

Manuela Müller-Gerndt

Daten – Diagnosen – Dialog

Neue e-Health Geschäftsmodelle

FU Berlin, 12. März 2013



Der Healthcare-Bereich ist ein Schlüsselsegment für IBM

Über 6,000 Healthcare-Mitarbeiter rund um die Welt

- Bewährte Kompetenzen in Beratung, Entwicklung, Umsetzung und Betrieb für unsere Kunden im Gesundheitswesen

Know How zu Services, Hardware und Software

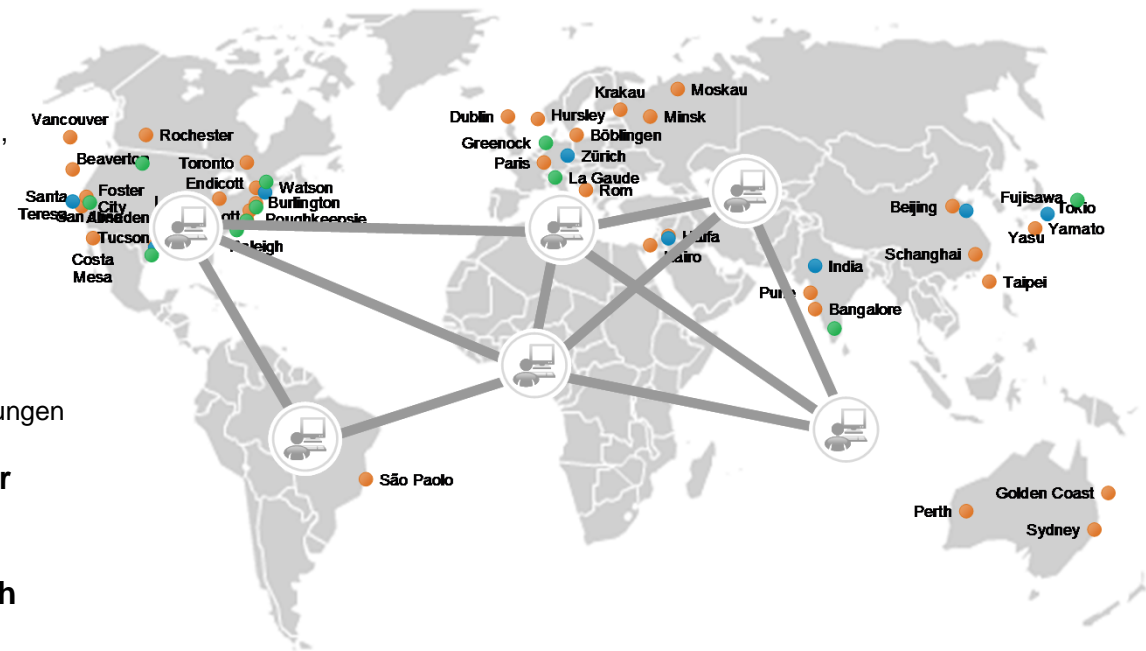
- Zugang zu Tausenden von branchenübergreifenden Ressourcen
- Sichere, skalierbare, effiziente und flexible IT-Lösungen

Healthcare-Kunden und Business Partner in allen Regionen der Welt

\$ 100M Investition in Healthcare Research

- 100 Forscher in 9 Zentren
- Zusammenarbeit mit Universitäten und Firmen
- Beschäftigung von Medizinern und Wissenschaftlern

Aktive Mitgliedschaft / Vorsitz von wichtigen Standards- & Branchenorganisationen:



- Grundlagenforschung
- Hardware-Entwicklung
- Software-Entwicklung

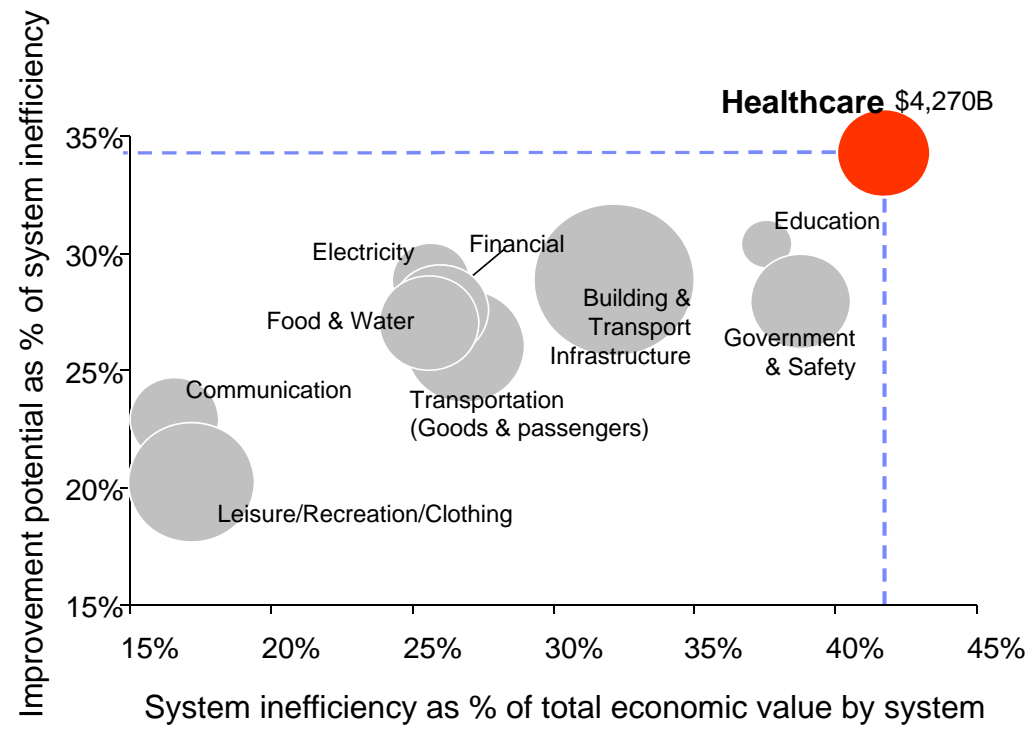


Evidence is mounting that the global healthcare system is increasingly challenged by entrenched inefficiencies

- **Healthcare** is the largest contributor to “system of systems” inefficiency, wasting over 2 trillion USD per year¹
- Economists estimate that the current level of **healthcare inefficiency could be reduced by nearly 35%**
- The integration between the various systems extends and amplifies the impact of idiosyncratic **inefficiencies**
- These inefficiencies were attributed to several factors, including the **ineffective gathering, sharing, and use of information**

Efficiency Analysis of the System-of-systems

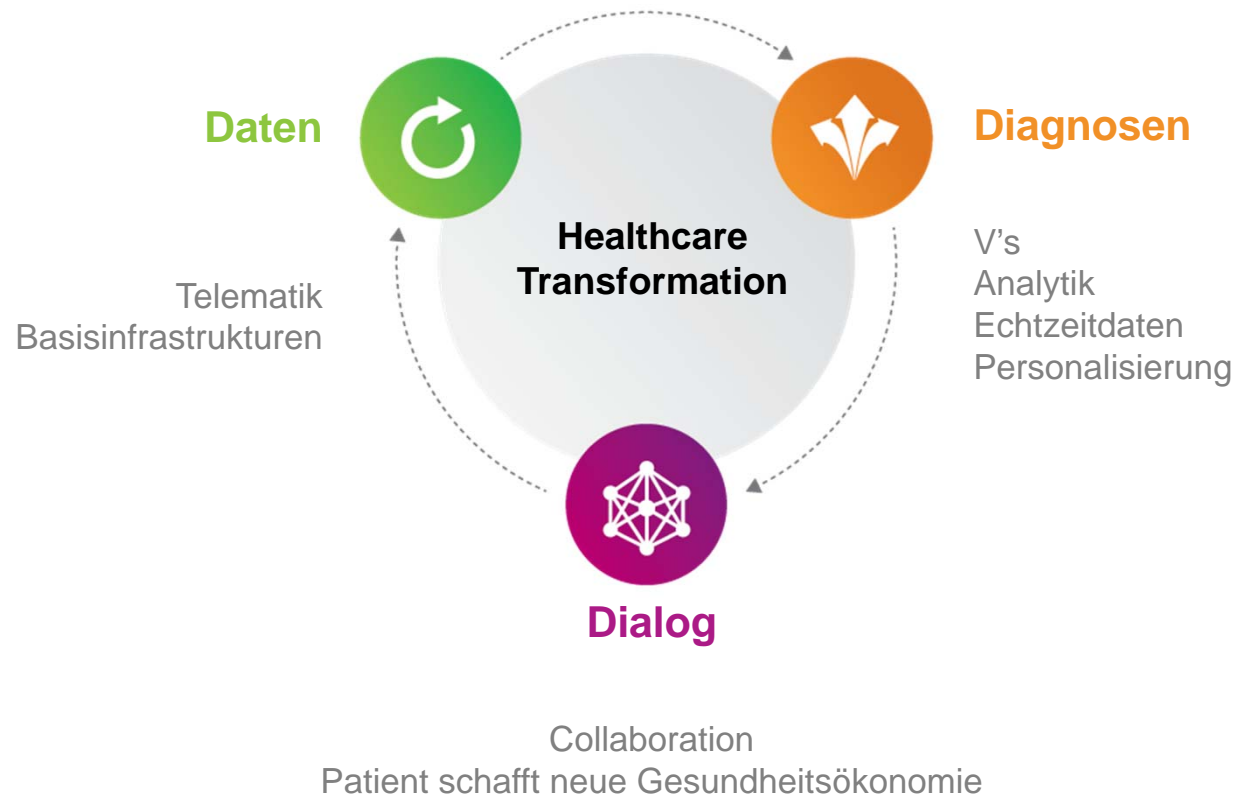
Size of the bubble indicates absolute value of the system (USD Billion)



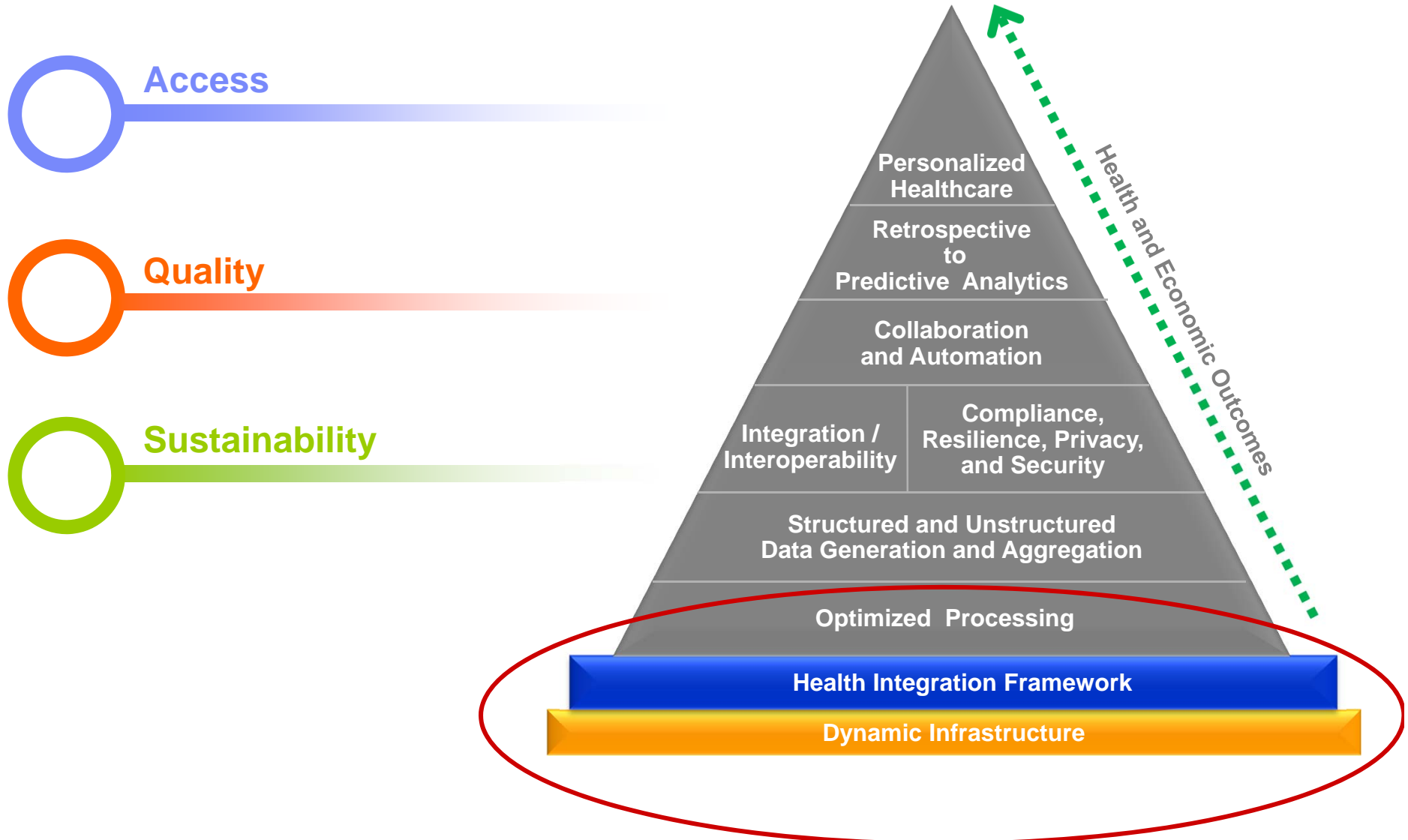
"The problem lies not in technology, but in a lack of common objectives and an incomplete understanding of the importance of efficiencies in the planet's system, a united long-term view and a system for global optimization." – Economist, Asia Pacific

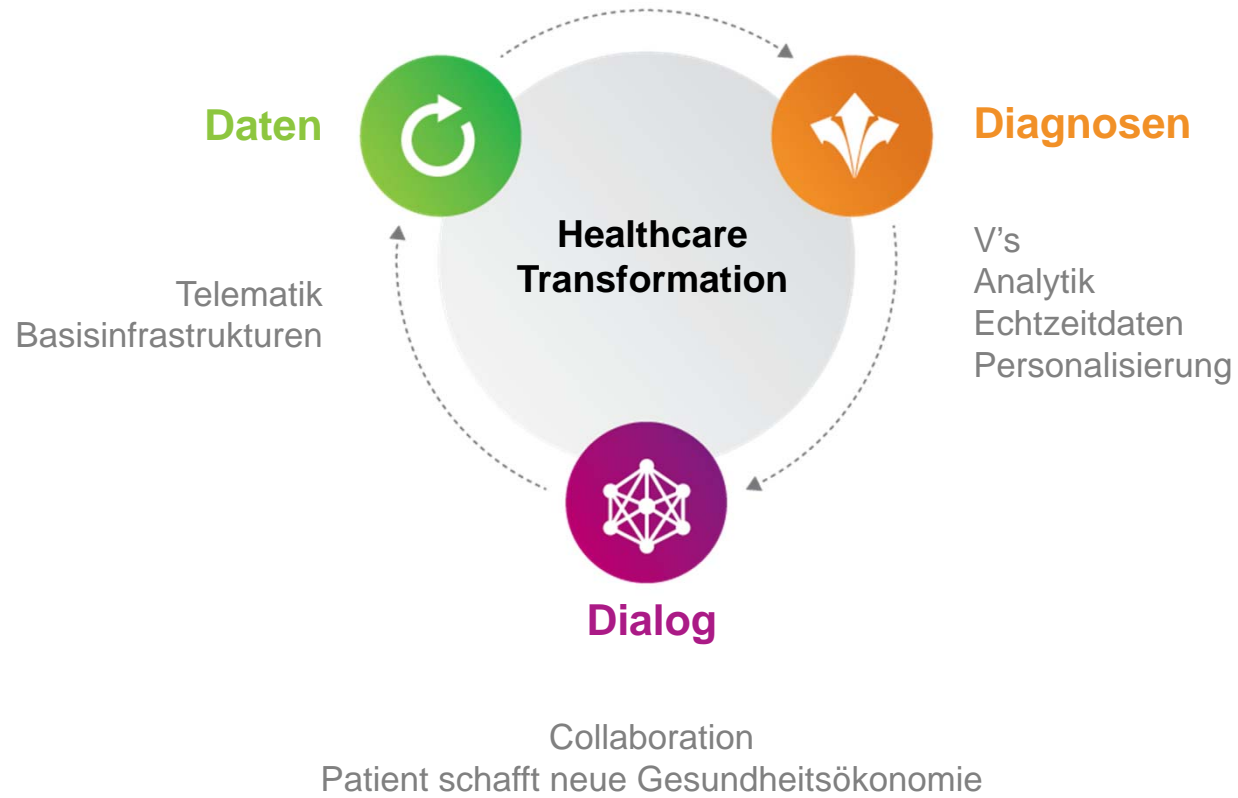
Sources: IBM Institute for Business Value "The world's 4 trillion dollar challenge", January 2010

1) IBM Institute for Business Value analysis based on 2009 survey of 518 economists.



We apply our systems and solution focus to help you transform and realize business value





Die Zukunft der Transformationen im Gesundheitsmarkt wird datenzentriert sein

Ray Campbell, Exec Dir, CEO Mass. Health Data Consortium.

Was bedeutet Big Data für Healthcare?

Volumen

26 Millionen

Einzigartige Moleküle in der ChemSpider Datenbank, von 400+ Quellen

Velocity

1,000/sec

Vitalparameter werden in Echtzeit von medizintechnischen Geräten gespeichert

Variety

80%

Unstrukturierte Daten in Patientenakten, Geräten, Publikationen, Wirkstoffstrukturen...

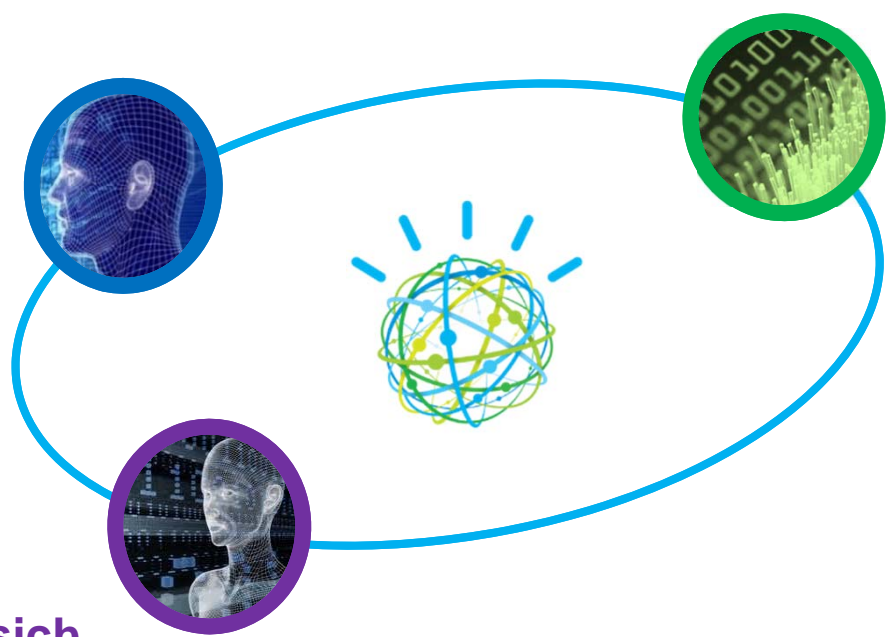
Medizinische Forschungsdaten liegen in riesigen Datenbanken brach, das medizinische Wissen verdoppelt sich alle fünf Jahre, ein Arzt müsste täglich ca. 300 Seiten lesen um auf dem aktuellen Wissensstand zu sein.

Real-time Datenanalyse unterschiedlicher Daten und Bilder wird die Rolle der Monitoring Geräte zugunsten intelligenterer Systeme verändern

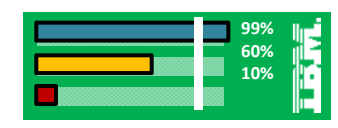
Eine Vielfalt von Daten sind in der Medizin derzeit unstrukturiert - Arztbriefe, medizinische Informationen, Gesundheitsreports, Social Media und Web Inhalte

Technologische Basis von IBM Watson

1 **Verständnis**
von natürlicher
menschlicher
Sprache



2 **Findet und bewertet**
Hypothesen um
Antworten zu liefern



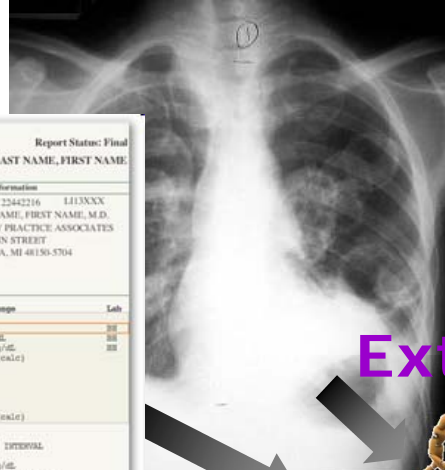
3 **Lernt und**
verbessert sich
ständig über
Feedback und
neue Daten

*Interdisziplinär und holistisch Wissen verfügbar machen
durch systematisches Auswerten von Informationen*

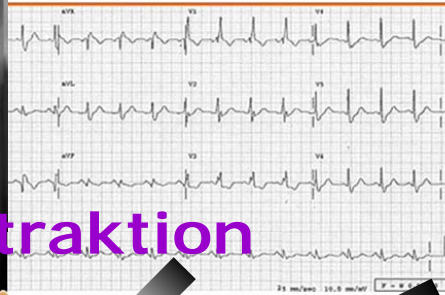


Datenarten im Kontext

Radiologie



EKGs



Patientenakten

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</entry>
</RegionOfInterest>
</entry>
</section>
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Med. Literatur

Shape-based Similarity Retrieval of Doppler Images for Clinical Decision Support

T. Syeda-Mahmoud, D. Byvoni, J. Wang
A. Amir, H. Greenupak, Publ
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Abstract

Flow Doppler imaging has become an integral part of the cardiovascular exam. Automated interpretation of flow Doppler imaging has not been reported in literature. This paper describes a shape-based similarity retrieval system for Doppler images. In this paper we explore the shape patterns in Doppler images to help the similarity in retrieval. We propose a shape-based similarity retrieval system support. Specifically, we model the similarity in appearance of Doppler images from the same disease class as a continuous wavelet transform modulus of the velocity envelope contained in these images. The shape similarity between two Doppler images is characterized by measuring the alignment correlation using a variety of dynamic shape matching. Results of similarity retrieval of Doppler images for cardiac decision support on a large database of images are presented.

1. Introduction

With more and more medical records now containing multimodal imaging data, an exciting application of image and video retrieval is emerging in the area of clinical decision support. Cardiovascular, in particular, routinely use multiple imaging modalities including X-ray imaging, ultrasonography, and CT imaging for their diagnosis making. However, their diagnostic methodology is still largely sample guided in that only the data from the given patient is used along with their own knowledge to make decisions. It is often hard to extract knowledge from similar patients to enable related decision making for physicians. For example, using similar case data, physician can validate their current hypothesis. Further, by examining the associated therapies with the similar patient cases retrieved, they can check for any overlooked possibilities or diseases in

Labor Reports

Patient Information		Specimen Information	Client Information
LAST NAME, FIRST NAME		Specimen: 123456789	Client F: 22442216
DOB: 03/01/1952 Age: 56		Requisition: 1234567	LAST NAME, FIRST NAME, M.D.
Gender: M Marital: Single		Collected: 08/28/2008 / 11:00 EDT	FAMILY PRACTICE ASSOCIATES
Phone: 800-555-1212		Received: 08/28/2008 / 18:11 EDT	123 MAIN STREET
Patient ID: 12345		Reported: 08/29/2008 / 14:12 EDT	LIVONIA, MI 48150-5704

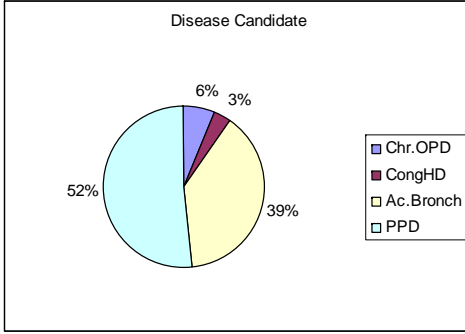
Test Name	In Range	Out Of Range	Reference Range	Lab
LIPID PANEL				
TRIGLYCERIDES		185 H	<150 mg/dL	BB
CHOLESTEROL, TOTAL	139		125-200 mg/dL	BB
HDL CHOLESTEROL		30 L	> 40 mg/dL	BB
LDL CHOLESTEROL	72		<130 mg/dL (calc)	BB
DESIRABLE RANGE <100 mg/dL FOR PATIENTS WITH CHD OR CHANGING AND <70 mg/dL FOR ASYMPTOMATIC PATIENTS WITH KNOWN HEART DISEASE.				
CHOL/HDL RATIO	4.5		< 5.0 (calc)	
BASIC METABOLIC PANEL				
GLUCOSE		112 H	65-99 mg/dL	
UREA NITROGEN (BUN)	23		7-25 mg/dL	
CREATININE	1.27		0.50-1.30 mg/dL	
SGPT (ALT)	40		> 40 IU/L (1.75u)	
SGP (ALP)	40		> 40 IU/L (1.75u)	

Extraktion

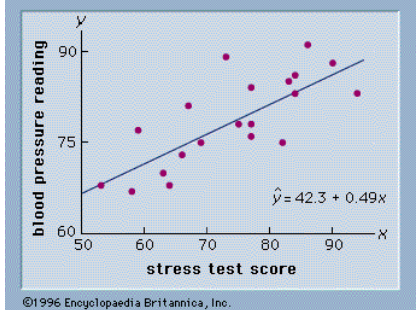


Integration

Statistische Validierung von Diagnosen



Korrelation von Kernindikatoren



Optimierte Therapie



Treatment Options to Consider



WATSON:

Treatment options are listed based on the information available.

Request Pre-auth

Identified Options

<input checked="" type="radio"/>	Treatment plan 1 Systemic Chemo: Cisplatin, Pemetrexed, Bevacizumab	Confidence 95% 	Acceptable match with patient preferences	 EVIDENCE
<input type="radio"/>	Treatment plan 2 Systemic Chemo: Carboplatin, Paclitaxel, Bevacizumab	Confidence 45% 	Unacceptable match with patient preferences	 EVIDENCE
<input type="radio"/>	Treatment plan 3 Systemic Chemo: Erlotinib	Confidence 8% 	Preferred match with patient preferences	 EVIDENCE

Radiation and Surgery are unlikely to be appropriate.

Ask Watson

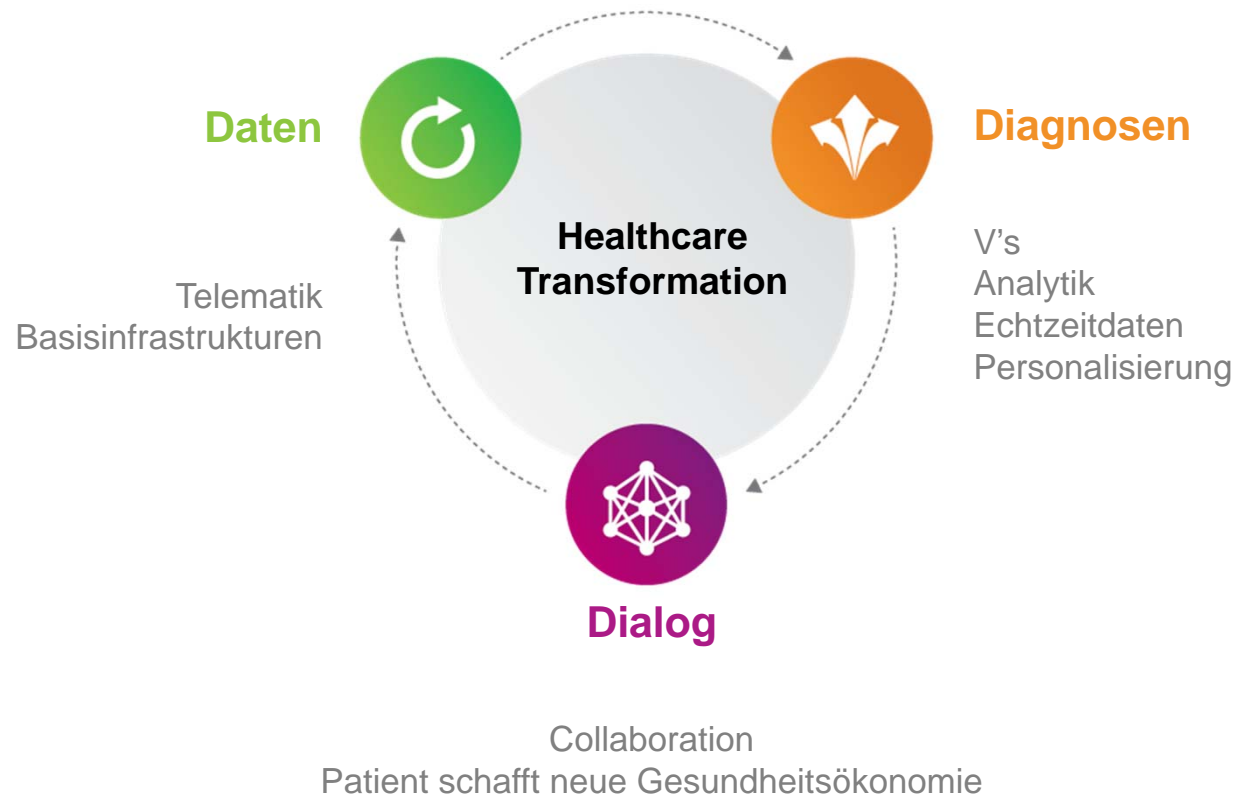


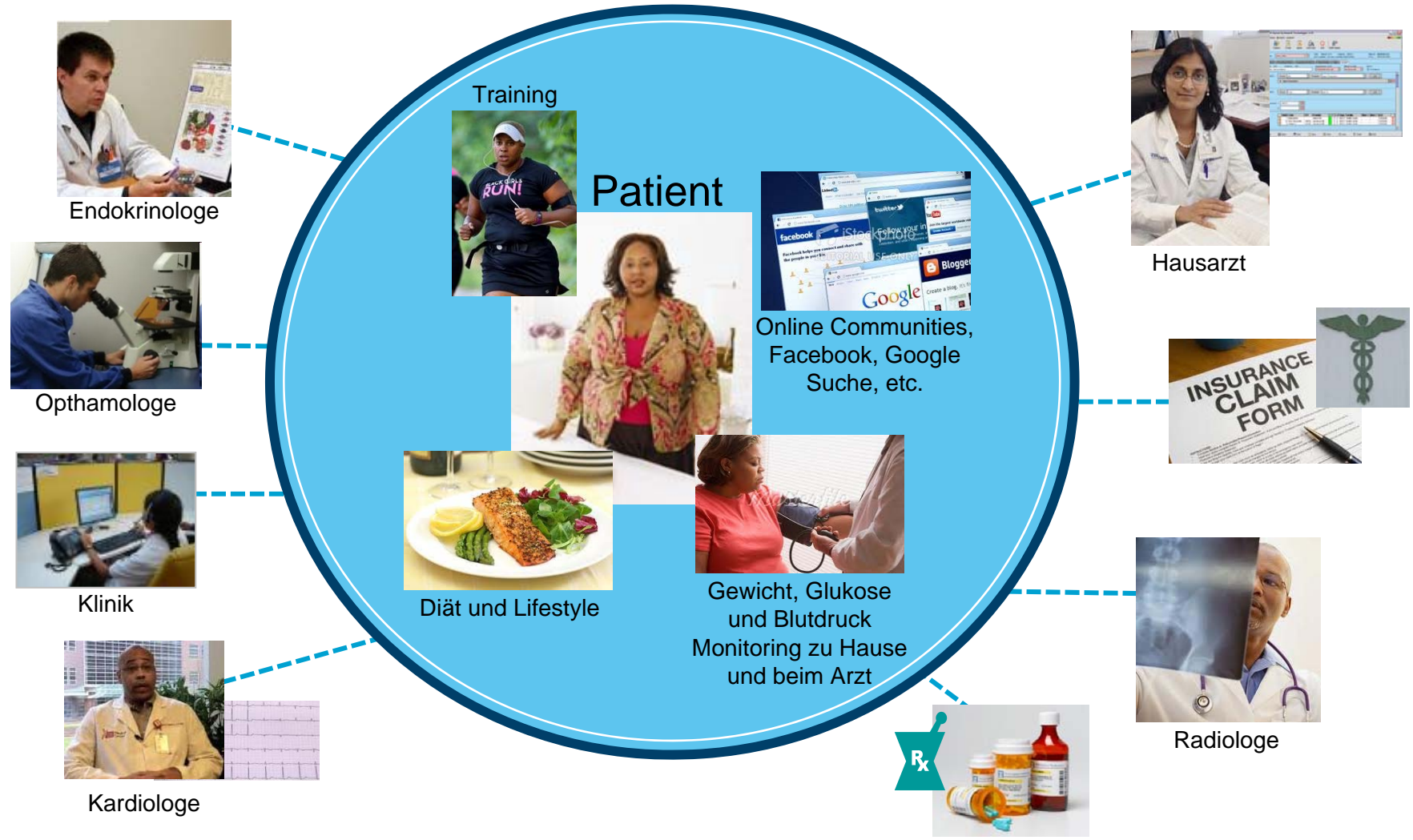
Case Information

Test Options

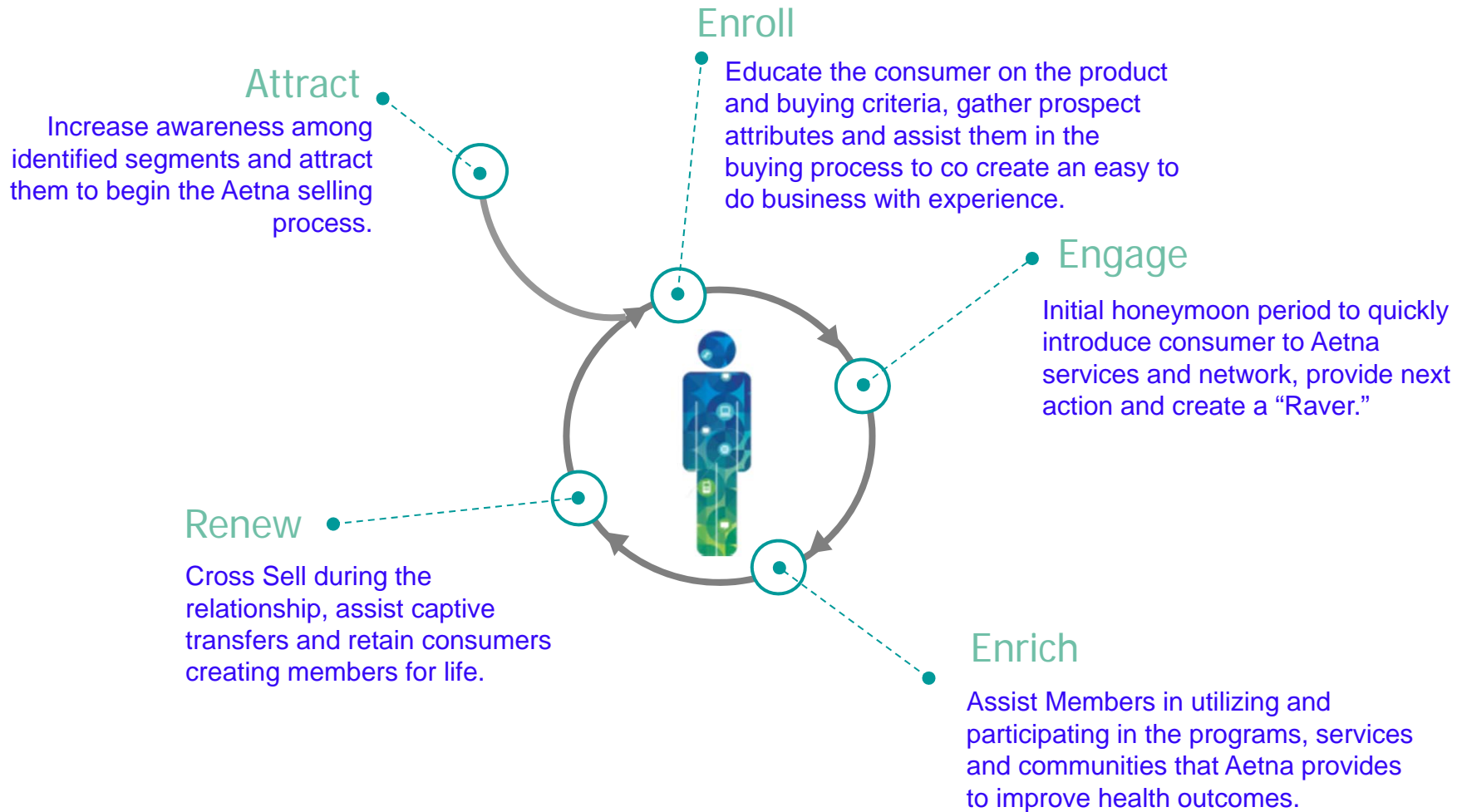
Treatment Options

IBM WATSON

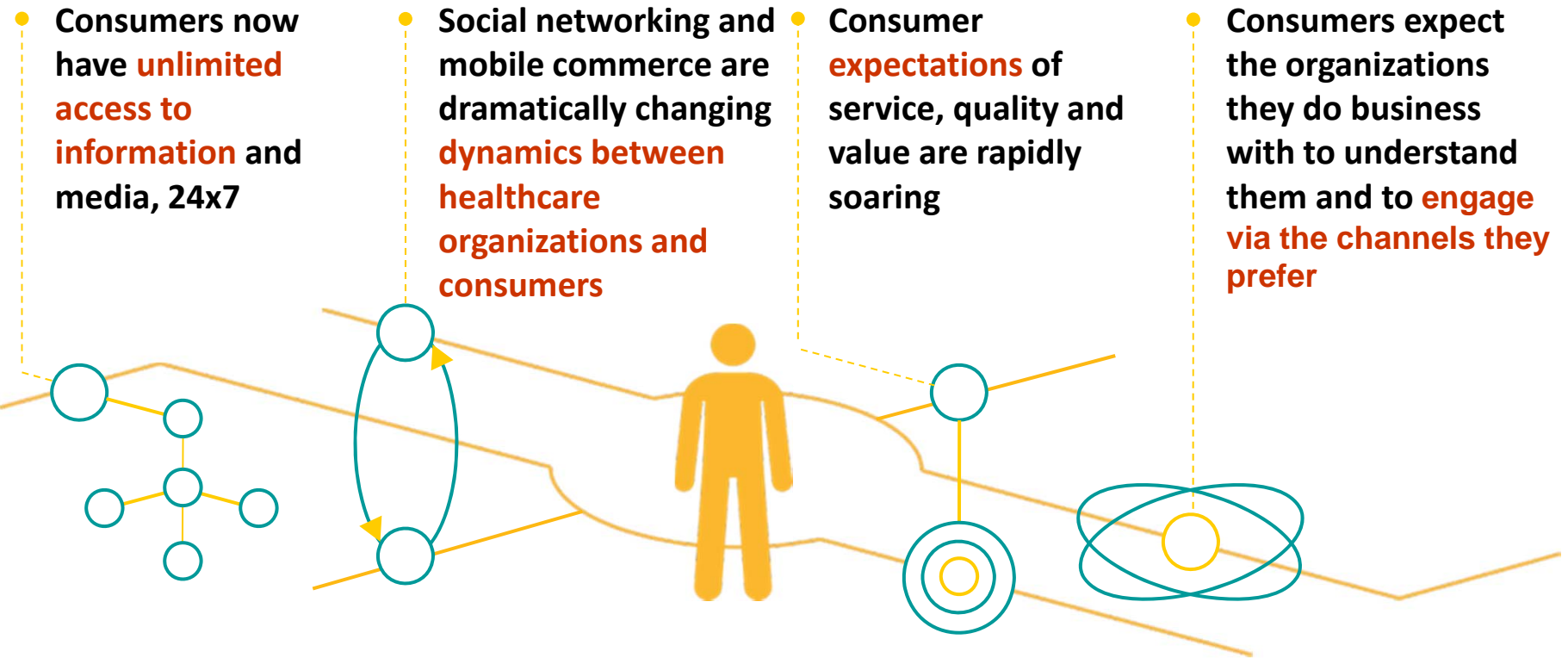




Exceptional consumer experiences is built upon carefully designed and orchestrated consumer engagement lifecycle – Aetna Example



We have entered the age of the: Empowered Health Care Consumer



50 million
Number of consumers entering individual & exchange insurance market by 2017

40%
Percentage decline in group health care coverage by 2017

\$430 billion
Amount annual private healthcare spending will increase by 2015

Personal healthcare analytics?

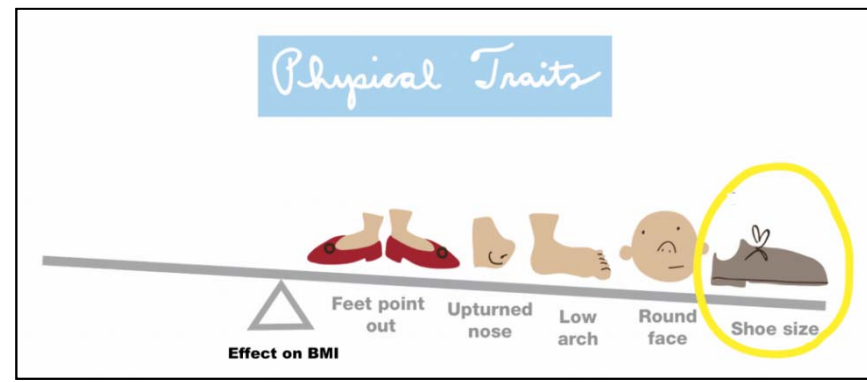


Get your health in order.

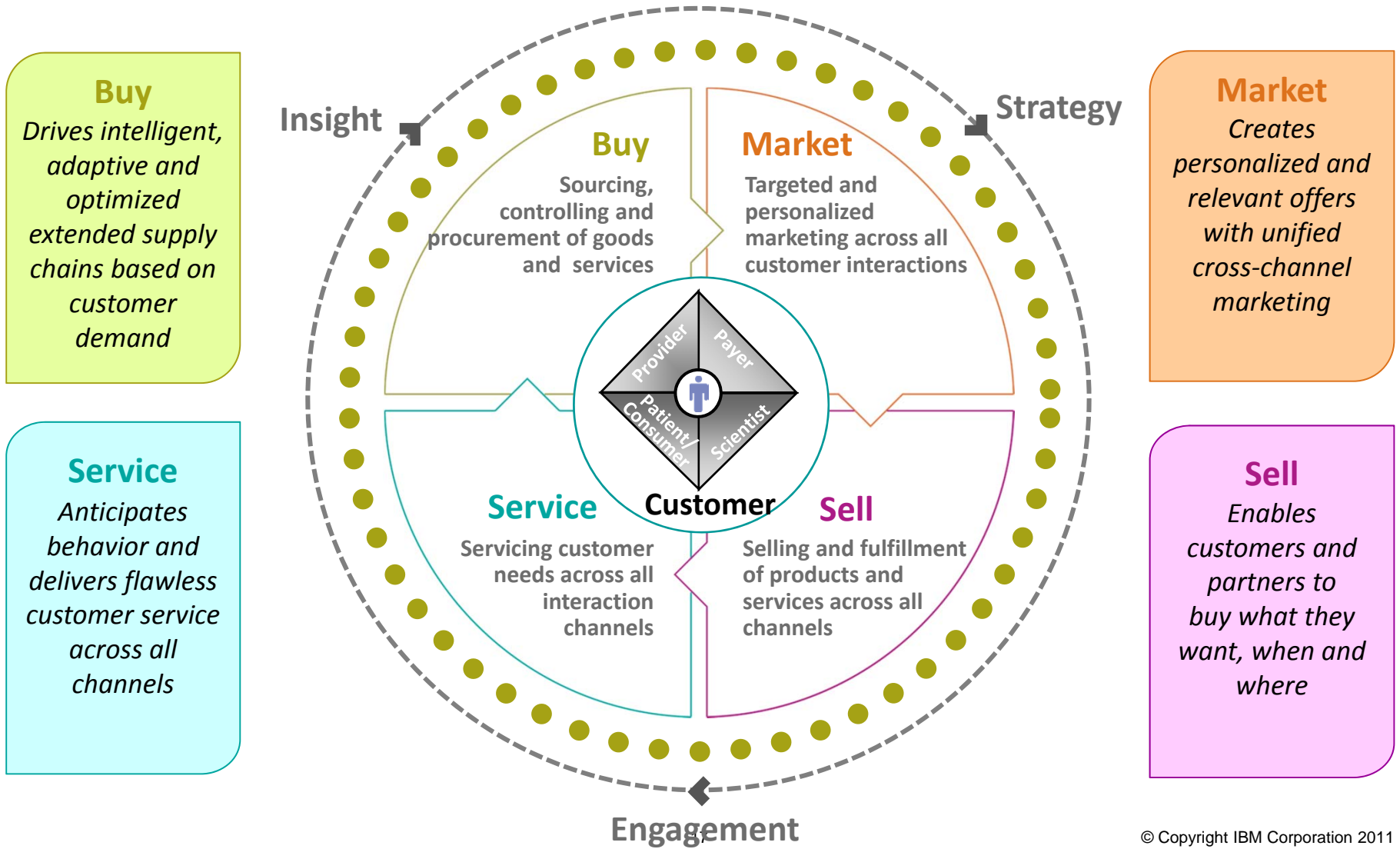
Join Now! (It's free)

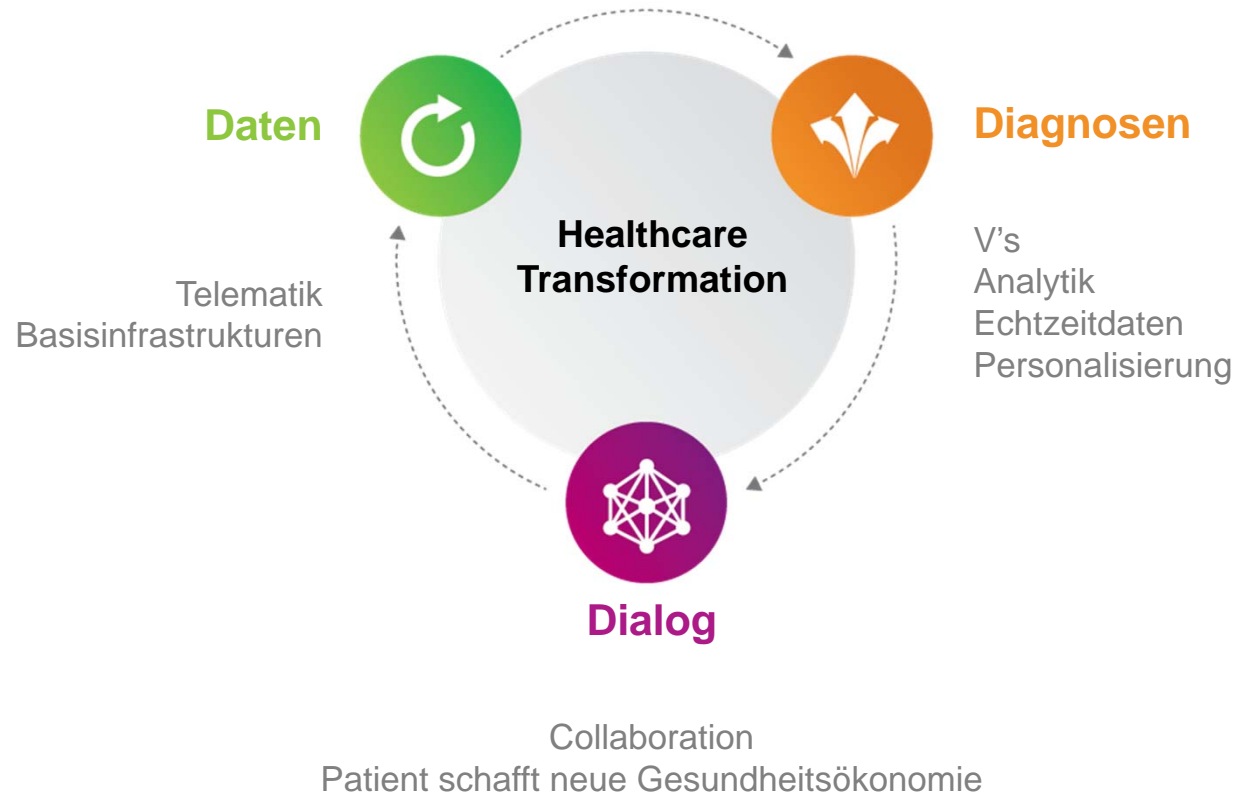
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your profile



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Herzlichen Dank!

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