

Efficiency Improvement in Infrastructure Migration Projects through Communication, Scheduling and Control

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Abstract— The article introduces a very interesting example of improving the project efficiency via simple project management tools communication and control. In this case study the project manager takes over the project with delay. The execution of the project scope within timing and budget seems to be “mission impossible”. We will see if we apply the appropriate planning, significantly improve communication and apply continuous control we can close a successful project.

Keywords—project management, infrastructure migration, communication, planning, scheduling, control

I. INTRODUCTION

In my previous article “How to turn issues into project success” I reflected the wider definition of the project success. We will see in this article a similar example how to win from a loser position. This time I would like to highlight the importance of the appropriate application of three project management tools: communication, scheduling and control.

II. THE IRON TRIANGLE

In the modern corporate landscape, a project is typically “bound” or constrained by three elements, which may be expressed in different ways. The triple constraint theory, also called the Iron Triangle in project management, defines the three elements (and their variations) as follows:

- Scope, time, budget
- Scope, schedule, cost
- Good, fast, cheap

While the names of the three elements of the triangle may change, they all measure essentially the same thing: a fixed budget, a fixed schedule or timeline, and a fixed set of expectations or deliverables.

The triangle comes into play when something affects one of its “legs.” If that happens, you may need to adjust one or both of the other elements to accommodate the change. For example, if a client suddenly shortens a time frame, then a project will likely need more resources, or perhaps a scope reduction.

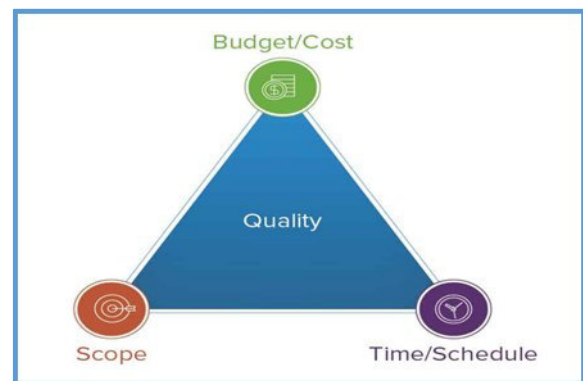


Figure 1: The project management triangle of scope, time and cost

The Iron Triangle can be considered the model of the hard skills of program and project management. **What makes these hard skills effective is the communication around the Iron Triangle topics.**

III. COMMUNICATION

A. The information transfer model

Shannon was an American mathematician, Electronic engineer and Weaver was an American scientist who worked for Bell Telephone Labs in the United States. Dr. Shannon was working on methods to decrease the noise on a telephone call while increasing the clarity of the person speaking on the phone.

In 1948 both of them join together to write an article in “Bell System Technical Journal” called “A Mathematical Theory of Communication” and also called as “Shannon-Weaver model of communication”.

This communication model is the information transfer model. The information transfer model is also known as the transmission model.

Shannon and Weaver's original mathematical model contains five elements:

1. An information source, which produces a message.
2. A transmitter, which encodes the message into signals.

3. A channel, for which signals are adapted for transmission.
4. A receiver, which reconstructs the encoded message from a sequence of received signals and decodes it.
5. An information destination, which processes the message.

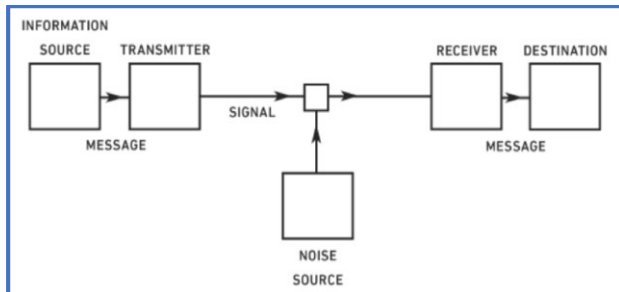


Figure 2. The information transfer model

This is a very simple and general model, also called as a mother of all communication models. It is effective in reducing the noise in the communication channel while intensifying the signal. The transmission model of communication describes communication as sending and receiving information.

The biggest issue with the Shannon Weaver Model of Communication is that when we transfer information, when we transmit that communication, we're assuming that understanding has occurred.

In the real project management life we really need to rethink about when we do communicate, has understanding occurred?

B. The emergence model of communication

The second communication model is the emergence model created by Dr. Nicholas Luhmann in 1934. Dr. Niklas Luhmann was a prolific writer of many books, report articles, and lectures. He attributed his creative success to the creation of his Zettelkasten, which we can almost consider an early version of the Internet. He would take notes and connect them in a specific numbering scheme. Using his numbering scheme, he could connect ideas and thoughts into new insights and theories. The Zettelkasten is the inspiration for Dr. Luhmann's emergence model of communication - meaning emerges from combining pieces of communication with each other.

The emergence model of communication is similar to the information transfer model because both models deal with transmitting information from the sender to the receiver. The difference between the two models concerns understanding.

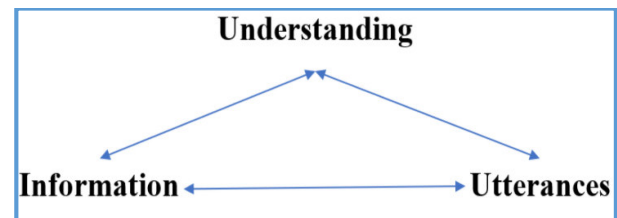


Figure 3. The emergence model of communication

On the left-hand side of the triangle is the information to be exchanged. On the right-hand side of the triangle are utterances. Utterances refer to how the information is encoded, transmitted, and decoded. At the top of the triangle between information and utterances is understanding. According to Dr. Luhmann, understanding emerges between the parties involved in the communication. Understanding is not wholly held by one communication partner and then transmitted to the other communication partner. Both partners work together to create understanding.

IV. THE IMPORTANCE OF SCHEDULING

When I do not know where to go how can I get there? The definition of the project scope gives me the goal what I have to achieve as a project manager with my team. The key element of the how is the work breakdown structure. The WBS contains all the work that must be completed in order to deliver the project scope. The basic element of the work breakdown structure are activities. The activities describe the actual tasks. They generally begin with a verb in the project plan. The group of activities create work packages. There is an important rule of creating activities: one resource should complete an activities within 5-10 days.

In the project plan we should identify Milestones. A Guide to the Project Management Body of Knowledge (PMBOK® Guide), Project Management Institute, 2017, Page 711. definition is the following: Milestones are used to identify "a significant point or event in a project." They are used to identify the completion of key deliverables or the completion of key events in a project. The milestone has no cost, no resource and no duration.

The WBS contains the detailed list of the work to be completed. In many cases the tasks are not independent from each other, some activity must finish before the next can start. In this logical sequence the first task is the predecessor of the next task and should be completed first. Then the the successor task follows it.

Costs are allocated to the project at the activity level and includes all costs associated with the completion of each activity. By linking costs to the activities in the project, we can establish a time phased view of the budget for the project. The Budget plan and continuous control belong to the project manager responsibility – as shown in the Iron Triangle. The introduction of budget planning is not my intention in this article as I would like to focus on the WBS.

If we determine the order of the activities, the required resources and the duration (how long) each activity should take to complete: the outcome will be the project schedule.

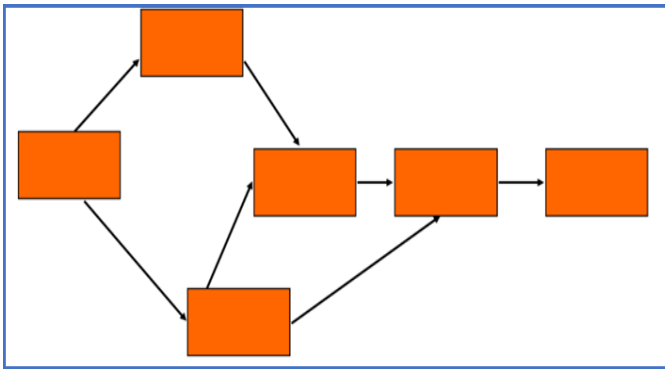


Figure 4. Network diagram in scheduling

The creation of the project schedule is usually done by a network diagram. It is a visual depiction of the flow of work (activities) in order to complete the project.

The Critical Path Method (CPM) is a common network diagramming method used to determine the project schedule. The PMBOK® Guide (Project Management Institute, 2017, Page 704.) provides us with the following definition: CPM is "a method used to estimate the minimum project duration and determine the amount of scheduling flexibility on the logical network paths within the schedule model." It is also a common method used in scheduling software tools such as Microsoft® Project. Other scheduling tools are: CPM involves identifying which activities are critical and must be completed on schedule or it will delay the entire project.

The documentation of the project schedule is the task and responsibility of the project manager, but it does not mean that it needs to be done alone. In my opinion the best practice of creating the project schedule is a cooperation with the technical or execution team. It is usually feasible in case of small projects usually in the BAU business as usual phase of the migration project.

The project schedule is usually is a forecast but in this case it can be very punctual as the plan is based on personal commitments. The project manager as a leader has the task to help the team members to execute their job without any issues.

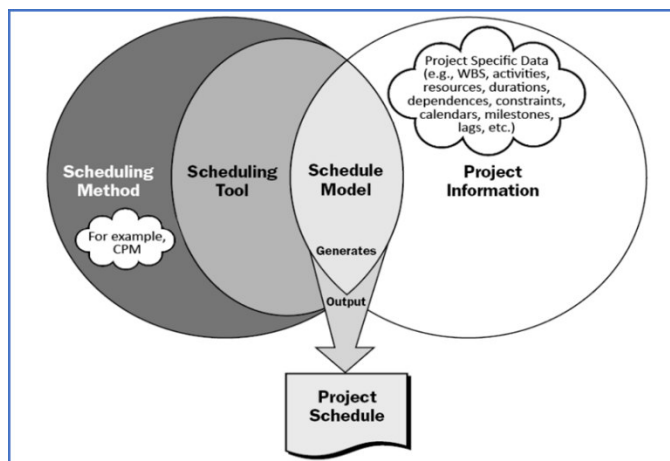


Figure 5. Scheduling Overview

The timely project execution will depend on the dedication of the team members. During our teamwork we can apply agile tools: Mural, Trello, Bluesight and a very open communication. In case of small project the schedule can be created based on collaboration. This means that the project manager puts the schedule together based on personal commitments. When the project is executed in a matrix organization, where the resources are shared the project manager has an additional task: support the team members in fixing their resource problem. For example talk with their manager.

The project manager has to consider the risk of delay and somehow a certain buffer time should be built in the project schedule as well. There are some cases when it is not possible at all – for example in the case study below. In such a case the communication is essential during the teamwork: the technical subject matter experts should explain very detailed why it is not possible to execute the tasks within the requested date, what prevent them from the timely execution. Once we put the plan together, the SMEs should inform the PM immediately in case of any problem, issue that can cause or caused delay. If the project schedule should be changed than the PM should inform the impacted stakeholders immediately and should adjust the schedule immediately. This situation can be stressful for the stakeholders – and this brings the question how can we handle the stress during the project work? We will take a look at it in the case study.

V. CONTROL DURING THE PROJECT EXECUTION

A. What is control?

Project controls are processes for gathering and analyzing project data to keep costs and schedules on track. The main objective of project controls is to minimize the variance in costs and schedule from what was originally planned. The project controls measure the project status.

Project controls contribute to successful project management, as it alerts project stakeholders to potential trouble areas and allows them to course correct, if needed.

Project controls activities must run through the complete project life cycle—from the initiation phase until closure—to monitor and control the various factors that impact cost and schedule. Depending on the project phase the controlling activities can be different for example:

- documentation,
- monitoring project costs,
- tracking project schedule,
- feedback and reporting.

B. The importance of project control

On the webpage of Ecosys (www.ecosys.net) the following information can be found. "In a 2018 survey, 88% of respondents said they perceive project controls to be important or critical to the success of enterprise projects. The

report also confirms the correlation between project controls and success: those that perceived controls as ‘critical’ were twice as likely to meet all project objectives. Those who perceived project controls as ‘not important at all’ were more than 3 times more likely to fail.”

The study results emphasize the importance of project control. I share this opinion: there is no project success without strong and consistent tracking and control.

In the communication plan it must be established what will be the frequency of the project status meetings.

VI. THE CASE STUDY: z/OS UPGRADE FROM 2.2 TO 2.3

The case study introduces a project that was executed at a multinational IT service provider company.

The project scope was: migrate the z/OS systems from 2.2 up to 2.3. for four clients on twelve servers by an exact date (when the z/OS support of 2.2 will be terminated). The original length of the project was two years, I took over the leadership for the last five months.

A. Take over the project – the discovery phase

The first task was to understand what happened in the last time period and get familiar with the project organization. The z/OS upgrade was feasible only in case of prepared servers. The prerequisite of the z/OS upgrade was the following: all software product had to be compatible with the new z/OS level. The preparation itself required significant effort and time.

- The technical team members had to check on each server the available software products. They were responsible for providing the actual status. The software lists were collected in excel sheets: one sheet for each server, one document for each client. One excel document usually included 3 sheets – for the development, test and production environments. The length of one list was between 100 up to 300 lines.

- If the software product was not compatible with the planned z/OS upgrade date the software upgrade should be executed first. In some cases this task required cooperation between the SMEs, like downloading a PTF than execute the upgrade on the server.

It turned out that there was no project management at all. The technical team members worked individually. They put their data without coordination and cooperation into the excel sheets. Due to the lack of proper scheduling and communication most of these data were missing from the four excel sheets what I took over.

B. Change the management system with hard and power skills

That was a good approach, manage the project in smaller pieces but parallel for each customer. The biggest missing project management tasks were the time planning, communication and control.

I made a very simple action in terms of the communication: I organized planning and status meetings.

First of all I emphasized the importance of the task and the delay of the project and I asked the team members for a very strong cooperation. I asked for feedback many times if their understood my messages. During the planning meeting I put the z/OS upgrade dates into the excel sheets, so it was based on personal commitments. Once the plan was ready, it was communicated to the client. Delivering the plan was our last chance to get back the trust of the customer.

The communication was changed within team, it became more frequent, clearer and focused to the understanding. Due to these changes the continuous postponing was ended, and the focus was on the software and z/OS upgrade execution.

If the project leader finds the way to the heart of the team with the right tone of communication, the success can be reached more likely.

In my opinion the continuous tracking and control of the project progress is a very important success factor in terms of the project delivery. I introduces weekly status meetings and encouraged the team member to give me information if they think the agreed delivery date is jeopardized. All the agreements and results: who does what and when were documented during the meetings.

Finally with these small changes the z/OS upgrade project was on the right path to deliver the expected results to the client.

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