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WHITE PAPER

The IT foundation for value-based healthcare

Making the right IT investments today to improve patient outcomes tomorrow

Introduction

Value-based health care is a bold, all-encompassing and ambitious new framework for delivering health care services worldwide. Rather than funding health care providers based on the number of treatments or services delivered for each patient, the new model aligns payments with patient outcomes, such as years of survival or completeness of recovery. Value is achieved when the patient outcome is improved for the same cost or the patient outcome is maintained for a lower cost. Fundamental to the value-based approach is the need to be able to measure patient outcomes in a standardized way and calculate the cost of delivering services for patients across multiple departments and service areas.

More than a decade after the term value-based health care was first coined, the principles of this approach have been thoroughly discussed, trialed and widely accepted. So much so that, now, many health care providers are putting the theory into practice. Respected global organizations including the World Economic Forum and Organization for Economic Co-operation and Development (OECD) are working on programs to support the definition of patient outcomes and accelerate the adoption of value-based health care approaches worldwide.

IT will play a critical role in enabling health care organizations to adopt the value-based model. It will facilitate greater integration of systems and data between different departments and teams, to enable care to be delivered consistently and efficiently at every stage of the patient's care cycle. In addition, IT will support the collection and analysis of data on patient outcomes and end-to-end care costs, allowing value to be accurately measured. IT will also widen access to data, to improve collaboration between health care teams and support national and global value improvement initiatives.

While not insurmountable, there are nonetheless several IT challenges that will need to be addressed to ensure the successful and widespread adoption of the value-based health care model. These challenges include the need to break down traditional siloes between departments and systems and prepare to collate, analyze and store huge volumes of data on patient outcomes and end-to-end costs for the first time. New technology, such as wearable health monitors and in-home medication dispensing devices, will focus attention on the need for exceptional reliability in back-office systems, while IT managers will need to think carefully about how to ensure their IT environments remain easy and inexpensive to maintain.

> *The success of the value-based health care approach hinges on the health care industry's ability to measure patient outcomes.*

The demands of the new value-based health care model will put increased pressure on IT professionals in the health care industry. When they are making investments in new medical solutions and IT infrastructure or upgrading their legacy systems, they will need to pay close attention to four key issues: interoperability, scalability, reliability and value for money.

Vendors of IT solutions for the health care industry will likewise need to ensure their products are interoperable and scalable and offer high availability at a fair price. Then, organizations in the health care industry will be able to make the right IT investments today, to deliver better outcomes for patients tomorrow.

What is value-based health care?

Value-based health care was first proposed in 2006 by the Harvard Business School Professors Michael E. Porter and Elisabeth O. Teisberg in their book Redefining Health Care[1]. They set out a new service delivery model in which health care providers are remunerated, not based on the number of individual services they deliver, but on how successfully a combination of services delivers value for patients. Value is defined as how well the patient recovers, relative to how much it costs to deliver this outcome. If a health care provider improves patient outcomes without escalating costs, it is delivering value. If the health care provider delivers equally good patient outcomes more efficiently, it is also delivering value. The ultimate aim is to deliver improved outcomes for patients at lower costs.

The value-based health care approach aims to address two global challenges: rising numbers of patients and rising costs. All around the world, health care providers are struggling to cope not only with growing populations, but also with growing numbers of older people who have higher demand for medical services. Deloitte reports that by 2022, there will be 668 million people in the world aged over 65, representing 11.6% of the total global population[2].

1 Porter, M. E. and Teisberg, E. O. (2006). Redefining Health Care, Creating Value-Based Competition on Results. Boston, Mass.: Harvard Business Press.
2 Deloitte (2019) 2019 Global Health Care Outlook, Shaping the Future

At the same time, health care 'payers' (governments and insurers) are facing escalating and unsustainable costs. According to a report published by The Economist Intelligence Unit, global healthcare spending is predicted to increase at an annual rate of 5.4% in 2018–2022, as compared to 2.9% in 2013–2017[3]. One contributing factor is the availability of new medications and advanced technology-led treatments, which are effective but costly. Patients, understandably, want to be able to access these life-saving and life enriching services when they need them, but payers cannot fund them all while providing equitable access to health care for everyone.

> *A value-based approach to healthcare delivery characterized by an emphasis on cost-effectiveness and a focus on patient outcomes looks likely to become the dominant trend in European countries.*

The success of the value-based health care approach hinges on the health care industry's ability to measure patient outcomes. This could be how long a patient survives after treatment or even the speed at which a patient can return to work after an operation, and outcomes will be measured differently for diabetes than for cancer or back pain. Health care providers will also need to reorganize to deliver integrated suites of services and calculate the price of multi-phased treatments. For instance, the cost of treating a broken leg may include A&E, surgery, outpatients and physiotherapy. The value-based approach envisages that eventually, governments and insurers and other health care payers will pay for bundles of services, covering the complete care cycle.

How soon will value-based health care become reality?

In many leading hospitals and clinics around the world, it already is. Back in 2017, in a guest editorial in the journal HealthManagement.org, Michael E. Porter and Robert S. Kaplan reported that significant progress had already been made on key components of the value-based health care model. They named several institutions in the USA, including MD Anderson Cancer Center, the Cleveland Clinic and the Children's Hospital of Philadelphia, that were already successfully pioneering different aspects of the value-based approach at that time[4].

3 The Economist Intelligence Unit (2018) World Industry Outlook, Healthcare and Pharmaceuticals
4 Porter, M. E. and Kaplan, Robert. S. (2017) 'Value-Based Healthcare in 2017', HealthManagement.org, Healthcare Alliance Special Supplement, Issue 1 2017.

> *42% of the US-based health care executives, clinical leaders and clinicians, think value-based reimbursement models will become the primary revenue model for health care in the USA*

In Europe as well, several hospitals and clinical services are piloting value-based approaches, including a group of six hospitals in the Netherlands that is measuring outcomes for patients with prostate and lung cancer[5]. A report by The Economist Intelligence Unit in 2016 records that "a value-based approach to healthcare delivery characterized by an emphasis on cost-effectiveness and a focus on patient outcomes looks likely to become the dominant trend in European countries."[5] Inevitably, the situation in Europe will be complicated by "different cultures, payment systems and philosophies,"[6] so different countries will adopt the value-based approach at different speeds, in varying ways.

Several global organizations are playing a key role in helping to accelerate and facilitate the adoption of value-based health care models. For instance, the World Economic Forum set up a Value in Healthcare project in 2017 "to clearly identify the foundations that can stimulate and recalibrate health systems towards alignment around value."[7]

In addition, significant progress has been made towards establishing a global set of standards for measuring patient outcomes. As of September 2019, the International Consortium for Healthcare Outcomes Measurement (ICHOM) had developed and published 28 'Standard Sets', covering everything from diabetes and chronic kidney disease to childbirth and dementia[8], paving the way for health care providers to incorporate patient outcomes into their evaluations of the quality of service they deliver.

5 The Economist Intelligence Unit (2016) Value-based healthcare in Europe, Laying the foundation
6 The Economist Intelligence Unit (2015) An introduction to value-based healthcare in Europe
7 World Economic Forum (2017) System Initiative on Shaping the Future of Health and Healthcare. Available at: https://weforum.ent.box.com/v/ValueinHealthcare-2017 (Accessed: 25 September 2019)
8 ICHOM (2019) Standard Sets. Available at: https://www.ichom.org/standard-sets/#about-standard-sets. (Accessed: 25 September 2019)

Likewise, the Organization for Economic Co-operation and Development (OECD) is driving an initiative to support the collection of internationally comparable information about the "outcomes and experiences of health care that matter to people and that help policy makers to make health systems more people-centered.9" Through this project, thirty six member countries worldwide are now moving towards a future in which information on patient outcomes will be available to support the calculation of value in the delivery of health care.

> *IT needs to provide the underlying platform to enable the value-based healthcare approach to function*

Having standardized ways to measure patient outcomes will pave the way for new reimbursement models, based on outcomes. In July 2018, a survey found that 42% of the US-based health care executives, clinical leaders and clinicians who are members of the NEJM (New England Journal of Medicine) Catalyst Insights Council, think value-based reimbursement models will become the primary revenue model for health care in the USA. Whether they are right and the value-based approach will become the primary model – or eventually even the only reimbursement model – cannot be foreseen. However, value-based reimbursement is already becoming one of the reimbursement models used in the USA, so all organizations operating in or with the health care industry must get ready for it.

The value-based health care model is not without its critics. One recently published research paper points out valid concerns about how competition in a value-based health care approach could adversely impact on patients' personal values, the focus on caring, trust in health care professionals and equitable access to care[10]. This suggests that the value-based health care model may yet need to be adapted in implementation to address valid concerns. However, the momentum that has already built up behind the value-based health care movement means that it will, almost inevitably now, play a key role in how the global health care industry evolves.

What role does IT need to play in value-based health care?

Simply put, IT needs to provide the underlying platform to enable the value-based healthcare approach to function. In a presentation to Harvard Business School students in 2014, Michael E. Porter presented IT diagrammatically as the priority action that underpins all the others in his Strategic Agenda.[11] Subsequently, in The Strategy That Will Fix Healthcare, he and Thomas H. Lee wrote that "the right kind of IT system can help the parts of an IPU [Integrated Practice Unit] work with one another, enable measurement and new reimbursement approaches, and tie the parts of a well-structured delivery system together.[12]"

9 OECD (2019) Health Care Quality and Outcomes. Available at: https://www.oecd.org/health/health-systems/health-care-quality-and-outcomes.htm. (Accessed: 26 September 2019)
10 Groenewoud, A. S., Westert, G. P., & Kremer, J. A. M. (2019) Value based competition in health care's ethical drawbacks and the need for a values-driven approach. BMC Health Services Research. Available at: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4081-6. (Accessed: 26 September 2019)
11 Porter, M. E. (2014) Value-Based Health Care Delivery [Presentation] Available at: https://www.youtube.com/watch?v=DRkhppxZzL0. (Accessed: 19 September 2019)
12 Porter, M. E. and Lee, T. H. (2013) The Strategy that will fix health care. Harvard Business Review. Available at: https://hbr.org/2013/10/the-strategy-that-will-fix-health-care. (Accessed: 26 September 2019)

IT systems and infrastructure intended for use in the health care industry will, therefore, need to be designed, specified and implemented to support the delivery of the value-based approach. In particular, the IT industry and IT professionals working in the health care sector will need to make sure that their solutions are suitable for helping health care providers to:

Focus on the patient journey

IT systems and data will need to be better integrated to support the delivery of care for patients as they access different services, across multiple sites and facilities. Doctors' notes, x-rays, test results and other patient information will need to be available to everyone who is assisting in delivering care or treatment for that patient, from his first arrival at A&E to discharge from physiotherapy months later, and at every step along this journey, to improve quality of care and boost efficiency.

Understand how value is delivered

IT will play a fundamental role in enabling hospitals, clinics and health care service providers to capture, interpret, analyze and store data on patient outcomes and the end-to-end cost of delivering care. The architecture of IT systems must be designed to simplify the consolidation and extraction of relevant data and include templates or expert systems to make it easier for medical teams to find data and measure their performance.

Make data accessible to more people

The aspiration is that IT will also begin to break down barriers to accessing data, by introducing common data definitions so that different teams can share information more effectively. Patients' medical records should be accessible to all parties involved in delivering care, while anonymized data on patient outcomes and care delivery costs should be shared widely, globally, to support value improvement initiatives. In Europe, "There is scope for stronger cross-border co-operation to help countries to make more accurate decisions about cost-effectiveness. However this requires better sharing of data.[13]"

13 The Economist Intelligence Unit (2016) Value-based healthcare in Europe, Laying the foundation

What are the main IT challenges?

Without doubt, the current IT landscape in health care will need to evolve significantly to fulfil the new expectations of IT in a value-based health care model. Suppliers of medical IT solutions will need to rethink how their products are used and consider how these IT systems might need to be adapted to become more accessible, interoperable and resilient. At the same time, IT professionals working for hospitals and clinics will need to review their core IT infrastructure to make sure that it is ready to cope with an avalanche of new data, support greater data sharing and deliver high performance.

Some key challenges include:

> *"They will need to take steps to ensure their own solutions meet the new requirements of the industry"*

Breaking down siloes

One of the challenges of the value-based health care approach is that it necessitates strong integration between different, specialized IT applications. Currently, in most health care providers, IT systems are organized in siloes with applications and data linked to a department or service type rather than patient need. Images, for example, are often stored together, in imaging systems, regardless of what disease or ailment they relate to. A new approach to IT will be needed to integrate disparate systems and data sources so patients get the best care at every stage of their treatment, in every department, and value can be measured across the whole care cycle.

Managing huge data volumes

If the move to digital patient records – the Electronic Medical Records system in the USA – has been a challenge, the transition to value-based health care could be even more overwhelming for the health care industry in terms of data storage. The process of collecting data on patient outcomes and measuring value across service areas will inevitably result in terabytes and terabytes more data to manage, maintain and make sense of. Information about cycles of care will also need to be collected in near real-time, so that outcomes and costs can be analyzed at the time, and acted upon promptly to improve value.

Maintaining high availability

As part of the industry's drive to improve patient outcomes while reducing costs, more and more health care providers are beginning to introduce remote technology – such as wearable monitors, smartphone apps and at-home devices. With these remote data collection apps, the data collected needs to be conveyed quickly to the right person, so it is vitally important to ensure that back office systems are available and performing optimally 24/7. If an irregular heartbeat, detected on a patient at home, does not reach the cardiac department due to a failure of a server in a central IT department, a life could be at risk.

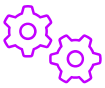
Keeping things simple

In a world in which technology is getting more and more sophisticated every day, one challenge that health care providers will inevitably face is how to avoid unnecessary IT complexity. Hospitals, clinics and other care facilities will need products that are simple to use and flexible to adapt to change. They will need products that need little intervention but that they can depend upon to work, day after day.

Which factors should influence IT investments?

IT professionals who are specifying and purchasing new IT equipment and systems for use in the health care industry will need to ensure that any new investments they make today are capable of supporting the movement towards value-based health care. Specifically, they will need to pay close attention to the four factors below, all of which have heightened importance for organizations aiming to achieve improved cost efficiency and better outcomes for patients.

Vendors of medical imaging, PACS and other systems for the health care sector will also need to be aware of the demands of the value-based health care model. They will need to take steps to ensure their own solutions meet the new requirements of the industry, delivering the interoperability, scalability, reliability and value for money that their customers need.



Interoperability

All IT systems in health care organizations must be capable of being integrated with other systems, to enable data to be shared more easily by clinicians and to allow data from different departments to be consolidated as part of value calculations across entire cycles of care. To facilitate better integration, many organizations will need to strengthen their core IT infrastructure and use load balancers as a bridge between different legacy systems, specialized applications, departmental systems and partner organizations.

Scalability

To respond to predicted increases in data volumes, IT professionals will need to ensure that their IT systems and infrastructure offer as much scalability as possible. The use of load balancers will enable health care providers to balance increased data loads over more servers and scale up easily on demand. IT professionals should seek out products with no license-based restrictions on bandwidth, allowing them to scale up their services quickly on demand in the future, if new medical solutions based on artificial intelligence and remote monitoring lead to sudden escalations in application traffic.

Reliability

The reliability of IT systems has always been a paramount consideration in the health care industry and this will not change. IT professionals must continue to look for products that offer exceptionally high availability to give clinicians access to electronic medical records, medical imaging and other patient data 24/7. The best products for health care will always be those backed up with confident Service Level Agreements (SLAs) and a strong record for responsive support.

Value for money

In the new health care model, where value is the central goal, minimizing the cost of IT investments will remain a key requirement. IT professionals will need to evaluate their actual requirements and avoid paying inflated sums for products that offer additional functionality, that isn't needed and won't contribute to the delivery of improved outcomes for patients. Lower-priced solutions, with the right functionality, will offer better value than more expensive products packed with features that will never be used.

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