How Chief Digital Officers Can Boost Digital Transformation

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Conflict of Interest

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have no real or apparent conflicts of interest to report.
Agenda

• Where we are today
• Everything goes digital
• Current roles: CDO, CCIO, CMIO, CNIO, CIO
• The new kid on the block: The Chief Digital Officer
• Examples and outcomes
Learning Objectives

• Explain the role of a CDO in large healthcare organizations
• Discuss the value of CDO - driven transformation projects
• Compare the digital transformation program before and after the CDO assignment
About Charité

- The Charité is Europe’s biggest University Medical Center with ~3000 beds on four main campuses in Berlin
- 17,100 employees - of these, about 4000 Clinicians and 4300 Nurses
- 146,000 inpatient Cases and 694,000 outpatient Cases in 2016
- 1,6 billion € total revenue yearly, 150 million € in third-party funding 200 million € in subsidies for teaching and research
- Charité educates > 7,000 students, 1,300 come from abroad
- Research summary:
  - 5 Projects of Excellence Initiative, 3 as project coordinator
  - 14 Collaborative Research Area, 6 as project coordinator
  - 1 Clinical Research Group (as project coordinator)
  - 5 DFG Research Groups, 3 as project coordinator
  - 3 German Centers for Health Research
Where we are today
1. Political and social determinations of health
   • Covering expenses
   • Financing medical innovations
   • Growing awareness of the population for health and wellness

2. Technological progress: data improves healthcare
   • Digitization is leading to more and more data
   • Genome analysis → new type of data: requires data lifecycle management

3. Patients have increasing service expectations
   • In-time and accurate information (Google / other internet services)
   • State-of-the-art services (e.g. electronic appointment booking)
   • Requirements for interoperability / collaboration
<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Impact</th>
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| 2015     | SHI-Care Reinforcement Act (GKV-VSG)      | • Increase of medical care within rural areas and downsizing overcapacities in congested areas  
• Limitations for transfers of insurance licenses in regions with overcapacities  
• Patient have a right to get a second opinion on selected procedures for economic reasons |
| 2016     | E-Health Act                              | • Implementation of a digital infrastructure with utmost security standards  
• Applications for the electronic health card and support of electronic patient records introduction |
|          | Hospital Structure Act                    | • Establishment of “structure funds” (EUR 0.5bn) in order to improve health care provision  
• Funding program for nurse positions  
• Reinforcement of minimum quantities for selected procedures |
| 2017 / 2018 | European Union General Data Protection Regulation | • Designed to harmonize data privacy laws across Europe  
• Breach of GDPR can be fined up to 4% of annual turnover or €20 Million (whichever is greater)  
• Data Subject Rights, like Breach Notification, Right to access, right to be forgotten, etc. |

(Source: German ministry of health; Deloitte analysis)
### EMRAM Maturity in Germany

<table>
<thead>
<tr>
<th>STAGE</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>7</td>
<td>Complete EMR, Data Analytics to improve care</td>
</tr>
<tr>
<td>6</td>
<td>Physician Documentation (templates), Full CDSS, Closed Loop Medication Administration</td>
</tr>
<tr>
<td>5</td>
<td>Full R-PACS</td>
</tr>
<tr>
<td>4</td>
<td>CPOE; Clinical Decision Support (clinical protocols)</td>
</tr>
<tr>
<td>3</td>
<td>Clinical Documentation, CDSS (error checking)</td>
</tr>
<tr>
<td>2</td>
<td>CDR, Controlled Medical Vocabulary, CDS, HIE Capable</td>
</tr>
<tr>
<td>1</td>
<td>All Three Ancillaries Installed — Lab, Rad, Pharmacy</td>
</tr>
<tr>
<td>0</td>
<td>All Three Ancillaries Not Installed</td>
</tr>
</tbody>
</table>

### EMR Adoption in Europe; mean EMRAM Scores by country:

- **Denmark**: 5.3
- **Netherlands**: 4.5
- **Spain**: 3.6
- **Italy**: 3.0
- **Austria**: 2.9
- **Turkey**: 2.9
- **Germany**: 2.2
- **Europe**: 3.1

(Source: HIMSS, Electronic Medical Records Adoption Model (EMRAM) Score Distribution, Q3 2016)
German Healthcare Provider CIOs

Four Faces of the CIO Role

- **CATALYST**: Instigate innovation through transformational change to business architecture, strategy, operations and technology.
- **TECHNOLOGIST**: Assess technologies and design technical architectures to increase business agility and manage complexity.
- **STRATEGIST**: Partner with the business to align business and IT strategies and maximize the value of technology investments.
- **OPERATOR**: Operate and deliver efficient IT services and solutions to support the business while managing risk and protecting core assets.

(Source: 2016 survey of Germany by Deloitte)
Everything becomes digital

The Digital Transformation
The ‘Digital Push’ lead to rethink Strategy

Emerging

Quantum computing
Virtual Reality
Blockchain, Smart Contracts
Commercial drones
Internet of Things & Sensors
3D printing
Cloud Computing
Social media & Digital platforms
Enterprise systems

Maturing

Human augmentation
Conversational Computing
Artificial Intelligence
Driverless vehicles
Algorithmic automation
Big Data analytics
Mobile endpoint devices & Apps

> 10 yr.

Human augmentation
Brain-computer interfaces
Social robotics
Virtual Assistance
Cognitive Computing
Autonomous things

The ‘Digital Push’ lead to rethink Strategy
Lag of Alignment between Digital Strategy and existing Operating Models

Digital Strategy

What is our winning aspiration?

Where will we play?

How will we win?

What capabilities must be in place?

What management systems are required?

Traditional Technology Operating Model

Business / Users

Business Relationship Management

Plan
Vision and Strategy
Enterprise Architecture

Build
Design & Develop
Test & Deployment

Run
Service Mgmt
Service Operations

Manage & Control
Workforce Mgmt
Finance & Control
Quality & Compliance

Vendor & Contract Management

Vendors / Sourcing partners

- Discrepancy

- Digital Strategy

- Traditional Technology Operating Model
## The 9 Big Shifts

### Ways of working

1. **Agility and speed** become the new norm. Organizations learn and adapt by experimenting and fast deployment.

2. The **boundaries** between business and IT blur, business-led IT increases, and tech fluency is vital for all.

3. The rise of **innovation ecosystems** with joint risk taking, and value creation among quickly engaging and disengaging partners.

### Resources

4. The **workforce** transitions as digital, data, AI, and robotics create new jobs and cause existing jobs to disappear.

5. Organizations adopt the vision, values, culture, and leadership required to build **digital DNA**.

6. Innovation and experimentation require a larger **share of resources**, with fit-for-purpose funding mechanisms.

### Technology

7. **Cloud** becomes the dominant IT delivery model, with highly **automated** IT processes.

8. Competitive advantage shifts in favor of **data and algorithms** fueling algorithmic business.

9. Information technology (IT) and operational technology (OT) **converge**.
Challenging Shift Orchestration

Booster shift: Blurring boundaries

Booster shift: Innovation ecosystems

Showstopper shift: Workforce transition

Showstopper shift: Funding and Governance

Showstopper shift: Digital DNA

Dominant shift: Data, Algorithms, AI

Loosely coupled shift: IT/OT Convergence

Loosely coupled shift: Agility and Speed

Booster shift: Cloud and Automation
Current roles

CDO, CCIO, CMIO, CNIO, CIO
The Chief Medical Information Officer (CMIO) was defined as a senior leader in health information technology focusing on medicine and research. Most CMIOs are practicing physicians with a background or interest in technology. Some CMIOs are technology professionals who have been trained in health informatics, which focuses on the use of information for physicians.

The role of the Chief Nurse Information Officer (CNIO) emerged over the last decade with the realization that leadership is required to bridge the gap between patient care and technology for the largest sector of healthcare workers – an estimated 3 million US nurses.

(Sources: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4817341 and http://hitcomp.org/roles)
The role of the **Chief Clinical Informatics Officer (CCIO)** remains heterogeneous with individuals deriving from a variety of clinical settings and backgrounds. The CCIO was added to the healthcare leadership teams to compliment the CIO.

The term encompasses the more commonly used **Chief Medical Informatics Officer (CMIO)** and **Chief Nursing Informatics Officer (CNIO)** as well as the rarely used **Chief Pharmacy Informatics Officer (CPIO)** and **Chief Dental Informatics Officer (CDIO)**.

(Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4817341)
CIO and CTO

The **Chief Information Officer (CIO)** serves as the **company's top technology infrastructure manager**, he runs the organization's internal IT operations and works to **streamline business processes with technology**. The CIO focuses on internal customers (users and business units).

The **Chief Technology Officer (CTO)** serves as the **company's top technology architect**, he runs the organization's engineering group and uses **technology to enhance the company's product offerings**. The CTO focuses on external customers (buyers).

The Chief Digital Officer (CDO) is the top executive responsible for ensuring that the enterprise's business strategy is optimal, given current and emerging digital realities, opportunities and threats.

The CDO champions the use of information and technology in business model design, and all aspects of the business to create business success. The CDO may also execute on some or all digital initiatives.”

(Source: Gartner, 2013)
The New Kid on the Block:
The Chief Digital Officer
Emphasis of Different Roles

- Administration
- Medical Processes
- Research
- Nursing

Illustrative

- CMIO
- CNIO
- CIO
- CDO
CDOs often focus on:
- Digital initiatives dedicated to customer-facing front-end tools
- Driving digital disruption within their individual business areas

The broader CIO view on digital also includes:
- Agile Processes
- Harmonized Data
- Legacy Modernization
- Machine Learning
- Cloud Based Infrastructures
- Fast adoption of Tech-Trends
- Rolling Tech-Stack Management
- IoT Technology
- Transformation of Skill Sets
- Autonomous Product Teams
- API Economy
- DevOps Procedures
- Advanced Analytics
- Robotics and Process Automation

The CIO Remains Important
Chief Executive Officer
Be the catalysts for the transformation and innovation agenda of the CEO.

Chief Information Officer
Build a complementary team resulting in new organization skills with innovative outputs

Chief Financial Officer
Drive better outcomes to the bottom line. Digital becomes an enabler to save money and drive new revenue.

Chief Nurse Officer
Support the digitalization needs of the largest employee group in a hospital – nurses.

Chief Digital Officer
Drive digital transformation in the entire enterprise
Examples and Outcomes
EMRAM Maturity in Germany

Currently, the Charité is on **HIMSS EMRAM Level ~5** and intend to **move to level 7 until 2024**.

(Source: HIMSS, Electronic Medical Records Adoption Model (EMRAM) Score Distribution, Q3 2016)
Pre-CDO: Initial Position & Findings

1. IT Infrastructure and Operations
   - Infrastructure (e.g. network) partly insufficient
   - Software applications heterogeneous and inadequate user adoption
   - IT-/Project-Panel: huge backlog (> 5800 workdays)

2. People
   - Insufficient education (partially from IT), mostly paper-based material
   - Project management understaffed

3. Clinical IT
   - EMR platform not up to date / only partially used
   - Mobile solution missing (outdated pilot only)
   - Some modules with (too) little use or even not rolled out (medication)

Resulting in significant shortcomings in organization and structure, as well as in an inappropriate IT- and digital strategy

4. IT and Digital Strategy
   - Missing focus on (digital) services for patients
   - Missing strategy for clinical / scientific data management
Fields for Action

- **Platform for Digital Medicine**, e.g. Telemedicine
- **Data Management based on International Standards**, e.g. Platform for Clinical Trials
- **Patient Empowerment**, e.g. Charité App for Patients and Patient Portal
- **Reorganization of IT**, incl. Focus on IT Security (GDPR) and a central Project Management
- **Technical Improvements**, e.g. Enhance Network, Establish Cloud Services for Collaboration
- **Clinical System Enhancements**, e.g. improve EMR adoption and Mobile Solutions
- **Integration Supporting Systems**, e.g. e-Learning, e-Recruitment and Social Media Platforms

In Sum, **104 projects ongoing**

- **Platform Digital Medicine**: #14
- **Data Management**: #21
- **Clinical System Enhancements**: #23
- **Technical Improvements**: #14
- **Reorganization**: #9
- **Patient Empowerment**: #17
- **Supporting Systems**: #6

**In Sum, 104 projects ongoing**
Example #1: Strategy defines Structure

Transform silos to platform!
Example #2: Setup a Digitalization Team

Team 42*

- This is not a separate CDO - Organization
- Instead, a **cross sectional team**:  
  - Project managers
  - Quality managers
  - Relevant department specialist (law, finance)
  - Physicians
  - Nursing staff
  - Scientists

- Periodic meetings → **work on strategic goals**
- Team members directly engaged in **operational work**!

### Example #3: Resources – Staff & Budget

#### Start CDO

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<tbody>
<tr>
<td>FTE in IT</td>
<td>118</td>
<td>126</td>
<td>159</td>
</tr>
<tr>
<td>Staff Budget</td>
<td>10,2m €</td>
<td>11,2m €</td>
<td>13,9m €</td>
</tr>
<tr>
<td>Investment Budget</td>
<td>4,0m €</td>
<td>4,1m €</td>
<td>7,2m €</td>
</tr>
<tr>
<td>Budget for Services and Maintenance</td>
<td>12,4m €</td>
<td>13,2m €</td>
<td>15,4m €</td>
</tr>
<tr>
<td><strong>Total Budget</strong></td>
<td><strong>26,6m €</strong></td>
<td><strong>28,5m €</strong></td>
<td><strong>36,5m €</strong>*</td>
</tr>
</tbody>
</table>

* Which is 2.5% of the total revenue
CDO is effective:

1. Working on a **comprehensive Strategy** – supported by the board!

2. **Addressing organizational issues**: document it - write it down!

3. **Foster structural improvements**: communicate, communicate, communicate!

4. **Cross Sectional Team** is essential

5. **Prioritization** is crucial:
   - “Don’t do everything, but what you do: do it better than others”
   - Overall approach: as **Homogeneous** as possible and as **Heterogeneous** as necessary

6. **Be strategic** and don’t miss operational issues
Questions?

• Your Speakers:

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• Please complete online session evaluation.
The End of the presentation.
Your start into the digital journey?

Have a nice weekend & safe travels!