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Generative UI:

Revolutionising User Experiences

Enter a new era of digital interaction: Interfaces that adapt to you, not the other way around.

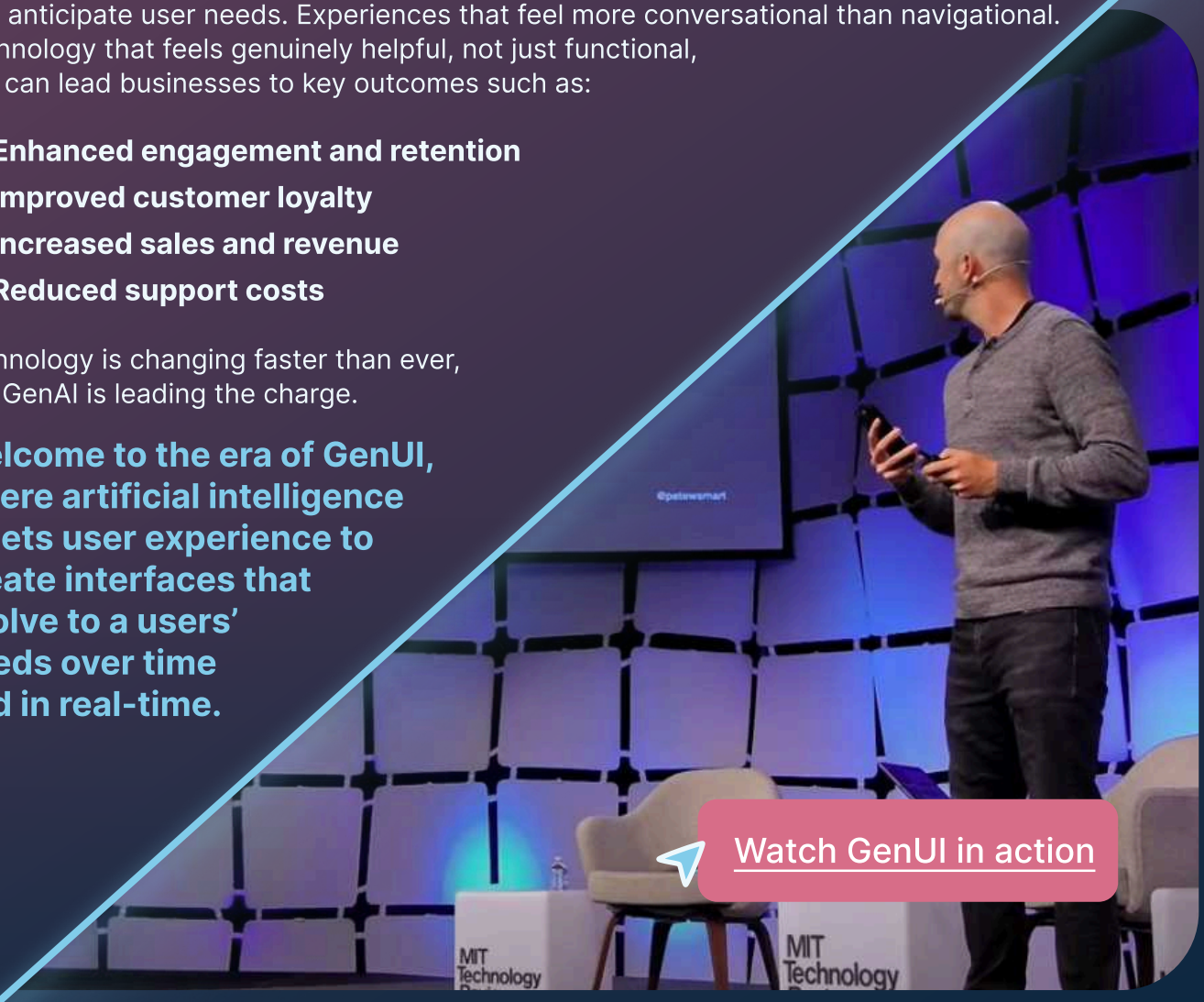
The interfaces found on digital apps today are largely pre-defined and static.

Generative User Interfaces (GenUI) promise something different. Interfaces that anticipate user needs. Experiences that feel more conversational than navigational. Technology that feels genuinely helpful, not just functional, and can lead businesses to key outcomes such as:

- **Enhanced engagement and retention**
- **Improved customer loyalty**
- **Increased sales and revenue**
- **Reduced support costs**

Technology is changing faster than ever, and GenAI is leading the charge.

Welcome to the era of GenUI, where artificial intelligence meets user experience to create interfaces that evolve to a users' needs over time and in real-time.



Peter Smart, Chief Experience Officer and Managing Partner at Fantasy, demonstrates how generative interfaces can offer personalised and seamless interactions that help better contextualise information and keep you in your chain of thought. Source: https://www.youtube.com/watch?v=A5rniBTm2uo

What we can expect

Adaptive, dynamic interfaces take **personalisation** to the next level

With the rise of GenUI, we can expect a step change in today's interfaces, moving from static to hyper-personalised ones that meet users in their own context and dynamically adapt to their needs.

GenUI will **unlock new solutions** and allow quicker innovation

GenUI has the potential to revolutionise numerous industries and products. As the technology advances, we can expect to see GenUIs implemented at an unprecedented scale, unlocking entirely new possibilities.

Use of design to find and mitigate **familiarity bias** and **privacy concerns**

Familiarity and a fair value exchange will remain key to user experience as GenUI offers increasingly hyper-personalised and dynamic experiences.

A **designer's focus** will narrow on core experiences and guardrails

The emergence of GenUIs will transform how we design digital systems. While established UX/UI principles will remain crucial, their implementation within GenUI systems will present new challenges and opportunities.

Note: GenUI is an emerging field, and this information is current as of May 2025. This perspective is a forward-looking prediction and may evolve as the field develops.

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What is GenUI?

GenUI or AI-Assisted Design?

What exactly is **GenUI?**

Occasionally referred to as Generative Adaptive UI or Outcome-based Design, global UX industry experts Nielsen Norman Group have defined this emerging capability.

> *"Generative UI ("GenUI") is a user interface that is dynamically generated in real time by artificial intelligence to provide an experience customised to fit the user's needs and context.*
>
> **Kate Moran & Sarah Gibbons - Nielsen Norman Group**

It's easy to confuse GenUI with AI-assisted design, especially with the popularity of tools like Midjourney and Canva. While both leverage AI, their purposes differ significantly.

Think of AI-assisted design as a tool for creators. Designers and product teams use it to speed up User Interface (UI) design and coding, streamlining the development process.

GenUI, on the other hand, focuses on the end-user experience. It generates interfaces dynamically and in real-time, offering a personalised and adaptive experience for each user.

AI-assisted design helps build the UI, while GenUI is the UI.

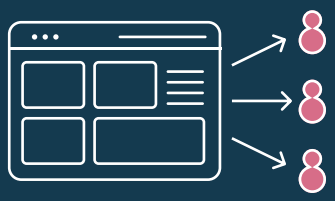
	Generative UI	**AI-Assisted Design**
Who benefits?	End users	Designers and product teams
What is the output?	A dynamic, custom interface generated in real time for a specific end user	AI-generated UI designs and code
What is the impact?	Every end user interacts with an interface built just for them and their needs in that moment.	Product teams can significantly accelerate the ideation, design, and implementation of interfaces.

Source: Generative UI and Outcome-Oriented Design

GenUI brings a new level of **personalisation**

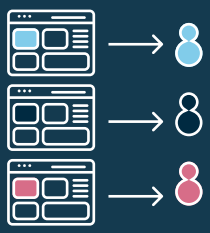
We've come a long way from the static, one-size-fits-all interfaces of the past. First came personalisation, tailoring experiences to individual preferences. GenUI takes us further, generating truly unique and dynamic interfaces for every user in real-time.

Here we can see the evolution, with GenUI representing the next frontier in user experience design.



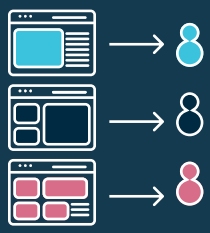
Traditional Interface

Presents the same layout and content to all users



Personalised Interfaces

Adjusts content and features based on user data and preferences



Generative User Interface

Dynamically creates a unique interface for each user in real-time, including **hyper-personalised** experiences

What is **hyper-personalisation**?

Answer: Hyper-personalisation is an evolution of experience optimisation that uses real-time data, artificial intelligence, machine learning, and advanced technologies to deliver deeply individualised experiences.

Unlike traditional personalisation, which often relies on historical data and explicit user input for broader recommendations, hyper-personalisation leverages real-time behavioural data, contextual cues, and predictive analytics to create dynamic and contextually relevant interactions.

This advanced approach aims to proactively anticipate individual needs and preferences, fostering more engaging and uniquely satisfying customer journeys.

Defining features of **GenUI**

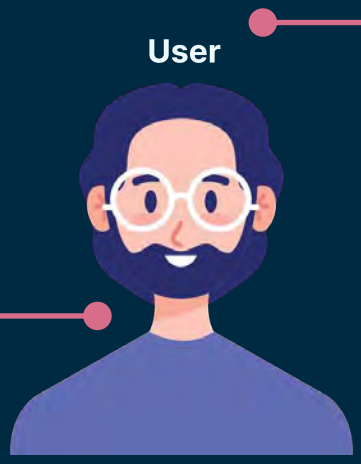
GenUI is poised to transform the way we interact with technology. Due to its ability to adapt the interface to users' context, preferences and behaviours in real-time, here are the key features and benefits we are expecting from this new paradigm.

Adaptive accessibility

Automatically adjusts interfaces to meet individual **accessibility needs**, such as adjusting font sizes, generating speech from text, and simplifying complex language.

Natural language input

Users can interact with the interface using natural language, **making complex tasks simple and intuitive**.



Seamless feedback loops

Identifies friction points in the user experience and **uses this feedback to generate alternative interfaces** that enable smoother and more seamless interactions.

Content & component generation

Visual content, including images, icons, animations are designed and generated dynamically, **optimised for both aesthetics and usability**.

We expect these features to combine to create intelligent, empathetic, and truly user-centric digital experiences that adapt and evolve with each individual, ushering in a new era of human-computer interaction.

What is powering **GenUI?**

Answer: GenUI is powered by several key components that work together to create dynamic, responsive, and personalised user experiences.

AI Agents & GenUI

Generative User Interfaces and AI Agents work together to create adaptive systems that respond intelligently to user needs and context. These systems autonomously perform tasks while presenting dynamic, context-aware interfaces that evolve in real time. Using fixed rules and real-time context—such as recent actions, system status, and user preferences—they determine what content, components, and layouts to display, ensuring personalised and efficient user experiences.

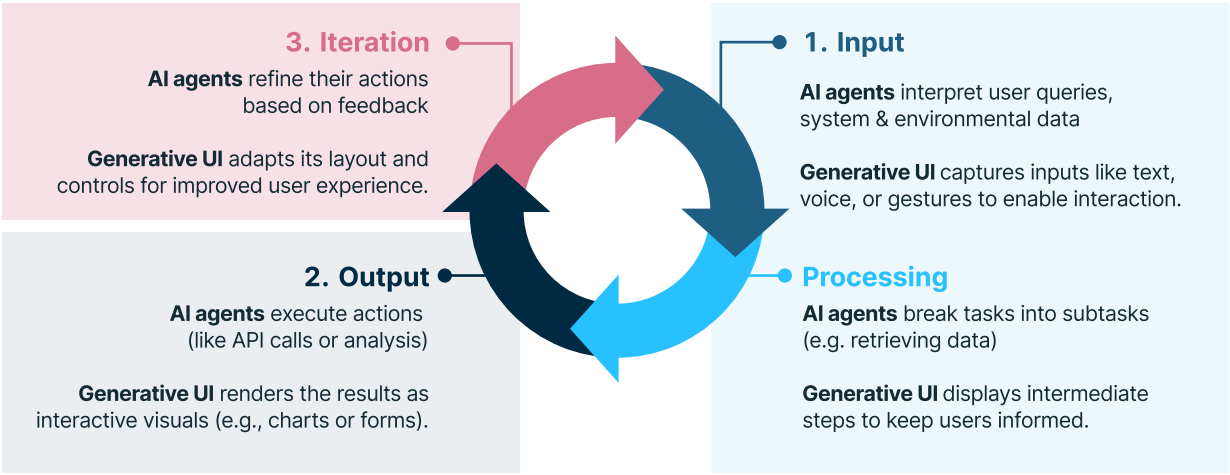
1. AI agents analyse context

Agents process **user inputs, system data**, and **environmental factors** using large language models (LLMs). By processing this information, the system gains a comprehensive understanding of the user's context and needs. For example, a travel planning agent might analyse flight availability, budgets, and preferences to suggest itineraries.

2. Generative UI renders dynamically

Based on the agent's analysis, the interface automatically generates relevant components like forms, charts, or interactive tools without fixed layouts. For example, a financial agent could produce custom dashboards with real-time stock charts and transaction buttons.

3. Continuous feedback loops



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GenUI in Action

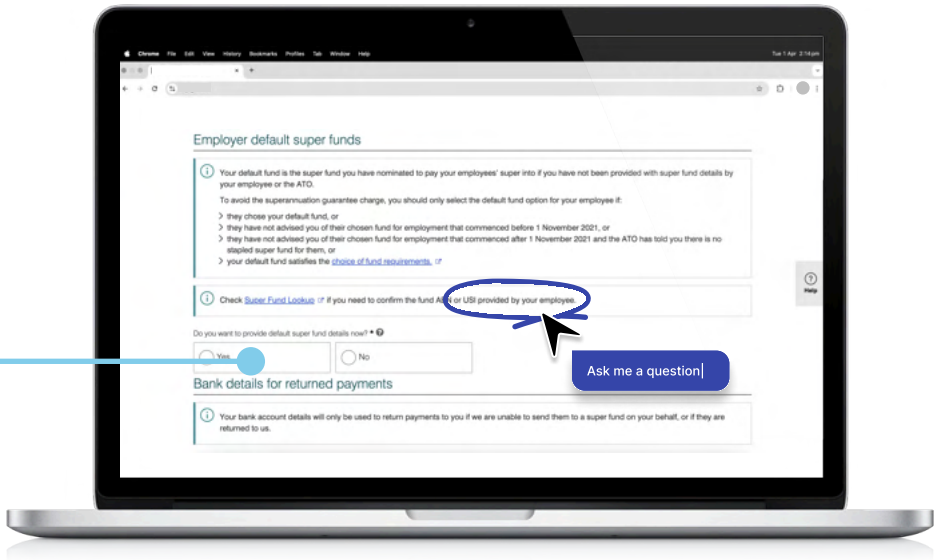
Example use cases

Content is illustrative only and not based on factual information

1 Self help for online services

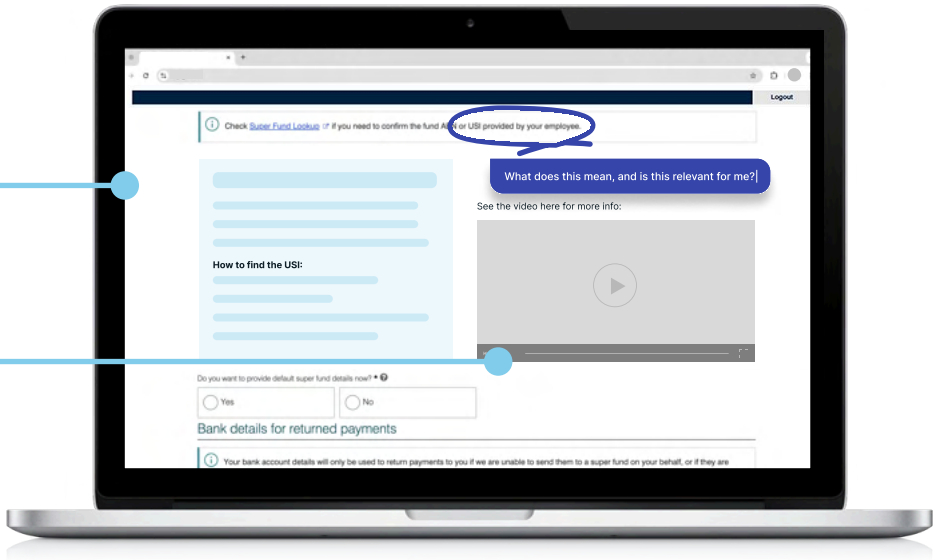
Sam is a new business owner who has recently employed a few new team members. She uses a self-serve tax portal to manage her new employees' super but finds herself quickly overwhelmed by unfamiliar terms like "WPN" and "USI".

Instead of getting lost in a maze of help articles or resorting to Google, Sam simply highlights the confusing terms and asks for clarification.



Thanks to GenUI, a clear and concise explanation appears in the UI below the highlighted term, using plain language and utilising the design system components and rules.

The GenUI goes a step further, generating a personalised visual tutorial that breaks down the concept step-by-step, using interactive elements.



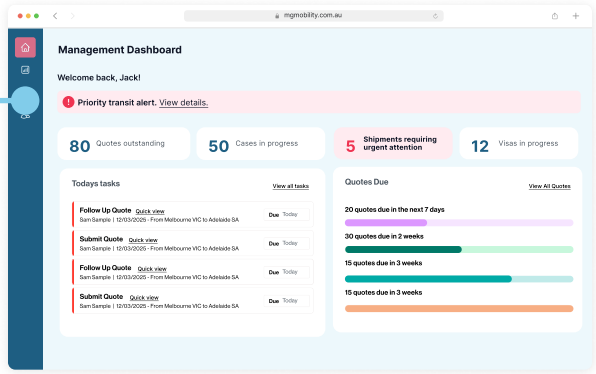
Business outcomes: Higher customer satisfaction, lower operational costs with customers less reliant on customer service teams

2 Interfaces for proactive problem solving

Simon, a relocation specialist at a global company, is responsible for monitoring employee relocations across different countries and time zones. He uses a mobility dashboard to understand critical situations and identify emerging problems, however the dashboard is cumbersome and requires him to manually search, filter and cross-reference information.

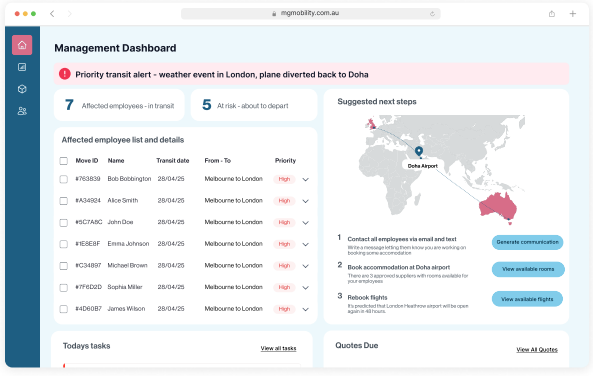
Before GenUI was implemented, Simon had a very basic dashboard and had to manually search for information in multiple systems when an alert came through.

Before GenUI



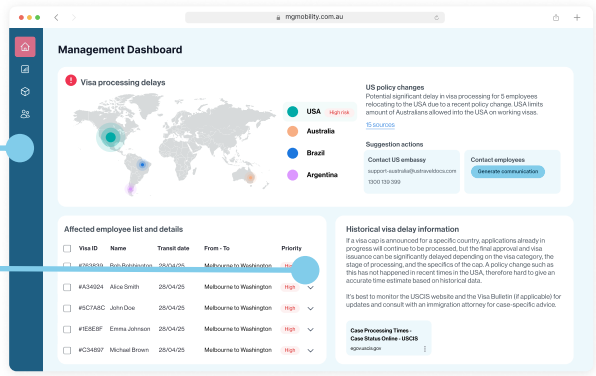
With GenUI integrated, Simon has access to a dynamic interface that highlights the most critical situations. Today, it shows him employees that are currently stuck in transit due to a weather event.

With GenUI implemented



Simon also receives smart alerts based on patterns that are emerging, such as delays in visa processing times for a specific country and the people affected.

The alert will surface the most relevant information, such as the embassy's details and a summary of past delays, to avoid cross-referencing different tools for information.



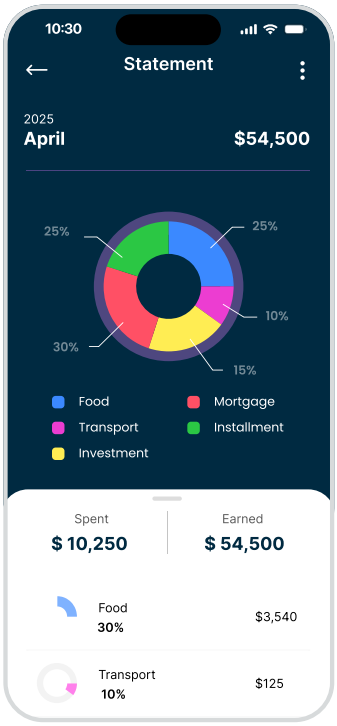
Content is illustrative only and not based on factual information.

Business outcomes: Increased efficiency, improved decision-making, enhanced employee experience, stronger compliance and risk management

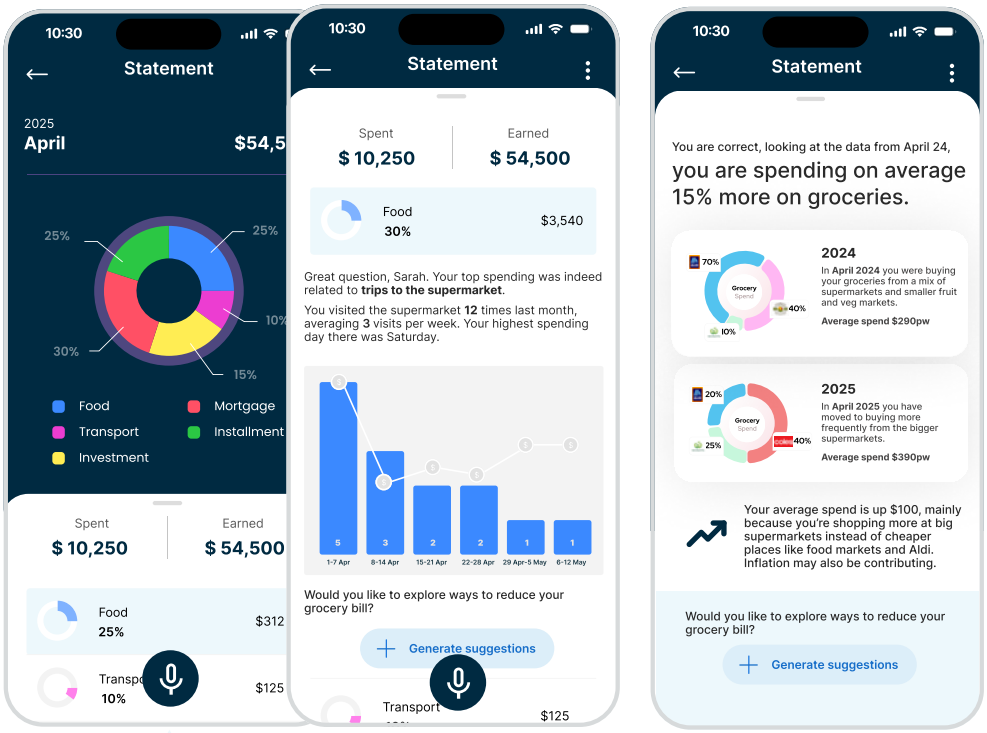
3 Instant insights for conscious consumers

Sarah, a busy mum of two, struggles to manage her family's finances. She uses her bank's mobile app to track spending, but finds it difficult to identify areas where they're overspending and create a realistic budget. The app provides transaction history and basic categorisation, but Sarah has to manually analyse the data.

Before GenUI



With GenUI impemented

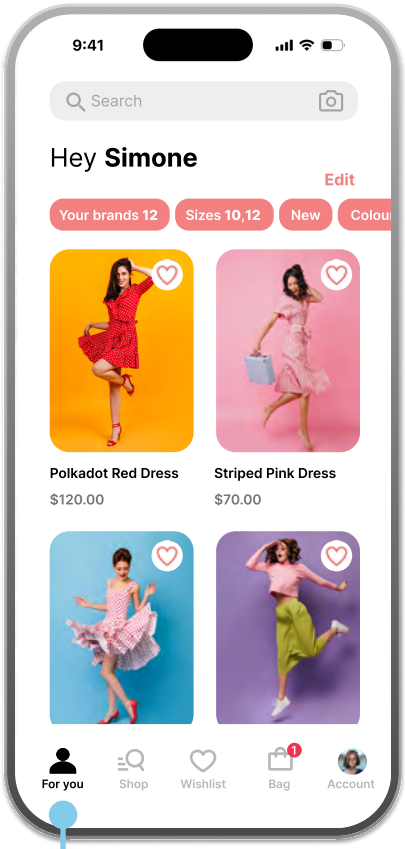


With GenUI integrated into the banking app, Sarah can now easily understand her spending habits by pressing different areas and asking questions for the answers to appear in her user interface, allowing her to gain insight without leaving the page. Without this functionality, she would have to manually research and calculate this data herself.

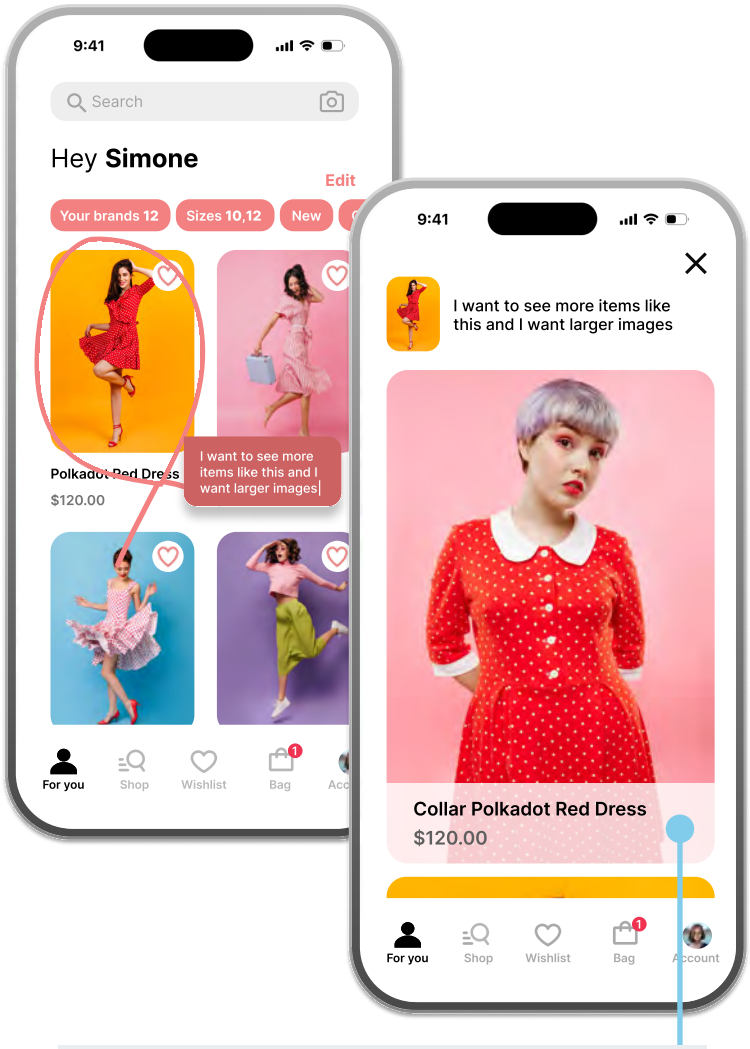
Business Outcomes: Higher customer satisfaction and retention due to ease of use and money saving options and ideas.

4 User interfaces that adapt to you

Simone loves shopping online and uses her shopping app every week to see what new items are available from all the brands she loves. She has a specific way she searches the app every time and has to go 3 levels deep in navigation to get to where she wants to go.



With GenUI integrated into the shopping app, Simone's shopping has been made much easier. Her interface has adapted to her behaviours and her home page now just shows the content of her search and filter that used to be 3 levels deep in navigation. Her home page is now called 'For You'.



Simone can circle items she likes and give a prompt, the GenUI would then show the results in an overlay sheet and in the larger image format that Simone wants.

Business Outcomes: High customer satisfaction and retention

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The Human Factor

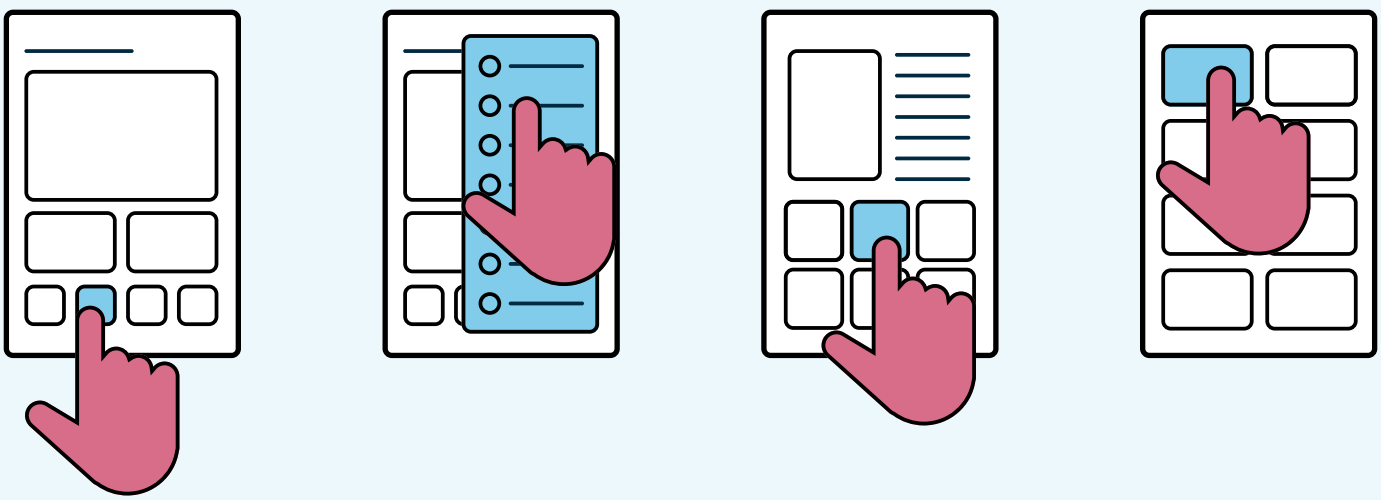
What to consider in pursuit of a good GenUI experience

Ensuring the best customer experience

Just as with traditional interface design, a central tenet of delivering GenUI is prioritising and optimising the end user experience.

Focusing the user experience requires us to explore certain questions: **Will users appreciate the cognitive offload, or will they feel overwhelmed and annoyed by the constant change? How can we leverage a dynamic interface to minimise user effort and maximise efficiency?**

Consider your favourite app. Imagine the feature you always use is buried levels deep in navigation, and there's no way to customise the interface to prioritise your most used-features. It’s a frustration many have experienced.



This is where GenUI in its very basic form can have a big impact on usability.

With GenUI, the app can automatically generate a more helpful ordering of pages and elements based on your past or current behaviour and usage. It would be trained on the brand’s design system to ensure consistency in components generated, and on tone-of-voice guidelines to ensure it always looks and sounds on brand.

However, it could become frustrating if the interface changes constantly, to the point where the interface is different every time you enter the app or platform. This can cause learnability issues, potentially impacting the usability of the platform and hindering the experience, rather than improving it.

The importance of user familiarity

Jakob's Law emphasises the importance of familiarity in new designs.

> Users spend all of their time on other sites, so they expect their site to work like all the other sites they already know.
>
> **Jakob Nielsen - Nielsen Norman Group**

Users bring their prior experiences and expectations when interacting with new interfaces. By designing in alignment with these mental models, we can create intuitive systems that feel familiar, reduce cognitive load, and enhance usability.

For instance, when purchasing a new car, regardless of the manufacturer, certain elements like the steering wheel, stalks, pedals, and seatbelts remain consistent, providing a sense of familiarity. However, thoughtful design still determines how these core features are presented.

GenUI embodies this principle by adapting dynamically to user needs and preferences. This approach ensures that the presentation of core designs is not only intuitive, but also personalised and adaptive.

If a GenUI constantly changes in ways it assumes are helpful—but aren't—it can negatively impact customers; imagine if your indicator and wiper stalks in your car were constantly swapping sides.

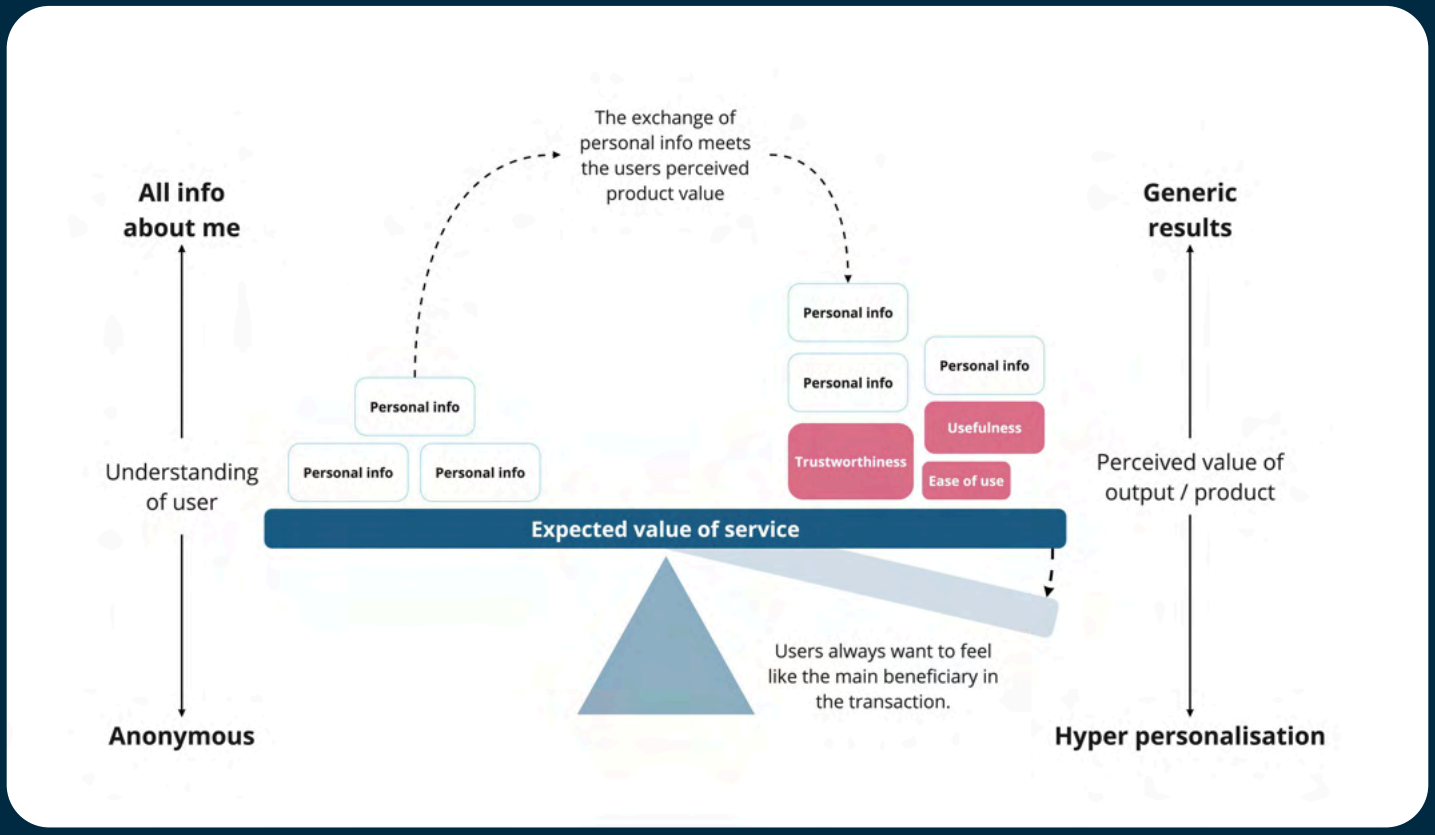
However, when implemented correctly with the right parameters, GenUI has the potential to significantly enhance the customer experience and allow users greater focus on their important tasks.

Incorporate familiar design elements and interaction patterns to enhance, not confuse, the experience.

Getting the personalisation balance right

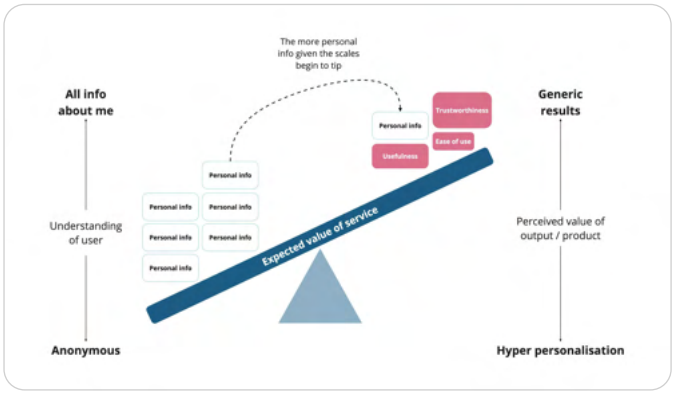
For personalisation to be possible, companies need to understand the customer to a level that allows them to tailor experiences to that individual. The more information the user gives, the more personalised the experience can become.

The success of personalisation, especially GenUI, hinges on customers feeling that the personalised output they receive is worth the information they share. This perceived value exchange is a fundamental consideration for all personalisation approaches.



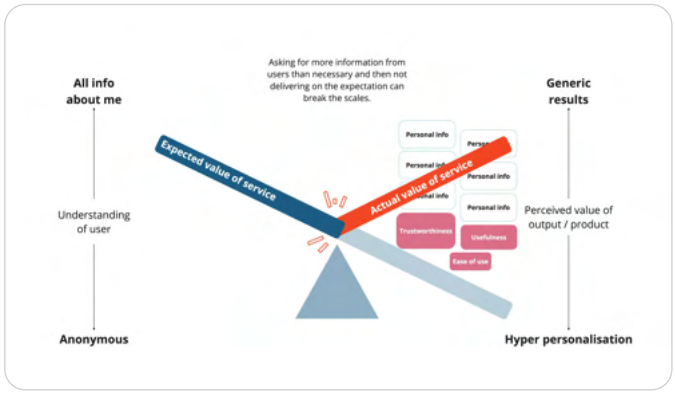
When customers grant access to all their usage data for a GenUI-powered experience, they expect a highly personalised and tailored output. If this expectation isn't met, they will likely feel the exchange of information was not worthwhile.

The value exchange explained



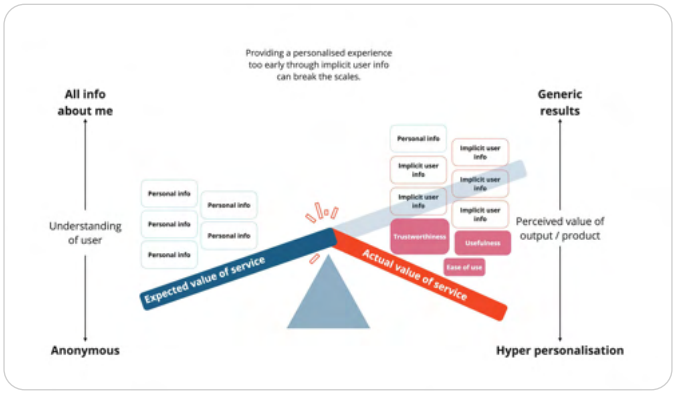
Value of personal information

Personalisation requires businesses to deeply understand customers, using their data to tailor experiences. The more data shared, the more personalised it becomes. However, businesses must balance this by offering value that justifies the personal data users provide.



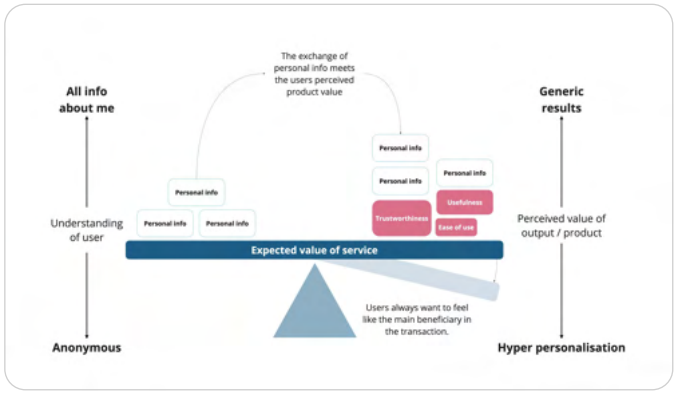
Value imbalance: Perceived by user to be unfair

An imbalance occurs when a user perceives the exchange to be unfair for them, the result is a decrease in trust in the brand, or furthermore, disenchantment in general.



Value imbalance: Perceived by user as creepy

An imbalance can also occur when a user receives a personalised experience before they've given enough or any personal info away. The reaction again is decreased trust in the brand, as it calls to question how the business could know this much personal information.



A fair exchange

Influencing user intent requires a fair value exchange, where the user feels they benefit most from the transaction, even if the business gains more from the data. The user must perceive the output as meeting or exceeding their expectations.

Ensure a fair value exchange between the personal information and data provided and the perceived value.

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Shifts in Design

Expected changes to a designers' focus

Anticipated shifts for design

The rise of GenUIs will reshape digital design, emphasising adaptability, personalisation, and collaboration. Below are the top 6 areas we expect to be an important focus for teams designing GenUI experiences.

Outcome-oriented design

Designers will shift from static components to systems that prioritise user goals and outcomes. Frameworks must adapt to support flexible, intent-driven experiences.

User-centred personalisation

GenUIs leverage AI to dynamically assemble interfaces based on individual behaviours, preferences, and contexts. Teams will focus on creating modular components that can be recombined for tailored user experiences.

Iterative and cross functional collaboration

The design process will integrate UX design, AI development, and data science. Continuous iteration and testing will be critical to refine adaptive systems and ensure usability.

Transparency, trust and explainability

Building trust requires transparency about how AI operates in GenUIs. Designers must explain how decisions are made, offer users options to adjust outcomes, and ensure ethical data usage.

Data privacy and ethical design

Robust policies for data usage and storage are essential. Users should have control over their data with clear consent mechanisms and options to opt in or out of GenUI features.

Accessibility and inclusivity

Adaptive elements must be designed inclusively to avoid alienating or confusing certain user groups. This ensures equitable access across diverse audiences.

Emerging best practices

- Start with a responsive base layout as a foundation for adaptivity.
- Use real-time data to identify usability pain points.
- Test GenUI features early to validate effectiveness.
- Maintain transparency about GenUI while ensuring user control over key elements.

As user interfaces move towards more dynamic, personalised digital experiences, how they are thought about and designed will be fundamentally changed.

Questions that will need to be explored

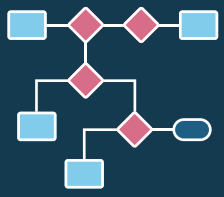
When designing for GenUIs, designers must address critical questions to ensure the technology is effective, ethical, and user-friendly. Some of these questions include:

User goals and tasks

What are the primary tasks users need to accomplish?

Does the interface provide sufficient guidance to enable success without slowing down the user?

Are the expected outcomes clearly defined and achievable through the interface?



Prompt design and interaction flow

How can prompts be optimised to reduce cognitive load and ensure users input relevant information?

Does the interface help users ask better questions or clarify their intent?

How are we collaborating with prompt engineers to refine conversational flows effectively?

Transparency and trust

How can the system explain its processes, decisions, and limitations to foster user trust?

Are users informed about how generative outputs are created and given control over adjustments?

Is there a mechanism for users to provide feedback or report issues?

These are just some of the questions that will help guide designers in creating adaptive, ethical, and user-centric GenUI experiences while addressing challenges like trust, privacy, accessibility, and continuous improvement.

Getting started

What's been shared is a projected and target state for GenUIs. Acknowledging the future evolution of its functionality and impact, we anticipate that several established concepts will remain foundational to its long-term success.

A deep understanding of your customers

Established ways to analyse and understand user needs, patterns and preferences. These data points provide the context, goals and constraints that ensure a interface is genuinely valuable for its intended users.

A well-defined design system

A central repository of predefined UI components, styles and interaction guidelines. This provides the structure and consistency to produce high-quality and brand-consistent interfaces at scale.

Ability to rapid prototype and validate

An ability to rapidly create prototypes for rigorous testing and gathering feedback. This provides a crucial feedback loop to ensure the interface performs as expected.

Gathering feedback & analytics

Capture of user interactions and performance data with high granularity. This provides vital information for continuous optimisation of the experience.

With any emerging tech, such as GenAI, there are opportunities for things to be done better, quicker or differently. Setting up for the future requires a solid foundation today, and this is how our team are using GenAI tools to help us work faster than ever.

Accelerating insight generation

In a recent discovery project, with **27** interviews conducted over **2** weeks, the team used AI to help synthesise over **5000** sticky notes to quickly determine emerging themes.

Rapid concept generation

For a proof-of-concept project, the team used GenAI to rapidly prototype and turn a concept into working code in just **2** days.

Speeding up design system creation

We use GenAI to accelerate design system creation by analysing UI for accessibility and automating repetitive tasks like component duplication across dimensions and documentation.

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Our outlook

The transformative potential of generative user interfaces is only beginning to be understood. We are optimistic about the future, envisioning a world where technology empowers users in unprecedented ways, anticipating their needs and simplifying complex tasks.

This future hinges on our capacity to learn, adapt, and evolve alongside this capability. Embracing a mindset of curiosity and willingness to experiment will be critical to navigate this evolution towards a more intuitive and accessible digital landscape for all.

Authors

Tiffany Pun
Designer

Bianca Speranza
Lead Designer

Tegan Henderson
Lead Designer

Reach out if you want to talk about enhancing your digital experience:

Jane Nguyen
Partner - Digital

jane.nguyen@mantelgroup.com.au

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Let's Connect

Start a conversation about using technology to impact people in positive ways.

Contact us