SOLUTION BRIEF

Advanced prototyping for medical technology and pharmaceutical companies

Accelerate product design and de-risk manufacturing for faster time to market

KEY BENEFITS

- Capitalize on innovation cycles and accelerate time to market
- Employ a multidisciplinary approach across prototyping methodologies
- Demonstrate concepts clearly for better feedback and collaboration
- Interact with prototypes to evaluate ergonomics, functionality, and workflows
- Assess all aspects of product design thoroughly in advance of production

From concept to care: user-centered prototyping

Prototyping is intrinsic to good product design, empowering companies to solve complex problems by surfacing unmet needs, exploring desired benefits, and honing in on features and functionality well before manufacturing commences. From concept and design through engineering, Flex's team of multidisciplinary experts deploy a breadth of prototyping techniques, tools, and user-centered processes that enable medical technology and pharmaceutical companies to innovate, iterate, and get products to market faster across a range of categories, including:

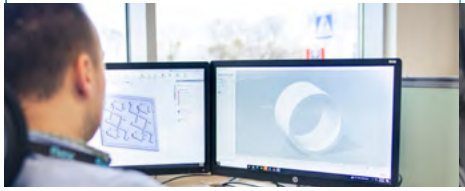
- Connected wearable devices
- Biologics autoinjectors
- IVD systems
- Advanced surgical tools
- Diagnostic imaging systems
- Surgical robotic systems

Design thinking is integral to innovation

Prototyping is intertwined throughout the design process, enabling designers, engineers, and users to explore ideas in context as they advance from initial impressions toward increasingly intricate models that mimic real-world scenarios. Knowing how and when to use each prototyping method is important — and powerful.

The Flex prototyping process centers on three phases:

1 **Discover and frame**
Surface needs and make ideas tangible



2 **Think, ideate, test, and refine**
Work out the details

3 **Simulate to validate**
Make it real

Flex uses state-of-the-art tools, materials, and engineering platforms to deliver prototypes with the **highest level of precision**, **aesthetic resolve** and **functional clarity.**

Phase 1: Discover and frame

Prototyping begins with fieldwork, shadowing users to document their challenges and capture early ideas for design, features, and workflows. Designers and co-creators translate these insights into observations, maps, and sketches that make concepts tangible. Three-dimensional models then explore form, composition, and ergonomics, while mock-ups bring materials to life, revealing how they feel, behave, and interact. Storyboards help teams express user needs more clearly, and digital wireframes or reference designs build on that foundation, adding detail and refining priorities.

Phase 2: Think, ideate, test, and refine

As prototyping moves into the second stage, designers are now exploring all the possible solutions they've discovered thus far. Ideation, testing, and refinement take center stage. Techniques and models move toward higher fidelity. Approaches include:

- Articulated interaction models – Understand setup, ergonomics, interfaces, feature placement, spatial considerations, and more.
- Workflow modeling – Explore how users will interact with the product in the space for which it's intended.
- Rendering tools – Showcase sophisticated models in context, incorporating textures, finishes, screen content, etc.
- Virtual reality (VR) – Become immersed in a space or handle a product using VR glasses.
- Augmented reality (AR) – Simulate and experiment with digital prototypes in real-world environments.
- Wireframing – Understand how information should appear on a screen.
- Storyboarding – Inspire a visceral response to what works and what doesn't.
- Engineering proof of concept – Test mechanical and electronic interactions with highly detailed form factors.

Phase 3: Simulate to validate

As prototyping advances, detailed physical models that simulate realistic design, usage, and environments enable you to interact with new products in an authentic way. From tactile and audible features to working buttons, interfaces, and robotic arms, these functional prototypes enable deep learning about the user experience at key points of interaction. Digital twins can also be used to envision, analyze, and test virtual replicas of products and processes across attributes to improve design.

ABOUT FLEX

Flex provides advanced manufacturing capabilities and specialized end-to-end services that enable healthcare companies to deliver products at scale with increased quality, productivity, and speed, in every major region of the world.

The Flex advantage

Bring innovative products to market faster and more cost-effectively with state-of-the-art prototyping tools and methodologies that let you explore every aspect of a design in detail, prior to production. With the user experience as our touchstone, Flex's multidisciplinary design and engineering teams collaborate with you throughout the prototyping process, getting to the core of the challenge, exploring the nuances of features and functionality, and driving toward a solution perfectly suited to the task at hand.

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Accelerate product innovation with advanced prototyping tools and methodologies from Flex.

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