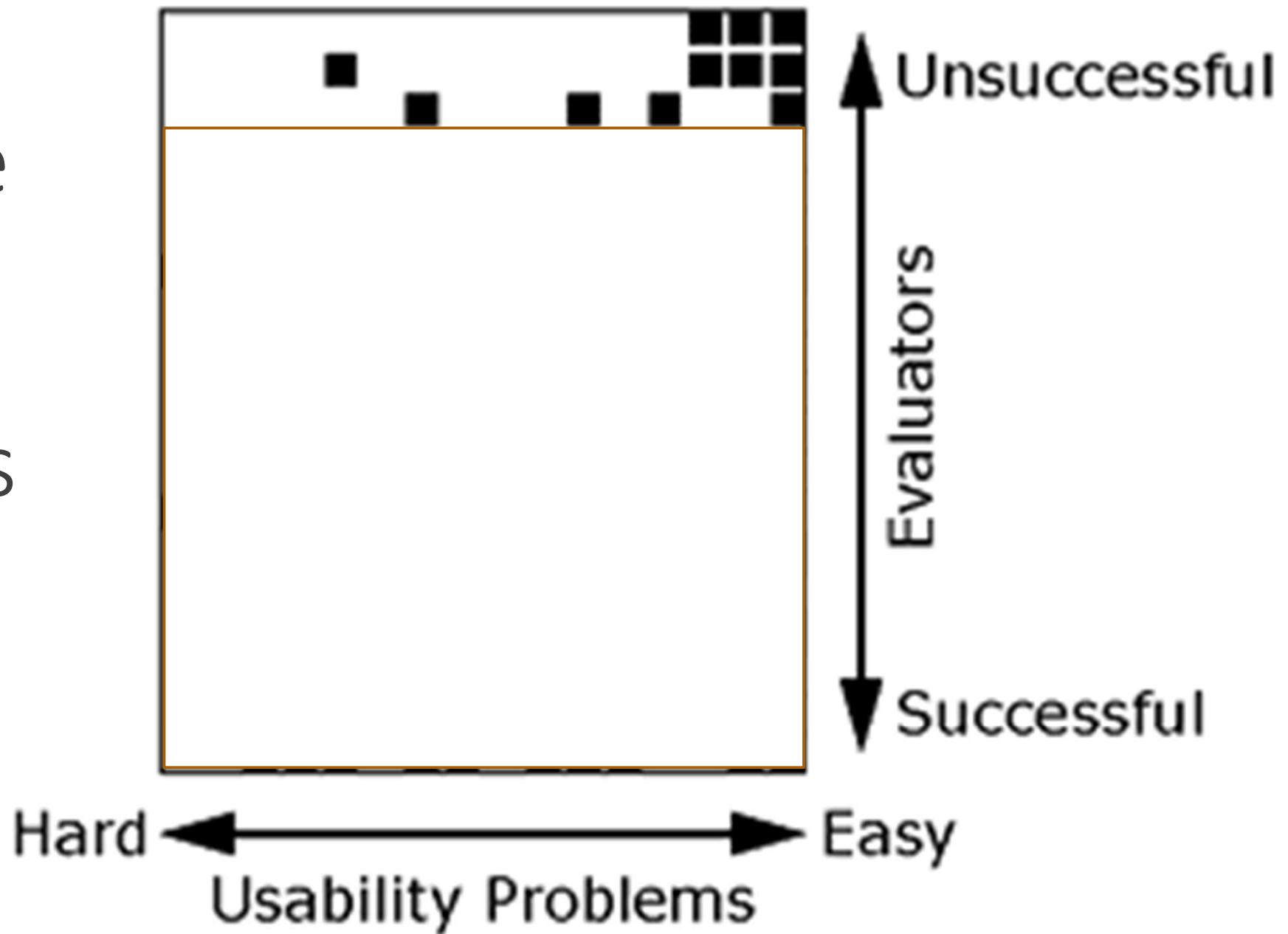
# Expertise vs Usability Problems



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