An Evidence-Based Model for Agile Organizational Change

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Abstract

Despite evidence predictive project management is not appropriate for the majority of projects, it remains the dominant form. Unfortunately there is no proven method for large-scale transformations to Agile. Only one scientific source has been published. An exploratory narrative literature review in the related field of organizational change (OC) was conducted. Evidence-based OC models exist for overcoming barriers such as isomorphism, inertia, and resistance to change, but follow waterfall forms. An Agile alternative adapted from those models is proposed using eleven prioritized “epics.” It may serve as an educated guess for Agile coaches and a basis for Agile transformation research.

Keywords

Agile, organizational change, model, transformation.

Waterfall in a Dry World

Evidence that traditional (“predictive”) project management is not appropriate for many projects, particularly for research and development, has been available for decades. Though he did not use the term “waterfall,” Prof. William Royce is credited with first criticizing the approach for software in 1970. His diagram of what today we would call a waterfall process is followed by the words, “the implementation described above is risky and invites failure,” and then by diagrams of an iterative approach (Royce, 1970). A seminal work that introduced the term “scrum” to project management in 1986 (Takeuchi & Nonaka, 1986) described the successful development of seven hardware products using iterative methods. (“Scrum” now is a popular Agile method for software.)

Nearly 50 years after the Royce article, “data gathered from 10,000 project managers” showed that 20 percent or less of projects should have been waterfall based on their characteristics, yet PMs “continue to apply these traditional methods to projects for which they are not suited” (Ahimbisibwe, Cavana, & Daellenbach, 2015). A 2018 survey of members of the Project Management Institute (PMI) reported 87% of projects were still fully or partially waterfall (PMI, 2018). A 2015 survey of 859 respondents from PMI and relevant LinkedIn groups, reporting on more than 1,300 projects, was the first attempt to quantify whether Agile “works.” It “found that the greater the Agile/iterative approach reported, the higher the reported project success,” particularly for satisfying stakeholders. Yet only 6% of projects were fully Agile, another 65% having some Agile elements.

There is evidence many organizations that claim to be Agile may be in denial. In a 2017 PMI survey (PMI, 2017b), three of the top four factors influencing whether Agile or waterfall was chosen did not relate to characteristics of the project, raising the odds of the wrong method being applied. A 2016 study found that managers of 75% of respondents still expected “certainty of time, budget, and specifications from the beginning of the project” (Gregory, Barroca, Sharp, Deshpande, & Taylor, 2016), the “Triple Constraint” of traditional project management. Many job advertisements for “Agile project managers” still contain references to that Triple Constraint.

In February 2018 Agile professional groups felt compelled to hold a World Retrospective Day to encourage use of the frequent “retrospective” or “lessons learned” session, a technique
fundamental to almost all Agile methods and explicitly called for in the Agile Manifesto principles (see http://worldretroday.com/). Long after adopting Agile implementations at the team level, large companies often retain waterfall-ish phase/gate project approval models. Meanwhile, startups and family businesses are often run as traditional leader-led, command-and-control organizations (Wiesner, McDonald, & Banham, 2007).

How do we change all that? An empirical model for full adoption of Agile across an enterprise would be helpful. Unfortunately, very few publications on Agile change are based on objective evidence. Only one peer-reviewed source has covered organization-wide transformations, and its authors admitted their data was not objective: Most were cases presented by people involved, many of whom were openly “pro-agile,” and most reported on successes (Dikert, Paasivaara, & Lassenius, 2016). Easily accessed resources like blog posts, books, and presentations, are produced by consultants or practitioners reporting their own experiences with, at best, some reference to other tertiary sources.

Fortunately, there is a large body of empirical studies and secondary sources dating back at least 70 years on a relevant topic: organizational change (OC). Agilists attempting to lead large-scale transformations face challenges neither unique nor unprecedented. Models for overcoming the same issues reported by Agile practitioners have been proposed and tested for decades. So a model specific to Agile transformations should not be hard to create.

Methodology

This paper describes a literature review performed for that purpose, its findings, and a proposed evidence-based model for changing an entire organization—a full enterprise or autonomous subunit of two or more teams and supporting functions—to an Agile mindset.

Search Method

Searches were conducted in Google Scholar and through a university library catalog accessing numerous databases including major sources of management journals: Elsevier, ProQuest, and SAGE. Technique terms such as “Agile” or “Scrum” were combined with topic terms such as “enterprise” and “transformation,” and abstracts of the first 100 results in each combination, sorted by relevance, were reviewed. As mentioned, only the one study cited above related directly to the research topic. That result eliminated the possibility of a meta-analysis or systematic literature review on Agile transformations, so this study became exploratory, and no hypotheses are proposed. The narrative literature review approach thus was selected.

The search effort was repeated using terms such as “organizational change” and “factors” to identify empirical evidence on success factors and barriers to successful organizational change. Sources that seemed applicable to Agile transformations, based on practitioner reports from a previous research effort (author-identifying citation omitted) and the author’s experiences as an Agile coach, were read in full. Relevant sources cited by those studies were accessed if available through the same databases. Based on recommended practices from evidence-based management (EBM), only peer-reviewed sources were used, with more weight given to 1) meta-analyses and systematic reviews, followed by 2) primary academic studies, and then 3) practitioner reports with empirical references (Barends, Rousseau, & Briner, 2014; Nesta & Alliance for Useful Evidence, n.d.). “As with meta-analyses, systematic reviews are conducted out of recognition
that single empirical studies… should not be emphasized because their biases and limitations cannot be fully accounted for,” an EBM article points out (Briner & Rousseau, 2011). “Looking at all relevant studies, systematically gathered, constitutes more reliable evidence.” Some articles from general sources were included, but only to illustrate the empirical findings.

Limitations

Only studies available in full-text through the databases were included, so relevant sources may have been missed. As with all narrative literature reviews, this one was subject to the author’s sense of relevance. This problem is heightened by only having one author. However, use of neutral terms like “factors” brought up both successes and failures, and synonyms with positive (“success”) and with negative (“barriers”) connotations were tried, resulting in additional sources. Having no hypotheses reduced the impact of confirmation bias, and unexpected results are included. Also, the types of studies given the most weight are expressly designed to reduce subjectivity.

Isomorphism

There is both empirical and significant anecdotal evidence that the majority of firms use similar structures and practices which have remained relatively static over decades, especially within industries (Batenburg, Benders, & van der Blonk, 2008; Beckert, 2010; Lai, Wong, & Cheng, 2006; Nelson & Gopalan, 2003; Van der Stede, 2003). Heugens & Lander (2009) defined this “isomorphism” as: “The structural and strategic resemblance of one unit in a population to other units in that population, especially those facing similar institutional and task-environmental conditions.” They said symptoms include similar management structures even across industries (e.g., hierarchies subdivided by function); use of the same methods within industries, like Six Sigma; and similar market strategies among competitors.

Researchers long ago moved past proving isomorphism exists to trying to understand why. Most recent research has focused on three forces (Beckert, 2010; Heugens & Lander, 2009; Lai et al., 2006):

- Coercion—Leaders or customers requiring organizations to follow similar models.
- Mimesis—In which organizations copy others, believing the concepts they borrow were the reasons for the others’ successes.
- Norms—By which particular approaches are spread through publications and professional groups.

For example, Lai shows how the spread of radio frequency identification (RFID) was accelerated by all three:

- Coercion when Wal-Mart said major suppliers had to use RFID if they wanted to maintain the business relationship.
- Mimesis when competitors considered following Wal-Mart’s example.
- Norms when the spread of information about RFID caused companies to change voluntarily, even without the promise of Wal-Mart business.
Organizations can also be pressed to conform by government requirements and signals from “the economic environment… regarding how the firm ought to manage its internal functions” (Fleming & Spicer, 2014).

Some researchers have looked into whether organizations conform to national cultures, and found only limited support. A comparison of Brazilian, Indian, and U.S. firms found some correlation of their organizational cultures to national culture (Nelson & Gopalan, 2003). However, all three countries had significant clusters that rejected or mixed national values. When another study flipped the approach by looking at 46 companies from the same country (Belgium) with subsidiaries in others, significant variances were found across companies, but very little across countries within firms (Van der Stede, 2003). In short, isomorphism seems related more to organizational and industry factors than national culture.

Technology can be both a result and a cause. “This ‘technical isomorphism’ results from the embeddedness of organizational procedures and business rules within technology” (Batenburg et al., 2008). Batenburg’s case study showed how SAP forced customers to conform their practices to its software, resisting requests to change the software to reflect customer practices.

From a longitudinal case study in a manufacturing plant, Langstrand and Elg (2012) determined that attention must be paid to how artifacts like control systems and physical layouts can hinder (or be adapted to support) process change. A change “will be mediated, filtered and translated through the artifacts that exist within the boundaries of the organization, and the resulting practice will most likely differ from the original intent,” they wrote.

Anecdotal support came from Sir Tim Clark, president of Emirates Airlines. He told a business blogger (Zhang, 2018), “the airline industry is restricted by the constructs of the many systems in place that allow operations to work. And the mindset of the workforce is framed in by the limitations imposed by these systems.”

Heugens and Lander (2009) performed a meta-analysis of all 144 studies they could find on isomorphism and confirmed the existence of coercive, normative, and mimetic pressures, appearing in more than 75% of the studies. They found signs of hope, however, since “their magnitudes suggest that they hardly represent an institutional iron cage from which no escape is possible,” with correlations only around +0.08. Beckert (2010) describes how all three forces can also lead to divergence under different circumstances, and notes that competition can create isomorphism by driving out inefficient approaches. Mimesis can result from intentional benchmarking, and provide a safe approach that affords a defense in case of failure. It also reduces learning costs compared to creating an original path, Beckert says.

That is, isomorphism can be positive up to a point, helping late adopters of innovations just as much as the early adopters, Heugens and Lander say. In fact, isomorphism had mild positive correlations to both “reputation” and, contrary to their hypotheses, to financial performance, specifically return on assets (ROA), return on equity (ROE), and cost reduction.

Again, those effects were mild (+0.12 for financials), and a number of moderating variables were found, so there are many cases where too much isomorphism was harmful. Also, firms isomorphic for good reasons might perform even better if they searched for forms more applicable to their specific environments, or more rapidly adopted progressive structures and practices like Agile. And even when mostly isomorphic, they still “are able to differentiate
themselves from competitors in ways that remain well within the ‘range of acceptability’” Heugens and Lander say.

If Agile became the isomorphic approach to R&D projects, the evidence for Agile’s benefits suggest it would help all adopters, while those that customized better could further outpace competitors. For any of that to happen, persistent isomorphism in structures, policies, and management practices related to waterfall must be overcome.

**Persistence**

One negative form isomorphism takes is the remarkable persistence of outdated and scientifically disproven management techniques in a variety of fields. Evidence regarding the persistence of waterfall has already been mentioned. In a related example, “Accumulating evidence suggests that certain human resource (HR) practices are consistently related to organizational productivity and firm financial performance…” one study says. “Nevertheless, it is a well-known fact that organizations often fail to adopt practices that research has shown to be effective” (Rynes, Colbert, & Brown, 2002). In that survey of 959 HR leaders (“manager” or higher) on their beliefs about those practices, the mean accuracy rate was only 57%, ranging from 26% to 86% on specific practices. Roughly half or more of respondents were wrong or unsure about multiple items around hiring, performance appraisals, and personality testing. Apparently having a professional organization did not help, given that all respondents were members of the Society for Human Resource Management (SHRM).

The HR leaders were not unique. An ambitious study checked individual predictions from 80,000 experts in their fields and found that “dart-throwing monkeys” were more accurate (Nesta & Alliance for Useful Evidence, n.d.).

Earlier research by the author identified a number of evidence-based teamwork practices that still appear to be the exception rather than the rule today: self-direction; creating team charters; team-led hirings, etc. (author-identifying citation omitted). The field of medicine provides more frightening evidence. For example, The New York Times reported that expensive and risky heart stent procedures are still used routinely despite meta-analyses showing them to be no more effective than medical treatment or faked procedures (Carroll, 2018).

Researchers have long noted the gap between what they know works and what practitioners do. In the 1990s an effort was started to close it in medicine through a concept called “evidence-based practice” (EBP). This calls for helping doctors access, weigh, and apply the research literature related to specific conditions they are treating, also utilizing expert opinion and their own professional judgment. It has since spread to many other disciplines, including management. A university supported Center for Evidence-Based Management has summarized significant proof that “EBM” leads to better decisions (Barends et al., 2014), but the practice remains little-known among managers. Barriers to adoption in industrial/organization psychology, Briner and Rousseau (2011) say, include lack of demand from clients more interested in fads and/or short-term gains; insufficient training in the skills of EBM, even among master's-level practitioners; organizational politics; and fear of admitting what practitioners don’t know, especially “because other organizational consultants outside the discipline can be extremely bullish about their products and services despite their own absence of evidence.”

If these practices were relatively new, one could argue managers had no way of knowing about them. But the “accumulating evidence” goes back long before they were in college—or were
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born. Some are in this passage about a garment plant: “A high value has been placed on fair and open dealing with the employees and they are encouraged to take up any problems or grievances with the management at any time. Every effort is made to help foremen find effective solutions to their problems in human relations, using conference and role-playing methods.... Plant-wide votes are conducted where possible to resolve problems...” This was published in 1948, about a plant in Virginia. Yet they would seem remarkable today. The CEO of a garment manufacturer that operates entirely in the U.S. recently expressed his frustration at being called an “innovator” for using methods any company could (Haggerty, 2018). A highly successful 17th Century industry consisted entirely of self-organizing, democratically run firms that elected their leaders, split profits equitably, and provided full medical insurance: Caribbean pirates (Talty, 2007).

**Forces Against Change**

Since poor practices apparently will not evolve away, hope turns to active organizational change (OC) efforts. Unfortunately, the track record for OC is dismal. The figure reported in many of the reviewed studies is that only 30% of change projects succeed (Maurer, 2010; Rosenberg & Mosca, 2011). The number received further empirical support from a review of 49 reports in management publications. Median success rates by type ranged from 19% for “Culture Change” to 58% percent for “Strategy Deployment,” but the overall median was indeed 33% (Smith, 2002b).

A host of reasons have emerged from a mature body of work on the topic:

- “(M)anagement and organizational culture, which accounted for nearly 89 per cent of the variance, emerged as the two most significant obstacles to organizational change” (Hoag, Ritschard, & Cooper, 2002).
- “Project failure correlated most strongly with ineffective, missing, or conflicting leadership” (Smith, 2002a).
- Organizational inertia or history (Beckert, 2010; Brunninge, 2009; Dikert et al., 2016; Pardo del Val & Martínez Fuentes, 2003; Self & Schraeder, 2009); indeed, “Simply stopping a non-evidence-based practice tends to be more difficult than replacing it with an evidence-based practice that brings the user benefits” (Rousseau & Gunia, 2015).
- In a similar vein, lack of continuity, meaning a change differing too much from the organization’s historical culture or practices (Brunninge, 2009).
- Learning barriers due to: “a lack of autonomy”; “the speed of the change”; “poor feedback” or “neglecting feedback”; “the absence of experiments”; or “the absence of a dialog” (Schimmel & Muntslag, 2009).

**Resistance to Change**

The most-cited reasons for OC failure are inter-related topics unto themselves: resistance to change, and communication failures.

**Defining resistance.** Even if a manager is motivated to adopt Agile, he or she will have to overcome “resistance to change” (RTC) from peers, bosses, customers, and employees. Giangreco and Peccei (2005) summarize the numerous definitions for RTC by calling it “a form
of dissent to a change process (or series of practices) that the individual considers unpleasant, disagreeable or inconvenient on the basis of personal or group evaluations. This dissent may manifest itself in a range of individual or collective actions and take the form of non-violent, indifferent, passive or active behaviours.”

The list of those behaviors is long. “Active resistance includes behaviors such as being critical, selective use of facts, sabotaging, and starting rumors. Passive resistance includes behaviors such as supporting a change publicly but failing to implement it, procrastinating, and withholding information” (Rosenberg & Mosca, 2011). There is some evidence resisters prefer passive behaviors that don’t require the risks attendant with speaking out. For example, in their study of the privatization of an Italian utility, Giangreco and Peccei found only one percent of middle managers actively resisted related changes, while another 31 percent passively did.

**Causes of RTC.** For many years, the literature focused on situational causes of RTC (Oreg, 2003). Two Spanish researchers (Pardo del Val & Martínez Fuentes, 2003) conclude that while “formulating” a change, these include:

- “lack of a creative response,” due to the speed and complexity of the driving forces for the change, resignation to the change, or lack of top management strategy and commitment;
- “low motivation for change” thanks to the direct or opportunity costs, hiding of problem costs, prior failures, and different levels of interest between managers and employees; and
- “wrong initial perception,” including short-term thinking, denial of the problems, refusal to adapt thinking to current circumstances, and subconscious assumptions.

In the “implementation” phase, they found: “political and cultural deadlocks to change,” such as “departmental politics” or a disconnect between organizational and change values; leader fear; “embedded routines”; and lack of skills to make the change.

Rosenberg and Mosca (2011) report 20 similar reasons. Their organizational factors included several leadership issues (lack of trust, management RTC), dysfunction, top-down imposition of the change, resource conflicts, and again, politics. Two factors were specific to the change itself: appropriateness of the chosen change, and bad planning of the change.

Surely it is no coincidence these factors largely overlap with the reasons given earlier for OC failures. Resistance thus can be both a mechanism for failure and a symptom of problems with the change effort.

Rosenberg and Mosca also describe personal factors in RTC, including fear of failure, disruptions, extra workload, “Lack of reward,” and, “Perceived loss of control, security, or status.” Fear or anxiety shows up regularly in the RTC literature. “Unresolved anxiety in organizations can lead to a range of dysfunctional behaviors including bullying, depersonalisation, ritualized behavior, techniques for blame shifting or diffusion, approaches that reduce the chance to learn from failures and… resistance to change," write Edwards and Saltman (2007).

People who tended to use negative defense mechanisms like denial, withdrawal, and projection (onto others) were more likely to resist change efforts according to Bovey and Hede (2001). Those who managed change with humor and forethought were not. The study points out RTC in organizations “is similar to resistance experienced by a psychotherapist…” Organizations are
just people, so OC “requires the participation of people who must first change themselves for organisational change to succeed.”

Oreg (2003) developed a scale that accurately predicted change behavior in a series of studies. It has four categories of causes: rigid thinking; negative emotions around change; a preference for routine; and near-term thinking. His results did not correlate with general personalities as measured on a Big Five assessment, however. He notes that even if someone supports the change “in principle,” they might resist because of “the required adjustment period.”

Going deeper, psychologists and economists have identified numerous shortcuts our minds use that prevent evidence-based decisions in many situations (Jager, 2018). Examples from behavioral economics (Gino & Pisano, 2008) include:

- “Information avoidance—People’s tendency to avoid information that might cause mental discomfort”
- “Confirmation bias—People’s tendency to seek information consistent with their own views or hypotheses”
- “Availability heuristic—People’s tendency to judge an event as likely or frequent depending on the ease of recalling or imagining it”
- “Illusory correlation—People’s tendency to believe that two variables covary when they do not”
- “Anchoring and adjustment heuristic—People’s tendency to rely too heavily, or ‘anchor,’ on one trait or piece of information when making decisions”

The current review found no studies relating these to OC or Agile, but many seem applicable. Points made by a scholar in his popular books on the topic, Dr. Dan Ariely, include (Ariely, 2010):

- “Hedonic adaptation,” in which both novelty and discomfort with a change wear off, which suggests asking people to give themselves time to adapt.
- Interruptions to an adaptation can prolong the emotional valence, good in pleasurable changes and bad in negative ones, so a “big bang” approach to major change might be more effective.
- Our willingness to help one identifiable person more than suffering masses may partially explain why top leaders underestimate potential RTC.

Ariely suffered major burns at age 18, and perhaps worse treatments. He went back to his nurses years later with proof that removing burn victims’ bandages slowly instead of quickly reduced overall patient suffering. The nurses resisted because doing so would increase their own stress by prolonging that suffering. Only some changed their approach (Ariely, 2008).

Managerial resistance. As a group, managers top the suspect list regarding OC failures. Many researchers had posited that managers would seek change “to generate more sales and deliver more value to customers” while employees “do all they could to preserve the status quo in order to protect their turf, social position, and livelihood…” Hoag et al. (2002) write. “Perhaps surprisingly, our research has shown that the opposite is true: staff often see the need for change
and are anxious to just do it, but their managers seem to be unwilling or incapable of exercising the leadership required…”

“Some research argues that leaders never, rarely or only sometimes effectively implement change, describing leadership as a significant barrier or resister for change,” another team says (Appelbaum, Degbe, MacDonald, & Nguyen-Quang, 2015b).

The problems start at the top. “Senior management often agrees to improvement initiatives without completely realizing the investment required for the effort,” write Stelzer and Mellis (1998). In some organizations top managers assume that the initiative will occur without modification of other commitments.” In 2016 the CEO of a large multinational declared publically that a new effort would be completed many times faster than was technologically feasible (experience of the author).

“By attempting to lay down timetables, objectives and methods in advance it is suggested that the process of change becomes too dependent on senior managers, who in many instances do not have a full understanding of the consequences of their actions…” says By (2005).

Regarding adoptions of Total Quality Management, Kaynak (2003) writes, “Successful implementation of TQM requires effective change in an organization’s culture, and it is almost impossible to change an organization without a concentrated effort by management aimed at continuous improvement, open communication, and cooperation throughout the value chain.”

Managers play a key role in making their enterprises ready for change, Self and Schraeder (2009) assert. One study “observed that failing to select, train, and promote individuals equipped to deal with a changing environment could lead to a management team’s being ill-equipped to recognize the need for change, and then successfully guide the organization through the process of change.” Consultants in a case they cite recommended delaying a change until a resistant executive retired as scheduled.

A case study of a successful change says, “Top management has to be willing to dedicate substantial training resources to educate the workforce…” and, “Management behaviors have to change from autocratic to facilitative” (Paper, Rodger, & Pendharkar, 2001). In a survey of people in a variety of positions and industries in the U.S., “Success was more likely when the organizational change was sponsored by top management in conjunction with middle management,” and not likely when the sponsor was (just) the CEO/COO (Smith, 2002a). Respondents reported 75% of change projects “failed to make any dramatic improvement in the organization’s performance.”

A notable exception to this slew of indictments was one study finding top management support was not a critical success factor in adopting Agile for software (Chow & Cao, 2008). However, Agile methods often are implemented at the team and cross-team levels without involving upper management. The one study on large-scale Agile transformations determined management support was the most critical success factor (Dikert et al., 2016).

Management support also was not related to successful implementation of a productivity improvement system in a meta-analysis. However, the authors point out, without management support the implementation might never have started, or might have been stopped before study data was generated (Pritchard, Harrell, DiazGranados, & Guzman, 2008).
**Middle managers.** More concern is directed at line and middle managers (Marrewijk, 2018). “In a member survey, the Lean Enterprise Institute (LEI) found that more than 36 percent of the respondents attributed change failure to middle management resistance,” report Langstrand and Elg (2012). Oreg found in 2006 that managers in a defense company changing its structure were more likely to resist the change than nonmanagers, perhaps due to apathy after experiencing multiple change initiatives. Referring to direct managers in a case study of two law-firm mergers, “Interviewee reports included poor treatment by management and the impact of this on how interviewees felt both about themselves and about managers” (van Dijk & van Dick, 2009).

For OC success, middle managers must sell issues and concerns to top management, thus influencing strategy and trying to get action on unit priorities. They influence change efforts through “sense-making” with peers. And they can increase the odds of success by reducing workers’ negative reactions and increasing positive ones (Appelbaum et al., 2015b).

Taking a sympathetic tone, Stelzer and Mellis (1998) note that “middle management often find themselves caught in a trap. On the one hand they have to modify software processes, on the other hand they have to accomplish project objectives without affecting deadlines, milestones, budget restrictions, and functional requirements…” Giangreco and Peccei (2005) agree, observing that middle managers are “often simultaneously both the ‘victims’ (targets) and the ‘carriers’ (agents) of change.” They “are often required to transform their professional profile by shifting from more specific, technical roles to more generalist, managerial ones” while risking “their position in the hierarchy and their specific (technical or technological) expertise…” The utility they studied addressed the issue though a new selection process and training for middle managers. In a successful Agile transformation at Ericsson, leaders had to re-compete for their positions (Esser, 2017).

Paper et al. (2001) concur that middle managers must change their roles. “The biggest obstacle to execution was within the middle management ranks. Members of middle management were too used to being experts in a specific area.” They mention an operations manager who viewed all manufacturing problems as coming from materials flow, his area of expertise.

Relating political history to management, Brunninge (2009) said organizational history can “provide managers with an opportunity to engage in organizational politics by for instance seeking legitimacy in historical circumstances.” In fact, one reason managers my resist EBM is that, “The need to be explicit in evidence-based decision making means that those with vested interests in a particular course of action may find it more difficult to hide such interests” (Briner & Rousseau, 2011).

It might seem businesses small enough to have no middle managers are in better shape. “However, the widely held assumption that small businesses are, by definition, flexible should be treated with caution. (These) may lack flexibility where the organisation’s culture is dominated by an owner or chief executive who is inflexible and rigid,” says Wiesner et al. (2007). Their study sampling all small and medium enterprises in Australia found medium-sized businesses were more likely to have adopted high-performance work practices than small ones.

An Agile practitioner reported sources of middle manager resistance that fit the literature (Gerardi, 2018):
• “Disbelief that executive level is truly on board”
• “Removal of authority, without any removal of accountability”
• “Victims and perpetrators of churn”
• “Difficult to see connection between their contributions and value to the company”
• “Loss of identity”

Per Gerardi’s second bullet, some researchers suggest loss of power as a primary cause of managerial RTC. This was seen by “consultants at Burswood Resort Hotel in Western Australia who found that empowered actions and independent thinking were often frowned upon by supervisors who were more used to the existing structured hierarchy” (Appelbaum, Habashy, Malo, & Shafiq, 2012). Even in nonprofits, says Kovner (2014), “Management has to be persuaded and trained to convert from current decision-making processes to a new method.”

Organizations “are rife with day to day political bustle, characterized by powerful actors either revered or despised, groups vying for influence and subordinates contesting decisions. Rather than being an aberration, it seems that power is an endemic part of organizational life…” conclude Fleming and Spicer after their comprehensive review of power in management (2014). Along with obvious expressions, it “also infuses many of the systems, processes, ideas and even identities that organizations constitute,” at all levels of the organization. This issue can be a primary concern in Agile transformations, given that two of the Agile Manifesto principles explicitly call for employee empowerment: “Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done,” and, “The best architectures, requirements, and designs emerge from self-organizing teams.”

**Change agents.** Whether managers themselves or not, change agents have come in for scrutiny as well. “Change agents initiate and support the improvement projects at the corporate level,” Stelzer and Mellis (1998) explain. “They are individuals or teams external to the process that is to be improved.” Or as Ford et al. (2008) defines them, “those who are responsible for identifying the need for change, creating a vision and specifying a desired outcome, and then making it happen.”

Most research up to 2000 was from the perspective of the change agent, causing RTC to be seen as strictly negative, Pideret says. He points out that other studies have found positive reasons for resistance, including ethics and a desire to maintain high organizational performance. Ford’s team says resistance behaviors can be seen as an important form of feedback: “When agents are included in the resistance dialogue, the interesting question is no longer ‘Why do recipients resist change?’ but ‘Why do agents call some actions resistance and not others?’” Blaming RTC “absolves or mitigates agent responsibility for the unexpected negative aspects of change,” they write.

Pideret says “managers in charge of rolling out a change initiative blame others for the failure of the initiative, rather than accepting their role in its failure.” Of course, “Employees are likely to do the same thing—assigning blame for failed change attempts to their managers, rather than themselves.”
Creating resistance. Summarizing the literature, it seems managers and agents can create resistance, primarily through A) making assumptions about employee support levels; B) failing to make personal changes they claim to support; and/or C) failing to communicate accurately or enough. Regarding A, in the legal firm mergers, as many as 40% of the change agents thought no employees had concerns about the merger, even though around 85% did. “In the post-merger period, change leaders in neither firm recognized the extent or type of employee problems with the merger changes—they underestimated, and misinterpreted the reasons for, employee problems with the merger…” (van Dijk & van Dick, 2009). During a plant spin-off from a manufacturing firm, managers considered this a “paper change” with no significant impact and made minimal effort to communicate with line workers. The result was high levels of cynicism and low commitment to the change among workers (Walker, Armenakis, & Bernerth, 2007).

“Management should never assume that the reason resistance… is occurring is because people don’t like change,” Self and Schraeder write (2009). “To object in writing to a change initiative or to stand in front of management and verbalize it is an act of courage.”

In fact, managers experience the same reluctance. Observing the adoption of a new IT system at a Dutch airline, researchers noticed that, “Management seems to speak with a ‘double tongue.’” Project documents claimed support for the change, however “the interviews reveal that managers question the long-term benefits of the new system.” They stay quiet out of fear of creating employee RTC, or because they “believe that employees accept the formal message, but in fact most employees are skeptical because they sense the inconsistency” (Pieterse, Caniëls, & Homan, 2012).

A participant-observer study over four years in a university housing department spotted that problem. The directors articulated values around collaboration. “While many people in the organization would have said, ‘this is the way we would like to act around here,’ few would have said, ‘this is the way we do act around here’” the researcher says (Feldman, 2003).

Sussing out the truth of RTC would seem to be a primary task of change agents. Indeed, “Part of the challenge for a change leader is to identify the level of resistance, identify its causes, and take action to minimize its undesirable effects…” (Appelbaum, Degbe, MacDonald, & Nguyen-Quang, 2015a).

Reducing resistance. Two critical means of overcoming that challenge often intertwine: communication and employee participation. “Ineffective communication” was found to impact 56% of projects in a recent PMI survey of its members (PMI, 2017b), the most pervasive problem on the list—and this may be an underestimate, given managers’ misperception of the extent of RTC. “The timely and accurate provision of information, opportunities for participation, and the diffusion of trust in management’s vision underlying the change, have all been noted as potential alleviators of employees’ resistance to change,” one article summarizes (van Dam, Oreg, & Schyns, 2008). In their survey related to a merger, a worker’s relationship with their manager and the sense that growth was encouraged reduced RTC, via impacts on information spread, participation in decision-making, and trust in the managers.

The law-firm merger showed what happens when that kind of communication doesn’t occur (van Dijk & van Dick, 2009). Employees who were not part of the dominant firm or leading the change in some capacity reported:

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• “a ‘dictatorial’ leadership style of new management following the merger;
• “a lack of opportunities to feed back ideas; and,
• “Change Leaders’ disinterest in receiving staff suggestions about the merger changes.”

This “led them to withhold information, as they perceived their input would make no difference even if it was offered.”

Top managers at a British chemical manufacturer ran into resistance when they tried to implement Six Sigma. Much of it was based on misinformation, especially that Six Sigma only applied to larger organizations, so managers responded with communication and participation. “They consistently communicate this at various occasions and by various means (i.e. project kick-off meeting, root-cause analyses) throughout the project… The involvement and participation from the team members through the whole project fostered a common sense of ownership, which had a positive effect in terms of individual contribution and commitment to the project” (Pinedo-Cuenca, Gonzalez Olalla, & Setijono, 2012). The implementation raised throughput by 35%, and reduced variation by 21% and downtime by 45%.

Stelzer and Mellis (1998) write, “Intensive communication helps to rectify rumors, to preclude misunderstandings, to overcome resistance, and to dispel software engineers’ fears.” Among conference attendees they surveyed, Hoag et al. (2002) report, “Communication was seen as the channel through which the management influenced the organization's culture, whether positively or negatively.”

The problem of misinformation is regularly encountered by Agile coaches, such as developers who claim they do not have to do documentation based on a selective reading of the Agile Manifesto. A literature review on RTC (Pardo del Val & Martínez Fuentes, 2003) notes the various sources of “wrong initial perception” when a change is being formulated: “(a) myopia, or inability of the company to look into the future with clarity (Barr et al., 1992; Krüger, 1996; Rumelt, 1995); (b) denial or refusal to accept any information that is not expected or desired (Barr et al., 1992; Rumelt, 1995; Starbuck et al., 1978); (c) perpetuation of ideas, meaning the tendency to go on with the present thoughts although the situation has changed (Barr et al., 1992; Krüger, 1996; Rumelt, 1995; Zeffane, 1996); (d) implicit assumptions, which are not discussed due to its implicit character and therefore distort reality (Starbuck, Greve and Hedberg, 1978); (e) communication barriers, that lead to information distortion or misinterpretations (Hutt et al., 1995); and (f) organizational silence, which limits the information flow with individuals who do not express their thoughts, meaning that decisions are made without all the necessary information (Morrison and Milliken, 2000; Nemeth, 1997).” One of the three companies adopting Agile in a case study failed, because the team refused to use a core requirement of the method. “The reason… was that the team lacked the necessary knowledge and because management was not committed to organising or participating in planning meetings,” the authors say (Pikkarainen, Salo, Kuusela, & Abrahamsson, 2012).

When the change is driven from the top down, higher-level managers tend to support the change more than lower-level employees who participate “less in decision making (and) are less aware of the strategic goals…” (Appelbaum et al., 2015b). The quoted article makes the obvious point that top managers communicate more with other top managers, and encourages better two-way communication to reduce worker RTC by collecting feedback and allowing input.
This approach reflects one reason RTC can be positive. Ford et al. (2008) write, “the mere threat or anticipation of resistance can encourage change agents to adopt some of the management practices known to reduce resistance and strengthen change. These practices include communicating extensively, inviting people to participate, providing people with needed resources, and developing strong working relationships…” Each figures prominently in models for OC.

A Path to Enterprise Agile

Agile practitioners regularly lament difficulties with getting people outside of an Agile organization into “the Agile mindset.” The OC literature suggests change agents may have caused the problem by not involving those people from the start. One point to this review is to drive home how many things can go wrong in Agile transformations, and thus how critical robust OC management is for success.

A Sense of Purpose

A counseling psychologist writing about OC says resistance can arise in an individual when “they believe their needs are already being met” or “they believe (the change) is unnecessary to avoid or escape a harmful situation” (Hultman, 1995). The need for relevance is echoed by Stelzer and Mellis (1998): “It is essential that staff members understand the relationship between the objectives of software process improvement and revenues, cash flow, or other business results. Mere conformance to a standard, attaining certification, or reaching a CMM level usually is not a relevant goal for staff members.” The manufacturing spinoff study surmises, “It seems possible that management underestimated the impact of the change on the employees (and) spent little time explaining the change to the employees, therefore resulting in the low levels of affective commitment for change” (Walker et al., 2007).

Self and Schrader (2009) say, “Management must provide evidence that the current ways are no longer acceptable or appropriate if the organization is to remain successful or regain success.” From the law firm mergers, the researchers concluded a way to facilitate genuine two-way communication is to ensure the “objective is boss” (van Dijk & van Dick, 2009).

The Association of Change Management Professionals (ACMP) states the case firmly: “A misunderstood or incomplete change rationale may be one of the biggest risks in successfully gaining stakeholder adoption” (ACMP, 2014). Merely assuming everyone will understand the benefits of Agile and want to change is a precursor to failure.

Participation

One of the proven high-performance work practices from the HR leader study is “empowerment,” moving decision-making authority from managers to workers. The specifics range across studies from control over task and work products all the way up to leaderless teams, but generally delegation is a powerful predictor of higher financial and operational performance (Cappelli & Neumark, 1999; Combs, Liu, Hall, & Ketchen, 2006; Evans & Davis, 2005; Guest, 1997; Huselid, 1995; Kaynak, 2003; Kehoe & Wright, 2013; Laursen & Foss, 2003). Leadership styles that emphasize team empowerment were strongly correlated to higher performance in a meta-analysis (Stewart, 2006). An early study of Agile success factors (Dybå & Dingsøyr, 2008)
found only one definitive result: “it seems that a high level of individual autonomy must be balanced with a high level of team autonomy and corporate responsibility.”

It therefore should be no surprise that empowerment is a critical factor in successful OC efforts (Dikert et al., 2016; Erwin & Garman, 2010; Toussaint & Correia, 2018; van Dam et al., 2008). The telecomm study “supports the frequently made claim that broad involvement of organizational members that are affected by change is associated with success at implementation” (Lines, 2004). Specifically, “an authentic invitation to participate as a full member of the project/change team is the key mediating factor that link(s) participation to implementation success.” Upfront participation correlated to lower RTC and higher goal achievement. Strikingly, only having veto power over a change correlated with lower achievement.

A review of the antecedents to successful change (Giangreco & Peccei, 2005) concludes, “All the significant recent literature on the management of change… as well as most of the classic contributions on how to overcome resistance to change… consider involvement in the change as a critical factor for facilitating its acceptance and, thus, for reducing the incidence of RTC.” In their study, involvement in the decision-making reduced middle-manager RTC regardless of managers’ sense of the costs.

A Caterpillar plant management system “has in place an organizational structure conducive to cross-functional teamwork and a management structure designed for facilitation of empowered workers” (Paper et al., 2001).

John Kotter’s well-known OC model (presented below) seems to hold participation to a later point, but the evidence on participation suggests it needs to come as early as his Step 2, by including all impacted groups in the “guiding coalition” (Kotter, 1996). Letting this broader group develop the Agile “vision and strategy” and then communicate that information in peer-to-peer forums that encourage feedback (similar to Scrum team ceremonies) should greatly reduce negative resistance.

### A Systematic Approach

There is both evidence and strong expert sentiment that a systematic approach to change like Kotter recommends is vital. Agile writers and presenters correctly mention the need to customize a methodology to the organization, but miss the importance of the timing of that customization. There is little objective evidence regarding Agile, but the evidence from related fields suggests you should implement the methodology first, and then customize—not the other way around. PMI agrees. Its *Agile Practice Guide* advises, “adopt a formal agile approach, intentionally designed and proven to achieve desired results. Then take the time to learn and understand the agile approaches before changing or tailoring them. Premature and haphazard tailoring can minimize the effects of the approach and thus limit benefits” (PMI, 2017a).

In an early test of this approach, the 1948 study’s garment workers were split into three groups. One was merely told about a new job method; Group 2 also got a demo, and a subset ran a pilot test; and Group 3 adopted the method immediately. Group 1 resisted to the point of aggression against the manager, while Group 3 learned the new method the quickest, with the fewest problems. The Group 3 approach was then applied to Group 1, and its problems went away (Coch & French, 1948).
Several large studies of HR best practices agreed that adopting a number of these practices as a set outperformed picking-and-choosing. A meta-analysis of 92 studies covering 19,319 organizations determined having a set provided twice the financial and operational performance improvement of any one practice, due either to additive effects or synergies between practices (Combs et al., 2006). The most innovative Danish firms in another study had three or more such practices (Laursen & Foss, 2003). As quoted below, a review of all OC studies from 1990 to 1998 said skipping steps harmed results (Armenakis & Bedeian, 1999).

A survey of members from relevant professional groups found that “the interdependent nature of TQM practices helps explain why TQM has not produced maximum benefits for every company that has implemented it.” That is, companies that tried to leave out some practices did not get as much out of the change. Successful Honeywell and Caterpillar programs for manufacturing plants mandate systematic adoptions. For example, Caterpillar’s “provides a disciplined problem-solving approach and acts as a rallying point for everyone involved along the process path” (Paper et al., 2001).

A primary finding from a meta-analysis of 83 ProMES productivity method adoptions is that “when the original process is followed, the effect sizes are very large, and they drop off dramatically when the intervention deviates from this original process.” This could be causal, the authors say, or factors preventing full implementation might also reduce success (Pritchard et al., 2008). In their report on implementing holistic improvements to a healthcare system, two consultants emphasize, “Every nurse and doctor does not get to do it his or her own way. Standards are established about how the work is performed, and those standards are followed by all until a better way is determined collectively by the team” (Toussaint & Correia, 2018).

In Ericsson’s transformation to Agile, they found it important to, “Clarify which processes & tools are mandatory and which ones are optional” (Esser, 2017). One of the lessons Primavera Systems drew from its conversion to Agile was, “There aren’t many rules in Scrum, but you need to adhere to the ones that exist” (Schatz & Abdelshafi, 2005). Finally, the one journal review to date on large-scale Agile transformations (Dikert et al., 2016) concludes, “to successfully perform an agile transformation, it seems important to use a single approach as a starting point…”

Upfront customization seems best limited to the choice of Agile method and any decisions the method requires adopters to make. Beyond that, adopters should learn how to ride the bike before deciding what parts to remove or modify.

Models for Successful Change

Numerous models have been proposed for successful organizational change (Alexandrina, Lavinia, & Aurel, 2010; By, 2005; Ford & Ford, 2009; Gilley, Godek, & Gilley, 2009; Jacobs et al., 2015; Mullen, Bledsoe, & Bellamy, 2008; Olsson, Alahyari, & Bosch, 2012; Pinedo-Cuenca et al., 2012; Self & Schraeder, 2009). The 1990-98 OC lit review concluded, “it is obvious that the process used to plan and enact an organizational change is as important as the state of existing content and contextual factors. Two basic lessons underscored by all six of the implementation models reviewed are that (a) the change process typically occurs in multiple steps that take a considerable amount of time to unfold and efforts to bypass steps seldom yield a satisfactory result, and (b) mistakes in any step can slow implementation, as well as negate hard-
won progress” (Armenakis & Bedeian, 1999). These lessons appear supported by the subsequent research.

Accounting for “existing and contextual factors” was part of each model, so it seems safe for Agile practitioners to focus on the processes. Notice for example the first process group of the Standard for Change Management from the ACMP (2014):

1) “Evaluate Change Impact and Organizational Readiness”
2) “Formulate the Change Management Strategy”
3) “Develop the Change Management Plan”
4) “Execute the Change Management Plan”
5) “Complete the Change Management Effort”

Note that “change management” in this sense refers to organizational change, not to managing change within projects.

The various models have significant overlap with the ACMP approach. The most commonly cited across the studies in this review is Kotter’s, also the only one tested to see if research evidence supports it, the answer being mostly “yes” (Appelbaum et al., 2012). Kotter’s model as it appears in his book Leading Change (Kotter, 1996) follows, with the Appelbaum team’s findings summarized in parentheses:

1) “Establishing a Sense of Urgency” (supported)
2) “Creating the Guiding Coalition” (generally supported, though a case study “revealed the need for building multiple guiding coalitions on multiple occasions”)
3) “Developing a Vision and Strategy” (supported, though the implementation may be more important)
4) “Communicating the Change Vision” (supported, with studies emphasizing the need for face-to-face, two-way communication)
5) “Empowering Employees for Broad-Based Action” (supported, with “broad” including all levels of the hierarchy)
6) “Generating Short-Term Wins” (supported)
7) “Consolidating Gains and Producing More Change” (supported)
8) “Anchoring New Approaches in the Culture” (supported)

Appelbaum’s team stressed that an implementation of Kotter’s full model had not been tested (still true as of this literature review). Thus Kotter’s requirement to follow all eight steps in his original order remains unverified. It is also possible some steps may not be necessary in a given effort. For example, if the threat is apparent enough, a sense of urgency may already exist. Lines (2004) says one reason a telecomm conversion worked was the urgency was strong, given the competitive threat to the organization.
The Agile Transformation Model

A glaring issue for Agile practitioners viewing these models is their waterfall nature. The ACMP process groups are explicitly so. Though Kotter says his steps can overlap, he does not explain how to do so and, again, emphasizes the order. An Agile Transformation Model begs Agile terminology and methods.

Use Agile to Implement Agile

A poor change process can be a source of resistance separate from the change content, and change efforts meet the “high uncertainty” characteristic suggesting the use of Agile for a given project. Also, adults learn best by doing, so it seems logical to use disciplined Agile practices to run the change project. Thus instead of “steps,” the Agile Transformation Model presented below provides “epics” (“features”) prioritized in start order. Under Scrum, the team would break these down into “user stories” small enough to complete in one “iteration” or “sprint” of one to four weeks—not in advance, but only when ready to start on the epic.

Overlap and Iterate

As in any Scrum effort, nothing prevents the team from working on stories from lower-priority epics before higher epics are completed, and in fact that will be the norm. The epic order below reflects the Kotter, ACMP, and other models, and logic suggests the epics will be started and finished as prioritized. But in an Agile approach, there will be significant overlaps. For example, the change leader or initial sponsor will propose a purpose statement and success measures (Epic 5). However, participation and ownership will be enhanced if the other executives (Epic 6), and then the Change Team (Epic 7), are allowed to refine these prior to stakeholder evangelizing, and later on based on ongoing feedback. That feedback should be encouraged early and often throughout the effort, so initial Epic 11 stories to establish feedback mechanisms will be needed long before higher-ranked epics are completed.

Scrum calls for its sprint deliverables to be “done” to the degree they could be released to a customer. Typical OC artifacts like those in the ACMP Standard may not be needed in an Agile approach that de-emphasizes upfront planning. Those that remain cannot be completed in a sprint, nor can a method be chosen, but the “done” principle can still apply. Each relevant user story should focus on one small part of the final deliverable, with the understanding that a similar story may be done in a future iteration to update that part based on new information including feedback.

Foster Transparent, Two-Way Communications

Evangelize the change to all stakeholder groups with repeated communications through multiple channels, emphasizing consistent messages and leveraging peer-to-peer conversations. Include techniques that create psychological safety for speaking out, such as forums in which higher-level managers are not present and comments are reported as anonymous summaries. Treat initial RTC as a positive form of feedback, and revisit previous decisions if resistance remains significant.

Once the transformation begins, monitor and broadcast performance metrics to identify potential failure points and to communicate interim wins. Consider a digital Agile tool instead of wall
An Evidence-Based Model for Agile Organizational Change

charts to provide greater transparency and roll-up reporting. Use Scrum “demonstration ceremonies” to emphasize continuous achievements and again take feedback. Besides continuing the theme of participation, this will help prevent backsliding to old behaviors. Continue Epic 11 communication efforts until the “point of no return” is clearly reached, rather than assuming everyone is on board.

Eleven Epics to “Done”

Pulling all of this together suggests the following model for successful transformation to Agile across an enterprise. The model is meant to apply to any size of multi-team organization. In practice many Agile transformations begin as “emergent” bottom-up change. The model presented here assumes a “directed,” top-down change which may have emerged further down, but now requires a coordinated enterprise-wide effort to maximize benefits.

Again these should not be viewed as steps, but rather as epics prioritized in “start” order. The epics are written in a format accepted by many Agile methods (“As a user, I want... so that...”), and include the notes:

1) Define the Why—As a member of this organization, I want to know why a change in our work management is required, so I will feel motivated, instead of forced, to make the change.

   Note: A shared understanding of why a change to Agile is necessary helps to align efforts and reduce negative RTC.

2) Prepare a Sponsor—As the change leader, I want an enthusiastic supporter as high in the organization as possible, to ensure the necessary resources will be provided and a sense of urgency sustained.

3) Determine Organizational Readiness—As the stakeholders of the potential change, we want to determine if the organization is capable of and ready for Agile, to prevent wasted time and lost goodwill if not.

4) Specify the Objectives—As a stakeholder, I want to know how Agile success will be measured, to make it easier to sell the effort, celebrate small wins, define “done,” and prevent backsliding.

   Note: These should be objective metrics around factors like productivity, customer satisfaction, or issues the change means to address.

5) Foster Two-Way Communications—As change agents, we want to proactively seek input, squelch rumors, address concerns, and publicize successes, to prevent and reduce resistance throughout the project.

6) Build Broad Sponsorship—As the change sponsor, I want organizational leaders to understand the full implications and benefits of Agile for their functions, so they assist with instead of resist the change.

   Note: For example, Finance may need to switch to rolling forecasts; Sales to bonuses based on customer satisfaction rather than meeting deadlines; and IT to allowing or supporting Agile applications.
7) Create a Change Team—As the change sponsor, I want voting representatives from each stakeholder group to serve on an Agile Change Team, because letting the people who will implement the change influence that change greatly increases the odds of success.

8) Choose an Agile System—As stakeholders, we want a scaled Agile system that fits our needs, to gain the maximum benefits from the transformation.

   Note: Consider all of the available systems and choose one that seems to best suit the purpose of the change and your organizational resources, structure, history, culture, stakeholders, and environment.

9) Prepare Stakeholders and Teams—As the Change Team, we want to gain support among, and provide training to, all stakeholder groups and teams, to reduce resistance to the desired behavior changes.

10) Go “All-In”—As an organization, we want to implement our Agile system as quickly and completely as possible, to reduce resistance based on inertia and cynicism about change, and allow for shared learnings across teams.

   Note: An incremental adoption is fine, but should be by all teams at once and of the whole method (possibly after a pilot test to prove feasibility and value).

11) Customize through Experimentation—As Agile teams, after adoption of the Agile system, we want to experiment with changes one at a time, to balance the need for a systematic approach with the need for team empowerment.

   Note: This epic is “blocked”—cannot be started—until the metrics indicate success, and each team must continue to meet those metrics.

Critically, the last epic helps embed Agile in the culture. Using the Agile methodology to make further changes reduces the odds the system will be wholly abandoned. When all teams are meeting the metrics consistently, the change effort is “done.”

Discussion

Very little academic research has been conducted on large-scale Agile transformations. But evidence from the OC literature suggests much of the effort goes far beyond teaching Agile techniques like Scrum. Agile transformations require complex, long-term efforts to identify and address multiple barriers in and outside of the organization. The epics in the proposed model seem like the “best educated guess” for Agile change agents wishing to increase their odds of success. It may also provide a framework on which scholars can begin to build a research literature on Agile change.

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