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WHITE PAPER

Convergence of Health and Pharma

The whole is greater than the sum of the parts.

Traditionally, the healthcare and pharmaceutical industries have followed a conventional supplier-consumer relationship. However, both industries face the same core challenge to deliver better health outcomes at lower cost. This paper discusses challenges faced by the two sectors, their close association, and the need for them to converge to find common, workable solutions that would benefit both. This is part of a series of white papers on key aspects affecting the move toward an Enlightened Healthcare Ecosystem. The other two papers focus on *Healthcare Challenges and Trends* and the need for *Innovation in Health IT*.

INTRODUCTION

As the biggest industry sector in most European countries, healthcare already represents a huge chunk of the gross domestic product (GDP). The European Commission predicts that healthcare spending will rise by 2 percent of GDP by 2050. This growth will create significant issues for employment and opportunities to grow businesses and economies in general.

Globally, all health economies face similar challenges in terms of rising costs, clinician shortages and demographic shifts, as well as quality, access and safety issues. Additionally, new consumer technologies promoting greater patient power are creating fresh challenges and opportunities.

Government financial incentives and regulations will make automation in healthcare practices a must. There is also an increasing need for hospitals to achieve cost efficiencies and provide evidence of effective use of information technology in healthcare practices.

Action is required at all levels to change the way healthcare is delivered, and how it uses IT. New health IT systems must offer: software that supports the core medical processes, hardware that allows easy access to information at the point of care, and standards that make it easier to integrate different systems.

The ability of governments to pay for healthcare is a continuing challenge. This also presents one of the biggest challenges to the pharmaceuticals industry, as cost containment measures likely will be needed to respond to new policies, such as for drug reimbursement.

While traditionally the healthcare and pharmaceutical industries have followed a conventional supplier-consumer relationship, both industries face the same core challenge to deliver better health outcomes at lower cost. This paper discusses the challenges faced by each sector, the close association between the two, and the need for health and pharma come together to find common, workable solutions that would benefit both.

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HEALTHCARE-SPECIFIC CHALLENGES

Among the significant challenges facing the healthcare industry are:

- **Costs**: Macroeconomic factors like aging populations or insufficient public funding are challenging both receivers and providers of healthcare.
- **Resources:** Even as demand increases, there is a global shortage of clinicians, both doctors and nurses.
- **Demographics**: In the face of unprecedented shifts (aging populations, low birth rates, changing family structures and migration), policies must be reviewed and adapted to ensure sustainable public finances for pensions, healthcare and long-term care. Notable in the EU is the rather steady increase in life expectancy without a parallel increase in healthier lifestyles. Some countries—particularly Nordic countries, but also Austria, France, Germany and the UK—have moved toward a long-term view on healthcare, focusing on illness prevention and community care. Such emphasis suggests that efforts to tackle obesity, etc., will have their economic benefits in the long run.
- **Access**: As demand and spending increase, health economies increasingly need to balance ease of access to their services against the cost of operating smaller hospitals.
- **Quality**: Quality of care is increasingly important as patients begin to exercise their right to choose how and with whom they engage for their healthcare, and demand transparency of data and care processes. Patient safety is the major focus of patient advocacy groups and healthcare leaders.
- **Patient centricity**: To address the needs of the expert patient, and to start the transition of healthcare to a demand-driven model, some of the world's leading hospitals are placing the patient firmly at the center of everything they do.

PHARMA-SPECIFIC CHALLENGES

Pharma 1.0, the traditional business model that relies on high-value blockbuster drugs, is coming to an end. IMS Health forecasts a maximum CAGR of 6 percent[1], some way below the usual level. It is a time when blockbuster drugs are few and far between, and generics are competing for a greater share of the market. What does all this imply for Pharma?

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Demonstrating benefits and cost-effectiveness is in demand

The cost of developing new drugs is increasing. From the scientifically intense discovery of new compounds, early stage development and pre-license clinical trials, to data capture, submission to regulatory bodies and even late stage development—every related activity is proving more expensive. To add to the pressure, regulatory bodies insist on "seeing" the benefits and cost-effectiveness, more than ever.

Reducing spend at the national level is in focus

Health economies and insurance companies, themselves under financial pressure, are driving cost savings in their drugs bills. Faced with budget pressures and evidence of cost inefficiency, all OECD countries have introduced healthcare reforms or are planning to do so in the near future. While the direction of reforms has not always been the same in all countries, these reforms aim to provide better means of dealing with such issues as the evaluation of new technologies, aging populations, pharmaceuticals and cost-sharing by health consumers.

With continued growth in other components of health spending, pharmaceutical reforms are directed at restraining overall spending. Pharmaceutical products are restricted through the use of "negative" and "positive" lists. Prices or profits in this sector have been tightly controlled, incentives to use cheaper generic products have increased, and attempts have been made to change the prescribing practices of doctors (e.g. peer comparisons).

Pipeline assets are under scrutiny, seeking to address unmet needs.

What are the assets in the pipeline and how are they faring? Pharmaceutical companies are taking a close look at these assets with a critical eye. They are also looking at the decreasing productivity of research and development. All are arriving at the same conclusion: only by building an ecosystem based on collaboration with competitors, the healthcare provider community, and an increasingly well-informed society, can they continue to drive good returns for their shareholders.

Ernst & Young has called the new era "Pharma 3.0, the health outcome ecosystem."[2] To reach it, pharmaceutical companies need advanced capabilities to:

- Connect and share information for competitive advantage; information is the currency of Pharma 3.0
- Drive business model innovation through radical collaboration
- Operate multiple business models.

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1 IMS Institute for Healthcare Informatics Global Use of Medicines Outlook through 2016

2 Ernst & Young. Progressions: Building Pharma 3.0. Global pharmaceutical industry report 2011.

WHY CONVERGE?

Traditionally, the healthcare and pharmaceutical industries have followed a conventional, supplier-consumer relationship. However, both industries face the same core challenge: how to deliver better health outcomes at lower cost.

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At the drug discovery level

Working together on pre-license activities: the sensible way forward

Pharmaceutical organizations want to understand the causes of diseases and to develop compounds that can be tested in the lab for their effectiveness in treating a disease. Once these targets are identified by the research and development team, they are usually passed to a team responsible for turning these targets into medicines that can be submitted for clinical trials. Once the complex clinical trials process is completed, the medicines can be submitted for regulatory approval, and if granted, sold to healthcare providers. End to end, this process of discovering and developing a new molecular entity (NME) takes in average 13.5 years, and (capitalized) costs of $1.8 billion.[3] The number of targets that hit the market as medicines is a small percentage that is fast diminishing.

During target identification, scientists work to understand the cause of disease by looking at pathways, for example, of how the disease begins and spreads. They investigate gene expression, the process by which information from a gene is used in the synthesis of a functional gene product. They also investigate protein mechanisms and many other highly complex aspects of the causes of disease. Advances in genomics (the study of genes and their functions), proteomics (the large-scale study of proteins) and protein modeling are transforming the discovery process. At the same time, the sheer volume and structure of the data is challenging the leaders in the field to develop shared ontologies (structured hierarchies of knowledge) to express the meaning of the data.

It is in this area of intensive scientific research that collaboration and transformative partnerships between the pharmaceutical companies themselves can take place. A common ontology allows a shared understanding of the semantics of the original data. The cloud offers to host large volumes of complex data in collaborative platforms and at relatively low cost.

At the end of the discovery process, the object is to turn target compounds into medicines. This is a costly part of the process, and the later a target falls out of the process, the greater the loss incurred by the company. It is therefore vital that those medicines entering the later-stage clinical trials, with live patients, are targeted at a narrow, highly specific cohort — a group of persons with a common characteristic, set of characteristics or exposure that is followed for the incidence of new diseases or events.

Post-marketing surveillance and translational research

All drugs have to be monitored even after they are licensed. Now it is slow, uncertain and expensive. In addition, while it may not be traditionally included in pharma R&D phases, it is evident that phase V of translational analysis and evaluation is increasing in importance for both society and the pharma industry.

Access to adverse reaction reporting in primary and secondary care can be made automatic, continuous and accurate. These streams of rich information also provide an opportunity to analyze the effectiveness that compounds currently in the market may have for other diseases. With data already in electronic form we can easily do it.

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[3] Paul SM, Mytelka DS, Dunwiddie CT. How to improve R&D productivity: the pharmaceutical industry's grand challenge. *Nature Reviews Drug Discovery,* (March 2010); 9: 203-214

Obviously those results will not be enough for officials to justify a claim for new indication, but it can tell us, where to look, and how. Many older drugs may have uses about which we are not at all aware of. An extension in indication of an “old” drug would be an optimal scenario for patients, healthcare and pharma since that way it would get a new “life” without the need to undertake costly studies for safety.

Effective drugs coming to market sooner, and at lower cost, would benefit everyone.

At the patient level

Fidelity of patient cohorts – needs everyone to be involved

Effective drugs coming to market sooner, and at lower cost, would benefit everyone. Healthcare providers are therefore keen to ensure the patients enrolled onto clinical trials are the best possible candidates for the drug under test.

Healthcare providers have a wealth of information within their “walls” that could help pharmaceutical companies improve the fidelity of their patient cohorts for trials. More often than before, academic hospitals are carrying out genetic sequencing for their own research purposes, using the latest machines from Illumina and others. Many health authorities have substantial, longitudinal patient records collected over years. These may include records for members of the same family. Finally, some organizations are starting to collect phenotype (or lifestyle) data as part of various Citizen Scientist initiatives. This treasure trove of information presents a great opportunity to improve the quality of the cohort of patients invited onto clinical trials, and bring effective drugs to market quicker and more efficiently.

During clinical trials, issues associated with compliance management are common: patients may stop taking the medicines. It could be because they feel the drug does not have a positive effect on their condition, they experience side-effects or they simply lose interest. Advances in mobile technology provide the industry interesting ways to address such issues. For example, there are multiple solutions for smart packaging that inform people managing the trials when a patient has opened a blister pack and retrieved a pill or a syringe. There are smart pills that can even communicate when they have been swallowed. There are a growing number of smart devices that can monitor physiological signs as evidence of compliance and monitor adverse side-effects if they should appear. It is this latter type of development that could see another collaborative model evolving between healthcare and pharma.

A great example of this type of collaboration is in prostate cancer. There is a specific biomarker — a substance used as an indicator of a biological state — for this cancer type (PCADM-1, present in urine). In fact, several companies have already developed near-field capable devices to measure the level of the biomarker. Such real-time monitoring of the progress of disease when being targeted by a new drug is of immense value to the healthcare provider, the pharmaceutical company and to the patient.

It is arguable that a patient witnessing a real-time reduction in the biomarker levels would continue with the treatment, thus assuring compliance with the trial and providing accurate and the most current information for all stakeholders. Suppose this was combined with a real-time monitoring solution for previously identified adverse side-effects like raised blood pressure levels or increased heart rate. We would then be able to identify safety issues before a patient approaches his or her healthcare provider.

Close collaboration between healthcare providers and pharma for cohort identification and compliance management will dramatically improve the efficiency of the regulatory process.

CGI CAN HELP

Within this paper, we have highlighted the challenges facing the medical and pharmaceutical communities, as well as the huge opportunities that inevitably are born of necessity. There is opportunity for everyone involved in the process – pharma companies, healthcare providers, patients, and IT solution providers.

CGI and our partner ecosystems look forward to supporting the academic medical community and pharmaceutical industries in moving toward a more holistic approach to patient care. As an example, our leading Machine2Machine platform provides a secure solution for managing remote monitoring information, regardless of whether wireless or wired networks or devices are used. Such a platform could support the convergence of real-time monitoring of the progress of a disease and real-time monitoring for previously identified adverse drug treatment side-effects.

As a major supplier to health systems integration and business services, we have considerable experience in developing and integrating innovative business, clinical and IT solutions for pharma and life sciences as well as patient-centric care management, electronic medical records, healthcare administration, health information exchange, health analytics, enterprise content management, military health, public health and translational research.

We welcome the chance to be a part of a new enlightenment for each player in the healthcare ecosystem, from governments to enterprises to individuals.

ABOUT CGI

At CGI, we're in the business of satisfying clients by helping them succeed. Since our founding in 1976, we've operated upon the principles of sharing in clients' challenges and delivering quality services to address them. As the world's fifth largest IT and BPS provider, CGI has a strong base of 68,000 professionals operating in more than 400 offices worldwide. Through these offices, we offer local partnerships and a balanced blend of global delivery options to ensure clients receive the optimal combination of value and expertise required for their success. We define success by helping our clients achieve superior performance and gain competitive advantage.