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Why Industrial Project Definition Needs to be Split in Stages

Splitting project definition in several stages is a common approach for industrial project owners. There are generally as a minimum 3 main stages: concept, preliminary feasibility and detailed feasibility (also called bankability). Why is the project definition phase thus split in stages and what are the rationale and benefits of such a practice? How can agile project management suggest improvements to the current practice? This White Paper discusses the philosophy of splitting the project definition phase in stages.

Introduction

While industrial project execution is generally performed as a single phase due to the need for continuity of the project value chain and the long lead time of key hardware equipment and material, project definition is generally performed in several stages. Those stages are separated by in-depth governance reviews, which may result in stopping the project, or in redefinition of a scope for the next stage accompanied by an authorisation for expenditure for that stage. Each stage requires an increased commitment of resources (people and funding): it is therefore essential to achieve sufficient maturity at the end of a stage before committing to the next (or deciding to kill it due to circumstances, risk or business case).

Project definition is in most cases a paperwork exercise with no concrete commitment (with the exception of very long lead items in some industries, and the possible need to setup a pilot plant for innovative processes), where various options are progressively rationalised to arrive at the best value proposition for the project. This phase is thus adapted to a more agile approach to project management. Still, project definition teams do not fully implement agile recommendations which could increase effectiveness.

Project definition stages as an agile approach

The agile project management philosophy is to define clear short-term targets accompanied by a commitment to achieve them at the end of the agile run. This ensures maximum engagement and productivity of key contributors. Between each run, targets can be rediscussed and adjusted based on feedback from project stakeholders and environment, or on the actual difficulties encountered in developing certain aspects of the project.

The iterative nature of the project definition phase is well suited to an agile approach, whereby project governance and financiers can review the outcome of each stage and decide how they should be amended for the next iteration. The conventional staged approach can thus be seen as an application of the agile philosophy.

However, agile generally recommends stages to be as short as possible. Project definition stages can last months. What is the rationale for such a duration of each iteration?

Justifying the duration of project definition stages

At the conclusion of each project definition stage a consistent description of the project is required that covers numerous areas from the business case to some level of design maturity and preparedness for the next stage. Producing a consistent vision of the project across many different disciplines is an essential task in itself. In the meantime, each discipline must progress its project definition level with actions that typically take several weeks or months. This explains why project definition stages typically last several months. In addition, the duration of governance review and decision-making has to be included in the overall cycle time; these can take some time in particular if a number of stakeholders are involved. Therefore, the usual duration of several months is justified.

Locally shorter iteration cycle times

This does not prevent shorter iteration cycle times in certain disciplines or on certain topics which require a particularly iterative development. Typical examples include process-related R&D and testing. Agile approaches can then also be used with a much faster cycle time while remaining consistent with the overall stage duration. Intermediate milestones can be defined accordingly.

About the number of project definition stages

We observe that while the minimum number of project definition stages is generally 3:

- a quick concept stage to filter out opportunities,
- a preliminary definition stage to confirm feasibility and final decision parameters,
- a detailed definition stage to reach a sufficient definition level to have acceptable uncertainty levels at Final Investment Decision stage

However, some organisations do have more stages as a standard, or some projects require more stages. Additional stages generally include:

- more stages at the preliminary definition level, in particular when innovative processes are involved or

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when options have to be progressively resolved while avoiding excessive parallel development

- an intermediate stage between the end of the detailed feasibility stage and the effective final investment decision, involving the authorisation for early works, in particular when long lead items or activities are required.

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particular if contractors need to be mobilised to carry out some studies or activities.

One other key element is to be very clear from the outset of one stage about the objectives and deliverables that are expected at its conclusion.

Summary

Project definition stages can be seen as runs in an agile iterative approach, where

the opinion of key clients and stakeholders is obtained at the end of each run to adapt the objectives of the next. It is useful to consider project definition in that manner because it explains much of the actual practices implemented and highlights the need to be strict on the actual duration of each stage and on the clarity of the deliverables that are expected. It also emphasises how stakeholder feedback at the end of each stage will inform the expectations for the next stage of project definition.

Thus, it can be useful to adapt the stages to the circumstances of the project.


Agile learnings that improve project definition

Agile teaches us that it is essential to be very strict on the timing of each iteration and to let sufficient time to determine the exact objectives of the next run. Therefore, as an essential performance parameter, it is important to avoid the temptation to lengthen development stages beyond the expected duration.

This discipline can only be achieved if there is proper anticipation of what will be required for the next stage in

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