

Lean Agility at Scale: A Role for Strategy in Determining Performance

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Abstract

An executive leader directs their organization with a strategic orientation from the top down. In a classic closed-system approach, the strategic plan feeds into the initial execution plan but no feedback is subsequently provided once execution of the plan begins. This approach is sufficient when the market is highly constrained and/or changes to the process execution are expensive. The organization deals with innovation as a closed-system research and development project, and a traditional approach in project management provides a viable execution model.

What happens when the constraints do not apply, such as when a market varies and system requirements need to be accommodated even after the process execution begins? An open-system is required to engage the client in the execution process. This is when agile project management flourishes, yet from a CEO's perspective this appears as organized chaos and the challenge becomes how performance is measured. To that end, the purpose of this article is to give eight guiding principles for measuring performance in the open-system environment.

Introduction and Purpose

Achieving lean agility at scale can be viewed as a non-linear systems engineering challenge to an organization's sustainability in today's competitive business arena. The National Baldrige Criteria provide a proven systems framework to improving performance and enhancing competitiveness [1]. The aims of the applied research reported in this article are the following: 1) to suggest a systems framework for addressing both closed and open approaches to innovation by leveraging a proven strategic planning process and simultaneously embodying dynamic program management practices; 2) to provide coaching points and implementation principles for executing such a framework to mitigate risks when lean agility is applied at scale in a large service sector organization; 3) to illustrate the framework and provide success metrics and measured improvements when applied to a large Fortune 500 organization with an Innovative Information Technology Growth Strategy; and 4) to recommend a research path forward.

The first author's experience serving as an examiner and member of the Tennessee Center for Performance Excellence (TNCPE) Panel of Judges for 20 years and his dozen years at

Raytheon as a senior executive coupled with the second author's experience as a member of the Automatic Data Processing (ADP) leadership team provides a unique set of talents and an ideal study setting. ADP, LLC is a Fortune 500 company providing global business processing and cloud-based solutions. ADP builds configurable human capital management solutions that are designed to meet client goals of providing improved compliance, reducing costs, and affording a more human resource for your employees; as an added dimension relevant for the applied research discussed in this article, Business Agility and Innovation in Information Technology are strategic pillars across the global enterprise of ADP.

The TNCPE is a Baldrige based state quality award program with four levels of recognition. Over the twenty year window cited above, more than 1000 Tennessee organizations were reviewed. By national policy, organizations must win their state's highest level of recognition first, before competing for the National Baldrige Award. During this window Eastman Chemical, Federal Express, Caterpillar Financial, and Pal's Sudden Service received Tennessee's highest award level, and subsequently won the National Baldrige Recognition. One important point is that although recognition is nice, organizations generally pursue the process to improve their performance and develop the leadership talent within their organization. The author's joy has been observing the growth in the leadership talent that results from the TNCPE Process. Benchmarking both metrics and processes for achieving outstanding results is fundamental. Excellence Level Criteria mandates that a two step Strategic Planning process must have both strategy development and deployment phases. Furthermore, action plans must demonstrate superior results that are directly linked to these processes [1].

Exhibit 1 has been compiled from these best practices and augmented with the authors' practical implementation experiences. Quoting NASA's Joe Shea in the late 1970's, "One thing that I learned while serving on the President's Commission addressing cost overruns is that if you want to control something you must be able to measure it!" Although not national Baldrige winners, ADP and Raytheon have deployed management approaches to ensure strategic alignment and measurable accomplishments tied to specific goals and objectives. At the 2016 TNCPE Quality Conference, the authors were pleased that the Excellence Award Winner advocated a similar approach to deploying strategic action plans. The authors draw on the strategic planning process best practices summarized in Exhibit 1, coupled with practical project management experience, to suggest the Conceptual Implementation Framework in Figure 1.

Relevant Literature

Agile software development emphasizes the following foundational values: individual and team interaction, incremental value delivery, client collaboration, and dynamic responsiveness to change [2]. Embedded within the descriptions of these foundational values is a relevant observation that the values do *not* inherently *exclude* formulation of any of the following constructs at an enterprise level: defining process models, capturing requisite levels of documentation, performing requirements-centric contract negotiations, and/or executing structured planning cycles.

Strategy Development

- Review mission, vision, values, core competencies, strategic advantages, and strategic challenges.
- Assess Research & Development and innovation results.
- Analyze financial performance, investment returns and strategic partnerships and alliances.
- Study global competitive landscape, market growth opportunities, legal and regulatory constraints.
- Conduct a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis on a business unit by business unit basis.
 - An organizational feedback process consisting of cascading down and percolating up SWOT goals is often most effective.
 - Strengths and Weaknesses are an internal focus while Opportunities and Threats are external.
- Address past performance in the context of market growth potential and share.
- Benchmark competitors and review sustainability, innovation and financial outlooks for your entire organization compared with benchmarked best practices and associated metrics.
- Develop key success factors for each business unit. Then examine the entire organization from a total systems perspective. Focus on innovative technology and business models simultaneously.
- Develop Goals, Objectives and measurable performance targets.
- Check alignment with key success factors. In this context key success factors should be limited to the overarching aims for the entire organization.

Strategy Deployment

- Develop strategies for each business unit ensuring alignment with overarching key success factors.
 - Each business unit develops detailed operational plans.
 - Often growth strategies merit a detailed business plan.
 - Risks of independent technology centric and business centric should be formally assessed and reviewed at the Senior Management Level.
 - Once approved operational plans are implemented and reviewed.
 - A closed loop performance assessment and corrective action system such as the Plan-Do-Check-Act Cycle is often important.
 - Operational tools such as lean thinking and six sigma are often part of the strategy deployment process.
 - Such projects are generally reviewed quarterly at the business unit level and annually at the organization level.
 - Improvement opportunities and lessons learned are then provided as inputs to an annual strategic planning session.
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Exhibit 1: What Excellent Organizations Use as a Strategic Planning Process

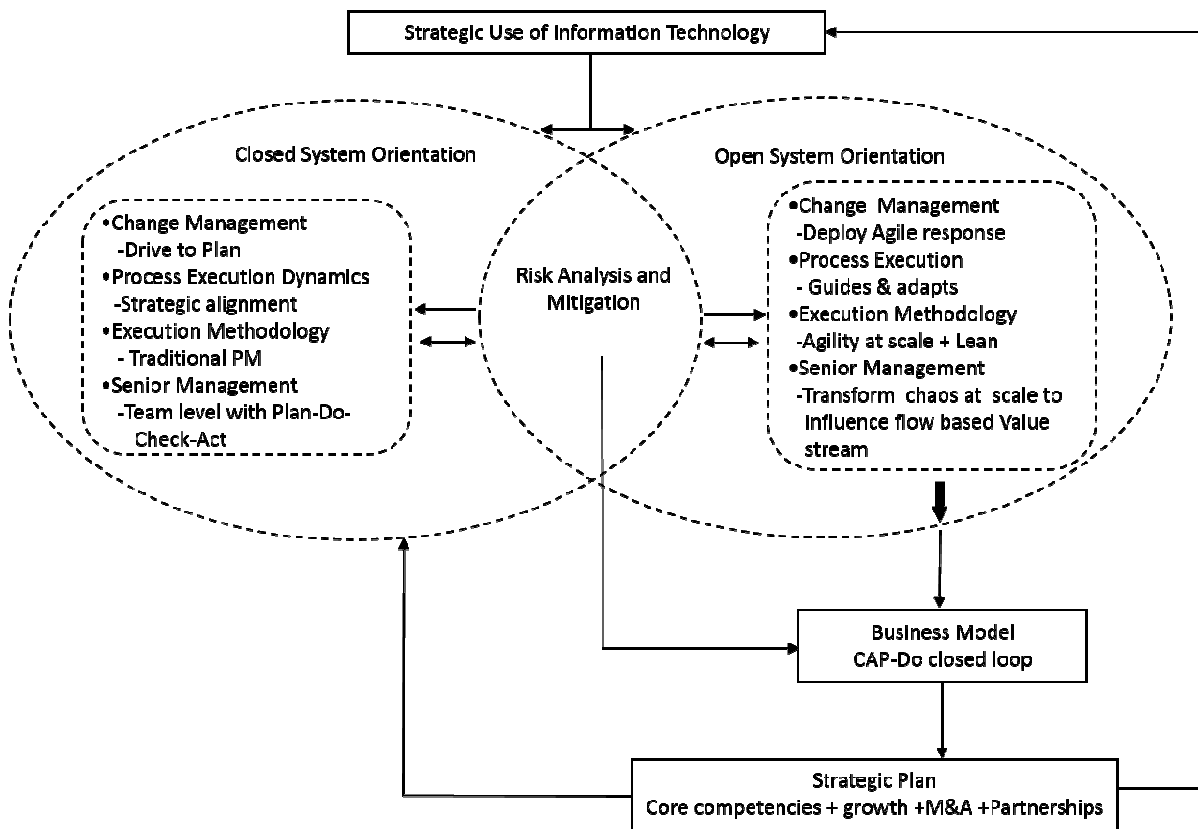


Figure 1: A Conceptual Framework for Implementing Agile Project Management at Scale

The judicious application of such enterprise-level constructs is enhanced through the collection of execution principles serving as guiding pillars for delivering results via Agile software development practices [3]. Furthermore, a broad collection of Agile methodologies has been published both as practical models for fulfilling the values and practices via descriptive execution models, and as depictions of an Agile solution space that bridges small and large enterprises. The most commonly practiced of these methodologies include Scrum and XP at the team level (e.g., Rubin [4], Cohn [5], Schwaber and Sutherland [6], Schwaber [7], Beedle et al. [8], Schwaber [9], Beck [10], as well as enterprise-driven “at scale” models for Lean Agility [11], [12], [13], the Scaled Agile Framework [14], and RAPD [15]. However, even given the broad solution space covered by these published methodologies, a gap remains relative to bridging the *execution dynamics* as global enterprises transition their practices across each leadership level and disciplines within a global company. Related analyses are captured for Business Agility approaches where Information Technology is used as a tool for increased Agility and competitive advantage [16] and is exacerbated when Information Technology is part of the product itself.

A useful reference [17] addresses key IT issues and focuses on three areas of recurring importance: concerns of IT Executives, investments, and organizational impacts. Overall, the top ten concerns have remained relatively constant since 1980. Among the recurring

concerns, “IT and business alignment, IT strategic planning, and security & privacy” have appeared in the top 10 since 2003. “Business productivity and cost reduction,” introduced in the Society for Information Management (SIM) Survey in 2007, has consistently remained in the top three concerns since 2009. In the 2012 SIM list “business productivity and cost reduction” emerged as the #1 top concern [17]; the #2 and #3 top concerns were “IT and business alignment” and “Business agility and speed to market” respectively. IT Strategic Planning ranked #6 overall in the 2012 SIM Survey.

Two of the top three concerns in the 2012 SIM list, “IT and business alignment” and “Business agility and speed to market,” are the focus of the current article’s project as discussed in a subsequent section and the project shows encouraging results. Extending this work and incorporating the authors’ experience with organizations adopting the National Baldrige Criteria, combined with the fact that 17 percent of respondents ranked IT Strategic planning as their number one concern, the authors suggest that the #6 top concern of the 2012 SIM list (IT Strategic Planning) be considered as a candidate for future research (see Exhibit 1 in this current article for a summary of benchmarking results for Strategic Planning Best Practices).

One caveat is important when discussing innovation in business and technology: there is a difference in the use of the terms “open system” and “closed system” when appearing in the business literature as compared to the engineering literature. In business literature, a “closed system” is one that relies on its internal Research and Development and tends to pull innovation through the supply chain to deliver to its customers [18]. Examples of “closed system innovation” can be seen in Apple Computer. “Open systems” in business literature, on the other hand, tend to engage the customer more directly in the innovation process. Innovations will then be pushed throughout the supply chain. ADP traditionally leverages a model of “closed system innovation.” An example of leveraging both closed and open practices is Raytheon. In their second source programs, Raytheon found product cost savings innovations lying dormant throughout the supply chain (“closed system” approach). Changing the prime contractor supplier relationship to a more “open system” approach resulted in simultaneous reliability improvements and cost reductions. As a consequence, a cultural shift combining “open system” and “closed system” strategies became a strategic competitive advantage when dealing with complex products involving multiple tiers of suppliers. Similar situations have occurred in the automotive industry.

On the engineering literature side of the equation, closed loop control systems employing appropriate feedback are more stable than open loop systems. Closed loop tracking is now pervasive in quality management systems such as ISO and Baldrige and has even become a requirement for university accreditations. Closed loop tracking and corrective action systems such as Plan-Do-Check-Act (PDCA) Shewhart [19] and Plan-Do-Study-Act (PDSA) Deming [20] have become part of the System Engineering much like Wi-Fi and apple pie. However, when IT agility is included from the engineering perspective it is critical to clearly distinguish process and products. This is important because IT can be either a tactical enabler of organizational agility [21] or IT can be a product itself combined with Business services as in the project discussed in this article. The result of applying IT and Business agility together, across a combined product and service suite, can be a new weapon for the

strategic arsenal leading to a transformation in a successful organization's Business Model [22].

In addition to publications on Agility execution for both Information Technology and Business teams, another body of knowledge important to the authors' research agenda is the outstanding work published in the Harvard Business Review (HBR) on the difference between the art of leadership and the science of management [23]. As a perspective on delineating the differences between leadership and management, the authors found Bohn's 2005 work [24] in chronicling the transition from art to science in manufacturing technology insightful. Analogous transitions from art to science may also apply as Information Technology Agility is extended to encompass Business Agility for Information Technology companies. Overall, the intent of the current authors' article is to introduce a framework to help address challenges in Business Agility execution and adoption as experienced in large global business enterprises.

An Eight Principle Methodology for Using the Conceptual Framework in Figure 1

Principle 1: The strategic plan serves as an overall guide for alignment and establishing touchstones for measuring performance. Starting with the major objectives resulting from the planning step in Exhibit 1, goals with measurable performance are viewed as the scope of work for subprojects in the action planning and deployment phase. As a top level question, ask how will IT be used in achieving these objectives. Define, at the top level, the scope of IT necessary and establish priorities. Generally it is best to have each objective defined as subprojects; such an approach helps ensure strategic alignment.

Principle 2: These touchstones are separated into defined elements with binary completion. Avoid percent completion in spite of what some methodologies promote. Define what constitutes acceptable completion for each subproject. Then as the initial step for market variability, ask how stable are the requirements. Note that this requires marketing input and often having a strategic champion for the overarching objective may help. Generally this initial step is a project management task that may not be appropriate for functional managers.

Principle 3: Each touchstone is further divided into specific tasks. What are the major tasks? What resources are required to achieve acceptable completion defined in principle 2? A Plan of Action (POA) chart format is helpful in getting individual buy-in and binary milestone definitions (see Exhibit 2). The POA chart is helpful when dealing with innovation management because when individuals establish their completion dates they also become accountable.

Principle 4: Groups of tasks are defined as a subproject with binary completion measures. For each subproject, ask what are the major risks and/or barriers to completion. Project management, including agile project management constructs, provides a solid approach to risk management. Let the team members who are responsible for completing the tasks assess risks magnitude and probability of occurrence. Do not get seduced by Monte Carlo analysis or other fancy risk assessment techniques; they are overkill and typically not worth the effort. "Risks" are in the eyes of those responsible for completing the work. When risks are low to

moderate, ask what value does the subproject add to our customers, or to the sustainability of our organization. Now get ready for the collision between art and science. Since innovation is by definition non-linear in general, greater benefits from innovation in use of technology carries with them higher ambiguity. How will you know that you are making progress?

Top Priority Effort: Brief Description
Lead's Name, Phone Number and Email Address
Completion Measure

	Tasks	Responsible Individual	Completion Date		
			Plan	Outlook	Actual
1.					
2.					
3.					

Exhibit 2: Sample Plan of Action Chart

Principle 5: The subprojects are segmented into planned value from the client's perspective. Ask the following: how confident are you in achieving subproject milestone/touch stone completion? Often it is helpful to define 90% confidence levels as "betting your paycheck on completing the task by the given date 9 out of 10 times." We look at the subprojects and segment them into planned value from the client's perspective. This is the key transition from the R&D closed system perspective to the open system with client engagement. However, please do not conclude that an open system with Agile PM is always best! What if engaging the client prematurely increases the security risks of losing intellectual property trade secrets or proprietary software? Perhaps our marketing team can provide the appropriate bridge. The authors' experience suggests the technical support to marketing is what is called for in these situations. A marketing manager together with a technical support person often is the best approach to solving a combined business and technology problem. If the appropriate decision is to continue with a closed system orientation, please go to Figure 2 for deployment and include strategic alignment through interaction with senior management and provide quantified risk mitigation tasks. Creativity and innovation are encouraged and marketing inputs are derived and used with a classic team interaction and a Plan-Do-Check-Act closed loop management system. Large discontinuous innovations addressing overarching strategic objectives, or contributing to market share and growth, can be studied as independent projects. It is generally best to explicitly identify additional scope and propose an internally funded research and development project, or present as a business

growth plan or as a defined experiment to elicit market feedback to be reviewed with the strategic planning committee. Explicitly addressing additional scope is one alternative for dealing with the chaos and disruptions that are often essential in innovation. On the surface this apparent advantage of Agility may carry a hidden downstream risk of customer disappointment due to schedule slippage plus cost growth. This can be addressed by explicitly engaging the client throughout the journey, if that is viable from a security perspective. Remember that bad news does not get better with time, so planned feedback increments can be a valuable risk mitigation tool. The authors' experience suggests that upfront acknowledgement of such innovation risks with alternative paths forward tied to cost, benefits, and schedule often helps justify customer engagement.

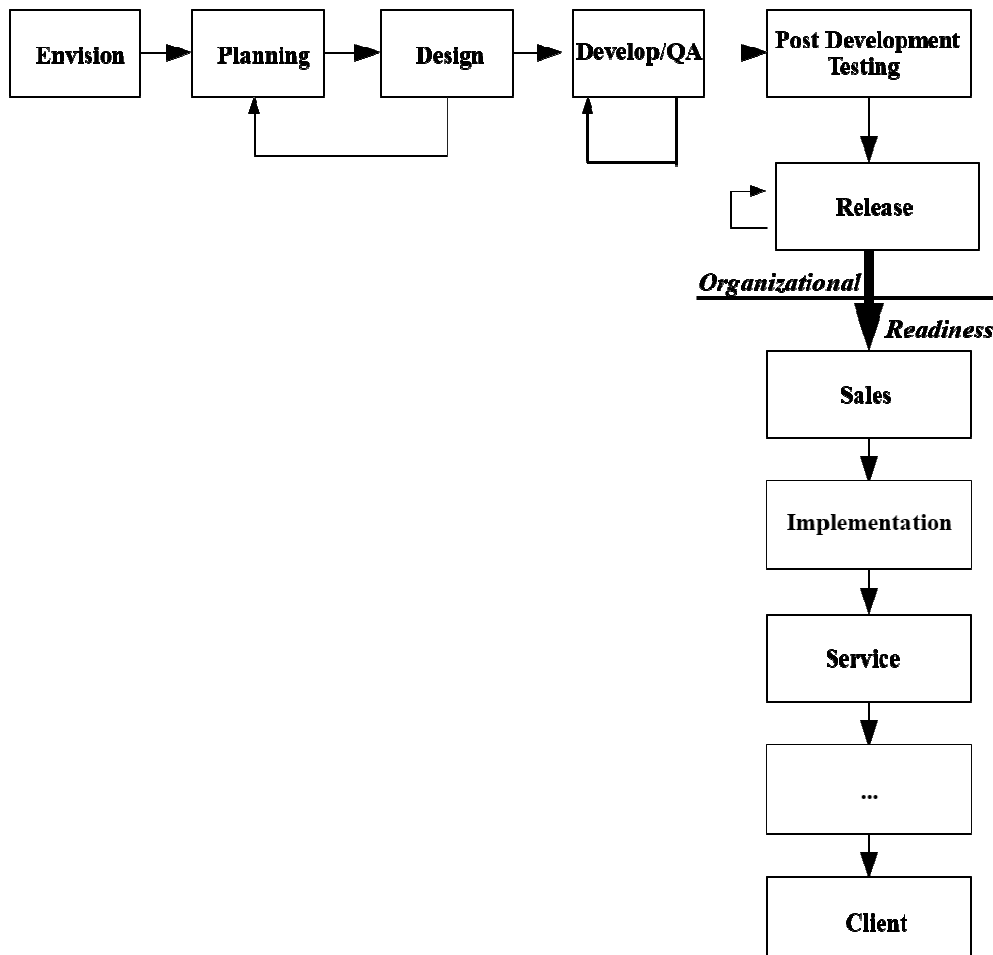


Figure 2: *Initial State* - Value Stream has Gaps in Feedback (Feed-Forward Execution) and Changing Requirements Becomes Disruptive (Closed Requirements Flow)

Principle 6: Determine the applicable degree of client engagement as part of the overall team.

The discussions in principle 5 are key drivers in the transition from the R&D closed system perspective to the open system with client engagement. When marketing approves a shift in the level of client engagement we identify and prioritize the top 20% of tasks that will receive 80% of the return incrementally. One approach is to grade Likert items ranked with 1

being fluid with low stability and 5 being firm and stable. Ideally each item with a binary touchstone would be ranked in two dimensions: a) Value to the customer in terms of Importance and b) Impact and stability of requirements. High Impact with moderate to high stability (3 or higher) would be given higher priority. A Pareto chart which gives the 80% value for the 20% work necessary and is combined with root cause and effects impacts to differentiate between causes and correlation. Often, using the collective team knowledge together with Google search is adequate for the prioritization process as long as the customer benefits are quantifiable. There is also content and relationship building that emerges from such a process because customers share in the innovation and the “Use of Information Technology in helping customers gain market share” is impactful. (A modified **BCG** matrix guided by Walter Synder’s unpublished work while at sabbatical with the Oak Ridge National Labs circa 2000 is very helpful in assessing the use of information technology on market share.)

Principle 7: Leverage the approach of the solution life cycle as an overarching guide (see Figure 3). Historical data in terms of market share becomes a significant benefit when growing the parent company’s market strategic planning process.

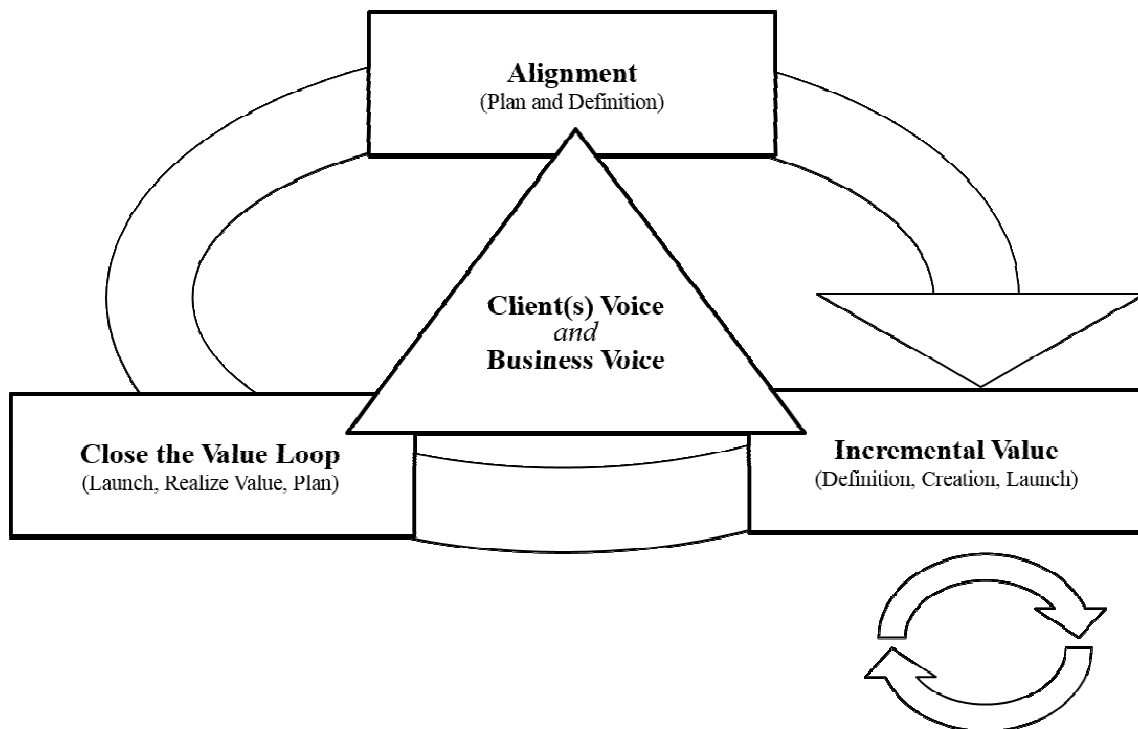


Figure 3: *Target State - Full Value Stream Embodies Explicit Feedback (Dynamic Feedback Execution) and Responsive Requirement Adaptations (Open Requirements Input)*

Principle 8: Execute with incremental delivery, including feedback to the client and the strategic plan to sustain alignment. Armed with the customer’s additional buy-in, transition to the agility framework and execute with incremental delivery and feedback to the client and overall strategic plan to sustain alignment. In this step we are careful to deploy a CAP – Do Improvement where step wise

changes do not cause huge changes in either organization's business model. Such an approach appears essential in transforming from the chaos when agility is implemented at scale to a more systemic incrementally stable introduction of innovations. Large innovations with impacts on the DNA of engaged organizations can be explored deploying a Plan-Do-Check-Act Shewhart Cycle [19] with the Plan step using a "Just Imagine" approach. Such a more highly non-linear subproject is analyzed in a broader strategic context of growth and innovation acquisition. Mergers, strategic alliances, acquisitions and R &D decisions are deployed in a more traditional leadership style. In any event, the IT effort capitalizes on the creative dimension of Agility while eliminating waste due to dynamic instability of requirements in the global marketplace.

Conclusions and Managerial Implications

Four aims were accomplished in this article: 1) to suggest a systems framework for addressing both closed and open engagement approaches to innovation by leveraging a proven strategic planning process and simultaneously embodying dynamic program management practices; 2) to provide coaching points and implementation principles for executing such a systems framework to mitigate risks when lean agility is applied at scale, for software development in a large service sector organization; 3) to illustrate the systems framework and provide success metrics and measured improvements when applied to a large Fortune 500 organization with an Innovative Information Technology Growth Strategy in the service sector; and 4) to recommend a research path forward. These aims are dealing with nonlinear systems implementation in the business context. The achievement between outcomes at each level is not uniform and certainly discontinuous.

The first aim was accomplished by providing a practical approach to using strategy as a means of measuring performance. Typical metrics were used from generally accepted good practices in software development driven agility; these include product deployment cycle time, timeline to new revenue, customer satisfaction as measured by Net Promoter Score[®], growth in revenue, elimination of waste, reduction in planned outages, and reduction in effort for implementation and service. The second aim is depicted in the transformation synopsis of the solution execution model of a Global Fortune 500 company as shown visually via three figures with eight implementation principles. Figure 1 provides a strategic view of closed and open approaches to innovation linked by a risk analysis and mitigation approach extracted from the Project Management discipline. Figures 2 and 3 depict the beginning and ending states of the process transformation. Exhibit 3 provides a summary of the eight implementation principles for execution and provides the backdrop for addressing the third aim. Because the approach has merit for IT, we are optimistic that some benefit may also accrue for innovation management in manufacturing as well; in conjunction with addressing the fourth aim, please see the path forward for future research summarized below.

With ADP as a mini-case study setting for this article, Agile Project Management at Scale was pursued. The *initial state* was a "Feed-Forward Execution and Closed Requirements Flow" system: a role-centric, linear handoff, release-centric model *across the value stream* as depicted in Figure 2. The *target state* was a "Dynamic Feedback Execution and Open Requirements Input" system: a value-centric, collaborative, client-centric model *across the full value stream* as depicted in Figure 3. As was brought out and discussed, the target state

representing Enterprise Business Agility was achieved through the ADP Solution Lifecycle (see Figure 3). This is an important accomplishment because the Market was dynamic and the Strategic Plan needed to incorporate feedback so it could adapt to the feedback from the Market. Execution was accompanied by a full playbook and corresponding proof points produced as the lifecycle model was ushered through the transformation from problem to solution concept to pilot to adoption for operational execution.

1. The strategic plan serves as an overall guide for alignment and establishes incremental touchstones for measuring performance.
 2. The touchstones are separated into defined elements with binary completion.
 3. Each touchstone is further divided into specific tasks.
 4. Groups of tasks are defined as a subproject with binary completion measures.
 5. The subprojects are segmented into planned value from the client's perspective. This provides the key transition from a closed-system perspective to an open-system with client engagement.
 6. With the client potentially engaged as part of the overall team, identify and prioritize the top 20% of segments that will receive 80% of the return incrementally.
 7. Leverage the solution life cycle as an overarching guide for execution.
 8. Execute with incremental delivery, including feedback to the client and/or the strategic plan to sustain alignment.
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Exhibit 3: Eight Execution Principles for Measuring Performance in an Open-System Environment

Key outcomes relative to established objective baselines within one year specifically *shortened product deployment timeline* by 18%, *reduced Net Promoter Score[®] Detractors* by 48%, *reduced unplanned outages* by 96%, *increased revenue*, *shortened time to new revenue*, *eliminated waste* in misaligned requirements, and *reduced the effort to implement and service clients*. These results are encouraging and serve as a preliminary indication that the framework indicated by Figures 1, 2, and 3 with the eight principles for implementation may prove helpful to the service industry.

The path forward with regard to future research is to conduct qualitative and quantitative studies regarding innovation in the service, production, and education communities. The authors appreciate the comments and suggestions from the peer review process and these improvements have been incorporated into this manuscript.

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