



Tech Trends 2018 | A life sciences and health care perspective

## Reengineering technology in life sciences and health care

Building new IT delivery models from the bottom up and top down

How quickly and effectively can any single IT organization respond to changes in the business it serves? For CIOs in life sciences and health care, this is no mere rhetorical question—they're faced with new pressures that challenge their responsiveness every day. In life sciences, think patent cliffs. Pipeline acceleration. Regulatory changes. Consolidation. Carveouts. Divestitures. Spin-offs. Similarly, for health plans or health care providers, think patient data security. Changing local care delivery models. Interoperability challenges. Increasing financial pressures in the shift from volume-based to value-based care. And regulatory changes that can flip the script for the entire organization at a moment's notice.

Any of these developments require the support of an IT organization that is ready to move instantly to deliver the highest value at the lowest cost. That's why many organizations are taking on a more fundamental shift: Instead of reengineering their toolsets or helping business units reengineer their use of technology, these IT operations are reengineering themselves. The aim? Enterprise-wide use of the latest capabilities, led by a shop that is as wired into the business as it is into the network.

As the rate of change in the life sciences and health care industry has continued to steadily accelerate, CIOs are now taking a more head-on approach to issues they've long been aware of but have so far been able to work around. For example, the "invented here" mentality that has driven IT for years in life sciences and health care has resulted in a technology portfolio marked by highly specialized capabilities in different pockets of the organization, largely disconnected from one another. It can be difficult to effectively marshal technology resources in support of a business demand when operating in such a system.

Just as important, many IT departments are working with platforms that weren't designed to perform all the tasks a sophisticated, modern IT organization requires. Master data management, for example, wasn't really a business requirement when many of these systems were introduced. With these legacy platforms operating at the heart of IT, it can be virtually impossible to deliver the high level of service and responsiveness required to compete in the industry today. These challenges are only exacerbated in IT organizations marked by silos—in information storage, sharing, management, resources, you name it. These legacy systems breed decision-making processes and barriers

to knowledge sharing that can be as challenging as any hardware issues. But those silos are beginning to come down—along with the barriers separating those within the broader industry itself.

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It is against this backdrop that many life sciences and health care CIOs are beginning to act on broader trends underway in the world of technology—starting with building new IT delivery models. For years, IT has faithfully helped reengineer the business in these industries, yet few IT shops have reengineered themselves with the same vision, discipline, and rigor. That's about to change: Over the next 18 to 24 months, we will likely see CIOs begin reengineering not only their IT shops but, more broadly, their approaches to technology. The goal of these efforts will be to transform their technology ecosystems from collections of working parts into high-performance engines that deliver speed, impact, and value.

Reengineering approaches may vary, but expect to see many CIOs in life sciences and health care deploy a two-pronged strategy. From the bottom up, they can focus on creating an IT environment in which infrastructure is scalable and dynamic and architecture is open and extendable. Importantly, automation (driven by machine learning) will likely be pervasive, which can help take human elements out of functions where they aren't needed and free people for higher-order work. These principles are baked into infrastructure and applications, making them elemental to all aspects of the operation. From the top down, CIOs and their teams have an opportunity to transform how the IT shop budgets, organizes, staffs, makes decisions, and delivers services.

### Reengineering from the bottom up in life sciences and health care

One dimension of reengineering focuses on modernizing the underlying infrastructure and architecture of IT organizations. CIOs at life sciences companies, health plans, and health care providers can focus their planning on three major areas of opportunity:

- **Automation:** Automation is often the primary goal of reengineering efforts in life sciences and health care. There are automation opportunities throughout the IT life cycle, from automated provisioning, testing, building, deployment, and operation of applications to large-scale autonomic platforms that are self-monitoring, self-learning, and self-healing.

- **Technical debt:** Technical debt doesn't happen just because of poor code quality or shoddy design. Often it's the result of decisions made over time—actions individually justified by their immediate return on investment (ROI) or the needs of a project. It may help to imagine technical debt as an analog to sedimentation in layers of earth: Things just change, and as new layers cover the old, the older systems and code may receive less attention and deteriorate. For example, heavy processing volume was once a value-add. Now it's a commodity. For health plans, for example, moving member data out of those big core platforms can make it easier to use. The challenge is to do so without rewriting the whole system. Life sciences and health care organizations that regularly repay technical debt by consolidating and revising software as needed will likely be better positioned to support investments in innovation.

- **Modernized infrastructure:** There is a flexible architecture model whose demonstrated efficiency and effectiveness in start-up IT environments suggest that its broader adoption in the marketplace, including within life sciences and health care, may be *inevitable*. In this cloud-first model—and in the leading practices emerging around it—platforms are virtualized, containerized, and treated like malleable, reusable resources, with workloads remaining independent from the operating environment.

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### Top-down reengineering in life sciences and health care

The first job of life sciences and health care CIOs is to maintain efficient, reliable IT operations. But that's just the start. They're also on the hook for harnessing emerging technologies, monitoring, and understanding the changes that leading-edge tools introduce. They're also expected to communicate and collaborate with a growing cadre of enterprise leaders with "C" in their titles—chief digital officers, chief data officers, chief algorithm officers, you name it.

As growing numbers of these overextended life sciences and health care CIOs are realizing, the traditional operating model that IT has used to execute its mission is no longer up to the job. Technological

advances are creating entirely new ways of getting work done that are, in some cases, upending traditional views about people and machines complementing one another. That's why so many of these CIOs are concluding that it's time to build a new operating model from the top down. For example, with fewer silos and more flexible IT teams, organizations can avoid "over the wall" engineering, roll out more self-service options, reduce costs, and work more closely with the business.

- **Reorganizing teams and breaking down silos:** In many IT organizations, workers are organized in silos by function or skill set. Network engineering is distinct from QA, which is different from system administration, and so on. In this all-too-familiar construct, each skill group contributes its own expertise to different project phases. This can result in projects becoming rigidly sequential and trapped in one speed—slow. It also encourages "over the wall" engineering, a situation in which team members work locally on immediate tasks without knowing about downstream tasks, teams, or the ultimate objectives of the initiative.

Transforming this model begins by breaking down skill set silos and reorganizing IT workers into multi-skill, results-oriented teams. These teams focus not on a specific development step—say, early-stage design or requirements—but more holistically on delivering desired outcomes. A next step might focus on erasing the boundaries between macro IT domains such as applications and infrastructure.

- **Budgeting for the big picture:** A new budgeting model is beginning to emerge in life sciences and health care organizations in which project goals reorient toward achieving a desired outcome. For example, if "customer experience" becomes an area of focus, IT could allocate funds to e-commerce or mobile products or capabilities. Specific features remain undetermined, which gives strategists and developers more leeway to focus effort and budgetary resources on potentially valuable opportunities that support major strategic goals. Standing funding for rolling priorities offers greater flexibility and responsiveness. It also aligns technology spend with measurable, attributable outcomes.
- **Managing your portfolio while embracing ambiguity:** As IT budgets focus less on specifics and more on broad goals, it may become harder to calculate the internal rate of return (IRR) and ROI of initiatives. Consider a cloud migration. During planning, CIOs can calculate project costs and net savings. Increasingly, life sciences and health care CIOs are becoming more deliberate about how they structure and manage their project portfolios by deploying a 70/20/10 allocation: 70 percent of projects focus on core systems, 20 percent focus on adjacencies, and 10 percent focus on emerging or unproven technologies that may or may not deliver value in the short term.

combined with the strict requirements of regulatory compliance and patient privacy, make it vital for IT to evolve at least as fast as everyone else. But this is a field that finds much of its technology fragmented from department to department, with corresponding deficits in automation, interoperability, and data aggregation. Patients can't find the engagement they want and physicians say the state of technology is slowing them down.

Health care is a risk-sensitive industry, and many provider organizations may also feel they just made significant technology investments in areas like electronic health records. But they can't ignore the need to reform both their technology stacks and the organization that runs them. Too often, the desire to make each function "best of breed" leads to a proliferation of small platforms that don't work well together. Integration among many functions may serve a provider better than maxing out the performance of any one of them. An IT organization with fewer silos, localized decision making, and faster deployment can help pave the way for users to enjoy virtual care technologies, cloud and mobile utility, and fast, penetrating analytics—all of which can contribute to improvements in the core mission of maintaining people's health while lowering costs. One element of this reengineering should be a move toward scalability, in part by using Software-as-a-Service (SaaS) models that don't tie the IT operation to large, long-term system investments.

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## Prospects by sector

### Health Care Providers

The shift from volume- to value-based reimbursement is a foundational change that ripples through almost all the ways provider organizations handle data. Other changes in care models,

## Health Plans

Core modernization is an imperative for health plans, but many organizations are in various states in their digital journeys. Many of them have accumulated technology debt as they have postponed modernizing their core admin systems due to the complexity of the systems. This debt grows more costly every day, and it can impair the ability of some plan organizations to make fast decisions.

This is set against a backdrop of increasing demand for IT that helps a plan be more responsive to its members. Plans that work with members and providers in this new environment can either bolt on another layer of new capabilities, or rework the assumptions that govern their IT operations, so that using these new methods is a consistent, core mission and rolling out new capabilities can happen without delay.

With a reengineered IT approach, plans can be better positioned to take advantage of advanced analytics that deliver customized recommendations to their members. Cognitive technologies can help automate benefit translation, while machine learning speeds payment approvals. A plan should be able to compute costs and benefits in real time, while a customer inquiry is happening. And thanks to blockchain, plans may be able to participate in an ecosystem of authorized users of a patient's single health record, reducing delays and errors.

## Life Sciences

As in other sectors, organizations in life sciences find themselves under cost pressure. They have to work to preserve revenue against threats such as patent cliffs and the consolidation of previously separate organizations that buy drugs and devices. These companies are asking IT to do more—but they aren't necessarily offering more budget to do it. In order to free resources for innovation that contributes to growth, IT organizations need to engage in cost control of their own, and they need to find new efficiencies in the everyday activities that keep the lights on. One way to help teams focus well on this challenge is to tear down the distinctions between innovation and maintenance—between stability and agility—and treat them as different gears in the same machine.

Technology teams can make meaningful contributions to growth. Technology can help bolster revenue streams by helping streamline the discovery and pipeline progress of new offerings. It can play a central role in the digital engagement strategies that help life sciences companies engage more directly with the end users of their products. And IT can help drive savings through means such as shared services and robotic process automation. It's important to note, though, that process automation doesn't happen on a technology island. For example, many different units within an enterprise often have their own finance structures and practices. Their attempts to apply process automation in a purely technological way may not deliver efficient returns. But when business practice transformation and technology transformation happen in a coordinated way, the result can be a process of organization-wide standardization that is ultimately more effective.

Similarly, the IT functions that were once considered “back-of-house” can collaborate with the drug- and device-related operational technologies in the “front-of-house” to help drive innovation throughout the company. It's true in life sciences as in other sectors that companies of all types are becoming “technology companies” whether or not they've previously thought of themselves that way. The use of data and digital systems permeates operations, and drives value, in ways that make it less appropriate to distinguish between the platforms that keep the lights on and the ones that generate salable products and offerings.

As many organizations in this space are involved in consolidations, IT organizations can shape their own transformations to make valuable contributions at a moment when they're in the spotlight more than usual. Treating the integration of IT and the integration of IT operating models as parts of a holistic process, rather than as separate steps to handle in series, can make the final result more effective.

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## Risk considerations

Even when there's a clear case for wholesale change, it's risky to upset systems, practices, and teams whose mandate to provide service never pauses. Reengineering technology in life sciences and health care is like fixing an engine while the car is running. Any effort in this area should be supported by broad coordination, leadership buy-in, and a detailed plan that leaves nothing to chance.

There are also the concerns specific to the industry in the way organizations handle sensitive data. By fundamentally changing how IT services are performed and delivered, this will introduce new sources of cyber risks that an organization may not have faced before, so their risk management frameworks should be modernized in parallel to be able to respond to new and evolving risks. The concern isn't just security and access, but also the ways authorized people use the data once they have access to it, and how IT and security professionals respond to cyber incidents that emerge from adopting new capabilities.

Reengineering technology also brings challenges in human capital and organizational change management. Reworking machines around a cadre of people who stick to old ways is only a partial improvement. What skills will be important under a new IT regime? How will the operating model shift in unison with the technology model? An important consideration in the provider sector is to make sure physicians are engaged in the leadership of the transformation effort. That way, system changes can account for their real-world workflow, and a source of resistance can turn into an engine of support.

Regulatory concerns introduce risk into the technology reengineering effort—not only because an organization in transition needs to maintain its compliance with complicated rules, but also because the specter of regulatory issues may stand as an excuse not to try in the first place. Organizations should take a bold stance in moving forward with IT changes knowing (and documenting) that they're following the spirit of the law even when changing circumstances make it hard to be certain of the letter of the law.

## Conclusion

Does the prospect of reengineering your IT delivery models seem daunting? That's understandable, particularly for IT organizations at life sciences companies, health plans, or health care providers awash in legacy systems and entrenched ways of doing business—many of which have little to do directly with the IT organization but nonetheless profoundly affect its operations. In reality, these changes are probably easier to begin implementing than they may first appear. Plus, whether your organization seems ready to take them on or not, it may not be a choice: Given the state of the life sciences and health care industry, marked by constant evolution and upheaval, the IT organization has to be prepared to deliver more value, faster, while also driving down costs. New technology capabilities such as automation have a huge role to play in this evolution, but they have to be introduced in the context of broader changes to the IT organization in order to deliver on the full promise of their value.

When it comes to business developments like these, in technology and beyond, the life sciences and health care industry at large is conservative—and leaders tend to take notes from other industries before making their own moves. If that's your approach, take note: Leading IT organizations across industries are already working to reengineer their IT delivery models in order to keep up with the pace and demands of their businesses. You're not alone. Just make sure you're not the last to the party.

For more on reengineering technology, visit [www.deloitte.com/insights/reengineering-technology](http://www.deloitte.com/insights/reengineering-technology)

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