Evaluation Methods, Models, and Techniques in Chapter 15

1. Usability Testing

- **Definition**: Usability testing is the process of evaluating a product by testing it with real users in controlled environments. The goal is to ensure that the product is easy to use and meets user expectations.
- **When and Why It Is Used**: Usability testing is employed during different stages of product development to gather data about user interactions, including the ability to complete tasks and overall satisfaction.
- **Necessary Steps/Principles**:
  i. Define the objective and scope of testing.
  ii. Recruit participants representative of the target audience.
  iii. Develop specific tasks for users to complete.
  iv. Collect data through observations, logging actions, and think-aloud methods.
  v. Analyze the data to identify usability issues and recommend improvements.
- **Who Created the Model and When**: Usability testing was popularized in the 1980s as digital products grew in complexity. Key contributors include Shneiderman (1986) and Dumas & Redish (1999).

2. Controlled Experiments

- **Definition**: Controlled experiments are a method to compare different versions of a product or interface, often testing hypotheses regarding usability features.
- **When and Why It Is Used**: These experiments are used to evaluate specific hypotheses about user performance, typically with controlled variables to minimize external influences.
- **Necessary Steps/Principles**:
  i. Establish a hypothesis to be tested.
  ii. Define independent (manipulated) and dependent (measured) variables.
  iii. Set up different-participant, same-participant, or matched-participant designs.
  iv. Conduct experiments in lab settings with strict control over environmental factors.
  v. Analyze data using statistical tools like t-tests to determine significant differences.
- **Who Created the Model and When**: Experimental design techniques have roots in early psychology studies in the 20th century, with statistical methods being integral in many usability research fields.

3. In-the-Wild Studies

- **Definition**: In-the-wild studies involve evaluating products in natural settings to see how users incorporate them into their real-world environments.
- **When and Why It Is Used**: These studies are used to understand how products work in uncontrolled environments, where participants use them in realistic contexts over extended periods.
- **Necessary Steps/Principles**:
  i. Identify target participants and natural usage settings.
  ii. Deploy products with minimal intervention by evaluators.
  iii. Collect data through observation, diaries, and automatic logging of usage.
  iv. Analyze findings qualitatively, often using narratives, patterns, and critical incidents.
- **Who Created the Model and When**: In-the-wild studies gained traction with the development of mobile and ubiquitous computing technologies during the late 20th and early 21st centuries, with contributions by Rogers & Marshall (2017).

4. Remote Usability Testing

- **Definition**: Remote usability testing involves conducting usability studies with participants at a distance, often through digital communication tools and software that tracks interactions.
- **When and Why It Is Used**: It became especially prominent during the COVID-19 pandemic to ensure safety while continuing usability evaluations.
- **Necessary Steps/Principles**:
    i. Select tools for remote communication and tracking (e.g., Zoom, Teams).
    ii. Recruit participants and ensure they have necessary hardware.
    iii. Conduct sessions either synchronously or asynchronously.
    iv. Ensure clear instructions are given for remote self-guidance.
    v. Log participant interactions automatically and conduct post-session interviews.
- **Who Created the Model and When**: Remote usability testing started in the 1990s (Hartson et al., 1998), with increased importance during the pandemic (Gov.UK, 2021).

5. Think-Aloud Protocol

- **Definition**: The think-aloud protocol requires participants to verbalize their thoughts while interacting with a system, revealing the thought processes behind actions.
- **When and Why It Is Used**: It is commonly used during usability testing to provide deeper insight into the reasoning behind user behavior.
- **Necessary Steps/Principles**:
    i. Ask participants to narrate their thoughts as they work on tasks.
    ii. Ensure moderators take note without interfering.
    iii. Analyze the recorded data to identify pain points and areas of confusion.
- **Who Created the Model and When**: The think-aloud method traces its roots to cognitive psychology, particularly studies by Ericsson and Simon in the 1980s.

These various methods demonstrate a range of evaluation techniques from controlled laboratory settings to real-world environments, each suited to different research needs. Let me know if you need more detail on any specific method or want to explore some case studies!