

**KEYWORDS** ■ Project management ■ project organization  
■ portfolio management ■ case study ■ uniformity

# UNIFORMITY IN PROJECT-BASED WORKING

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■ **ABSTRACT**

Several numbers are available to estimate the losses created by unsuccessful projects. Based on these economic numbers studies have shown that a uniform approach for project-based working increases the possibility of successful delivery. These studies are focused on the execution of projects. As projects are not stand-alone and embedded in programs and portfolios there is also a link between uniformity in projects and uniformity in programs and portfolio. This text discusses a model to describe the link between portfolio, program and project (the levels of project-based working) and identify three blocks of uniformity. The first block is the Way of thinking, focusing on defined ranking of priorities within the strategic level and aligned with this strategy followed by the second block Way of working. It is actually the process of how the manager navigates through the life circle of the project. Finally there is the Way of writing to be considered as support by templates and/or tools. The blocks of uniformity and the link between portfolio, program and project we created a DNA of uniformity. With a survey and individual cases this DNA is proven. The results show the known positive impact of uniformity within the project itself but also show the impact of the uniformity within the blocks as well as within the levels of project-based working on the success of projects.

## 1. Research question and approach

### 1.1 Research question

The PMI's 2013 Pulse of the Profession [1] as well as the pwc White Book 2013 [2] identified that there are typical reasons why projects fails. PMI identified an organization's risk, on average, of \$135 million for every billion dollars spent. The use of project management methodologies may be a rem-

edy, it is widespread and organizations that do not have such a defined project management methodology have reported lower performance according to pwc. Several studies show that companies which implement standardized project management (SPM), expect a significant potential for improving their project performance. Here SPM has been defined as a standardized set of project management practices such as tools and templates. This correlation has been investigated many times and proven in numerous studies for established organizations and innovations [3, 4]. Within projects this correlation has been less investigated.

As Pinto and Covin [5] stated, all projects share the same characteristics for management and even more, a universal set of characteristics [6,7]. Therefore projects can be seen as temporary organizations within organizations and there might be the same correlation existing for established organizations. In modern literature the link between success factors and project success is shown in different studies. Toney and Powers [8] stated that standardized processes (*approaches and procedures*) are a success factor, while Sobek et al. [9] add skill sets for project leadership to this list. Kerzner [10] includes a standard PM metrics as influencer for project success. Of course other aspects as communication, and interpersonal relationships (*trust, respect, etc.*) [11], project organization [12] or corporate culture [13] belong in this list. This literature review will not provide a complete list of success factors but it shows the complexity of the concept of project success. It shows that the critical factors are correlated to the construct of an aggregated measure of project success. This means that the success is not directly related to measurable key performance indicators (*KPI*) but also to subjective estimations of customer satisfaction. Additionally these studies are focused on single Project Management areas such as time management, scope management or budget and resource management. In 2005 Milosevic et al. [14] investigated the effects which standardized project management have in IT projects in high- velocity industries. This study is limited to the level of projects but it focuses on all aspects of project management. As projects are parts of either a portfolio or a program there is a kind of relation between them. To the authors knowledge there has been no research done to investigate

the impact of standardized project management applied to different levels of project-based working, on the project success. On the other hand pwc state in their White Book 2013: *Let us consider low-performing organizations which apply and spread project management methodology less widely than their high-performing counterparts, thus they risk a 14 times higher failure rate in their projects. That competitive disadvantage shows how a defined approach in project management and project performance isn't just something that is nice to have. Additionally in a complex global environment, it can actually decide whether an organization thrives or fails.* *Effective project management means to achieve project success by 90%* (versus 34%, if projects are performed without such management). *The successful organizations focus on investing in project talent and providing consistent training and career paths* (Strong Talent Management) *as well as strategic alignment of their management to vision, mission and strategy while at the same time creating improved maturity* (Portfolio Management). *Additional to these aspects, there are two more points to be considered: standardization of practices and tools, which lead to more efficient use of resources and greater ability to lead and innovate. They are also a common characteristic of high-performing project organizations.* [2] As seen in this research the correlation between project management standards in single or multiple projects will lead to more success. But projects are not an end in them-

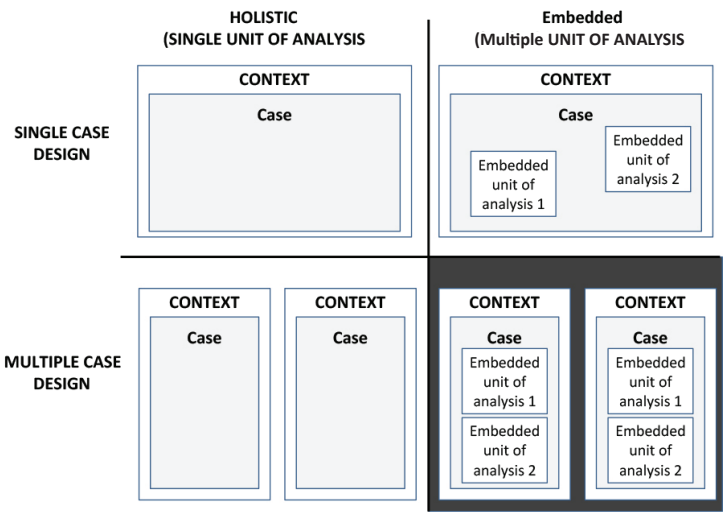


FIGURE 1. Research model and used case-study of this paper

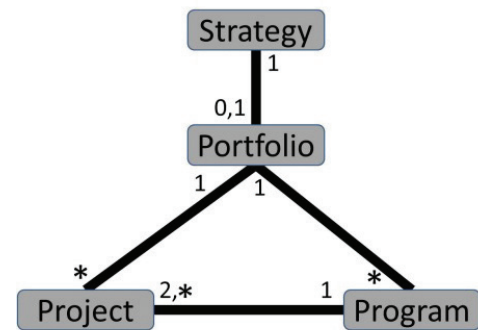


FIGURE 2. Entities and relations within Project-based Working [23]

selves. They are embedded into the organization at different levels. This leads to the following research questions:

1. What is the methodology to identify and cluster different levels in project-based working?
2. How can we identify the degree of uniformity within the project-based working?
3. Is there a correlation between degree of uniformity, levels in project-based working and project failure rates?

## 1.2 Research approach

The following research model [15] is necessary to give a schematic overview about the used methodology. Based on this model the approach of this research is briefly explained combined with the description of some technical research.

Limited cases [16] can be studied in any research project, and randomly chosen cases in such research are neither necessary, nor preferable [17]. However, we need to ensure that investigated links emerge; therefore we have chosen extreme cases or polar types. Here the cases were selected to represent two polar types: successful and unsuccessful projects [18]. In the current study, the researchers initially conducted and assessed 30 cases across all industries. Within these 30 cases, 3

cases are analyzed in depth. These cases allow the researchers to give a first overview of the impact of uniformity which allows the additional in-depth investigation later on. Finally an online survey will deal with the assumptions of project managers concerning the link between standardization and project success.

## 2. Uniformity model for project-based working

### 2.1 Strategic alignment as information model

Within this chapter we briefly discuss the model used to identify the need of *uniformity*. Therefore we use a standardized model for Strategic alignment [19].

Strategic alignment can be seen as a two-way process [20]. In one direction the overall business strategy influences the project planning, and in the other direction the success of projects impacts the execution of the enterprise strategy and their success. This two-way process can be managed in either a structured or an unstructured way. By using a structured way a certain degree of structured data as well as uniformity is necessary to ensure the link.

Strategic alignment of a project takes into account strategic focus, operational efficiency and team leadership. This is done by strategic parameters according to the alignment. The extent to which a project is focused in each dimension determines the level of “strategic maturity” for a given project and is measured by strategic parameters. Research has shown that higher levels of strategic maturity are associated with higher levels of project success [21]. This shows the direction of development towards projects.

Additional research shows that the core functions and the key performance indicators are related to each other [22] and can be used as information to see the fulfilment of the strategy. Sometimes these KPIs are defined in a strong way so that they are uniform and quantitative across all projects; sometimes they are defined in a weak or qualitative way across all projects and need further discussions to best use them.

The KPIs, the project core functions and the strategic parameters are the information transferred in the two-way process of strategic alignment.

### 2.2 Pyramid of project-based working

Within project-based working we identify 3 entities which are Project, Program and Portfolio. The last one is related to the strategy as described above. The relationship between these 3 entities is explained by the equations below:

$$\begin{aligned}
 & \text{Strategy} \rightarrow \text{Portfolio} \\
 & \text{Portfolio} = \left\{ \bigcup_1^n \text{Project}_{\text{Portfolio}} \cup \bigcup_1^n \text{Program} \right\} \\
 & \quad \text{with} \\
 & \text{Program} = \left\{ \bigcup_2^x \text{Project}_{\text{Program}} \right\} \\
 & \quad \text{and} \\
 & \text{Project}_{\text{Portfolio}} \neq \text{Project}_{\text{Program}}
 \end{aligned}$$

Similarly these relations can be shown in the Figure 2.

These entities can be re-organized into a pyramid of project-based working [24]. The highest level is the Visionary level. Here the strategic drivers are to be defined, weighted and measured. They are the input from corporate level to the portfolio. Therefore the Vision (*the Enterprise mission*) is defined and translated into the company strategy. This input means to prioritize the projects. It is the main input for the strategic level, besides the financial and budgetary parameters and other drivers (*resources, etc*). Here the translation of all the parameters will be done into the well selected portfolio of projects and programs. The Tactical Level is the level of execution through the project management. The Operational Level is dealing with the delivery, including project and task execution [25]. Figure 3 shows these levels.

This pyramid goes beyond the go/no-go of project investment decision-making. It means to actively manage project investment. Thus it confirms investment on a continuous basis, not only when approval is being sought. It ensures:

- **Correct Project Selection:** It means making the right choices when selecting project proposals and prioritizing them against current projects.
- **Optimum Strategic Contribution:** Project investment aligns and contributes to strategic objectives, measuring and optimizing the value which projects make to the organization's objectives.
- **Value Management:** The value is correctly quantified, safeguarded through the lifecycle of the project and realized once the project is closed.
- **Execution Sequencing:** Projects are sequenced, governed and executed based

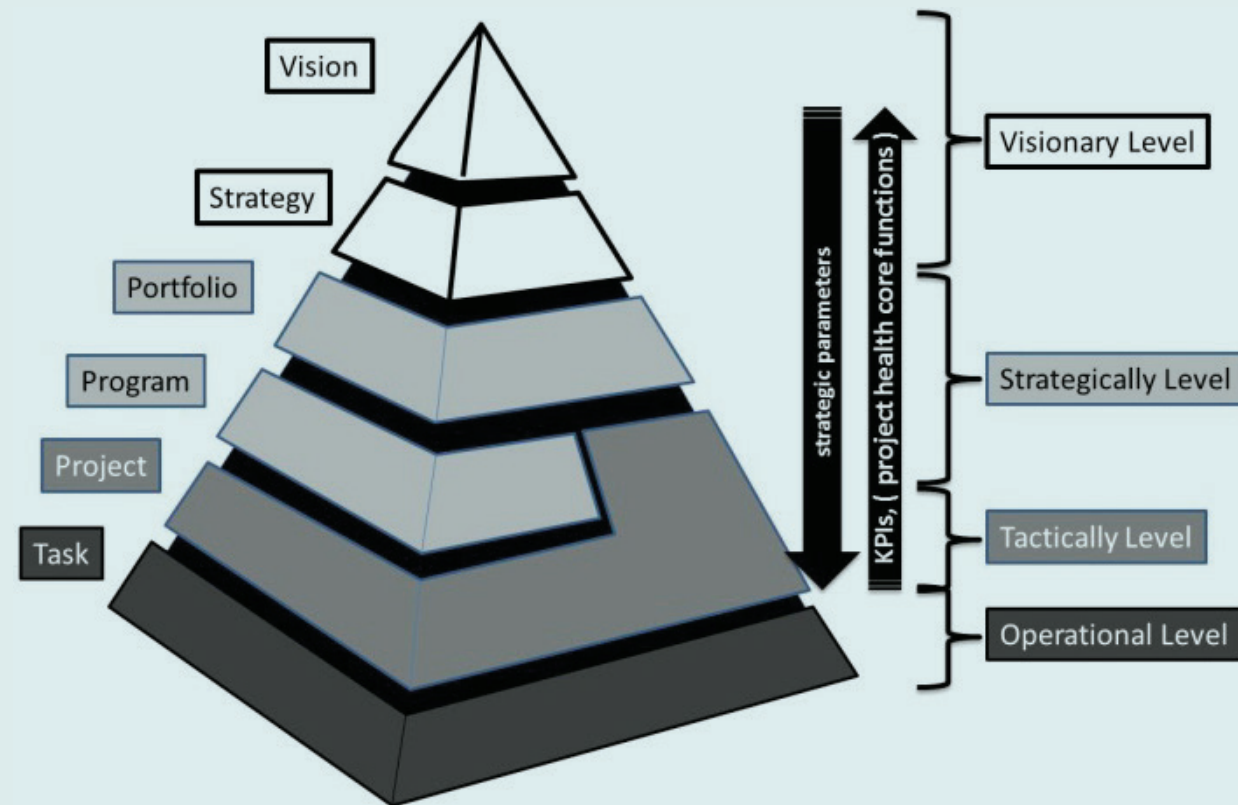


FIGURE 3. Levels within Project-based Working and the information flow



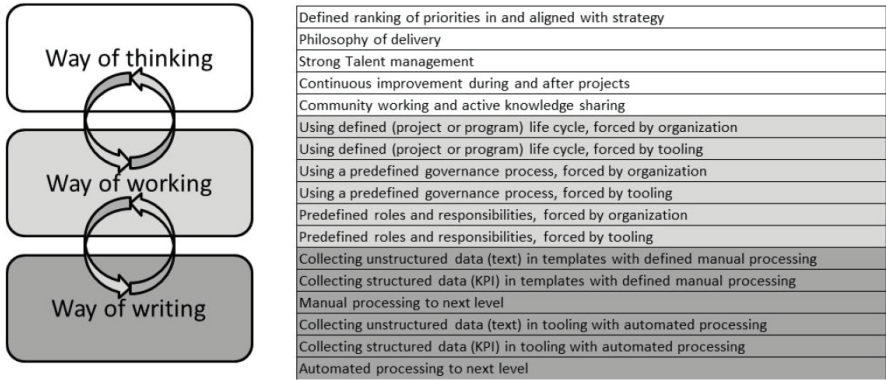


FIGURE 4. Blocks of uniformity within each Project-based Working level

on dependency, change and resource constraints from a whole-of-enterprise perspective and thus the original investment decision is validated.

This approach also ensures that projects deliver the strategic and operational improvements required to increase shareholder value, and create competitive advantages. This will be followed up by the KPIs and further strategic parameters [26].

2.3 Areas of uniformity

The above defined KPIs and the strategic parameters are necessary to execute the strategic alignment. Therefore a certain level of uniformity is necessary to execute this strategic alignment. The alignment can be defined on three different levels and it can be weak or strong, as mentioned above.

Looking at Figure 4, we recognize three different blocks describing *uniformity*. The first block is the *Way of Thinking* [27]. The first focus is on defined ranking of priorities within the strategic level and aligned with this strategy. This is an indicator to show how the strategic parameters are defined and used within the company. Secondly we focus on how project-based working should be executed. Different emphasis can be assigned:

- 1 economical drivers (e.g. Business Case)
- 2 quality drivers (e.g. Tollgates, Gateways)
- 3 process drivers (e.g. a certain methodology with a predefined process).

As mentioned in the introduction, strong talent management is also included as well as continuous improvement during and after the projects. Both are indicators of how the staff development is done within project-based working. Finally, enterprise cooperation and active knowledge-sharing need to be included. They allow the company to learn from experience, to network the knowledge and to increase the effectiveness and efficiency within a certain level. These

different aspects contribute to the definition of the project core functions and its strategic parameters.

The second block is the *Way of working*. It is actually the process of how the manager navigates through the life circle of the project. It means to decide which steps are to be taken and which information is needed, when to execute the project, who is getting which responsibility and what will the organization of the project look like. Here we focus on the use of the predefined project or program life circle. Furthermore we look at the use of the predefined governance process. Finally predefined roles and responsibilities are discussed within a responsibility assignment matrix. For all these questions we ask how they are introduced. Either they are forced on the organization (*through hierarchy, processes, rules, etc*), through tooling or both.

Finally there is the *Way of writing* to be considered. It describes how the manager is supported by templates and/or tools to execute the job [28]. All these aspects are included in the way of writing. In both tooling and template-use we can collect structured data (*e.g. KPIs*) and unstructured data (*e.g. text*). These data can be processed manually, automated or in a mixed way. Templates are mainly processed manually but tooling supports automated processing. Finally the links between the levels of project-based working in the pyramid (Figure 3) can be done automated or manually, meaning the information transfers in both directions. As the level of tasks has no lower level and the level of vision no higher level, here the processing is limited to the possible direction [29].

The Figure 4 shows these blocks.

2.4 Combining the models to a rough “DNA of Uniformity”

We are using the levels of project-based working (chapter 2.2) as the vertical axis and the details of the blocks (chapter 2.3 and Figure 4) as the horizontal axis in order to create the DNA-matrix of uniformity. This matrix can be used to

identify uniformity. We use 3 values to allow differentiation of uniformity:

- 3 Fully implemented in the company (3) – This value will be given when the company considered has this activity fully implemented. It means repeatable and identical project-based working being used and managed across the whole company.
- 1 Partly implemented (1) – This value is valid if the company has already parts of this activity implemented.
- 0 Not implemented (0) – It comes up if the company does not have any implementation of this activity.

2.5 Project Failure and Project Failure rates

Project Failure

Different definitions of project failure are available. According to Pinto and Mantel the two most commonly used definitions on project failure are [30]:

- 3 Expectations not met – Stakeholders or some subset of stakeholders are not satisfied with the delivered results. Their expectations (explicit and implicit) are not fulfilled and

they declare the project as a failure. In other words, a project is a failure if its stakeholders consider it a failure. This is the most commonly accepted definition of project failure.

- 1 Not delivered as planned – Any project that fails to meet time, budget and quality targets is considered a failure. This is a relatively strict definition that may lead project managers to pad schedules and budgets with excessive contingency or to redefine the plans during execution.

In each case the failure rate will be estimated to be able to show the correlation between an implemented model and the failure rate. All these wide-spread definitions as well as case-owned definitions will be taken into account.

Project Failure rates

On the success side, the average is only 16.2% for projects that are completed on time and on-budget. In the larger companies, the news is even worse: only 9% of their projects come in on-time and on-budget. And, even when these projects are completed, many are not more than a mere shadow of their original specification and requirements [31]. Other studies rate the average failure rate at 25%. Meanwhile 20

FIGURE 5. DNA of Uniformity

	Way of thinking					Way of working						Way of writing					
	Defined ranking of priorities in and aligned with strategy	Philosophy of delivery	Strong Talent management	Continuous improvement during and after projects	Community working and active knowledge sharing	Using defined (project or program) life cycle forced by organization	Using defined (project or program) life cycle forced by tooling	Using a predefined governance process, forced by organization	Using a predefined governance process, forced by tooling	Predefined roles and responsibilities, forced by organization	Predefined roles and responsibilities, forced by tooling	Collecting unstructured data (text) in templates with defined manual processing	Collecting structured data (KPI) in templates with defined manual processing	Manual processing to next level	Collecting unstructured data (text) in tooling with automated processing	Collecting structured data (KPI) in tooling with automated processing	Automated processing to next level
Vision																	
Strategy																	
Portfolio																	
Program																	
Project																	
Task																	

Indicator Failure rate	Named Failure rate	Project Failure Rate [FP]
1	Very low	50%≤FP
2	Low	70%≥FP>50%
3	Average	80%≥FP>70%
4	High	90%≥FP>80%
5	Very high	FP>90%

TABLE 1. Project Failure and Success rates

	Way of thinking					Way of working					Way of writing				
	Defined ranking of priorities in and aligned with strategy	Philosophy of delivery	Strong Talent management	Continuous improvement during and after projects	Community working and active knowledge sharing	Using defined (project or program) life cycle forced by organization	Using defined (project or program) life cycle forced by tooling	Using a predefined governance process, forced by organization	Using a predefined governance process, forced by tooling	Predefined roles and responsibilities, forced by organization	Predefined roles and responsibilities, forced by tooling	Collecting unstructured data (text) in templates with defined manual processing	Collecting structured data (KPI) in templates with automated processing	Manual processing to next level	Collecting unstructured data (text) in tooling with automated processing
Vision	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2
Strategy	3	3	3	1	3	2	2	2	2	2	2	2	2	2	2
Portfolio	3	3	3	2	3	2	2	2	2	2	2	2	2	2	2
Program	3	3	3	2	3	3	3	2	3	2	3	3	3	3	3
Project	3	3	3	2	3	3	3	2	3	2	3	3	3	3	3
Task	3	3	3	2	3	3	3	2	3	2	3	3	3	3	3

	Way of thinking					Way of working					Way of writing				
	Defined ranking of priorities in and aligned with strategy	Philosophy of delivery	Strong Talent management	Continuous improvement during and after projects	Community working and active knowledge sharing	Using defined (project or program) life cycle, forced by organization	Using defined (project or program) life cycle, forced by tooling	Using a predefined governance process, forced by organization	Using a predefined governance process, forced by tooling	Predefined roles and responsibilities, forced by organization	Predefined roles and responsibilities, forced by tooling	Collecting unstructured data (text) in templates with defined manual processing	Collecting structured data (KPI) in templates with defined manual processing	Manual processing to next level	Collecting unstructured data (text) in tooling with automated processing
Vision	2	2	2	0	0	2	0	2	0	2	0	2	0	0	0
Strategy	2	2	2	0	0	2	0	2	0	2	0	2	0	0	0
Portfolio	2	2	0	0	0	2	0	2	0	2	0	2	2	2	2
Program	0	2	2	0	0	2	0	2	0	2	0	2	2	2	2
Project	0	2	2	0	0	2	0	2	0	2	0	2	2	3	0
Task	0	0	0	0	0	2	0	2	0	2	0	2	2	3	0

	Way of thinking					Way of working					Way of writing				
	Defined ranking of priorities in and aligned with strategy	Philosophy of delivery	Strong Talent management	Continuous improvement during and after projects	Community working and active knowledge sharing	Using defined (project or program) life cycle, forced by organization	Using defined (project or program) life cycle, forced by tooling	Using a predefined governance process, forced by organization	Using a predefined governance process, forced by tooling	Predefined roles and responsibilities, forced by organization	Predefined roles and responsibilities, forced by tooling	Collecting unstructured data (text) in templates with defined manual processing	Collecting structured data (KPI) in templates with defined manual processing	Manual processing to next level	Collecting unstructured data (text) in tooling with automated processing
Vision	3	3	2	2	2	3	2	3	1	3	2	3	3	3	2
Strategy	3	3	2	2	2	3	2	3	1	3	2	3	3	3	2
Portfolio	3	3	3	3	3	3	2	3	2	3	2	2	2	2	3
Program	3	3	3	3	3	3	3	3	2	3	2	2	2	2	3
Project	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3
Task	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3

FIGURE 6. DNA of Uniformity with the cases “Manufacturing”, “Financial and Insurance industry”, and “Electricity, gas, steam and air conditioning supply”

to 25 % do not provide ROI and up to 50 % require material rework [32]. This leads to the fact that approx. 10% of all projects are completed as expected.

In this study we assume an average success rate of 25% (*between 80% and 70% failure rate*) as the benchmark. The reason behind it is that according to the definition of failure a project can even be seen as a success when the stakeholders agree on it. Therefore all changes in the plan can be argued in a positive way and the project will, in contradiction to other failure definitions, be delivered without failure.

We need to be able to estimate the correlation between the DNA of Uniformity and the project failure rate. Thus we use the **Table 1**.

### 3. The Cases

We have analyzed 30 cases, 3 of them in some depth as mentioned above. The cases are distributed across different industrial areas. The majority of participants was situated in the “Financial and Insurance industry” (23.33%) followed by “Information and communication” (20%) and “Human health and social work activities” (16.67%). The other areas are “Manufacturing”, “Electricity, gas, steam and air conditioning supply”, “Construction”, “Accommodation and food service activities”, “Education” and “Other service activities”. From these cases we analyzed three specific cases in depth with the full DNA of Uniformity. They are discussed in the next chapter. The other 27 cases are analyzed further on only at the level of the projects.

#### 3.1 Results of the cases

##### Detailed cases

##### MANUFACTURING

This company is one of the world’s largest automotive companies. With its several divisions for cars, trucks, busses and financial services this company is one of the biggest producers of premium cars and the world’s biggest manufacturer of commercial vehicles with a global reach. The Financial Services are financing, leasing, fleet management, insurance and innovative mobility services.

This company uses one global standard for project-based working. Houston is one specific project management method, which is a recommended course of action, of how projects can be successfully implemented. The method is based on the PMI project management methodology. This method is

divided into nine classes: project structure, time management, cost management, quality management, risk management, project roles, communication, supplier selection and involvement in the environment.

Within this company approx. 275000 employees are working world-wide. The estimated failure rate is Low ( $70\% \geq FP > 50\%$ ).

##### FINANCIAL AND INSURANCE INDUSTRY

This company is a bank-insurance group, catering mainly to retail, private banking, SME and mid-cap clients. Geographically, it focuses on their core markets of Western and Central Europe.

Within their project-based working the company is using a variety of different methods and tools from their own development via standards to locally-based small-scale solutions. A last study shows that there are more than 20 different management methods used in the group.

Within this company approx. 25000 employees are working world-wide. The estimated failure rate is Average ( $80\% \geq FP > 70\%$ ).

##### ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY

This company enables its partners to generate, transmit and distribute electrical power at the highest levels of efficiency. They also help them produce, convert and transport the primary fuels: oil and gas. This company is the only manufacturer worldwide with know-how, products, solutions and key components spanning the entire energy conversion chain. In the fiscal year 2013 (*which ended September 30th*), the Energy Sector had revenues of EUR 26.6 billion, it received new orders totalling approximately EUR 28.8 billion and posted a profit of approximately EUR 2 billion. On September 30, 2013, the Energy Sector had a work force of approximately 83 500.

Within this company approx. 90 000 employees are working world-wide. The estimated failure rate is Low ( $70\% \geq FP > 50\%$ ).

##### COMPARISON OF THE DETAILED CASES

Looking at the DNA of Uniformity we see that the case of the “Financial and Insurance industry” appears different to the two other cases. These show the two companies’ strategy of employing a central steering concept. Furthermore the cases “Manufacturing” and “Electricity, gas, steam and air conditioning supply” invest more effort on strategic alignment, talent management and the different tools and methods to be used.

Both cases with a low failure rate achieve this success because of their KPIs. The calculation of the failure rates is based on different indicators. As both industries faced many changes (*e.g. environmental regulations, laws, safety guidelines, etc.*) during project execution they were forced to change their plans in the projects’ running time.

The *Manufacturing company* tried to anticipate these developments by allowing a certain number of changes of the project baseline but still kept the initial baseline as reference. They even used three different definitions of failure rates

$$FP_{Baseline} = \frac{Baseline_{initial} - Baseline_{final}}{Baseline_{initial}}$$

and

$$FP_{deviation} \approx f(\#_{Baseline\ changes})$$

and

$$FP_{Customer} \approx f(CSS)$$

❶ **FP<sub>Baseline</sub>**: Failure rate based on the derivation of the last (delivered) plan compared with the initial plan.

❷ **FP<sub>deviation</sub>**: Failure rate based on the number of changes made in the baseline. This rate is selected from a table with the parameters duration, cost and strategic impact.

❸ **FP<sub>Customer</sub>**: Failure rate based on a standard Customer Satisfaction Survey.

The highest failure rate is used as indicator for the project. That’s the reason why the failure rate is higher for single projects.

The other company within Electricity, gas, steam and air conditioning supply calculated two different failure rates

$$FP_{BC} = f(NPV_{initial}, NPV_{final})$$

and

$$FP_{Customer} \approx f(CSS)$$

❶ **FP<sub>BC</sub>**: Failure rate based on the deviation of the Business Case at the end of the project.

❷ **FP<sub>Customer</sub>**: Failure rate based on a standard Customer Satisfaction Survey.

Subsequently this company took the average value of both failure rates above.



In both cases above the projects were finished successfully in more than 90% ( $<10\% FP_{Customer}$ ) of the cases.

Within the case of the Financial and Insurance industry the failure rate is only based on a non-standardized Customer Satisfaction Survey ( $FP \approx FP_{Customer}$ ). In this perspective the failure rate is relatively higher than in the two other cases.

If we look at the portfolio at the program level the differences are more visible. While the failure rate is decreasing for the portfolios in the companies with a higher degree of uniformity, the failure rate for the case of the Financial and Insurance industry stays constant. In the cases of Manufacturing and Electricity, gas, steam and air conditioning supply the failure rates are also calculated the same way.

The main reason behind this is that the standardizations of all projects and programs in a portfolio allow rebalancing projects within the portfolio. While some projects are providing a “negative failure rate” (*they perform better than planned*) the projects with a “positive failure rate” (*they perform less successfully than planned*) are compensated.

Additionally the structured portfolio management also ensures that only projects are executed with a high positive impact on the strategy execution. Here the case in the Financial and Insurance industry is missing the advantages of more uniformity.

Beside this we see the more standardized Way of thinking as better for the success of project delivery. This correlation can be defined as:

$$NV_{WoTh} \vdash NV_{WoWo} \vdash NV_{WoWr} \text{ and } NV_{WoTh} < NV_{WoWo} < NV_{WoWr}$$

And with the correlation of  $FP \rightarrow NV_{WoWr}$

and with

- ➊ **NV<sub>WoTh</sub>**: Number of Varieties “Way of Thinking”
- ➋ **NV<sub>WoWo</sub>**: Number of Varieties “Way of Working”
- ➌ **NV<sub>WoWr</sub>**: Number of Varieties “Way of Writing”
- ➍ **FP**: Failure rate Projects

This means that the failure rate will be lower if the variety of the *Way of Writing (tools, templates)* is low. This variety is derived from the variety in the *Way of Working* which is derived from the *Way of Thinking*. To reduce the failure rate a reduction of varieties of thinking and working is absolutely necessary. It is also seen that using structured data (*KPIs*) has a significant positive impact due to the possibility of failure forecasting. Also the automated reporting allows to identify possible issues in advance and to make them comparable concerning their impact. This is the main advantage of uniformity in the cases.

All detailed cases mentioned that they are dealing with defined ranking of priorities in and aligned with strategy. This is an indicator for portfolio management. Also the 3 cases are committed to managing delivery successfully. Here

they decide which way of execution should be taken. They select between different kinds of agile delivery (*e.g. Kanban, Scrum*) or sequenced delivery (*e.g. Waterfall, STP*). They are also paying close attention to strong Talent management as they recognize the scarcity of suitable resources. Only the financial industry case is managing this manually. The two others are using any kind of support. Within the case “Electricity, gas, steam and air conditioning supply” they even suggest the automatic philosophy of delivery and provide a list with most suitable project managers for a specific case. This is done based on their historical data.

In all detailed cases a Continuous Improvement Process has been implemented. All of them are managing this process manually. Both companies using an integrated EPM system mentioned that the solutions they are using are not supporting their process. The two companies working with an integrated EPM system also use an ESM (*Enterprise Social Media*) integrated with the EPM. Here Communication commitment and active knowledge sharing is implemented. Both companies are using ESM to distribute the tasks to the team members also. There is a slight difference of time-tracking systems and their ways of ETC-calculation. In the case within the Financial and Insurance industry it has been decided not to mix these activities with their project management: They implemented a different environment across the whole company.

3.2 Survey results

So far we have discussed the 3 comprehensive cases. In this chapter we are looking at the results which were verified in a survey across a larger number of enterprises. Within this survey, 30 companies gave their information about their ways of working in projects. In this survey, the trends visible are similar to those in other surveys. The relation between size and failure rate as well as the level of implemented structures follow other statistics. So there is some correlation and a certain level of representative data.

General results

As expected many companies give themselves better scores on the project failure rate than expected. Only one company mentioned a very high failure rate. This company decided recently to undertake a project to develop a Managed Learning Environment (*MLE*) and it wanted to use a structured project management methodology. The company chose to use one specific methodology in their Project Management but was not successful in delivery. This leads to the fact that they score themselves negatively with a high failure rate ( $90\% \geq FP > 80\%$ ).

Three companies mentioned that their failure rate is Average ( $80\% \geq FP > 70\%$ ). These companies invested some effort in a structured Way of writing. They defined templates and tools to support their project-based working. This correlation is not bi-directional, thus it does not automatically lead to higher project failure rates if they are not using tools and

structured templates. However if companies are not using tools and structured templates it can be seen as indicator for a possible higher failure rate. Additionally 6 out of 14 responses with a very low failure rate ( $<50\%$ ) are using a kind of tooling and templates which forced them in handling project data. Knowing that various companies define project Multiple Case Study success by satisfied customers and not by tooling, the 6 out of 14 is a relatively high number.

Only 2 companies are using a fully implemented KPI system. These companies have actually very low failure rates which are based on their calculated KPIs. This allows to conclude that having a KPI-based project success calculation is not contradictory to successful project delivery.

Within this study it cannot be proved that larger companies have higher failure rates. If we look at the specific failure rate “Very low- $50\% \leq FP$ ” we see that the range of companies is from 20 up to 275 000 employees. Thus, no correlation is possible.

The Way of thinking - Survey results

The defined ranking of priorities in and aligned with strategy are not part of the project-based working within 4 companies. These companies also give low priorities to the philosophy of delivery (*e.g. Agile or waterfall.*) and to the talent management. The same can be said for continuous improvement during and after projects as well as communication commitment and active knowledge sharing. Interestingly these companies are midsize companies. On the other hand 5 companies mentioned that they are using a defined ranking of priorities in and aligned with strategy and that they have it fully implemented. These 5 companies are larger companies or dedicated service companies within larger groups. These 5 companies are also scoring high on the other aspects discussed here.

This splits the group into three sub-groups. One sub-group comprises 4 companies with an average size of 5500 employees (*min:1700, max 12 000*), they are focusing less on strategic aspects of project-based working, and another sub-group of 5 large companies with an average size of 90 000 employees (*min 15000, max 275 000*) focusing on a structured way for strategic aspects of the projects. The rest of the companies show medium size without any structured correlation between size and strategic aspects. These observations cover the majority of all responses.

Finally one can point out that 75% of all companies in this survey know about the necessity of talent management and knowledge sharing. These are the two main concerns of pwc for the future of project-based working.

The Way of working - Survey results

Larger companies and dedicated service companies within larger groups are using defined (*project or program*) life cycle concepts, forced by tooling. Smaller companies are mostly following the project states of the customer. The same can be identified for using a predefined governance

process, forced by tooling, and predefined roles and responsibilities, forced by organization and tooling. Significantly, one can see that the automated processing of structured and unstructured data is not part of the Way of writing in more than half of all reactions. Almost half of all reactions do not use automated reporting at the portfolio level. Companies which are collecting KPIs either manually or automated are doing the same with unstructured data. This allows to conclude that once an automated system is in place both structured and unstructured data are handled automatically.

A standardized set of project management tools has an important impact on the success of projects. Less experienced managers can rely on the support of the system as they may not have resources or expertise to select their set of tools on their own. Additionally the exchangeability, as well as the interoperability of project managers increases. This was clearly mentioned in the detailed cases. Projects from all types and industries studied here share enough similarities in project management and often share components (*like Charters, Reports and even KPIs*) so that we can make these statements.

4. Discussion of the results

- ➊ 1. What is a methodology to identify and cluster different levels in project-based working?
- ➋ 2. How can we identify the degree of uniformity within the project-based working?
- ➌ 3. Is there a correlation between degree of uniformity, levels in project-based working and project failure rate?

The results of this study can be organized around its research questions. The first question is about a methodology to identify and cluster different levels in project-based working. The developed model allows a systematic view on the different levels of project-based working. We may start from the input of strategy. Thus the model organizes the different levels hierarchically. For each executed strategy one portfolio is necessary. This can be separated into projects and programs. Each project, either within a program or directly within the portfolio, can then be separated into tasks. This level is not further discussed here as it is standard of project management. It is described with the pyramid of project-based working.

The second question deals with the degree of uniformity. Here we provide a methodology to identify and cluster the standardization in project-based working. Therefore we split the uniformity into three blocks: the Way of thinking, the Way of working and the Way of writing. For each block we suggest detailed questions to capture more detailed information.

The needed degree of uniformity within the domain of project-based working is a combination of the previous two answers. We use the levels of project-based working as the

vertical axis and the three blocks and their details as the horizontal axis. Thus the new matrix is created which can be used to identify the degree of uniformity. This matrix is called here the “DNA of Uniformity”.

Finally we see a correlation between the DNA of Uniformity and the success of projects. Significant results are that companies using a uniform (*standardized*) methodology for project-based working do not only have a lower project failure rate per individual project; they also have these lower rates on program and portfolio level.

During the execution of the survey we faced the fact that the levels of details are not sufficient to provide detailed results about the specific impact of uniformity on project failure rates. This means that we cannot show the correlation between a certain entry of the matrix of the “DNA of Uniformity” and the project failure rate. Additionally the three detailed cases show that a full analysis of the matrix of the DNA of Uniformity was not possible. In this perspective the model

shows rough trends but is not able to provide a more detailed analysis.

The results of the detailed analysis allow the assumption of a correlation between uniformity and the success of projects. This is an empirical correlation based on three cases in different industries. The survey supports this correlation but does not provide enough cases to allow a validated statement. There is need for more research.

Based on the model used in this study we have analyzed different cases from different industries and different project failure rates. One issue here is that project success in the majority of the cases is based on the satisfaction of the customers. As a consequence the failure rate appears very low for most of the cases. Therefore the failure rate appears high only in the cases where the original plans are compared with the final results of the project. Further research is necessary to prove the correlation between uniformity and project failure.

Rate–	Selected
Very low-50%≤FP	61,54%
Low-70%≥FP>50%	15,38%
Average-80%≥FP>70%	19,23%
High-90%≥FP>80%	3,85%
Very high-FP>90%	0%

TABLE 2. Project Failure and Success rates

	Full implemented and structured	Implemented	Known and organizational handled	Not part of project-based working	Total
Defined ranking of priorities in and aligned with strategy	25% 5	35% 7	20% 4	20% 4	20
Philosophy of delivery	25% 5	30% 6	25% 5	20% 4	20
Strong Talent management	20% 4	20% 4	40% 8	20% 4	20
Continuous improvement during and after projects	15% 3	40% 8	20% 4	25% 5	20
Community working and active knowledge sharing	15% 3	25% 5	35% 7	25% 5	20

TABLE 3. Details of the results “The way of working”

	Full implemented and structured	Implemented	Known and organizational handled	Not part of project-based working	Total
Collecting unstructured data (text) in templates with defined manual processing	25% 5	30% 6	25% 5	20% 4	20
Collecting structured data (KPI) in templates with defined manual processing	21,05% 4	21,05% 4	36,84% 7	21,05% 4	19
Collecting unstructured data (text) in tooling with automated processing	10,53% 2	31,58% 6	5,26% 1	52,63% 10	19
Collecting structured data (KPI) in tooling with automated processing	15,79% 3	31,58% 6	5,26% 1	47,37% 9	19
Automated processing to portfolio and program management	21,05% 4	15,79% 3	21,05% 4	42,11% 8	19

TABLE 4. Details of the results “The Way of writing”



authors



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