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# EXPERIENCE DESIGN: TOWARD AI-POWERED, IMMERSIVE, AND INCLUSIVE FUTURE

Infosys® | Knowledge Institute

# Contents

**Organizations must offer secure, transparent, and AI-powered interactions to meet heightened user expectations. Experience design understands and harnesses user behavior and preferences to fashion experiences that are not just intelligent and customized, but also deeply engaging. Generative AI has revolutionized the way users engage with digital interfaces.**

The convergence of digital and physical worlds has elevated novel experiences, with customer expectations steadily on the rise. Today's consumers demand hyperpersonalization and seamless interactions. Organizations face a pressing need to meet the growing demand for intelligent, AI-powered experiences while ensuring security and transparency. AI-powered experiences, particularly generative AI (GenAI), are key to achieve this level of personalization. Experience design analyzes user behavior, preferences, and habits, to create intelligent, personalized, and engaging experiences. Organizations must leverage these technologies to not only understand users' unique needs and preferences but also to create organic human-like, personalized interactions.

Several key trends shape how organizations engage with their customers and adapt to the changing times. These trends significantly impact user-centric technologies, experience design, and the workplace of the future. Organizations harness AI-driven content generation, recommendation systems, and predictive analytics, among many strategies

Sustainability isn't limited to consumers; it extends to design principles. Mitigating environmental and social impacts is paramount, and static design falls short. The solution is fluid design that creates adaptable and flexible experiences for seamless transition across devices and contexts. Responsive interfaces and adaptable architecture are just the beginning.

The call for borderless and inclusive design transcends geographic, cultural, and accessibility boundaries. Inclusivity in design ensures everyone's engagement with digital and physical environments, which means a more harmonious global society.

The future of work is more human-centric and phygital (a blend of physical and digital). Enduring remote work environment necessitates ongoing investments in secure, productive, and efficient remote work tools. According to the Infosys Knowledge Institute's Future of Work 2023, organizations increasingly opt for real-time conversational, chat-based, and VR/AR tools. Digital tool automation is a top-two executive investment priority in the report, and there is good reason for this: AI analytics, extended reality (XR), and other UX technologies unlock human insights and create a smarter, interconnected, and efficient workplace.

Organizations embrace these trends with agility and innovation to meet evolving customer expectations and create a more sustainable, inclusive, and human-centric work environment.

# Inclusive experiences with AI-powered interactions

Today's tech-savvy consumers demand seamless experiences across devices. Transformative trends in UX, VR, and human-centric design ensure our digital interactions are utmost personalized, inclusive, and innovative. AI's growing significance lies in creating hyperpersonalized, adaptive UX. AI systems analyze user data for tailored interactions, while GenAI elevates content creativity. This fusion empowers designers to craft intuitive and responsive experiences.

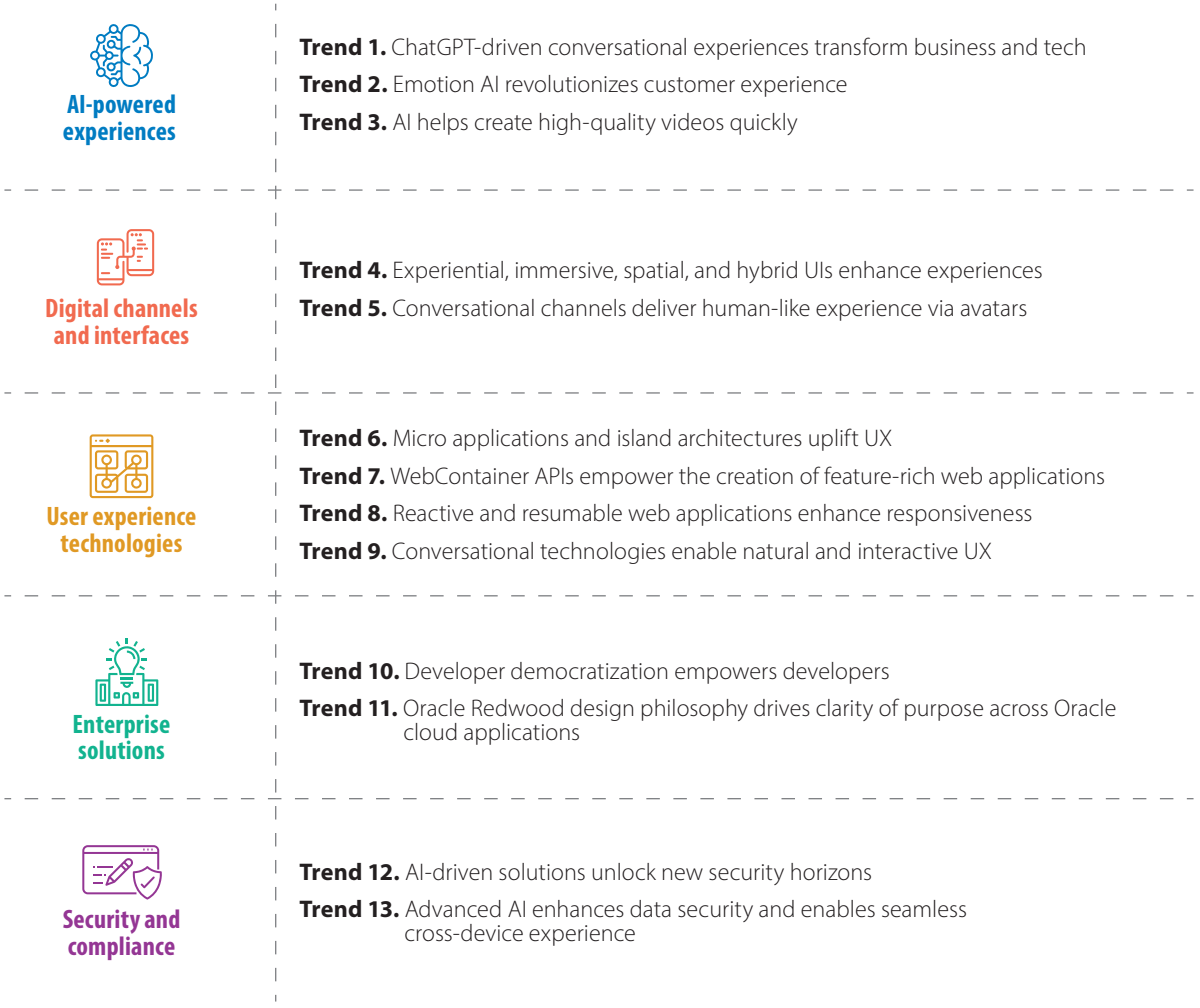
The Metaverse, a digital extension of our world, is changing some aspects of our lives, work, and leisure activities. Easy access and interaction in this space are important for this transformation. Designing inclusively is not just an option; it's important. It ensures that more people can use technology, promoting fairness and involvement in the digital world.

Intelligent AI-powered applications deliver dynamic and context aware experiences. They anticipate user needs and provide seamless information flow. As these apps grow, the demand for personalized and efficient UX intensifies. The rise of human centricity emphasizes function over form, ushering in modern paradigms like design thinking. Businesses now enhance UX through technology that serves as a supportive companion rather than a constraint. According to Bridget van Kralingen, senior vice president of a global services business provider, "there is no longer any distinction between business strategy and UX design."

Design through advanced technology means orchestrating interactions with intelligent AI systems that are capable of learning, adapting, and evolving. Businesses must not only understand human-to-screen interactions, but also human-to-algorithm interactions. Design ethics will move beyond usability and accessibility to encompass AI fairness, safety, transparency, and data privacy.

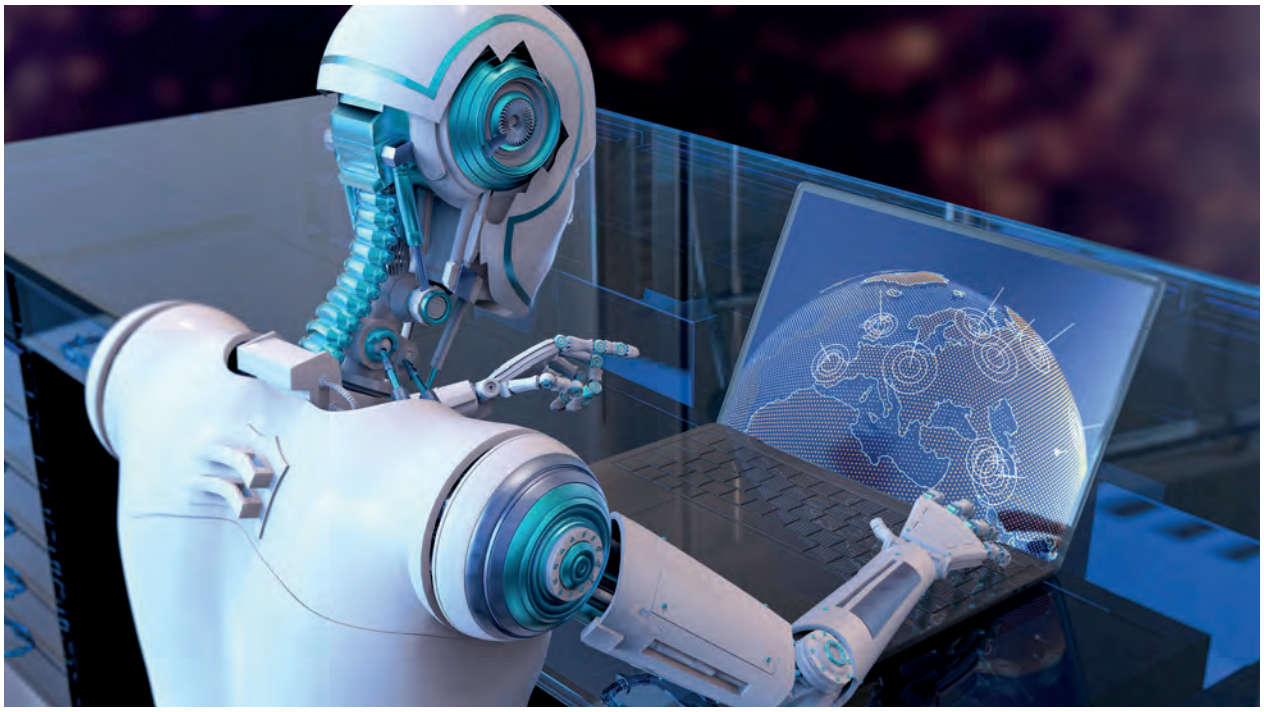
The fusion of AI-powered experiences, GenAI, metaverse, inclusive design, and intelligent apps reshapes tech interactions. Infosys is moving toward seamless, tailored UX that merge virtual and real worlds while adhering to human-centric design principles. As we innovate in this ever-changing landscape, the possibilities to enhance UX are boundless.

## Figure 1. Key trends across experience design subdomains




Source: Infosys

# AI-POWERED EXPERIENCES



AI is reshaping the landscape of user interface (UI) and user experience (UX). The integration of AI into interfaces enables a deep analysis of user behavior, preferences, and habits and create personalized, intuitive, and engaging experiences. Designers now build interfaces that not only adapt to individual user preferences but also captivate and immerse, enhancing overall satisfaction and fostering user loyalty.

## Trend 1 — ChatGPT-driven conversational experiences transform business and tech

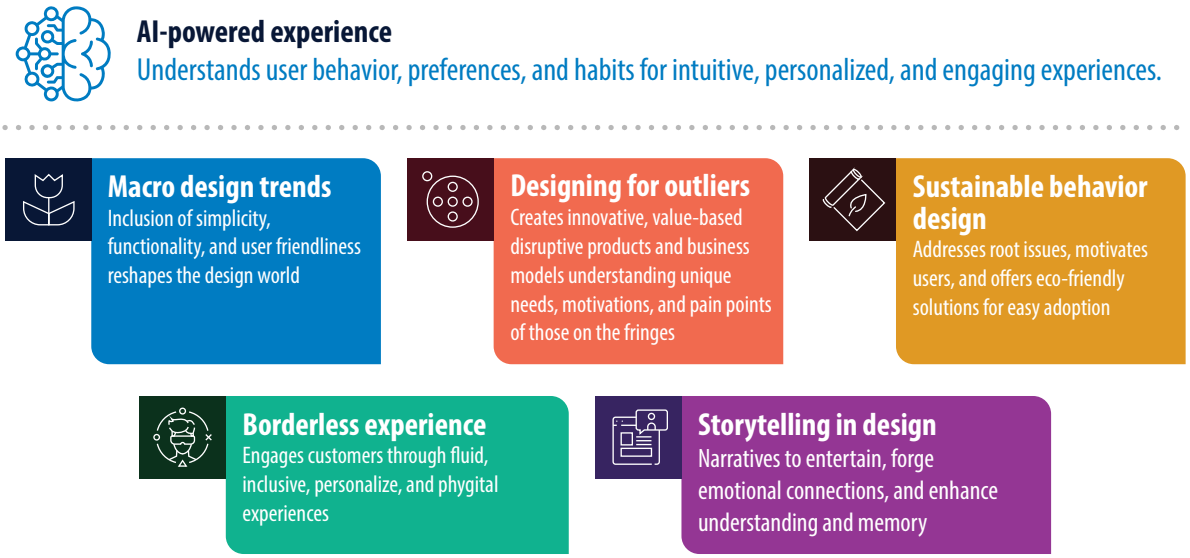
With ChatGPT's rise, fluidic and natural conversational experiences take center stage in the realm of business reimagination. This transformation not only helps tech beginners but empowers users to resolve issues at their convenience without external support.

In today's tech-driven world, English has emerged as the universal programming language, which reflects the growing dependence on technology for daily tasks. ChatGPT is pivotal in this paradigm shift, reducing support costs, fostering user autonomy, and significantly amplifying customer satisfaction. This trend's dominance is set to persist.

Customer support chatbots leverage ChatGPT's capabilities to provide fluid and natural conversational experiences to users. This cost-effective solution fosters user autonomy, enhances customer satisfaction, and is set to persist in this tech-dependent world.

Firms must think about whether to use open- or closed-access large language models in their enterprise chatbots. They should employ more prompt engineers to tune the chatbots on domain-specific knowledge, and, most importantly, ensure chatbots are responsible by design. This means a turn to stronger data privacy, security, and reliability. At Infosys, we build responsible by design in all key processes and employee experiences. In our push to go AI-first, we provide a conversational assistant (Zoiee) through Infosys Topaz to our employees for better productivity and value, and take the pressure off designers and developers.

## Figure 2. AI-powered solutions




Source: Infosys

## Trend 2 — Emotion AI revolutionizes customer experience

AI-powered tech understands and addresses customer emotions, which ensures customer satisfaction, reduces agent stress, and boosts revenue — providing superior customer experience. Emotion AI continues to be a game changer across industries spanning food to medical. The technology has revolutionized various industries, from food to healthcare. Some apps leverage emotion AI to prioritize information and reduce cognitive load, creating a ripple effect of improved customer satisfaction, efficient support, and increased revenue.

Content streaming services and popular restaurant chains utilize mood tracking technology or emotion AI to enhance customer experiences. In gaming, it automates difficulty levels based on emotions. Mental health support apps monitor and detect users' emotional states, offering guidance and connecting them with counselors. NVIDIA has designed an emotion AI (called SteerLM) that enables users to toggle chatbot outputs based on user preferences, such as a desire for greater kindness, empathy, or even humor in conversation. The LLM differentiates between high- and low-quality responses, and learns a comprehensive range of human preferences, a method that outperforms reinforcement learning with human feedback (RLHF), which is used in current LLMs.

## Trend 3 — AI helps create high-quality videos quickly

AI makes video production efficient and creative than ever before. Editors now save time through AI-powered indexing and searching to find the right clips quickly. Facial recognition technology identifies individuals and tracks their movements, even in crowded scenes, generating highlight videos. In sports, AI showcases key moments of players in real time. AI also aids commentators by suggesting relevant video clips and data, enhancing storytelling and viewer insights, akin to Google Photos' memory feature but on a larger scale.

AI enhances video accessibility by creating transcripts and captions, benefiting people with hearing or vision impairments. This new technology brings big-budget capabilities to filmmakers, including video editing and post production, while generative AI is used in the scriptwriting and storytelling phase by analyzing vast amounts of data, including scripts, books, and movies, to generate plotlines, characters, and dialogue.

AI enables fast, cost-effective, high-quality video production. It enhances accessibility for individuals with disabilities. This contributes to a more inclusive and equitable media landscape.

# DIGITAL CHANNELS AND INTERFACES


Today's customers use multiple digital channels to experience products and services according to their convenience. UI is the primary contact point for customers across channels and is pivotal to a product's success.

Mobile, smart phones, tablets, desktop browsers, and social media remain essential options for digital interaction. Conversational channels are prevalent for personalized communication, with GenAI and avatars enhancing content richness.

## Trend 4 — Experiential, immersive, spatial, and hybrid UIs enhance experiences

UX has become more 3D, social, experiential, embodied, and persistent. Advanced untethered or standalone devices drive immersive digital experiences with robust real-time 3D applications.

Devices like Apple Vision Pro, Meta Quest Pro, and HoloLens are set to boost developments in spatial computing. In such scenarios, environmental scanning/mapping is done to get a detailed representation of real-world surfaces to create true/seamless hybrid experiences. Digital twins can also be used in industries as disparate as healthcare, energy, financial services and manufacturing – creating dynamic, virtual representations of complex systems using both operational technology (OT) and informational technology (IT). The twin reduces operating cost, extends equipment life in manufacturing and energy, and troubleshoots known vulnerabilities in real time, leading to greater value capture.

AI and GenAI drive adoption by auto generating content, including images, virtual worlds, and lifelike avatars. Enterprises can harness this evolution for employee engagement, hybrid workplace, collaborative work, training, digital twins, self-help, and remote field force assistance, boosting productivity and efficiency.

Infosys has developed a Meta Quests 2 experience for a large American bank to attract a younger, web-savvy audience. This immersive solution fosters innovative customer acquisition, product marketing, and brand promotion within the virtual world.

## Trend 5 — Conversational channels deliver human-like experience via avatars

2D/3D avatars are virtual representations that immerse users in a shared virtual world, fostering engaging collaboration. They create a safe environment for confident virtual communication. Advancements in lip sync, animations (walking, hands, eyes movements), and facial expressions make avatars more lifelike. GenAI enhances text-to-speech, speech-to-text, and language translation, enriching the overall experience.

Infosys has developed a private metaverse for a large American consulting firm to shape the future of work. Audit managers select predefined avatars and customize attires, accessories, and more. These avatars engage in training, meetings, onboarding, and other activities.

At the AWS re:Invent 2022, an annual developers conference, Infosys introduced a personalized avatar showcase. Visitors had their photos transformed into 3D avatars placed in virtual environments such as castle, playground, etc., and they received a personalized digital souvenir video of this unique experience.

# USER EXPERIENCE TECHNOLOGIES

UIs went from server-generated to dynamic client-side rendered, and back to server-rendered. This journey has significantly improved UX, content richness, reactivity, and performance. Advances in AI enable seamless and immersive UX across devices.

## Trend 6 — Micro applications and island architectures uplift UX

Web frontend development has evolved in a cyclic quest for a balance between rich UX and performance. Initially, web pages were server-rendered, but the introduction of JavaScript improved interactivity. However, as complexity grew, performance suffered due to lengthy code downloads. A combination of microfrontends and module federation partly addressed this issue.

The latest trend, island architectures, introduces functional islands to enhance web performance by delivering only the necessary code for specific business functionality. This strikes a balance between web performance by limiting the amount of code needed to only those specific functional islands that may be necessary within each page.

Infosys follows a microfrontend approach across multiple platforms to enhance parallel functional development and simplify complexity.

> Infosys helped a French container transportation and shipping company develop an advanced quotation application with a micro UI to handle price management and quotations, including spot and long-term contracts.

## Trend 7 — WebContainer APIs empower the creation of feature-rich web applications

Recent advancements like WebAssembly, WebContainer API, and File System Access API empower developers to create highly functional web experiences.

WebContainers enable hosting complex functionalities such as database-in-a-browser, while File System Access API facilitates complex business applications running intricate logic in the browser, securely storing and accessing data on the user's device.

Although WebContainers and File System Access APIs are still in early development stages and await wider adoption, significant progress on this route indicates limitless possibilities.

> Infosys is implementing a progressive web application for a leading US-based CPG company. The application uses database in a browser concept, which enables on-field sales teams to work seamlessly even during mobile device sync issues. It locally saves data and syncs when connectivity is restored.

## Trend 8 — Reactive and resumable web applications enhance responsiveness

The complexity of modern web applications poses a challenge in efficient change detection. Updating the Browser DOM to reflect data model changes requires substantial compute processing, which can hinder application performance.

Innovations in web frameworks such as SolidJS introduce Signals, a new concept. Signals prompt immediate Reactions, invocating subscriber code, but only if at least one subscriber exists. This internal tracking of subscribers by Signals eliminates unnecessary code execution and optimizes the end-to-end process.

Another trending concept is resumability. Instead of running JavaScript to create the client-side application state, frameworks like Qwik transfer the state directly from the server to the client. This enables the application to seamlessly resume where it left off on the server.

## Trend 9 — Conversational technologies enable natural and interactive UX

UI technologies evolve with the integration of front-end systems using conversational technologies to enhance natural and interactive UX. GenAI simplifies chatbot development, while gesture-based interfaces recognize expressions and hand movements for enhanced user interactions. Microsoft's Power Virtual Agents enhance chatbot conversations and streamline AI chatbot development. GenAI simplifies development by abstracting NLP, while technologies like Microsoft's Emotion API enable custom gesture-based interactions for app designers and developers.

> Infosys helped a large technology company deploy a chatbot for its in-store products (laptops/desktops). The bot offers product recommendations, instant answers, and supports 13+ languages, enhancing customer experience. This increased customers' purchase readiness by 1.3 points, earning a 7.7 out of 10 customer satisfaction rating for an enhanced buying experience.

# ENTERPRISE SOLUTIONS

## SAP applications

SAP has refined its UX design guidelines and toolsets over the past decade and cemented its place in the UX arena with a robust toolset – SAP Build Apps. This toolset enables developer democratization and empowers citizen developers to generate low code/no code (LCNC) applications that can leverage AI cloud services on SAP business technology platform. The end goal is to develop streamlined, user-centric, AI-first cloud apps, leveraging SAP's LC tools and domain best practices.

### Trend 10 — Developer democratization empowers developers

Businesses innovate and adapt in dynamic markets to meet new customer needs and develop AI-first solutions. They embrace LCNC platforms with AI, ML, and IoT, leveraging large datasets and REST APIs to accelerate smarter, safer AI-first app development. AI services from OpenAI, Microsoft, Google and others quickly reached over a 150 million users. Such services democratize AI and accelerate LCNC AI-first app development. SAP leads this trend through SAP Build Apps that place AI at the core of the UX roadmap. SAP Build Apps optimize seasoned developers' productivity with preconfigured templates, while enabling citizen developers to focus on domain rather than technology. The technology offers seamless integration, better business-IT collaboration and alignment, significant savings, and a great UX.

Other trends include experience as code (experience design) and AI-assisted development with sentience (digital experience). By democratizing developer capabilities through LCNC platforms, firms can develop products and services that are tightly woven to market dynamics and customer appetite.

> Infosys helped a leading energy firm digitally transform its core plant maintenance processes, including generating notification and managing service orders. It utilized SAP Build platform to expedite development during the innovation phase. The LC approach facilitated rapid creation of SAP Build apps and significantly increased end-user engagement.

# Oracle cloud applications

Oracle stands out as a top-tier provider of robust and scalable cloud solutions combining software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS). Oracle Cloud Applications, the flagship SaaS offering, harness the latest technology on Oracle Cloud Infra to deliver industry-specific solutions with innovative designs for a seamless UX.

The Redwood design philosophy unifies Oracle's investments in cloud applications to offer a consistent and coherent experience to enterprises and their users.

## Trend 11 — Oracle Redwood design philosophy drives clarity of purpose across Oracle cloud applications

Redwood Design Philosophy revolutionizes enterprise applications, including Oracle ERP, Oracle HCM, and Oracle CX. It offers high-quality, consumer-grade experiences. Enterprise users enjoy the same experience they expect from consumer software on the tools and devices they use at work. Its key UX features include dark mode enablement, buttonless design, and minimalist, responsive, and flowing UI.

Redwood-driven Oracle SaaS applications feature a powerful search and conversational interface, which makes information retrieval and task completion as easy as having a conversation with the product. Oracle's Redwood experience incorporates state-of-the-art ML technology to offer ongoing recommendations that adapt to user and enterprise preferences, continuously improving the feedback and recommendation loop. Its reference templates provide best-in-class data visualizations that enable users to see data in new ways, discover hidden insights, and unlock newer possibilities.

Redwood Reference Application (RRA), an order management system example, demonstrates how to build Redwood applications. It showcases best practices in design, coding, usability, and UX.

For a multinational electrotechnology manufacturer serving data centers, Infosys implemented Redwood UX upgrade, enabling the sales team to perform research, generate and qualify leads, and conduct partner recruitment drives. The solution was designed for high-volume outbound calls and included functions like click to dial, Zoom info integrations, and LinkedIn integrations for B2B sales. This product provides a nimble UI, advanced search, and visualizations. It includes a chatbot-powered conversational interface that enhances sales user productivity, facilitating guided selling.

# SECURITY AND COMPLIANCE


From foundational security measures like captcha and login credentials, we've shifted to a new era of multifactor authentication (MFA), biometrics and advanced AI-driven security solutions. As technology becomes central, companies enhance defenses, address a broader threat landscape, and integrate compliance. This has set the stage for AI, automation, data security, device-driven experiences, and generative AI to take the lead.

## Trend 12 — AI-driven solutions unlock new security horizons

AI and automation transform how we predict, prevent, and respond to threats. The potential for pre-empting breaches grows exponentially with AI-driven solutions, which ensures compliance and streamlines operations. Advanced AI algorithms analyze vast data sets in real time, identifying patterns and anomalies that indicate security threats. Organizations should embrace AI-driven security solutions, ensure ethical AI, conduct regular audits for transparency, ensure model validation against bias, and stay abreast of evolving regulatory landscapes.

Generative AI revolves around creating new content, where distinguishing between human-generated and AI-generated content becomes vital for authenticity, copyright, and legal considerations. Its ability to create content, from images to text, impacts various industries, including media, entertainment, design, and legal. Organizations should implement mechanisms to trace content origins, ensure legal protections, respect copyright norms, and embed AI ethics. Generative AI models simulate security scenarios to aid organizations in preparedness and response planning.

However, AI for traditional cybersecurity vectors isn't enough. As generative AI evolves, so do the threats it faces. For instance, poor security in computer vision models can lead to accidents and loss of life (automotive) or malfunctioning of critical infrastructure, causing large scale power outages.

To address this, we need secure-by-design AI, robust defense platforms to detect adversarial ML attacks, and early adoption, especially with developments like ChatGPT.

## Trend 13 — Advanced AI enhances data security and enables seamless cross-device experience

In this hyperconnected world, data security involves safeguarding sensitive information from unauthorized access and breaches, a critical requirement for sustainable business growth; Advanced AI detects vulnerabilities, monitors data access in real time, and predicts breach attempts, while generative AI creates synthetic data for safer testing and analytics, prompting companies to adopt anonymization methods, encrypted storage, regular protocol updates, and ongoing access monitoring.

Businesses must actively create secure and compliant immersive experiences within the metaverse, spatial computing, and conversational UIs, with AI-driven personalization, adaptive content, and robust security measures as essential enablers.

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