Everest Group®

The Future of Healthcare: Accelerating Your Cloud Journey

Driving Change by Aligning Business and IT

Infosys cobalt | Cloud Conversations

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Executive summary

Cloud transformation has been a key focus for healthcare enterprises as they have sought to deliver better healthcare services, operate more efficiently, and be more resilient and adaptable to changing market dynamics. The pandemic has highlighted the need for healthcare organizations to future-proof themselves, accelerating cloud transformation.

We believe the enablement of cloud transformation for healthcare enterprises rests on the following four pillars:

- **Legacy modernization:** With the healthcare industry moving toward digitalization, enterprises are investing in the digitalization of front- and back-end processes to enhance customer experience and improve operational efficiency. Enterprises have also begun to consider large-scale investment in legacy modernization through cloud adoption to improve time-to-market

- **Artificial Intelligence (AI) investments:** AI has taken center stage among healthcare enterprises, becoming an integral part of service offerings and platform-based products to enable seamless support and enhance customer experience. Enterprises are gaining competitive advantage by investing in the right talent and solutions for an AI-enabled future

- **Consumerization:** Consumers are becoming the central element around which healthcare enterprises are designing their IT strategies. With the shift toward value-based care, enterprises are enabling consumers with greater ownership, control, and responsibility in four pivotal areas: data centricity; member/patient engagement; integrated, coordinated, and preventive care; and services management

- **Talent management:** It is important for healthcare enterprises to source the right talent that complements the technologies they are leveraging and focuses on future gaps; talent will be a critical differentiator for success. Healthcare firms are undertaking strategic initiatives to upskill/reskill, acquire cross-functional talent, and onboard talent to enhance digital capabilities and domain expertise. However, challenges persist in the form of high worker retirement age, low willingness of millennials to join the workforce, and the lack of an attractive talent-value proposition to retain skilled resources. The pandemic has provided these firms an opportunity to introduce agile ways of working that can last beyond the current crisis

Keeping these four elements in mind, enterprises are devising their cloud-first approach to build seamless and resilient IT architectures. These architectures will both enhance the business units' internal functioning and enable better features for their consumer-facing platforms or services. The efforts and timelines for cloud enablement and migration might deter some enterprises from starting the journey, but their confidence will grow when they realize the tangible benefits that some leading enterprises are already achieving.

Healthcare industry resilience amid COVID-19 challenges

The pandemic and the resulting economic fallout have adversely impacted most industries, creating demand stress, revenue compression, and profitability pressures. In addition, consumer needs, habits, and expectations have radically shifted during the pandemic, forcing enterprises to carve out a digital-first strategy. While the announcement of fiscal and monetary policy responses from local governments and a potential return to normalcy have improved industry sentiment, uncertainty prevails as industries recovers from recessionary conditions.

Healthcare enterprise leaders have realized that they need to reimagine their organizations for the next normal by building resilient growth models. One of the biggest pain points is that decision-making process is slowed by the necessity for CIOs/IT executives to build internal business cases for their executive leaders.

Business philosophy needs to evolve to develop differentiated experiences for each customer segment, powered by data and digital capabilities. This need has propelled healthcare enterprises to shift to an IT-enabled architecture based on the cloud. As healthcare enterprises have shifted their focus to digital transformation, IT outsourcing spends have remained steady through the pandemic, in contrast to other industries (see Exhibit 1.) These IT outsourcing initiatives include legacy modernization, AI/ML adoption, data & analytics, IoT, and cloud migration. These technologies are acting as enablers to propel the shift to value-based care for payers and providers.

EXHIBIT 1

IT outsourcing trends by industry

Source: Everest Group (2021)
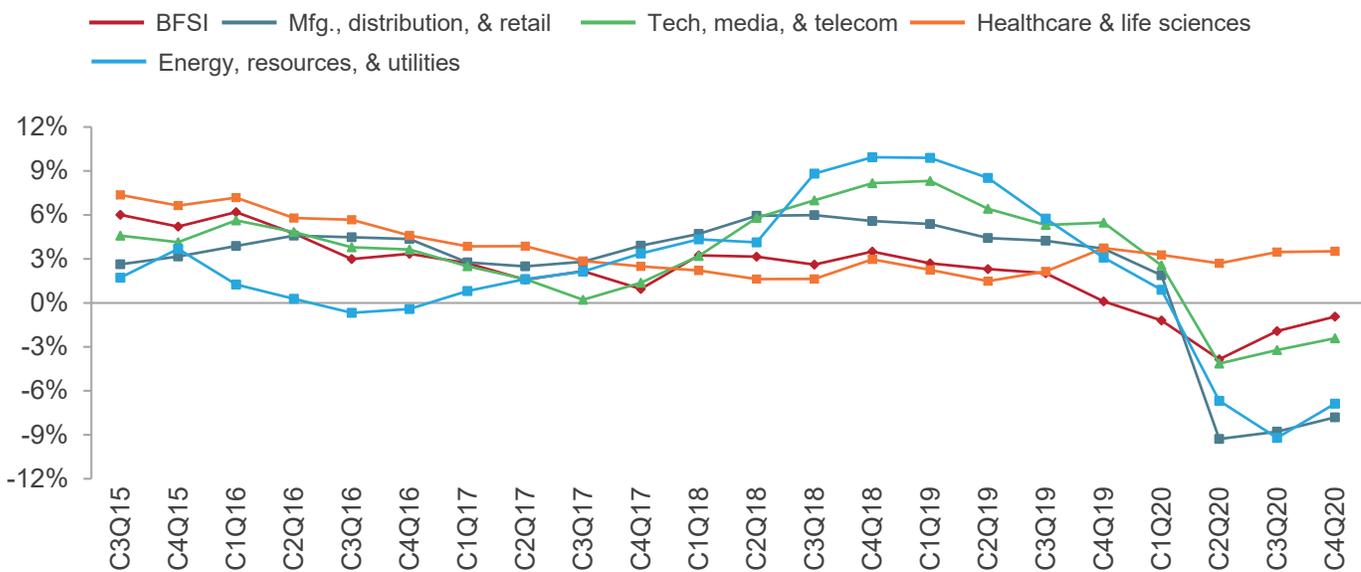
The pandemic might have acted as an economic roadblock for many enterprises, but the silver lining is that it also served as an accelerator for digital transformation.

Key components of a cloud-first approach

Cloud enablement and migration has become a frontrunner in the wide array of emerging technology initiatives. While healthcare enterprises, in particular, have a big appetite to implement cloud technologies to accelerate their digital transformations, they are also keen to compress their five- to seven-year transformation timelines.

We believe the roadmap to cloud adoption among healthcare enterprises will be centered around four key objectives:

- **Legacy modernization:** changing healthcare enterprises' legacy architectures or technical debt by modernizing – this can help enterprises address interoperability challenges, poor data quality, cost inefficiencies, and limited business agility
- **AI Investments:** increasing AI/ML investments to effectively leverage the data coming in from multiple sources and utilizing the cloud's massive power-on-demand to drive innovation, reduce costs, improve operations, and create business impact
- **Consumerization:** transforming customer experience by building cloud-based digital experience platforms to provide omnichannel customer outreach and engagement
- **Talent management:** planning for return-to-work scenarios, ensuring productivity, and introducing agility in work management

Legacy modernization

Evolving member/patient expectations and disruptive digital-native challenges have put the healthcare industry in dire need of modernization. The key roadblock to that modernization is legacy systems. Modernizing healthcare systems is the necessary foundation for the transition to the future. Key healthcare modernization drivers include:
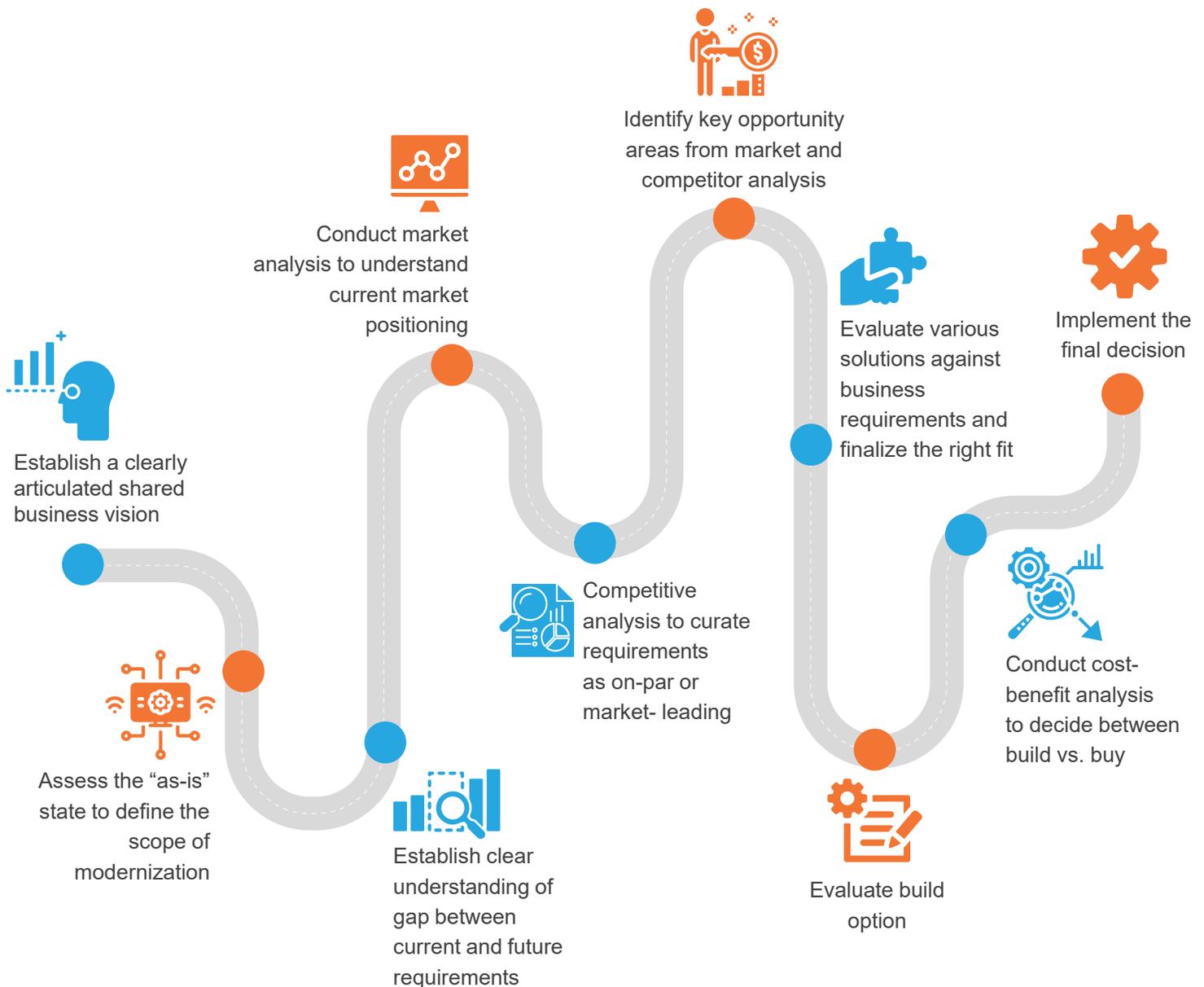
- **Cost-effective computing power:** The costs of running large systems and data centers are huge. To mitigate these expenses, many enterprises are moving toward cloud computing
- **Value-based outcomes:** Current IT infrastructure lags in supporting the configuration and administration of complex risk-sharing processes, which is a significant challenge as the healthcare market moves toward value-based reimbursement. Healthcare enterprises need a modern infrastructure that can help in establishing a robust payer-provider network with better data structuring
- **Regulatory changes:** CMS and other agencies are strongly promoting data transparency and interoperability within healthcare systems. However, the current ecosystem is highly siloed, hindering seamless data flow. To support these changes, enterprises require a central database and connected systems
- **Flexibility to support future business needs:** Healthcare IT infrastructure is fragmented, and its data systems siloed, restricting enterprises from upgrading or implementing new features or capabilities. Accommodating future business needs requires a flexible and scalable IT system in place
- **Digitization for data-driven outcomes:** Health data volume is growing every day, but current core systems lag in providing data-informed insights. To address this challenge, enterprises need automation, advanced analytics, and AI/ML capabilities, which would require digitization of healthcare systems

To find the right solution for their specific business requirements, enterprises can adopt a phased approach for solution/platform selection as described in Exhibit 2.

EXHIBIT 2

Roadmap for legacy modernization

Source: Everest Group (2021)

Establish a clearly articulated shared business vision

Assess the "as-is" state to define the scope of modernization

Conduct market analysis to understand current market positioning

Establish clear understanding of gap between current and future requirements

Identify key opportunity areas from market and competitor analysis

Competitive analysis to curate requirements as on-par or market- leading

Evaluate various solutions against business requirements and finalize the right fit

Evaluate build option

Conduct cost-benefit analysis to decide between build vs. buy

Implement the final decision

Enterprises can opt for an optimal mix of the following approaches to enable modernization with minimal business disruption. Exhibit 3 analyzes the key options to consider in legacy modernization.

EXHIBIT 3

Legacy modernization approach options

Source: Everest Group (2021)

	Description	Pros and cons	Use cases
RETAIN	Does not require "rip and replace," the API ecosystem can help put in place new systems without impacting critical legacy infrastructure	• Pros: Does not affect critical legacy infrastructure • Cons: Focus only on developing the interface. Does not maintain or upgrade the internal components of the legacy system	Modernization of existing platforms: updating obsolete technologies, advancing existing software assets, adding a new interface to a legacy component, etc.
RENEW	• Components on monolithic legacy environment can be updated using cloud-based architecture • Make small changes to the code in order to adapt to a new solution, while keeping the code structure and features intact	• Pros: Scalability and cost-effective, with infrastructure improvement opportunity • Cons: Cannot provide capabilities for changing market needs beyond the renewed component function area	Movement of an existing platform to the cloud; use of web-native technologies
REPLACE	Platform adoption might require some cloud-native investments such as adding a microservices/API layer, talent movement, structural changes, etc.	• Pros: Faster developing time, better security, and customization by utilizing new coding techniques • Cons: High investment, resource-intensive, and time-consuming	Replacement of bespoke claims management / network management solution with a best-of-breed solution to enhance efficiency without changing the underlying platform architecture
ADD	Flexibility to add bolt-on features to help payers unlock value from existing core platforms	• Pros: Regular updates as per market needs and better security • Cons: Staff training and change in few business processes to support new functionalities	Addition of functionalities such as support for specialty and/or new LOBs, value-based care modules, and addition of end-user portals

Enterprises must address the challenges associated with legacy system modernization to maximize efficiency in the change process and ensure business continuity, including:

- **Cost and duration:** Enterprises remain skeptical about investing time and money in migrating legacy system infrastructures as migration requires substantial funds and enterprise-wide acceptance. Migrating data from a legacy system to a new system is a complex and time-consuming task. In the event of a heavy data migration, organizations adopt a phased approach, which may require supporting several overlapping business operations at the same time

- **Change management:** Existing IT resources and talent might not have the right technical skills or information to migrate data to the modernized system. Also, getting all the stakeholders on board for system modernization may be challenging, as the ROI is not immediate

- **Right fit:** The overwhelming number of options available in the market is creating challenges for enterprises to find the solution best suited to their current IT estates and business needs. Selecting an option without proper assessment increases the chances of onboarding a solution that might serve only the current requirement but is not scalable and flexible to accommodate future requirements

AI investments

Healthcare enterprises leaders are increasingly interested in AI technologies. AI presents unique opportunities for healthcare enterprises – enabling them to improve customer experience, achieve operational efficiency, enhance employee productivity, reduce costs, accelerate speed-to-market, and develop more personalized products. While AI is a relatively new area in the healthcare space, digitalization of healthcare is accelerating enterprises' interest in AI. With CEOs and CIOs acknowledging the transformative power of AI, enterprises are rapidly building AI strategies. In the healthcare provider domain, AI is used for inpatient care, wellness management, medical imaging, and diagnostics. Payers leverage AI to enhance member experience and improve adherence.

Healthcare organizations have increased their focus on embedding AI across the value chain with the explosion of healthcare data, the shift to value-based care, and growing consumerism. Majority of AI initiatives in healthcare are still driven by large enterprises as most mid- and small-sized firms are taking a wait-and-see approach. Large firms with sizable market share are leveraging their better margins to focus on transformational initiatives, whereas smaller firms with poor margins and low market share are focused on operational initiatives.

Several things are driving investment in AI across the healthcare industry:

- The healthcare sector is a victim of disparate information systems, fragmented member information, and legacy IT burdens. Additionally, a large amount of the data is unstructured and is rarely leveraged to generate insights. The sector is becoming aware of the fact that AI can be used to derive meaningful insights from this data to form better business strategies. AI-driven systems can leverage the explosion of unstructured and structured data to train themselves and generate real-time insights for the healthcare ecosystem

- The healthcare sector's shift from fee-for-service to value-based care has necessitated AI to analyze large amounts of medical data to help providers offer faster and more accurate treatment, and make better decisions going forward. Value-based care initiatives – primarily in the areas of patient engagement and care management – are the major drivers of healthcare technology spending. Data management and AI capabilities are the backbone of the value-based care business model. These technologies allow effective use of EHR by analyzing real-time data, allowing care providers to devise strategies to provide better quality care at a lower cost, assess patient health status effectively and efficiently, and treat patients with personalized and unique care plans and services

- With consumerism gaining ground in healthcare, members/patients are demanding increased engagement, control, convenience, quality, and affordability through automated tools; healthcare leaders are tackling this challenge by leveraging AI to offer portals and mobile applications for self-service and personalized experience

Healthcare payers and providers are creating impact from AI for the organization as well as the customers in the following ways:

- **Cost impact**: Enterprises are leveraging AI capabilities to automate routine processes and optimize business processes, thereby saving time and money. A few examples include:
  - Reducing inpatient and emergency room utilization
  - Reducing people and processing cost involved in data collection and analysis
  - Reducing people cost by automating customer support
  - Reducing people and processing cost by automating administrative/redundant tasks
  - Automating sales orders / claim processing

- **Operational impact:** To optimize performance, drive productivity, and improve the use of existing resources, enterprises are identifying processes that can be automated and executed more efficiently by leveraging AI. Enterprises are applying AI to multiple operations including health-specific processes such as personalized patient care and preliminary diagnosis and treatment, as well as generic enterprise processes such as sales, pricing, and security and compliance

- **Business impact:** Enterprises need to proactively invest in innovative solutions and leverage them to deliver more value to customers – by reducing resolution time, processing unstructured data, and resolving complex queries – and build strong market positioning. AI has enabled enterprises to lead their customers through better patient journeys; active investments and extensive leverage of capabilities such as cognitive computing, ML, and NLP to deliver customer-centric solutions from healthcare data has been a key differentiator

EXHIBIT 4

Key benefits of AI-powered solutions for healthcare enterprises

Source: Everest Group (2021)

Low Medium High

Provide competitive advantage	Drive process efficiency	Drive business growth	Enhance Customer experience
AI helps companies gain competitive advantage by helping them develop distinctive products, meet customer needs more effectively, and streamline decision-making	• AI is deployed in back- and middle-end operations (automating parts of supply chains) to enhance process efficiency • Machine learning helps healthcare professionals spend less time on mundane tasks and focus more on personalized patient care	• AI allows data-driven decision-making, improving efficiency and providing cost-effective alternatives to some business processes • AI helps to identify the most valuable customers and deliver targeted experiences	• Customer-facing technologies (chatbots / visual assistants) address low- and medium-complexity queries directly • AI devices empower patients to have a greater stake in their own health

While there are many benefits to AI adoption, there are also barriers that have restricted its universal acceptance, including:

- **Absence of interoperability:** AI models are only as good as the data that is fed into them. In healthcare, the potential benefits of AI are severely limited by siloed data sources and restricted information availability

- **Regulatory implications:** With hundreds of AI-driven healthcare apps and devices being developed each month, it seems likely that regulatory approval for algorithms is not far off

- **Moral/ethical implications:** As AI is increasingly entrusted with individuals' lives and health, ethical concerns are bound to arise. And the possibility of a mishap occurring as a result of a rogue AI algorithm haunts healthcare

- **Concerns about data privacy:** To enhance personalized experience, AI-driven devices and systems are collecting customer's personally identifiable data. Individuals do not have visibility into how their personal data is being used (or misused)

- **Shortage of relevant and sufficient talent:** As AI technologies are being developed, their successful deployment becomes essential. For this, enterprises need relevant talent, which is not readily available. While this is not an insurmountable challenge, it may continue to hamper adoption of AI in the short term
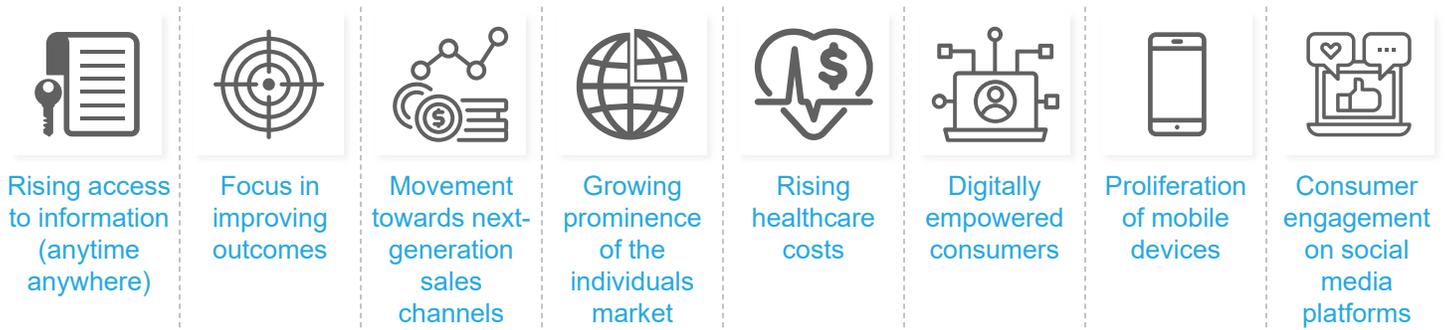
Consumerization

Consumers are assuming the central role and taking increasing ownership over their healthcare outcomes, driving enterprises' investments in next-generation technology. The current state of consumerization in the healthcare industry is characterized by a combination of industry-specific reforms as well a transformation of service consumption habits, leading to consumerization of demand. As consumers assume greater ownership, control, and responsibility over their healthcare, enterprises look to digital enablers of consumerization—big data, analytics, cloud, and social media.

EXHIBIT 5

External drivers for consumerization in healthcare

Source: Everest Group (2021)

| Rising access to information (anytime anywhere) | Focus in improving outcomes | Movement towards next-generation sales channels | Growing prominence of the individuals market | Rising healthcare costs | Digitally empowered consumers | Proliferation of mobile devices | Consumer engagement on social media platforms |

Three key consumerization components need to function effectively together for a cohesive go-to-market strategy; enterprises need to ensure adequate attention among them to design, implement, and execute a robust consumerization model:

- **Channels**: Mobility and social media are pivotal channels for consumer outreach and engagement, given their tremendous traction. Enterprises are leveraging them to interact and engage with their consumers in real time
- **Enablers:** Analytics and software-as-a-service play a vital role in operationalizing and driving consumerization initiatives. While analytics help tap real-time information to aid business decision formulation, SaaS is an important tool to provide services efficiently and seamlessly
- **Interfaces:** Enterprises interact with consumers through various media, such as marketplaces and direct engagement models. They leverage these interfaces to connect with evolved consumers and deliver relevant services

Enterprises need to align these key components to their investments, specifically in cloud, analytics, mobility, and social media, as depicted in Exhibit 6.

EXHIBIT 6
Consumerization investments
Source: Everest Group (2021)
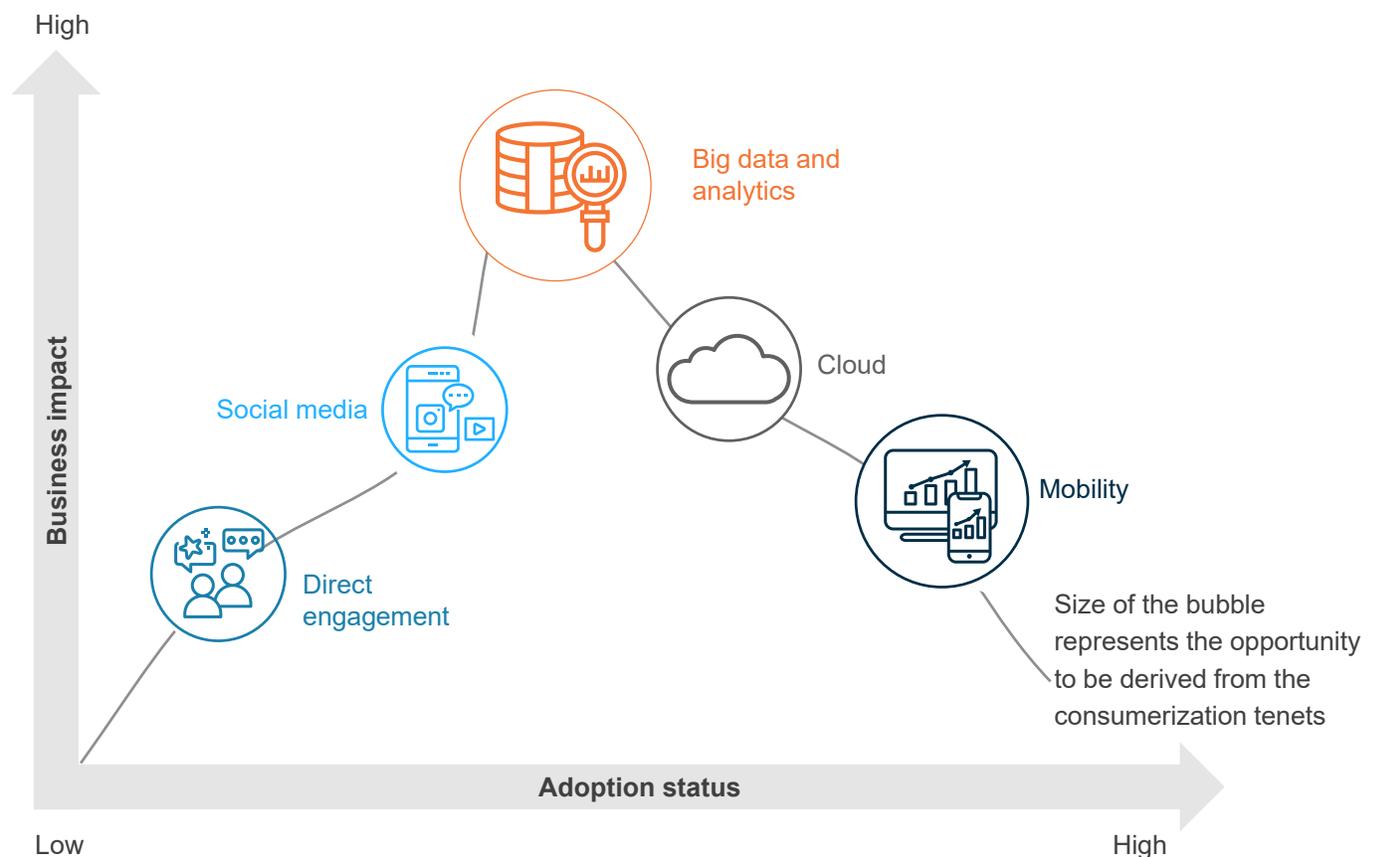
While evaluating enterprises investments in specific consumerization model elements (social media, data analytics, cloud, mobility), best-in-class enterprises typically invest uniformly across all these technology themes, thereby indicating a consistent focus on ramping up technology infrastructure to drive business outcomes.

Leading healthcare payers and providers are leveraging four key areas to transform consumer experience:

- **Data centricity:** To build consumer-centric organizations, it is essential to effectively collect data to analyze and act on it. The movement of data within healthcare is stymied today by architecture and complexity. Effective data sharing is essential to coordinate care

- **Member/patient engagement:** Different stakeholders have access to data residing in different places; as a result, they are unable to build a holistic picture, and patients/members receive disjointed care. It is essential to integrate the experience at different points of a patient's journey to draw a complete view and consolidate/coordinate experiences and care

- **Integrated, coordinated, and preventive care:** Improved patient centricity requires the delivery of coordinated, integrated, and preventive care. It requires both providers and payers to make systemic changes. Coordinating care across delivery modes and investing in preventive care can enhance the patient/member experience and improve their overall health

- **Services management:** Payers need to move beyond the traditional reactive service delivery to proactive service delivery. Creating amazing experiences requires building a 360-degree view to deliver AI-driven insights that can be actioned anywhere and can provide personalized service across channels and devices

Talent management

With a boom in emerging technologies, talent scarcity has become one of the biggest leadership challenges in implementing and evolving capabilities. Enterprises that win the talent war will gain exponential advantage. Technology adoption at the enterprise level is creating constant workforce transformation and requires upskilling of existing roles within every business function.

Prior to the pandemic, 58% of enterprises[1] said they have insufficient internal resources to drive digital transformation programs. Following the onset of the crisis, this percentage increased to 69%[1] – enterprises realized that digital transformation is no longer a choice but a necessity and that access to the right talent is pivotal to execute this mandate. Everest Group - Charting the Skilling Journey to Build the IT Services Talent of Tomorrow (Aug 2020).

The COVID-19 disruption is creating a new talent dynamic – while generic IT talent supply is currently overpowering demand, the market for emerging roles remains supply-constrained:

- About 75% of enterprises[1] believe that, despite COVID-19, there will still be a talent shortage for key roles across next-generation IT and analytics

- About 67% of enterprises[1] believe new skill gaps will emerge due to structural changes in businesses because of the current disruption

In parallel to alignment of internal resources, enterprises are also investing in external talent, as described in Exhibit 7. Strategic partnerships with third-party technology vendors, rather than building everything in-house, is more capital efficient and leads to better results.

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1   Everest Group - Charting the Skilling Journey to Build the IT Services Talent of Tomorrow (Aug 2020)

EXHIBIT 7

Internal vs. external talent

Source: Everest Group (2021)

Internal talent	External expertise
• With the healthcare industry transitioning toward becoming technology-focused, players are building in-house capabilities to undertake new initiatives	• Market players are collaborating with leading technology vendors to navigate the complex technology landscape and to accelerate their AI projects

• Companies are investing in training and reskilling of employees at all levels, partnering with educational institutions, and setting up Centers of Excellence (CoEs), to enhance technology adoption across organizations
   – Players are also investing in building innovation labs which function as the internal research team
	• Companies are acquiring emerging technology capabilities through partnerships with / acquisitions of startups / service providers / ISVs / open-source platforms, to complement their internal initiatives
	   – These third-party experts bring expertise from technology implementation across healthcare as well as other industries that are ahead on the technology adoption curve

• Additionally, companies are recruiting top talent from non-healthcare firms to scale up their organization's tech capabilities	

Examples				
Innovation labs	Academia	Digital studios	Leverage outsourcing relationship	Acquisition of startups
Digital teams	Design thinking	CoE	Leveraging open-source platforms	Partnership with service providers / ISVs
Innovation funds	Training	Experience hiring		

Although the healthcare industry is plagued by siloed organizational structures to some extent, there is scope to implement a more integrated model by focusing on hiring initiatives and aligning internal resources and partnerships to their overall IT strategies. A holistic approach to build good talent management capabilities would include:

- **Demand forecasting and gap assessment:** Identify the current state of competencies within the organization

- **Planning and forecasting:** Identify future competencies and associated definition of roles needed to narrow or eliminate the gap

- **Role definition:** Determine base roles, which can be a starting point for skilling and charting a skilling journey for these roles by identifying key competencies

- **Measure** the success of role development by **assessing** the feedback from business teams and employees

Enabling data security in a cloud-first approach

Cloud enablement has been touted as one of the key enablers of business growth and digital transformation for healthcare enterprises. Healthcare cloud adoption creates new data security risks that must be managed. Fluid applications and data moving among multiple clouds pose a significant risk from malware and other threats, creating an urgent need for:

- **Data security controls:** Secure storage and sharing of sensitive patient data is of paramount importance in the healthcare sector. A recent spike in phishing attacks and the proliferation of IoT devices to capture patient data have increased exposure. Firewalls, network access controls, data loss prevention, data encryption (in transit and at rest), and database security are key investment areas

- **Data privacy regulation compliance:** Health Insurance Portability and Accountability Act (HIPAA) establishes privacy and security rules to ensure healthcare enterprises handle and protect patient information. HIPAA, in part, mandates that every organization adopt a security framework, such as ISO, COBIT, HITRUST, NIST, and CIS. The HITECH act helps ensure HIPAA compliance and increases penalties. The Office of Civil Rights (OCR) can levy fines of up to US$1.5 million per violation category per year for non-compliance with HIPAA regulations

Conclusion

Leading healthcare enterprises have already embarked on their cloud journey to accelerate their digital transformations. The pandemic has only accelerated this effort, particularly among enterprises that were skeptical based on unclear return on investment. While healthcare had lagged other industries in cloud initiatives pre-pandemic, larger healthcare enterprises have adapted to the changing times. Small and medium enterprises are likely to follow suit and adopt cloud technologies once they see the substantial benefits larger enterprises are realizing.

In adopting a cloud strategy, it is vital that the four pillars – legacy modernization, AI investments, consumerization, and talent management – should function in an integrated manner, which creates an interplay for synergic advances. An example of this interplay in many enterprises can be - disparate legacy systems being modernized to provide the right data for AI initiatives, these AI initiatives providing better consumer experience, and emerging technologies (such as AI, data analytics, cloud) creating a need for talent upskilling and reskilling.

When the four pillars are effectively integrated, the result is significant benefit, including a better consumer experience, cost savings, operational efficiency, and competitive advantage. The importance of these benefits is further accentuated by the shift toward value-based care, regulatory changes, and the need for data-driven outcomes. To complement these four pillars, the cloud environment should include data privacy and security controls to avoid interception of personal health information by hackers and prevent serious vulnerabilities.

Lastly, a cloud-first approach needs to be a combined decision between the IT and business functions. While it might appear to be an IT-driven initiative, its implications in business outcomes make it imperative to competitive advantage. It has long-lasting impact on the costs and profits as well of the enterprise overall. A well-managed cloud strategy implemented today can be a key driver of exponentially better competitive positioning in the future.

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With you on the journey

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