

Project Strategy: Matching Project Structure to Project Type to Achieve Better Success

Michael Poli

Wesley J. Howe School of Technology Management, Stevens Institute of Technology, USA,
Michael.Poli@stevens.edu

Ilija Cosic

Faculty of Technical Sciences, University of Novi Sad, Trg Dositeja Obradovica 6, 21000 Novi Sad, Serbia,

Bojan Lalic

Faculty of Technical Sciences, University of Novi Sad, Trg Dositeja Obradovica 6, 21000 Novi Sad, Serbia,

Received (13.06.2010); Revised (19.06.2010); Accepted (20.06.2010)

Abstract

This research looked at a number of real-life projects to determine if a distinct project structure was employed for a specific project type and whether the project structure/project type pairing employed had an effect on project success (i.e., which project structures when employed with which project type led to project success and which did not).

Often organizations use only one particular project structure, the matrix, for their projects. Unfortunately one size does not fit all. Form must fit function. Project managers must be able to choose the project structure which is appropriate for their project and thus better position their project to be more successful, to create better business results and achieve the competitive advantage/value that the organization envisioned.

Key words: *project structure, project type, project success, project strategy*

1. INTRODUCTION

Projects offer an enormous opportunity for achieving competitive advantage and/or value for the corporation [5]. Projects must be managed more than just tactically or operationally. Projects must be managed strategically to take advantage of the enormous opportunities that they represent [6] [10]. A Project Strategy is necessary to take advantage of these opportunities. Project-based organizing is potentially effective because it “creates and recreates new project structures around the needs of each product and customer” [1]. Following the right patterns as part of an explicit Project Strategy will help organizations achieve better competitive advantage/value in their projects and achieve the strategic intent that stakeholders expect [8].

One of the key elements of a Project Strategy is to employ an appropriate project structure for a project. An organization’s culture plays a significant role in the choice of which project structure is used on their projects. Often organizations use only one particular project structure, the matrix, for their projects. They feel comfortable with doing work in a specific way and naturally fall back on what is familiar to them. Project managers must be able to choose the project structure which is appropriate for their project and thus better position their project for success.

“Project management studies with regard to strategy are rather limited. Several works related to strategy were in the context of project selection. These studies suggested that projects should be selected to support the organizational strategy.” [6]. In previous research, individual researchers used a standardized case study format to collect data and analyze the Project Strategy of real life projects from within their organizations. Project Strategy helps the project achieve the intent of the strategic stakeholders. The researchers focused on the questions of what, why, how, who, when and where of the project as well as the project’s desired strategic results. Previous results indicated a strong relationship between the project type and the customer type [7].

This research builds upon the work of previous research. Using case studies developed for real life projects, the researchers analyzed the relationship between the project structure used for specific project types and the success of those projects.

It was hypothesized that choosing an appropriate project structure for a specific project type better positions that project to be more successful thus enabling that project to create better business results and achieve the competitive advantage/value that the organization envisioned.

2. PROJECT TYPE

Wheelwright and Clark [3] [12] proposed a framework for selecting projects to include in an organization’s project portfolio. They map development projects based upon the degree of product and process change involved in the project. They define five project types. Research and development projects precede commercial development. Breakthrough, platform and derivative projects are commercial development projects. The fifth project type, alliances and partnerships, can be either commercial or basic research. Each project type requires a unique blend of resources and management styles. See Figure 1.

The project types are defined as follows: in breakthrough projects there is extensive product and process change; in platform projects there is moderate product and process change; and in derivative projects there is modest or incremental product and process change. Our research focused on only these three project types.

We hypothesize that using a specific project structure for each of these project types helps the project be more successful in achieving competitive advantage or adding value to the organization.

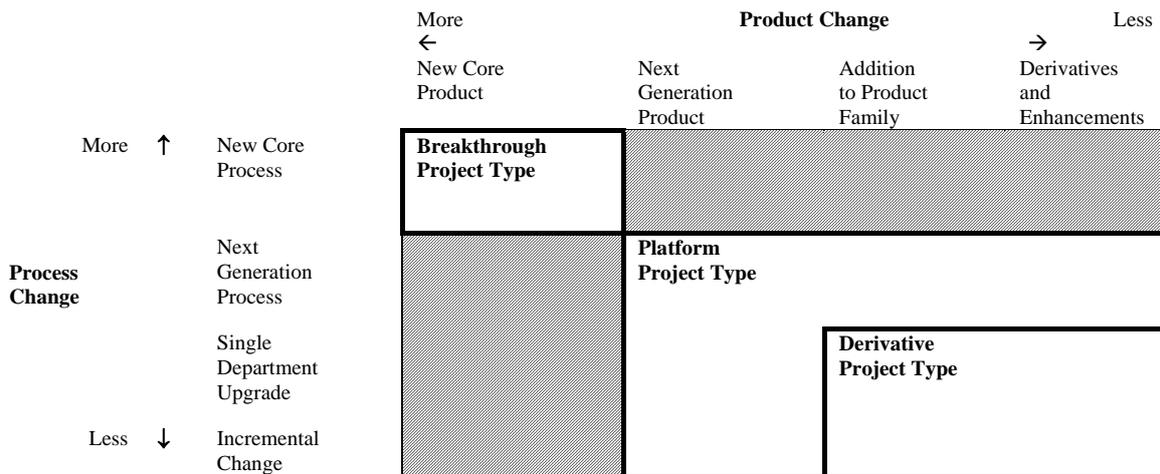


Figure 1. Wheelwright and Clark Aggregate Project Portfolio Framework

External versus Internal Customer Projects

While Wheelwright and Clark [3] [12] focused on only commercial development projects, it was noted from the real-life case studies that projects were instantiated for both external and internal customers [7]. The motivations for external customer projects were to develop products, services, or processes; to achieve a direct competitive advantage; to create sales revenues and profits. The projects focused on internal customers were to develop and/or install products, services, or processes; to add value to the organization; to cut costs, increase productivity, reduce response times; to enhance the effectiveness of the organization’s value chain. These internal customer projects have an indirect effect on competitive advantage. These internal projects also have to be included in the company’s aggregate project portfolio in order to assess the total organizational resources needed [6] [7].

Article I. Breakthrough Projects

Breakthrough projects involve significant changes to existing products and processes. These projects are often termed “radical” breakthroughs because they obsolete the existing product/process. For external customer projects, the intent is to achieve a major competitive advantage by leapfrogging over the competition. For internal customer projects, the intent is to achieve major breakthroughs in the value chain. These are often associated with the need for the

organization to survive or to compete more effectively [7].

Article II. Platform Projects

Platform projects require significant planning and execution. For external customer projects, they are the basis for future product developments. For internal customer projects, they are the basis for value chain improvements. As such, they must be architected in such a way as to allow the easy addition, modification or removal of different elements of feature/functionality. The platform accepts different modules in a “plug-and-play” manner. This leads to reuse of the majority of the base design and parts, yet allows for future development/deployment of many new derivatives. It often costs more to develop the generalized platform then it would if the product, service or process was designed for one specific purpose. To minimize risk, development/deployment is based upon known technologies and materials [7].

Article III. Derivative Projects

Derivative projects employ minor changes to the existing product, service or process. Add-ons, new packaging, materials, cost-reduction or manufacturing efficiencies can result from this type project. The costs and resources are usually clearly defined and bounded. Derivative projects are usually the least risky to attempt. They extend the life cycle of the existing product,

service, or process. For external customer projects, they extend the revenue generating capabilities of the product, service, or process in a known market. In the Boston Consulting Group model, this is known as milking the cash cow [7].

Cross-Hatched Areas

The cross-hatched areas of the diagram are areas where Wheelwright and Clark suggest that the organization not attempt any projects. They suggest that projects that are mapped into these areas should be moved either to the Breakthrough or Platform areas. Most companies would tend to move them to the Platform area as these projects are better understood and less risky.

3. PROJECT STRUCTURE

Project structure is described in the PMBOK® Guide [9] as an “enterprise environmental factor that can affect the availability of resources and influence how projects are conducted.” An organization’s culture plays a significant role in the choice of which project structure is used on their projects. Often organizations use only one particular project structure, the matrix, for their projects. They feel comfortable with doing work in a specific way and naturally fall back on what is familiar to them. “There is no single, perfect project structure for managing projects and similar temporary organizations. But you can, and should, assess the feasibility of the various alternatives.” [9]. This research discusses the appropriate project structure for each different project type.

Shenhar [10] discusses factors that emanate from project types and can be correlated to project success in terms of the organization’s interests. One of the four main dimensions of project success is ‘future opportunity’ which deals with evaluating a project’s success in terms of goals, opportunities and the future scope of the organization executing the project. It further emphasize that project structure proves to be a backbone for not only project success in terms of its schedule but for the future scope and lifetime of the organization itself.

Unfortunately one size does not fit all. Form must fit function. The choice of project structure is often not really a choice. Project managers are forced to conform to using the project structure which is nominally used in their organization even if this structure is not appropriate to their project. That project structure is most often the matrix form. This is not a way to position a project for success. Project managers must be able to choose the project structure which is appropriate for their project and thus better position their project for success.

The literature identifies three basic project structures that are employed on projects: pure project, matrix and functional. The basic project structures are defined below.

Pure Project Organization

The pure project organization is also known as the “projectized” organization. The project team in this structure is focused on completing the work of the project (i.e., developing the project deliverables). The project manager is the head of this structure. He/she runs the show with almost complete independence, responsibility and authority for the project. He/she has funding responsibility; as well as hiring and firing responsibility for the team members; coordination of project needs; and intra-company and customer liaison [9].

The project team is often co-located and removed from the day-to-day organizational operations. This project structure is ideal for working on new products, services or processes without being constrained to the old way of doing things. The project team is allowed to think out-of-the-box, to develop new and better ways to improve the products or operations of the organization. In a computer systems company, a pure project organization may be instantiated to develop a new computer system to include the software, hardware and associated offerings.

Matrix Organization

The matrix organization takes on both functional and pure project characteristics. The matrix organization is subdivided into: weak matrix, balanced matrix and strong matrix. These structures are fraught with many distractions and complexities all of which can lead to frustrations and or project failure. [9]. The matrix is a ‘mixed’ organizational form in which the normal vertical hierarchy is ‘overlaid’ by some form of lateral authority, influence, or communication [6] [9]. The three basic forms of the matrix project are described below.

Strong Matrix

In a strong matrix the project manager acts more like the project manager in a pure project organization. He/she does not normally report to a functional manager. The project manager must coordinate with the functional managers. There can be conflict between the project manager and the functional managers. Does the project manager ask for the people to do the work or for the work to be done or for both? It has to be made clear to the people assigned to the project who they report to and what work they are responsible for. Having two masters, the project manager and their functional manager, may confuse them. This problem can be avoided by the project manager negotiating with the functional managers for the work to be done and not for who will do the work. Thus the functional manager is responsible for making sure that the deliverables are completed on time, to budget and to specification regardless of who works on the deliverables. The project manager checks that the work is completed as agreed upon [9].

Weak Matrix

In a weak matrix the “project manager” reports to a functional manager and acts more like a coordinator of the work effort between the different functions. In this

role the person assigned is not in a strong position to manage the project. The functional manager will retain most of the project management responsibility while delegating elements of the project to the “project manager”. The person fulfilling this role does not have the title project manager [9].

Balanced Matrix

The balanced matrix is one in which the project manager and functional managers share roughly equal authority and responsibility for the project. [6]. In a balanced matrix the project manager reports to a functional manager but has more responsibility than in a weak matrix but less responsibility than in a pure project. The person fulfilling this role has the title project manager but again does not have full autonomy for the project. The functional manager maintains elements of the project management as in the weak matrix [9].

Functional Organization

In this project structure, workers are grouped by their function or area of specialization, such as engineering, finance, marketing, etc. Engineering can be divided into software, electrical, mechanical, etc. Project work is done in each of these special areas. Software engineers work on software projects while electrical engineers may work on developing computer hardware circuit boards. The functional manager is the ultimate project manager for projects conducted in a function however the functional manager may designate a project team leader from within the functional group to lead a project [9].

4. PROJECT SUCCESS

Shenhar’s Success Dimensions

Based on a large-scale survey conducted in Israel over a 10 year period, Shenhar performed a factor analysis to ascertain the possibility of distinct success dimensions by which managers perceived project success. This revealed four distinct primary categories (principal success criteria) as seen at project completion. These are described as follows [7].

Success Dimension #1: Efficiency

The nearest term measure immediately after project completion is Success Dimension #1. It measures Project Success based on “Efficiency,” whether the project was completed on time and within budget, two of the traditional Triple Constraint measures. Budget and schedule are usually well kept measures within the project and used as measures of the project’s progress. It should be noted that these measures of success are short-term and only indicate whether the project was completed as planned. They measure whether the project manager was able to keep the project constrained within the box of project execution. Budget and schedule do not measure the “true” success of the project.

Beyond Traditional Measures of Project Success

A longer-term view of project success introduces the notion that projects must be measured on the business results that they achieve. It is no longer good enough to just complete projects on time, within budget, and to spec – i.e., to the Triple Constraint. Projects must increase competitive advantage, bring in much needed revenues, achieve much needed cost savings, and add value to the organization, whether it is a for-profit or non-profit organization.

Success Dimension #2: Impact on the Customer

Within six months to a year of project completion, Success Dimension #2 measures “Impact on the Customer.” It includes the third measure of the traditional Triple Constraint, was the specification met. Additionally, Success Dimension #2 focuses on the customer and the users. Were they satisfied? Were the project deliverables delivered with the proper quality? Were the deliverables used? Success Dimension #2 goes beyond the traditional view of “meet the spec.” It speaks to a medium-term measure based on the goodness of the deliverables. The proof is in customer and user acceptance and use of the project deliverables which can be measured with customer/user surveys and analysis of field service reports or change requests. Success Dimension #2 is the key to achieving “true” project success.

Success Dimension #3: Impact on the Business

Success Dimension #3 measures “Impact on the Business” within a year or two after project completion. Were customers and users using the out-of-the box project deliverables to the levels required to achieve the full cost/benefit and thus complete project success? Or were the usage levels less than expected leading to partial failure or complete project failure? Were costs reduced? Were revenues, profitability, ROI, ROE increased? The proof is in the extent of customer and user usage of the project deliverables.

Organizations must instantiate external projects which significantly increase cash inflows which can easily be measured as registered by sales and profitability while decreasing cash outflows through internal projects which can be measured by lower costs of production and/or operations. The organization is an economic engine that requires that cash inflows exceed cash outflows to ensure its long-term viability. Success Dimension #3 is the most important measure of project success beyond the traditional measures of the Triple Constraint. Projects that have a positive impact on the business help to grow and sustain the organization.

Success Dimension #4: Building for the Future

In three to five year’s time, Success Dimension #4 measures “Building for the Future.” Was new infrastructure (facilities, networks, etc.) built ahead of time? Were employees given the opportunity to acquire new skills that could be used in the future? Was the company positioned to address new products or new markets with this project? It is the longest-term dimension and involves management thinking of

investing in “forward looking” projects. The lack of investment in specific, dedicated forward looking projects has to be offset by finding a way to make a small investment in the future, in each of the projects in the organization’s portfolio. Without an investment in the future, there will be no future. The success

measures are time-dependent. This time relationship is shown in Fig. 2.

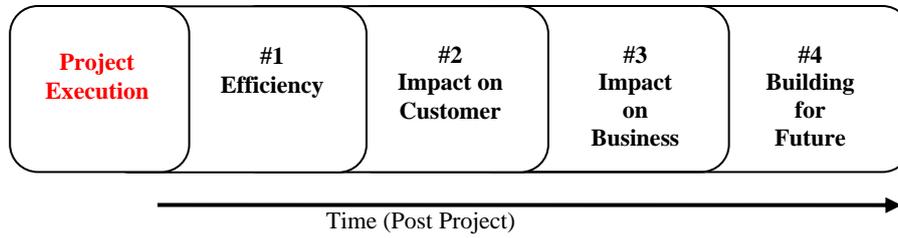


Figure 2. Time-dependent project success dimensions (Poli 2006)

The success measures are summarized in Table 1.

Table 1. Shenhar’s success dimensions and measures (Shenhar 1996)

Success Dimension	Success Measures
Success Dimension #1 Efficiency (Short-term: immediately after project completion)	-Meeting schedule -Within budget -Other Resource constraints met
Success Dimension #2 Impact on the Customers (Medium-term: within six months to a year of project completion)	-Meeting functional performance -Meeting technical specifications and standards -Favorable impact on customer/user -Fulfills a customer’s needs -Solves a customer’s problem -Customers/users are using project deliverables -Customers/users expresses satisfaction
Success Dimension #3 Impact on the Business (Long-term: within a year or two after project completion)	-Achieves business and/or commercial success -Deliverables used to expected levels of usage -Achieves revenue, profits or productivity goals -Larger market share generated
Success Dimension #4 Building for the Future (Longer-term: within 3 to 5 years after project completion)	-Create new opportunities for future -Position customer competitively -Create new market -Assist in developing new technology -Add capabilities and competencies

5. HYPOTHESIS

The researchers contend that the project structure must be chosen to fit the project (i.e., that the project structure must fit the project type, form must fit function). The researchers hypothesize that to be successful a project must use a project structure that is appropriate for that specific project type [7].

Specifically it is hypothesized that:

Breakthrough Project Type – Pure Project Organization

For a breakthrough project type the project structure that is most appropriate to use is the Pure Project structure [7].

Platform Project Type – Matrix Organization

For a platform project type the project structure that is most appropriate to use is the Matrix project structure [7].

Derivative Project Type – Functional Organization

For a derivative project type the project structure that is most appropriate to use is the Functional project structure [7].

These hypotheses are shown in the following Wheelwright and Clark Project Map (Fig. 3):

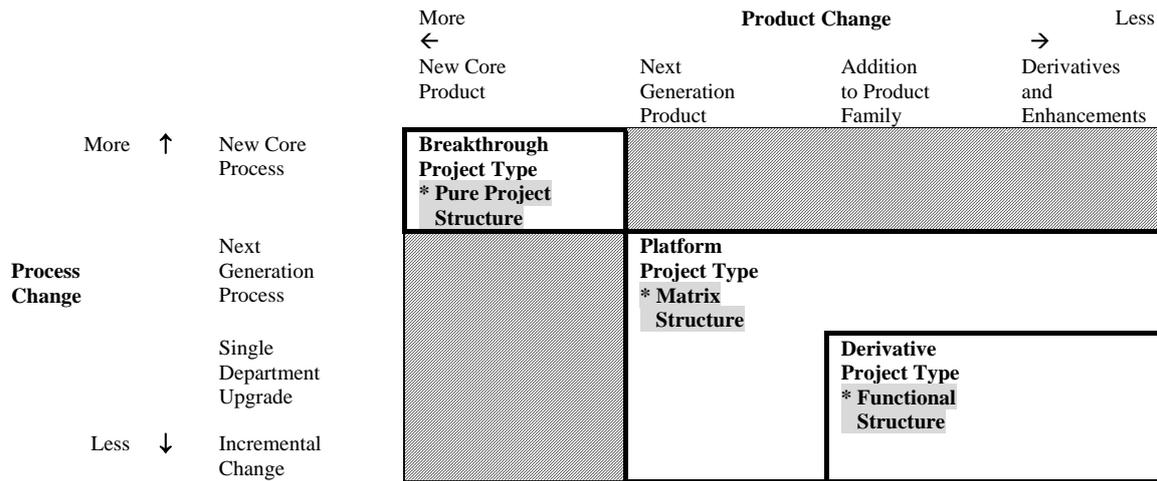


Figure 3. Hypotheses – Project Type and * Appropriate Structural Type

6. RESEARCH METHODOLOGY

The case study method was used because it is a frequent mode of research employed extensively in social science research and practice-oriented fields such as management science. [4] “It allows an investigation to retain the holistic and meaningful characteristics of real-life events, such as ... managerial processes.” [13] Project management is such a managerial process.

It is hard to control behavioral events in real-life projects. Each project is unique. The project unfolds over time. The events in any one project are contingent on the environment in which the project is undertaken. Thus to determine if there are general results requires that the whole project story be analyzed and that a number of project stories be compared for similarities and differences. [4]

“Real-Life Project Analysis – Guidelines”

To ensure quality, the authors used the “Real-Life Project Analysis – Guidelines” originally developed by Shenhar and continuously modified over subsequent years by Poli. These guidelines are an extensive set of questions relating to various topics surrounding the preparation for and the execution of a project. Analysts used the guidelines to analyze “real world” projects by examining how projects were managed strategically and how this contributed to project success or failure. Ninety-two real world cases were analyzed quantitatively [7].

Real-Life Case Studies from Companies

The research encompassed the use of real-life case studies from different projects. Analysts chose their case study projects from within their own company. They were required to interview key stakeholders in the project, such as the project sponsor, the project manager, the customer, and project team members. Analysts were coached on how to interview stakeholders and how to elicit the information needed to provide a complete picture of their real-life project [7].

The variables being mined from the case studies were explicitly asked for in the case study format. Training sessions were held wherein the definitions and nuances of the classification variables was described and illustrated. This was done consistently over the course of the data collection. In addition to the case study, analysts were asked to create a short presentation which summarized their case study findings.

Quantitative and Qualitative Results

Long, detailed case studies were encouraged. Many of the real-life project case studies were between 50 and 70 pages in length. This enabled the analysts to capture as many elements as possible and to weave a richer project context. The authors are indebted to these analysts for the time and diligence each devoted to their real-life project case studies [7]. The details of these project stories lend both quantitative and qualitative support to our results.

Definition of Variables

In the previous research, criteria for the project type [3] [12] and project success [7] variables were defined based on the literature. These same criteria were reused in this research. Additionally, criteria for the project structure variable were developed by the authors based on the PMBOK® Guide. [9] Thematic analysis was used to discover the qualitative information relevant to these variables. In this process a theme or pattern was found that “at minimum described and organized the possible observations and at maximum interpreted aspects of the phenomenon.” [2] The themes were generated inductively for multiple case studies. The authors analyzed and compared the project structure variable to the project type variable and project success variables to determine if project structures matched specific project types with a subsequent affect on project success.

7. QUANTITATIVE REAL-LIFE PROJECT CASE ANALYSIS

Sometimes simple statistics prove more meaningful than more complex statistics. Statistical analysis of the cases shows that nearly two-thirds of the projects (see Table xx) were executed using the matrix project structure. This finding was not unexpected. It illustrates that organizations use the structure which “is the way we always do projects.” This lack of attention to design of the project structure to fit the project type may explain the failure of many projects, as they use the wrong structure for the wrong project type, whereas using the right structure for the right project type could lead to better overall project success. By not paying enough attention to the project structure, organizations may be missing an opportunity to achieve better project success.

Overall Project Success

Analysis of overall project success for the nine different pairs of projects structure/project type shows that any project executed using the pure project structure is

more likely to be a success than projects executed using the matrix project structure (see Table 3). The matrix project structure was the dominant project structure used, yet it is not as likely to produce a successful project as the pure project structure. The number of projects executed using the functional project structure is too small of a sample to even comment about. Even still, should we not rethink which project structure we should use in our projects?

Derivative and platform project types are more likely to be successful than breakthrough project types. Breakthrough project types are the projects which hold the most hope for the future success of the organization. Why do we insist on executing breakthrough projects using the matrix or functional project structures when clearly the pure project structure is the structure which provides better project success for breakthrough projects? Given this surprising result, isn't it time to rethink which project structure should be used in our projects? Clearly, the pure project structure offers us the best chance of achieving project success.

Table 3. Project Type versus Project Structure Overall Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough	6/8 .750	7/14 .500	1/1 1.000	14/23 .609
Platform	8/11 .727	22/33 .667	2/3 .667	32/47 .681
Derivative	4/5 .800	9/14 .643	2/3 .667	15/22 .682
Total	18/24 .750	38/61 .623	5/7 .714	61/92 .663

Success Dimension #1- Budget

Comparing the project structure/project type combinations to Success Dimension #1 Budget shows that project success on this dimension is attainable when executing a derivative project type. See Table 4. Using the pure project structure for derivative project types or the matrix project structure for platform and derivative project types provide the best budget project

success. For breakthrough project types, the matrix project structure is marginally useful in achieving budget project success. Meeting budget is not a distinctive feature of breakthrough project types. The question then becomes, is meeting budget success the ultimate goal of the project or is achieving better business results the ultimate goal?

Table 4. Project Type versus Project Structure SD1- Budget Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough	3/8 .375	8/14 .571	0/1 .000	11/23 .478
Platform	6/11 .545	23/33 .697	1/3 .333	30/47 .638
Derivative	5/5 1.000	10/14 .714	3/3 1.000	18/22 .818
Total	14/24 .583	41/61 .672	4/7 .571	59/92 .641

Success Dimension #1- Schedule

Comparing the project structure/project type combinations to Success Dimension #1 Schedule shows that using the pure project structure for derivative project types or the matrix project structure for platform and derivative project types provide better

budget project success. For breakthrough project types, both the pure project and matrix structures are marginally useful in achieving schedule project success. See Table 5. Again, the question becomes, is meeting schedule success the ultimate goal of the project or is achieving better business results the ultimate goal?

Table 5. Project Type versus Project Structure SD1- Schedule Success

Project Type	Project Structure			
	Pure Project	Matrix	Functional	Total
Breakthrough	4/8 .500	7/14 .500	0/1 .000	11/23 .478
Platform	6/11 .545	20/33 .606	1/3 .333	27/47 .574
Derivative	5/5 1.000	11/14 .786	2/3 .667	18/22 .818
Total	15/24 .625	38/61 .623	3/7 .429	56/92 .609

Success Dimension #2 Impact on the Customer

Comparing the project structure/project type combinations to Success Dimension #2 Impact on the Customer shows that overall most projects are successful in the eyes of the customer. See Table 6. This is in spite of project problems in meeting budget or being over schedule. In particular, using the matrix project structure provides high levels of customer project success for the platform and derivative project

types. The pure project structure provides high levels of customer success for the breakthrough and derivative project types. The functional project type provides high levels of customer success for any of the three project types. Thus almost any project structure is useful in attaining customer project success. So then what differentiates which project structure is best to use with which specific project type?

Table 6. Project Type versus Project Structure SD2 Success

Project Type	Project Structure			
	Pure Project	Matrix	Functional	Total
Breakthrough	5/8 .625	8/14 .571	1/1 1.000	14/23 .609
Platform	6/11 .545	27/33 .818	2/3 .667	35/47 .745
Derivative	4/5 .800	11/14 .786	3/3 1.000	18/22 .818
Total	15/24 .625	46/61 .754	6/7 .857	67/92 .728

Success Dimension #3 Impact on the Business

Comparing the project structure/project type combinations to Success Dimension #3 Impact on the Business shows that overall projects have a successful impact on the business. Using the pure project structure provides the highest levels of business project success regardless of project type. See Table 7. The matrix project structure fares well in with platform and derivative type projects. The functional project structure fares well against any of project type. The pure project structure is the best structure when executing a breakthrough project type; the matrix project structure is the best project structure when executing a platform

project type; and, the functional project structure is the best project structure when executing a derivative project type for achieving an impact on the business.

Thus if achieving better business results is the ultimate goal for projects, then matching the right project structure to the right project type will prove to be a key decision. The choice of project structure should not be made based on which structure is dominant in the organization but rather which project structure better positions the project to achieve better business results for the project type that is being executed. Make an explicit decision to choose the project structure to fit the

project type, and be prepared to achieve project success.

Table 7. Project Type versus Project Structure SD3 Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough	7/8 .875	8/14 .571	1/1 1.000	16/23 .696
Platform	9/11 .818	27/33 .818	2/3 .667	38/47 .809
Derivative	4/5 .800	11/14 .786	3/3 1.000	18/22 .818
Total	20/24 .833	46/61 .754	6/7 .857	72/92 .783

Success Dimension #4 Building for the Future

Comparing the project structure/project type combinations to Success Dimension #4 Building for the Future shows that overall projects are successful

building for the future regardless of which combination is employed. However, the pure project structure displays the highest levels of project success on this dimension. See Table 8.

Table 8. Project Type versus Project Structure SD4 Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough	8/8 1.000	11/14 .786	1/1 1.000	20/23 .870
Platform	10/11 .909	26/33 .788	3/3 1.000	39/47 .830
Derivative	4/5 .800	12/14 .857	2/3 .667	18/22 .818
Total	22/24 .917	49/61 .803	6/7 .857	77/92 .837

8. DISCUSSION OF RESULTS

Ninety-two real-life project cases were analyzed. Each case was coded with respect to the variables of interest in this analysis: project type, project structure, the four Success Dimensions and overall success. The resulting analysis led to the conclusion that specific project types when executed using specific project structures lead to different project success stories. The project

structure/project types achieving over .700 project success rate are shown in the tables.

Overall Project Success

The pure project structure is the project structure to use to achieve the best overall project success regardless of project type. See Table 9.

Table 9. Project Type versus Project Structure Overall Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough	.750			
Platform	.727			
Derivative	.800			
Total	.750		.714	

Success Dimension #1 – Budget

If meeting budget is important, then execute only derivative project types with any of the project

structures. The matrix project structure proves successful for the platform project type. See Table 10.

Table 10. Project Type versus Project Structure SD1- Budget Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough				
Platform		.697		
Derivative	1.000	.714	1.000	,818
Total				

Success Dimension #1 – Schedule

If meeting schedule is important, then execute only derivative project types using either the pure project or the matrix project structure. Meeting schedule is one

measure of project success that is not easily attained in projects of larger scope, such as the platform or breakthrough project types. See Table 11.

Table 11. Project Type versus Project Structure SD1- Schedule Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough				
Platform				
Derivative	1.000	.786		,818
Total				

Success Dimension #2 Impact on the Customer

If having an impact on the customer is important, then execute derivative project types using any of the

project structures or execute platform project types using the matrix project structure. See Table 12.

Table 12. Project Type versus Project Structure SD2 Success

	Project Structure			
Project Type	Pure Project	Matrix	Functional	Total
Breakthrough				
Platform		.818		.745
Derivative	.800	.786	1.000	,818
Total		.754	.857	.728

Success Dimension #3 Impact on the Business

To achieve the best business results, to have an impact on the business, use the project type/project structure pairs marked with an X in Table 13. Use the pure project structure for breakthrough project types; the

matrix project structure for platform project types; and the functional project structure for derivative project types. The pure project structure is the best overall project structure to use to achieve consistently better business results regardless of project type.

Table 13. Project Type versus Project Structure SD3 Success

Project Type	Project Structure			Total
	Pure Project	Matrix	Functional	
Breakthrough	X .875			.696
Platform	.818	X .818		.809
Derivative	.800	.786	X 1.000	.818
Total	.833	.754	.857	.783

Success Dimension #4 Building for the Future

When building for the future, any project structure, with any project type can be chosen. However, the best

project structure for building for the future is clearly the pure project structure. See Table 14.

Table 14. Project Type versus Project Structure SD4 Success

Project Type	Project Structure			Total
	Pure Project	Matrix	Functional	
Breakthrough	1.000	.786		.870
Platform	.909	.788	1.000	.830
Derivative	.800	.857		.818
Total	.917	.803	.857	.837

Best Project Structure to Use

It can be seen from the previous analyses that the pure project structure offers the best overall project success, the best business results and the best building for the future results. This finding is counter to the perceived notion that the matrix project structure is the best project structure to use. The pure project structure allows the project team to focus on developing the desired project deliverables without the distraction of having to pay attention to the day-to-day operation that matrix project resources have to contend with. It is clearly time to recognize the power of organizing projects using the pure project structure to achieve better business results.

9. CONCLUSIONS

Unfortunately, current management thinking does not consider project structure as a key to project success and thus organizations resort to the using the project structure that is common to their culture. Until such time as management is enlightened and allows the project manager to choose the project structure which is proper for the project type being undertaken, then project success will continue to exhibit variability and often lead to project failure. It is imperative that project structure be designed to fit the project type such that project success can be guaranteed. Until that time, management must assume responsibility for project failure based on poor choice of the project structure.

Management must rethink the importance of project structure on project success. The project manager must accurately assess their project's project type and then choose the project structure which will provide the best desired results. The days of just using the matrix project structure for all projects are numbered, as the power of the pure project structure in achieving project success becomes more evident.

Projects have received increasing attention because they are the basis for achieving organizational results. It is all too clear that many projects still fail. Previous research has shown that choosing the right project type for the right customer is an element of a Project Strategy. Determining the best project structure to employ for a specific project type adds yet another piece to the Project Strategy story. More pieces of the project success puzzle still need to be completed. A Project Strategy encompassing these high level project decisions will become an essential part of the path to achieving better competitive advantage and value for the organization.

10. REFERENCES

- [1] Arto, Karlos, Perttu Dietrich, Miia Martinsuo and Jaakko Kujala, (2008) Project strategy – strategy types and their contents in innovation projects, International Journal of Managing Projects in Business, Volume 1
- [2] Boyatzis, Richard E. (1998). Transforming Qualitative Information, Sage Publications, Thousand Oaks, CA.
- [3] Clark, Kim B. and Wheelwright, Steven C. (1993). Managing New Product and Process Development, The Free Press, New York, NY.

- [4] Eisenhardt, Kathleen M. (1989). "Building Theories from Case Study Research". *Academy of Management Journal*. pp. 532-550.
- [5] Hamel, Gary and Prahalad, C.K. (1994). *Competing for the Future*. Boston. Harvard Business School Press.
- [6] Larson, E.W. and D.H. Gobeli, (1989) Significance of project management structure on development success, *IEEE Transactions on Engineering Management*, Volume 36, Issue 2, May 1989.
- [7] Poli, Michael (2006) *Project Strategy: The Path to Achieving Competitive Advantage/Value*, UMI Number: 3223515, ProQuest, Ann Arbor, MI
- [8] Poli, Michael and Aaron J. Shenhar, (2003) "Project Strategy: The Key to Project Success", PICMET 2003, Portland, OR.
- [9] Project Management Institute (2008). *A Guide to the Project Management Body of Knowledge (PMBOK® Guide) - Fourth Edition*. Newtown Square, PA.
- [10] Shenhar, Aaron J. and R. Max Wideman, (1996) *Improving PM: Linking Success Criteria to Project Type*. A paper presented to the Southern Alberta Chapter, Project Management Institute, Symposium "Creating Canadian Advantage through Project Management", Calgary, May.
- [11] Shenhar, Aaron J., O. Levy, Dov Dvir and Alan Maltz, (2001) "Project Success – A Multidimensional, Strategic Concept." *Long Range Planning*, pp. 699-725.
- [12] Wheelwright, Steven C. and Kim B. Clark, (1992) "Creating project plans to focus product development" *Harvard Business Review*, vol. 70 no. 2, March-April, pp. 70-82.
- [13] Yin, Robert K. (1994) *Case Study Research*, Sage Publications, Thousand Oaks, CA.