

## Chapter 12

# Orchestrating the C3 Journey of the Digital Enterprise

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### ABSTRACT

*As businesses embrace digital technologies and drive business growth, this transformation demands a reimagination of their products, processes, and work beyond just “digitalization.” The enterprise starts by capturing diverse sensor data and integrates just-in-time data to achieve “connected” stage. It further uses data along with contextual intelligence to drive integrated decisions in “collaborative” stage. It aspires to share decision making between machines and humans and evolves into “cognitive” stage. In this C3 journey—connected to collaborative, further to cognitive—enterprises need to take advantage of innovative technologies across machines, facilities, and operations in the ecosystem of products, processes, and partners. The authors highlight the nuances and opportunities across the C3 journey focusing on manufacturing value chains. Customers can orchestrate their C3 journey using innovative digital solutions outlined here for information sharing and interactive analytics that will deliver best business results with data-driven decisions.*

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## **INTRODUCTION: C3 JOURNEY IN DIGITAL TRANSFORMATION**

Since the beginning of the 21st century, advances in information and communication technologies (ICT) have fueled a “digital transformation” of all different industry operations and all aspects of society. These digital technologies enable the business goals of most enterprises, such as accelerating production efficiency, product design, revenue growth and customer reach, delivering better competitive advantage. Further digitalizing products and processes can improve cost-effectiveness and provide a high-quality customer experience (Tata Consultancy Services [TCS], 2018). However, across the breadth of the enterprises, minimal collaboration among multiple partners (involved in producing and delivering a product or service to customers), aging automation infrastructure, lack of digital standards along with risk-averse concerns about data and intellectual property security are critical issues in the rate of adoption of digital technologies and the realization of sustained improvement in productivity, revenue or quality.

As businesses embrace digital technologies and address major roadblocks, they recognize that this transformation demands a reimagination of their products, processes and work beyond just digitalization, wherein current solutions are inadequate. In this journey, they need to take advantage of innovative technologies across machines, facilities and operations at various levels of their ecosystem of products, processes and partners. Most enterprises in their digital journey will be working with diverse partnering teams and systems that are possibly in different states of C3 evolution – Connected, Collaborative or Cognitive, each evolving to its next level (Figure 1). The most vibrant ecosystems continue to refine their links to get more relevant data, to refine and speed up contextual integration, and to further automate their execution of more complex environments. In the following paragraphs, we further detail the Connected, Collaborative, and Cognitive states.

Enterprises typically will collect and track data across multiple devices and systems, then integrate contextual insights and analyze their relations to manage performance metrics of the ecosystem. Such a business system achieves a “Connected” state, which enables real-time data, drives quick alerts and warnings to manage disruption or variation, and presents alternatives visible to the stakeholders.

Over time and across the locations in this connected network, multiple teams can further share and update necessary information, verify ongoing assumptions, and rebalance competing performance metrics using interactive scenario analytics. In such a “Collaborative” state, business teams can leverage easy-to-use platforms and interfaces to share and validate the single view of truth through challenging each other’s intuition, confirming insights, and converging to the best business decisions.

As the partners in their digital journey of using connected data and converging to the best decisions, they can further share the load of decision making with the sensors and devices. The historical sensor data, events and decisions can guide opportunities for automated actions to address certain frequent but low risk issues while the learnings gained by the team along with manipulation of both physics-based and data-driven models can provide more intelligent ways to handle complex challenges. In this evolution of teams sharing decision making with sensors, a business system attains “Cognitive” state simplifying its daily work load and further leveraging self-healing fixes for anticipated issues.

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