The Missing Sociotechnical Systems Elements for Strategy to Implementation

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Introduction

It was a disaster that ended an era of military dominance and likely control of all Europe. The plans were made, the French soldiers ready, and destined to defeat the British army. Napoleon’s battlefield strategies had won him many wars. However, a mistake in implementation - delaying the attack - led to Wellington’s historic victory at Waterloo [1, 2]. More recently, General Electric, a perennial best performing company, longest initial member of the Dow Jones Industrial Average, fell out of that index because of its inabilities to implement strategy. The firm had become unable to “continually improve their value equations with customers.” [3]

These tales from the past and present all illustrate the challenges of strategy implementation. Challenges arise when leaders are making decisions at one time and place and the efforts to carry them out are with others elsewhere in another time and place. Whether that elsewhere is in another galaxy or organization, these are recurring parallels for strategy and its implementation in business organizations. These failures are not exceptional instances; they are illustrations of a consistent challenge, and one that has been, according to recent surveys, found to be endemic to nearly all managers. In the Economist Intelligence Unit’s 2017 survey of over five hundred senior executives from large, global multi-sector companies,¹ ninety percent of managers admitted that they fail to reach all their strategic goals because they do not implement well. Why? According to the survey, these executives cited 1) failures to understand the company, its environment and its abilities to execute (65%), 2) inadequate delivery capability (53%), 3) inabilities to translate the results of strategy development and into its effective implementation (59%), and 4) just poor implementation of strategic directives (20%). Only a small ten percent of the executives reported no significant difficulties in the preceding three years for achieving their strategic goals. What were the financial results for those one-out-of-ten companies? Not surprisingly their results were significantly better than those of their industry rivals [4, 5].

The aforementioned issues are the motivation for the Characterizing the Gap between Strategy and Implementation SDM Symposium for which this paper is written. This and other papers in this book resulting from the symposium address various aspects of the strategy-to-implementation challenge, drawing upon existing research, reviewing what has been settled in the literature, and striving to collect and propose the theory and principles that promise better outcomes. In this paper we focus on what happens between the formulation of strategy and the management of the projects, programs and activities that are created to carry out strategy. That area is also the focus for the MIT Strategy Implementation Research Project, which have various research, writing and method development efforts underway that seek to improve strategy-to-implementation efforts. We take on this focus as a way to investigate other aspects of an organization’s strategy cycle that influence what happens in strategy-to-implementation activities.

We have two explanations for beginning with implementation for studying and improving an organization’s strategy cycle. The first reason is pragmatic – we see strategy-to-implementation as the time and place to begin to collect information, diagnose and contribute improvements, and then examine an organization’s strategy cycle, including its decisions and their implications. The second reason is opportunistic – given the repeated findings, strategy-to-implementation seems is problematic for managers and insufficiently studied by academics. There are numerous, well-developed methods and approaches for formulating strategy; and an extensive literature along with specified

¹ Of the companies of the executive responding to the survey, 48% had revenues between $1 and $5 billion; 39% had revenues of $5 to $10 billion; and 13% had revenues greater than $10 billion. The companies were 30% each from North America, Europe and Asia-Pacific, with the remaining 10% based in other part of the world. The companies were from a wide range of industries, with 10% in information technology, 9% in financial services and 8% in manufacturing as the largest representations.
methods and training programs for effectively managing programs, projects and activities. We see the need to focus on the territory for what is between that formulation of strategy and setting of goals and the execution of the activities associated with getting to those goals, or what we call the strategy-to-implementation territory.

Approach for Strategy-to-implementation

Where might we look for insights into improving strategy-to-implementation? In reviewing social science research, we identified several theories and principles that aptly apply to strategy-to-implementation. These concepts both guide further research and provide immediate guidance for leaders and. While there is a social science research in the relevant areas of designing organizations, creating strategy, develop leaders, effective decision-making, and managing teams and organizations, we focus on three of these literatures for strategy-to-implementation: Systems Theory, Sociotechnical Systems and Organizational Learning. System theory treats an organization as a system with a set of distinct parts that form a complex whole. Sociotechnical Systems focuses on the interaction between technology and people to guide the design of organizations and work. Organizational Learning focuses on people and process for creating, retaining, and transferring understanding and knowledge within and across organizations. Each of these areas of organizational research applies directly to strategy-to-implementation. What follows is a summary of each literature, and then synthesis and integration of these concepts to guide further study and practice of the strategy-to-implementation territory.

Systems Theory

Systems theory evolved from efforts to understand behavior and outcomes in both physical and social realms [6, 7]. Systems theory encompasses a wide field of research with multiple conceptualizations and different areas of focus [8]. The application of systems theory to organizations and their management holds to several premises – holistic attention in the understanding of organization is not the same as understanding of its various and discrete, multiple elements [9, 10] and an understanding the relationships among elements are as important those elements themselves [11, 12, 13]. This theory develops the concepts of homeostasis, equilibrium, self-regulation, equipotentiality and autopoiesis as processes that regulate and transform behaviors in systems [8, p. 129]. The implications for organizations and management from system theory is the focus on 1) nested systems – where a system is a unit of analysis and every system is within supra- and sub-systems [14]; 2) open systems – the attention to relationships between organizations and their environment [15, 16]; and 3) feedback and cybernetics – the source and consequence of information and action taking place within the system are foundations for changes [17].

Systems principles suggest that the behaviors found in implementing strategy may be studied and better understood by applying these aforementioned orientations. First, a nested systems orientation proposes that an examination that is one level above and one level below what happens in strategy implementation activities. For one level below, this would inquire into the strategy team at the level of its individual members, and their selection, behaviors and characteristics, particularly those influencing learning and performance. At one level above the strategy implementation, this involves examination of organizational arrangements and how they influence strategy-to-implementation. Examples of these organizational arrangements are an organization’s culture, routines and structure, and their influence on behaviors, events, patterns at organizational levels, including formulation and communication of strategy, as well as planning and execution of strategy. We have seen examples of these boundary-spanning parallel structures, or “bridging units,” create incremental and ongoing performance benefits.² These which are

² United Technologies Corporation (UTC) created its ACE program, to which it attributed increases in gross margin, profitability and share prices. This effort was managed by a cross-functional ACE “council,” which met regularly, took responsibility for the content, delivery and deployment of the associated tools, methods, training and certification of individuals and units. CEO at the time, George David, said, “it is the basis of more than half the shareholder value increase in UTC.” Roth, G. “An Uncommonly Cohesive Conglomerate,” strategy + business, Issue 72, Autumn, page 73, 2013.
organizations, such as Program Management Offices, made up of members representing various division, functions, and geographies, that from guide the development, training and use methods across organizations.

An open systems view places attention on the outside influence to the organization and its internal activities, including its exchanges of energy, matter, people, and information with the external environment. An organization’s adaptation to new conditions can both contribute to and result from changes in the environment. A feedback view examines flows of information, where individuals’ purposeful behavior, social construction, distortion, and delays filter and alter information in ways that attenuate and amplify behaviors in the system, particularly in the ways that endogenous factors influence its ability to adapt to new conditions.

The challenges found in embracing the complexity inherent in systems views have been addressed by developing and testing computer-based systems dynamics models. The models are used to simulate what might happen so that people can explore the consequences of alternative actions given system conditions, often in the context of a “managerial practice field,” which we describe in the subsequent section on learning organizations [18]. Systems theory suggests going beyond elements to developing overall representations of systems. A model and information, created by capturing, representing and modelling information flow, material movement, and work processes give an overall view of a system. These models allow for analysis using concepts and methods for reducing variation (quality methods [19]), improving throughput and flow (lean methods [20]), or identifying and eliminating bottlenecks (theory of constraints [21, 22]) that enable planned and continuous improvement activities.

**Sociotechnical Systems**

The term “sociotechnical systems” was introduced based on the realization that neither social nor technical could be effectively developed in isolation. Techniques and technology had to be considered and developed in combination, using an understanding of human behavior while also involving the people impacted [23, 24]. Sociotechnical systems theory is an open systems view, developed from the insights into unpredictable behaviors that arose from introductions of new technology. There are two main components of a firm as a socio-technical system: a social component (people), and a technical component (technology and machines) [25]. These ideas had their origins in coal mines [26], and through their development and application in many settings over multiple decades (extractive industries, agriculture, manufacturing, government, business, and services), were developed as principles for the integration of social and technical domains that achieve and sustain better outcomes.

How does strategy and its implementation relate to the industrial settings in which sociotechnical systems approaches developed? Organizations, and the design of their work and processes, are techniques developed and purposefully designed to achieve particular outcomes. Strategy-to-implementation activities link decision-making in the formulation of strategy and guidance in goals to projects, programs, policies, budgets and other activities that people do to carry out that strategy. In the strategy-to-implementation setting, the technology is not manipulating raw materials and physical goods, but it is techniques or technologies that capture and manipulate data, information and knowledge as part of a company’s business processes.

In navigating strategy-to-implementation, sociotechnical systems principles examine the organizational arrangements that join decision-makers and technical systems with those asked to take action and adjust their work and goals. These principles suggest that this be done in ways that inform and guide people’s activities, and generate feedback to those decision-makers. Three sociotechnical systems principles – responsible autonomy, adaptability, and meaningfulness of tasks [27, 28, 24] – provide a basis for the design of organizational arrangements that promote effective interactions among people. Each of these principles can be translated from an industrial context for adaptation to strategy implementation.

Responsible autonomy is based on insights from how technology changes social patterns, and addressing those changes by forming groups that are given direction and resources to design their activities. In this application,

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3 “The outstanding feature of the social pattern with which the pre-mechanized equilibrium was associated is its emphasis on small group organisation at the coal face” [26, p. 7]
responsible autonomy would give people that are impacted by a strategy some direction, resources and opportunities to participate in associated planning and implementation activities.

Adaptability[^4] is based insights that change creates conditions which are impossible to predict, so that people need to be given some freedom and ability to draw upon their aspirations to then make adjustments that can achieve desired targets.[^5] The application of adaptability to strategy implementation would have managers and workers engaged in prototyping implementation plans, with leaders providing feedback, guidance and support as they went forward.

Meaningfulness of tasks[^6] is based on recognition that people’s experience within systems is important to sustaining performance. Related research has identified, measured and applied meaningfulness as part of “core job characteristics.”[^29] Applied to strategy implementation, meaningfulness suggests people impacted by strategy implementation see the bigger impact that they can have, and be involved in its planning, implementation, and assessment of outcomes, particularly in terms of balancing performance targets with changes in their tasks and responsibilities.

The underlying principle from sociotechnical systems applied to strategy implementation is the importance of engaging people that are implementing strategy in a meaningful way in the processes and techniques for doing so. This would avoid the separation of leaders that make decisions to set goals and direction from the people that carry out the plans and activities to achieve those goals.

### Organizational Learning

Organizational learning seeks to balance efforts for performance and achieving targets with efforts to improve the abilities to perform into the future. The notion that “the only competitive advantage the company of the future will have is its managers’ abilities to learn faster than its competitors” drew much attention. Organizational learning focusses on how people learn in and about complex organizations, stressing learning as a feedback process.[^30, 31] There is also a shift in this literature from learning in organizations to learning organizations[^32], or what is needed to enable and support learning.

A learning organization aligns with desired results from strategy implementation, namely the notion that the organization develops its capacity to create its desired future.[^13] The prevailing orientation that dominates behavior in business organizations is based on setting and achieving performance outcomes. In contrast, a learning orientation involves enabling individual learning as a basis for collective learning. There is an ability to be both adaptive (coping with change) as well as generative (creating desired futures). Importantly, facilitating generative learning requires leaders to develop skills as stewards, designers and teachers; business teams use managerial practice fields to learn new methods, lower learning anxiety and exercise those new skills; and support that application of what they learned in the performance fields (ordinary workplace settings). Senge proposed Personal Mastery, Team Learning, Shared Vision, Mental Models and Systems Thinking, in what he called, “disciplines,” as prescriptive approaches for creating such learning organizations.[^33, 13]

Given the goals and orientation, the learning organization approaches can be applied in strategy implementation. Teaching and using learning methods would develop the people and teams tasked with strategy implementation. The learning methods create a context for generating and using feedback for reflection during implementation, and could be used to infuse a learning orientation into an organization’s strategy cycle. This introduction of learning methods, described in learning initiative case studies[^34], enhance both individual and collective learning while surfacing

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[^4]: “Though his equipment was simple, his tasks were multiple”, the miner “…had craft pride and artisan independence.”[^26, p. 6]
[^5]: A recent example extensively covered by the popular press has been the new Tesla Model 3 production line. The efforts to achieve scale through high automation created extensive dependencies, and required scaling back and engaging the workforce. The irony in this experience was that the Tesla factory in on the site of the former NUMMI factory, where the General Motors and Toyota joint venture used Toyota’s “flexible automation” with adaptability in 1980s to bring the Freemont to world class quality and performance levels. See [^38]
[^6]: In mining, Trist and Bamforth found the traditional method had “the advantage of placing responsibility for the complete coal-getting task squarely on the shoulders of a single, small, face-to-face group which experiences the entire cycle of operations within the compass of its membership” giving each participant and task significance [^26, p. 6].
information that provides feedback used in other activities. In strategy implementation, this flow of information would better inform implementation plans and their adaptability, and provide feedback for future strategic decision-making.

**Integrating Systems Thinking, Sociotechnical Systems and Learning Organization Approaches**

Organizational learning provides approaches and practices that are vigilant in their attention to individual and group relationships that enable learning and change [33, 13]. Those that are particularly important to navigating the strategy-to-implementation gap are the development and uses of managerial practice fields to cultivate shared vision in creating desired futures. The disciplines that enable this focus on such things as dialogue, which leads to greater transparency in assumptions and revealing the ways of thinking (mental models). Understanding mental models becomes a basis for developing complementary thinking among individuals, which then aligns their behaviors across separate activities to more effectively produce desired outcomes.

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<td>Nested systems: System as unit of analysis and influence from one system level above and below</td>
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Table 1. Summary of ST, STS and OL Principles and Methods for Strategy-to-Implementation

Learning organization approaches, which involve creating an appropriate context and while teaching and using practices that enable and promote individual and collective learning, have some common history and share some elements with systems thinking and sociotechnical systems. That commonality enables an integration of concepts,
tools and methods without conceptual or pragmatic conflicts. All three approaches are oriented to teaching, learning, applying and deploying tools and methods that invest in individual and collective abilities to learn and perform better. People learn and then apply methods to collect data, conduct analysis, and gain insights with the result that create a greater shared understanding. These activities also develop interpersonal relationships, and as people have to depend upon one another as they develop greater trust. The combination of greater trust and shared understanding provide a way to guide and align independent activities toward desired collective outcomes. These are the conditions that proponents of sociotechnical systems claim for its creation of “a radical new approach to resilience.” [35, p. 129] An organizational system made up of different people from various units needs to make and sustain a constant, vigilant focus on enhancing and maintaining interpersonal relationships needed for its collective learning and performing [36, p. 38 ff.]. See Table 1 for summary of these principles and list of tools and methods for strategy-to-implementation.

Drawing upon and applying insights and principles from systems theory, sociotechnical systems and organizational learning provides a pathway for improving the strategy-to-implementation outcomes in organizations. In important question is where to get started with applying these ideas and improving outcomes in organizations? As suggested earlier in this paper, there is a point in time where setting a context conducive to learning and teaching methods for collective learning could start. This is the point in an organization’s strategy cycle when the strategic plan and its goals are “handed off” to begin implementation. The opportunity at this point in time is to go beyond the handoff of a document, or the event or presentation that is the organization’s current practice, to initiate a system learning process. In the context of the MIT SDM symposium “Characterizing the Gap,” 7 this set of principles provides a framework to assess and guide these research and practice suggestions. We suggest that these systems theory, sociotechnical system, and organizational learning ideas become a “call to action” for researchers test in their studies and thus write about in their findings so that they provide better guides for organizations’ strategy-to-implementation efforts.

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References


