Hype Cycle for User Experience, 2023

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Initiatives: Software Engineering Technologies; Build and Deliver New Digital Products/Experiences to Drive Business Results

> User experience is a core competency for digital product design and development for both customers and employees. Software engineering leaders can use this Hype Cycle to decide whether to adopt, explore or prioritize the leading innovations related to user experience.

More on This Topic
This is part of an in-depth collection of research. See the collection:

- 2023 Hype Cycles: Deglobalization, AI at the Cusp and Operational Sustainability

Analysis

What You Need to Know

This document was revised on 10 August 2023. The document you are viewing is the corrected version. For more information, see the Corrections page on gartner.com.

The innovations presented in this Hype Cycle reflect macrotrends in user experience (UX) across industries. The discipline focus continues to shift from single practices, tooling and technology to platforms, processes and methodologies. UX professionals are swapping desktop tools for web solutions and adopting formal practices like DesignOps. The growing influence of generative AI on design and front-end development is evident with the emergence of innovations such as text-to-image and design-to-code tools. This Hype Cycle advises software engineering leaders and their teams on whether they should adopt, explore or prioritize hyped technologies and trends in the field of UX.
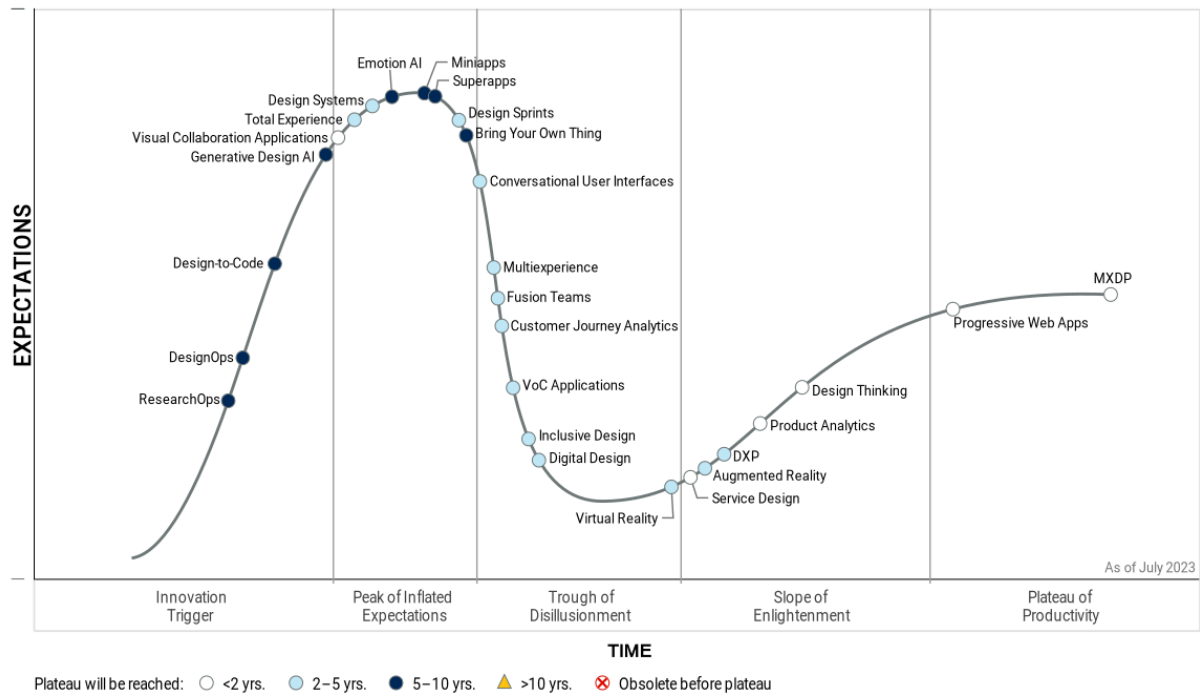
The Hype Cycle

A focus on UX is an essential part of delivering exceptional and effortless experiences that drive measurable business results. The technologies and trends vary. Some affect how UX work is done, while others define or extend the range of possible digital solutions.

Several macrotrends continue to accelerate the hype around UX:

- **AI and generative design AI.** Advances in AI continue to shape the UX landscape as generative AI is able to produce sophisticated and near-production-ready designs. Expect to see generative design AI gain mainstream adoption in several markets in the next two to five years. Greater adoption of tools — such as professional UX design tools, low-code/no-code tools and citizen design tools — will lead to major gains in efficiency, quality and time to market.

- **Multimodal interactions.** Multimodal interactions provide greater flexibility in reaching customers and employees. Voice, already a key modality for smart home devices, will continue to grow in sophistication and expand its reach into more markets, such as e-commerce, health and home security. Virtual reality (VR) is blending advances in AI with other interaction experiences, such as augmented reality (AR) and mixed reality (MR) to deliver new, innovative and personalized user experiences.

- **ResearchOps.** Instead of once-per-release user testing, teams are increasingly moving to a ResearchOps model — enabling teams to embed user research methods deeply and continuously into the software development cycle. User research is continuous and user insights are continuously fed into the agile software life cycle.

- **Design systems.** As design systems come to widespread use and reach the Peak of Inflated Expectations, we expect early adopters to begin to face challenges related to the overheads, governance and stewardship of their design systems. Organizations will need to treat their design system like a valuable internal product — providing the resources it needs. This is particularly true for generative design AI, where design systems are an essential part of successful generative design AI workflows.

Figure 1: Hype Cycle for User Experience, 2023

Hype Cycle for User Experience, 2023

EXPECTATIONS

Emotion AI
Miniapps
Superapps
Design Systems
Total Experience
Design Sprints
Visual Collaboration Applications
Bring Your Own Thing
Generative Design AI
Conversational User Interfaces
Design-to-Code
Multiexperience
Fusion Teams
Customer Journey Analytics
DesignOps
VoC Applications
ResearchOps
Inclusive Design
Digital Design
Design Thinking
Product Analytics
DXP
Augmented Reality
Service Design
Virtual Reality
MXDP
Progressive Web Apps

As of July 2023

Innovation Trigger | Peak of Inflated Expectations | Trough of Disillusionment | Slope of Enlightenment | Plateau of Productivity

TIME

Plateau will be reached: ○ <2 yrs.   ○ 2–5 yrs.   ● 5–10 yrs.   ▲ >10 yrs.   ⊗ Obsolete before plateau

Gartner

The Priority Matrix

2023 has been dominated by AI hype. ChatGPT, released in November 2022, quickly captured public imagination, attracting more than one million users in five days. Text-to-image AI tools like Midjourney and Adobe Firefly have demonstrated impressive ability to generate images from text prompts. Emerging GPT-enabled tools, which can generate editable screen designs from natural language descriptions, have the potential to be both disruptive and transformational. This hype around AI is reflected in this year's Hype Cycle with four of the six transformational innovations being related to AI innovation.

Turning to innovations in the high-impact category that are expected to mature in the next five years, we highlight visual collaboration applications and platforms. These solutions continue to support product stakeholders in delivering value to end users. Such platforms provide a shared space for product, UX and development to plan, design and implement digital solutions with fewer handovers and improved alignment. Visual collaboration platforms, such as FigJam and Miro, support product ideation and design work by providing a single shared space for designers, developers and product managers to work together on planning, prioritizing and design activities. We believe that there are opportunities for such platforms to further standardize and operationalize product and design activities by incorporating important UX tools and practices, such as design systems, research Ops, DesignOps and customer journey mapping.

Table 1: Priority Matrix for User Experience, 2023

(Enlarged table in Appendix)

Benefit	Years to Mainstream Adoption			
↓	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Transformational		Conversational User Interfaces Fusion Teams Total Experience	Design-to-Code Emotion AI Generative Design AI	
High	Design Thinking Product Analytics Visual Collaboration Applications	Augmented Reality Customer Journey Analytics Design Systems Digital Design DXP Multiexperience VoC Applications	DesignOps Superapps	
Moderate	Progressive Web Apps Service Design	Design Sprints Inclusive Design Virtual Reality	Bring Your Own Thing Miniapps ResearchOps	
Low	MXDP			

Source: Gartner (July 2023)

Off the Hype Cycle

Gamification and chatbots have been dropped from this year's Hype Cycle as they have both reached mainstream adoption. Some may notice that conversational user interfaces has moved backward on the Hype Cycle since 2022. This owes to an update, where the technology, CUI, now also encompasses virtual assistants and recent innovations in LLM-powered chat interfaces such as ChatGPT. This update to the conversational user interfaces accounts for the fact that this innovation has moved backward on the Hype Cycle.

On the Rise

DesignOps

Analysis By: Will Grant, Brent Stewart

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

DesignOps is a set of operational practices that enables design-team management and product-level delivery of design assets. The team management side stresses strategic alignment with business operations for the central design function and career development. The product delivery side combines user experience (UX), product management and technology operations to enable efficient and DevOps-compatible plans, estimates and processes that support quality, collaboration and ongoing innovation.

Why This Is Important

DesignOps introduces formalized approaches to governance, operations and people management. As a set of easy-to-use operational standards, DesignOps continues to gain in popularity. Digital product companies and agencies are discovering the tremendous value of a proven operational approach for UX team management and design delivery on product teams.

Business Impact

DesignOps represents the first widespread implementation of operational methods and techniques created for both designers and developers. DesignOps adds value during the creation and delivery of design assets. DesignOps practices should cover how teams are organized such that they can better support ongoing feature enhancement and idea generation without interrupting the continuous workflow of development teams.

Drivers

- **Innovation:** When coupled with DevOps, DesignOps leads to more innovative solutions. As a practice, DesignOps employs dual-track agile, which sets aside ongoing tracks of work dedicated to new discovery, idea generation and design exploration. This work acts as a constant source of evidence-based, multidisciplinary innovation.

- **Speed:** DesignOps reduces the time to market for major updates and incremental feature enhancements alike. Due to the concepts of continuous discovery and continuous delivery, developers engage in tech design, architectural explorations and proofs of concept (POCs) sooner than before, and with a deeper understanding of the overall vision.

- **Collaboration:** DesignOps increases communication and camaraderie between design and development teams. The design-development gap exists for many reasons, one of them being culture. DesignOps promotes multidisciplinary teams in workshop settings, design sprints or one-on-one "pairing and sharing" that promotes understanding, empathy and relationship building between these two crucially important groups.

Obstacles

- Few UX practitioners are educated in detailed planning and estimation, using a common work breakdown structure (WBS).

- Few product managers are trained in UX planning, estimating and tracking, and many of the design platforms lack robust change control solutions, although this is improving.

- Popular enterprise agile planning (EAP) tools are not designed with UX practitioners, activities and deliverables in mind (although this is changing), leading to resistance from UX teams to adopt tools they perceive as "for developers."

User Recommendations

Software engineering leaders should:

- Encourage design and UX professionals to adopt a DesignOps practice to better manage the complete design life cycle.

- Ensure that the DesignOps practice covers the following three key aspects: how UX teams are organized, the tools and processes for delivering UX artifacts and how success is measured.

- Develop Agile training designed for UX professionals, available as part of the DesignOps practice.

- Determine the value of a DesignOps approach with a pilot program involving an existing high-performing team.

Following a successful pilot, application leaders and the pilot team members should:

- Engage in a productwide rollout that involves training, updated product plans and the allocation of one or more people to the role of design manager.

It should be noted that a successful rollout of DesignOps at the product level requires buy-in from product management, design and development teams, as well as robust logistical and administrative skills.

Gartner Recommended Reading

How Design, Development and Product Management Can Work Together Successfully

The 4 Secrets of Design-Led Companies

2023 Software Engineering Primer: Build and Deliver New Digital Products/Experiences to Drive Business Results

Keys to DevOps Success

ResearchOps

Analysis By: Nabeeha Ahmed, Will Grant

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Research operations (ResearchOps) encapsulates the people, processes and tools that optimize user research and enable successful, test-and-learn practice in software engineering. ResearchOps enables teams to embed user research methods deeply and continuously throughout the software development cycle. It makes evidence-based user research a valuable, long-term resource for product design and strategic decisions.

Why This Is Important

Unlike traditional business-oriented models for designing software, ResearchOps focuses on user-centered design driven by ongoing user research. This enables product development teams to determine whether they are building the right thing — that is, software that meets customer needs and business goals. It provides the necessary framework for successful user research, enabling organizations to confidently build the most useful software.

Business Impact

ResearchOps improves efficiency in user research processes, governance structures, knowledge management, research design, participant engagement and more. It enables organizations to have more streamlined user research workflows, robust management of user experience (UX) insights, better control of research budgets and better alignment of UX teams and stakeholders. ResearchOps supports software development teams in understanding user needs and enhancing key success metrics like adoption, revenue, cost avoidance, savings and retention.

Drivers

- **Knowledge management:** Dedicated research repositories and knowledge management structures help organizations to build, organize, disseminate and easily access a body of user research findings in the long term. User experience (UX) teams can continuously revisit study findings for new insights, and multiple development teams can easily share and access cross-organizational, holistic insights.

- **AI-enabled analysis:** ResearchOps enables the curation and effective use of research tools — especially those that feature AI-enabled analysis — and can speed up research efforts significantly. For example, instead of watching hours of recordings of research sessions, the AI can extract sentiments for quick analysis, showing researchers the instances where a user was frustrated in a video recording.

- **Integration with Agile:** ResearchOps works well in agile software development and its findings can influence goals, features, user stories and backlog prioritization. ResearchOps enables the user research function to align with agile product team cadence, delivering evidence-based improvements in every release.

- **Economies of scale:** Multiple research teams in a large organization can rely on ResearchOps because it formalizes processes around participant recruitment, research design, reporting and knowledge management, thus generating cost-efficiencies.

- **Standards and regulation assurance:** ResearchOps implements a holistic approach to research governance and regulation, thus providing assurance on research design, data privacy and security protocols, research ethics, evidence quality and more.

Obstacles

- **Lack of senior stakeholder buy-in**: User research is often seen as a "nice to have" or a distraction from building software. Without strong leadership support and empowerment, there is a risk of wasting resources and proliferating inefficient processes. ResearchOps and user research struggle to get off the ground.

- **Lack of budget and resources**: Building and maintaining a world-class research function requires budget and resources — in terms of people and tools. However, organizations hesitate to provide these as the impact on the bottom line may not be apparent until product changes are implemented.

- **Lack of skills**: User research is a well-established discipline, but not everyone has developed these skills. Teams must hire new talent or train existing user researchers for strong performance.

- **The wrong tools for the job**: Using generic tools — for example, storing research studies in Microsoft Word documents — can lead to muddled taxonomy and siloed findings.

User Recommendations

- Establish ResearchOps capability by choosing and supporting a ResearchOps manager for your organization.

- Address the pain points for user researchers and the teams they work with by enabling a program to analyze, redesign and implement efficient user research workflows.

- Embed and reinforce efficient user research practices by championing and advocating for user research and ResearchOps.

Sample Vendors

Airtable; Dovetail; dscout; Grain; Maze; Notion; Testbirds; UserTesting

Gartner Recommended Reading

How to Measure the Value of User Experience Design

Use Continuous Feedback Loops in Software Development to Improve Your Products

Quick Answer: How Can We Incorporate User-Centric Design Into the Features We Build for Our Product?

How Design, Development and Product Management Can Work Together Successfully

Design-to-Code

Analysis By: Frank O'Connor, Brent Stewart

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Design-to-code tools automatically generate near production quality UI code from sketches and/or screen designs. By automating work that would have otherwise required a developer, efficiency is improved. Design-to-code tools also facilitate closer collaboration between UI designers and developers, by enabling designers to iteratively deliver snippets of near-production-quality code, which can be integrated and tested earlier.

Why This Is Important

When user experience (UX) designers and front-end developers work apart, collaboration is difficult. When key UX decisions are handed off as images or documents, much can be lost in translation to code (e.g., details like microinteractions or UI control behaviors). Design-to-code tools help teams deliver near-production-ready front-end code from UI designs. Teams using design-to-code tools are more productive, more aligned around design decisions, and have fewer design miscommunications.

Business Impact

Improved UX: Design-to-code tools enable designers and developers to work iteratively. Generating UI code from designs means that coded UIs can be delivered in small batches, which can be integrated and tested sooner.

Better productivity: Teams using design-to-code tools are more efficient as they can automatically generate UI code from screen designs. These tools can also scan design tools for similarly styled elements and create common classes, reducing dependencies and producing cleaner code.

Drivers

Two adjacent technology innovations are underpinning successful design-to-code solutions:

- **Design systems:** Increasing adoption of design systems by leading product-led organizations is a significant boost for design-to-code solutions. These tools rely on design systems to be able to generate UI code, which is based on established UX standards and practices, and reflect the organization's established brand and UI style.

- **Generative design AI:** Text-to-image AI tools like Midjourney and Adobe Firefly have demonstrated impressive ability to generate images from text prompts. We also note the emergence of generative-pretrained-transformer-enabled design-to-code tools where a large language model (LLM) can take natural language descriptions and generate editable screen designs. Design-to-code will continue to use generative AI to produce more sophisticated UIs based on combinations of design and conservational style prompts.

Other drivers for design-to-code are:

- **Speed:** Design-to-code significantly improves development cycle time by eliminating design handovers between designers and developers, and by delivering near-production-ready presentation layer code generated from UI designs.

- **Consistency:** Design-to-code enables the creation of consistent UXs across disparate teams by using a standard, consistent procedural method of generating UI code from designs.

- **Usability:** UIs that are generated from design-to-code tools are typically built in accordance with time-tested, established product types and UI design patterns that are familiar to most users.

- **Democratization:** Design-to-code helps bridge the gap between professional and nonprofessional developers, such as designers, researchers and citizen developers. Design-to-code tools enable nonprofessional developers to create near-production-quality front ends by creating the UIs in design tools and relying on design-to-code tools to generate the code.

Obstacles

- **Maintenance considerations**: Designers will most likely lack technical knowledge of how the existing codebase and technology stack is constructed and therefore, may unknowingly, create UIs that are difficult to maintain or expensive to operate.

- **Implementation drift**: Design-to-code tools will attempt to generate code close to the provided design, but in most cases there will not be a one-to-one mapping between the design and the implementation. Code produced by a design-to-code tool is close to the design but may have some minor differences which can be frustrating and time-consuming to correct.

- **Limited UI framework support**: The majority of the design-to-code tools support leading popular UI frameworks, such as Angular and React, but if your organization's UI stack is nonstandard you may not be able to use design-to-code tools easily.

User Recommendations

- Conduct a thorough design-to-code tool evaluation and selection process. Make sure to involve UX designers and front-end developers in this process to enable a sense of ownership and ensure future adoption of the selected tool.

- Choose a tool that allows you to operationalize your existing design system or UI code component library.

- Educate your team about the business value of design-to-code to decrease development time and increase quality.

Sample Vendors

Anima; Clutch; Figma; Framer; Infragistics; Locofy; Overlay; TeleportHQ

Gartner Recommended Reading

Predicts 2022: Generative AI Is Poised to Revolutionize Digital Product Development

Quick Answer: What is Design-to-Code?

Quick Answer: How Can We Incorporate User-Centric Design Into the Features We Build for Our Product?

Generative Design AI

Analysis By: Brent Stewart

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Generative design AI, or AI-augmented design, is the use of artificial intelligence (AI), machine learning (ML) and natural language processing (NLP) technologies to automatically generate and develop user flows, screen designs, content and front-end code for digital products.

Why This Is Important

Generative design AI has been introduced in several product markets, including user experience (UX) design tools, citizen design tools, image editing software and video editing software. Gartner expects generative design AI to lead to major leaps in UX design efficiency, quality and time to market. The technology will initially appear as feature-level support (for example, intelligent design recommendations) and will transition rapidly to full product design and front-end development capabilities.

Business Impact

In a future powered by generative design AI, sites, apps and software will be generated in minutes or days, rather than weeks or months. The resulting designs will be based on proven design principles and patterns that ensure maximum usability and accessibility. In this future, UX teams will become more strategic and directional, with the remaining practitioners focused more on research, strategy and design curation, and less on detailed design production.

Drivers

To understand the drivers for generative design AI, consider this hypothetical scenario for creating an online store:

- Tell the AI that you want an online store; the AI automatically generates the standard structural elements of an online store from the homepage to product detail templates to the shopping cart.

- Provide the app with your brand identity or style guide, giving the AI inputs on color, typography, iconography, photographic style, writing style, etc.

- Provide some inspiration to the AI by indicating a set of stores you'd like to emulate.

- Hit submit and, within minutes, the AI produces three high-fidelity design directions that you can evaluate and iterate.

Furthermore, every design element will have an associated code component that is updated as you tweak or curate the final design.

The promise of operational efficiency and "democratization" of UX design contribute to the business case driving generative design AI. Key drivers in this category include:

- **Product delivery** — Generative design AI promises to accelerate digital product delivery more than any technology in recent history.

- **Accessibility** — Generative design AI design and code deliverables will account for assistive technologies and deliver the most accessible screen designs and code possible. This will drastically improve the digital lives of people with disabilities.

- **Democratization** — More and more nonprofessional (citizen) designers and researchers are engaging in UX tasks and must be able to produce high-quality experiences without deep design training or education.

- **User interface (UI) design standardization** — The overwhelming majority of digital products are based on established product types and UI design patterns. In general, the standardization of common digital experiences continues to expand.

Generative design AI will quickly apply three key technologies to common UX tasks as they expand:

- Visual AI (computer vision)

- ML

- NLP

- Large language model (LLM)

Obstacles

- **Cost** — Generative design AI is a heavy lift that requires deep talent, long time frames and deep pockets.

- **Jobs** — Generative design AI drastically reduces low-level UX production tasks, reducing the need for production designers, front-end developers and UX writers. These team members will need to retool and "move left" to become UX design strategists/researchers who can guide and tweak the output of design bots.

- **Originality** — Since generative design AI pulls from established product types and design patterns, it will not be notable for its originality. Many UX practitioners are concerned that user experiences will become too uniform and lack originality.

- **Ethics** — AI algorithms and associated training datasets may contain inherent gender, cultural and selection biases.

- **Maintainability** — AI-generated designs may have higher maintenance costs, as it may be more difficult to make small, custom tweaks to a design element and automate those adjustments in future builds.

User Recommendations

- Assess developments in generative design AI, specifically at Adobe, Figma, the citizen design market (for example, Canva), and the low-code/no-code market.

- Prepare digital product teams for the emergence of generative design AI — first through design-to-code technology followed by tools that produce high-fidelity screen designs and written content.

- Transition the role of humans in the design process from production-level creators to strategic curators.

Sample Vendors

Adobe; Builder.ai; Figma; Inmagine Group (Designs.ai); Locofy.ai; TeleportHQ; Uizard

Gartner Recommended Reading

Innovation Insight for Generative AI

How Can Generative AI Be Used to Improve Customer Service and Support?

Use Generative AI to Enhance Content and Customer Experience

Predicts 2023: How Innovation Will Transform the Software Engineering Life Cycle

Quick Answer: How Can Generative AI Tools Speed Up Software Delivery?

At the Peak

Visual Collaboration Applications

Analysis By: Brent Stewart

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Visual collaboration applications are cloud-based tools that enable teams to communicate and creatively collaborate during both asynchronous and real-time work. They provide a shared digital canvas offering collaboration features and templates for common frameworks, flows, activities and designs.

Why This Is Important

During the pandemic, visual collaboration applications became an essential part of the digital product team's toolset, and have only grown in popularity and impact as organizations return to the office or engage in hybrid work models. The most significant insights, ideas, strategies and designs for leading digital products emerge on the whiteboard of a visual collaboration app. As such, they are seen by many as the place where "the magic happens" for design, product and engineering teams.

Business Impact

Visual collaboration applications make remote and hybrid creative work possible. Without them, the only other viable approach is colocated, workshop-style collaboration that used to be standard practice for digital product teams. In fact, Gartner hypothesizes visual collaboration apps elevate creativity and productivity, regardless of whether they are used remotely or in person, due to the templates they provide, team participation they promote and traceability they enable.

Drivers

- Permanence of remote and hybrid work: The global shift to remote and hybrid work makes visual collaboration applications the "new whiteboard" and a required platform for any digital product or business strategy team, whether used in person or remotely.

■ Product team collaboration: Coordinating handovers between product management, design and development can take significant effort, and a misaligned product team results in misaligned products. Visual collaboration apps reduce, and even eliminate, handovers between stakeholders and contribute to the delivery of more cohesive products.

■ Design thinking and collaborative creativity: The rise of design thinking and collaborative creativity, in the form of workshops, design sprints, strategy sessions and more, requires a workspace that enables shared ideation, evaluation and decision making.

■ Templates: Visual collaboration tools include templates for brand, business, marketing and product strategy methods and techniques that accelerate discovery, exploration and validation of insights, ideas, strategies and designs.

■ Integrations: Recent feature enhancements from vendors include integrations with popular product management, user experience (UX) design and software engineering tools.

■ Generative AI: With AI completing increasingly more production work, such as screen designs, user flows, and code, the role of the human will shift strongly towards research and strategy activities. Visual collaboration tools will become the single-most important "home" for human creativity in the enterprise.

Obstacles

■ Customer perception as a remote-only tool: Many view visual collaboration applications as a solution for remote or hybrid teams only. As organizations transition from fully remote work to in-office or hybrid arrangements, it is possible purpose-built visual collaboration applications (e.g., Miro, Mural, Klaxoon, etc.) will be viewed as expendable by some teams.

■ Competition from design and business communication platforms: Collaboration and co-design features (such as a digital whiteboard) in design platforms (e.g., Figma [FigJam]) and business communication platforms (e.g., Microsoft Teams, Zoom Video Communications, etc.) are close to — or on par with — purpose-built visual collaboration tools.

User Recommendations

- Build a platform evaluation and selection process, by ensuring that the needs of all product stakeholders are considered when choosing a visual collaboration application.

- Employ a visual collaboration application as the de facto means for sharing product and design knowledge with development. Plan and execute workshops and design sprints on the selected platform, whether working remotely or in person.

- Use a visual collaboration application to plan and execute user research activities that require real-time, one-on-one facilitation.

Sample Vendors

Bluescape; Figma; InVision; Klaxoon; Lucid; Miro; Mural

Total Experience

Analysis By: Michelle DeClue, Jason Wong

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Total experience (TX) is a strategy that creates superior shared experiences by intertwining four disciplines: customer experience (CX), employee experience (EX), multiexperience (MX) and user experience (UX). The goal is to drive greater customer and employee confidence, satisfaction, loyalty and advocacy using digital and nondigital techniques.

Why This Is Important

The march toward mobile, virtual and distributed customer and employee interactions has accelerated, making a compelling case for TX adoption. TX is about using technology and interactions to enhance, empower and embolden both customers and employees. Executive leaders must evaluate the intersections between these experiences and increase both customer and employee confidence and lifetime value. It's about how these experiences make the customer and employee *feel about themselves and the decisions they have to make.*

Business Impact

TX is designed to retain and cultivate greater **customer and employee lifetime value,** a calculation based on the longevity of the relationship and the value they bring to the organization. Losing profitable customers can harm the financial position of an organization. Employee lifetime value also has financial repercussions:

- Loss of institutional knowledge and productivity when an employee leaves.

- Impact to existing team members in terms of morale and load management.

- Cost of recruiting, onboarding and training new talent with no guarantee of productivity.

Drivers

- Technology advancements allow greater opportunities to connect across multiple platforms with multiple ways of engagement (voice, gestures, immersion, etc.).

- Edge devices with cloud-based applications have proliferated across multiple organizations and in consumer electronics and vehicles, providing more opportunity to connect and understand employees, customers and the technology data points at a higher level.

- Employees can facilitate better CX through digital solutions, such as giving a discount or promo code, adding additional time to due dates and deadlines, unlocking exclusive content, or providing next best actions.

- Initial investments can be scaled to add external ecosystem partners to increase the long-term value.

- AI can be applied to see how other similar customer issues were resolved and offer the solution to rectify a customer's issue. Machine learning can recognize where gaps are and either refine the process or notify a developer to address the issue. Recurring patterns or orders can be used to identify how to improve products and services, such as with personalized products or most-requested additional services for a venue.

Obstacles

- **Concept:** The TX concept in the early stages of permeating into organizational roadmaps for joining CX and EX initiatives. Some organizations may feel like they've already been doing some aspects of TX. While they may have focused on each of the four disciplines of TX separately, many have not interlinked or aggregated them from a holistic perspective of the multiparty experiences to have seamless and frictionless UX.

- **Ownership:** Ownership over digital employee experience is also unclear in many organizations. Expanding the aperture to the more expansive TX can have knock on improvement effects to EX, which then yields a better CX — not only digitally, but within employee-to-customer interactions.

- **Inertia:** Organizations making it through the disruptions of the last couple of years without drastic changes to the CX may be inclined not to adopt a new TX strategy.

- **Technology:** Even as organizations transform digitally, they still struggle to modernize digital experiences. This prevents them from achieving richer MX customer and employee journeys across multiple devices with multiple touchpoints and modalities.

User Recommendations

- Form a TX fusion team that crosses activity silos by engaging with CX, EX, UX and MX leaders or centers of excellence across your organization. Use intersecting performance plans (such as OKRs), to incentivize interteam cooperation.

- Start small by applying total experience to a single customer or employee journey, to be built upon further in the future. Engage with business stakeholders and product managers by conducting workshops to determine how TX strategy can transform their roles and make the organization more agile.

- Identify critical gaps in customer and employee interactions by encouraging project teams to also consider how to leverage MX and UX initiatives to improve those experience gaps.

- Use TX strategy to determine future-state business capabilities, which, in turn, will drive targeted business outcomes. This should include customer and employee journey mapping.

- Apply TX to close the strategy to execution gap by finding important business opportunities that have been held back by their siloed CX, EX, UX or MX efforts.

Sample Vendors

Deloitte; Qualtrics; Salesforce; ServiceNow; TechSee; Valtech; Zoom

Gartner Recommended Reading

Achieve Best-in-Class CX Wins Through Total Experience

Quick Answer: How Do I Get Started With Total Experience?

Tool: Total Experience Scoping Guide

Case Study: Connect Customer and Employee Journeys to Deliver Superior Experiences (the LEGO Group)

Design Systems

Analysis By: Will Grant, Brent Stewart

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Design systems are collections of reusable assets that are based on clear visual, user interfaces and technical standards. They serve as building blocks to quickly and consistently design and develop digital products. Organizations can deliver better user experience for customers and reduce development effort, while preparing to leverage emerging generative AI technologies. A complete design system is composed of: style assets, structural assets, code components and documentation.

Why This Is Important

Using a design system is one of the most effective ways of ensuring design consistency across digital product offerings. Building a design system into your software development process contributes to increased brand consistency, better user experiences and higher front-end developer productivity. Popular SaaS platforms — including Salesforce and SAP — maintain their own design systems to facilitate application design and development on their platforms.

Business Impact

A design system is one of the most important strategic assets for an organization that builds and configures digital products. A robust design system that is resourced and maintained well will drastically shorten design and development timelines. It will ensure the user interface (UI) design is consistent, predictable and usable, and guarantee brand compliance across an organization's full portfolio of digital products both customer and employee facing.

Drivers

- **Speed:** Design systems drastically reduce the time required to design and code the presentation layer of software by reducing the need to repeatedly design from a blank template. Design systems enable easy component assembly and fast screen design tweaks that allow designers to work at pace.

- **Usability:** Design systems are typically composed of time-tested, proven UI design patterns that are familiar to most users. Foundational UI design heuristics, such as "visibility of system status" or "recognition rather than recall" are built into these patterns.

- **Consistency:** Design systems enable the creation of consistent user experiences across disparate teams, whether they are feature teams delivering into a single product or multiple product teams sharing a design system across a larger product portfolio.

- **Scale:** Design systems make it easy for designers and developers to share common, approved design assets and code components across an entire portfolio of digital products, and to work independently using the same assets.

- **Reduction of defects:** Over time, design system code components become "hardened," leading to far fewer production defects in the presentation layer.

- **Brand compliance:** Design systems reinforce a brand identity and infuse key elements such as color and typography into every single design and code asset.

- **Accessibility:** Design system assets can be created in compliance with the latest Web Content Accessibility Guidelines (WCAG), eliminating unnecessary rework downstream.

- **AI-Ready:** Looking forward to emerging generative AI tools, a codified design system will be essential to enable generative AI to work with your in-house style.

Obstacles

- **Effort to create and maintain:** While design systems bring many benefits, they need to be resourced and maintained like any other internal product.

- **Lack of governance:** Without a clear process to update and encourage the use of a design system, it quickly becomes outdated and less impactful.

- **Cross-discipline buy-in:** Without the whole software engineering team getting behind a design system, there's a risk that *several* ad-hoc design systems emerge, multiplying effort and reducing impact.

- **Executive buy-in:** Few executive leaders outside of the design field are aware of the strategic importance and tremendous business value of design systems. Without strong leadership support, design systems easily become underutilized and diminished in terms of the value they add.

- **Originality:** Many UX practitioners are concerned that their designs will become too uniform and lack originality. This fear is generally unfounded as a well-implemented design system will still look and feel unique, while enhancing usability.

User Recommendations

- Conduct a regular review of available design systems by auditing leading examples.

- Assemble a team including UX, product development and product marketing to gather, organize, define and launch an enterprisewide design system, like an internal product.

- Don't start a new design system from scratch unless you're prepared for a significant multiyear investment to catch up with established systems.

- Update design and development processes to mandate the use of the design system rather than starting from scratch for new initiatives.

- Document your design system with style guides, technical component documentation, usage guides and accessibility considerations.

- Set up a structure of governance and stewardship to treat the design system as a vital internal product, with a backlog, roadmap and dedicated resource.

- Consider design system solutions that support design tokens and reusable components to enable the operationalization of your design system, and its readiness for AI-augmented design tools in the future.

Sample Vendors

Figma; Google; IBM; Knapsack; Sketch; Storybook; UXPin; zeroheight

Gartner Recommended Reading

Start Using Design Systems, Accelerate Digital Product Delivery

Predicts 2022: Generative AI Is Poised to Revolutionize Digital Product Development

How Design, Development and Product Management Can Work Together Successfully

The 4 Secrets of Design-Led Companies

How to Build a User Experience Team

Emotion AI

Analysis By: Annette Zimmermann

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Emotion artificial intelligence (AI) technologies (also called affective computing) use AI techniques to analyze the emotional state of a user (via computer vision, audio/voice input, sensors and/or software logic). Emotion AI can initiate responses by performing specific, personalized actions to fit the mood of the customer.

Why This Is Important

Emotion AI is considered transformational as it turns human behavioral attributes into data that will have a large impact on human-machine interface (HMI). Machines will become more "humanized" as they can detect sentiments in many different contexts. Furthermore, applying deep learning to computer vision or audio-based systems to analyze emotions in real time has spawned new use cases for customer experience enhancements, employee wellness and many other areas.

Business Impact

Contact centers use voice analysis and natural language processing (NLP)-based algorithms to detect emotions in voice conversations, in personal chat conversations and chatbots. Computer vision (CV)-based emotion AI has already been used for more than a decade in market research with neuromarketing platforms that test users' reactions toward products. In addition, we see the technology expanding to other verticals and use cases, i.e., healthcare (diagnostic), sales enablement and employee wellness.

Drivers

The increasing number of use cases we have identified indicates an increase in commercialization as emotion AI finds applicability in new domains:

- One of the drivers for detecting emotions/states is the need for a system to act more sympathetically. For instance, it creates anthropomorphic qualities for personal assistant robots (PARs) and virtual beings, making them appear more "human." This "emotional capability" is an important element in enhancing the communication and interaction between users and a PAR.

- This can be an empathic avatar or an emotion-detection-enabled chatbot. A person's daily behavior, communication and decisions are based on emotions — our nonverbal responses in a one-to-one communication are an inseparable element from our dialogues and need to be considered in the human-machine interface (HMI) concept.

- Combinatorial technology solutions such as computer-vision-based and audio analytics, or language-based and computer vision, enable customer experience enhancements.

- Strongest adoption is currently happening in the context of contact centers where voice-based emotion analysis supports multiple use cases such as real-time analysis on voice conversations, emotion detection in chat conversations, emotional chatbots and more.

- Market research and neuromarketing tools are continuously leveraging emotion detection in various user scenarios including focus groups and product testing. Vendors have been extending their offerings toward remote/online interviews during 2020 — due to the pandemic.

- In the creation of virtual beings in customer service or other consumer-facing scenarios, emotional responses are a critical element.

- As the metaverse unfolds, virtual beings will play an important role as business models evolve and the entire ecosystem of this new digital world emerges.

Obstacles

- Privacy concerns are the main obstacle to rapid adoption in the enterprise. This is especially a concern in real-life situations (vs. lab/research environments) for both consumer-facing (e.g., monitoring emotions in a retail environment via cameras) and employee-facing situations. Research environments like product testing have the advantage that the emotion AI is used for this specific purpose and the user (product tester) is fully aware that their emotions are being captured to improve usability or other features.

- Bias: When using facial expression analysis, models are likely to be retrained in different geographies to get the system to detect the different nuances present due to different cultural backgrounds.

- Variation across modalities. Certain emotions can be better detected with one technology mode than with another. For instance, "irony" can be detected using voice-based analysis while this is close to impossible to detect with facial expression analysis.

User Recommendations

- Review vendors' capabilities and reference cases carefully. As the market is currently very immature, most vendors are focused on two or three use cases in two or three industries. At the same time, identifying and processing human emotion is currently a gray area, especially in the EU. The EU Commission has started an initiative to review the ethical aspects of AI technologies, and emotion AI will certainly be part of this debate.

- Enhance your customer analytics and behavioral profiling by applying emotion AI technologies bringing your customer experience strategy to the next level.

- Be use-case-driven. The use case will determine the emotion AI technology to be used and vendor selection.

- Appoint responsibility for data privacy in your organization — a chief data privacy officer or equivalent.

- Work with your vendor on change management in order to avoid user backlash due to sensitive data being collected.

Sample Vendors

Behavioral Signals; Cogito; DAVI; Intelligent Voice; kama.ai; MorphCast; Soul Machines; Superceed; Symanto; Uniphore

Gartner Recommended Reading

Competitive Landscape: Emotion AI Technologies

Emerging Tech: Computer Vision, Voice Analysis and CGI Evolve Into Emotionally Intelligent Virtual Beings

Tool: Vendor Identification for Natural Language Technologies

Miniapps

Analysis By: Tigran Egiazarov

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

A miniapp is a discrete, focused and autonomous application that deploys and operates within the context of a container application platform rather than a core OS (iOS or Android). It is designed to enhance an app's core capabilities without the need for separate installation or switching to external applications. A miniapp must be tightly scoped and composed of user interface, business logic and data components, which optionally interact with a back-end service via API.

Why This Is Important

Miniapps can be applied to multiexperience development by delivering a consistent and cohesive user experience (UX) across different platforms (mobile, web, immersive technologies). The miniapp pattern enables businesses to build a front-end experience that can run in a superapp platform — expanding an organization's reach to new audiences and enabling more customer convenience. It also solves superapp extensibility challenges, allowing application developers to integrate new features and services.

Business Impact

Miniapps can provide value in these ways:

■ Miniapps enable a company to reach more customers. They also offer new monetization opportunities (in-app purchases, payment services, revenue sharing) for superapp platform owners who offer their superapp platform to other developers.

■ With miniapps, organizations can provide enhanced UXs across multiple platforms (multiexperience).

■ Miniapps can also improve productivity and reduce user flow complexity, because multiple miniapps can be used in one superapp.

Drivers

■ Miniapps allow both superapps platform owners and third-party service providers to reach new audiences. Miniapps have gained traction as part of mobile app development, and also based on the growth of conversational platform technologies.

■ The superapp trend for both consumer-facing and employee- (internal) facing use cases is also driving miniapps. Superapps provide the runtime mechanism for the creation and distribution of miniapps within their ecosystems. The WeChat and Alipay apps in China are examples of superapps that allow third parties to create and deploy miniapps (also known as miniprograms) within their apps. Enterprises targeting the Chinese consumer market have to build miniapps for both WeChat and Alipay, and this trend is spreading to Southeast Asia, Africa and Latin America. At the same time, enterprises are increasingly adopting internal-facing superapps to foster employee engagement.

■ On the technology side, there are an increasing number of mobile frameworks like React Native, Flutter and Cordova, as well as the use of WebView inside superapps, rendering an HTML/JavaScript/Cascading Style Sheets micro-front-end. These frameworks make development of superapp platforms easier, which reinforces adoption of miniapps.

■ Enterprise collaboration and messaging platforms, such as Microsoft Teams and Slack, are taking cues from consumer superapps to enable third parties to create and distribute miniapps within their main desktop or mobile apps. It is essential to distinguish the miniapp, which provides a complete new experience, from the plugin-in, which extends the existing experience with new features or user flow.

- Miniapps are part of the evolution of the app economy, allowing extension of the existing UX and business capabilities to a new platform (e.g., a superapp platform) and elevating miniapps to the same level as iOS, Android and other applications.

Obstacles

- Low levels of standardization (e.g., the stagnant W3C miniapp standard) and interoperability within superapps do not enable miniapp portability. This increases the investment and effort required to support "yet another platform."

- Designing for miniapps requires understanding of the user journey and the breaking down of interactions into specific modular use cases for miniapps. This poses a significant UX challenge to maintain alignment across mobile apps, superapps and conversational apps such as chatbots.

- The lack of comprehensive miniapp frameworks significantly restricts options for developers. Moreover, some organizations use proprietary platforms like low-code application platforms (LCAPs) and multiexperience development platforms (MXDPs) to build cross-platform applications, which often lack support for specific superapps.

- Ensuring security and governance is a crucial concern for the miniapp-superapp relationship. A mutual verification process must be established to serve as a layer of trust and accountability between both parties.

User Recommendations

- Align with your company's strategy by presenting a solid business case before deciding to build miniapps for a particular superapp. This will avoid the risk of unnecessary expenditure.

- Analyze your users' superapp preferences and be ready to adapt more quickly to support ever-increasing digital experiences by using miniapps to facilitate multiexperience development.

- Identify suitable development frameworks or technologies for miniapp enablement across your target touchpoints (such as web, mobile apps, conversational platforms and immersive technologies, if supplied by superapp).

- Avoid functional conflicts by managing governance of the miniapp runtime container's capabilities (such as permissions, user consent and location service).

- Use miniapps to deliver functionality into third-party superapps.

- Isolate miniapp code from the superapp platform by investing in a superapp abstraction layer (SAL) to maintain flexibility and reduce the risk of vendor lock-in.

Sample Vendors

DCloud.io; DronaHQ; GeneXus; Ionic; KOBIL

Gartner Recommended Reading

How to Make the Right Technology and Architecture Choices for Front-End Development

Adopt a Mesh App and Service Architecture to Power Your Digital Business

Is React Native or Flutter The Best Fit For Building Mobile Apps?

Key Considerations When Building Web, Native or Hybrid Mobile Apps

Quick Answer: Are Cross-Platform Mobile Apps As Good As Native Apps?

Superapps

Analysis By: Jason Wong

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

A superapp is a mobile app that provides end users (e.g., customers, partners or employees) with a set of core features, as well as access to independently created miniapps. The superapp is an open platform to deliver a miniapps ecosystem. Users can choose miniapps from this ecosystem to activate for consistent and personalized app experiences. There is no separate app store or marketplace for miniapps; instead, superapp users discover, activate and deactivate miniapps in the superapp.

Why This Is Important

Users demand mobile-first experiences that are powerful and easy to use. Superapps have expanded outside China and South Asia to India (e.g., Tata Neu, MyJio and Paytm); Latin America (e.g., Rappi, PicPay, Mercado Libre); and the Middle East/Africa (e.g., M-PESA, Careem and Yassir). The superapp concept is rapidly expanding to employee-facing use cases, such as frontline workers, and employee communications and engagement, such as Walmart's me@Walmart and Wipro's MyWipro apps.

Business Impact

Organizations can create superapps to consolidate multiple mobile apps or related services that reduce user experience (UX) friction (such as context switching) and development effort. Superapps can achieve economies of scale and leverage the network effect of a larger user base and multiple providers. Superapps provide a more-engaging experience for their customers, partners or employees. They improve UX by enabling users to activate their own toolboxes of miniapps and services.

Drivers

- Superapps are gaining interest from forward-thinking organizations that embrace composable application and architecture strategies to power new digital business opportunities in their industries or adjacent markets.

- Superapps are growing beyond mobile apps for consumer use cases. Frontline and remote work trends are driving the evolution of employee communications apps into workforce superapps through the addition of plug-ins for HR, payroll, shift management and other miniapp functions.

- The superapp concept is expanding into enterprise software as a service (SaaS) applications and tools, such as workflow, collaboration and messaging platforms (e.g., Slack and Microsoft Teams, which already have a large number of add-on apps to their main applications). Superapps are starting to expand to support a wide range of modalities, including chatbots, Internet of Things (IoT) technologies and immersive experiences.

- To achieve agility and digital transformation, a superapp advances the concept of a composite application that aggregates services, features and functions into a single app. Multiple internal development teams and external partners can provide discrete services to users by building and deploying modular miniapps to the superapp. This development ecosystem also amplifies the superapp's value, by providing convenient access to a broader range of services in the app.

Obstacles

- There are numerous technical ways to build a superapp, but creating the business ecosystem can become a bigger challenge than technology implementation. A superapp serves as a platform for internally developed miniapps across the business and for third-party, externally developed miniapps. Business partners are needed to create an extended ecosystem for monetization by deploying miniapps to an established user base.

- Another obstacle is getting the UX design of a superapp right for the audience, and also having consistency of the miniapps published to the superapp. Different user personas prefer to interact differently with miniapps — for example, some prefer single, task-focused miniapps versus others preferring everything at their fingertips. Inconsistent UX patterns in a superapp could negatively affect adoption and retention.

- Data sharing could be complex, including simple user authentication, such as single sign-on (SSO), and tracking user preferences or app usage history.

User Recommendations

- Educate partners on the innovations and business value a superapp strategy can drive to improve or consolidate mobile apps.

- Ensure that there is a sound business model and organizational structure to support the distributed development ecosystem for miniapps.

- Secure executive sponsorship by preparing the partnership strategy and financial case for funding as a digital business initiative.

- Identify core features in your superapp (e.g., commerce, communications or collaboration) that will drive a critical mass of adopters and create interest on the part of developers to serve those users

- Offer an easy developer experience and convenient developer tools (e.g., APIs, design guidelines, software development kits [SDKs] and frameworks) for partners to build, test, register and submit miniapps for potential monetization.

- Define security and data protection needs by establishing governance reinforced with common platform implementation to satisfy security and data protection constraints.

Sample Vendors

Alipay; DingTalk GeneXus; Ionic; KOBIL; LINE; Microsoft; PayPay; Paytm; Slack; WeChat

Gartner Recommended Reading

Quick Answer: What Is a Superapp?

Quick Answer: How Does a Superapp Benefit the Digital Employee Experience?

How Banks Can Take On Super-Apps

Top Strategic Technology Trends for 2023: Superapps

Bring Your Own Thing

Analysis By: Nick Jones

Benefit Rating: Moderate

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Definition:

Bring your own thing (BYOT) refers to individuals using personal smart devices at work, because they provide benefits in convenience, fashion or productivity. BYOT will involve a wide range of consumer smart objects, such as wearables, smart lights, air purifiers, voice assistants, earbuds, remote-controlled power sockets, virtual reality (VR) headsets, drones and beverage makers. In the longer term, BYOT will include highly sophisticated devices, such as autonomous vehicles and domestic robots.

Why This Is Important

BYOT is an inevitable evolution of the consumerization trend that has been driving personal technology into the workplace for decades. As consumers acquire more sophisticated personal IoT, a growing range of "things" will be brought into offices or used to support remote working. They'll provide new and more convenient ways to perform tasks, or will improve the quality of the working environment. BYOT may also highlight more formal innovation activities.

Business Impact

The early business impact of BYOT both in office and home working situations will be to improve convenience and quality of life, such as using smart lights, beverage makers, smart earbuds, virtual assistants and personal healthcare devices. In the longer term, it is likely that some workers will find new ways to use advanced smart devices to assist them, like using domestic robots or indoor drones to fetch and carry items, or VR devices such as smart contact lenses to support some tasks.

Drivers

- The early drivers for BYOT will be convenience and ease of use (for example, using technologies like smart assistants to provide simple control of devices such as lights or beverage makers). Workers will also use personal accessories such as fitness bands to monitor working behavior, and smart earbuds for calls and to control equipment.

- Technologies such as Web 3 and the metaverse will encourage early adopters to find new ways to communicate and collaborate, and will enable new working practices. Some of these innovations will drag personal electronic devices such as smartglasses or novel user interfaces into the workplace.

- BYOT will grow slowly over a decade as homes and domestic technology become smarter and consumers acquire a wider range of personal smart devices. One of the long-term legacies of COVID-19 is likely to be a reduction in office-based work, which will encourage BYOT in the home working environment.

- In the longer term, some workers will discover new ways to use smart devices to improve their performance at tasks or to automate processes in new ways (for example, using domestic robots, earbuds for hands-free tasks, or assistive devices that improve their senses such as smart contact lenses). In the very long term, BYOT will extend to technologies such as implants.

Obstacles

- Many personal smart devices will be networked and location-aware, and will contain sensors, cameras and audio capabilities, posing security and privacy concerns.

- Many consumer BYOT devices will exploit cloud services, and may transmit information to unacceptable organizations or locations.

- Personal devices such as drones and robots could cause physical risks such as collisions.

- Cybersecurity staff will resist connecting uncontrolled personal devices to corporate networks, such as Wi-Fi, because of attack risks.

- Enterprise security tools and policies are unsuitable or unable to manage or monitor the diverse range of personal smart devices that will increasingly use networks such as 5G that the organization can't monitor or regulate.

- BYOT may encourage fragmentation of data formats and working practices, and create distractions and diversity in the workplace.

- BYOT may create new digital divides inside organizations, depending on employees' ability to afford new types of devices and services.

User Recommendations

- Explore ways in which consumer IoT devices could improve productivity, effectiveness or working conditions. Monitor BYOT both in the office and in home working situations to identify opportunities.

- Extend risk management and governance strategies to address home and workplace BYOT. Create policies and guidelines for BYOT and educate employees.

- Establish a separate controlled Wi-Fi zone for office-based BYOT.

- Deploy security tools such as network monitoring and CASB, which can indicate where some types of BYOT are occurring and monitor the behavior of certain devices.

- Discuss BYOT with your device management and security vendors to understand their roadmaps in this area.

Sample Vendors

Amazon; Apple; Blue Frog Robotics; Google; iRobot; Panasonic Group; Samsung Electronics; Signify

Gartner Recommended Reading

Future of Work Trends: 5 Trends Shaping the Future of Frontline Workers

Design Sprints

Analysis By: Will Grant, Brent Stewart

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

A design sprint is a multiday, workshop-style process designed to solve business problems through strategic design exploration, prototyping and rapid user testing. A typical design sprint lasts five days and includes steps to define the business problem, generate ideas, prototype the solution and test the prototype with real users. Design sprints help developers and designers to work better together by providing a structured process for collaboration.

Why This Is Important

Design sprints enable the rapid generation and evaluation of big ideas. Using quick prototyping and fast feedback helps maintain focus on delivering customer value. Teams work together to generate new ideas, revolutionary features and products, or to identify new ways to solve old problems. By employing design sprints, an organization taps its collective knowledge from across the business to gain deeper insight from cross-disciplinary subject matter experts.

Business Impact

Many popular and impactful products — both digital and physical — were born during a design sprint, or a similar process. Design sprints give businesses a fast, proven and human-centered means to generate and/or evaluate new ideas, experiences, designs and products. Very few methodologies in business move at the speed of technology. Design sprints are an exception and have become a popular way to infuse experience research and experience strategy into rapid design-development cycles.

Drivers

- **Innovation:** The first and most important business impact of design sprints is innovation. True and meaningful innovation requires deep expertise, diversity of thought, empathy for users and validation of requirements. Design sprints empower organizations to innovate quickly and cheaply, while still maintaining their ability to incrementally evolve and maintain core products and services.

- **Accelerate product delivery:** At the core, a design sprint is simply a shortened version of the human-centered design process. While deeper human-centered design (HCD) is often required, design sprints provide a "quick and dirty" evidence-based approach to design. As a result, teams that use design sprints drive deeper consensus and move faster than the average product team.

- **Collaboration and decision making:** Design sprints have a significant cultural impact on an organization. During a design sprint, ideas rule the day, not people. This democratization of influence is empowering to individuals who may not always have a voice at the table of product strategy and innovation.

- **Foster better relationships:** The experience of collaborative creativity builds bridges between people, teams and across disciplines. Most critically, design sprints open channels of communication and build relationships that close the gap between design and development, leading to better ideas, easier execution, superior design and higher-quality releases.

- **User centricity:** By bringing the whole team — not just designers — along for the journey, design sprints have the effect of instilling a user-centric mindset in nondesign staff. Developers, salespeople, customer support and business leaders are operating in a "user first" mode for the whole design sprint, with lasting impact on how they see the process of ideation.

Obstacles

- **Workshop skills:** In order to succeed, a design sprint must be planned meticulously and run with precision and finesse. Only experienced workshop planners and facilitators can do the low-level planning, preparation and ongoing production work.

- **Availability:** A sprint is worthless unless you have the right attendees — both from the user experience (UX) team and the business. For the average product team, it is difficult to lose key team members from product delivery tracks of work for an entire week or more.

- **Echo chambers:** The best feedback comes from users of the product. If it's not possible to present to users during (or at the end of) a design sprint, be cautious about feedback from the same set of internal stakeholders. Managers are a poor proxy for users.

- **Not a panacea:** Design sprints are great to initiate action on a new initiative, but don't expect definitive answers or deep solutions. It's about getting started, and where to go next, rather than finished products.

User Recommendations

- Educate software engineering leaders and their teams in the practice of design sprints and periodically employ them for larger-scale strategic initiatives, new product concepts and transformative feature enhancements.

- Recognize that design sprints are overkill for smaller, incremental improvements. Product teams with collaborative workshop experience can learn the design-sprint process easily with the help of articles, books and shared templates.

- Employ process, activity, and deliverable templates from visual collaboration tools (e.g., Miro, Mural, Figjam) to improve the quality of design sprint sessions.

Gartner Recommended Reading

Quick Answer: How Can We Incorporate User-Centric Design Into the Features We Build for Our Product?

How Design, Development and Product Management Can Work Together Successfully

The 4 Secrets of Design-Led Companies

Sliding into the Trough

Conversational User Interfaces

Analysis By: Gabriele Rigon, Stephen Emmott, Van Baker, Bern Elliot, Frank O'Connor

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Conversational user interfaces (CUIs) are human-computer interfaces that enable natural language interactions for the purpose of fulfilling a request, such as answering a question or completing a task. The sophistication of a CUI can vary from understanding basic queries to handling complex multiturn dialogs, so CUIs range from Q&A bots to more advanced virtual assistants (VAs). CUIs fundamentally shift the interaction medium from traditional point-and-click to natural-language-driven.

Why This Is Important

UIs provide direct control between the user and the applications they are operating. In a CUI, this responsibility shifts from application-specific controls to conversational controls, and the CUI is determining the intent and acting upon it. This makes CUIs more widespread as agent (acting) UIs for software, devices and the Internet of Things. AI-enabled CUIs can provide a single, intuitive, common interface to multiple application functions across the entire organization.

Business Impact

Training, onboarding, escalations, productivity, empowerment and responsibility all change with CUIs and need to be embraced as part of CUI projects. AI-enabled CUIs can dramatically standardize and improve the usability of a variety of applications across all business functions, such as CRM, the digital workplace and ERP, hence improving efficiency. They can also benefit customer experience when used to automate support in the form of self-service chatbots or VAs.

Drivers

■ **Users' expectations and generative AI**: Users increasingly expect to be able to hold conversations with and ask natural language questions of the applications they use. CUIs are beginning to complement or even replace traditional interfaces in a variety of applications, such as search and insight engines, business intelligence platforms and productivity software, such as document and spreadsheet applications. The trend toward the enablement of interactions in natural language between users (customers and employees) and software has been significantly accelerated by the hype around generative AI and ChatGPT.

■ **Conversational AI platforms**: The underlying technology supporting custom-developed CUIs (like chatbots and VAs) built on top of conversational AI platforms (CAIPs) has matured significantly in the last few years. Vendors are investing in core AI technologies, such as large language models (LLMs), to improve components such as natural language understanding. They are also expanding their capabilities to support broader use cases beyond self-service chatbots and toward broader B2C and B2E automation.

■ **Search**: CUIs will be increasingly used for knowledge search and retrieval based on document ingestion. Some technologies driving this include LLM-enabled enterprise applications, such as Microsoft 365 Copilot, as well as ChatGPT-like Q&A chatbots and LLM-powered VAs. This is also causing the market to be flooded with dedicated add-ons and even new vendors.

■ **Multimodal interactions**: Generative AI methods are increasing the availability of multimodal interactions, such as those based on images, videos, audio and other sensory data. As a matter of fact, beyond text, voice is emerging as a primary modality of interaction between users and CUIs. This can add a powerful enhancement to the communications. Multimodality can solve some of the problems of the current generation of LLMs. Multimodal language models will also unlock new applications that were impossible with text-only models.

Obstacles

■ Developing CUIs is intrinsically complex and requires more effort than graphical UIs. More sophistication has to be built into VAs' conversational capabilities to deal with a range of users and edge cases. CUIs' predictions about users' intents can be wrong, so the CUI designer has to keep ambiguity in mind.

■ Lack of CUI personality, poor accuracy and conversational design, as well as unreliability of answers generated by LLMs, can affect user sentiments negatively and, as a consequence, adoption and ROI.

- CUIs are available from many sources, whether offered by applications, CAIPs or through separate augmentation. For example, transactional conversational AI use cases require capabilities that only platforms can provide. Q&A scenarios may also be supported by architectures primarily leveraging search and LLMs. Understanding the sophistication and the limitations of these and other approaches is not trivial. This may lead buyers to choose the wrong tooling and many CUIs to fail.

User Recommendations

- Treat CUIs as transformative, and plan on them becoming the dominant interaction model between users and applications.

- Prioritize the requirements of your custom CUIs in terms of sophistication, integration and control. Do not underestimate the risks of building CUIs that do not meet enterprise-grade performance, accuracy and security standards.

- Develop your strategy for consolidation upon one or few conversational AI platforms or approaches, avoiding challenges that derive from the proliferation of CUIs deployed by different business units in different regions.

- Educate stakeholders around benefits and limitations of generative-AI-enabled CUIs, and encourage well-informed employees to experiment with such CUIs.

- Prepare for new roles and skills in the enterprise. Dialogue designers and AI trainers, for example, are needed to enable custom CUI initiatives. Citizen developers will acquire prompt engineering and model management skills to leverage generative-AI-enabled CUIs effectively.

Sample Vendors

Amelia; Avaamo; Cognigy; Google; IBM; Kore.ai; Omilia; OneReach.ai; OpenAI

Gartner Recommended Reading

Magic Quadrant for Enterprise Conversational AI Platforms

Critical Capabilities for Enterprise Conversational AI Platforms

Competitive Landscape: Conversational AI Platform Providers

Emerging Tech Roundup: ChatGPT Hype Fuels Urgency for Advancing Conversational AI and Generative AI

Multiexperience

Analysis By: Tigran Egiazarov

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Multiexperience (MX) describes interactions that take place across a variety of digital touchpoints (i.e., web, mobile apps, conversational apps, AR, VR and wearables), using a combination of interaction modalities in support of a seamless and consistent digital user journey. Modalities include text, voice, vision and gesture. Multiexperience is part of a long-term shift from the individual computers that we use today to a multidevice, multisensory and multilocation ambient computing experience.

Why This Is Important

Through 2030, the digital user experience (UX) will undergo a significant shift in terms of how consumers, partners, citizens and employees experience their environments. MX represents a shift in both UX perception and interaction models — creating a multisensory, multidevice, multilocation and multitouchpoint digital journey for the user.

Business Impact

To achieve digital business transformation, it is essential to understand and exploit multiexperience. Applying multiexperience design to digital experiences removes friction and effort for the users — both customers and employees. MX delivers positive business outcomes by serving customers and employees in ways that best suit their needs and expectations. Adopting MX enables optimization and reuse of business capabilities, implementation components and data.

Drivers

- Organizations are shifting their delivery models from projects to products, but beyond products is the experience — the collection of feelings, emotions and memories. Web and mobile apps are already commonplace, but they are undergoing UX changes driven by new capabilities like progressive web apps, WebXR and artificial intelligence (AI) services. Conversational platforms, powered by Generative AI such as ChatGPT, allow people to interact more naturally and effortlessly with the digital world. Reinforced by hardware innovations and AI, immersive technologies such as virtual reality (VR), augmented reality (AR), mixed reality (MR) and the metaverse are changing the way people interact with and perceive the physical-digital world.

- As organizations continue to invest in customer experience (CX) and employee experience (EX), they will need to apply MX front-end architecture and technology strategies to be more agile at serving business needs and user expectations. When MX discipline is applied with great UX in support of CX and EX strategies, total experience (TX) transformation is achieved. TX requires MX to be executed with CX, EX and UX in harmony and synchronicity.

- The long-term manifestation of MX is a composable digital experience that is adaptive, seamless, collaborative, consistent, personalized and ambient. Design and architecture patterns, such as micro-front-ends, backends for frontends and superapps are important enablers.

- Greater availability of development technologies to build for multiexperience more easily, including multiexperience development platforms, digital experience platforms and cross-platform frameworks (i.e., Flutter, .NET MAUI, React Native, Vue Native).

Obstacles

- Privacy and security concerns may dampen the enthusiasm and impact of MX adoption. Multiple devices or digital touchpoints with different levels of security capabilities will increase risk of security breaches.

- On the technical front, the fragmentation of many consumer devices and the inconsistency of interoperability standards are enormous barriers to seamless MX integration of front-end technologies. Legacy noncomposable and non-API-ready service architecture makes those barriers even higher.

- The cost and effort, required for implementing MX, often do not justify the benefits of the resulting output.

- The skills needed for MX development, such as immersive interaction design, are still lacking in most enterprise software engineering teams.

- Currently, automatic plug and play of off-the-shelf devices, applications and services is not feasible for MX. Instead, proprietary hardware and software ecosystems of MX solutions will exist in the near term.

User Recommendations

- Identify three to five high-value pilot projects in which MX design can lead to more effortless, compelling and transformative experiences, such as e-commerce, healthcare, frontline workers and edge computing.

- Evaluate business applications, frameworks and platforms, such as field service management and digital experience platforms, for their native MX capabilities and support for custom MX development.

- Collaborate with UX design teams to create a design system that spans desired MX touchpoints and modes of interaction.

- Establish a multidisciplinary fusion (product) team including (but not limited to) IT, product managers, UX designers and business stakeholders.

- Invest in modern service architecture and technologies to ensure a seamless integration between MX applications with back-end services through APIs.

- Focus on understanding how unified digital experiences impact the business, and use evolving MX technologies to create targeted solutions for customers, partners and staff.

Gartner Recommended Reading

Adopt a Mesh App and Service Architecture to Power Your Digital Business

Market Guide for Multiexperience Development Platforms

2023 Strategic Roadmap for Adopting Modern Application Architectures and Technologies

How to Make the Right Technology and Architecture Choices for Front-End Development

Customer Journey Analytics

Analysis By: Matt Wakeman

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Customer journey analytics (CJA) tracks and analyzes customers' and prospects' interactions with an organization across multiple channels. It aims to provide a holistic view of customer experience by covering all the channels used by customers. CJA includes channels with human interaction (e.g., a call center) and those that are fully automated (a website). It also includes physical channels (a retail store), and those that provide customer assistance (live chat and co-browsing).

Why This Is Important

Consumers expect personalized, customer-centric engagement and marketers need to deliver it — challenging marketing strategies that take a business-centric approach to the customer experience. Moreover, customer activity across channels is increasing, so tools that integrate cross-channel customer behavior using CJA enable companies to identify opportunities to improve customer experience.

Business Impact

CJA is a strategic priority for a variety of internal roles in several different industries, as leaders strive to gain a better understanding of the customer journey across all phases — buying, ownership and advocacy. In many cases, marketers will be able to leverage CJA features in their existing martech stack rather than add a stand-alone vendor.

Drivers

- CJA is a strategic priority for multiple roles, as marketing, sales and service leaders strive to gain a better understanding of customers' complete journeys and touchpoints across channels and functions.

- CJA can improve marketers' personalization tactics by measuring each phase of a journey to optimize the entire journey for the customer (or customer segment) context and intent.

- CJA access is accelerating as more applications begin to add elements of journey analysis into existing tools, such as customer data platforms, personalization engines, customer analytics applications and multichannel marketing hubs.

Obstacles

- Marketers are challenged to access, analyze and activate their companies' customer data — from web activity to call center engagement. Gartner surveys show that on average, companies use nine channels for marketing, 2.9 for digital commerce and 5.4 for customer service. The greater the number of siloed customer channels or data sources, the more challenging to deliver comprehensive CJA.

- Digital data deprecation has accelerated, with changes to platforms (Apple) and regulations (across North America and Western Europe). While marketers must address regulatory and consumer concerns, this trend creates a journey analytics gap for anonymous audiences, due to the increasing challenge of linking anonymous digital activity across sessions and devices. Those challenges are larger for certain go-to-market models (primarily indirect sales models, e.g., B2B2C).

User Recommendations

- Acknowledge that valuable insights come from understanding the combination of channels used by customers, not by understanding customer (or segment) behavior within a single channel.

- Evaluate your existing technology stack to see if you're already paying for an application with journey analysis capabilities — because journey analysis functionality is often embedded into other systems.

- Avoid measuring outcomes with channel-specific key performance indicators (KPIs) (that ignore customer activities in other channels, such as single-channel conversion rates or cost per acquisition. Channel-specific KPIs can be useful diagnostic indicators for prioritizing optimizations.

- Start with customer identification and journey mapping across only two to three channels, where the journey benefits the customer and organization (high impact) and the data are both available and valuable (high feasibility).

Sample Vendors

Adobe; Cerebri AI; Splunk; Teradata

Gartner Recommended Reading

Market Guide for Web, Product and Digital Experience Analytics

What Marketers Need to Know About Customer Journey Analytics

Fusion Teams

Analysis By: Jason Wong

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

A fusion team is a multidisciplinary team that blends technology or analytics and business domain expertise, and shares accountability for business and technology outcomes. Instead of organizing work by functions or technologies, fusion teams are typically organized by the cross-cutting business capabilities, business outcomes or customer outcomes they support.

Why This Is Important

More software development will be done outside of IT as business users become more digitally dexterous. Business units building digital business capabilities want full control of all the people critical to that business, and closer collaboration between business and IT professionals.

Business Impact

The ongoing democratization of digital delivery is an effort to increase the realized value of digital initiatives, and drive speed and agility. This involves placing the design, delivery and management of digital capabilities where that value is created: with the people and teams closest to the customer, products or business operations. In this context, "democratization" speaks to making the creation and management of information and technology accessible to everyone.

Drivers

- According to the 2022 Gartner Digital Worker Survey, 48% of non-IT workers customize or build tools from technology provided by IT or from tools they acquire on their own. This is in line with Gartner's prior surveys showing that, on average, 41% of employees are business technologists.

- Development of digital products for use by external customers drives fusion teams.

- Business units need control of all the resources for delivering a product, including control of the professional software engineering teams.

- Mixed teams of business people and software engineers allow for tight collaboration on the details of a product, which often leads to more effective delivery and outcomes.

- Making software development an integral part of product development allows software engineers to inject innovative ideas for the product.

Obstacles

- Organizations that do not orchestrate the democratization of digital delivery may end up with misaligned or duplicative initiatives and capabilities; inconsistent customer experiences; inefficiencies; and compliance, privacy or security issues.

- Business leaders often find themselves unprepared to take on technology leadership responsibilities because they may have limited visibility into what this means for their own roles and their ways of working.

- Business leaders outside IT may not have adequate experiences, skills and competencies to lead their own fusion teams.

User Recommendations

- Update your division-of-labor practices for application governance. IT and business should share responsibility for portfolio strategy, roadmap planning, vendor product release planning and application project/sprint delivery.

- Encourage acceptance of fusion teams that do technology work outside of IT — the business units may need to have full control of the resources to deliver their product or service.

- Ensure that the CIO and other business leaders work together to build agile and effective governance frameworks for the work that the fusion teams do. With control comes responsibility.

- Focus on the human side of managing digital business risk and foster "digital judgment" in fusion team leaders. Digital judgment is the set of beliefs, mindsets and behaviors that lead to sound risk management among frontline technology decision makers throughout the enterprise.

Gartner Recommended Reading

Quick Answer: How Can Digital Workplace Leaders Support Business Technologists?

Quick Answer: What Types of Fusion Teams Do Business Technologists Lead?

Video: What Are Fusion Teams and Why Do CIOs Need Them?

Video: What CIOs Need to Know About Governing Business Technologist-Led Fusion Teams

VoC Applications

Analysis By: Wynn White

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Voice-of-the-customer (VoC) applications combine multiple traditionally siloed technologies associated with the capture and analysis of direct, indirect and inferred customer feedback. For example, surveys, social media monitoring and speech/customer journey analytics are integrated to provide a holistic view of the customer's voice. The resultant customer insights can be acted on automatically or disseminated to relevant employees and managed as part of inner- and outer-loop interventions.

Why This Is Important

Most organizations have multiple siloed customer feedback mechanisms at a departmental level, usually based on surveying complemented by other domain-specific information sources. Few organizations have aligned these various sources to create an integrated VoC solution and, as such, are failing to fully realize the potential positive impact that feedback can have on improving the customer experience.

Business Impact

A centralized VoC solution will:

- Instill more confidence in actions taken at both individual customer level (such as a retention call) and at overarching strategic level (such as a process or product change).

- Ensure that the right insight and action gets assigned to the right employee across the enterprise at the right time, regardless of where the feedback originated from.

- Help manage brand perceptions, understand and improve the customer experience and develop future customer engagement strategies.

Drivers

Several factors are accelerating the adoption and maturity of VoC, including the following:

- The emergence of large, big-name VoC vendors with revenue approaching $1 billion causing increased visibility and awareness of VoC applications.

- Adoption by B2B and B2B2C enterprises, not just B2C.

- Entrance into the market by mainstream CRM vendors such as Salesforce and Microsoft.

- Elevated commitment to the customer experience as the primary means of market differentiation by corporate executives.

- Alignment with complementary employee experience initiatives currently fashionable with HCM leaders.

- Elevated focus on value measurement of VoC.

- Better alignment of VoC with research (user and product).

- Advancements in both prescriptive (i.e., a recommended list of prioritized actions per employee) and automated (i.e., resolving the action from within the VoC solution and associated operational integrations without human intervention) actions.

- Customer wants/needs, which are changing much faster (due to several factors) than in the past. Organizations need to be more responsive to these changing needs, and require a robust VoC application.

Obstacles

VoC as part of the customer service technology suite is far from mainstream. Organizational maturity is low and the vendor landscape is still emerging, resulting in various obstacles:

- There are over 30 vendors that have expertise spanning the diversity of feedback techniques that a holistic VoC solution encompasses. New CRM vendor entrants with currently immature but potentially long-term viable offerings further complete procurement.

- Organizations will likely continue to collect feedback through multiple applications for many more years because individual departments will be reluctant to relinquish their tools and standardize on one central application. At best, an integrated multivendor ecosystem will be achieved.

- As the number of data sources ingested continues to expand, how VoC aligns with existing single-view-of-the-customer initiatives (for example, a customer data platform/lake) is an increasingly contentious discussion topic. The upside of time to value proposed to business by VoC vendors is countered by the cost, complexity and inherent duplication perceived by IT.

User Recommendations

Ideally, VoC should fall under the remit of a central customer experience function, but if not, then a cross-department VoC committee. Once set up, do the following:

- Conduct an internal audit to assess current customer feedback capabilities and reduce duplicate technologies.

- Prioritize future initiatives that collect VoC data by balancing quality (insightfulness) with the quantity of feedback available. Strive to obtain a single, holistic view of the VoC.

- Determine the most appropriate data architecture and analytical models/techniques to extract key customer insights at both individual respondents and aggregated across the customer base levels.

- Distribute relevant insights/actions across the organization (front line and management) in a timely manner using workflow and operational integration.

- Leverage VoC in core business processes, ideally in real time — for example, using a low survey score to open a customer service case within the customer service and support application.

Sample Vendors

Forsta; InMoment; Medallia; Qualtrics; SMG

Gartner Recommended Reading

Building a VoC Strategy for Measuring Customer Experiences in Service

Benchmark Analysis of Customer Service Voice-of-the-Customer Programs

Inclusive Design

Analysis By: Nabeeha Ahmed, Van Baker, Will Grant

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Inclusive design involves creating products and services that provide good experiences for people of all backgrounds and abilities, including those who are often excluded or marginalized. Even minor design decisions can present barriers to access and participation for many people, effectively excluding them. This exclusion directly affects lives when designers do not consider such attributes as sensory processing difficulties, disabilities, age, culture, ethnicity, gender and religion.

Why This Is Important

The goal of inclusive design is to deliver great experiences for as many users as possible, ensuring that the designs take into account those who are traditionally excluded. One aspect is to address the needs of people with disabilities, but inclusive design extends to other areas of bias and cultural considerations as well. Designing for diversity is important now for organizations to remain competitive in a world with rapidly changing demographics and levels of digital access.

Business Impact

Inclusive design reduces the delivery of inaccessible, inappropriate or insensitive designs. It is good for business, because it enables organizations to expand their reach and offerings, and has led to breakthrough products for many companies, as features designed to address inclusivity often appeal to a wide range of users. Designs that exclude users may increase risk of brand and reputational damage, threaten competitive advantage and product leadership, and affect regulatory compliance.

Drivers

- **Digital accessibility standards** — Products designed to be inclusive are more likely to meet Web Content Accessibility Guidelines (WCAG) compliance without extensive testing and remediation, saving the time, money and effort often involved in postlaunch accessibility initiatives.

- **Legislation** — Inclusivity ensures that your organization isn't discriminating against people and breaching certain laws. The U.S., the European Union (EU), the U.K., Australia, Canada and many other nations have passed laws to prevent such discrimination.

- **Brand image** — Companies that engage in inclusive design experience a "halo effect" that enhances their brand image among customers, employees, new-hire candidates and the market at large.

- **Customer base** — People who traditionally face barriers to the use of digital products are drawn to and frequently evangelize brands and organizations that they know create inclusive products. For example, once a product achieves WCAG compliance, and users with disabilities can search, shop, sell and socialize without boundaries, the customer base expands, loyalty increases and there is marked improvement in key performance indicators (KPIs).

- **Shifting demographics** — As major demographic shifts continue across the world, it is becoming increasingly important to consider a broad range of backgrounds and characteristics in designing products and services.

- **Bias** — Companies that focus on diversity will avoid inherent bias in limited datasets and user testing groups that fail to represent the full gamut of backgrounds and abilities across society.

- **Increased ROI** — Companies that design and deliver inclusive products and services often enjoy broader appeal, sometimes beyond the target audience, increasing overall revenue and returns.

Obstacles

- **Lack of expertise** — Inclusive design requires sophisticated research methods to gather and use insights. Few organizations have researchers capable of this level of discovery.

- **Lack of leadership support** — Effective inclusive design requires strong, visible advocacy from senior leaders in the organization, which is often lacking.

- **Resource constraints** — Most organizations lack the time and budget for work that does not guarantee a sufficiently tangible return on investment (ROI).

- **Front-end engineering effort** — Many of the changes to user interfaces (UIs) to make them fully accessible are nontrivial, especially on large or legacy software products.

- **Edge-case thinking** — Most product teams are encouraged to focus on core use cases and deprioritize edge cases. Exclusion is considered an edge case to be addressed later.

- **Technological limitations** — Inclusivity often requires adaptation, automation and the provision of varied designs, which may not be possible with the technology in use.

User Recommendations

- Make inclusive design a priority, and educate yourself and your teams on the principles for designing for diversity.

- Integrate inclusive design considerations into your design and development processes by making inclusion checklists part of the definition of "done" for stories.

- Perform accessibility audits as part of quality assurance (QA) processes to ensure that noncompliant software isn't shipped into production.

- Evangelize the benefits of inclusivity across the organization, to build allies and reinforce the message that inclusive design must be an ongoing commitment, not a "once and done" fix.

- Ensure that your design and development efforts do not focus exclusively on the "target customer"; this consciously excludes potential customers.

Gartner Recommended Reading

Market Guide for Digital Accessibility

Digital Design

Analysis By: Marcus Blosch, Akshay Jhawar

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Digital design is a multidisciplinary process used to improve the design of digital products and services. Deep customer insight, combined with a creative process, is ideal for digital innovation. It starts with empathy for users and the gathering of insight about their needs and motivations, developed using an iterative, experimental approach.

Why This Is Important

A proven methodology applied to a broad range of business problems, digital design typically enhances usability and user experience (UX). UX is a key element of the total experience (TX), affecting both the employee experience (EX), customer experience (CX) and operational experience (OX). Leading organizations regularly apply digital design to new digital projects/products, and it can also link to lean startup and agile methodologies, enhancing application development.

Business Impact

Digital strategy and innovation remains a priority for senior business leaders, so digital design will remain a core methodology. The usability of products and services affects key performance indicators (KPIs), such as customer satisfaction, Net Promoter Score (NPS), customer effort score, customer/employee retention, conversion, revenue and market share.

Drivers

- The growing importance of digital engagement with customers and employees has forced enterprises to take design seriously. Design teams, centers of excellence (COEs), user-centered design, usability testing, usability labs and skilled designers are just a few of the efforts made by enterprise IT to improve design. Although they generally work well, a digital design methodology is needed to bring these elements together.

- Digital design has a direct impact on CX and EX, the most significant investment areas for enterprises. Total experience, which ties together the relationship between UX, CX and EX, has become a new focus area for enterprises.

Obstacles

- Experience in digital design will ensure the smooth application of design thinking. Basic training is adequate; however, the pairing of designers and developers is a best-practice model for making digital design work effectively.

- Some digital design workshops are commissioned without a clear objective in mind and without appropriate research. This leads to workshop results that are not actionable.

- Digital design has historically been accomplished by a group of people in the same location, frequently a dedicated space. With COVID-19, these gatherings became nonfeasible, and digital design was forced into a remote-only model. This was challenging, especially for steps such as ideation and prototyping. Today's hybrid work scenarios will allow physical gatherings for design-thinking sessions, but the remote tools employed during the pandemic may be critical when teams include some remote participants.

User Recommendations

- Identify opportunities for the application of digital design to improve usability, especially in new digital projects and product development.

- Build cross-functional teams, drawing from business units and the IT department. Train them in the process of design thinking and give them time to practice it.

- Start simply and on a small scale in most cases. Take on more complex projects progressively as your experience grows.

- Train the cross-functional team in the digital design methodology, emphasizing practical experience of it. Ensure that the workshop objectives are clear, and that appropriate research is done prior to the workshop.

- Develop your design approaches to support hybrid work scenarios. The key elements for supporting a combination of physically present and remote team members are a collection of digital collaboration tools, electronic conference rooms, multiscreen capabilities for individual work-from-home (WFH) workers and the application of DesignOps.

- Continue to evaluate new tools to facilitate remote participants.

Sample Vendors

Accenture; Adobe; IBM; IDEO; JFrog; Massachusetts Institute of Technology; Nielsen Norman Group; Pegasystems; Salesforce; SAP

Gartner Recommended Reading

Quick Answer: How Can We Incorporate User-Centric Design Into the Features We Build for Our Product?Enterprise Architects Combine Design Thinking, Lean Startup and Agile to Drive Digital InnovationDesign a Better Digital Business With the Business Architecture LandscapeDesign Thinking Improves Customer-Facing Projects (FedEx)Ignition Guide to Conducting a Design Thinking Workshop as a Product Manager

Virtual Reality

Analysis By: Tuong Nguyen

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Definition:

Virtual reality (VR) provides a computer-generated 3D environment that supports both computer graphics and 360-degree videos. This environment surrounds a user and responds to an individual's actions in a natural way, either through immersive head-mounted displays (HMDs), computing devices or room-based systems.

Why This Is Important

VR is a fully digital experience or interface that can complement current tools and practices, transporting users into an immersive and fully digital 3D experience. Organizations can use VR simulations to change how they interact with employees, partners and customers by allowing them to mimic tasks and interactions. This is especially helpful whenever presence, embodiment, and empathy via remote 3D visualizations add value.

Business Impact

Virtual-reality 3D simulations can:

- Reduce training costs.

- Reduce equipment downtime by providing training to employees.

- Reduce employee risk by providing task simulations.

- Improve design cycle times.

- Provide innovative ways for employee engagement, soft skills training and collaboration.

- Deliver new experiences and ways of interaction for customers, such as tours or planning and designing capabilities.

Drivers

- As an interface for digital content, VR has gained significant traction from the hype around the metaverse. This is primarily because technology giants such as Meta have been focusing on the VR aspect of metaverses.

- The consumer interest in VR has had a spillover effect upon enterprises.

- Enterprise interest has also increased because COVID-19-related restrictions prompted organizations to actively seek alternative solutions for customer engagement, remote training and collaboration. While some offices have reopened, the increased prevalence of remote and hybrid working has sustained significant interest.

- There is a growing body of use cases that create value, for example in the fields of architecture, engineering and design. Further, 360-degree image or video tours can add value in real estate and documentation. Other use cases are training simulations in high-risk situations, for example, in expensive or inaccessible locations (such as space or deep sea exploration, surgical training). Finally, onboarding for dangerous or remote locations (such as an oil rig) and soft skills training are also growing VR use cases.

Obstacles

- The VR solution provider ecosystem has been slow to advance products.

- The breadth and quality of VR content remain limited.

- The existing solutions lack scalability.

- There is a lack of enterprise-ready solutions.

- Potential customization requirements and limited scalability make VR experiences much more expensive than augmented reality (AR) ones — outweighing potential benefits in many situations.

- Safety and comfort issues such as headaches and nausea present significant adoption hurdles, especially with HMD-based VR solutions.

- VR HMDs are purpose-built for different professions or use cases. Therefore, they lack standardized features and controls.

User Recommendations

- Use VR to support your organization's training, visualization and collaboration tasks that require 3D content. These tasks include building information modeling (BIM) and computer-aided design (CAD).

- Identify procedures and experiences that may benefit from virtualized visual interactions, such as tours and training procedures.

- Discover potential benefits of VR by benchmarking traditional practices against VR experiences.

- Focus on a small number of pilots based on platforms that are designed to meet enterprise requirements.

- Avoid point solutions. Instead, look for solutions that have a broader applicability and can be integrated into existing solutions and processes.

Sample Vendors

Arthur Digital; FundamentalVR; Immerse.io; Matterport; MetaVRse; Motive.io; Remio; SimInsights; Strivr

Gartner Recommended Reading

Augmented Reality and Virtual Reality Will Transform Selling

Virtual Reality and Augmented Reality for Remote Workers

Quick Answer: What Emerging Metaverse Capabilities Should Be Prioritized for More Effective Meetings?

Emerging Tech: Metaverse Providers Must Refine Their Go-to-Market Strategy and Use Cases to Succeed in the Emerging Metaverse

Climbing the Slope

Augmented Reality

Analysis By: Tuong Nguyen

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Definition:

Augmented reality (AR) is the real-time use of information in the form of text, graphics, audio and other virtual enhancements integrated with real-world objects and presented using a mobile, head-mounted display (HMD) or projected graphics overlays. It is this "real world" element that differentiates AR from virtual reality. AR aims to enhance users' interaction with the environment, rather than separating them from it.

Why This Is Important

AR is the next era of experience or interface that enhances the user's surroundings with real-time, relevant, interesting and actionable information. Frontline workers in asset intensive industries (such as mining, engineering, construction, energy and utilities, logistics, manufacturing, healthcare) are currently showing the most benefit from this type of experience. Particularly using digital overlays that help employees do their job more efficiently, effectively and more safely.

Business Impact

Current technology is best suited for purpose-built and specialized solutions. As such, position and adoption speed for AR will vary greatly with vertical and industry; however, the benefits of AR include cost reduction and task efficiency and effectiveness. Current horizontal tasks seeing the most traction are procedural tasks, and situational video with telestration. Visual design and customer engagement are also seeing traction, but to a lesser extent due to technology and market limitations.

Drivers

- Growing interest in asset-intensive enterprises to improve employee safety, efficiency and effectiveness using AR for training and workflow improvement.

- AR software tools providing better integration and with more systems of record — enabling enterprise seamless interaction with existing systems (instead of managing individual applications).

- Evolving partnerships (improved ecosystem) of AR software and hardware; which are evolving into enterprise-ready and off-the-shelf solutions.

Obstacles

- Turnkey solutions not available/viable, yet.

- Lack of appropriate digital content. AR is inherently digital, therefore, benefits organizations that are further along in their digitization journey.

- Limited accessibility: Current solutions are better described as AR-inspired solutions because these experiences contain elements of AR and offer limited, purpose-built capabilities; encapsulated within a stand-alone app, or for a specific task.

- Usability: New interface paradigms need to be created to handle interactions between physical and digital elements in 3D space. A mix of vocabularies of different interface modalities (speech, motion, touch, gesture and so forth) need to be defined and standardized to make AR interactions intuitive.

- Availability of form factors that make AR experiences seamless and valuable needs improvement. For example, handheld devices deliver a poor user experience for regular and extended AR usage; while the market for HMDs have few, purpose-built options.

User Recommendations

- Select/clearly define your use cases. Set benchmarks against unaugmented solutions to understand risks and benefits and determine ROI.

- Set the business goals, requirements and measurements for your AR implementation before choosing a provider.

- Plan deployments around AR based on handheld devices (phones/tablets). HMDs have higher business value for all-day hands-busy tasks.

- Determine a clear intention for your deployment to ensure value. For enterprise, use AR as a tool to enhance employee job function for frontline workforce. This could include, delivering context-specific information when needed for field workers, better leveraging experts (using one-to-many video support) in plant and maintenance operations, or enhancing business processes via AR-based training and instruction.

Sample Vendors

Augmentir; CGS; IrisCX; Librestream; OverIT; PTC; Scope AR; Taqtile; TeamViewer; Xerox

Gartner Recommended Reading

The Virtuous Circle of Collaboration With Augmented Reality in Field Service

Emerging Technologies: Tech Innovators in Augmented Reality — Augmentation and Spatial Interaction Layer

Emerging Technologies: Tech Innovators in Augmented Reality — AR Cloud

Emerging Technologies: Kick-Start Adoption With Essential Enterprise Augmented Reality Business Practices

Innovation Insight for Immersive Technologies in Frontline Working

DXP

Analysis By: John Field

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

A digital experience platform (DXP) is an integrated set of technologies designed to enable the composition, management, delivery and optimization of contextualized digital experiences across multiexperience customer journeys.

Why This Is Important

Organizations need a solution to enable the composition, management, delivery and optimization of contextualized digital experiences throughout multiexperience customer journeys. A DXP addresses these needs, creating digital experiences across a wide range of engagement scenarios, audiences, channels, devices and modes. The integrated nature of a DXP means faster time to market and lower deployment costs, as well as higher levels of customer and employee engagement and satisfaction.

Business Impact

Poor digital experiences, often delivered in silos, lead to customer and employee frustration. DXPs help enterprises deliver compelling digital experiences for consumers, employees, citizens and partners. They provide significant efficiencies in composition, management, delivery, contextualization and optimization of digital experiences throughout multiple touchpoints. DXPs face disruption from headless content management systems as priority for composability increases.

Drivers

- DXPs have the ability to bring multiple silos of engagement into a single seamless experience.

- There is a growing need to improve customer and employee experiences, and to establish a stronger competitive position.

- Multiexperience strategy adoption is leading to a total experience model.

- Organizations want the ability to scale and pivot as business needs/environments change — DXPs help them do that.

- Business agility, elasticity, flexibility, extensibility and faster time to market are all enabled by DXPs.

- DXPs embrace a composable user experience, supporting a composable business model.

- There is a need for an integration layer, supporting API, integration platform as a service (iPaaS) and other models.

- Many organizations want to manage content and digital experiences with minimal IT support.

Obstacles

- Lack of digital maturity

- Cost

- Conservative verticals or use cases with low DX aspirations

- Limited agility and complexity of deployment

- Rise in composing DXPs from multiple capabilities/vendors instead of buying a core solution

- Organizational inertia or resistance to change

User Recommendations

- Ensure a business-aligned and streamlined DXP strategy by focusing on business outcomes, along with governance, including key business and IT stakeholders.

- Create an architecture for DXP that best meets your vision by examining the current state, determining gaps in current functionality and assessing opportunities to employ innovations required to achieve the future vision.

- Create an internal roadmap based on desired outcomes, technology maturity, potential disruptors and risks for the next three to five years, keeping composable DXP and the ideal user experience in mind.

Sample Vendors

Acquia; Adobe; Bloomreach; Magnolia; Optimizely

Gartner Recommended Reading

Magic Quadrant for Digital Experience Platforms

Critical Capabilities for Digital Experience Platforms

Defining the Digital Experience Platform

Adopt a Composable DXP Strategy to Future-Proof Your Tech Stack

Service Design

Analysis By: Brent Stewart

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Service design involves the planning, organization and design of a business's people, processes and tools to directly improve the product user experience for the employee and, indirectly, the overall customer experience (CX). As employees become more efficient, better informed and more capable through high-quality service design, they transfer those benefits to the user in the form of improved service and support.

Why This Is Important

Established in the early 1980s, "service design" has experienced a renaissance over the past several years as user experience (UX) practitioners apply these time-tested principles to complex digital businesses and brands. In the process, they have extended and enhanced the methods and techniques of the discipline by employing common UX practices, such as journey mapping, segmentation modeling, and persona development.

Business Impact

For most brands, customer service is a key business capability and potential differentiator that can make or break a company. While service design can be focused only on the internal user, its greatest impact is on the customer that benefits from more informed and efficient service personnel. This fact is even more apparent for digital businesses that rely on exceptional service and support to compensate for the lack of face-to-face interactions.

Drivers

The business results of high-quality service design drive this design discipline forward:

■ **Operational efficiency:** Employee work effectiveness, productivity, intent to stay and discretionary effort all benefit significantly from a high-quality employee and user experience.

■ **Relationship building:** Service design helps employees understand task and role dependencies, which leads to better communication, collaboration and comprehension with co-workers.

- **Employee morale**: A more efficient and well-organized workplace is naturally more enjoyable. When employees feel productive and empowered by the people, systems and processes around them, they thrive.

- **Brand equity:** Service design plays a vital role in building brand equity by ensuring consistent brand experiences, adopting a customer-centric approach, driving differentiation and fostering emotional connections.

- **Customer service and support**: Consumers consistently rate customer service as a key decision-making and purchasing factor. As such, the quality of service design is a way to either build customer loyalty and satisfaction, or erode customer relationships and stoke attrition.

Obstacles

- **Customer-only focus**: This is the primary obstacle to service design. Most organizations put 100% of their focus and effort into customer-facing experiences and rarely make time for internal tools, systems, and processes.

- **Lack of resources**: Most organizations lack trained service designers, and the time and budget for internal initiatives.

- **Culture**: Corporate cultures are often resistant to change — especially if it affects the tools, systems and processes that are used regularly.

User Recommendations

- Educate your team about service design. If your organization interacts with customers in any communication channel — real-time, asynchronously or via bots — service design can provide tremendous benefits. Application leaders should study the recent history of service design to build a foundational understanding and to gauge its potential benefits.

- Repurpose UX designers to perform service design tasks. Service design requires a deep understanding of business process, workflow, UX design and operations. While service designers exist, they are rare and difficult to source. Instead, consider repurposing a UX designer, researcher or strategist with strong analytical skills and the ability to promote cross-discipline collaboration.

- Identify and optimize your service design "moments of truth" — or critical interactions that make or break the brand relationship — in which customers and employees engage in direct and/or multichannel interactions.

Gartner Recommended Reading

Product/Service Design and Creation Primer for 2023

Getting Value From Measuring Employee Experience, Productivity and Well-Being

The Modern Employee Experience: Increasing the Returns on Employee Experience Investments

Product Analytics

Analysis By: Radu Miclaus, Adrian Lee

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Product analytics are tools that organizations use to drive and analyze digital product usage and performance. They help better understand and improve end-user experience and outcomes through in-app communication and engagement with users. These tools typically are used for multiple purposes including product onboarding and activation, guided customer journeys, usage tracking, self-service support, and new feature notifications and testing.

Why This Is Important

Tracking, understanding and influencing the user activity through the digital experience created is becoming vital to running an organization. While product analytics has been adopted heavily by B2C software companies, the new wave of adoption is now impacting B2B software companies. Product analytics tools need to advance in adding automation of insight and extension into understanding how user experience influences financial outcomes for buyers.

Business Impact

End users responsible for digital products can improve adoption, customer experience (CX), cost for support, retention and revenue by:

- Building the experience and continually iterating to improve it through measurement.

- Uncovering and eliminating the bottlenecks and friction points for users across the entire life cycle, including education, activation, expansion, and support.

- Aligning the internal-focused metrics in engineering and user experience (UX) with the CX metrics and financial metrics.

Drivers

- The potential for high-growth and high-margin software models that are focused on CX is a driver for digitizing much of the experience across all interaction points. This experience needs to be tracked, analyzed and optimized.

- The advances in cloud computing are pushing the growth in the SaaS market size, and product analytics implementation is simplified in SaaS software.

- The increase in SaaS solution availability is decreasing the cost of switching for users and organizations, and the speed to value is a driving factor. Product analytics is a must for acceleration to business outcomes.

- Users are expecting the tools used in the workplace to be delivered and experienced just like the tools and applications in the B2C space. Hence, there is an increase in investment for improving the B2B CX. To achieve this, measurement and analytics are crucial.

- Buyers of product analytics technologies are now interested in moving beyond measure into actionable intervention that is motivated by financial outcomes. Hence, product analytics insights need to be used downstream for total relationship analysis like lifetime value calculation, and optimization of both inbound in-product communication and outbound communications.

Obstacles

- While the vendors are making strides in democratizing and augmenting the experience for product analytics tools, the steep learning curves still persist for regular product operations teams or marketing business analysts.

- The need to bring in and manage other data to augment the limiting view in the product usage data can be an additional effort outside the tools themselves. Alignment with the wider needs of marketing and sales organizations that are looking to maximize the financial impacts of their funnel operations is the "last mile" opportunity that still presents friction in adoption.

- Optimizing how data flows between product analytics, marketing analytics, centralized reporting data lakes and customer data platforms (CDPs) for holistic digital intelligence is a friction point for both vendors and buyers of product analytics technologies.

- Complex B2B applications that require multistep workflows and multiple personas' involvement can present difficulties in interpreting product usage data.

User Recommendations

- Make tracking and monitoring instrumentation a first-class tenet of any software application built for CX use cases.

- Evangelize the definition and reporting of the CX KPIs as a tool to align the organization around the customer-centric focus for a delightful CX.

- Build operations (product and/or marketing) teams that work with data engineers to build and augment the data and metadata structures needed for a holistic digital product analytics view.

- Build a feedback loop across the entire experience, where the data and analytics collected during onboarding, activation, usage and support will inform and prioritize the requirements for future capabilities designed to remove the friction points in the experience.

- Use off-the-shelf products for product analytics. The vendor landscape offers a robust set of capabilities to start and expand the product analytics processes. Use product analytics vendors that make it a priority to be interoperable and optimize data flows to downstream decision making.

Sample Vendors

Amplitude; Countly; FullStory; Gainsight; Glassbox; Heap; Mixpanel; Pendo; Pyze; Quantum Metric

Gartner Recommended Reading

Emerging Tech: Accelerate Time to Insight With Product Analytics

Market Guide for Web, Product and Digital Experience Analytics

Product Manager Insight: Create the CX Dashboard Your Product Needs

Leverage Customer Experience Analytics to Uncover New Growth Opportunities for Your Products

Design Thinking

Analysis By: Brian Prentice

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Early mainstream

Definition:

Design thinking is an ideation methodology extracted from the broader, multidisciplinary design process used in the creation of physical and digital products.

Why This Is Important

Design thinking within innovation management is an ideation methodology extracted from the broader, multidisciplinary design process, and is generally delivered through a workshop format. It promotes investment in empathetic learning about the organization's customers/stakeholders as the key step to ensure the right problems are defined before innovative actions are taken to deliver solutions. It ensures a human-centered approach, and works to minimize uncertainty and risk in innovation efforts.

Business Impact

Design thinking directs the focus of innovation teams toward the human aspects of any given challenge or opportunity. It helps business innovators explore multiple solutions and incorporate different perspectives throughout the innovation effort. It is particularly useful in tackling what are known as "wicked problems" — these are issues that are difficult to solve because of incomplete, contradictory and changing factors that are not easily recognized.

Drivers

- People centricity — Design thinking starts with people. It's oriented to see an organization's business process through the lens of its stakeholders, rather than seeing these stakeholders as nodes in a process diagram or users of technology. This simple reorientation in perspective leads to dramatically different insights and applies to both customer-facing and internal operational innovations.

- Diversity of perspective — The quality of output from design thinking increases in line with the diversity of the people participating in the effort. Different perspectives add significant value in interpreting people-centric data and drawing accurate conclusions.

- Outside-in orientation — Design thinking, if done properly, forces participants to look beyond the obvious spans of control or attention. It helps organizations see how they fit within the broader context of their customers' goals or see the organization's operations through the eyes of people at the front line.

- Integration with design practices — Design thinking isn't contingent on making a new product or service. However, when it is used for that, there is seamless integration into a broader design process.

- Most design thinking occurs through workshops run by design team members who understand the connection between design thinking as an ideation methodology, and design as a process of producing products and services to solve problems for people.

Obstacles

- Cutting corners on research — Design thinking is a process of applying unique analysis techniques to data coming from usage reports and, more importantly, observational research. This data can be time-consuming and expensive to produce.

- Often, workshops proceed without any research and quickly devolve into empathy sessions, resulting personas and journey maps are more likely to echo existing biases than create an accurate picture of reality that is needed to drive innovation.

- Design confusion — A common pitfall is to conflate design thinking with the design process. Design thinking, then, ends up as a training program instead of a repeatable ideation technique. The hope is that running staff through a couple of days in a design thinking workshop will mean no incremental investments are needed to build internal design capability or to retain design agencies. The end result is design thinking workshops that have neither any follow-through activity nor any hope for design capability.

User Recommendations

- Direct design thinking toward clearly articulated business problems where stakeholders can be identified and business value can be measured. Complex, "wicked" problems are fine; however, without proper grounding, design thinking can result in very creative insights that are unactionable.

- Don't skip observational, "empathetic" research — ensure research work precedes any design thinking initiative.

- Establish high diversity within design thinking participants for robust resulting insights.

- Leverage the investments in internal design talent to establish an ongoing program of applied design thinking and to ensure qualified designers are leading design thinking workshops.

- Link, where possible, design thinking workshops to broader design initiatives in order to increase the chances of ideation moving into an actual production process.

Entering the Plateau

Progressive Web Apps

Analysis By: Nitish Tyagi

Benefit Rating: Moderate

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Progressive web apps (PWAs) bridge the gap between web and native app experiences without the need to install app binaries. PWAs deliver app-like features such as offline data access, push notifications and a home screen icon. They combine an app shell with service workers installed on desktops or mobile devices, which enable HTML, JavaScript, Cascading Style Sheets and web content to be cached and synchronized for better performance.

Why This Is Important

PWA-enabled web applications and sites deliver better performance and improve user engagement. They are also efficient in increasing conversion rates, advertising revenue and employee productivity. PWAs can be installed directly from a PWA-enabled website and can be shared through links and QR codes. Google and Microsoft allow PWAs to be listed on and deployed through Google Play and the Microsoft Store respectively; however, Apple does not allow this for its App Store.

Business Impact

■ PWAs offer responsiveness (e.g., full screen, split screen), app-like experience, cross-platform compatibility.

■ PWAs combine with service workers that enable the browser to support offline caching and background synchronization.

■ PWAs can be changed and updated without the requirements to push revisions to an app store and force updates on users' devices.

■ PWAs can be delivered by existing web development skills and teams, and typically at a fraction of the cost but with fewer capabilities than native apps.

Drivers

- Most leading desktop and mobile browsers have embraced PWAs. Browsers such as Apple's Safari, Google Chrome and Microsoft Edge enable developers to implement service workers (albeit not consistently across desktop versus mobile browsers and operating systems), so that websites can behave like apps.

- Since PWAs are based on web standards, many development tools and frameworks support the creation and enablement of websites as PWAs. These tools include web frameworks, like Ionic, to low-code development tools that generate PWA-enabled responsive web and single page applications.

- PWAs are slowly being adopted for consumer-facing websites as the next step beyond responsive web design. Also, Gartner observes that PWA support for specific employee-facing web apps, in lieu of native desktop or mobile apps, is also becoming an option for certain app use cases.

Obstacles

- PWAs are coming into the Plateau of Productivity, but still organizations aren't fully utilizing the capabilities of PWA. Apple continues to be slow in implementing key features, such as web push notifications and an installation prompt.

- According to the Web Almanac, about 1.71% of desktop sites and 1.63% of mobile sites use service workers features. This is expected to be lower than real-world percentage due to additional checks that Lighthouse takes into consideration.

- PWAs have fragmented browser support, and the limited access of mobile device capabilities from within the browser has forced application leaders to recognize that PWAs are inadequate for advanced mobile app use cases.

- The web user can easily access data stored in the web browser, which can expose organizations to security threats. Furthermore, PWAs don't support the additional security features of applying controls and safeguards using mobile and endpoint management tools integrations.

User Recommendations

- Apply PWA service workers now to improve performance and UX in browsers that support PWA. Don't disregard PWAs' value because the capabilities are not available to all users, but factor in the variance in UX across devices.

- Evaluate PWAs for employee-facing app use cases, such as extending employee portal functionality to a mobile-optimized interface. Utilize PWAs in digital commerce as a means of turning web users into mobile-first users by increasing engagement and conversion rates with high-value, frequent interactions and supporting offline browsing of product catalogs.

- Investigate the potential security limitations of PWAs in terms of securing data cached locally on devices that use default web security and encryption technologies, such as HTTPS.

- Utilize JavaScript tools, frameworks and platforms that provide support for PWA capabilities to speed up the process of implementing PWA capabilities in your web apps.

Gartner Recommended Reading

How to Make the Right Technology and Architecture Choices for Front-End Development

Market Guide for Multiexperience Development Platforms

Key Considerations When Building Web, Native or Hybrid Mobile Apps

MXDP

Analysis By: Arun Batchu, Frank O'Connor, Adrian Leow

Benefit Rating: Low

Market Penetration: More than 50% of target audience

Maturity: Early mainstream

Definition:

A multiexperience development platform (MXDP) offers development teams an opinionated and integrated set of front-end development tools and back ends for front ends (BFF) services. Its purpose is to enable distributed and scalable development (in both teams and architecture) of fit-for-purpose apps across digital touchpoints and interaction modalities.

Why This Is Important

An MXDP unifies front-end application development activities across heterogenous types of apps, so that the user experience (UX) across these apps is seamless, persistent and enjoyable. MXDPs ensure maximum reuse and accelerate development velocity.

Business Impact

- MXDPs accelerate organizations' digital ambitions by enabling application UXs that seamlessly span multiple devices and augment human senses (e.g., touch, visual and auditory).

- They simplify the construction and composition of complex front ends that speed up application development and deployment.

- They smooth development experiences, resulting in more-engaged and happier software engineers.

- They reduce the number of development teams and personnel by supporting cross-platform development.

Drivers

- Need for consistent, seamless and distinctive application experiences that span an increasing number of end-user interaction modalities.

- Faster time-to-value for customer and employee digital experience enhancements.

- Supporting nontraditional modes of interactions, such as medical use cases.

- Increased capabilities of MX development platform technology.

- Increased demand for digitalization of industries using heavy machinery or operating in hazardous environments.

Obstacles

- The preference for popular open-source frameworks (e.g., Flutter and React/React-native) that are supported by cloud providers (such as Google and Amazon).

- A lack of portability of applications across MXDPs and vendor lock-in.

- Platform licensing costs, especially for consumer-facing use cases.

- The learning curve for proprietary stack.

- A lack of, and inability to retain, trained personnel.

User Recommendations

- Evaluate MXDPs, along with enterprise low-code application platforms and digital experience platforms, to meet your use case. We see increasing functionality overlaps, so minimize the number of platforms in your environment.

- Mitigate lock-in risk by encouraging modularity and layering. Use software engineering skills to extend the MXDP offerings with custom and reusable modules that citizen developers can use in no-code/low-code developments.

- Evaluate the merits of MXDPs versus open-source software (OSS), cross-platform, front-end frameworks-based development to achieve your use cases. Consider the software engineering costs associated with OSS.

- Evaluate licensing costs of the platform at scale, before increasing the impact of MXDPs.

- Develop plans for training and recruiting development resources for the chosen MXDP.

Sample Vendors

Amazon; Builder.ai; Globant; Google; HCLSoftware; Mendix; Neptune Software; Neutrinos; OutSystems; Umajin

Gartner Recommended Reading

Market Guide for Multiexperience Development Platforms

Magic Quadrant for Enterprise Low-Code Application Platforms

Critical Capabilities for Enterprise Low-Code Application Platforms

Appendixes

See the previous Hype Cycle:

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 2: Hype Cycle Phases

(Enlarged table in Appendix)

Phase ↓	Definition ↓
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant media and industry interest.
Peak of Inflated Expectations	During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the innovation is pushed to its limits. The only enterprises making money are conference organizers and content publishers.
Trough of Disillusionment	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the innovation are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the innovation to reach the Plateau of Productivity.

Source: Gartner (August 2023)

Table 3: Benefit Ratings

Benefit Rating ↓	Definition ↓
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner (August 2023)

Table 4: Maturity Levels

(Enlarged table in Appendix)

Maturity Levels ↓	Status ↓	Products/Vendors ↓
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-box methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner (August 2023)

Document Revision History

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Recommended by the Authors

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Understanding Gartner's Hype Cycles

Tool: Create Your Own Hype Cycle With Gartner's Hype Cycle Builder

Start Using Design Systems, Accelerate Digital Product Delivery

How Design, Development and Product Management Can Work Together Successfully

Table 1: Priority Matrix for User Experience, 2023

Benefit	Years to Mainstream Adoption			
↓	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Transformational		Conversational User Interfaces Fusion Teams Total Experience	Design-to-Code Emotion AI Generative Design AI	
High	Design Thinking Product Analytics Visual Collaboration Applications	Augmented Reality Customer Journey Analytics Design Systems Digital Design DXP Multiexperience VoC Applications	DesignOps Superapps	
Moderate	Progressive Web Apps Service Design	Design Sprints Inclusive Design Virtual Reality	Bring Your Own Thing Miniapps ResearchOps	
Low	MXDP			

Source: Gartner (July 2023)

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