

Complex Project management

A project is a temporal endeavor composed of a set of tasks that are coordinated into achieving a particular result. It is designed to execute on the organization's strategy. Tasks are integrated into processes to ensure the work is coordinated and completed within a given set of constraints such as time, quality, scope and budget. In other words, projects have a set of boundaries that define them and take place within a particular environment.

Like organizations, projects are systems. They can be simple, linear systems or complex systems. In this section we are going to talk about the qualitative difference between the two, so as to understand why we need a fundamentally different approach to our traditional project management methods. We will start by talking about the nature of linear standardized projects with some examples.

Moving house is an example of a simple standardized project. It is a relatively straightforward process. We know the current state to the system (our present house with all our things in it). We know the desired end result (the house we are moving to with all our things there). The environment within which our moving house project will take place is relatively stable and predictable. Thus the project simply consists of completing a very limited number of well-defined stages in a sequential order.

There are of course many examples of more complicated projects. Building an airplane is a good example of a complicated project. There are many parts, many instructions that need to be followed exactly, and many stages that need to be completed over a prolonged period of time. But although complicated, it is still a linear deterministic project. We know the starting state, the desired end state, and we can decompose the project into a clear set of sequences that follow a deterministic linear projection.

So let's itemize the key features to standardized projects so that we are clear about them.

Firstly, we are dealing with a well define project

With these standardized projects, the statement of work, the scope of the project and its boundaries are reasonably well defined. We know where we are, and we know where we want to go.

Secondly, the project can be decomposed

The project can be decomposed into a set of stages and these stages can be performed in isolation and then recombined to produce the end result.

Thirdly, the environment is relatively stable and predictable

The environment is unchanging and there are a limited number of elements interacting in a well-known linear fashion, making extreme events, extremely unlikely.

Fourthly, standardized procedures can be applied

We can use a project management methodology that has been developed and undergone continuous improvements after use on several previous projects. We are able to use best practices and lessons learned. We follow the well-defined life-cycle phases, and we have forms, templates, checklists, and guidelines to assist through each phase.

Much of our project management methods were developed during the industrial age to deal with projects of this nature and have proven effective and scalable in delivering large-scale industrial projects, from building national power grids to landing people on the moon. The problem arises when we have to deal with more complex situations, which is increasingly the case. So let's start with an example of a complex project.

One example of this might be trying to improve the standard of living within a particularly disadvantaged area of a city. We are dealing with many diverse elements from crime prevention to education to public services, infrastructure, social workers and so on, multiple stakeholders who have disparate opinions about the current state of the system and its desired future state.

Added to this, the neighborhood represents a unique social, cultural and economic mix that would reject any standardized process or procedure for altering it. The environment within which the project takes place may be dynamic and volatile, a financial crash may occur within the broader economy or there may be a major change in the political regime. Lastly, we are dealing with a whole system. Optimizing any component in isolation would be of limited value in achieving our desired outcome. We would need to work across traditional boundaries creating synergies to tackle interdisciplinary problems from different dimensions.

So let's analyze this project a bit more to untangle what makes it truly complex instead of just complicated.

To start with, we are not exactly sure where we are and where we are going with the project

In complex projects we do not have complete information and knowledge of the system we are dealing with. We may be starting the project with an ill-defined scope, thereby requiring numerous scope changes throughout the project and, consequently having a moving target as an end point. In such a case we have to take a step and then see where we are and what the goal is and then readjust.

The outcomes cannot be envisaged at the inception of the project then delivered as planned, but constant adaptation is required.

Secondly, complex and volatile environments

As with our example previously, complex projects are open to their environment, meaning they are interdependent on and embed within larger systems. Projects may be subject to constant and volatile change. Change in technologies, change in the business and market environments, change in organizational structures and policies, and change among the project's key stakeholders and the strategic directions, which are often outside the direct control of the project team. As we have seen in previous lectures these complex environments are nonlinear, meaning there is also a much higher likelihood of extreme events occurring

Thirdly, standard procedures cannot be used

Complex projects are more like living organism than machines for which we can have instruction manuals. They have to evolve over time in response to the particular local conditions, and they may go through phase transition into new unpredictable states.

Lastly, complex projects cross traditional boundaries and deal with multiple diverse stakeholders

There is often a complex social dimension to large projects. Governance will appear in the hands of the many rather than in the hands of the few. Stakeholders may represent widely divergent political, cultural and social values and beliefs. Within this environment there is a strong need to create a context for common understanding of objectives. Communications and stakeholder analysis become central.

In summary

In this section we have looked at our traditional approach to project management that is designed for standardized, well-defined endeavors within predictable and stable environments. We have talked about the key features to complex projects such as the uncertainty in defining our objective, meaning we have to take an adaptive flexible approach, the changing environment within which they take place and their holistic and interdisciplinary nature.

Nearly all large and many small projects exhibit characteristics of complexity, but in our VUCA world as we are challenged to redesign and reengineer our industrial systems of organization, complex projects are everywhere from food security, to building cities and reducing carbon emissions. In the next section we will look at their source what we call wicked problems.