Anatomy of an Organizational Transformation: A data-driven analysis of 'Drivers of Change' in Healthcare

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Abstract

This paper presents a quantitative framework for analyzing organizational transformation in the healthcare sector. The framework presents a systematic evaluation of the dimension of 'Drivers of Change' with four underlying sub-dimensions. Using Pfizer's transformation trajectory for the period of years 2015 through 2020 as a case study, the paper introduces a weighted scoring model that assesses four sub-dimensions: regulatory changes, technological advancements, market pressures, and crisis events. The framework employs temporal analysis to track the evolution and intersection of these sub-dimensions over time, addressing a significant gap in existing methodologies that primarily rely on qualitative approaches. Understand Pfizer's strategic initiatives through the lens of the proposed framework, the study demonstrates how organizations can quantitatively measure and evaluate transformation efforts consistently over a period. The proposed framework and case study provide healthcare organizations with a structured approach to understand and prioritize transformation drivers, while establishing a foundation for comparative analysis across different organizations, sectors, and timelines. Overall, organizations, industry participants, researchers, and governments stand to gain strategic insight into transformation and drive appropriate policy response in the form of resource allocation, regulation, etc. toward future transformation efforts.

Keywords: Organization Transformation

Introduction

The Context of Organizational Transformation

In today's strategic landscape, organizational transformation has become a fundamental imperative, particularly within sectors characterized by stringent regulatory oversight and rapid technological innovation. Healthcare organizations occupy a unique position in this paradigm. They have to navigate a stream of accelerated and co-mingled technological advancements, evolving regulatory frameworks, intensifying competitive pressures, and unforeseen global crises such as pandemics. These multifaceted challenges necessitate strategic transitions that holistically redefine operational processes, structural frameworks, and stakeholder engagements.

Significance of 'Drivers of Change'

Drivers of Change represent the foundational forces that propel organizational transformation. These drivers encompass a broad spectrum of underlying elements such as regulatory reforms, technological breakthroughs and evolution, market dynamics, and crisis-induced stratagems. Collectively, they shape the trajectory, scope and execution of transformative initiatives. A deeper understanding of these drivers is essential for healthcare organizations to effectively orchestrate strategic transitions, particularly given the sector's reliance on compliance, technological innovation, competitive positioning, and adaptive resilience.

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The Need for Structured Analytical Approaches

Despite the critical role of Drivers of Change, prevailing scholarly and industry analyses predominantly rely on qualitative frameworks, limiting their applicability in comparative and predictive contexts. This methodological gap constrains the ability to:

- Systematically evaluate transformations across temporal and organizational boundaries.
- Discern and classify emergent trends to recalibrate the relative importance of specific drivers.
- Equip decision-makers with actionable intelligence for optimal resource allocation, capability development, and strategic prioritization.

The Healthcare Industry Context and Pfizer Case Study

The healthcare sector, with its intrinsic dependency on data, innovation, and regulatory compliance, serves as an ideal domain for exploring transformative dynamics. Pfizer, a globally recognized leader in healthcare, offers a compelling case study for this analysis, particularly during the period from 2015 to 2020. This timeframe encapsulates pivotal milestones, including the groundbreaking development of the COVID-19 vaccine, the pioneering adoption of mRNA technology, and strategic responses to evolving market and regulatory landscapes. These developments position Pfizer as a prime example of organizational transformation in action.

Problem Statement

The Challenge of Organizational Transformation in Healthcare

Healthcare organizations today operate in a world of great complexity and rapid evolution. In this evolving landscape, the merging of different domains such as regulatory demands, technological innovation, market pressures, and public health crises drives the need for strategic adaptability through sustained transformations over different periods of time. Despite abundant research on transformation, organizations often struggle to:

- Identify and prioritize the most critical Drivers of Change.
- Quantify the impact of these drivers to understand what's important to transformation strategy and inform evidence-based decision-making.
- Navigate transformations that align with both near-term operational goals and long-term strategic imperatives.

Existing methodologies for studying organizational transformation predominantly rely on qualitative analyses or static characterizations, which fail to do the following:

- Capture the temporal dynamics of transformation efforts.
- Provide a framework for assessing changes across different organizations or industries.
- Address the unique challenges posed by the healthcare sector such as compliance, innovation, and crisis management.

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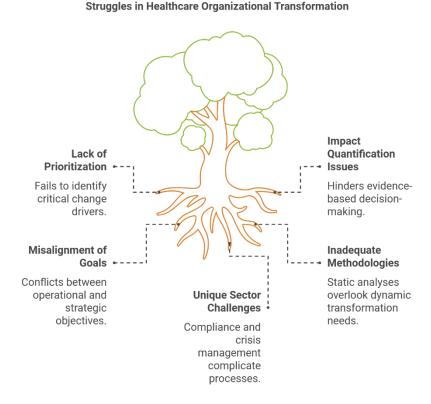


Figure 1: Struggles in Healthcare Organizational Transformation

Quantitative Approaches to observing role of Change

While qualitative analyses dominate the literature on organizational transformation, recent studies advocate for integrating quantitative metrics to enhance the rigor and replicability of insights. Methodologies such as weighted scoring systems, temporal trend analysis, and multi-criteria decision-making frameworks towards drivers of change are missing. This paper intends to address some of the gaps in an approach that is quantitative and accounts for these factors when observing Drivers of Change.

Literature Review

Theoretical perspective on Organizational Transformation

Organizational transformation has been extensively studied across various disciplines, including strategic management (Levy & Merry, 1988), organizational behavior (Orlikowski, 1996), network interdependence (Stebbings & Braganza, 2009), and innovation studies. Foundational theories, such as resource-based views (Lado & Wilson, 1994), (McGee, 2015) and dynamic capabilities frameworks and studies (Pike et al., 2005), underscore the necessity of aligning internal resources with external environmental demands. In the healthcare context, these theories highlight the role of agility in navigating regulatory shifts, technological disruptions, and market complexities.

Drivers of Change: An Interdisciplinary Synthesis

Research on Drivers of Change spans multiple domains, emphasizing the interconnectedness of the following key domains:

1. **Regulatory Influences**: Studies emphasize how compliance with evolving healthcare laws and policies shapes strategic decision-making.

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- Regulation is essential to define a clear framework within which health professionals acquire and maintain the competence needed to provide health services that are of high quality, i.e. that are safe, effective and patient-centered (Panteli et al., 2019).
- 2. Technological Innovation: Literature underscores the transformative potential of emerging technologies, including artificial intelligence and biotechnological advancements, in redefining industry norms. To provide better quality of care, and value for money, billions of dollars are being spent on bettering information systems in healthcare organizations. Strategic Information System Planning (SISP) is instrumental in making informed decisions to achieve the health organizations' goals and objectives (Lee et al., 2015).
- 3. **Market Dynamics**: Competitive pressures, patient expectations, and demographic trends are frequently identified as critical external drivers.
 - There are several strategic implications for competitive intensity which shape organizational transformations such as: 1) Quality and Investment Decisions (<u>Brekke et al., 2010</u>), 2) Performance boundaries in context of a pharmaco from below the healthcare provider and from above for its supply chain partners (<u>Montez et al., 2017</u>), 3) Strategic potential and overall competitiveness (Goddard, 2015).
- 4. **Crisis Management**: The emergence of COVID-19 pandemic has significantly proven the role of crises in accelerating organizational change, particularly in healthcare. The responses from the healthcare sector are still evolving but COVID-19 shows a dire need for consideration of a blackswan event towards planning and organizing for organizational transformations.

Drivers of Change in Healthcare Crisis Regulatory Management Influences Crises like COVID-19 Compliance with evolving laws shapes accelerate organizational change. strategic healthcare decisions. Market **Technological Dynamics** Innovation Emerging technologies Competitive pressures and patient expectations redefine industry norms drive transformations. and care quality.

Figure 2: Drivers of Change in Healthcare

The Need for a Quantitative and Temporal Approach

A robust, quantitative approach is essential to bridge these gaps. Such a framework should:

- Enable temporal analysis to track the evolution of Drivers of Change over time.
- Integrate diverse data sources, including regulatory filings, financial reports, and technological adoption metrics, to observe and record transformation and provide a comprehensive evaluation.

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• Facilitate actionable insights for decision-makers to optimize resource allocation and strategic planning.

The Case of Pfizer's Transformation (2015-2020)

Pfizer's transformation during 2015-2020 presents a unique opportunity to address these challenges. The company's strategic responses to diverse Drivers of Change in a publicly available, well-documented space presents a unique opportunity to analyze this case that provides a template for developing a structured, datadriven framework applicable to healthcare and beyond.

This problem statement underscores the urgency of advancing methodologies that not only dissect organizational transformations but also provide actionable, temporal insights for navigating the complexities of change in a rapidly evolving industry.

Proposed Methodology

Theoretical framework

Based on literature review and real-world observations for applicability, we propose a quantitative framework with components and application as described below.

Sub-Dimensions for 'Drivers of Change' as the core dimension

We propose 4 sub-dimensions for 'Drivers of Change' as follows:

- 1. Regulatory Changes: Shifts in healthcare laws, compliance requirements, or government policies. This can be codified as 'DRC'.
 - Applicable Indicators: Number of new regulations implemented, penalties for non-compliance, policy updates from health authorities (e.g., FDA, WHO, CMS).
- 2. Technological Advancements: Adoption of medical technologies, digital health tools, or AI in healthcare. This can be codified as 'DTA'.
 - Applicable Indicators: Investments in healthcare technology, adoption rates of electronic health records (EHR), AI-powered diagnostic tools deployed.
- 3. Market Pressures: Competition from new entrants, pricing pressures, or consolidation trends. This can be codified as 'DMP'.
 - **Applicable Indicators**: Number of mergers and acquisitions, average market growth rate, changes in market share for key players.
- 4. **Pandemic or Crisis**: Global or local health crises triggering transformation. This can be codified as 'DPC'.
 - Applicable Indicators: COVID-19 case rates, hospital capacity utilization, emergency funding allocated.

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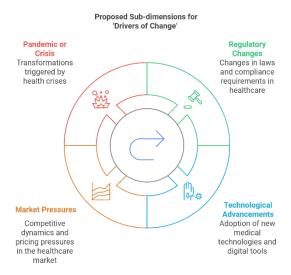


Figure 3: Proposed Sub-dimensions for 'Drivers of Change'

Proposed Scoring Model

The framework considers a weighted scoring model for each of the sub-dimensions with weights w1 through w4 and score for each sub-dimension. The scores observed are for each temporal section (timeline) for the observed transformation.

This is further illustrated below:

Drivers of Change Score= $(DRC\times W1) + (DTA\times W2) + (DMP\times W3) + (DPC\times W4)$

Proposed Likert scales for each sub-dimension score

- 1. Regulatory Change (DRC)
 - **1** (**Minimal Impact**): No significant regulatory changes affect the organization's operations or strategy. Compliance requirements remain stable and routine.
 - **2** (**Low Impact**): Minor regulatory updates are introduced, requiring minimal adjustments to compliance processes or policies.
 - **3** (Moderate Impact): Regulatory changes affect specific organizational segments or operations, necessitating localized adaptations but not widespread shifts.
 - **4** (**High Impact**): Broad regulatory changes occur, necessitating significant operational modifications or strategic realignment.
 - **5** (**Transformative Impact**): Pivotal regulatory shifts fundamentally redefine business operations, creating far-reaching implications for strategy and execution.
- 2. Technological Advancements (DTA)
 - **1** (**Minimal Integration**): There is no significant adoption of new technologies or innovation, and the organization continues to rely on existing processes.
 - **2** (**Limited Influence**): Basic technologies are adopted with minimal impact on strategic goals or operations.
 - **3** (Moderate Influence): New technologies are implemented, improving specific areas of the organization without widespread organizational effects.
 - **4** (**High Influence**): Advanced technologies are strategically adopted, leading to substantial organizational benefits and operational efficiencies.
 - **5** (**Transformative Influence**): Revolutionary technologies are integrated, fundamentally altering the organization's strategy, processes, and competitive positioning.

- 3. Market Pressures (DMP)
 - **1** (**Minimal Pressure**): The market remains stable, with negligible competition or external pressures affecting the organization.
 - **2** (**Low Pressure**): There are limited competitive or market-driven challenges, requiring only incremental operational adjustments.
 - **3 (Moderate Pressure)**: Noticeable competitive dynamics or market trends arise, driving targeted changes within the organization.
 - **4 (High Pressure)**: Significant market shifts occur, necessitating broad and strategic organizational responses to maintain competitiveness.
 - **5** (**Extreme Pressure**): The organization faces disruptive market changes that require immediate and fundamental alterations in its operations and strategy.
- 4. Pandemic or Crisis (DPC)
 - **1** (**No Impact**): The organization is unaffected by pandemics or crises, with no disruptions to its operations or strategy.
 - **2** (**Minor Impact**): Crisis-related disruptions are localized and manageable, requiring only minor changes.
 - **3** (Moderate Impact): The crisis impacts specific organizational functions, necessitating adjustments to certain processes or areas.
 - **4** (**High Impact**): The crisis leads to significant operational or strategic changes across the organization, affecting multiple domains.
 - **5** (**Transformative Impact**): The crisis drives a complete overhaul of organizational operations, strategy, and structure, fundamentally reshaping the organization's trajectory.

Proposed Weights for each sub-dimension as it applies to Healthcare Industry transformation

Since the framework considers a weighted scoring model, this paper proposes a weight for each of the subdimension with the reasoning as below:

1. Regulatory Change (DRC)

Proposed Weight: 30%

Rationale: The healthcare industry is heavily regulated, and compliance with government policies is critical for operations. Regulatory approvals and introduction of new regulations for drugs, technologies, or corporative activities such as M&A directly influence a company's ability to innovate and compete. For Pfizer, regulatory milestones (e.g., approvals for biosimilars, mRNA vaccines) represent significant drivers that shape its transformation trajectory. A moderately high weight reflects their persistent but not sole importance relative to other factors.

2. Technological Advancements (DTA)

Proposed Weight: 40%

Rationale: Technology has become the strongest enabler of transformation and creation of differentiation for firm in the healthcare space. Technology now touches all aspects of the healthcare and has promoted significant breakthroughs in key areas such as drug discovery, manufacturing, service, and delivery. For example, Pfizer's adoption of mRNA technology in 2020 revolutionized vaccine development. Technological advancements often drive strategic positioning, competitive advantage, and operational efficiency. This sub-dimension has the **highest weight** because technological progress is a key differentiator in the industry and was especially impactful during Pfizer's 2015-2020 transformation.

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3. Market Pressures (DMP)

Proposed Weight: 20%

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Rationale: Market dynamics, such as competition from generics, pricing pressures, and consolidation trends, influence strategic decisions. However, market pressures in the healthcare sector have the tendency to be incremental rather than step-transformations. For Pfizer, while competition (e.g., in biosimilars or oncology) was significant, the responses to these pressures were less transformative compared to technology and regulation. A **lower weight** reflects the ongoing, but not dominant, influence of market pressures on transformational change.

4. Pandemic or Crisis (DPC)

Proposed Weight: 10%

Rationale: Pandemics or global health crises are situational and not constant drivers. Although they are Black Swan events when they occur, as seen with the COVID-19 pandemic in 2020, these events can have a significant impact on the transformation trajectory for an organization (Antipova, 2020). For Pfizer, while the pandemic spurred rapid transformation in 2020, its influence was relatively isolated to that year and not a continuous driver across the study period. This sub-dimension is given

Applying framework to Pfizer transformations between 2015-2020

Key Transformation Events

During the observed period for years 2015-2020, Pfizer underwent significant transformations well-documented in the public space (Pfizer Investor Relations, n.d.)

. We consider the following key change events in our evaluation and scoring for Pfizer's transformation:

the **lowest weight**, recognizing its episodic but substantial influence in certain contexts.

- 2015: Acquisition of Hospira: Pfizer completed the acquisition of Hospira, a leading provider of injectable drugs and infusion technologies, enhancing its portfolio in generic sterile injectables and biosimilars.
- 2015: Proposed Combination with Allergan: Pfizer announced a proposed combination with Allergan, aiming to create a premier global biopharmaceutical company. However, this deal was later terminated in 2016 due to changes in U.S. tax regulations.
- 2015: Return to Operational Revenue Growth: Pfizer achieved its first year of operational revenue growth since 2009, driven by strong performance of new product launches.
- 2020: Development of COVID-19 Vaccine: In collaboration with BioNTech, Pfizer developed and delivered the world's first COVID-19 vaccine granted Emergency Use Authorization, marking a significant achievement in vaccine development.
- 2020: Launch of Oncology Biosimilars: Pfizer became the first company to launch three oncology biosimilars, addressing conditions related to nine different types of cancer, reinforcing its commitment to cancer treatment.

Temporal evaluation (2015)

- **Regulatory Changes (DRC)**: Pfizer's acquisition of Hospira expanded its biosimilars portfolio, requiring regulatory approvals. Score: 4
- Technological Advancements (DTA): Moderate adoption of new technologies. Score: 3
- Market Pressures (DMP): Intense competition in generics and biosimilars markets. Score: 4
- Pandemic or Crisis (DPC): No significant health crises this year. Score: 1 Drivers of Change Score $(2015)=(4\times0.3)+(3\times0.4)+(4\times0.2)+(1\times0.1)=1.2+1.2+0.8+0.1=3.3$

Temporal evaluation (2016)

- **Regulatory Changes (DRC)**: Pfizer faced moderate regulatory challenges, particularly related to maintaining compliance across its biosimilars portfolio and managing approvals for ongoing drug trials. These were significant but did not involve disruptive shifts. Score: 3
- **Technological Advancements (DTA)**: Pfizer adopted technologies that supported operational efficiencies but did not implement revolutionary innovations in this year. Focus was on scaling existing platforms rather than groundbreaking R&D tools. Score: 3
- Market Pressures (DMP): The competitive landscape in biosimilars and generics markets remained intense, requiring Pfizer to adjust pricing strategies and defend its market share. Score: 4
- Pandemic or Crisis (DPC): No significant health crises this year. Score: 1 Drivers of Change Score $(2016)=(3\times0.3)+(3\times0.4)+(4\times0.2)+(1\times0.1)=0.9+1.2+0.8+0.1=3.0$

Temporal evaluation (2017)

- **Regulatory Changes (DRC)**: Pfizer continued to navigate regulatory approvals for drugs in development, including oncology treatments, but no sweeping regulatory reforms were encountered. Score: 3
- **Technological Advancements (DTA)**: Pfizer started integrating more advanced data analytics and biotechnological platforms to enhance drug discovery processes. This represented a strategic shift towards leveraging innovation. Score: 4
- Market Pressures (DMP): While competition remained strong, Pfizer's strategic adjustments in previous years stabilized its position, leading to slightly reduced market pressure. Score: 3
- **Pandemic or Crisis (DPC)**: No significant health crises this year. Score: 1 Drivers of Change Score (2017)=(3×0.3)+(4×0.4)+(3×0.2)+(1×0.1)=0.9+1.6+0.6+0.1=**3.2**

Temporal evaluation (2018)

- Regulatory Changes (DRC): Pfizer navigated significant regulatory scrutiny during its oncology biosimilars expansion and compliance with stricter drug labeling and pricing transparency rules in the U.S. Score: 4
- **Technological Advancements (DTA)**: The organization adopted digital tools to accelerate clinical trial timelines and integrated innovative platforms like AI in targeted research areas. Score: 4
- Market Pressures (DMP): Pfizer maintained a strong and stable foothold in key therapeutic areas while addressing generics competition. Score: 3
- **Pandemic or Crisis (DPC)**: No significant health crises this year. Score: 1 Drivers of Change Score (2018)=(4×0.3)+(4×0.4)+(3×0.2)+(1×0.1)=1.2+1.6+0.6+0.1=**3.5**

Temporal evaluation (2019)

- **Regulatory Changes (DRC)**: Significant regulatory efforts were undertaken for new drug approvals in oncology and immunotherapy. These changes required enhanced compliance measures. Score: 4
- **Technological Advancements (DTA)**: Pfizer made substantial progress in R&D efficiency through revolutionary applications of AI and machine learning. The groundwork for its mRNA vaccine technology also began to solidify. Score: 5
- Market Pressures (DMP): Competitive dynamics persisted but were less disruptive due to Pfizer's strong market positioning and proactive strategies. Score: 3
- **Pandemic or Crisis (DPC)**: No significant health crises this year. Score: 1 Drivers of Change Score (2019)=(4×0.3)+(5×0.4)+(3×0.2)+(1×0.1)=1.2+2.0+0.6+0.1=**3.9**

Temporal evaluation (2020)

- **Regulatory Changes (DRC)**: Accelerated approvals for the COVID-19 vaccine and oncology biosimilars. Score: 5
- **Technological Advancements** (**DTA**): Breakthrough in mRNA technology for vaccine development. Score: 5
- Market Pressures (DMP): Competitive pressures remained steady, but Pfizer's response was proactive. Score: 3
- **Pandemic or Crisis (DPC)**: COVID-19 pandemic dominated transformation efforts. Score: 5 Drivers of Change Score (2020)=(5×0.3)+(5×0.4)+(3×0.2)+(5×0.1)=1.5+2.0+0.6+0.5=**4.6**

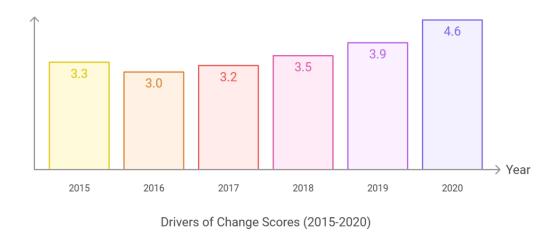


Figure 4: 'Drivers of Change' Scores for Pfizer case study

The scoring and rationale provided above is based on the author's subjective scoring based on year-by-year narrative for the evolution of 'Drivers of Change' as gleaned from publicly available sources and reports. The approach described here ensures alignment with observable trends and organizational context for the

transformation underway at Pfizer for the observed period of years 2015 through 2020.

Benefits of this study and future research

The author aims this paper to be a foundational study for researchers to contemplate a replicable framework for studying organizational transformation using quantitative metrics. Such a framework can be used to normalize and translate transformation efforts across different organizations, sectors, and timelines. This offers industry practitioners a lens to understand transformations better and drive actionable insights into prioritizing transformation efforts based on measurable drivers.

This framework can drive further research inquiry into transformations of healthcare organizations and driving correlations to economic contribution as it relates to the intensity of change as indicated by the 'Drivers of Change' scores. The same can also be applied to social benefits to understand the time and change intensity implications to solve for social problems such as new vaccine inventions. This broader understanding and linkage of change over time and its implication on new inventions can then help governments infer support needed for healthcare sector transformations and inform future regulation.

Conclusion

The framework proposed in this paper advances our understanding of organizational transformation by leveraging a structured framework for analyzing 'Drivers of Change' in healthcare organizations. The

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proposed methodology, demonstrated through Pfizer's 2015-2020 transformation journey, delivers a quantitative approach to evaluate the relative impact of sub-dimensions of 'Drivers of Change'. The sub-dimensions addressed are as follows: regulatory changes, technological advancements, market pressures, and crisis events.

The framework also introduces temporal scoring across these sub-dimensions thereby revealing how different drivers' influences evolve and intersect over time. The case analysis of Pfizer illustrates how this quantitative framework can be used to track transformation trajectory over a period of time and highlight critical transitioning points, such as the convergence of multiple drivers during the COVID-19 pandemic response.

This framework sets a foundation for future research to explore transformational patterns across different healthcare organizations and sectors, potentially informing policy decisions and organizational strategies. Further applications of this framework will lead to a deeper understanding of how transformation drivers correlate with organizational performance and social impact.

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