DOING AGILE RIGHT

TRANSFORMATION WITHOUT CHAOS

BY DARRELL K. RIGBY, SARAH ELK, AND STEVEN H. BEREZ

Contents

FIGURE I-1

Number of research papers found addressing each question

| Yes | 91% | 74% | 63% | 93% | 89% |
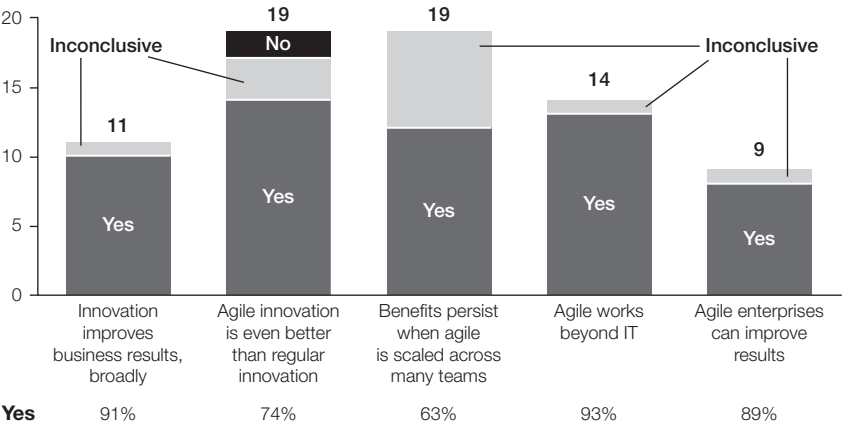
FIGURE 2-1

Flow efficiency is seldom better than 15–20 percent for most companies

Project 1

Project 2

Project 3

Project 4

Project 5

🏃 Work time

☐ Wait time

$$\text{Flow efficiency} \ = \ \frac{\text{Work time}}{\text{Work time} + \text{Wait time}}$$
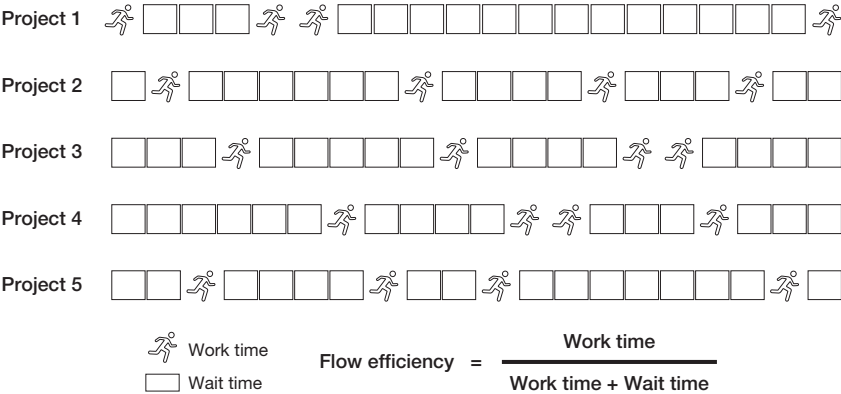
Data source: Daniel Vacanti, author of *Actionable Agile Metrics for Predictability: An Introduction*, and David J. Anderson, coauthor of *Kanban Maturity Model: Evolving Fit-for-Purpose Organizations*.
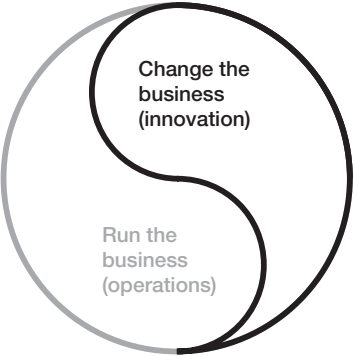
FIGURE 2-2

The yin and yang of business

Change the business (innovation)

Run the business (operations)

FIGURE 2-3

Simple user stories

As a: _____ (type of customer)

I want: _____ (desired solutions and experiences)

So that: _____ (customer goals; functional and emotional benefits)

FIGURE 2-4

More sophisticated user stories

As a: _____ (type of customer)

Struggling to: _____ (customer goals)

While: _____ (specific episode of the customer journey)

I am frustrated by: _____ (challenges and obstacles)

And often cope by: _____ (unsatisfactory workarounds)

I would love: _____ (desired experiences and definition of quality)

So that I can: _____ (desired functional and emotional benefits)

If you solve this, I would give up: _____ (competing alternatives)

Though I fear I would lose: _____ (benefits of alternatives)

And I worry that your solution might: _____ (perceived risks and adoption anxieties)

FIGURE 3-1

The agile golden mean

Impact

The agile
golden mean

Change benefits
Change costs

Net value of
change

Static—
change deficiency

Chaotic—
change excess

Agility

FIGURE 3-2

Typical conditions (top) and favorable agile conditions (bottom)

Impact

The agile golden mean

- Change benefits
- Change costs

Net value of change

Static— change deficiency

Chaotic— change excess

Agility

Impact

The agile golden mean

- Change benefits

Net value of change

Change costs

Static— change deficiency

Chaotic— change excess

Agility

FIGURE 3-3

Five kinds of metrics

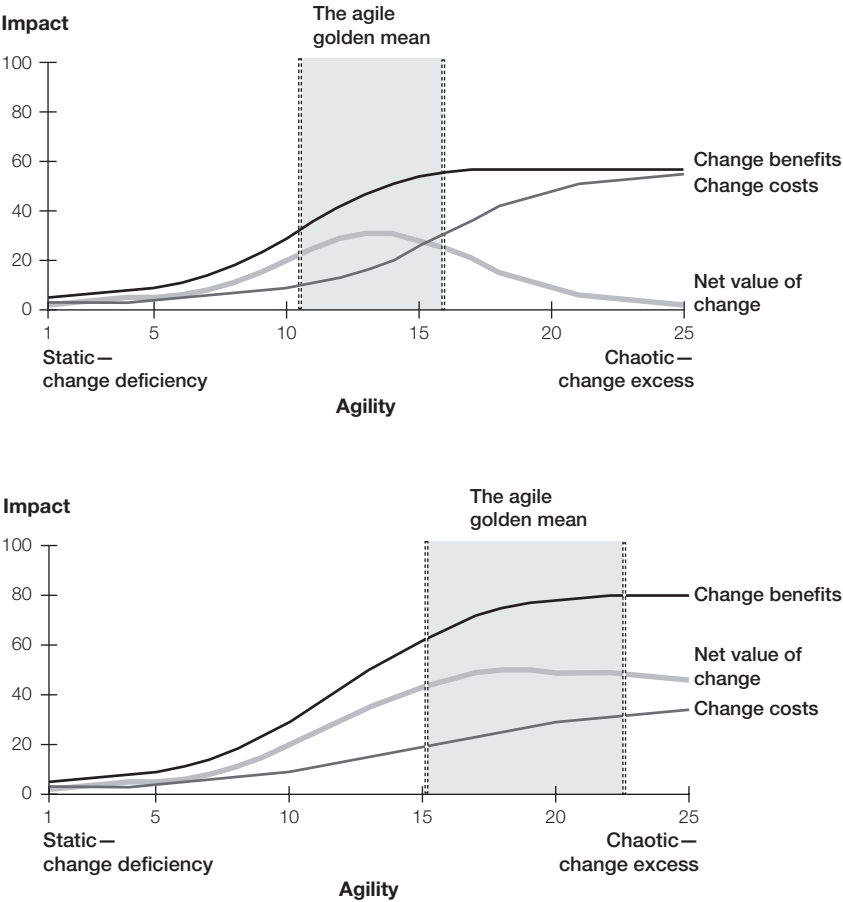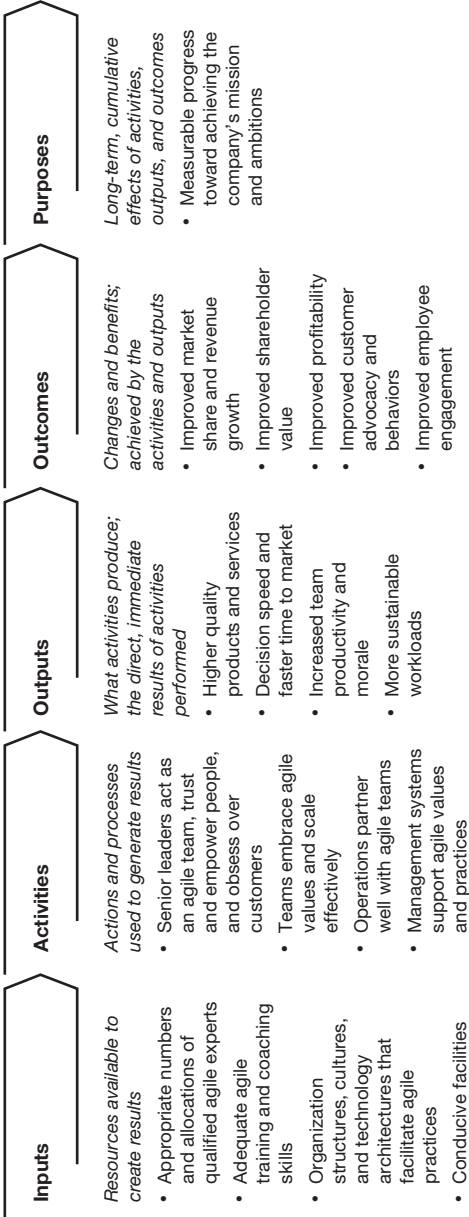| Inputs	Activities	Outputs	Outcomes	Purposes
Resources available to create results	*Actions and processes used to generate results*	*What activities produce; the direct, immediate results of activities performed*	*Changes and benefits; achieved by the activities and outputs*	*Long-term, cumulative effects of activities, outputs, and outcomes*
• Appropriate numbers and allocations of qualified agile experts	• Senior leaders act as an agile team, trust and empower people, and obsess over customers	• Higher quality products and services	• Improved market share and revenue growth	• Measurable progress toward achieving the company's mission and ambitions
• Adequate agile training and coaching skills	• Teams embrace agile values and scale effectively	• Decision speed and faster time to market	• Improved shareholder value	
• Organization structures, cultures, and technology architectures that facilitate agile practices	• Operations partner well with agile teams	• Increased team productivity and morale	• Improved profitability	
• Conducive facilities	• Management systems support agile values and practices	• More sustainable workloads	• Improved customer advocacy and behaviors	
			• Improved employee engagement	

Source: Adapted from the *W. K. Kellogg Foundation Logic Model Development Guide*, https://www.wkkf.org/resource-directory/resource/2006/02/wk-kellogg -foundation-logic-model-development-guide (accessed January 22, 2020).

8

FIGURE 3-4

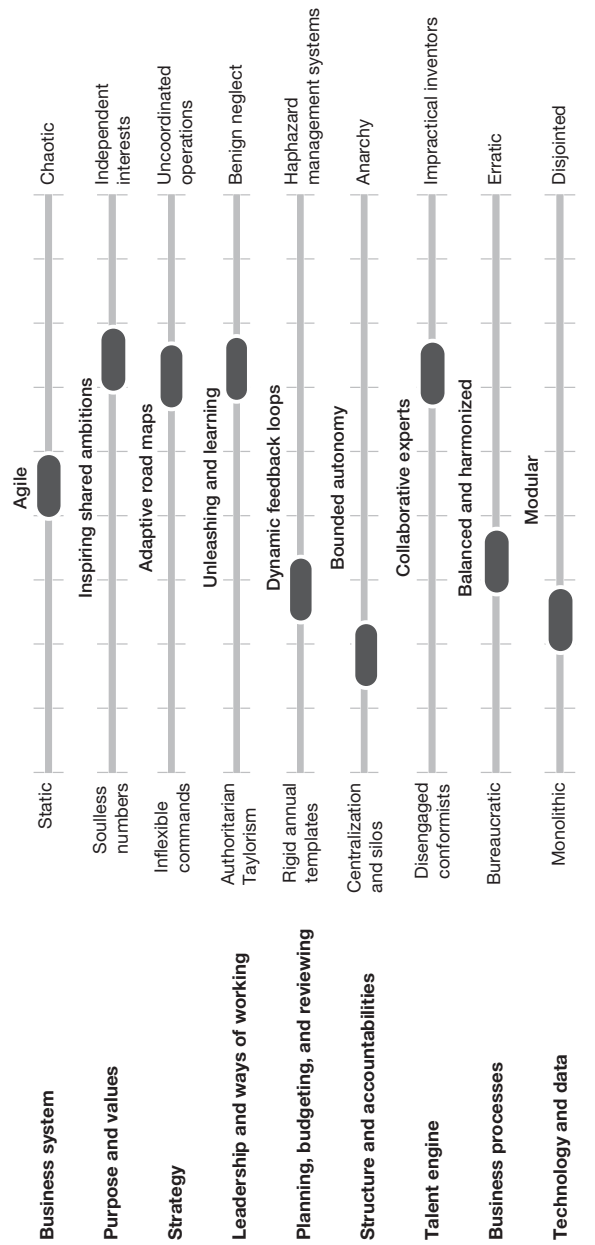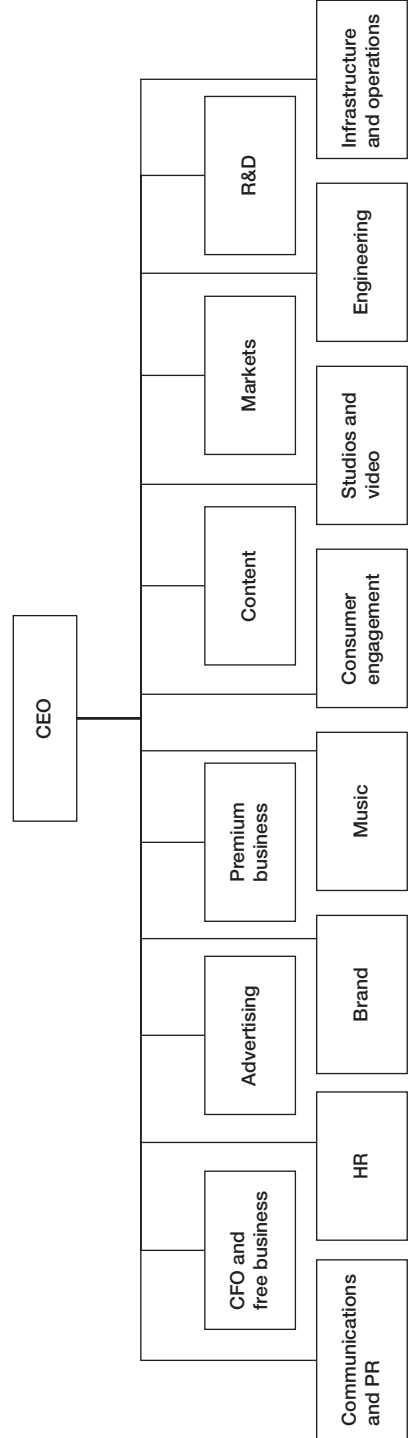# Balancing the agile enterprise operating model

Dimension	Left extreme	Balanced (agile)	Right extreme
Business system	Static	Agile	Chaotic
Purpose and values	Soulless numbers	Inspiring shared ambitions	Independent interests
Strategy	Inflexible commands	Adaptive road maps	Uncoordinated operations
Leadership and ways of working	Authoritarian Taylorism	Unleashing and learning	Benign neglect
Planning, budgeting, and reviewing	Rigid annual templates	Dynamic feedback loops	Haphazard management systems
Structure and accountabilities	Centralization and silos	Bounded autonomy	Anarchy
Talent engine	Disengaged conformists	Collaborative experts	Impractical inventors
Business processes	Bureaucratic	Balanced and harmonized	Erratic
Technology and data	Monolithic	Modular	Disjointed

9

FIGURE 6-1

Spotify organization chart

Source: "Spotify," The Official Board, https://www.theofficialboard.com/org-chart/spotify (accessed January 22, 2020).

FIGURE 6-2

What might the structure of an agile enterprise look like?
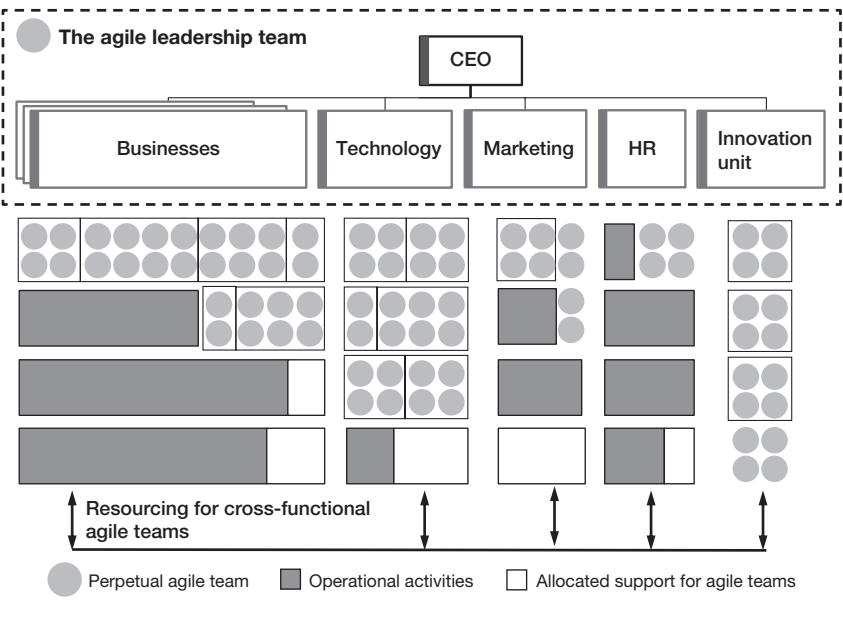
FIGURE 7-1
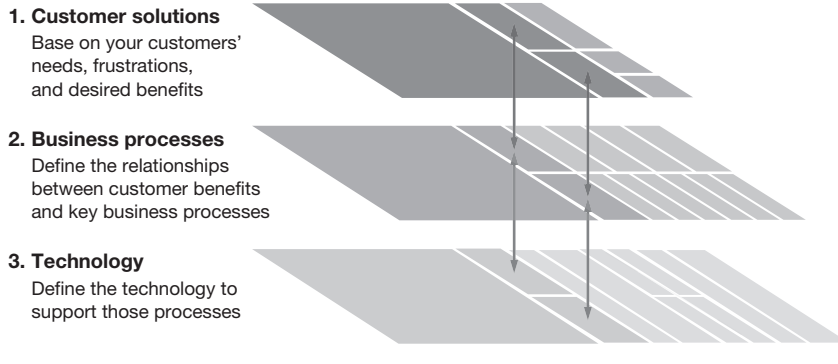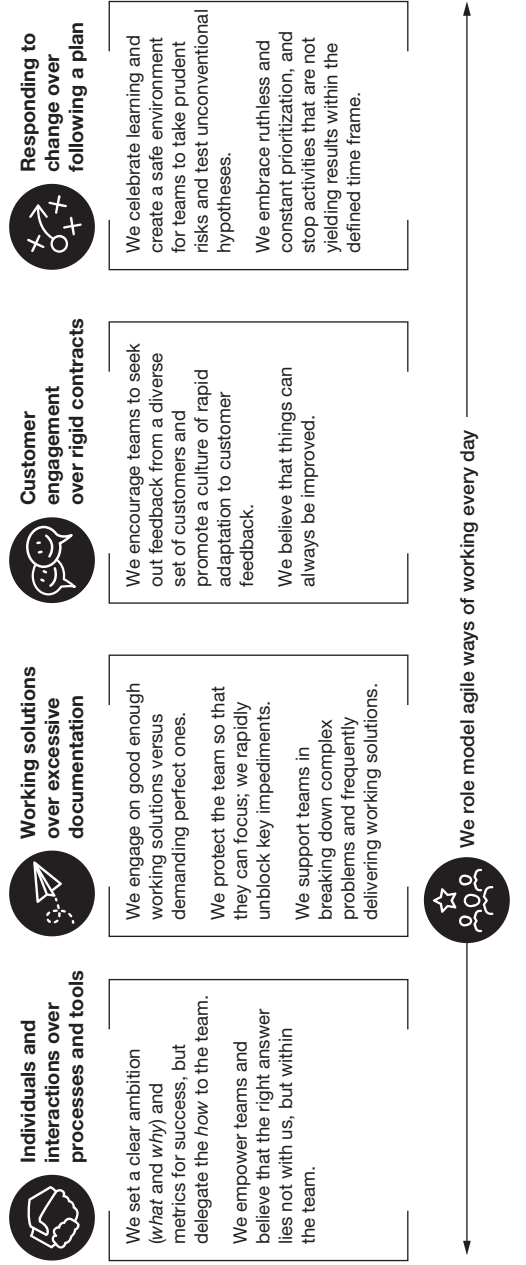
The taxonomy of opportunities aligns three components

1. Customer solutions
Base on your customers'
needs, frustrations,
and desired benefits

2. Business processes
Define the relationships
between customer benefits
and key business processes

3. Technology
Define the technology to
support those processes

An agile leadership team's manifesto

Individuals and interactions over processes and tools

We set a clear ambition (*what* and *why*) and metrics for success, but delegate the *how* to the team.

We empower teams and believe that the right answer lies not with us, but within the team.

Working solutions over excessive documentation

We engage on good enough working solutions versus demanding perfect ones.

We protect the team so that they can focus; we rapidly unblock key impediments.

We support teams in breaking down complex problems and frequently delivering working solutions.

Customer engagement over rigid contracts

We encourage teams to seek out feedback from a diverse set of customers and promote a culture of rapid adaptation to customer feedback.

We believe that things can always be improved.

Responding to change over following a plan

We celebrate learning and create a safe environment for teams to take prudent risks and test unconventional hypotheses.

We embrace ruthless and constant prioritization, and stop activities that are not yielding results within the defined time frame.

We role model agile ways of working every day

13

Works Cited

Innovation Improves Business Results, Broadly

Relationship Found

Atalay, Murat, Nilgün Anafarta, and Fulya Sarvan. "The Relationship between Innovation and Firm Performance: An Empirical Evidence from Turkish Automotive Supplier Industry." *Procedia—Social and Behavioral Sciences* 75 (April 3, 2013): 226–235. https://doi.org/10.1016/j.sbspro.2013.04.026.

> Product and process innovation positively and significantly affected firm performance.

Australian Bureau of Statistics. "Innovation in Australian Business, 2016–17." Australian Bureau of Statistics. Updated July 19, 2018. http://www.abs.gov.au/ausstats/abs@.nsf/0/06B08353E0EABA96CA25712A001 61216?Opendocument.

> Innovative businesses reported increased revenues, felt they gained a competitive edge, and had improved customer service.

Cho, Hee-Jae, and Vladimir Pucik. "Relationship between Innovativeness, Quality, Growth, Profitability, and Market Value." *Strategic Management Journal* 26 (April 11, 2005): 555–575. https://doi.org/10.1002/smj.461.

> Results show innovativeness mediates the relationship between quality and growth, quality mediates the relationship between innovativeness and profitability, and both innovativeness and quality have mediation effects on market value.

Jiménez-Jiménez, Daniel, and Raquel Sanz-Valle. "Innovation, Organizational Learning, and Performance." *Journal of Business Research* 64, no. 4 (April 2011): 408–417. https://doi.org/10.1016/j.jbusres.2010.09.010.

> Study shows that organizational learning and innovation contribute positively to business performance.

Kelly, Bryan, Dimitris Papanikolaou, Amit Seru, and Matt Taddy. "Measuring Technological Innovation over the Long Run." NBER Working Paper No. 25266, National Bureau of Economic Research, Inc., Cambridge, MA (November 2018). https://www.nber.org/papers/w25266.

> Breakthrough innovations corresponded with increased productivity across time periods, industries, and firms.

Linder, Jane C. "Does Innovation Drive Profitable Growth? New Metrics for a Complete Picture." *Journal of Business Strategy* 27, no. 5 (September 1, 2006): 38–44. https://doi.org/10.1108/02756660610692699.

Ranking based on financial data corresponds well to executives' self-reported information about how innovative their organizations are.

Minor, Dylan, Paul Brook, and Josh Bernoff. "Are Innovative Companies More Profitable?" *MIT Sloan Management Review*, December 28, 2017. https://sloanreview.mit.edu/article/are-innovative-companies-more-profitable/.

Study found a significant correlation between the ideation rate at companies and growth in profit or net income.

Nieves, Julia. "Outcomes of Management Innovation: An Empirical Analysis in the Services Industry." *European Management Review* 13 (March 21, 2016): 125–136. https://doi.org/10.1111/emre.12071.

Management innovation has a positive influence on product innovation and product innovation has a significant influence on financial performance.

Rajapathirana, R. P. Jayani, and Yan Hui. "Relationship between Innovation Capability, Innovation Type, and Firm Performance." *Journal of Innovation & Knowledge* 3, no. 1 (January–April 2018): 44–55. https://doi.org/10.1016/j.jik.2017.06.002.

Study supports assertion that companies with higher innovation capabilities are influenced positively and very strongly.

Shanker, Roy, Ramudu Bhanugopan, Beatrice I. J. M. van der Heijden, and Mark Farrell. "Organizational Climate for Innovation and Organizational Performance: The Mediating Effect of Innovative Work Behavior." *Journal of Vocational Behavior* 100 (June 2017): 67–77. https://doi.org/10.1016/j.jvb.2017.02.004.

Study shows that the relationship between organizational climate for innovation and organizational performance is significant.

Inconclusive

Youtie, Jan, Philip Shapira, and Stephen Roper. "Exploring Links between Innovation and Profitability in Georgia Manufacturers." *Economic Development Quarterly* 32, no. 4 (September 3, 2018): 271–287. https://doi.org/10.1177/0891242418786430.

Positive relationship between profitability and innovation in Georgia manufacturing in the 2005 survey, but no connection between innovation and firm performance in the 2010 and 2016 surveys.

Agile Innovation Is Even Better Than Regular Innovation

Relationship Found

Ambler, Scott W. "2013 IT Project Success Rates Survey Results." Ambysoft, January 2014. http://www.ambysoft.com/surveys/success2013.html.

> Agile, lean, and iterative strategies were superior on average to traditional and ad hoc strategies.

CollabNet VersionOne. *13th Annual State of Agile Report*. State of Agile, May 7, 2019. https://www.stateofagile.com/?_ga=2.258734218.1293249604 .1571223036-453094266.1571223036#ufh-c-473508-state-of-agile-report.

> Reported benefits of agile include ability to manage changing priorities, project visibility, business/IT alignment, time to market, increased productivity, and reduced project risk.

Fitzgerald, Brian, Gerard Hartnett, and Kieran Conboy. "Customising Agile Methods to Software Practices at Intel Shannon." *European Journal of Information Systems* 15, no. 2 (January 9, 2006): 200–213. https://doi.org/10.1057 /palgrave.ejis.3000605.

> Study investigated tailoring of the agile methods, eXtreme programming (XP), and Scrum, at Intel Shannon. Benefits included reductions in code defect density by a factor of 7 and faster project delivery.

Freeform Dynamics. *How Agile and DevOps Enable Digital Readiness and Transformation.* Freeform Dynamics, February 2018. https://freeformdynamics .com/software-delivery/agile-devops-enable-digital-readiness-transformation/.

> On average, agility masters reported 60 percent higher revenue growth and were 2.4 times more likely than peers to be growing at over 20 percent.

Johnson, Suzette, Richard Cheng, Stosh Misiazek, Stephanie Greytak, and James Boston. *The Business Case for Agile Methods*. Arlington, VA: Association for Enterprise Information, 2011. http://docplayer.net/5838794-The-business-case-for -agile-methods.html.

> Patriot Excalibur (PEX) software release cycle decreased from eighteen months to twenty-two weeks; BMC adoption of agile led to individual team productivity increases of 20 to 50 percent; adoption of agile helped US Census Bureau deliver mandated requirements 50 percent faster using a third of the staff of previous efforts.

Kakar, Adarsh K. "What Motivates Team Members and Users of Agile Projects?" *Proceedings of the Southern Association for Information Systems Conference* 17. Atlanta: Association for Information Systems (AIS), 2013. https://aisel.aisnet.org /sais2013/17.

Agile methods enhance the completion effect of project team members, motivating them to work toward completing the project.

Lo Giudice, Diego, Christopher Mines, Amanda LeClair, Luis Deya, and Andrew Reese. *The State of Agile 2017: Agile at Scale.* Forrester, December 14, 2017. https://www.forrester.com/report/The+State+Of+Agile2017+Agile+At+Scale/-/E -RES140411.

Benefits of agile include greater frequency of releases, improved customer experience, better business/IT alignment, improved functional quality, and higher team morale.

Przybilla, Leonard, Manuel Wiesche, and Helmut Krcmar. "The Influence of Agile Practices on Performance in Software Engineering Teams: A Subgroup Perspective." In *Proceedings of the 2018 ACM SIGMIS Conference on Computers and People Research*, 33–40. New York: Association for Computing Machinery, June 2018. https://doi.org/10.1145/3209626.3209703.

Daily stand-ups and retrospectives reduced levels of conflict and increased performance and satisfaction.

Reifer, Donald J. "How Good Are Agile Methods?" *IEEE Software* 19, no. 4 (2002): 16–18. https://doi.org/10.1109/MS.2002.1020280.

Benefits included improved productivity improvement (15–23 percent), cost reduction (5–7 percent), and time-to-market compression (25–50 percent).

Rico, David F. "What Is the Return on Investment (ROI) of Agile Methods?" Semantic Scholar. Accessed December 17, 2019. https://pdfs.semanticscholar.org /8e3d/c7208bc743037716f327ba98a7fcb1a69502.pdf.

Based on literature examined, use of agile methods results in increased cost-effectiveness, productivity, quality, cycle-time reduction, and customer satisfaction.

Scrum Alliance. *State of Scrum 2017–18 Report.* ScrumAlliance. Accessed December 17, 2019. https://www.scrumalliance.org/learn-about-scrum/state-of-scrum.

Ninety-seven percent of participants will continue to use Scrum in the future. Benefits of agile adoption include improved satisfaction with what gets delivered, better time to market, better quality, improved staff morale, and improved return on investment in IT.

Serrador, Pedro, Andrew Gemino, and Blaize H. Reich. "Creating a Climate for Project Success." *Journal of Modern Project Management* 6 (2018): 38–47. https://doi.org/10.19255/JMPM01604.

> Senior management support, stakeholder engagement, fully dedicated teams, support for agile methods, frequent meetings with product owners, and a good team attitude related to project success.

Serrador, Pedro, and Jeffrey K. Pinto. "Does Agile Work? A Quantitative Analysis of Agile Project Success." *International Journal of Project Management* 33, no. 5 (July 1, 2015): 1040–1051. https://doi.org/10.1016/j.ijproman.2015.01.006.

> Agile methods have a positive impact on efficiency and overall stakeholder satisfaction.

Standish Group. *CHAOS Report: Decision Latency Theory: It's All about the Interval.* Boston: Lulu.com, 2018. https://www.standishgroup.com/store/.

> Agile projects are three-fifths more likely to succeed (425 percent vs. 26 percent) and one-third as likely to fail (8 percent vs. 21 percent).

No Relationship Found

Budzier, Alexander, and Bent Flyvbjerg. "Making Sense of the Impact and Importance of Outliers in Project Management through the Use of Power Laws." In *Proceedings of International Research Network on Organizing by Projects at Oslo* 11 (June 1, 2013). New York: SSRN, 2016. https://ssrn.com/abstract=2289549.

> The group adopting more agile methodologies did not significantly differ in their median cost, schedule, or benefits performance.

Magazinius, Ana, and Robert Feldt. "Confirming Distortional Behaviors in Software Cost Estimation Practice." In *Proceedings of the 37th EUROMICRO Conference on Software Engineering and Advanced Applications*, 411–418. Institute of Electronics and Electronics Engineers, November 3, 2011. https://doi.org/10.1109/SEAA.2011.61.

> Examined the variation between agile and nonagile companies and found that the success in meeting time and budget goals and the causes of failures was not significantly different between the two methodologies.

Inconclusive

Dybå, Tore, and Torgeir Dingsøyr. "Empirical Studies of Agile Software Development: A Systematic Review." *Information and Software Technology* 50, nos. 9–10 (August 2008): 833–859. https://doi.org/10.1016/j.infsof.2008.01.006.

> Four studies showed a 42 percent increase in productivity for the agile team compared to traditional, but quality of the studies was low.

Eveleens, Johan, and Chris Verhoef. "The Rise and Fall of the Chaos Report Figures." *IEEE Software* 27, no. 1 (January–February 2010): 30–36. https://doi.org/10.1109/MS.2009.154.

> Criticizes the Standish chaos report methodology, a frequently cited report on the benefits of agile.

Lindvall, Mikael, Vic Basili, Barry Boehm, Patricia Costa, Kathleen Dangle, Forrest Shull, Roseanne Tesoriero, et al. "Empirical Findings in Agile Methods." In *Extreme Programming and Agile Methods—XP/Agile Universe 2002*, 197–207. Berlin: Springer, 2002. https://doi.org/10.1007/3-540-45672-4_19.

> Benefits to adopting agile included improvements in customer collaboration, handling defects, and estimation. Limitations included perceived inefficiency of pair programming and lack of attention to design and architectural issues.

Benefits Persist When Agile Is Scaled across Many Teams

Relationship Found

Atlas, Alan. "Accidental Adoption: The Story of Scrum at Amazon.com." In *Agile 2009 Conference*, 135–140. Institute of Electronics and Electronics Engineers, September 25, 2009. https://doi.org/10.1109/AGILE.2009.10.

> From 2004 to 2009, Scrum spread to a large portion of the software development teams at Amazon. Key success factors for adoption included culture, small team size, internal champions, and training.

Brown, Alan W. "A Case Study in Agile-at-Scale Delivery." In *Agile Processes in Software Engineering and Extreme Programming. XP 2011. Lecture Notes in Business Information Processing* 77, 266–291. Berlin: Springer, 2011. https://doi.org/10.1007/978-3-642-20677-1_19.

> Describes scaling agile at a bank. Initial eight pilots showed improvements in productivity and quality.

Fry, Chris, and Steve Greene. "Large Scale Agile Transformation in an On-Demand World." In *AGILE 2007*, 136–142. Institute of Electronics and Electronics Engineers, August 27, 2007. https://doi.org/10.1109/AGILE.2007.38.

> Describes Salesforce.com's adoption of agile at scale. In an organizational survey, 80 percent believe that the new development methodology is making their team more effective.

Furuhjelm, Jörgen, Johan Segertoft, Joe Justice, and J. J. Sutherland. "Owning the Sky with Agile." Global Scrum Gathering, San Diego, California, April 10–12, 2017. https://www.scruminc.com/wp-content/uploads/2015/09/Release-version_Owning-the-Sky-with-Agile.pdf.

> Through scaling agile, Saab Defense delivered aircraft at lower cost, with higher speed, and with greater quality.

Jørgensen, Magne. "Do Agile Methods Work for Large Software Projects?" In *Agile Processes in Software Engineering and Extreme Programming. XP 2018. Lecture Notes in Business Information Processing* 314: 179–190. Cham, Switzerland: Springer, 2018. https://doi.org/10.1007/978-3-319-91602-6_12.

> Projects using agile methods performed on average much better than those using nonagile methods for medium and large software projects.

Kalenda, Martin, Petr Hyna, and Bruno Rossi. "Scaling Agile in Large Organizations: Practices, Challenges, and Success Factors. *Journal of Software: Evolution and Process* 30, no. 10 (May 16, 2018). https://doi.org/10.1002/smr.1954.

> Global software company succeeded in scaling agile by tailoring the process to the needs of the company, maintaining an agile mindset, and having experienced agile team members.

Knaster, R., and D. Leffingwell. *SAFe 4.0 Distilled: Applying the Scaled Agile Framework for Lean Software and Systems Engineering*. Boston: Addison-Wesley, 2017.

> Cites various companies achieving improvements in quality, productivity, employee engagement, faster time to market, program execution, alignment, and transparency by adopting Scaled Agile Framework (SAFe) to scale agile.

Korhonen, Kirsi. "Evaluating the Impact of an Agile Transformation: A Longitudinal Case Study in a Distributed Context." *Software Quality Journal* 21 (November 1, 2012): 599–624. https://doi.org/10.1007/s11219-012-9189-4.

Nokia Siemens Networks increased visibility, increased ability to react to changes in requirements, improved quality of the software development, and increased employee motivation.

Lagerberg, Lina, Tor Skude, Pär Emanuelsson, Kristian Sandahl, and Daniel Ståhl. "The Impact of Agile Principles and Practices on Large-Scale Software Development Projects: A Multiple-Case Study of Two Projects at Ericsson." In *2013 ACM / IEEE International Symposium on Empirical Software Engineering and Measurement*, 348–356. Institute of Electronics and Electronics Engineers, December 12, 2013. https://doi.org/10.1109/ESEM.2013.53.

Implementation of agile was found to contribute to knowledge sharing, correlate with increased project visibility and coordination effectiveness, and possibly increased productivity.

Paasivaara, Maria, Benjamin Behm, Casper Lassenius, and Minna Hallikainen. "Large-Scale Agile Transformation at Ericsson: A Case Study." *Empirical Software Engineering* 23 (January 11, 2018): 2550–2596. https://doi.org/10.1007/s10664-017-9555-8.

Describes how Ericsson introduced agile in a new R&D product development program while simultaneously scaling it up aggressively. Key success factors included having an agile mindset, making gradual changes (vs. big bang), and customizing the scaling method to the company.

Schnitter, Joachim, and Olaf Mackert. "Large-Scale Agile Software Development at SAP AG." In *Evaluation of Novel Approaches to Software Engineering. Communications in Computer and Information Science*, 209–220. Berlin: Springer, 2011. https://doi.org/10.1007/978-3-642-23391-3_15.

SAP scaled agile to 18,000 developers in twelve global locations. Though implementation was difficult, agile significantly improved transparency and informal communication.

Vaidya, Aashish. "Does DAD Know Best, Is It Better to Do LeSS or Just Be SAFe? Adapting Scaling Agile Practices into the Enterprise." Presented at the Pacific Northwest Software Quality Conference, Portland, OR, October 20–22, 2014. http://www.uploads.pnsqc.org/2014/Papers/t-033_Vaidya_paper.pdf.

Cambia Health Solutions rolled out Scrum and other agile practices across more than forty teams. Benefits include improved delivery process and quality practices.

Inconclusive

Bjarnason, Elizabeth, Krzysztof Wnuk, and Björn Regnell. "A Case Study on Benefits and Side-Effects of Agile Practices in Large-Scale Requirements Engineering." In *Proceedings of the 1st Agile Requirements Engineering Workshop*, 1–5. New York: ACM, 2011. https://doi.org/10.1145/2068783.2068786.

Results indicate that agile practices (at least partly) remedy several challenges and issues related to traditional requirements engineering in large-scale software development, though they also pose new challenges.

Conboy, Kieran, and Noel Carroll. "Implementing Large-Scale Agile Frameworks: Challenges and Recommendations." *IEEE Software* 36, no. 2 (March–April 2019): 44–50. https://doi.org/10.1109/MS.2018.2884865.

Describes challenges to scaling agile and offers recommendations to mitigate them.

Dikert, Kim, Maria Paasivaara, and Casper Lassenius. "Challenges and Success Factors for Large-Scale Agile Transformations: A Systematic Literature Review." *Journal of Systems and Software* 119 (September 2016): 87–108. https://doi.org/10.1016/j.jss.2016.06.013.

Identifies challenges and success factors for large-scale agile transformations.

Moe, Nils, Bjørn Dahl, Viktoria Stray, Lina Sund Karlsen, and Stine Schjødt-Osmo. "Team Autonomy in Large-Scale Agile." ScholarSpace, January 8, 2019. https://doi.org/10.24251/HICSS.2019.839.

Identified barriers to team autonomy when scaling agile and suggested ways to mitigate them.

Paasivaara, Maria. "Adopting SAFe to Scale Agile in a Globally Distributed Organization." In *Proceedings of 2017 IEEE 12th International Conference on Global Software Engineering*, 36–40. Institute of Electronics and Electronics Engineers, July 17, 2017. https://doi.org/10.1109/ICGSE.2017.15.

Describes how Comptel, a globally distributed software development company, adopted the SAFe framework in two business lines. The second business line was more successful due to learnings from the first business.

Paasivaara, Maria, and Casper Lassenius. "Scaling Scrum in a Large Globally Distributed Organization: A Case Study." In *2016 IEEE 11th International Conference on Global Software Engineering*, 74–83. Institute of Electronics and Electronics Engineers, September 29, 2016. https://doi.org/10.1109/ICGSE.2016.34.

Commercially, agile transformation was a success, but team lacked agile mindset, did not adopt all important practices suggested by the LeSS framework, and interteam coordination was insufficient.

Paasivaara, Maria, Casper Lassenius, and Ville T. Heikkilä. "Inter-Team Coordination in Large-Scale Globally Distributed Scrum: Do Scrum-of-Scrums Really Work?" In *Proceedings of the 2012 ACM-IEEE International Symposium on Empirical Software Engineering and Measurement*, 236–238. New York: ACM, 2012. https://doi.org/10.1145/2372251.2372294.

> Scrum-of-Scrum meetings involving representatives from all teams were severely challenged. Interteam meetings where participants have joint goals and interests were more effective.

Agile Works beyond IT

Relationship Found

CMG Partners. *Sixth Annual CMO's Agenda: The Agile Advantage*. CMOs Agenda, 2013. https://cmosagenda.com/always-always-agile.

> Benefits of adopting agile in marketing include improved speed, ability to adapt, productivity, prioritization, and ability to deliver customer-centric outcomes.

Fryrear, Andrea. "State of Agile Marketing." AgileSherpas. Accessed December 18, 2019. https://www.agilesherpas.com/state-of-agile-marketing-2019/.

> Thirty-two percent of participants are adopting at least some parts of agile methodologies in marketing; 50 percent plan to adopt agile in the next year. Benefits include ability to adapt, improved quality, and faster speed.

Furuhjelm, Jörgen, Johan Segertoft, Joe Justice, and J. J. Sutherland. "Owning the Sky with Agile." Global Scrum Gathering, San Diego, California, April 10–12, 2017. https://www.scruminc.com/wp-content/uploads/2015/09/Release-version _Owning-the-Sky-with-Agile.pdf.

> Saab Defense has adopted an agile process to address the issue in both hardware and software teams to produce a new multirole strike fighter, the JAS 39E Saab Gripen. It was delivered at lower cost, with higher speed, and greater quality.

McFarland, Keith R. "Should You Build Strategy Like You Build Software?" *MIT Sloan Management Review* 49, no. 3 (2009): 69–74. https:// sloanreview.mit.edu/article/should-you-build-strategy-like-you-build-software/.

> Shamrock Foods Company, a food distributor, successfully implemented a spiral planning model, an agile approach to strategic planning.

Petrini, Stefano, and Jorge Muniz Jr. "Scrum Management Approach Applied in Aerospace Sector." Presented at the IIE Annual Conference, Montreal, Canada, May 31–June 3, 2014.

The adoption of Scrum in system testing of aircraft parts showed improved efficiency, adaptability, visibility, and employee motivation.

Raubenolt, Amy. "An Analysis of Collaborative Problem-Solving Mechanisms in Sponsored Projects: Applying the 5-Day Sprint Model." *Journal of Research Administration* 47, no. 2 (2016): 94–111. https://files.eric.ed.gov/fulltext /EJ1152255.pdf.

The Office of Finance and Sponsored Projects at the Research Institute at Nationwide Children's Hospital conducted a five-day design sprint session to redesign a reporting process. The sprint feedback was overwhelmingly positive: all teams indicated they would recommend the sprint model to solve future problems.

Scheuermann, Constantin, Stephan Verclas, and Bernd Bruegge. "Agile Factory—An Example of an Industry 4.0 Manufacturing Process." In *2015 IEEE 3rd International Conference on Cyber-Physical Systems, Networks, and Applications*, 43–47. Institute of Electronics and Electronics Engineers, September 21, 2015. https://doi.org/10.1109/CPSNA.2015.17.

Describes the successful development of an Agile Factory prototype to transfer agile software engineering techniques to the domain of manufacturing.

Serrador, Pedro, and Jeffrey K. Pinto. "Does Agile Work?—A Quantitative Analysis of Agile Project Success." *International Journal of Project Management* 33, no. 5 (July 2015): 1040–1051. https://doi.org/10.1016/j.ijproman.2015.01.006.

Data sample of 1,002 projects across multiple industries, countries, and project types showed that the greater the agile/iterative approach reported, the higher the reported project success.

Skinner, Ryan, Mary Pilecki, Melissa Parrish, Lori Wizdo, Jessica Liu, Chahiti Asarpota, and Christine Turley. *Agile Methodology Embeds Customer Obsession in Marketing*. Forrester, July 1, 2019. https://www.forrester.com/report/Agile+Me thodology+Embeds+Customer+Obsession+In+Marketing/-/E-RES139938.

Provides examples of companies adopting agile principles and practices in marketing. Benefits include improved focus, speed to market, ability to respond to change, and realism about team capacity.

Sommer, Anita Friis, Christian Hedegaard, Iskra Dukovska-Popovska, and Kenn Steger-Jensen. "Improved Product Development Performance through Agile/Stage-Gate Hybrids: The Next-Generation Stage-Gate Process?" *Research-Technology Management* 58 (December 28, 2015): 34–45. https://doi.org/10 .5437/08956308X5801236.

The five companies that implemented Agile/Stage-Gate hybrids reported significant positive effects including improved efficiencies, reduced process iterations, improved visibility, better defined goals, decreased customer complaints, increased team ownership and morale.

Sutherland, Jeff, and J. J. Sutherland. *Scrum: The Art of Doing Twice the Work in Half the Time*. New York: Crown Business, 2014.

> Provides examples of companies successfully adopting Scrum in various functions and industries. For example, Scrum was deployed in schools in the Netherlands resulting in a 10 percent improvement in test scores.

van Solingen, Rini, Jeff Sutherland, and Denny de Waard. "Scrum in Sales: How to Improve Account Management and Sales Processes." In *Agile 2011 Conference*, 284–288. Institute of Electronics and Electronics Engineers, August 20, 2011. https://doi.org/10.1109/AGILE.2011.12.

> Benefits of adopting Scrum in sales and account management included increased revenue, team self-motivation, and predictability of sales.

Willeke, Marian H. H. "Agile in Academics: Applying Agile to Instructional Design." In *Agile 2011 Conference*, 246–251. Institute of Electronics and Electronics Engineers, August 30, 2011. https://doi.org/10.1109/AGILE.2011.17.

> Applying agile to curriculum design increased productivity and employee motivation.

Inconclusive

Ahmed-Kristensen, Saeema, and Jaap Daalhuizen. "Pioneering the Combined Use of Agile and Stage-Gate Models in New Product Development—Cases from the Manufacturing Industry." *Proceedings of Innovation & Product Development Management Conference*, Copenhagen, Denmark, June 14–16, 2015. https://pdfs.semanticscholar.org/a53d/1f7909c01c8626b8da9dfa5ae7214f6e658b.pdf.

> Agile enabled faster identification of the need to change a requirement, and improved informal knowledge sharing. Challenges included understanding how to remain agile and welcome changes in design requirements while adhering to strict regulations.

Agile Enterprises Can Improve Results

Relationship Found

Appelbaum, Steven, Rafael Calla, Dany Desautels, and Lisa N. Hasan. "The Challenges of Organizational Agility: Part 2." *Industrial and Commercial Training* 49, no. 2 (February 6, 2017): 69–74. https://doi.org/10.1108/ICT-05-2016-0028.

> Organizational agility enables employees to respond proactively to unexpected environmental changes, but it's difficult. It requires changes in leadership, decision-making dynamics, skills, and interpersonal relationships.

Business Agility Institute. *2019 Business Agility Report: Raising the B.A.R.*, 2nd ed. Business Agility Institute. https://businessagility.institute/learn/2019 -business-agility-report-raising-the-bar/.

> Reported benefits from business agility include increased customer satisfaction, greater employee satisfaction, and improved market performance.

Denning, S. *The Age of Agile: How Smart Companies Are Transforming the Way Work Gets Done*. New York: AMACOM, 2018.

> Provides examples of agile enterprises (or companies on the path to becoming agile enterprises) and their success due to improved quality, innovation, and speed-to-market.

Glenn, Marie. *Organisational Agility: How Business Can Survive and Thrive in Turbulent Times*. Economist Intelligence Unit, CFO Innovation, March 1, 2010. https://www.cfoinnovation.com/organisational-agility-how-business-can-survive -and-thrive-turbulent-times.

> Nearly 90 percent of executives surveyed believe that organizational agility is critical for business success. Cites research suggesting agile firms grow revenue 37 percent faster and generate 30 percent higher profits than nonagile companies.

Project Management Institute. "Achieving Greater Agility: The People and Process Drivers that Accelerate Results." Project Management Institute, September 2017. https://www.pmi.org/learning/thought-leadership/pulse/agile-project.

> Organizations with high agility report more projects meet original goals and business intent; experience more revenue growth, with 75 percent reporting a minimum of 5 percent year-over-year; and are more likely to execute on critical people and process drivers.

Saha, Nibedita, Ales Gregar, and Petr Sáha. "Organizational Agility and HRM Strategy: Do They Really Enhance Firms' Competitiveness?" *International Journal of Organizational Leadership* 6 (2017): 323–334. https://doi.org/10.33844 /ijol.2017.60454.

> Study suggests increased awareness (sensing agility), responsiveness (decision–making agility), and organization promptness (acting agility) promote individual competence, organizational learning, and organizational innovativeness.

Sutherland, J. J. *The Scrum Fieldbook: A Master Class on Accelerating Performance, Getting Results, and Defining the Future*. New York: Currency, 2019.

> Describes examples and the benefits of becoming a Renaissance enterprise, a company that scales Scrum throughout the organization.

Yang, Chyan, and Hsian-Ming Liu. "Boosting Firm Performance via Enterprise Agility and Network Structure." *Management Decision* 50 (June 22, 2012): 1022–1044. https://doi.org/10.1108/00251741211238319.

Results show that a firm's agility capability and its network structure are critical to firm performance. In addition, firms with superior enterprise agility are better able to exploit the network structure.

Inconclusive

Ries, Eric. *The Startup Way: How Modern Companies Use Entrepreneurial Management to Transform Culture and Drive Long-Term Growth*. New York: Currency, 2017.

Provides examples of companies adopting agile and entrepreneurial principles across their organization to grow revenue and drive innovation; however, GE, a prominent example in the book, has faced historic stock decline since adopting lean start-up practices.