



Truly connecting data to medical science

How to cure today's IT symptoms
to deliver the future of Roche

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Introduction

This paper is all about the future of technology in the pharmaceutical industry, and how IT can help it to capitalize on the biggest step change in its history.

It's a response to the unique challenges of pharmaceuticals, in terms of the irreducible complexity involved in research, development, and testing. We believe that businesses cannot afford to let their IT stance add to that complexity – either now or as the business context continues to change.

It's also a response to the recent history of digitalization in the industry, in which significant benefits have accrued only at the cost of more complex tooling, more incompatible processes, and more cognitive overheads. We believe that the right IT stance can carry the benefits of speed and agility forward while enabling life sciences professionals to focus on what they are best at.

Most of all, it's a response to the unique opportunity which the industry today faces, and how technology's transformative impact on efficiency, productivity, and innovation in the industry can bring that opportunity to fruition.

Because, one thing which we believe has become abundantly clear is that what matters to the pharmaceutical industry, matters to everyone.



The challenge today

During the pandemic, as people looked to pharmaceutical businesses for hope and a route back to ‘normality’, the role of the industry was placed under a brighter spotlight than ever.

Even if the pandemic hadn’t happened, of course, this would have been a decade of extraordinary change, as systems of medical knowledge converge with technological breakthroughs and public health awareness to produce dramatic shifts in how we think about (and work with) the idea of health.

The pandemic catalyzed all of that, with the CEO of Roche describing the ongoing global situation as nothing less than a ‘pivotal moment in healthcare history’, in which ‘an unprecedented convergence of medical knowledge and data science is revolutionizing patient care.’

Covid-19 meant that pharmaceutical businesses found themselves center stage in the public conscience like never before. They became part of the pandemic narrative, on our screens and across our social media. As the processes of medicine development became household knowledge – and enormous collaborative efforts delivered results at unprecedented speed – assumptions, from every quarter, about what the industry can (and should do) were dramatically transformed, overnight.

Suddenly, pharma wasn’t just big business; it became everyone’s business.

And expectations were greater than ever.

This unique time in history, where technological possibility and social will are aligned, represents a huge opportunity to drive forward innovations in medicine. But, it’s one which will require bold technological steps to take full advantage of.

This challenge is made acute by the fact that pharmaceutical creation is an irreducibly complex task in which much of the process demands stepping into the unknown. While the obstacle course of development, testing, and approval is only getting more challenging, responding effectively to the market means completing that course ever faster.

It’s a situation where pharmaceutical businesses cannot afford to let IT add further complexity. This paper will explore some of the symptoms of digital complexity, explaining how it impacts efficiency, productivity, and innovation. It will also look at how the right technological approach can not only ease those symptoms, but produce a curative effect which enables talent to work at the speed of the world around it.

Efficiency: curing collaboration overheads

The symptom

Information flows in life sciences are intricate. The value chains involved are long; the safety and ethics considerations are stringent; requirements differ across geographies; and inputs vary hugely for different areas of health. This intricacy means that IT has long been a necessity to manage and process the volume of data being worked with, and the need to adopt technology as soon as possible has resulted in piecemeal and often disjointed digitalization.

The outcome is people pouring time and energy into digesting what other people are doing – energy which could be better spent on the next big idea. A new product only happens through alignment across many teams and experts, both within organizations as projects pass through specialist teams and across disparate organizations as alliances and partnerships are formed with private- and public-sector bodies.

The cure

Aligning in this way relies on stakeholders having a common language and frame of reference to communicate in; across systems designed at different times for different purposes, this imposes a significant additional workload. Collaboration, in

short, comes with a debilitating overhead which sits on top of the core issue of answering the scientific questions at hand.

The cure to collaboration overheads is introducing modern software and technology platforms which break down the silos separating teams' data, so that everyone is looking at the same thing no matter where they are. It's designing a strategic cloud roadmap to reduce complexity and introduce a rationalised approach where new apps integrate smoothly with what's already established. And, it's taking full advantage of that common platform by automating processes to integrate data and activate applications with minimal effort or disruption.



How we can help

From the perspective of the individual employee, collaborating without overheads means not only being able to access apps from anywhere, but having a clear, obvious choice about which tool to use for the task at hand.

When you partner with VMware, we take reducing complexity of choice as a guiding principle. Our unique combination of software and services reaches across the modern app lifecycle, helping IT teams to design a cloud strategy at one end and building in the measurement of business outcomes at the other.

For the talent at Roche, that means that app performance measurement is more fully aligned with their needs, and for your partners and customers it means keeping up with evolving patient expectations. With VMware Tanzu, you can free your apps with modernized, portable infrastructure that puts the focus back on outcomes, not methods.



Efficiency in practice

Founded in 2007, UK-based Aridhia is a world leader in clinical and translational informatics.

They found that shrinking healthcare budgets and tough clinical research funding environments were putting a squeeze on the bottom line as populations age.

Aridhia discovered that enabling doctors and researchers to collaborate and incorporate advanced health analytics and informatics into a clinical workflow would ultimately improve care standards and ensure that healthcare resources are spent more wisely.

The company is addressing these challenges by offering the market a quick and easy way to collaboratively interrogate data, within a subscription, that leverages cloud, big data, and mobile technologies to accelerate the analytic process. By working with VMware to eliminate data hand-offs, Aridhia enables clinical and research teams to work hand-in-hand.

Productivity: curing delayed time-to-feedback

The symptom

The work of pharmaceutical development ultimately only pays off when the results provably deliver healthier, happier lives – and no amount of investment can fully guarantee that outcome. At the same time, however, finding a competitive advantage and growth in the sector increasingly relies on delivery which is as agile as it is reliable in order to keep pace with changing business models and market demands.

Highly productive teams invest their efforts into work which produces returns, and in the pharma industry that means discovering what is and isn't working as soon as possible. The heat is on to not only establish effective partnerships with organisations from academic research groups to regulators, but also enable powerful, rapid iteration across those partnerships. Time is spent waiting for data to become available or accessible, conversely, is lost productivity and progress.

The cure

There is much in the timescales of life sciences that cannot be accelerated: biology, unlike technology, can move only at its own speed. That's why it's so important to ensure that everything else in those timescales is as frictionless as possible. Collection,

collation, transfer, conversion, and analysis of data are all things that should be accelerating alongside our technology.

The cure to delayed time-to-feedback is introducing a real-time platform which can inform improvement and identify failure earlier. It's quickly building applications which can run anywhere they're needed, so that services can be stood up and usable by every team that needs it when that need arises. And, it's making compliance part of the digital fabric of the business to remove roadblocks between product ideation and marketisation.



How we can help

Failing fast and failing safely means staying in control, no matter what the outcome is, and that starts with infrastructure that lowers the cost of entry, accelerates rollout, and performs regulatory compliance by default.

VMware can help ignite possibilities for IT teams at Roche by arming them with the knowledge and capabilities to become powerful advisors and influencers in the business, taking on a more complete role which frees others up to accelerate their research and development.

By simplifying your infrastructure to provide thorough oversight and insight, VMware's intelligent digital foundation makes the work of managing an agile multicloud environment one of continuous improvement – and one which can be measured against customer and business outcomes, not just technological SLAs. With a platform that takes full advantage of modern IT, Roche can ensure that everything which runs on it will accelerate too.



Productivity in practice

In a fiercely competitive \$28 billion electronic medical records market, with hundreds of vendors each looking for ways to differentiate themselves and grow market share, Cerner Corp is betting on speed.

By developing and releasing software to production in smaller batches more frequently, Cerner can listen more closely to users and let their feedback guide the roadmap. It's a vital step in a market where frustrated clinicians report spending nearly twice as much time struggling with clunky EMR software as interacting with patients.

Adopting VMware's de-siloed cloud platform has enabled Cerner to modernize its development environment, adopt agile practices and user stories, and reorganize into cross-functional teams – resulting in a significantly increased pace of feature development.

Innovation: curing stifled workflows

The symptom

While digitalisation is everywhere in the pharmaceutical space, the story of health innovation is still, ultimately, one of human ingenuity: businesses succeed when they apply that capacity to the right problems. Today we face real challenges in that regard, with employees needing new tools and technology to work effectively, while the growing diversity of methods and workflows arising as medicine converges with technology makes collaboration more difficult.

When too much time is spent making the workflow work, and not enough actually using the workflow, innovation suffers. At a time when third parties, including the public at large, are becoming highly invested in the possibilities of rapid drug development, losing time on establishing and maintaining processes comes at a higher cost than ever.

The cure

That task of making workflows work has been all too familiar in recent years, when our powers of adaptability and resilience have been called on to reroute essential processes around the realities of the pandemic. Now, we are in a position to look towards a truly modern workplace which meets needs better, with more flexibility and greater resilience.

The cure to stifled workflows is to modernise apps in ways that reduce the cognitive load of using them by giving them a common and portable framework. It's securely unifying data silos and empowering people to take action on the basis of well-evidenced insights – without sinking hundreds of man-hours into acquiring those insights. And, it's upskilling teams to the cloud native practices which will make the next generation of applications more resilient, helpful, and usable.



How we can help

Another way of looking at this innovation challenge is to see it as one of linking application development to business needs: tools only deliver value when they match the needs of the people who use them. Without common ways of working, it's impossible to ensure that the work being done will join up.

Whether it's from-anywhere access to apps, frictionless security enablement, or just giving staff the freedom to work from their own device, VMware and its partners have the platforms and tools to create a truly modern, fit-for-purpose workflow.

Cohesive infrastructure helps to create happier talent and greater staff retention – but it also opens up new ways of working with data, turning it into a core business asset which can power automated processes and actionable intelligence. To help Roche get there, VMware can work with your staff to upskill them with valuable hands-on cloud-native experience, preparing you for the next generation of life sciences innovation.



Innovation in practice

US-based Shields Health Solutions has revolutionized hospital specialty pharmacy with software.

When a patient is diagnosed with a chronic disease it can be challenging to start and stick with a treatment plan. This roadblock for vulnerable patients is exacerbated by the fact that about half of all US health systems don't have any specialty pharmacy programmes, whilst many others have only limited services.

In 2012, Shields Health Solutions partnered with health systems and academic medical centres to help them rapidly start a specialty pharmacy, or expand the system's existing specialty pharmacy programmes, so they can serve more patients.

Shields' high-touch model, connected through VMware's cloud data platform, enables seamless patient care between a hospital's clinics and its specialty pharmacy. This is, truly, lifesaving innovation.

The opportunity tomorrow

If problems with efficiency, productivity, and innovation are the symptoms we are interested in, the condition that VMware is positioned to treat is one of fragmentation. Pharmaceutical development workflows, whether through mergers and acquisitions, uneven digitalization, or just the inherent variety of processes their value chains cover, are at real risk of splintering in ways that limit progress and distract from delivering value.

Where that happens, the prospect of agility and scalability is lost: time spent managing how pieces talk to each other is time lost on developing what's next. Putting the splinters back together needs a specialist. VMware's combination of technology, consultation, and partnerships give it a unique capacity to deliver on both the promise of modern apps and new ways of working to accelerate growth.

VMware's proven track record in supporting healthcare and pharmaceutical businesses means that we are the partner that can make Roche's 'unprecedented convergence of medical knowledge and data science' a reality, today.



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