Establishing an Agile Portfolio to Align IT Investments with Business Needs

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Abstract

Those who implement agile software development and agile project management in a traditional corporate environment may encounter legacy corporate and IT processes that reflect legacy mindsets and cultures. These remnant processes, mindsets, and cultures represent opportunities to improve the systemic value that agile approaches are capable of enabling.

For example, in many large corporations the annual budgeting cycle drives a mindset that scope, budget, and schedule must be established up front, often many months before project work begins. Success means delivering on that scope within the budget and schedule commitments.

In turn, this mindset of defining business investment opportunities upfront, coupled with a project mentality where work must be completed before the next budgeting cycle begins, drives "big batch" (waterfall-type) project approaches and supporting IT processes.

As our IT teams successfully applied agile methods at the project level, we began to address our approach for managing portfolios of projects to increase the amount of value we deliver with our business partners. As we did this, we ran headlong into inherent conflicts between agile and legacy corporate processes and mindsets.

We recognized the need to transform those legacy processes and mindsets so that we manage the portfolios of project investments in an agile manner. This paper describes the challenges we faced as we applied agile methods to IT investment funding, change management, and governance; the success and failures we experienced; what we learned; and how we adapted to improve.

1. Introduction

DTE Energy, a Fortune 300 company headquartered in Detroit, Michigan, USA, is a diversified energy company involved in the development and management of energy-related businesses and services nationwide with $9 billion in annual revenue and 11,000 employees. DTE Energy's Information Technology Services (ITS) organization, now consisting of over 900 people, provides leadership, oversight, delivery, and support on all aspects of information technology (IT) across the enterprise.

One of the company's strategic IT goals is to produce and support world-class software. As a component of ITS, our software engineering capability of over 400 people includes development, test, business analysis, project management, and governance groups.

Another strategic IT goal is to deliver outstanding value to the company by broadening our business alignment and exploiting emerging technologies. We expect to achieve this through an increasing emphasis on business partnership-based prioritization and management of project investment opportunities.

1.1 History

In 1998 a part of the software engineering organization began using lightweight methods to enable short-cycle, iterative, and incremental software delivery. Our company embarked upon a journey to reengineer its business process, and ITS project teams needed to quickly respond to change along the way. Beginning with a few projects led by willing and able people, we embraced principles that were later succinctly stated in the Agile Manifesto [1].

Over the subsequent decade of delivering value to and with our business partners, we first enjoyed success at the project level using agile principles, then successfully attained CMMI Levels 2 and 3 accreditation in an agile manner [2, 3], and subsequently realized value from applying agile approaches in leadership contexts [4]. Like most organizations, we continually strive to improve and an area of focus with much promise is the alignment of IT with the business through agile portfolio management.

1.2 Context

Alignment of IT with the business is a function of the correlation between business objectives and technology-enabled solutions [5]. Business objectives are about making money; we increase the return on IT investment by focusing on the continuous flow of value [6].

To better enable that flow, we seek to understand value from the business perspective and to discuss it in terms that our partners find meaningful (such as operational efficiency, capital utilization, and brand leverage [7]).

Project portfolio management ensures that projects deliver the right value to the business with the right solution at the right time (rather than merely delivering "benefits," schedule, and budget compliance), and book value in terms of visible, real dollar benefits [8].

In recent efforts to align IT and the business, we identified behaviors that manifest in legacy corporate and IT processes. We describe these as *legacy* processes as they tend to persist even as we adopt agile methods. Intended to enable traditional business processes and to address perceived needs, we realize many of these yield minimal value and often impede our agile projects.

A factor in the persistence of these legacy processes is the underlying mental models held by people performing them. We describe these as *legacy* mindsets because they tend to endure, often subconsciously, even when they no longer contribute significantly (or are even found to be detrimental) to achieving our goals.

In this paper we (a) explore how legacy processes impact our effectiveness in delivering value through portfolios of IT projects in Section 2; (b) summarize the underlying legacy mindsets inhibiting our effectiveness in Section 3; (c) discuss changes we made and how we leveraged what worked and adjusted what didn't work in Section 4; and (d) characterize our intentions for moving forward in Section 5.

We conclude the paper with our key lessons learned and suggested ideas for the benefit of other organizations that may be on a similar journey.

2. Legacy Processes and Behaviors

In this section we explore three of our long-standing processes related to IT funding, managing change, and governance. Here we describe the observed behaviors that often impact our organization's ability to achieve its many and varied goals.

In subsequent sections we summarize the underlying mindsets that manifest these behaviors, discuss the actions we took to address these behaviors and mindsets, and characterize our intentions for further enhancements and improvements.

2.1 IT Investment Funding

Our company's decision-making model for funding IT projects is typical for a large corporation. It occurs as part of the annual corporate budgeting process where business units establish their budgets prior to the start of the upcoming fiscal year.

The executives in a business unit determine their top IT investments by evaluating detailed justifications articulated in business case documents. Within each business unit, executives have latitude to determine which projects they fund, within certain limits. The overall amount of investment funds is of course not unlimited, but justification is more about meeting thresholds for financial return on investment established at the corporate level. If the return is sufficiently compelling, then the business unit funds the work out of its budget or seeks additional funding at the corporate level.

A result of this funding model is that projects and funding levels are established prior to the start of a fiscal year. The funding level and corresponding suite of projects sets the IT agenda for the entire year, and the expectation of our business partners is that we will deliver the entire list of projects within the time and budget constraints established in the business cases.

The time needed to perform the process and the level of specificity in the business cases tends to establish a vested interest in the defined outcome; there is reluctance to change it because we have so much time and energy invested. We assume the agenda is valid and focus on achieving it rather than consider changing the agenda to respond to changing conditions over time. This limits the flexibility of IT and our business partners.

Additionally, detailed business cases tend to set IT projects up for the typical scope-driven problems with schedule and costs, and limit the ability of IT and the business to flexibly manage projects and investment dollars to deliver the most value.

2.2 IT Investment Change Management

Although the IT investment agenda established at the beginning of the year represents our marching orders, situations do change over the course of the year, and our IT groups respond to them.

Within the IT group supporting a business unit, we develop a planning model that represents all of the project work and timing for the year. This typically takes the form of a Gantt-type chart showing each project and its projected start and end dates. We estimate labor requirements and balance labor across the projects, seeking to ensure that we have adequate overall staffing and the proper distribution of critical skills and domain expertise to support all projects over the yearly schedule.

When limited specialized skills or domain expertise are necessary, we determine how to allocate people across projects and plan accordingly for when projects are able to start based upon availability of key people. Our strategy was to take our best and most expert people and allocate them across multiple projects to provide expertise and direction to less skilled or experienced people.

We lay out and rationalize this model for how the year will progress and convince ourselves that we have a plan that appropriately balances scope, schedule, and staffing, but over the course of the year things do not go as originally envisioned. Project timelines change as the year progresses, which causes a ripple effect on our

staffing plan. Business units come up with additional needs and want to start projects not on the original agenda. In the best intention of meeting the needs of our business partners, we react by adjusting and rationalizing our plan. We rebalance staffing and timelines, acquire new contract staffing when necessary, and agree that we have a workable approach that will be successful.

The problems that develop are obvious. The pressure to deliver can cause premature implementation of a solution that fails to operate properly or does not meet the expectations of the business partner. We must renegotiate commitments with business partners at the waning moments of a project. People are not fungible; the skills and domain expertise we need cannot be acquired and integrated into a project team in a short timeframe. Spreading the skill and domain expertise of a single person across multiple projects causes "thrashing" which reduces productivity and quality.

Ultimately, despite the focused and successful work of our teams, business partners are sometimes less than satisfied in the results, as in their minds we did not fully achieve the commitments. Although we deliver value on projects big and small, our partners are sometimes not delighted with the overall results.

2.3 Governance and Oversight

Governance is often seen as a means to ensuring that scarce IT resources are working on the right things at the right time. This concept typically includes some degree of oversight, reporting, and decision making; this was indeed the case for us as well.

Our previous governance mechanisms for feedback and control included a Project Management Office (PMO) to coordinate regularly scheduled status updates in a Program Management Table (PMT) meeting.

Dashboards, scorecards, and status reporting were performed on efforts above a certain threshold (typically in terms of dollars) and included common Earned Value Analysis (EVA) metrics such as CPI, SPI, CV, EV, etc.

Across the organization we previously had multiple tiers of governance such as intra-project, intra-portfolio, and cross-portfolio perspectives. Each used similar reporting structures and communication mechanisms, which became an issue as more of our portfolio leveraged agile methodologies.

We sought meaningful communication and reporting at all levels - how else could we make corporate decisions about projects within and across portfolios? However, the heterogeneous nature of each portfolio with a blend of agile and traditional projects posed a challenge as we now needed different (agile and traditional) playbooks.

Traditional metrics were tough to compare across portfolios; on agile projects CPI and SPI were very near 1.0, which accurately reflected our costs and schedules but did not provide much decision-enabling insights.

From the portfolio perspective, we found it difficult to recognize that an agile project was struggling until very late in the game. When it was impractical to visit each project team's shared space, the traditional governance mechanisms were not an adequate substitute.

3. Legacy Mindsets and Thought Patterns

In this section we summarize key underlying mindsets that drive three of our long-standing processes related to IT funding, managing change, and governance. Here we describe the thought patterns and habits that often impacted our organization's ability to achieve its goals.

The previous section explored three legacy processes and how they impacted our ability to effectively deliver value; in subsequent sections we discuss the actions we took to address these behaviors and mindsets, and characterize our intentions for further improvements.

3.1 IT Investment Funding

Two of the inherent mindsets underlying the legacy processes of the IT funding and business case development processes are "widget engineering" and "order taker."

The "widget engineering" mindset is characterized by the notion that we can completely think through anything that we have to build and any problem we have to solve before we actually begin the work. This mindset is quite pervasive as we are a company of many engineers and have a century of experience in building and maintaining energy generation and distribution systems.

However, as an IT organization we've learned that the most effective way to determine, specify, and build software that meets the business needs is to apply agile methods that enable an emergent solution based upon experiential discovery of the real problem to be solved. The "widget engineering" mindset stands in opposition to our agile approaches, and we continually confront this as a critical success factor. From a project portfolio perspective, this mindset tends to restrict our ability to adapt to needs as our understanding improves over time.

The "order taker" mindset is characterized by the notion that IT is a service organization whose purpose is to do as the business requests or directs – "no" is generally not a viable answer. Of course, our business partners rely on our technical expertise when it comes to implementation, but sometimes we find it difficult to engage in meaningful dialog about the underlying value.

In our best efforts to satisfy the demands of our business partners, we sometimes set ourselves up to disappoint (or at worst, outright fail) them when we strive to consistently deliver and meet expectations when the

expectations are ambiguous or unrealistic. In this situation, the hardworking efforts of people go unrecognized. The "order taker" mindset stands in the way of IT sitting at the table as an equal partner offering valid perspectives on the best way to deliver real value, making and meeting commitments, and delighting our business partners.

3.2 IT Investment Change Management

Two of the inherent mindsets underlying the legacy processes of managing change in the IT investment agenda are "maximize utilization" and "get it done."

The "maximize utilization" mindset is characterized by the notion that 100% utilization of people means maximum efficiency and maximum productivity. Less than 100% allocation for a person means an opportunity to work on another project. Slack time is bad; it means that a person has unproductive time.

To leverage our people who are most skilled and have domain expertise, we tend to over-allocate them; they even become unavailable to even casually help others. Too much time is spent transitioning from one task to another, reducing overall productivity and quality.

Although difficult to prove, striving to achieve maximum efficiency can reduce effectiveness and decrease the ability to respond to change. Slack time actually improves productivity by providing time to think [9]. Reducing time to think impacts the creativity and quality of the results we are able to deliver.

When we over-allocate our skilled resources we cause costly task-switching. This thrashing results in lost productivity and delays product delivery [10]. In our experience, this loss of time is not accounted for in work estimates and puts even more pressure on our best people to deliver. People become increasingly exhausted, decreasingly satisfied at work, and are at risk for burnout.

The "get it done" mindset is characterized by the notion that there is a way to accomplish our goals, and our job is to find it. This is a derivative of the "order taker" mindset - our business partners have high expectations, and we must find a way to meet them. We cannot walk away from a request and leave funding on the table. When the going gets tough, the tough get going!

The "get it done" mindset sometimes causes us to believe that a best-case plan will succeed. Over the course of the year, we consume our contingency and compromise our ability to deliver. We find ourselves "in the box" and it becomes easy to delude ourselves about the situation. The recognition of situational reality may be delayed until late in the year as we never give up; in these situations we lose credibility with our business partners.

3.3 Governance and Oversight

Our processes and behaviors for feedback and control are second-nature to us; as a regulated energy company, part of our genetic predisposition is to ensure our work is well-engineered and carefully monitored.

Our traditional approach to IT governance shared this "control through data" mindset, characterized by the notion that we seek more information and greater details. When agile projects flourished and propagated throughout our portfolios, this instinctive need for more data at a portfolio level was brought into question.

On agile projects we did not use detailed four-level work breakdown structures, earned value metrics, and fully resource-loaded Gantt charts. Rather, our burn-up charts, value velocity trends, and team engagement metrics [11] provided actionable insights.

Agile metrics did not resonate with the legacy "control through data" mindset where complex data was needed to make up-front decisions and even more exhaustive information was required to control change over time.

The legacy mindset resisted these new factors for project success and new gauges of progress. This was especially prevalent at the project portfolio level where the legacy mindset was comfortable with its ability to understand some of its projects and was frustrated with its inability to understand others.

Finally, the "control through data" mindset asserted we could plan out a full year's slate of projects; this was turned on its head as agile projects ebbed and flowed based on evolving business needs over time.

4. Actions Taken and Results Achieved

In this section we discuss the changes initiated to adjust the legacy processes and change mindsets related to IT funding, managing change, and governance. Here we describe the strategies adopted to address the underlying beliefs and to shape the observable behaviors.

The previous sections explored three legacy processes and summarized the underlying legacy mindsets that impacted our ability to effectively deliver value; in the subsequent section we characterize our intentions for further enhancements and improvements.

4.1 IT Investment Funding

To address the opportunities related to the IT funding and business case development processes in light of the "widget engineering" and "order taker" mindsets, we tackled the business case development process.

Our strategy was to change the business case development process to provide more flexibility into how

we managed individual projects and to extend that flexibility to the project portfolio.

The goal was to establish a common understanding that a business case was ideal for high-level problem and opportunity statements, with a funding level reasonable to address the need and a general implementation timeframe. This approach allows flexibility at a project level as well as a project portfolio level to adjust scope, dollars, or time as an appropriate solution becomes clearer.

We established a process improvement team under the auspices of our Software Engineering Process Group (SEPG) [12]. The goal of this team was to reconcile the business case development approaches in use, identify the best aspects of each, establish a standard process, and drive toward a common understanding of the approach.

We found it a challenge to reconcile viewpoints about the level of detail in the various business case processes. Those who used a more detailed approach did so because of a perceived need for specificity (the "widget engineering" and "order taker" mindsets at work).

The work group was successful in their efforts to define a common process and work products, but many of us continue to drive for much lower levels of detail.

4.2 IT Investment Change Management

Our approach to managing the set of IT investment projects, coupled with our "maximize productivity" and "get it done" mindsets, offered a significant improvement opportunity. We explored insights to leverage lean techniques to better manage the flow of work.

To raise awareness and to educate our leadership team, we retained Mary Poppendieck, a leading expert on the application of lean manufacturing techniques to IT work [13]. Mary provided us with insight about our particular situations, and initiated dialog amongst the leadership team about how we could use lean techniques. This was generally well received by our leadership team: Mary's perspectives about thrashing and applying the theory of constraints to manage the flow work were particularly compelling.

At about the same time, we developed and initiated the use of a new portfolio management model in one of the IT groups serving a business unit. We setup a simple model to represent our capacity, the projects that were on the agenda, and the available resources for these projects. Similar to agile project planning, we based this portfolio management model on the capacity of our available staff and would run no more projects than the level our staff could support. We recognized it was not feasible to respond to unplanned change by acquiring new contractors to reactively form new project teams.

Rather than plan out the entire year, the plan looked out three months and initially allocated our staff to get the most important set of projects started first. We placed the remainder of the projects on a backlog list with a projected start date based upon the expected availability of staff due to completion of in-flight projects.

We strove to ensure that the people were focused only on their areas of domain expertise by forming teams of domain experts, using a queue and pull work system to release work to the domain team, and to develop more domain expertise over time.

We explained the new portfolio management model to the affected business partners. We also explained that we were limited in what we would take on because of the people constraint. As engineers, they understood the notion of a system constraint, and expressed willingness to work with us using the new model. As the year progressed, the business partners began to realize they were not going to get everything they asked for. This drove healthy conversations within the business unit and with other affected constituents to identify and rally around the most important priorities for the business as a whole (rather than just a single business unit).

4.3 Governance and Oversight

The legacy mindset of "control through data" encouraged us to measure success with traditional metrics, and to use this information to control projects and portfolios.

We sought to shift our behaviors and processes from "Big Plan Up Front" (BPUF) to rolling wave planning with clear, well-understood decision gates along the way. Specifically, we wanted to employ our company's Four-Gate, Nine-Step process for IT projects, each gate having deliberate intentions to be satisfied along the way.

First, we brought the implicit gaps within our portfolio management and funding models into the open through a series of retrospectives and staff meetings.

From those discussions we sought to address the ways in which the portfolio of projects would be measured, recognizing that each project tailored our standard project methodology based on its context and specific challenges.

Second, we introduced terminology and concepts from lean manufacturing to help us better understand our constraints and how we could reorganize the way we prioritize our commitments and fund our work.

Principles like "sustainable pace" and "make the main thing the main thing" came into focus and we realized that we needed to manage the queue of projects within a portfolio and across the business units based on our scarce resources and subject matter experts, rather than to spread those resources across many parallel initiatives.

Thus, we viewed our key resources as platform teams and began managing the queue of pending projects for those teams. As a team completed one project, it began work on the next most important project for its platform.

Over time we successfully moved from the "control through data" mindset, which sought greater amounts of detail, to an "enable and ensure" mindset, which sought to more effectively manage each platform team given its context and operating parameters.

5. Sustaining Results and Moving Forward

In this section we characterize our intentions to sustain the progress we have made thus far, and to further embrace change as we refine our processes and mindsets related to IT funding, managing change, and governance.

Previous sections explored three legacy processes, summarized the underlying legacy mindsets, and discussed the changes that we inculcated into the organization; in the concluding section we offer some of our biggest lessons learned and recommendations.

5.1 IT Investment Funding

One of our overarching strategies in IT is to leverage the DTE Energy Operating System, a combination of lean and Six Sigma thinking, seeing, and doing tools and techniques based upon the Plan-Do-Check-Act cycle [14]. The company has invested in, and seen benefits from, this approach by training and rolling it out across the organization.

For the business case, we are implementing the Operating System's Project Charter tool. This tool provides a one-page overview of a proposed project. For the IT business case process, we are using the Project Charter as a means to provide "just enough" description of an IT investment opportunity and to defer definition of a formal business case until the confidence level for commencing the project becomes high.

Previously, our standard was to transform the business case document (and all its details) into a project initiation document. This document tended to be redundant with the business case and other standard documents (like project budget, timeline, risks, etc.). In a recent process improvement we effort identified the opportunity to phase out the project initiating document and to further leverage the Operating System's Project Charter tool. We will conduct retrospectives and After Action Reviews (another Operating System tool) to identify opportunities for further refinement.

These actions will move us toward "right sizing" the amount of detail in each business case, thus enabling flexibility to adapt and evolve a solution over the life of the project to better meet the real needs and deliver more value to our business partners. A smaller investment in developing the business case should also enable more flexibility at the portfolio level as there will be less invested interest in the business case document itself.

5.2 IT Investment Change Management

Our revised portfolio management model directly addresses our strategic IT goal to broaden our business alignment. Our intention is to further leverage our portfolio management model on two fronts: first, by further refining the model and applying it in the business area for which it was first developed, and second, by leveraging our experience for other IT groups and the business areas they support.

To further refine the portfolio management model, we are developing a systematic model of the portfolio production line. Our goal is to see more clearly how the system of delivering projects actually works. Managing the project portfolio first seemed like controlled chaos, then like each project was a special situation. We now realize we can view portfolio management as a systematic process. Our goal is to develop a model with simple measures that we can use to quantitatively identify where bottlenecks exist. Then, we can apply classic theory of constraint techniques to further optimize the system.

We also hold bimonthly retrospectives to review what's working and what's not, and make decisions about what we're going to do differently. Going forward, we intend to keep revisiting our principle that each person works on a single project (or task) until it is complete.

Serendipitously, we are encountering similar problems in other IT groups and business areas. We are working on applying these portfolio management approaches in one additional area at the moment. We are also planning how we will roll out these approaches on a broader scale to other IT and business groups as well.

5.3 Governance and Oversight

In our approach to portfolio governance, we moved from a "control through data" legacy mindset to a "enable and ensure" mindset, where we more effectively understood and dispatched queues of work by constraints.

One key enabler was to better identify our constraints (most prevalently, technical and business expertise) and more effectively balance our queue of work to the capacity of those constraints.

Going forward, we will continue delivering results by continuing to improve how we manage our constraints in the areas that are already using this approach.

For our areas that have not yet made this transition, we will manage the culture change in an intentional manner. We seek to avoid a "big bang" approach; instead, we will use a consistent pattern - standardizing terminology, identifying constraints, prioritizing and re-sequencing the work, and so on.

A second enabler to this mindset shift was to embrace a suite of fact-based measures that gave us the insights we

needed without force-fitting a comprehensive suite of metrics upon all projects and programs.

Going forward, we will continue to remind ourselves that the impulse to dive deeper into the details is one of the more prevalent legacy mindsets, to remain aware of when we slip into that old habit, and to challenge ourselves to take a step back rather than a step down.

6. Lessons Learned and Recommendations

To those who seek to foster an agile approach to project portfolio funding, change management, and governance, the following reflections and suggestions may provide some degree of utility.

First, be aware of your organization's processes and the mindsets that shape those processes. Rather than simply performing a process because "that's just how it is," challenge the underlying assumptions – this will either reinforce its value or prompt meaningful change.

We found that agile principles related to process improvement may be of additional benefit in this context. Specifically, the habit of introducing frequent, small improvements (in an incremental and iterative manner) tends to ensure that processes do not become too stale.

Second, be engaged in your organization's leadership communities (both IT and business). Rather than hoping they recognize their own legacy processes and mindsets, guide them to identify what is working well and where problems exist, and to introduce change in a deliberate and intentional manner.

We found that quite often, leaders were too close to the situation and its complexity (accumulated over the years) to see any other way to operate. We created a safe and enabling environment to take a step back and view those complexities from alternative perspectives (such as constraints) and proceed with a fresh set of ideas.

Third, be patient in rolling out an agile approach to funding, change management, and governance across a corporate enterprise. Rather than change everything all at once, select and collaborate with one or two business units first, reflect on the results, and then solidify those gains while branching out to another set of business units.

We found that while our business units had variations on the same themes of legacy processes and mindsets, each was different enough that a single approach would be inadequate. By adopting and adapting lean and agile techniques within each business unit (and in general, one unit at a time) we enabled agile funding and portfolio management capability and improved our business-IT alignment along the way.

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