How to build a strong foundation for digital transformation

An engineering and construction perspective

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The construction industry is highly fragmented and aggressive with adversarial culture permeating all levels. As a result, mainstream information technology has been slow in penetrating effectively into the Engineering and Construction (E&C) sector and the maturity of information processes in most of the E&C companies in US (E&C companies in other parts of the world are way behind US market in terms of Project Management and Control processes) is still rudimentary. Even companies with annual revenues up to one billion are operating with minimal information technology (rely on spreadsheets and manual processes) and have not yet adopted even enterprise systems for their business processes. This situation provides a significant challenge to the adaptation of latest advancements like Digital Analytics, Artificial Intelligence, Internet of Things, etc. to bring efficiency to the E&C sector.

The management of construction projects is a complex process. Every project is unique in terms of its organization, nature of contract, type of construction, local requirements and construction methodology. Due to this complexity and the project management team setup, information processing and communication using latest advances in information technology is critical and essential for efficient project management and control. The inherent complexity of information flows in construction projects has always posed a challenge for implementing seamless integrated enterprise software systems to cater to needs of all stakeholders.

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Major players in the industry are upgrading and adopting commercial software systems meeting the requirements of individual functions, instead of implementing comprehensive corporate-wide solutions. Hence, most of them have different maturity levels in their various functions and business divisions. Due to this situation, IT software systems of several functions in a typical business division or in a project lacks data synchronization and hence, lacks seamless data integrity. The Corporate and Project Management struggle to trust the information received as there is no single source of truth.
Business transformation through a comprehensive evaluation process is almost few decades old in Banking, Finance, Manufacturing, Retail markets, but is still a very new vision for the E&C industry. Senior management in the E&C industry lack the needed appreciation for a comprehensive transformation, needed belief in IT bringing overall business efficiency, and hence, are unwilling to allocate the budget needed.

How to make a change?

The best way to achieve the desired overall Project Management and Controls integration in an E&C organization is to have a comprehensive evaluation process of the Current State, Gap Analysis with respect to industry best practices and desired Future State, and development of a corporate-wide Target Operating Model (TOM) to be implemented in phases (See Figure 1).

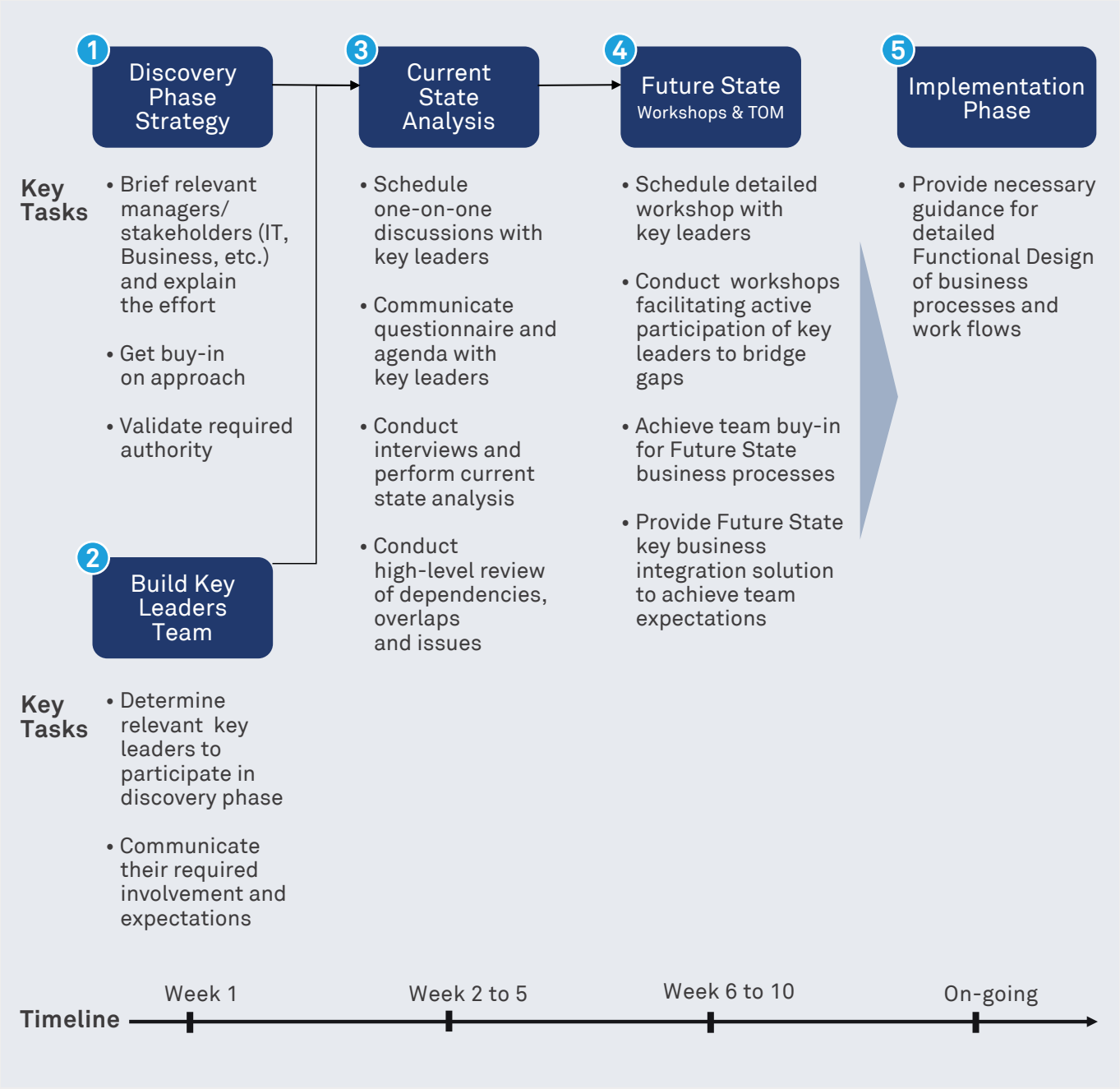

Figure 1: Discovery, gap analysis & TOM plan

Discovery - Current State

Most important is to get thorough alignment with the senior management of the organization with clear directions to all divisions and functions to contribute effectively in the transformation process. A systematic discovery process needs to be carried out by conducting workshops/surveys with key leaders and one-on-one interviews with subject matter experts to identify and understand the current practices (process, service delivery, data, reporting, dashboard, analytics, and enabling technologies).

Outcome of this discovery process is a clear understanding of the current state of the organization with respect to business processes, in-house software applications, IT maturity, state of existing integration and willingness to adopt latest innovations.

Gap Analysis & TOM

Future State requirements gathering is achieved through workshops conducted with key stakeholders by sharing and demonstrating the best practices used in the industry and evaluating the existing business processes to determine which processes need to be enhanced, which need to be modified, which need to be replaced and which need to be implemented. It also includes conducting one-on-one meetings with subject matter experts, functional department managers and project managers to understand the desire and extent of the changes expected in the Future State business processes.

Gap Analysis is an iterative process evaluating comprehensive Future State requirements solicited from the organization with respect to the Current State process, software applications and existing integrations.

With a detailed understanding of the gap, the extent of transformation journey the organization needs to go through is charted.

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A well-developed TOM provides the following details:

- Performance metrics defining key metrics, data, and measurement processes required to ensure that the Operating Model is effective and is delivering benefits
- The set of processes demonstrating how various functions and locations interact, how work is executed and where hand-offs occur
- The technology details outlining the services, applications and infrastructure supporting the business
- The cultural transformation indicating the values, norms and beliefs that drive how people in the organization act, and the skills and capabilities required
- The modification in the organizational structure, locations of where activities occur, and the mechanism by which implementation and changes to the Current State will be managed
- The clarity defining which activities will be performed within the organization, by other parts of parent groups, and by external parties

Final workshops are conducted with executive and management to achieve clear alignment with the recommendations included in the TOM and to facilitate decisions on the key challenges. Based on the feedback, the TOM is revised, risk mitigation strategy developed, change management plan defined and roadmap for implementation finalized. All the transformational processes are prioritized into phases (Immediate-Short, Short-Medium and Medium-Long Term) with clear timelines to achieve them through detailed functional design and subsequent implementation processes (See **Figure 2** - Given elements can change with respect to every project).

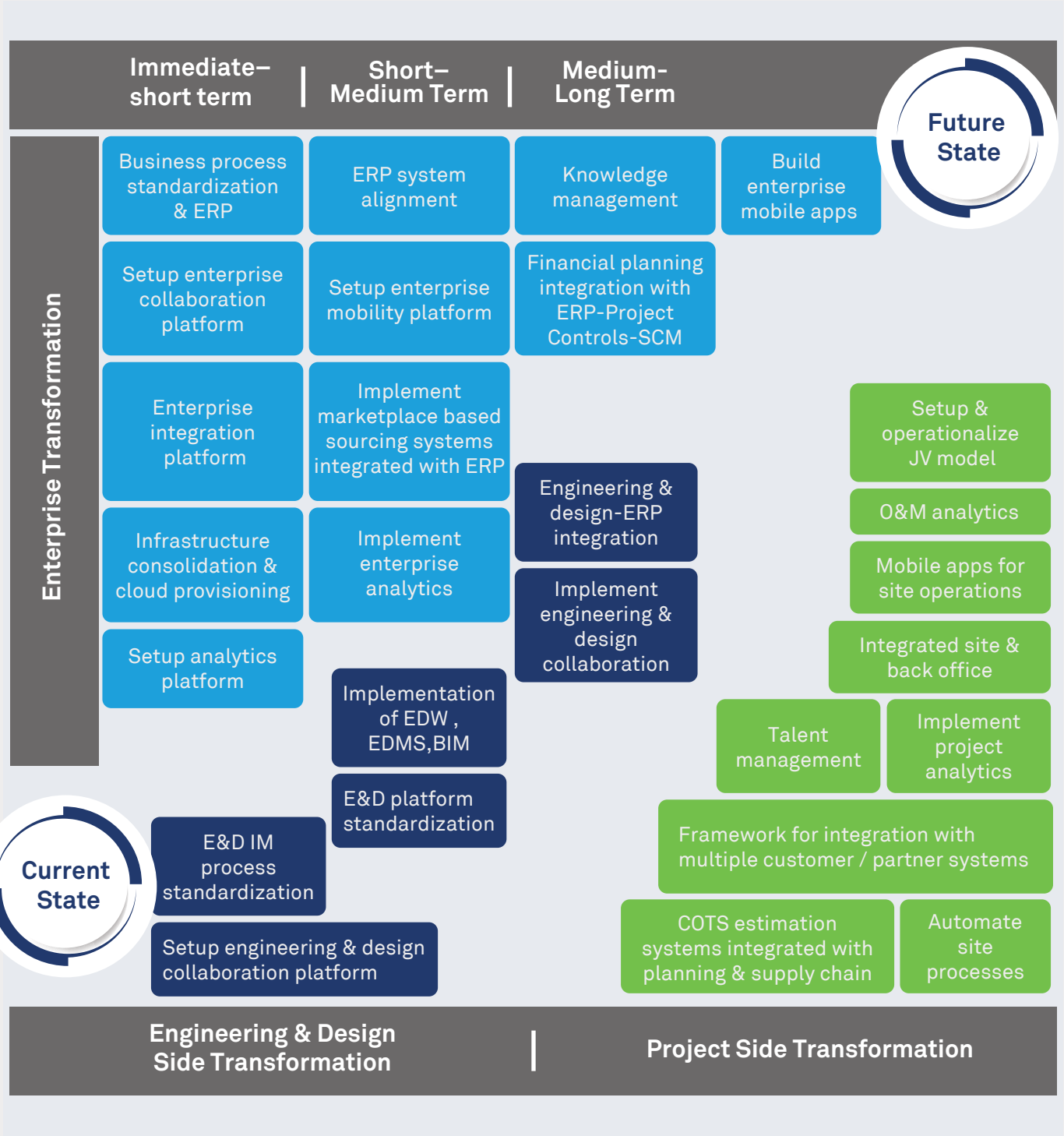

Figure 2: Phased path from current state to future state

Moving away from irregular functional approach that results in different maturity levels in the organization and adopting a comprehensive Discovery, Gap Analysis and TOM roadmap will help E&C companies join the essential wave of digital innovation and transformation shaking up the traditional processes in the industry.

About the author

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Harish has more than three decades of experience in the International Construction industry (14 years in US, 10 years in Middle East, 3 years in Australia, 2 years in Canada and 4 years in India). He has spearheaded several construction projects and his core competencies lie in mining and metal projects, transmission lines, fossil and nuclear power projects, high rise building and infrastructure projects, and oil, gas and petrochemicals projects. Harish, a graduate in Civil Engineering and a postgraduate in Industrial Structures, completed MS in Construction Management from Purdue University, West Lafayette, US.

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IND/BRD/JUL 2017-JUN 2018