



RESEARCHING NEW INTERACTION PATTERNS IN AI-DRIVEN WEB APPLICATIONS

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Abstract. *The work is devoted to the study of interaction patterns in AI-driven web applications. It examines how artificial intelligence transforms traditional web interfaces into adaptive, conversational, and predictive systems, influencing usability, trust, and user behavior. Particular attention is given to the shift from static interfaces to dynamic, intent-driven, and multimodal experiences. The study also explores design principles that support clarity, transparency, and human-centered control in AI-mediated environments. Figure 1 illustrates the evolution of interaction patterns from traditional web interfaces to autonomous AI-driven systems.*

Keywords: *artificial intelligence, web design, interaction design, human-computer interaction, adaptive interfaces, conversational UI, predictive systems, multimodal interaction, user experience.*

Modern web applications are undergoing a fundamental transformation due to the rapid integration of artificial intelligence into digital products and services. Traditional interaction models based on static navigation, predefined user flows, and manual input are increasingly being replaced by adaptive, conversational, and predictive interaction patterns powered by AI systems [1-5]. As intelligent web applications become more autonomous and context-aware, designers face the challenge of creating interfaces that remain understandable, trustworthy, and human-centered.

Recent developments in AI-driven products such as conversational assistants, generative interfaces, recommendation systems, and predictive workflows demonstrate the emergence of entirely new interaction paradigms [6-7]. Unlike conventional web interfaces, AI-mediated systems continuously adapt their behavior, interface structure, and content according to user intent, behavioral data, and contextual signals. This evolution changes the role of interaction design from building static screens toward designing dynamic relationships between humans and intelligent systems.

The research identifies several major interaction shifts shaping contemporary web applications:

- transition from command-based interfaces to conversational interaction models [1];
- increasing use of predictive and proactive interface behaviors [2, 6];
- emergence of adaptive layouts generated dynamically by AI systems [3];
- integration of multimodal interactions combining text, voice, image, and gesture inputs [7];
- growing importance of transparency and explainability in AI-assisted experiences [8].

These developments demonstrate that the future of web design extends beyond interface composition into the design of long-term relationships between humans and intelligent systems. Unlike traditional UX methodologies, speculative web design enables designers to visualize possible futures, explore unintended consequences, and question how digital environments may influence human agency over time [6].



Figure 1 illustrates the evolution of interaction patterns in AI-driven web applications, from static interfaces to autonomous, adaptive systems.

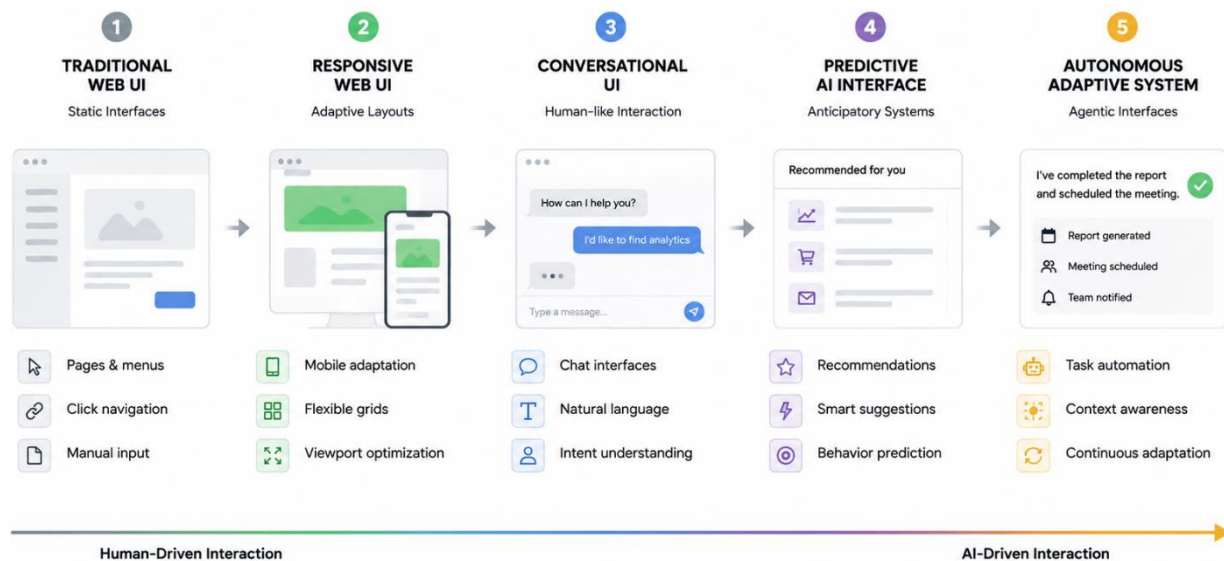


Figure 1 – Evolution of interaction patterns in AI-driven web applications, illustrating the shift from static interfaces to autonomous, adaptive, and conversational AI-mediated systems

AI-driven interaction patterns significantly change user expectations around control, feedback, and navigation. Instead of step-by-step interaction, users increasingly collaborate with systems that interpret intent and automate tasks. As a result, interaction design shifts from usability optimization toward ensuring clarity, transparency, and ethical AI behavior.

Special attention is given to conversational UX and adaptive interfaces. Natural language becomes a primary interaction layer in AI systems [6], while adaptive layouts introduce challenges related to predictability, trust, and cognitive load.

The research also emphasizes human-centered AI principles [8-9]. While AI improves efficiency and personalization, it can reduce user autonomy if not carefully designed. Designers must therefore balance intelligence with transparency and maintain user control [10].

In conclusion, AI-driven interaction patterns mark a shift from static interfaces to adaptive, collaborative systems. Understanding these changes is essential for creating ethical and sustainable digital experiences.

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