

breathe in(novation)

UNCOVER INNOVATIONS THAT MATTER



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INNOVATION-LED HEALTHCARE: ENGINEERING THE EXTRAORDINARY

Medtronic

Medtronic is a global healthcare technology leader, with more than 90,000 people across 150 countries and revenues of \$31.686 billion in fiscal year 2022.

Mei Jiang, SVP, Global Digital Innovation at Medtronic, is a serial entrepreneur with a blend of experience at both startups and corporations. Since early 2000 she has worked on and led three startups in Silicon Valley into accelerated growth and exit. Currently she is driving intrapreneurship at large enterprises and has helped many large corporations drive fundamental technology and business transformations. She started her career in product, and has led and contributed to multiple digital products' design and incubation, including China's early target drones (unmanned aerial target or UAT), the world's first low-cost, high-capacity tape drives in the 1990s, the industry's first large-scale, open, and secure big data platform, IoT, smart wearables and AI/ML, and telepresence robots in the 2010s.

Could you elaborate on your current role and responsibilities as Head of Global Digital Innovation at Medtronic?

— I lead Medtronic’s digital transformation journey. My job is twofold: First, exploit what we have today by continuously expanding and optimizing our medical devices and healthcare solutions to stay relevant and competitive; and second, explore the possible to create a radically new, future-fit, and innovative global healthcare technology leader for the foreseeable future.

Our mission – to alleviate pain, restore health, and extend life — unites a global team of 90,000+ passionate people across 150 countries. Our technologies and therapies treat 70 health conditions and include cardiac devices, surgical robotics, insulin pumps, surgical tools, patient-monitoring systems, and more. And we take great pride in knowing that we impact the lives of two patients every second. That adds up to roughly 80 million patients per year. That sounds like a lot ... but 80 million is just a small fraction of the world’s population.

We can do a lot more than doctors and devices. With advances in data and technology, including 5G, edge computing, IoT, AI/ML, immersive AR/VR, miniaturization, and robotics, among other areas, Medtronic can extend its range to a much wider demographic, not only late-stage hospitalized patients.

With a shift from Wellness Debt (patient) to Wellness Wealth (consumer), Medtronic can go from 80 million patients a year to 1 billion. To make the shift, we must be more digitally minded, creating the medical equivalent of the Apples and Amazons of the world.



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80 MILLION PATIENTS PER YEAR

"We impact the lives of two patients every second. That adds up to roughly 80 million patients per year."

BREAKTHROUGH INNOVATIONS IN MEDICAL DEVICES



Micra™, the world's smallest pacemaker

"Imagine a miniaturized, leadless pacemaker about the size of a large vitamin capsule, which listens "digitally" to blood flowing across a human heart."

Can you give some examples of the latest innovations in medical devices?

— Some of the greatest advances in medical technology are unfolding right now.

Imagine a miniaturized, leadless pacemaker about the size of a large vitamin capsule, which listens "digitally" to blood flowing across a human heart. In the event of an irregular rhythm, this tiny wireless device sends an electronic signal to keep the heart pumping as it should.

For decades, patients with diabetes relied solely on blood-sugar measurement to adjust the application of insulin therapy. By using AI, we are modelling patient behavior and diet to predict the impact on their blood-sugar level at a later date to help them plan their treatment proactively.

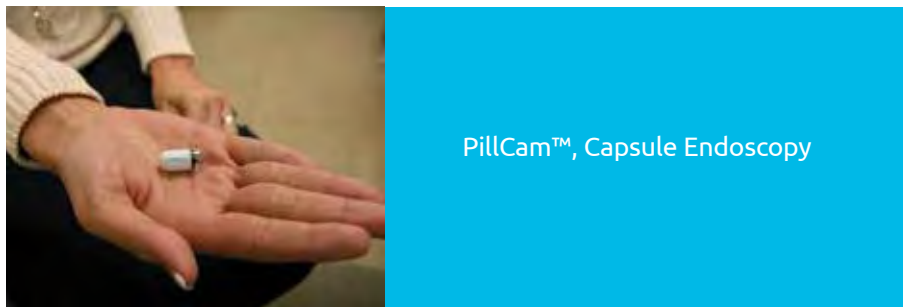
This kind of predictive technology can also help patients living with neurodegenerative disorders. A first-of-its-kind Medtronic deep brain stimulation (DBS) device can sense and record brain signals while delivering therapy to patients with Parkinson's disease. Now, imagine that in the future we could automatically adjust the stimulation levels and optimize them for each individual patient, based on their own brains and the pattern of their brain activities – that is true personalization.

How is Medtronic innovating through data and AI to enhance its range of products and therapies?

— Let's start with life-changing devices. Besides the world's smallest pacemaker, we have developed a swallowable camera. For colon cancer, routine colonoscopies may not be the answer. While they're the standard of care in the US, too many patients put them off and the guidelines for screening keep changing. Not to mention, they haven't even become

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A capsule you can swallow that includes an integrated camera that will take thousands of images as it works its way through your digestive tract. The images will then be downloaded by a clinician for detailed analysis.”



the standard of care yet in many countries outside the US. What if there was an alternative to a traditional colonoscopy? A more efficient way to screen moderate-to-low-risk individuals in everyday life, anywhere? And it was as easy to use as swallowing a multivitamin-sized pill?

Well, here comes Medtronic PillCam™. A capsule you can swallow that includes an integrated camera that will take thousands of images as it works its way through your digestive tract. The images will then be downloaded by a clinician for detailed analysis.

Now, can you also imagine a clinician having AI assistance during routine colonoscopies to scan for polyps that can be difficult to detect by the naked eye. The technology flags areas of concern independently and automatically as the clinician performs the procedure in real-time. This would be our GI Genius™ device, which is the first of its kind to be approved by the FDA in the US.

Executive Conversations

Besides life-changing devices, we're building new digital data and AI capability to enhance intelligent therapies, insight-driven med-tech solutions, and bigger, broader digital-health ecosystems to help lower cost, improving quality and outcomes.

The following new concepts could improve the quality of life for people around the world:

- **Intelligent therapies:** In the future, sensing and closed-loop algorithms that collect patient data and personalize therapy could be used to improve outcomes (e.g., BrainSense™ neurostimulator capturing brain signals while delivering therapeutic simulations)
- **Insight-driven med-tech suites:** Interconnected devices, products, and intelligent therapies across a care continuum that exchange data and information (e.g., NextGen Spine Surgery Ecosystem combines spinal implants, biologics, navigation, robotics, and AI-powered data to surgeons and patients)
- **Digital-health ecosystems:** Product suites that integrate and exchange insights with a broader community of partners and stakeholders

THE INNOVATION PROCESS

How do you assess innovation and decide how to allocate resources?

— Based on statistics from early-stage venture capital investments in the past decade or so, only one out of 250 VC investments will return 50x ROI, and nearly 70% of investments lose money. The hard truth is, we can't pick the winner. Good and bad ideas look exactly the same at the beginning. It will take several missteps before we can distinguish between them.

To avoid a 'HiPPO' –the highest paid person's opinion determining how we make our bets – we must take an evidence-based approach by building a robust funnel for systematic decision-making.

Here is an example of how to make better investment decision in three key dimensions, adapted from *The Invincible Company* by Alex Osterwalder (2020):

- a. **"Strategic Fit"**: Assess the problem space and proposed solution against your strategic direction, culture, brand, etc. In essence, you are asking, "Is this consistent with our DNA? Does this jive with our end-game and our corporate identity in 5–10 years from now?" Before we move forward with any opportunity, our strategic direction must be clear, agreed upon, and known to all involved – this is the first filter.
- b. **"Risk Readiness"**: Aim to reduce investment risk by building evidence for success or failure; in other words, our role is to prove or disprove whether the idea will work in the real world. Evidence come from research, interviews, concept testing, and experiments. We can't stay in the theoretical world, and we must try to fail with quick and dirt-cheap tests.
- c. **"Size of Opportunity"**: Quantify the opportunity. As with step 2, this is based on evidence. We expand our experiments beyond what is technically possible to what is financially possible. It is literally, "Is anyone willing to pay for this? And if so, how much?"

"Good and bad ideas look exactly the same at the beginning. It will take several missteps before we can distinguish between them. "



Executive Conversations

What are your tips for scaling innovations from lab to mass market?

— Avoid overengineering version 1.0. The key is rapid product iterations, delivering value in increments over months or even weeks, rather than years.

We begin by designing customer value, not specification of features and functions, into our product right from our very first prototype. We focus on technologies and products that can be matched to true, compelling market needs with adequate business cases.

What are the key capabilities/qualities of a Chief Innovation Officer (CINO)? How has this role evolved over the past few years?

— A successful CINO is a customer champion, a trailblazer, a commercial officer, a broker, and a storyteller. The customer champion puts the customer first. The trailblazer assumes there's always a different, better way to do things, and takes on the high-impact problems, the seemingly impossible. The commercial officer focuses on profit, building entirely new digital lines of business. The broker links disparate silos, uniting the organization in collaboration. The storyteller creates strong, potentially emotional experiences for customers using new technologies.

Which book or personality inspires you the most to drive innovation in your organization?

— One book that inspires me is *The Fearless Organization: Creating Psychological Safety in the Workplace for Learning, Innovation, and Growth* by Amy C. Edmondson (2018).

She uses the expression, "Innovation is culture." To truly innovate, a shift in culture is key to achieving ambitious strategic goals. Create a safe environment where people trust one another, do crazy things, and where risk-taking is encouraged and rewarded. Failures are readily accepted as an integral part of learning. However, we must learn how to fail small and cheap, recover fast, and pivot like a "lean startup."



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