DIGITAL HEALTH

Integrating science into digital health workflows: A strategic approach for leaders

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Abstract

As the digital health industry becomes increasingly competitive, companies must integrate science cross-functionally to drive innovation and differentiation. However, many companies face significant challenges in effectively leveraging science across their organization. This commentary explores the common obstacles digital health companies encounter when integrating science, including limited C-suite understanding, siloed structures, resource constraints, change resistance, and value demonstration challenges. We provide practical strategies for overcoming each challenge, such as educating leadership on science's strategic importance, fostering cross-functional collaboration, prioritizing high-impact initiatives, facilitating open dialogue, and quantifying science's measurable impact. By proactively addressing these hurdles through targeted solutions, companies can successfully integrate science across teams and functions. Effective cross-functional science integration will enable companies to leverage scientific insights, drive product innovation, build credibility through evidence-based outcomes, and ultimately gain a competitive advantage in the rapidly evolving digital health landscape. Strong scientific leadership that champions integration through clear communication, strategic prioritization, and cultural buy-in is essential for achieving long-term success.

The digital health landscape has undergone a seismic shift in recent years, with an explosion of over 20,000 apps now targeting mental wellness.[1] This rapid proliferation has created a highly saturated market, where differentiation has become increasingly challenging, yet critical for success. In this competitive environment, companies are searching for unique ways to stand out and demonstrate their value to customers, investors, and partners alike.[2,3]

One often overlooked avenue for differentiation is the strategic integration of science into business operations. While many digital health companies focus on technological innovation or marketing strategies, the systematic application of scientific methodologies throughout an organization's processes can provide a significant competitive edge. In this context, 'science' extends beyond traditional notions of research studies or clinical trials. It encompasses the comprehensive collection, analysis, and application of data to inform decision-making across all aspects of a business, from product development to customer engagement and strategic planning.[4]

This growing emphasis on evidence-based outcomes research is highlighted in a recent article on Quarter 1 (Q1) 2024 digital health funding, which notes that investors and enterprise buyers are increasingly seeking companies that can provide strong outcomes data to back their products/services.[5] To succeed in this competitive landscape, companies need to effectively integrate science cross-functionally from the earliest stages of product development, leveraging it to inform and improve their products,[3] guide the design

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process,[6] appropriately market to existing customers, and expand their customer base.[4] Cross-functional integration refers to the seamless incorporation of scientific methods and insights into decision-making processes across all departments, from product development to marketing and sales. This approach ensures that scientific insights are incorporated not just in evaluating outcomes, but in shaping the very design and delivery of digital health solutions.[7]

The integration of science into business practices is not without its challenges. Many organizations struggle to fully grasp and implement science, often due to misconceptions about the role of science in business, resource constraints, and organizational structures that impede cross-functional collaboration. Overcoming these obstacles requires strong scientific leadership. Leaders in digital health must establish a clear strategic direction that prioritizes science, applies change management and behavior science, allocates resources appropriately, and fosters an environment where scientific insights are valued across all functions of the organization. This approach necessitates navigating complex organizational dynamics and investing in the necessary infrastructure, talent, and processes to support scientific integration. In this commentary, we address the common challenges digital health companies face when integrating science and offer practical strategies drawn from our experience as a fractional Chief Science Officer and industry scientist. Based on real-world obstacles and solutions encountered across various companies, our guidance is intended to help leaders incorporate science into their organizations. While our insights are not derived from formal research, we hope they provide valuable, experience-based direction and encourage further studies to validate and build upon these observations.

Challenge 1: C-suite lacks understanding of science

One of the main challenges in integrating science cross-functionally is that the C-suite may not fully grasp its value or impact on the business. Common misconceptions, such as the belief that science is slow or requires costly randomized-controlled trials (RCTs),[8] can further hinder leadership buy-in. If the importance of science is not clearly communicated, key decision-makers may become disengaged. By demonstrating how science can attract investors,[9] boost customer acquisition, and build brand credibility, science leaders can provide tangible examples and metrics, such as return on investment (ROI) or customer feedback, to make a compelling case for C-suite investment in scientific initiatives.

The structure of the C-suite, composed of key decision-makers in distinct pillars of the business, is also important for successful integration. While the Chief Science Officer (CSO) often initiates efforts to integrate science cross-functionally, collaboration with other C-level executives is crucial to facilitate integration from the top down. For example, the Chief Technology Officer (CTO) can integrate scientific insights into product development, while the Chief Marketing Officer (CMO) can leverage data in marketing strategies.

Potential solution: educate C-suite on the value of science

To address this challenge, science leaders must educate the C-suite on the strategic importance of science and its direct impact on business goals. This can be achieved through a comprehensive approach:

1. Hold strategic meetings to define science's role within the company, establish clear expectations, and illustrate how competitors leverage scientific research for differentiation. Use these sessions to outline a comprehensive plan for implementing science across various departments, ensuring company-wide alignment and understanding. During these meetings, educate stakeholders on key concepts and compliance regulations (e.g., IRBs, HIPAA) in accessible terms.
2. Demonstrate the adaptability and efficiency of scientific methods by showcasing flexible, low-resource approaches such as retrospective analyses and cross-sectional surveys. Illustrate how agile research methods can align with fast-paced development cycles without disrupting workflows.
3. Frame science as a tool for innovation and continuous improvement, focusing on its ability to foster progress rather than merely evaluate performance. Involve the C-suite in co-designing evaluations to ensure alignment with business objectives and secure their ongoing support. Address potential challenges, such as IRB-related timelines, proactively to maintain momentum.
4. Maintain ongoing engagement with leadership by regularly reporting on the impact and value of scientific initiatives. Establish 'Science Updates' with the C-Suite to present key findings and their business implications.

Example

At a pre-seed company, the CSO faced initial resistance from the engineering team regarding the integration of scientific methods. To overcome this, the CSO organized meetings with the CEO, Chief Product Officer (CPO), and Head of Engineering. During these sessions, the CSO demonstrated that adding simple data collection features to the company's artificial intelligence (AI) system would generate insights beyond basic usage metrics. By illustrating the long-term value of minimal data collection, the CSO gained leadership support for early-stage scientific integration. As a result, the company implemented a small, budget-friendly update to the app, enabling more meaningful data collection.

Challenge 2: siloed organizational structures and lack of collaboration

Another significant challenge is the presence of siloed organizational structures that limit collaboration between teams. These silos lead to duplicated efforts, inefficient resource

use, and a fragmented approach to problem-solving. This fragmentation hinders the flow of scientific insights across departments, reducing opportunities for innovation and evidence-based decision-making.

Potential solution: foster collaboration

To address this issue, science leaders must break down silos and cultivate a collaborative culture.

1. Educate cross-functional teams, similar to the C-suite, on the value of science and how it applies to their roles. Provide tailored training and resources for teams like engineering, product, marketing, and sales.
2. Organize collaborative meetings where scientists and other teams share roadmaps. Align scientific initiatives with core business and department goals and key performance indicators (KPIs). Map scientific projects to support revenue growth, customer acquisition, and product innovation.
3. Develop a common "science language" by clearly defining key concepts and offering accessible resources such as slide decks, resource guides, and video walkthroughs.
4. Foster ongoing cross-functional communication through dedicated channels, along with regular workshops, lunch-and-learns, and updates on scientific progress.

Example

A public company addressed siloed structures by creating a dedicated science communications position. This new role bridged the gap between the science team and the marketing department, effectively translating scientific findings into marketable content. The company also encouraged collaboration with customer-facing roles, gathering insights on successful strategies and pain points. The team then used this information to update implementation materials, enhancing their ability to secure buy-in from organizations and schools. This integrated approach led to more effective use of scientific insights across departments and encouraged the existing science team to align their research questions more closely with business objectives.

Challenge 3: resource constraints and competing priorities

Teams often struggle to allocate sufficient time and resources to scientific initiatives amidst competing demands, leading to underinvestment in science. This may result in understaffing or a lack of necessary tools, creating tension between departments vying for limited resources and exacerbating siloed structures.

Potential solution: prioritize high-impact initiatives and leverage diverse integration models

To navigate these challenges, science leaders should:

1. Prioritize scientific initiatives based on their potential impact, available resources, and alignment with business goals. Start with quick, low-cost wins, like retrospective analyses or cross-sectional surveys, to build momentum.
2. Leverage diverse models for integrating science based on the company's resources: full-time in-house teams, fractional or consulting leadership, external academic partnerships, or hybrid models combining internal and external expertise.
3. Identify existing employees, such as junior staff, who can contribute to scientific projects and have the flexibility to engage more actively.
4. Leverage external partnerships, like collaborations with academic institutions, to bring in additional expertise and alleviate resource constraints.
5. Track success metrics aligned with business objectives to justify resource allocation for scientific initiatives.

By adopting these strategies, science leaders can balance resource constraints while advancing initiatives that add value to the organization.

Example

A Series C company lacked crucial knowledge about their product's effectiveness. To address this issue within their resource constraints, they implemented a cross-sectional survey for current users. This survey collected self-reported health data, providing valuable information for marketing and sales teams. Surprisingly, the results revealed a new market in which they could target sales. This unexpected insight led the company to pivot their marketing strategy and product development focus. The company used this low-cost initiative to inform immediate business decisions and lay the groundwork for future, more resource-intensive scientific initiatives.

Challenge 4: resistance to change and cultural barriers

Resistance to new scientific approaches can hinder adoption across teams. Some employees may perceive these initiatives as a threat to established practices or as unnecessary complications to their workflows.[10] This resistance can reduce engagement, limit collaboration, and prevent full utilization of scientific insights for product development and business growth.

Potential solution: encourage and facilitate an open dialogue, seek feedback, and celebrate successes

To overcome resistance, science leaders should employ strategies from change management and behavioral science to foster a culture that embraces scientific thinking[11]:

1. Conduct company-wide workshops to demonstrate the practical benefits of scientific methods, illustrating

Table 1. Challenges, solutions, and key actions for integrating science in digital health companies.

Challenges	Solutions	Key Actions
C-suite Understanding	Educate and Demonstrate Value	Define metrics, track outcomes
Siloed Structures	Foster Collaboration	Organize cross-functional meetings, develop common language
Resource Constraints	Prioritize and Leverage Partnerships	Identify high-impact initiatives, form strategic partnerships
Resistance to Change	Address Cultural Barriers	Implement change management, share success stories

how these approaches can enhance key business areas such as product development and marketing. Regularly share success stories to highlight the positive impact of science on the company and build enthusiasm.

2. Empower "science champions" within each department to act as liaisons, translating scientific insights into actionable steps for their teams.
3. Initiate collaborative pilot projects with other departments to demonstrate the real-world value of scientific methods.
4. Create feedback loops to address concerns and iterate on processes, ensuring that the integration of science aligns with the needs of various departments.

Example

A Series B company initially resisted integrating science across departments, with employees adhering to a "stay in your lane" mentality. The science team overcame this challenge by addressing infrastructural problems and identifying outcomes that other departments had overlooked. These contributions gradually built trust with the CEO and other team leaders. As the value of scientific input became evident, other departments increasingly sought the science team's expertise. The CEO began dedicating time to learn about scientific topics, which deepened their interest and investment in scientific projects. This gradual approach transformed the company culture from one of resistance to one that actively incorporated scientific insights into key decisions.

Future directions

As the digital health field evolves, leaders should stay informed about emerging methodologies such as rapid analysis,[12,13] developmental evaluation[14] and design thinking.[15] These approaches can streamline scientific processes and enable more agile responses to market changes. Integrating science into business practices is an ongoing process that requires leaders to manage expectations, maintain open communication channels, and establish realistic timelines and milestones.

Conclusion

Successfully integrating science across digital health companies is a complex, yet vital endeavor that demands strong leadership, clear communication, resource allocation, and a collaborative culture. Table 1 summarizes the key challenges, proposed solutions, and recommended actions for integrating science into digital health companies as discussed in this commentary. By proactively addressing challenges through targeted solutions, digital health companies can leverage science to drive product innovation, build credibility through evidence-based outcomes, and gain a competitive edge in the digital health landscape.

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