INTEGRATED METHOD OF IT-PROJECT MANAGEMENT

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Managing complex projects which are characterized by their multidisciplinarity, urgency, high risk-potential and by their strategic importance, poses high demands on the project manager and all other involved parties. A methodical procedure ensures that the project management is efficient and that the objectives are met. With the majority of established methodologies (CMMI [4]*, COBIT* [7]*, PMP* [11]*, IPMA* [3,12]*, ITIL* [10]*, PRINCE 2* [2]*, XP* [1] *and so on) however, the human success factor is neglected. It is rare that the methodologies are adapted to fit existing procedures or that specific project deliverables required by the company are considered. This paper presents a methodology which starts with the specific project deliverables and directly derives from methods, techniques, tools, templates and checklists which are appropriate and if possible already established in the company. This way, the compliance with company specific requirements is ensured and unnecessary theories are avoided.*

1. How can a project management-method be customized for a company?

It is expected that a project delivers its results at the stipulated date and cost. Since project management includes often more than 500 project activities, it is therefore inevitable to define some kind of a system in which they can be organised. Since the project activities are different in every company and in every project, the system has to be flexible to a certain extent, but at the same time it must be as simple as possible.

A first step towards such a system is to look at each project activity and identify corresponding processes, methods, techniques, templates and checklists which are established in the company. We label them as result-oriented rules (R) or as always applicable basic rules (B) and then

number them. If a company does not provide any rules for an activity, the project manager is free to choose his preferred procedure (see Fig 1).

nr	*project activity*	*importance of activity*	*relevance for the role e.g. Project manager*	*methods*	*techniques*
1	formulate project proposal	10	10	R1	R2
2	develop project vision from project proposal	10	10		R5
3	draft the coarse project plan	10	8		R4, B1
4	write the project manual	10	2	B2	B3
5	define the project objectives	10	6	R5	R6
6	register the project	10	10	B4	B5
7	modify the objectives with documentation	10	6		
8	write the product concept	10	6	R7	
9	create product breakdown structure	10	0	R8	R9
10	structure the library of results	10	10	B6	
		$\Sigma = 100$ %	0-10 each		

Fig 1: Examples of project activities, rules and basic rules, numbers are coincidental

Upon setting these principles the company has a uniform and well structured procedure, which makes results and decisions of the project reconstructable and comparable in a multiproject environment. Deriving project activities from needs of the company and integrating successfully established procedures significantly increases the acceptance of the project and thus improves the probability of successful projects. A customized methodology is flexible to the type and size of the project and at the same time adapts to the situation of a company and its specific needs.

2. How is the Project manager supported?

Project manager is responsible for reaching the project objectives. Thus everything what contributes towards these goals is essential and needs his action. This begins from the contribution in specifications of a system, system design, goes over purchasing through earned value and quality control, risk and change management, installation and documentation. And not missing human factor: management of the resources, team, communication and conflicts. Each of these areas with tens of individual actions themselves forms an individual process: with initialisation phase, planning, realisation and closing phases.

Perfectly mastering several hundred project activities like the one above is almost impossible if the project manager is not supported by a system with provides navigation and precise guidelines or rules.

In first place, it is important to develop a system to organize all processes relevant to the project manager. In this system, the procedural and administrative processes as well as those concerning the human success factor have to be considered equally. To help the project manager understand and apply the system, there should be a clearly recognizable thread going through all processes and those activities that link them (e.g. methods for project structuring, plan organisation financing, progress control, risk management).
There is no all-purpose model of a perfect project manager. The desired profile depends on the type of the project (complexity, size), its structure and on the viewpoint (vendor, purchaser). Accordingly, the relevance of each project activity can differ for the project manager in different projects and must be weighted individually as shown in Fig 1 in the column "relevance for role".

While looking at the currently available methods, one shall notice, that the following profiles are often neglected:
- project managers of the purchaser of software,
- project managers of multiple concurrent projects.

While the project manager of the vendor usually has sufficient knowledge on the subject of the project, the project manager of the purchaser can not be expected to be an expert in that area. Therefore, he has to be supplied with instruments to effectively support him in assuming his responsibility towards the sponsor. Also, the functional and financial views have different optimization criteria for vendors and purchasers that have to be considered. When managing multiple, concurrent projects, the focus is on being able to compare the assessment of different projects that are managed and coordinated at the same time. Multiproject management is in the area of conflict between operative and strategic decisions. On the strategic level, the portfolio needs to be compiled "right" and the emphasis must be placed rightly, while on the operative level, the projects need to be realised economically and conflicts for resources have to be solved. Since it can be assumed that many tasks in different projects are similar and require similar knowledge, one of the tasks of the multiproject manager is to discover synergies and make it possible for team members to use the knowledge gained in other projects. Management of operating resources and knowledge management are therefore vital areas of multiproject management.

3. Cornerstones of the desired methodology

After having described how the needs of the project manager and the company are considered in an efficient way, we can now define the cornerstones ofthe desired methodology:

- The methodology should use the Balanced Scorecard of the company as the basis for the planning and assessment of the project. Balances Score Card comprises all relevant goals of the company and substitute the project goals where not specified.
- The methodology should support both vendors and purchasers effectively.
- Only those project deliverables required by the project or the company should be included in the methodology. Producing these deliverables should be supported with appropriate methods, techniques, tools, templates and checklists.

Procedures, methods and tools which are already established and successfully applied in the company should be integrated within the method wherever they are appropriate. The new methodology is one among many other project management methodologies. Therefore, the project manager should be supported wherever possible and he should be given clear directions, tasks and responsibilities. Thus it is important to check the requirements of existing project management rules and to adapt them to the expected project deliverables.

- All management processes concerning the human success factor should be included systematically in the methodology and supported by homogenous structures the same way as any "administrative" parts like quality control, as they are at least equally important.
- The project activities should be analyzed and assigned to the appropriate process.
- It should be easy, intuitional and efficient to navigate through the processes and project activities.

4. The concept of the L-Timer

The L-Timer is a project management methodology which considers all processes relevant for project management (see also [9]). It is characterized by its integrated, systematic and efficiency oriented complete view of the project and is particularly designed for IT-projects. The approach of the L-Timer is based on a process view to optimally meet the needs of the customer. A set of processes containing project activities all serve a precisely defined goal. A process is seen as a chain of activities and decisions which produces a result oriented towards the overall objective. Interaction between processes is an important feature of project management; its success depends on how well this interaction works. An example for this is the interface between the areas of controlling the progress of the project and of human resource management, where the ability of an applicant to assess the project greatly influences the quality of the reports he has to write. Processes like Change Management are even used by all other processes.

We may illustrate the processes with the simple buying of a new fridge: Imagine you plan to buy a new fridge. Without realizing it, you will consider as many criteria as if you were building a nuclear plant, they will just not have the same dimensions and risk. First, you will have to decide on the size of the fridge, how to install it, where you can possibly buy it and how much it will cost. Naturally you will want the seller to meet the delivery date and you will carefully check the quality of the fridge. Which problems could arise from buying from an unknown dealer? Which issues have to be negotiated? If you plan to change the colour of your fridge, you do Change Management. Questions of integration arise if fridge and deep freezer form a unit and are not to be installed separately. When you discuss the topic with your friends, you do Knowledge Management. You use your documentation when you draw up the account after buying the fridge and you use your Balanced Scorecard when you look at how satisfied your family is. Not only the facts, but also issues concerning people are constantly considered: Human Resource Management means that you ask yourself, who will use the fridge in the end and then decide who helps choosing it. Are you going to systematically solve conflicts or will you prevent them from arising? Good communicational skills help, if you need financial help from relatives. Leadership qualities matter, if the carpenter and other involved persons have to be motivated to work together when installing the fridge. Finally, how much you can do yourself and what you delegate is a question of your Self Management

Optimizing the interrelationships of all processes (we distinguish 18) is a central topic of the L-Timer. Redundancies in the project management processes are avoided by adhering to the Management System ISO 9001:2000. The L-Timer and its project activities contain all requirements of project management. The specific requirements vary depending on the size, complexity and type of the project and are reflected in the column “importance of activity” of the table shown in Fig 1. Fig 2 shows an example of the use of the L-Timer in a project taken from everyday life. To improve the usability of the methodology and to establish a clear structure, the system is represented by a clock. This has the advantage, that connections between the project processes and activities usually performed at the time can be made. The sequence of processes is not coincidental: we begin with planning and scheduling, then purchase, earn the value, control the quality and so on until the end of a day, where we make the day evaluation. Such a system on one side recalls us at specific time of a day about the suitable process (e.g. hey, its 1 P.M.: how about our risks?) on the other side secures that no action will be missing, once we consequently follow the day (most of us begin with a day plan at 7 A.M.).

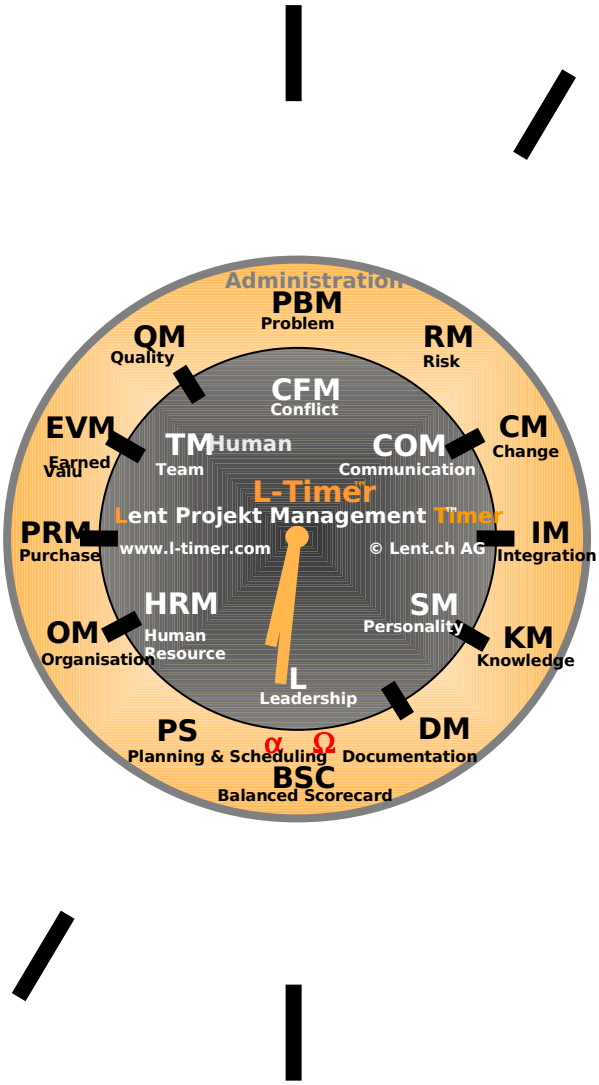


Fig 2: L-Timer

To continue the analogy to the clock, the processes are passed clockwise. When one cycle is finished, a new cycle is started considering the results of the previous one. The processes are based on the leadership tasks of project management and are divided into procedural and human processes. The human processes consider all persons involved in the project or its environment and are a central part of the L-Timer. These processes are a critical key to success and are often underestimated. In the L-Timer however, theses processes are considered at the same level of importance to the procedural ones. For each process, the L-Timer shows the relationships between methods, roles and project activities and makes them easy to understand. Special attention is given to the concerns of purchasers and their relationship to the vendor.

The process goals of the L-Timer are aimed at successfully implementing IT-projects; however, the system can also be used for other projects by adapting the process goals, project activities and methods if necessary. With the L-Timer, the project manager is occupied with "administrative" processes during the "day" while at night, he manages the soft skills (for most

of us being home means “soft skills” are required: wife, children, girl friend, mother in law...) There is no difference to project life.

The order of the processes is derived from the course of action of the project: In the beginning the planning of the project (PS) takes place and when it is finished it is assessed (BSC); first the team members are chosen(HRM), then the team is developed (TM) and later the employees are systematically influenced (L). One of the strengths of the L-Timer is that its logic can also be used as a navigation tool in other methodologies. Figures 3 and 4 give a brief description of each of the processes of the L-Timer. Profound description may be found in [9].

Process name		**objectives**
PS	Planning and Scheduling	You elaborate, structure and plan the objectives of your project. Project targets are aligned with the overall assignment specified by the customer and the higher-ranking enterprise strategy and are guaranteed over the entire duration of the project.
OM	Organization Management	You define project roles, responsibilities and the form of the organisational structure for the successful realisation of your project.
PM	Purchase Management	Through formal relationship with suppliers over all phases of the project, you secure the proper procedures and optimal results, along the formal laws, regulations and enterprise guidelines.
EVM	Earned Value Management	You control the activities in the project according to the result / deadline / cost stipulations set up in the Planning and Scheduling, with consideration for unforeseen events in the project.
QM	Quality Management	You constantly monitor project results, project processes and the other characteristics for compliance with project target stipulations, project requirements and their implementation planning, and promptly draw attention to deviations.
PBM	Problem Management	Together with your team and the applied methodology you master the technical or organisational problems within the cost and time-frame of your project.
RM	Risk Management	You minimise the overall risk to your project by permanent, creative and timely identification of potential risks, their analysis and the development of suitable countermeasures.
CM	Change Management	You ascertain, assess and decide on the implementation of proposed changes with a systematic procedure, introduce them – keeping their effects to a minimum – to the planned project handling and have the updated configuration of the system continuously under your control.
IM	Integration Management	According to the project plan and schedule you ensure that the elaborated solutions are embedded problem-free into the existing environment (organisation, human resources, applications, platforms) and that a high level of client and personnel satisfaction is achieved with its introduction.
KM	Knowledge Management	You acquire and store process experiences gained in the course of the project for its use in the current project and in other projects.
DM	Documentation Management	You ensure the documentation and archiving of project results for ease of access during project realisation, the successful placing in operation of the project results, cost-effective operation and full user satisfaction.
BSC	Balanced Scorecard	You submit the results of your project to an internationally recognised, integral and comprehensive evaluation with the aim of making a permanent, positive contribution to the implementation of enterprise strategy in your company.

Fig 3: Description of „administrative“ processes

Process name		**objectives**
HRM	Human Resource	You select personnel for appointment to the formal and informal project roles

	Management	best suited to their skills and experience and promote their personal further development according to the enterprise strategy
TM	Team Management	You ensure the best possible efficiency of the complete project team measured against yielded performances, staff satisfaction client satisfaction and process improvement.
CFM	Conflict Management	You promptly identify potentials for conflict in your team and in the overall project environment. You solve conflicts successfully with suitable methods and technologies.
COM	Communication Management	You master the effective communication, including that of marketing, devoted to the achievement of project goals, both in the project and its environment.
SM	Self Management	Your personal satisfaction and performance is very important. You promote it through effective self-appraisal and dealings with your own engaged resources.
L	Leadership	You skilfully and consciously control the behaviour of your team members to guarantee the achievement of the project goals.

Fig 4: Description of soft processes

5. Structure of each process in the L-Timer

The system of the processes described above now makes it possible to assign every project activity to the appropriate process. The resulting 20-30 activities per process then can be ordered to form a logical sequence (e.g. plan the task, do the task, assess the result). This helps the project manager to handle all project activities. Up to date techniques and Best Practice in project management are always incorporated into the L-Timer.

The rules and basic rules described abovenow contain the following elements:

- Description of processes
- Description of goals
- Methods
- Techniques and tools
- Templates
- Tasks and results of the phase

Most of the activities can be associated to a single process and are therefore included in the system as for example in problem management. There are always three steps to be performed while approaching a problem:

- gather information; in this step interviews, checklists and similar techniques are recommended,
- finding a solution: expert interviews or creativity techniques like brainstorming are possible.

assessment: includes various analyses like a risk or efficiency

The analogy to the clock is extended by subdividing each hour (process) into minutes: At each hour, a process is presented in a summary. Then, at ten minutes past the hour, the objectives of the process are described, at 20 past the methods are explained and so on. An example below show the supporting structure for the process of Team Management (22:00): objectives, methods, techniques & tools, templates, task & results.

22:00: Team Management

22:10 pm: Objectives:

Maximizing the efficiency of the group considering

- the performance
- satisfaction of employees
- satisfaction of customers
- improvement of processes
- team spirit

22:20 pm Methods

Group dynamics and building the team

The most important thing of the team-building process is that team members get to know the personal characteristics of each other.

The process is divided into four phases:

- Forming (getting to know each other)
- Storming (work together)
- Norming (develop team norms and standards)
- Performing (reach the potential of the team)

Team analysis

The needs, wishes and fears of team members have to be analyzed to be able to positively influence their acceptance of and commitment for the project. Each team member has a different level of motivation and has to be motivated in a different way.

Negative influence on teams

- "not invented here effect": information from outside (e.g. criticism) are disregarded by the group.
- "Gatekeeper effect": Only one member communicates with the outside.
- isolation of the group, establishing filters to specific information
- members who don't have any opinion or oppose everything, members are socially excluded or harassed.

22:30 Techniques and tools

Techniques for team building

Observation, workshops, trainings, events, rules of group interaction

Techniques to influence motivation

Discussions and feedback, tools to help setting personal goals, team oriented wage models.

22:40 Templates

Documents about project management

Group leadership in the project related wage model.

Product related documents

Data sheet "product characteristics" for brainstorming

22:50 Tasks and results of phases

Initialization

No tasks and results expected in this process.

Planning

Tasks: observe potential team members, put together the team, initiate building the team, organize workshops, trainings and events, create a performance oriented wage model with team components.

Results: performance oriented wage model

Realization

Tasks: organize workshops, trainings and events, interview team members to identify conflicts early.

Results: Reports of interviews.

Rollout

Organize workshops, trainings and events, interview team members to identify

A more detailed description of the processes can be found in [9].

6. How is customization for the company achieved?

Goal of the Balanced Scorecard is to give an integral, all-embracing assessment of the project management processes and results which can be used to support implementing the corporate strategy. The process BSC, which finishes the day in the L-Timer, systematically assesses the

goals defined in PS, then these assessments are used as an input to the PS of the next day and the cycle of the procedural processes starts again.

The Balanced Scorecard takes up all the factors that are crucial for the companies success, makes them measurable and communicates them. This includes the performance of employees as well as quality of innovations, internal workflows and financial developments. The scorecard displays the data with its internal relationships and brings them in line with the vision of the company and its corporate strategy [5, 6]. Like that, the BSC creates a frame to measure the integration of strategic decisions and translates vision and strategy into goals. The BSC is divided into four perspectives (customers, finances, internal processes and learning & development) for which appropriate measures have to be defined. Starting point for all four perspectives is the vision of the company, at which the corporate strategy, goals, planning and assessment are aimed.

The processes of the L-Timer are consistently derived from the Balanced Scorecard. To help the project manager establish the connections between the BSC project evaluation, the Earned Value Management (EVA), single project activities and the methods, techniques and checklists, the project activities are all aimed at the measures of the BSC.

To evaluate the project from different perspectives, the method “Project Excellence” (PE) is given special attention [13]. The main reasons for this are its compliance with BSC and its increasing acceptance and usage in companies [9]

Evaluation with Project Excellence is grouped into the following sections: customer orientation, employee development and involvement, partnerships with suppliers, Leadership & goal orientation, social responsibility, processes & facts and result orientation. These sections are weighted and appropriate evaluation criteria are defined.

Figure 5 shows the connections between the concepts of BSC and PE. The PE-criteria are assigned to the appropriate sections of the BSC. Few, like for example, the criterion “goal orientation” are relevant to all sections of BSC and therefore the total score is linearly divided between the perspectives of BSC. Other criteria like customer satisfaction can be assigned to a single BSC section (“customer perspective” in this case) which gets all the points of the criterion.

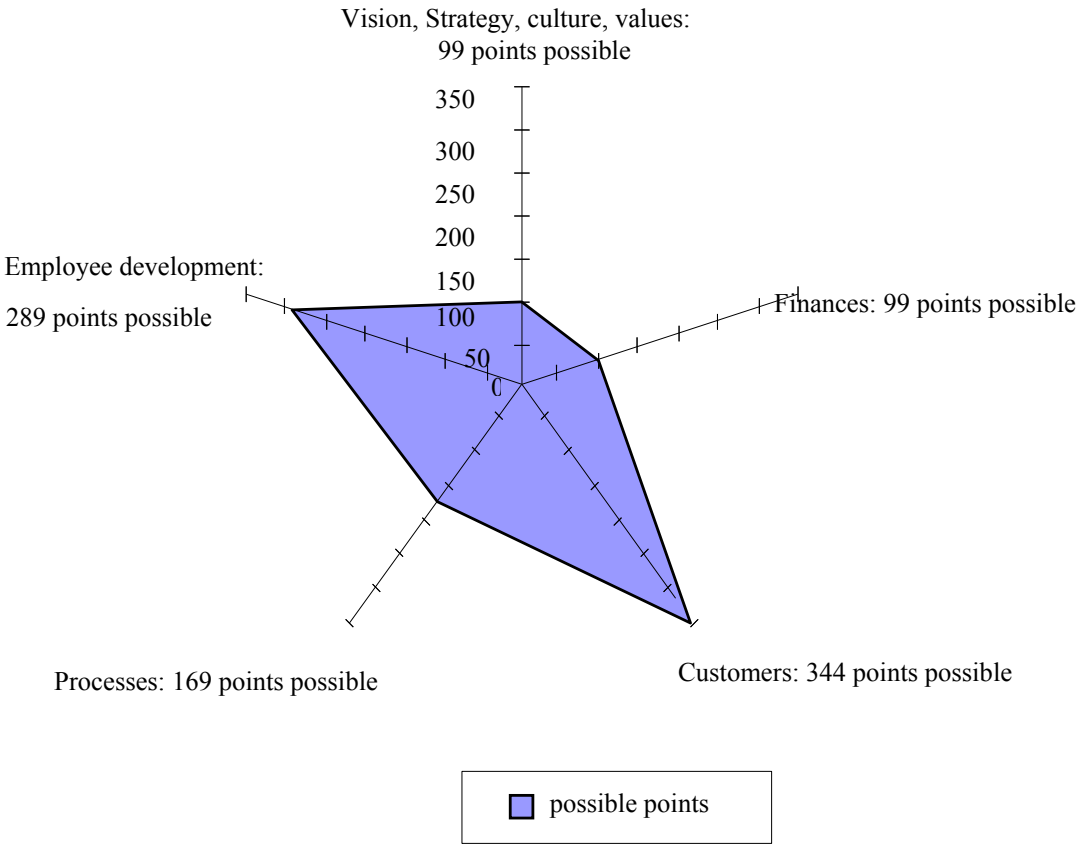


Fig 5: Weighting BSC-areas using PE

A striking characteristic of integrating Project Excellence into a BSC is that not all sections of the BSC have equal weight. In the example of Fig 5, the section “financial perspective” has rather little importance (max. 99 points) while the section “customer perspective” is quite dominating (max. 344 points). Thus, Project Excellence can be used to adapt the principles of the BSC to the existing project situation.

7. How are requirements specific to the company integrated?

The company expects the project manager to lead the project far-sightedly. The number of the activities, at least 500 may reach 1000 and more is specific to the company. They are collected, precisely described and assigned to one of the 18 processes of the L-Timer.

Evaluating the importance of the project activities and weighting them accordingly leads to an integrated assessment of the requirements which can be displayed in a graph as shown in Fig 6.

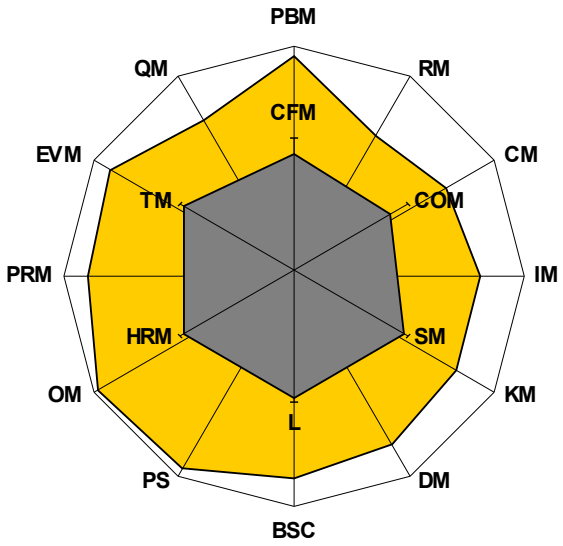


Fig 6: Kiviath-graph of processes

For all project activities, existing rules of the company are incorporated and project activities are (looked at in a functional way) defined as:

Project activity = function (results of applying specific rule (called earlier R)
upon occurrence of an event
and (sum)
an application of basic rule (called earlier B))

Rules are related to events (e.g. implement the concept after it is released by the executive board.) while basic rules always apply (usage of forms for the project proposition). Together, these rules and basic rules form a concise, company specific and project activity oriented project manual.

8. How are humans involved into the project?

In organisation management, the project manager has the task of assigning activities to one or more project roles. As described before in the section about evaluating project activities, this is done by judging the importance of an activity for each role. As an example, compiling the cost input has maximal importance (10 pts) for the project controller, while the project manager does not need to know how to do it (0 pts). For each role, these results are compiled to form a profile structured by the 18 processes of the L-Timer and can be displayed with the same chart as the whole project (Fig 6).

The requirements can change during the course of the project (Fig 7) like processes in Rational Unified Processes RUP [8].

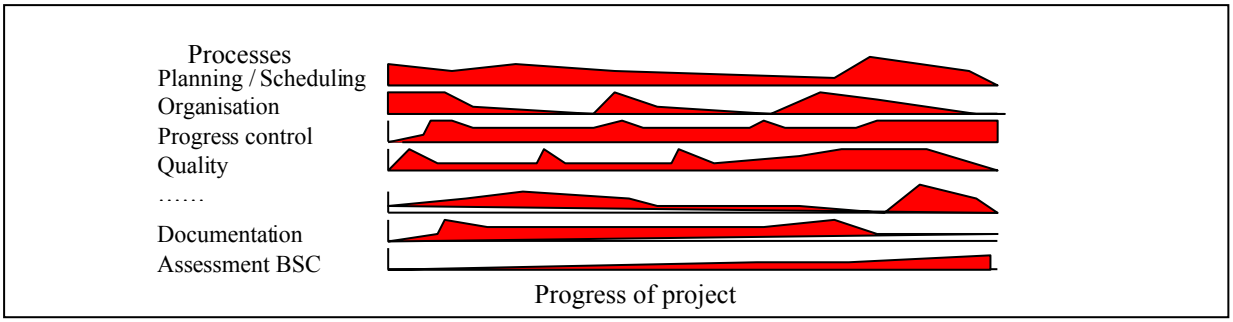


Fig 7: Changing importance of project activities during the project

As mentioned before, the perspective of the employee is explicitly included in the Balanced Scorecard. In the area of "Learning and development" issues like employee satisfaction, motivation, training and importance of employee suggestions are addressed. Additionally, the soft processes are emphasised in the L-Timer and thus the perspective of the employee is strengthened even more. In Human Resource Management (HRM), the skills and project expectations of the project manager and the team members are examined to ensure that they are not overwhelmed with their tasks. In Team Management, the building of teams is systematically supported, in Conflict Management the involved employees are trained in methods of solving and preventing conflicts. Communication Management includes the face-to-face communication as well as marketing aspects, Self Management helps better organizing oneself and in Leadership, the skills to systematically influence the team are explained.

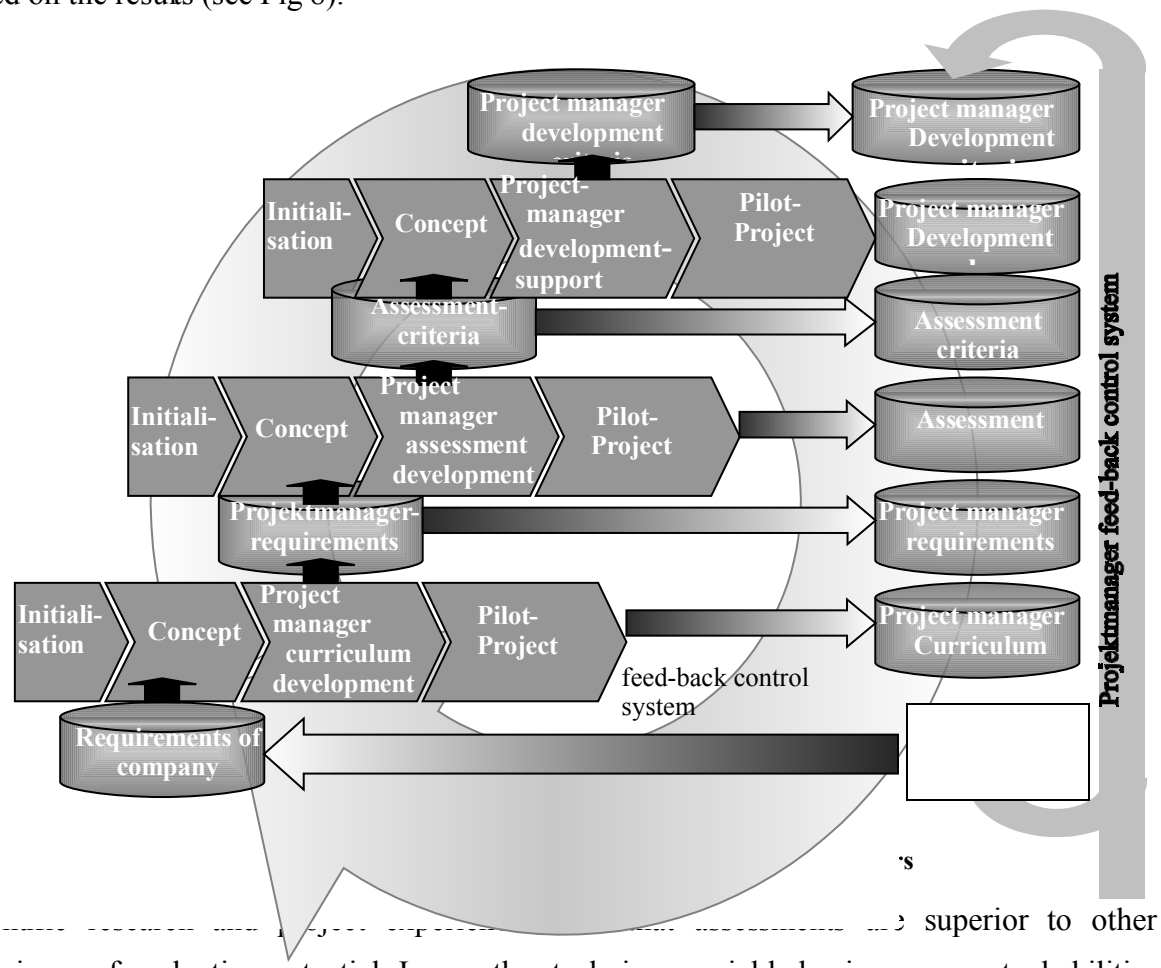
9. How is the skill-development of employees supported?

After having seen the previously mentioned variety of activities and challenges that are part of every project, it becomes clear that handling the complexity of project management tasks requires well-developed skills and tools. The most important thing in this regard is that the project manager and his team are supplied with a project manual which is aimed at the expected project results. Furthermore, a training program which is based on the project manual and the activities ensures an individual and economically optimal curriculum. The perfect adjustment of the curriculum to the needs of the team members should be constantly verified by interviewing course participants before or after the training.

Establishing a standardized assessment of project managers facilitates choosing the best suited project manager for each project. A uniform and objective process of assessment makes it possible to record competences systematically and leads to better transparency

Assessments draw conclusions about skills, competences, potential and character traits by observing the behaviour and the performance of the candidate in tests, simulations, role plays, case studies and interviews. The personal assessment tailored for the project manager and the

project activities tests the skills of the candidate in order to create a personal development plan based on the results (see Fig 8).



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superior to other techniques of evaluating potential. In no other technique social behaviour, conceptual abilities and cognitive capacities are studied as closely and evaluated as systematically. By using assessments, companies and their project managers can adjust staffing decisions to the actual skills of their employees.

Apart from these advantages in quality, well performed assessments usually reach high acceptance with everyone involved and are useful in many different ways. Systematically observing and evaluating competences that are clearly defined and relevant for the job helps with decisions about promotion and development: Team members have the possibility, to show their skill and potential in a fair, transparent and project-related procedure. Furthermore, the feedback is useful to the candidates since they can refer to it when planning their career.

Conclusion

The L-Timer is a system, which (based on the well-known model of a clock) enables navigating through all known project activities, processes, methods, techniques, tools, templates and checklists. Since the human success factor is critical in project management, it is given significant weight and is considered equal to other success factors like progress control.

Efficiently adjusting project management to corporate objectives is ensured by deriving the project activities and the project manual from corporate processes as well as by weighting these project activities according to the needs of the company. Goal oriented management of projects is also supported by providing project related training, assessment and personnel development.
A structured and detailed analysis of all project management processes and activities makes it possible to discover the interdependencies of the project management processes.

All these aspects lead to a higher efficiency in project management and at the same time increase the probability of successfully completing the project on time and at the projected cost.

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