Acceptance and Adoption of AI Technology in the Context of Reliability and Maintainability

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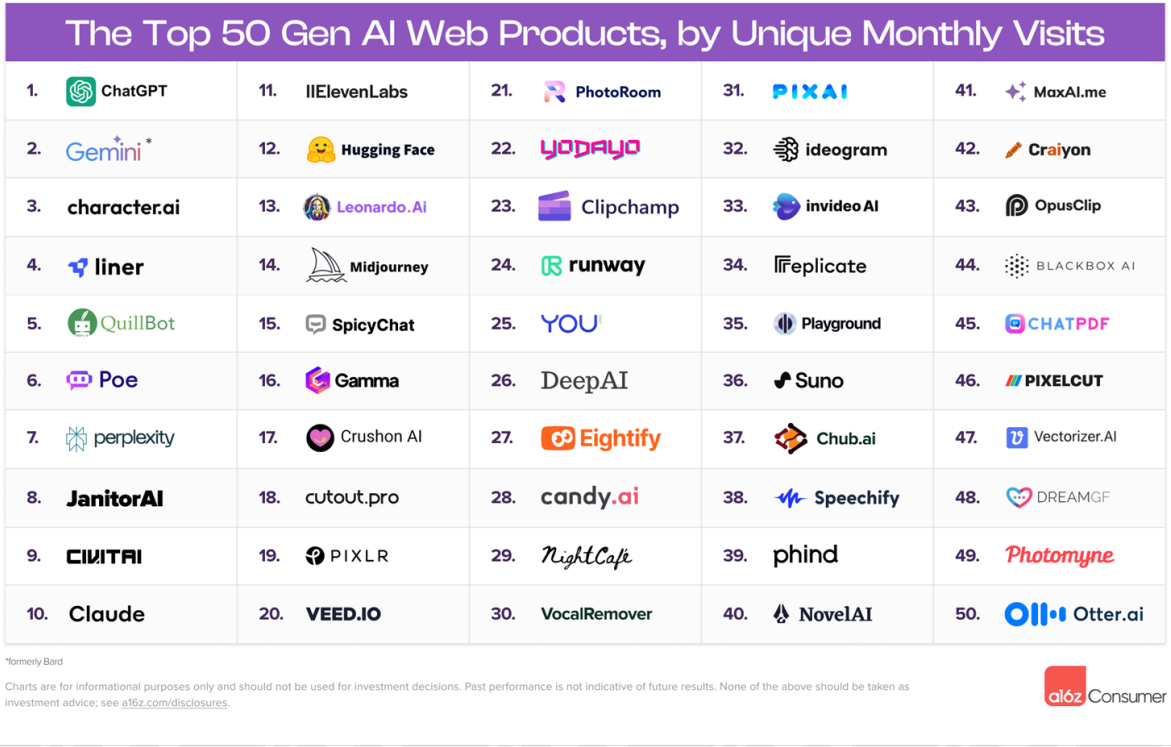
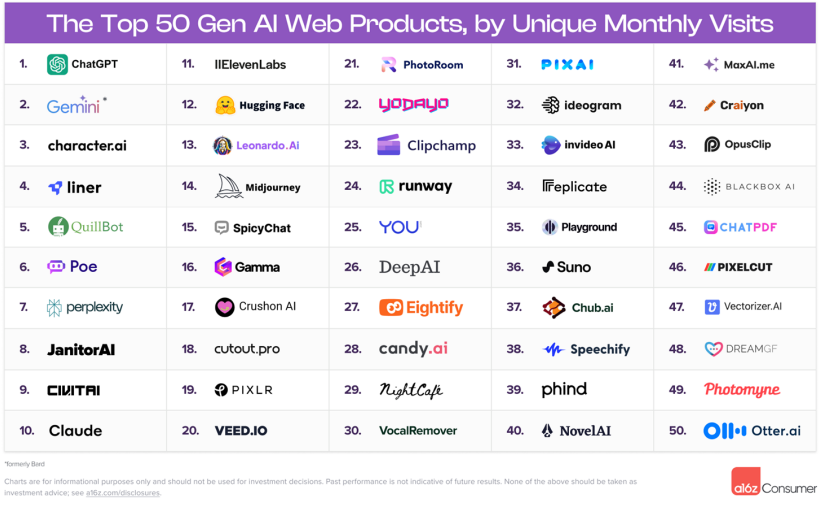
50 AI-first Web tools as of January 2024



Introduction

- Technology, particularly AI technology, is growing at an incredible rate
- With that, the uses of this kind of technology are also growing
- Adoption of technology does not keep up with the growth of the technology



AI Technology

- There is no single definition of AI in literature (Gansser and Reich, 2021)
- AI is often defined by its likeness to humans, or its ability to act rationally (Sindermann et al., 2022)
- With the help of the definition above and for the purposes of this presentation, we define AI as such:

  “**AI-technology is technology that is characterized by its ability to function without human assistance and to provide an output that is similar, if not identical, to that which a human would give.”**

Acceptance and Adoption of Technology

Often used interchangeably

- Acceptance - An attitude towards technology that is influenced by factors such as perceived usefulness and perceived ease of use (Weger et al., 2022)
- Adoption - The actual use of the technology to its full capabilities (Weger et al., 2022)

Individual Differences (ID)

- An **individual difference (ID)** is any psychological trait that varies from person to person
  - For Example: Age, Gender, Career, Personality, Education, etc. (Zhang et al, 2021; Korber & Bengler; 2014)
- Individual difference variables affect user acceptance and adoption (Agarwal & Prasad, 1999)
- Importance of Understanding the impact of ID

Purpose

This review was conducted for the following two purposes:

- To explore the various ID factors that contribute to the acceptance and adoption of AI technology, recognizing that these factors can vary from person to person.
- Provide insights that can guide the development of AI systems with a focus on enhancing system reliability and maintainability.

Methodology

- PsycINFO and Google Scholar search engines
- Inclusion Criteria:
  - Peer reviewed
  - Keywords (“Individual Differences”, “Acceptance of AI Technologies”, etc.)
- Collected 123 articles and conference papers
  - 10 excluded
  - 8 of these concerned AI Technology
- Qualitative comparison of AI Technology Literature on ID versus General Technology

16 Primary Individual Difference (ID) Factors Identified

Gender	**Learning/ Cognitive Style**	**Satisfaction**	**Self-efficacy**
Age	**Experience**	**Technostress**	**Culture**
Personality	**Attitude**	**Trust**	**Social influence/ Subjective norm**
Income/ Socio-economic status	**Voluntariness**	**Enjoyment/ Hedonic Motivation**	**Computer Anxiety**

9 IDs found for AI Technology

Gender (n = 2)	**Learning/ Cognitive Style**	**Satisfaction**	**Self-efficacy (n = 1)**
Age (n = 2)	**Experience**	**Technostress**	**Culture (n = 2)**
Personality (n = 3)	**Attitude (n = 1)**	**Trust (n = 3)**	**Social influence/ Subjective norm (n = 2)**
Income/ Socio-economic status	**Voluntariness**	**Enjoyment/ Hedonic Motivation (n = 3)**	**Computer Anxiety**

Individual Difference Factor: Trust and Culture

- Trust = the willingness to be vulnerable with the expectation of achieving something in exchange (Wua, et al., 2011)
  - Many studies indicated that trust positively predicts behavioral intentions to use AI (Kelley et al. 2023)
  - Trust positively influences willingness to use AI technology (Chi et al., 2023)
- Cultural differences = culture referred to the country in which the study took place.
  - Across studies, different cultures demonstrate differences in

Individual Difference Factor: Enjoyment and Hedonic Aspects

- Enjoyment or Hedonic Aspects = the perceived amount of fun or entertainment someone gets from using a technology (Sohn & Kwon, 2020, Chi et al., 2023)
  - Enjoyment had the largest proportional influence on purchase intention of various AI technologies among other factors such as subjective norms, attitude, technicality, ease of use, usefulness, perceived value, and perceived fee (Sohn and Kwon, 2020)
  - Hedonic aspects positively influences behavior intentions to use AI (Gansser and Reich, 2021)

Individual Difference Factor: Social Influence and Subjective Norm

- Social influence or subjective norm = degree to which someone is influenced by what they thought others would want them to do or would approve of them doing
  - Subjective norms were the second most influencing variable in AI adoption after enjoyment (Sohn and Kwon, 2020)
  - Social influence positively influenced behavior intentions to use AI (Gansser and Reich)

Individual Difference Factor: Personality

- Personality = behavior and intrapersonal processes that originate within individuals and are consistent over time (Burger,2018)
  - Many more significant relationships between personality and AI technology acceptance (Gessl et al., 2019, Weger et al., 2022)
  - In a Chinese sample, agreeableness and openness were positively related to acceptance of AI, and agreeableness was negatively related to fear towards AI (Sindermann et al., 2022)
  - Neuroticism positively associated with fear towards AI (Sindermann et al., 2022)

Individual Difference Factors: Others

- Other IDs in AI technology acceptance and adoption
  - Acceptance of AI technology does not differ by gender

    (Weger et al., 2022; Gessl et al., 2019)
  - Age demonstrates highly mixed results in terms of significance

    (Weger et al., 2022; Gessl et al., 2019)
  - Self-efficacy positively correlates with acceptance of AI technology

    (Montag et al., 2023)
  - Attitude has a small positive effect on behavioral intention

    (Sohn and Kwon, 2020)

Discussion

- IDs play a large role in both general and AI-specific technology acceptance
- There are large similarities between the IDs that play a role in both the AI-specific and general technology acceptance research
- AI acceptance and adoption research is still in its infancy
    - Future research: Broaden analysis on ID's such as satisfaction, experience, technostress, computer anxiety, income/socioeconomic status, and voluntariness

Implications for Reliability and Maintainability

- Implications for Reliability
  - User Differences: AI systems must perform reliably across diverse user profiles and preferences.
  - Consistent Performance: Ensuring AI operates consistently, regardless of individual differences, to build trust and dependability.
- Implications for Maintainability
  - Adaptability: Systems must be easy to update to accommodate the changing needs of diverse user groups.
  - Long-Term Usability: Designing AI technologies that remain effective and user-friendly over time, ensuring they can evolve with user expectations.

Thank you!

References

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