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PM@CH

The Swiss Project Management Review

PM@CH-Interview: Martin Härri

Financing: The Role of the Independent Engineer
Elisabetta Carrea

Kostenkontrolle mit Earned Value Management in Softwareeinführungsprojekten
Beat Dietziker

Project Management Institute
Switzerland Chapter

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A Word from the Publisher

James Greene
Chapter President
PMI Switzerland Chapter

This 3rd Edition of PM@CH – the Swiss Project Management Review – focuses on the financial aspects of project management.

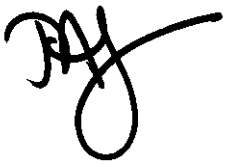
To begin, PM@CH interviewed Martin Härri, PMP, the new president of the PMI Switzerland Chapter. Martin returned to the Chapter Board of Directors after a two year absence, and was elected by the other Board members to lead the Chapter into 2008 and beyond.

Dr. Elisabetta Carrea, PMP, has written a fascinating article, "The Role of the Independent Engineer: Correlation between the Project Finance Cycle and the PMI PM Framework". This article looks at the role of a subject matter expert in the overall project management life cycle, specifically focusing on the financial planning and controlling of large construction projects.

Beat Dietziker's contribution discusses the method and use of EVA (Earned Value Analysis) during the project lifecycle. EVA is a way of measuring project progress from a financial perspective.

Once again, I would like to thank the team of volunteers that make PM@CH possible: Dr. Claudia Casciaro, PMP; Beat Dietziker and Rüdiger Geist, PMP – the PM@CH editorial team. Dr. Elisabetta Carrea and Beat Dietziker, PMP, both contributed articles, and Peggy Hartman, PMP, provided invaluable review feedback. I would also like to thank the companies that continue to support PM@CH through advertising: Orange Communications, TenStep, GAF, Threon and Virak.

The 4th Edition of PM@CH will be published at the end of 2008. If you would like to contribute to the next edition, either as an author, co-author or reviewer, please contact the PM@CH editorial team at journal.taskforce@pmi-switzerland.ch.



James Greene

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PM@CH – The Swiss Project Management Review – talks to Chapter President Martin Härri, PMP

Martin Härri
President PMI Switzerland Chapter

"I have received a lot of useful information at our events"

Martin Härri, what is your current job?
At the time of this conversation (February 2008): President of the PMI Switzerland Chapter. No, seriously: end of 2007 I had decided to quit my job and take a break before seeking a new challenge. Seeing that this new board position currently occupies about a fourth of my time I believe that was a good decision. But once this initial phase is over it should go back to "normal".

In the past 17 years since university I have worked for several international and national companies as consultant, team leader, project controller, and project manager, always in the field of project management. The last two jobs were at Swiss Life, where I set up and managed a program office, and at T-Systems Switzerland, were I developed and rolled out a project management methodology.

What did you want to be when you were a child? Why aren't you doing that today?
I wanted to become an architect, as I love design and architecture. But since I was not really talented in free-hand drawing I decided to do something where I could type instead of draw, and studied Business Administration. Well, nowadays architects also work with computers, but I guess my career choice for this life is made. But I still hope that after my retirement I will find that charming abandoned farm somewhere in the Provence, where I can architect and build to my heart's content.

When and how did you become interested in Project Management?
Even my first jobs for a large consulting company were in the project business. They had an elaborate corporate methodology, in which all staff was trained. And miraculously most projects ran very well. Then I switched to a Swiss insurance company where I was involved in some projects which did not turn out results, or needed several attempts to finally succeed. I realized that there must be a "secret" behind the successes of one company and the failures of the other and believed that this must be this so-called "project management". So I joined another consulting company and had the luck that in my third week I was sent to a project management course, run by Ute Brodmann, which would later become the first VP Programs of the PMI Switzerland Chapter. I immediately knew I had hit the "mother lode", as this company had a very extensive and mature project management methodology. Over the years I have soaked up as much of this knowledge as I could, becoming more and more fascinated by the topic.

What benefits do you see by being a member of a Project Management organization like PMI? What has being a member of PMI done for your career?
There are benefits in three areas: the first one is global. Out of the many benefits that PMI members receive, the "PM Network" magazine is one I really appreciate. Although it is – "typical American" – colourful, pompous and sometimes superficial, I think it has many articles on today's and tomorrow's hot topics of project management, and often it makes you aware about some aspect of your projects you did not consider or even gives you a hint on a solution of a problem.

The second area is the national one: at the many events where I have participated I have received a lot of useful information. Hearing something directly from someone who has "been there – done that" is even more useful than reading it in a magazine, as you can discuss your questions with the speaker. Another invaluable aspect of the Swiss events is the networking. I have checked my address book: there are exactly 100 contacts from all over Switzerland categorized as "PMI".

These contacts help me when I need information, or when I need contacts within a company. And it certainly helped me get my last job, which was to introduce a PMI-based project management methodology for an entire company.
And there is a third, more "mental" area: project management is not (yet) a recognized profession. Every person out there who is in charge of some task with a limited timeframe can give themselves the title "project manager". As a member of PMI I know that I am part of a huge "family" of like-minded people, who really deserve that title, because they are not accidentally applying some project knowledge, but using it systematically and consciously.

How are you involved in PMI or the Switzerland Chapter activities? How does this involvement benefit the Chapter membership?
Wow, that is a long story. When the Chapter was founded in 2001 Ute Brodmann convinced me to become one of the first 25 members a chapter needs to become chartered by PMI. In the first years of its existence I was a speaker at two local events. When Ute retired as VP Programs I took her succession in 2004 and organized several events, at first mainly in the Zurich area, also developing all the checklists and tools needed. I then wanted to do more for the whole of Switzerland and set two large events in 2005 in Berne, the National Event and the Training Event with Dr. David Hillson. As the workload became a bit too overwhelming I decided to retire for 2006 and focus on organizing events in Zurich. I am very proud that we now have two teams of very motivated and talented volunteers which quite independently ensure a steady stream of events in Zurich. I also realized that to effectively organize projects with virtual teams you need the necessary tools and managed to convince Microsoft Switzerland to support us in setting up a collaboration platform based on SharePoint Services, which I developed together with a team of volunteers. We branded it "PMI Teams" and the platform today helps support many of our activities. My former colleagues from the board then convinced me to come back for 2008 and even elected me as president. Currently I have three main activities:

- Managing the Chapter board
- Managing the Steering Committee for the PM Training Forum 2008, which we jointly organize with the "spm – Schweizerische Gesellschaft für Projektmanagement"
- Coaching the two event teams in Zurich

What is your motivation for volunteering your time and effort to the Chapter?
I can honestly say that it is a very interesting and satisfying work. It's like being in a start-up company, where the management, i.e. the Chapter board, is continuously establishing mature operational processes, and in parallel discusses and decides how the organization can grow. And it is all driven by enthusiastic volunteers, it's us who defines the success of the Chapter, the board, the volunteers, the members. Some people – including my wife – sometimes ask me how I can spend so much time for a hobby. But then I tell them that everyone who takes a hobby serious invests a lot of time. The trainer of a junior football team, a member of a political party or someone who builds model railways does not really count the hours, they just love what they do. There have even been times when my daily job routine was so dull that I felt like my activities for PMI kept me "mentally alive", as this was where I could realize my ideas.

In your opinion, what kind of project is the most challenging? Why?
Projects with large audiences. When a construction project gets into trouble, well, then the tunnel just opens a few years later. Or when an IT project fails, then you perform a roll back and try again next month. But in a project such as for example the EURO 2008, there is no second attempt. If the project for organizing the opening ceremony screws up, then you have millions of spectators who are disappointed, real-time. Project managers who can make sure that everything goes right under these tough conditions really have my respect.

What has been your hardest "lesson learned"?
That most line managers don't understand the value of systematic project management. They either think it is just administration, or that project management is not something you can learn, it is just something you do because you are told to. Finding subtle ways of convincing executive management that project management is a skill by itself, and that it is worth investing time and money in, is a challenge which PMI is very actively working on. I believe that this will also be an important topic for the Chapter in the coming years.

What single piece of advice would you give to a young project manager who is just entering the field?
To actively seek companies where project management is valued as a discipline. Of course you can grow professionally and personally just by taking courses and reading books, and by practical experience. But that approach has its limits.

A company where project management is recognized on executive level, where project methodology, exchange of experience and identification of best practices are not only tolerated, but actively fostered, is a place where you can really grow your professional knowledge and experience.

If you feel that your organization does not offer that environment, quit, and seek a company with a higher project management maturity.@

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The Role of the Independent Engineer: The Correlation between the Project Financing cycle and the PMI PM Framework

Abstract

The role of the Independent Engineer in Project Financing has been extensively addressed in the literature. However, little has been written on his relevant activities in correlation to the PMI PM Framework.
This paper explores the correspondences between the Project Finance cycle steps and the PMI PM Process Framework. Three PM Process Groups have been identified in which the Independent Engineer plays a fundamental role: Initiation, Planning and Controlling. The Independent Engineer's contribution to each process group is analyzed with reference to the pertaining Knowledge Area.

Introduction

Project Finance has been rising at a significant rate in the last decade as a new form of external funds for large construction projects.
Project Finance can be defined as financing of an industrial project with myriad capital needs, usually based on non-recourse or limited recourse structures, where project debt and equity used to finance the project are paid back from the cash flow generated by the project, with the project's assets, rights and interests held as collateral. In other words, it's a flexible and comprehensive financing solution that demands a long-term lending approach not typical in today's marketplace.
The challenge with innovative financial structures such as Project Finance is that the investment is made upfront while the anticipated benefits of the initiative are realized years later.
Most of this financing is related to the energy sector, while industrial Project Finance remains the domain of a select few institutions.
Often lenders involved in project financing rely on independent technical advisers, such as independent engineers (IE) and others who can analyze the project and determine its viability. Lenders often share independent advisers instead of each having their own in order to avoid excessive cost to the project. In this framework, the IE analyses and monitors the project along its course on those areas that can have the greatest impact on the technical and financial success of the transaction from technical and risk assessment to financial model appraisal.
While the role of the IE within project financing has been extensively addressed (Switala, 2007; Gendreau, 2004) both by engineering and financial entities, little has been written so far on its relevant activities in correlation to the PMI PM Framework. Of the PM Knowledge Areas which closely pertain to the role of the IE within the project financing framework, mainly, and almost only, the risk analysis has been deeply addressed so far in the literature (Switala, 2007; Eaton & O'Connor, 2002; Klompjan & Wouters2002; Rode, Lewis & Dean, 2003; Ruster, 1996). While the fundamental role of the IE in risk identification, qualification, quantification, monitoring and control is acknowledged, this is not the only relevant PM Knowledge Area the IE contributes to in the framework of Project Financing.
This paper explores the correlations between the Project Finance cycle steps and the PMI PM Process Framework. Three PM (PMI, 2003) Process Groups have been identified in this work, in which the IE plays a fundamental role: Initiation, Planning and Controlling. This paper focuses on these three steps and analyzes the contribution of the IE to Project Finance from the PMI PM Process perspective.
The analysis considers the typical set-up of a construction project in the energy sector, however, the critical steps apply also for other sectors where Project Finance applies (i.e. infrastructure, telecommunication, oil & gas, mining public services and others).

Project Finance Cycle versus PMP Process Steps

Figure 1 offers a simplified illustration of a typical Project Finance cycle, while Figure 2 is the typical representation of the PM PMI Process Steps.

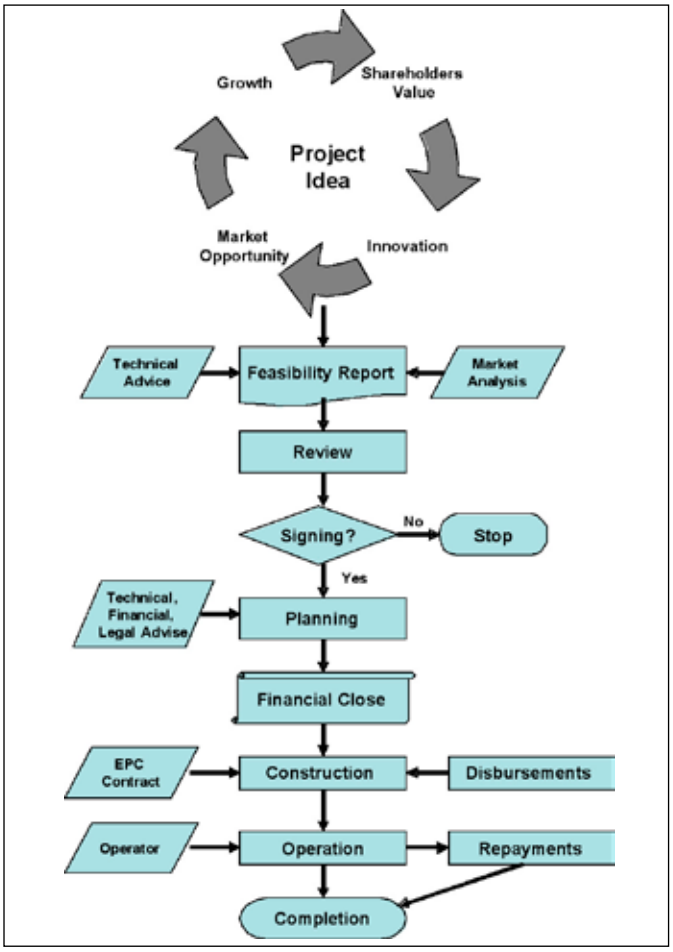


Figure 1. Project Finance Cycle

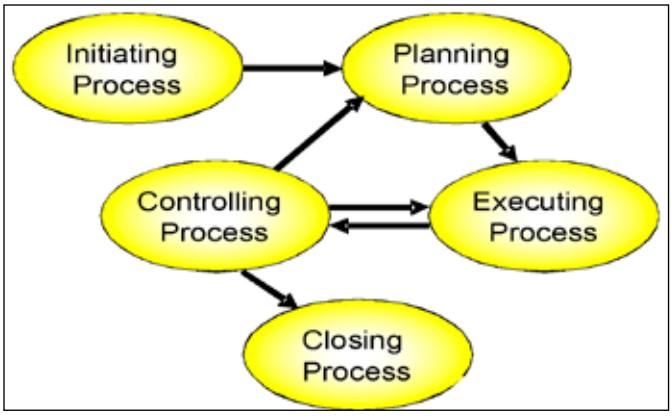


Figure 2. PMI PM Process Steps

Figure 1 shows that initiation of a project is founded on a sound project idea, subsequently supported by a satisfactory feasibility study and financial model. The initiation of the project is concluded with a Review Step, which might be further broken down to concept, final and board review (EBDR, 2007). The Concept Review analyses and gives approval to the project concept and its overall structure, including proposed financing structure and supporting obligations. Once the basic business deal has been negotiated and all investigations have been substantially completed, the project receives a Final Review. Following a successful Final Review, the project will undergo a formal Board Review or Formal Acceptance; the deal is signed and becomes legally binding.
The project enters a critical Planning Phase, which results in the Financial Close. Financial Close is the milestone in the project cycle that is reached when funds are secured. To secure this milestone, the feasibility of the project needs to be proven and the project contractual structure must be substantially in place. A characteristic of the process is the involvement of a number of advisers on behalf of the sponsors and the lenders to provide advice on technical, market, financial, legal and other issues. These services are typically referred to as Due Diligence. Due Diligence is the process of investigation and evaluation, performed by investors with the support of legal, commercial and technical advisors, into the details of a potential investment, such as an examination of operations and management and the verification of material facts.
Financial Close marks the starting of the Construction Phase. This is made possible by the presence of an Engineering, Procurement and Construction (EPC) Contract and funds disbursements based on agreed repayment conditions. The Construction Phase is followed by the Operation Phase, which depends on the successful completion of the Construction Phase and the presence of an Operator. During this phase, the scheduled repayments are executed. Completion of the project is achieved when the loan amount has been fully repaid.
Within this cycle, the IE is active by providing advice on the technical, market and financial set-up of the project. In the early stage of the project, the IE is responsible to analyze the information which form the basis of the project and indicate his findings and judgment by issuing the pre-contract Due Diligence Report. The IE contributes to review the project in order to assess its value and viability prior to final signing. In the following Planning Phase, the IE will continue monitoring the project by providing technical and financial advice in order to ensure that a consistent integrated project plan is in place to ensure a successful completion. This activity culminates in the Financial Close.
In the following Execution Phases (construction and operation) the IE is responsible to monitor the project course and development ensuring that all procedures in place are properly followed and that the project is progressing as planned. The IE will play a fundamental role in this phase by reviewing the scope changes occurring along the project development and exercising project cost and schedule control and risk/mitigation supervision.
The IE activities highlighted in this section are described in detail in the following chapters per each analyzed project phase.

The Independent Engineer in Project Finance: Correlation to the PM Framework

While the Project Manager of a large project typically applies, although through customization, all activities related to the PM Process Groups, the IE acts as an independent adviser of the project and as such plays an active role in specific Process Groups.
In the following sections we analyze the single Project Finance cycle steps, the role of the IE in each of these steps and we attempt a correlation between the IE activities in this framework and the PMI PM Process Steps and Knowledge Areas.
As already indicated, three Process Groups have been identified where the IE plays a key role: Initiating, Planning and Controlling.

Initiating

In the Initiation Phase of the project the IE prepares the Pre-Contract Due Diligence. This is a report which describes the facilities or infrastructure, including design philosophy and operating characteristics of the various components, written for the investor, lender, legal counsel and others, as applicable. The report describes each of the main systems and equipment of the facilities and infrastructure. The IE provides conclusions and recommendations regarding the technical merits of the assets involved in the transaction. Aim of this initial phase of the work is to provide the lenders with an independent evaluation of the characteristics of the project in view of their decision to provide financing.
Figure 4 shows the hierarchy and relationships among the main activities performed by the IE in the Initiation Phase in order to assess the general characteristics of the project. The assessment focuses on the completeness of the defined Project Scope, in agreement with the core activities of the Scope Initiation as per PMI PM Framework. An analysis of the activities, as reported in Figure 4, is hereafter offered.
Review technical performance and cost assumptions. This is the evaluation of the project set-up which shapes the whole project. Within the PMI PM Framework this activity consists of reviewing the product description and assessing if the project objectives are clearly determined, realistic and in line with performance and cost assumptions. In this respect, the IE considers also the commercial aspects of the concession agreement, where the high level resource constraints and the deliverables are assessed and the allocation of project responsibilities is analyzed, forming the basis for the Risk Management activities. Parallel to the commercial aspects, the IE reviews the available technical studies, supporting the project assumptions from the technical side and performs an assessment of the Project Design Basis. This activity is complemented by the identification of sensitivities studies that should be performed, which reflect the range of uncertainty, resulting in the identification and analysis of all high level constraints and assumptions. In this respect, the IE shall confirm that all relevant sensitivities studies are considered within the project, in order to ensure that no constraint is neglected for a comprehensive assessment of the project. This last task has a fundamental importance as the identifica-

		Process Groups				
		Initiating	Planning	Executing	Controlling	Closing
	Integration		Project plan development	Project Plan execution	Integrated Change control	
	Scope	Initiation	Scope planning Scope definition		Scope verification Scope change control	
	Time		Activity definition Activity sequencing Activity duration estimate Schedule development		Schedule control	
	Cost		Resource planning Cost estimating Cost budgeting		Cost Control	
	HR		Organizational planning Staff acquisition	Team development		
	Communication		Communication planning	Information distribution	Performance reporting	Administrative closure
	Quality		Quality planning	Quality assurance	Quality Control	
	Risks		Risk planning Risk identification Qualitative assessment Quantitative assessment Risk response planning		Risk monitor and control	
	Procurement		Procurement planning Solicitation planning	Solicitation Source selection Contract administration		Contract Closure-out

Figure 3. PM Process Groups and Knowledge Areas Matrix.

Figure 4. IE activities in Project Finance Initiation: hierarchy and relationships.

tion of high level constraints and assumptions will set the basis for the risk, schedule and cost planning in the following phase.

Balance Sheet review. In the Initiation Phase, the IE also performs a high level analysis of the value of the project based on the available information and taken assumptions. The analysis ranges from rate of return studies to assessment of the financial model, reviewing the pertinent assumptions and factors, to review of capex (capital expenses) and O&M (operating & maintenance) costs. The IE starts this task in this phase and will reiterate the analysis at a deeper level during the Planning and Execution Phase of the project. This assessment forms the main input for the Pre-contract Due Diligence and plays a major role in influencing the decision whether to finance the project. From the PMI PM perspective, this activity contributes significantly to the identification and confirmation of the project high level constraints and assumptions and to substantiate the project business need. In his work, the IE also considers the input coming from the review of the permit requirements and the identification of sensitivities studies. The review of the permit requirements is fundamental to assess the project capability to meet such requirements under all anticipated operating conditions in order to obtain such permits. This is a necessary condition for the project to be continued. The lack of only one of the required permits can potentially jeopardize the project having a considerable impact on cost and schedule up to the worst case scenario of stopping or cancelling the project. In this respect, the IE shall confirm that all permits needed for the Execution Phase are available and indicate if any are missing.

Legal aspects of the concession agreement. The IE supports the legal advisory team in the identification and assessment of high level constraints and assumptions from the legal point of view, thus contributing to the completeness of the project assessment within the legal framework.

The above analyzed activities contribute to two major outputs of the PMI PM Initiation Step: the high level Scope and the high level Constraints and Assumptions. Figure 5 illustrates the contribution of the IE activities to the outputs of the PMI PM Initiation Process within the Initiation Phase of Project Finance.

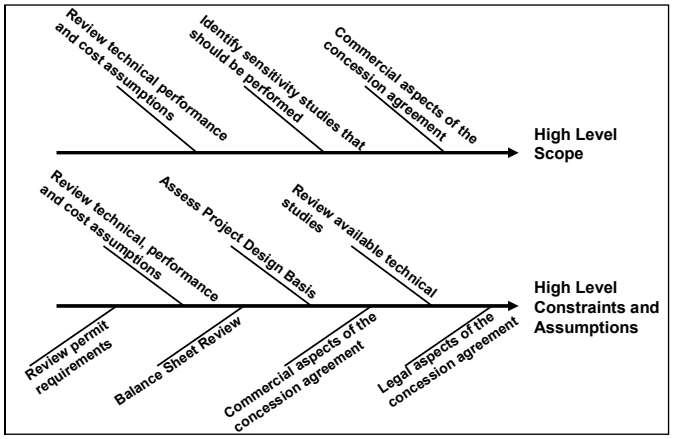


Figure 5. IE's contribution to the output of the Initiation Process Group.

Planning

In the Planning Phase of Project Finance, the IE focuses on those critical aspects of the project which are to provide the evidence for the quantification of the investment. As the project is approaching Financial Close, the essential elements to be looked at in this phase are the Financial Model, the contracts in place, the risk analysis and consistency and sustainability of the triple constraint (time, cost, scope) (Mulcahy, 2005).

Figure 6 visualizes the main activities performed by the IE in this Planning Phase and their interdependency.

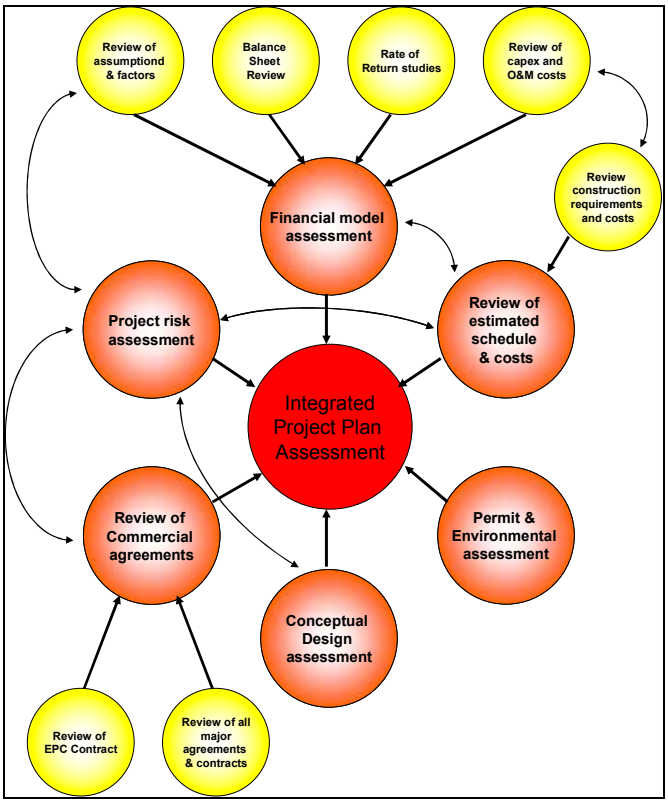


Figure 6. IE activities in Project Finance Planning Phase: hierarchy and relationships.

Financial Model Assessment. The critical decision making instrument in financing a project is its financial model. The model connects revenue, capex, opex (operating expenditures), capital structure and other inputs to provide projected multi-year financials, e.g. income statement, balance sheet and cash flow statement with appropriate ratios, IRRs (internal rate of return), etc. The exercise includes determining the sensitivity of the project parameters such as forecast of operation performance, exchange and interest rates, tariffs, product reliability, pricing and payment schedule, ongoing working capital requirements, capex, opex, cash flow, sustainability of the payment schedule, taxes and other financially relevant parameters. In performing this analysis, the IE provides an unbiased professional assessment of the project

value within the following Knowledge Areas:
- Cost => cost estimating and cost budgeting
- Time => schedule development
- Scope planning => benefit/cost analysis and product analysis

Review of commercial agreements. The review of the specifications, terms and conditions of the EPC contract and other agreements leads to the assessment of the guarantees in place, testing and operation procedures and protocols, the entity of liquidated damages, payment terms, change request procedures and Force Majeure conditions. According to the PMBOK Guide (PMI, 2003), the contract must clearly express the scope statement and clearly describe the project scope. The IE links the project scope to the project cost and schedule estimates to make sure that the triple constraint rule is not violated. In reviewing the agreements, the IE monitors not only the sustainability and consistency of the triple constraint, but also the procurement activity (PM Procurement Knowledge Area).

Conceptual Design assessment. The IE is the best suited figure to evaluate if the project technical basis is solid, checking all assumptions and models used, using also the experience accumulated from other projects. This task requires multi-discipline technical assessment capabilities, typical of medium to large engineering companies. The validity of the project technical basis is proven by assessing the selected technology, its state of the art, correctness of technical assumptions and calculations, safety margins, reliability and validity of used calculations and simulation models. In this framework the IE analyses the project scope and the project schedule at a deeper level (WBS and critical path) to ensure that there are no inconsistencies between these two elements of the project. The sensitivity analysis focuses on technical project parameters as well as schedule, costs and local regulations.

Review of estimated schedule and costs. This activity is closely related to the activity of reviewing the technical aspects of the project. In this case, experience, along with knowledge of the project scope and technical basis, helps perform a sound, independent and reliable assessment. These tasks embrace the broad PM Knowledge Areas of Time and Cost Management. One critical aspect to be reviewed by the IE is the validity of the schedule and the correctness of the activity identification, sequencing, duration estimates and critical path, elements which form the basis for the overall project schedule development. In terms of project cost estimates, the IE analyses the resource planning to ascertain that all needed resources in terms of quantity and skills have been included in the cost estimation and that proper hourly rates have been considered along with market and local manpower situation. The IE also assesses the estimates done for the material and overhead costs to determine if the overall project cost budgeting truly represents the needs of the project.

Permit and environmental assessment. This activity has a fundamental relevance, as already stated, in order to avoid project delays or even cancellation. This will impact not only the project development schedule, but obviously the project construction and operation phase. In this specific assessment the IE operates within the PM Knowledge Areas of Risk, Schedule, Cost and Scope Management.

Project Risk Assessment. The role of the IE in the Risk Management Knowledge Area consists of assessing whether risks have been properly identified, evaluated and allocated to the various parties associated with project financing (investors, developers, EPC contractors, consulting engineers, lenders, multilateral institutions and others) to maximize flexibility, liquidity, and profits. As previously indicated in the beginning of this paper, extensive analysis has been carried out on the Role of the IE in the risk analysis within Project Finance. Switala (Switala, 2007) gives a comprehensive overview of how risks can be classified in Project Finance being allocated within the control either of the Company, outside of Company's control and within the Financer Control and offers indication of the respective mitigation measures to be taken. This paper will not elaborate any further on Risk Management, but will be limited to list the main risks of Project Finance and the typical mitigation categories.

Main risks of Project Finance: Technical risks, Technological risks, Feedstock price risks, Feedstock availability risks, Construction risks, Completion risks, Performance risks, Operations risks, Market price risk, Market access risk, Financing risks, Judicial risks, Political risks.

Typical mitigation categories: Performance guarantees, Acceptance tests, Liquidated damages.

Table 1 summarizes the PM Knowledge Areas in which the IE is active, as a result of the above analysis and considerations.

IE Activity in Project Finance	Pertaining PMP Knowledge Area	Enveloping PMP Knowledge Areas
Financial Model Assessment	Cost Time Scope	Integration Communication Quality
Review of commercial agreements	Cost Time Scope Procurement	
Conceptual Design assessment	Time Scope	
Review of estimated schedule and costs	Cost Time Human Resources	
Permit and environmental assessment	Cost Time Scope Risk	
Project Risk Assessment	Risk Communication	

Table 1. Correspondence between Project Finance activities and PMI PM Knowledge Areas.

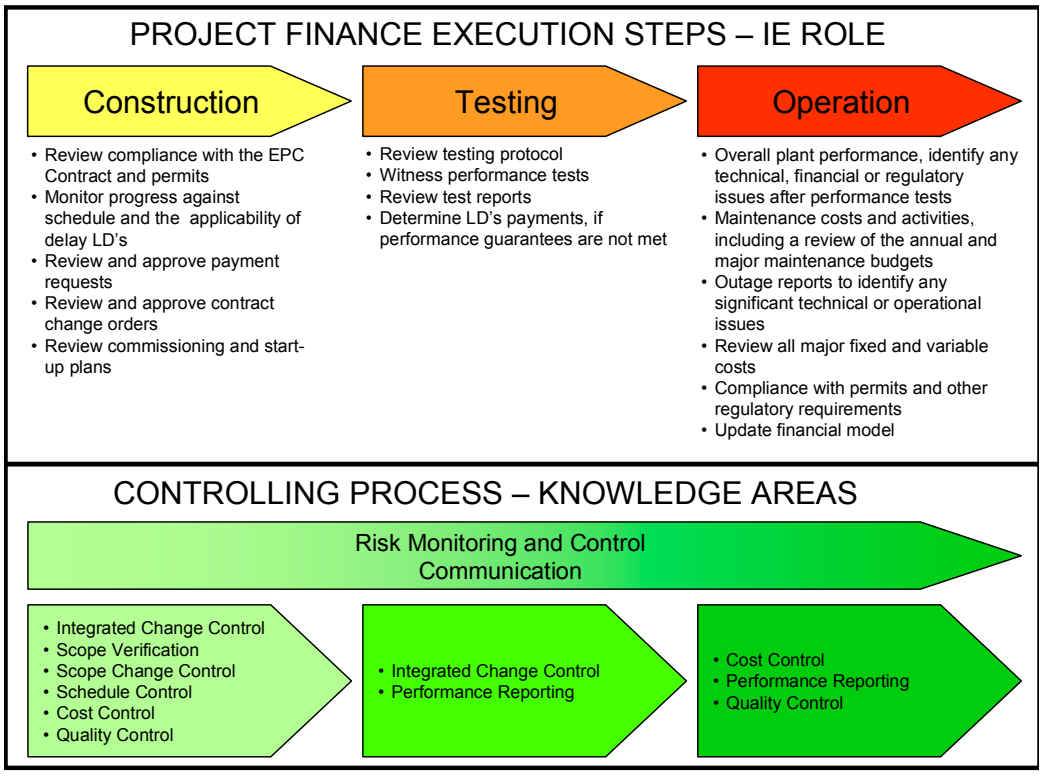
From the outcome of the analysis it appears evident how the role of the IE within the Planning Phase of Project Finance relates to all PM Knowledge Areas. The elements of the triple constraint (cost, time, scope) are the major Knowledge Areas where the IE is active in the Planning Phase as they recur in more than one of the IE activities. The several tasks are enveloped within the Knowledge Areas of Integration, Communication and Quality. In his activity, the IE analyses all the information and elements at disposal to draw an integrated picture of the Project Plan and to assess its consistency and sustainability. By doing this, the IE discusses with all the parties involved in the projects and reports his findings and conclusions to the lenders.

Due Diligence Report as an output of Initiation and Planning Phases. The project general assessment in the Initiating Phase and the project assessment for Financial Close in the Planning Phase build up the Due Diligence. Due Diligence can be executed in two steps, each pertaining to one of the two Project Phases. It constitutes the essential input for the two critical milestones preceding the Project Execution Phase: Signing and Financial Close. In this respect, the Initiation and Planning Phase are of critical importance to ensure to the project the necessary funding to further proceed in the Execution Phase.

Controlling

In this phase, the IE's function is essentially aimed to provide to the lenders an independent opinion about the progress of the project implementation and possible difficulties which may arise. The role of the IE is not just to witness the occurrences, but also to provide suggestions on how to solve potential technical or time schedule difficulties avoiding or minimizing cost over runs. This task requires a sound analysis of technical aspects as well as understanding and, when necessary, mediating between the requirements of the lenders, of the developer and of the EPC contractor. The Communication Management Knowledge Area is thus a recurring element of the IE activity during the Controlling Phase. In this phase the activity of the IE unfolds over three consequent steps (Gendreau, 2004): Construction stage services, plant acceptance testing and plant operation monitoring. In each step, the IE monitors the progress of the project activity and the performance of the product, performing a series of cyclic analyses. Figure 7 offers an overview of the typical tasks performed by the IE within the Project Finance Execution Phase and the links with the PM Project Controlling Knowledge Areas.

During the Construction Phase, the IE periodically reviews the construction progress; this is mainly carried out by regular site visits, audits and meetings with the parties involved in the construction: Developer, contractor and sub-contractors. By reviewing compliance with the EPC contract and permits, the IE performs the cost, schedule, quality control and scope verification of the project. The review of the project progress against planned schedule triggers the applicability of the liquidated damages by applying the Schedule Control. By reviewing the schedule the IE will also release his approval for the payment requests and the commissioning and start-up plan for the successive phase. The IE plays a fundamental role in reviewing the project scope change requests and ensuring that the project overall course is not adversely affected and that there are no inconsistencies within the updated project plan. At the end of the construction, the IE witnesses the commissioning procedures and certifies to the lenders that the project is ready for commercial operation.



Nomenclature

capex
Capital Expenditures
DSCR
Debt-service coverage ratio
EPC
Engineering, Procurement and Construction
IE
Independent Engineer
IRR
Internal Rate of Return
O&M
Operation and Maintenance
opex
Operational Expenditures
PF
Project Finance or Project Financing
PM
Project Management
PMI
Project Management Institute
PMP
Project Management Professional
WBS
Work Breakdown Structure

Figure 7. Project Finance steps and Controlling Knowledge Areas.

In the following Testing Phase, the focus shifts predominantly into the technical appraisal of the product conceived by the project and to its performance evaluation to ensure the product performs as indicated in the original description so that it will enable the project to repay the debts. Any deviation from the agreed product requirements or characteristics is duly analyzed and settled following the established integrated change control procedure.

The project reaches its maturity when entering the Operation Phase. In this step, the IE focuses on the product to ensure full compliance with the agreed terms and conditions of the contract and the funding

agreement. By analyzing the product, the IE will ensure that its status and performance do not raise technical, financial or regulatory issues which may compromise the product value or performance and consequently the agreed repayment schedule. The O&M plan and budget will be assessed as well as fixed and variable costs. The pro-forma input will have to be confirmed. In this step, the IE applies the tools pertaining to the following Knowledge Areas:

- Cost control: Focusing especially on performance measurements and Earned Value management to confirm the project value corresponds to the originally agreed value.
- Performance reporting: Carrying out performance review, variance and trend analysis as well as Earned Value analysis to communicate to the lenders if the status of the project/product respects the planned and agreed terms.
- Quality control: Performing periodic inspections and audits.

The assessment activities performed by the IE in the three steps of the Execution Phase are accompanied by the risk monitoring and control process to ensure the planned mitigations are properly activated in case deviations from the original project course occur and to ensure that the mitigation plan is continuously updated and realistically reflects the risk exposure of the lenders.

Conclusions

This work has explored the correlations between the Project Finance cycle steps and the PMI PM Process Framework related to the activities of the Independent Engineer (IE). Three PM Process Groups have been identified in this work, in which the IE plays a fundamental role in the Project Financing cycle: Initiation, Planning and Controlling. The paper offers an analysis of the IE role in each group within the Project Finance framework and correlates the IE individual activities with the specific PMI PM Knowledge Areas.

The analysis focused on the typical set-up of a construction project in the energy sector; however the critical steps apply also for other sectors where Project Finance applies.

The key activities conducted by the IE during the Project Finance Initiation Phase contribute mainly to the high level scope and high level constraints and assumptions, outputs of the PMI PM Initiation Process.

The activity of the IE within the Planning Phase of Project Finance touches all PM Knowledge Areas, with special emphasis and impact on the elements of the triple constraint (cost, time, scope).

Initiation and Planning Phase in Project Finance are marked by two key milestones: Signature and Financial Close. During these phases, the work of the IE is documented in the Due Diligence, a report which provides the lenders with an independent evaluation of the characteristics of the project in view of their decision to provide financing. In this respect, the Initiation and Planning Phase are of critical importance to ensure to the project the necessary funding to further proceed in the Execution Phase.

The assessment activities performed in the Project Finance Execution Phase touch all the main PMI PM Knowledge Areas pertaining to the Controlling process in an integrated project control activity.

As a whole the work of the IE within Project Finance results in an integrated monitoring activity of the project all along its course, from plan initiation and development in the Initiation and Planning Phase to project plan execution and change control in the Execution Phase. @

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Kostenkontrolle mit Earned Value Management bei Softwareeinführungsprojekten

About the Author
Beat Dietziker holds a diploma in business administration from the Kaderschule Zurich. He has over 25 years experience in managing IT projects. Before he established his own consultanting and training companies in Switzerland and Germany, he spent 15 years as a co-partner and CEO of the Swiss branch of a large German software company. He has worked for both international and local companies, especially in ERP Software integration.

Abstract
If you are a project manager: Have you ever been asked how far along you were in a project? Of course you have. The question itself is vague, and so your equally vague answer of "we are pretty close to schedule" sounds like an appropriate response.

Many projects end with budget overrun. If the project sponsor is informed early about deviations and can take appropriate actions the project may be successful even if the budget was not strictly adhered. This paper shows how to remove the guesswork from determining where you are in relation of the baseline using Earned Value Management. It also shows the basic requirements to implement Earned Value Management and the additional value you gain using Earned Value Analyses.

Keywords
Earned Value Management, Budget, Project Controlling, Project Costs

Kostenkontrolle mit Earned Value Management in Softwareprojekten

Projektcontrolling statt Feierabend
Es ist beinahe zwanzig Uhr, und ich sitze über meinem Excel Sheet, das ich mir für die Überwachung meiner Projekte entworfen habe. Kurz vorher hat mich meine Frau angerufen und nachgefragt, wann ich nach Hause komme. „Bald, ich muss nur noch …", war meine Antwort. Eine Antwort, die sie kennt und aus der sie dank ihrer Erfahrung ableitet, dass es spät werden kann. „Bald" und das sogenannte 90-Prozent-Syndrom – „ich bin zu 90 Prozent fertig mit meiner Arbeit" – sind ähnlich subjektive Schätzungen, schmunzle ich über mein Gedankenspiel. Mehr dazu etwas später.

Ebbe und Flut von Information
Ich fahre fort, die Fortschrittskennzahlen in mein Excel Sheet zu übertragen. Leichter gesagt als getan, da die neuen Arbeitspakete in meinem Termin- und Kostenplanungs-Excel File noch nicht vorhanden sind. Infolgedessen fehlen mir jetzt nämlich auch die Budgets, die prognostizierten Restaufwände, die Dauer und weitere Grössen dieser neuen Arbeitspakete.

Ich will mich nicht über zu wenig Information beklagen, denn mein Schreibtisch ist voll davon. Ich klage darüber, dass ich für mein Projektcontrolling eine Vielzahl von Kennzahlen benötige, die erst aus einer noch grösseren Zahl von Quellen ermittelt werden müssen. Und, was weitaus schlimmer ist, es fehlen mir vielfach wichtige Grössen. Ebbe in der Informationsqualität und Flut in der Informationsmenge.

Wie steht's um das Projekt?
Seit Längerem habe ich mir abgewöhnt, nach dem Fertigstellungsgrad in Prozenten zu fragen. Ich erkundige mich stets nach dem Restaufwand, der zur Fertigstellung einer Aktivität notwendig ist. Dies schützt mich wenigstens ein bisschen vor dem 90-Prozent-Syndrom. Mein schlaues Excel errechnet daraus dann den prognostizierten Restaufwand und den prognostizierten Gesamtaufwand. Zudem erstellt es einen Vergleich zwischen Budget und Ist-Zahlen her. Nachdem ich mein Excel vervollständigt habe, erhalte ich einen Gesamtüberblick. Aber kann ich meinen eigenen Zahlen glauben? Sind die Schätzungen im Laufe des Projekts zu pessimistisch geworden? Wie wirkt sich dies nun auf das Budget aus? Ehrlich gesagt: Ich weiss es nicht. Die Kennzahlen bestätigen vielleicht mein Gefühl, mehr jedoch nicht.

Ich hatte grosszügig kalkuliert
Das schöne Balkendiagramm hat sich geduldig ins Papier eingebrannt. Seit Projektstart vor vier Monaten hat sich zwar im Projekt einiges geändert, aber dies spiegelt sich nicht im Diagramm wider. Die einzelnen Arbeitspakete sind teilweise viel zu gross geworden und dadurch ergibt sich auch die Ungenauigkeit der Budgets. Die Folge: Es wurden die wohlbekannten „Wo ist noch Platz?"-Budgetumverteilungen durchgeführt. Letztendlich steht das Ergebnis unserer aufwendigen Datensammlung in keinem Verhältnis zu der Qualität der Aussage über den Projektstand.

Diese Geschichte spielte sich vor einigen Jahren ab. Ich erzähle sie Ihnen, weil sie der Auslöser zur Einführung von Earned Value Management (EVM) in meiner Firma war. Heute bin ich froh, dass wir dank Earned Value Management im Vorfeld gründlicher planen und aktiv mit dem Projektsponsor auf Inhalts- und Umfangsänderungen eingehen.

Earned Value Management – Beginn im Vorfeld
Die schlechte und die gute Nachricht ist: Earned Value führt man nicht einfach durch, sondern es bedingt eine Änderung der Arbeitsweise und der Projektprozesse. Es verlangt nach einer methodischen und disziplinierten Vorgehensweise, was jedoch, wie dieser Artikel noch zeigen wird, zusätzlichen Nutzen generiert. Die wirklich gute Nachricht ist: Stimmen die nachfolgenden Voraussetzungen, dann ist die Methode sehr einfach anwendbar. Mit nur drei Werten erhalten Sie ein hervorragendes Frühwarnsystem.

Die Einführung von Earned Value kann kosten- und zeitintensiv sein, da häufig Änderungen in der Projektkultur, den Arbeitsabläufen und ein Mehrbedarf an Schulungen notwendig ist.

Und nachdem Sie die Kosten und den Aufwand kennen, müssen Sie sich nicht zuletzt fragen: Ist der zusätzliche Nutzen, der durch eine präzisere Aussage entsteht, auch den administrativen Aufwand wert? Andererseits – wie viel Kostenüberschreitung oder Terminverzögerung können Sie sich leisten? Oder bauen Sie bereits von vorne herein hohe Reserven ein?
Dass Projekte scheitern können, liegt in der Natur der Projektarbeit, daran wird auch EVM nichts ändern. Wenn Sie jedoch früher erkennen, dass ein Projekt im Verzug ist oder das Budget überschritten wird, werden die Steuerungsmassnahmen um so einfacher und kostengünstiger sein.

Die Entscheidung EVM anzuwenden – unsere Ziele
Für unsere Firma war der Nutzen von Earned Value essenziell. Folgende Überlegungen führten zur Entscheidung, EVM anzuwenden:
- Wir sind es unseren Kunden schuldig, den Projektfortschritt genau zu kommunizieren und frühzeitig auf Probleme aufmerksam zu machen.
- Verzögerungen und Kostenüberschreitungen schaden dem Image unserer Firma.
- Uns stehen knappe Ressourcen zur Verfügung, die sowohl an Projekten als auch an Tagesarbeiten beteiligt sind. Das „traditionelle" Projektcontrolling, bei dem geplante und tatsächlich eingetretene Kosten miteinander verglichen werden, liefert hier ungenügende Ergebnisse.
- Durch Planung und aktives Inhalts- und Umfangsmanagement werden Kosten eingespart, weil rechtzeitig über den zu erwartenden Nutzen einer Änderung mit dem Kunden gesprochen wird. Die Earned Value Analysis (EVA) soll uns dabei unterstützen, Kostenabweichungen frühzeitig zu erkennen.

Voraussetzungen für einen Nutzen aus EVM

Die Methode zwingt ihren Anwender zu einer gründlichen **Projektstrukturplanung** (PSP) mit Teilprojekten und Arbeitspaketen und einem darauf abgestimmten **Terminplan**. Alle Arbeitspakete müssen **budgetiert** werden. Das war in unserer Situation die grösste Hürde, die wir zu bewältigen hatten, da Projektmitarbeiter leider gerne mit Sätzen wie „Macht mal was und was soll diese ganze Planerei, es kommt ja doch anders“ in die Ecke gedrängt werden. Da müssen Sie auch durch.

Inhalts- und Umfangsmanagement. Sicherlich treten zusätzliche Änderungen auf, die Sie in Ihrer Planung und Ihrem Budget berücksichtigen müssen. Auf keinen Fall dürfen Sie Inhalts- und Umfangsänderungen in Ihre Reserven einrechnen. Die Reserven werden Sie für andere Dinge benötigen! Inhalts- und Umfangsänderungen müssen mit dem Auftraggeber abgestimmt werden. Dies ist nicht immer angenehm, und die Versuchung ist insbesondere zu Beginn des Projekts gross, klein beizugeben und den Posten zu irgendeinem Budget dazuzupacken. Stärken Sie Ihren Projektleitern den Rücken und liefern Sie ihnen Argumente, um auf Äusserungen wie: „Ich dachte, das sei enthalten“ oder „Sie haben doch noch Reserven“ reagieren zu können. Klären Sie bereits zu Projektbeginn, wie Inhalts- und Umfangsänderungen gehandhabt werden sollen. So weiss der Kunde, was auf ihn zukommt und ärgert sich nicht, weil Sie alle drei Wochen wegen einer Entscheidung in seinem Büro stehen.

Erfassung von Aufwand und Kosten. Auch wenn Ihnen gute Terminpläne zur Verfügung stehen, benötigen Sie für EVM Ist-Zahlen. Für unseren Betrieb war dies kein Problem, da unser Geschäft von Dienstleistung lebt und diese dem Kunden auf der Grundlage von Arbeitsrapporten belastet werden. Ich kann mir aber vorstellen, dass dies für viele Organisationen die wohl grösste Hemmschwelle ist, da interne Kosten nicht erfasst werden. Wenn keine Kosten erfasst werden, sollte statt in Franken in Personenstunden gerechnet werden. Sie erhalten dadurch ein Budget und Ist-Werte in Form von Arbeitszeiten und können dann genauso Performance-Indikatoren berechnen, als ob Kostendaten vorliegen würden.

EVM Earned Value Management (EVM)

Was ist Earned Value Management? Im PMBOK® Third Edition, im Netz und in diversen Büchern erhalten Sie viele Informationen darüber und sehr gute Rechenbeispiele, daher halte ich mich nur kurz mit Formeln auf.

Nachdem ich auf die Voraussetzungen für die Einführung von EVM eingegangen bin, gehe ich nun auf die Vorteile und den Nutzen ein, die unser Unternehmen daraus ziehen konnte. Dazu beginne ich mit der Definition einiger Grundbegriffe:

Earned Value Management

Earned Value Management ist eine einfache Methode, mit der Sie sich mit wenigen messbaren Grössen und daraus abgeleiteten Kennzahlen ein Bild über den aktuellen Stand eines Projekts bezüglich seiner Termin- und Budgeteinhaltung verschaffen. Die erhaltenen Kennzahlen geben Ihnen ausserdem einen Ausblick über die weitere Entwicklung des Projekts und lassen Sie frühzeitig auf Abweichungen reagieren.

Fertigstellungsgrad

Wir haben uns für diesen Zweck vollständig vom prozentualen Fertigstellungsgrad und prognostizierten Restaufwand getrennt. Wir wenden ausschliesslich die 0/100 Methode an. In der Literatur existieren darüber hinaus noch einige andere Methoden (50/50-Methode, 20/80-Methode), für uns war jedoch die 0/100 Methode die geeignetste. Oder, um es mit der treffenden Formulierung von Dr. Georg Angermeier in seinem Beitrag „Projektcontrolling mit Earned Value Management“ (erschienen 2003 auf www.projektmagazin.de) zu sagen: „Ein Tor ist erst dann ein Tor, wenn der Ball drin ist. Ein 99%-Tor, bei dem der Torwart den Ball auf der Linie stoppt, ist eben kein Tor. Ein Arbeitspaket ohne fertig gestelltes Ergebnis hat auch keinen Fertigstellungsgrad.“

EV = Earned Value

Der Wert EV (Earned Value) wird berechnet, indem die **budgetierten** Aufwände bzw. Kosten jedes **erledigten** Arbeitspakets zu einem bestimmten Stichtag addiert werden.

PV = Planned Value

Den Wert PV (Planned Value) erhalten Sie, wenn Sie die **budgetierten** Aufwände bzw. Kosten jedes geplanten Arbeitspakets zu einem bestimmten Stichtag addieren. Der Planned Value (PV) Wert erhöht sich beim **geplanten** Beginn des Arbeitspakets, egal ob Sie mit der Arbeit anfangen oder nicht. Die Formeln in PMBOK® lassen hier aber Interpretationsfreiheit zu. Viele erhöhen den PV erst am geplanten Ende des Arbeitspakets. Entscheidend ist, dass Sie dies immer identisch handhaben. Wir erhöhen den PV jeweils am geplanten Beginn des Arbeitspakets, da wir daraus im Sinne einer Zieltransparenz Vorteile sehen, und das Projektziel dadurch eine handfeste, monetäre Messgrösse erhält, die zu erfüllen ist.

AC = Actual Costs

Mit AC werden die Ist-Kosten bezeichnet, die bis zum Berichtstichtag angefallen sind. Zur Bewertung unseres Projekts benötigen wir die **tatsächlich angefallenen Kosten**. Diese auf dem aktuellen Stand zu halten ist zugegebenermassen eine schwierige Aufgabe, da uns die Daten vielfach mit enormer Verspätung zur Verfügung stehen. Fürs Projektcontrolling benötigen wir jedoch aktuelle Zahlen zum Berichtszeitpunkt. Die Erhebung der Ist-Kosten kann unter Umständen also sehr aufwändig sein, insbesondere, wenn Ihnen keine automatischen Prozesse (Buchhaltung, Arbeitszeiterfassung etc.) zur Verfügung stehen.

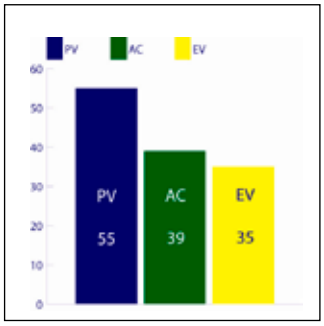
Drei Grössen, um das Ziel zu erreichen?

Earned Value (EV), Planned Value (PV) und Actual Costs (AC) reichen, damit eine Earned Value Analysis (EVA) erfolgen kann und Sie daraus auf den Zustand Ihres Projekts schliessen können. Nicht die Grössen an sich sind kompliziert, sondern der Weg, wie Sie an diese Grössen kommen, ist entscheidend. Ohne gründliche Planung, ohne methodisches Vorgehen und ohne ständige Aktualisierung werden Ihnen diese drei Grössen keine Aussage liefern.

Indem wir die Grössen zueinander in Beziehung setzen, erhalten wir Kennziffern. Dabei gehört ein Cost-Schedule-Diagramm, also die Veranschaulichung von EV, PV und AC zur Mindestausstattung. Hierzu ein Zahlenbeispiel:

Projektstart 10.02 Heute ist der 15.03

	PLANWERTE			ISTWERTE			EVA-Kennzahlen		
Arbeitspaket	Start	Ende	Kosten	Start	Ende	Kosten	PV	EV	AC
1	10.02	10.03	20’000	10.02	10.03	20’000	20’000	20’000	20’000
2	05.03	15.03	10’000	05.03	14.03	5’000	10’000	10’000	5’000
3	13.03	31.03	15’000			0	15’000	0	0
4	14.03	10.04	10’000	10.03		4’000	10’000	0	4’000
5	25.03	05.04	5’000	15.02	03.03	10’000	0	5’000	10’000
			60’000			39’000	55’000	35’000	39’000



Abkürzungen:

EVA	=	Earned Value Analysis
PV	=	Planned Value
EV	=	Earned Value
AC	=	Actual Costs

Stichtag 15.03.				Hinweise
APK1	PV	=	20'000	Planstart am 10.02.
	EV	=	20'000	APK wurde am 10.03. beendet (EV = PV)
	AC	=	20'000	Ist-Kosten per Stichtag
APK2	PV	=	10'000	Planstart am 05.03.
	EV	=	10'000	APK wurde am 14.03. beendet (EV = PV)
	AC	=	5'000	Ist-Kosten per Stichtag
APK3	PV	=	15'000	Planstart 13.03., die Planwerte gehen gesamt in PV
	EV	=	0	Die Arbeit hat noch nicht begonnen
	AC	=	0	Die Arbeit hat noch nicht begonnen, daher keine Ist-Kosten
APK4	PV	=	10'000	Planstart am 14.03.
	EV	=	0	Die Arbeit hat am 10.03. begonnen, aber ist nicht fertig gestellt
	AC	=	4'000	Ist-Kosten per Stichtag
APK5	PV	=	0	Planstart ist erst am 25.03.
	EV	=	5'000	Die Arbeit wurde früher beendet (03.03.)
	AC	=	10'000	Ist-Kosten per Stichtag

Liegen wir im Budget?

Die CV = Cost Variance rechnet sich aus EV minus AC und ist die Abweichung der aktuellen Kosten von den geplanten Kosten der abgeschlossenen Arbeiten. Ist CV negativ, haben wir mehr als geplant ausgegeben. Ist sie positiv hat das Projekt weniger verbraucht als geplant.

EV	-	AC	=	CV	
35'000	-	39'000	=	-4'000	Unsere Cost Variance ist negativ. Wir müssen mit einer Budgetüberschreitung rechnen.

Cost Performance Index = $CPI = \frac{EV}{AC}$ für unser Beispiel: $0.9 = \frac{35'000}{39'000}$

Sobald der CPI unter Null liegt, zeigt uns dies, dass zur Erreichung der geplanten Ergebnisse mehr aufgewendet wurde. Wir müssen uns also fragen, ob das Budget für die richtigen Aufgaben eingesetzt wurde.

Nur die geplanten Kosten der erledigten Arbeitspakete (EV) lassen den CPI anwachsen. Kosten und vor allem Kostenüberschreitungen (AC) drücken ihn unabwendbar nach unten.

Liegen wir im Plan?

Die SV = Schedule Variance errechnet sich aus EV minus PV. Ist SV positiv, haben wir mehr erreicht als geplant und liegen gut in der Zeit. Ist SV negativ, hinken die Ergebnisse der Planung hinterher.

EV	-	PV	=	SV	
35'000	-	55'000	=	-20'000	Unsere Schedule Variance ist negativ, wir hinken den Ergebnissen hinterher und müssen mit einer Terminüberschreitung rechnen.

Schedule Performance Index = $SPI = \frac{EV}{PV}$ für unser Beispiel = $0.64 = \frac{35'000}{55'000}$

Der Schedule Performance Index gibt Auskunft, ob wir mit den erbrachten Leistungen noch im Terminplan liegen. Ist der SPI kleiner Null, dann hinken wir mit den Ergebnissen hinterher, ist der SPI grösser Null, dann haben wir mehr erreicht als geplant.

Prognosen

Wir geben uns noch nicht mit diesen Kennzahlen zufrieden und wollen auch eine Kostenprognose wagen. Dazu benötigten wir eine weitere Grösse, nämlich das Gesamtbudget (englisch BAC = Budget at Completion).

Budget at Completion (BAC) = 60'000 in unserem Beispiel

Daraus errechnen wir das **prognostizierte Projektbudget** am Projektende. Für unser Beispiel ergibt sich ein EAC (Estimate at Completion) von

$EAC = AC + \frac{BAC - EV}{CPI}$ in unserem Beispiel: EAC = $66'778 = 39'000 + \frac{60'000 - 35'000}{0.9}$

Es gibt mehrere Varianten, den EAC zu berechnen. Wir halten uns an diesen Ansatz, weil in unseren Projekten aktuelle Abweichungen typisch für zukünftige Abweichungen sind.
(Vgl. PMBOK® Kapitel 7.3.2 Steuerung der Kosten: Werkzeuge und Methoden)

Neben der Kostenprognose sind mit dem Schedule Performance Index (SPI) auch Terminprognosen möglich. Dazu müssen aber notwendigerweise weitaus komplexere Berechnungen angewendet werden als hier beschrieben. Die Earned Value Kostenanalyse und eine Meilensteintrendanalyse sind zunächst die einfachsten Methoden für die Prognose und für unsere Projekte völlig ausreichend. Es genügt uns, die Werte zu analysieren und zu interpretieren und daraus die nötigen Steuerungs- und Korrekturmassnahmen abzuleiten.

EVM für jedes Projekt

Wir mussten uns natürlich überlegen, ob sich bei uns die Anwendung der Earned Value Analysis (EVA) für alle Projekte lohnt. Das ist gewiss nicht der Fall, denn es gibt Projekte, die dafür einfach zu klein und zu kurz sind. Ein aussagekräftiger Index ist auch erst dann interessant, wenn ca. 10 Arbeitspakete abgeschlossen sind.

Grundsätzlich gibt uns die EVM eine Anzahl von Kennziffern, damit wir uns die richtigen Fragen und die daraus notwendigen Massnahmen ableiten können. Die Ermittlung der Kennziffern ist einfach. Damit sich die EVM jedoch auch lohnt, müssen wir wissen, wie diese Zahlen zu interpretieren sind.

Jede Erhebung kann viele Fragen nach den Gründen aufwerfen – diese Fragen müssen wir uns stellen. Tom Mochal sagt dazu: „There are many possibilities and many questions to raise – all brought to light by the Earned Value calculation."

Earned Value Management kann so schmerzlich sein wie ein Zahnarztbesuch

Es ist für die Projektleiter schmerzlich zuzugeben, dass sie bereits masslos in Verzug oder über Budget sind. Herr Dr. Angermeier hat dies in seinem Beitrag „Projektcontrolling mit Earned Value" (www.projektmagazin.de) so formuliert: „Die Aussage von EVM kann so schmerzhaft sein wie ein Zahnarztbesuch. Deshalb beginnen viele Projektmanager unter dem Vorwand, ein möglichst realistisches Bild ihres Projekts zu erzeugen, die unterschiedlichsten Rechenübungen. Dadurch schaffen sie schnell einen Verwaltungsaufwand, der den IST-Zustand des Projekts eher vernebelt als erhellt."

Zusammenfassung

Die Herausforderung bei der Einführung von EVM war die Änderung unserer Projektmanagementprozesse. Wir investierten vor allem in die Ausbildung und in die Methodik. Anfänglich waren die Projektstrukturpläne nicht ausreichend detailliert. Wir mussten uns diszipliniert daran halten, die Arbeitspläne laufend zu aktualisieren und besonders bei Inhalts- und Umfangsänderung aktiv mit dem Sponsor zu kommunizieren.

Gewonnen haben wir viel und unsere Zielsetzungen wurden erfüllt. Vor allem werden die Projektbudgets eingehalten, da der Projektleiter frühzeitig Abweichungen erkennt und gegensteuern kann. Terminprobleme werden schneller erkannt und die Überwachung ist wesentlich einfacher als durch ein Balkendiagramm bzw. durch einen Netzplan. Der Projektfortschritt ist nun auch für den Kunden transparent und wir stehen ab Projektbeginn im Rampenlicht. Ganz nach dem Motto: „Lieber vorbeugen als heilen."

Entsprechend der Forderung, Projekte innerhalb des Budgets und pünktlich zu realisieren und dafür ein einfaches Frühwarnsystem zu verwenden, haben wir uns für Earned Value Management entschieden. Bekommen haben wir darüber hinaus weit mehr, nämlich direkte Kostenersparnisse dank höherer Planungssicherheit und zufriedenere Kunden dank Projekten, die im Budget liegen.@

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