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How to Develop Lean Project Management?

Peter J. A. Reusch, Pascal Reusch
Fachhochschule Dortmund, University of Applied Sciences and Arts,
Emil-Figge-Straße 44, 44227 Dortmund, Germany,
peter.reusch@fh-dortmund.de, reuschp@gmail.com

***Abstract*—Lean project management will improve existing concepts and standards on project management.**

Concepts, methods and tools of lean management, quality management, knowledge management and many more disciplines can help to develop lean project management.

Here we focus of extensions of project management standards to shape lean project management.

Keywords—Lean Management; Project Management; Lean Project Management; PMBOK

I. INTRODUCTION

Concepts of lean management were initiated on the manufacturing side. "Lean" is a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. Working from the perspective of the customer who consumes a product or service, "value" is defined as any action or process that a customer would be willing to pay for.

So lean management is a management of values – as developed by OGC for example and applied to improve project management [1].

On the other side lean management and quality management are overlapping. Stephan Wood says "Quality Management means Lean Management" [2]. The principles of quality management as fixed in ISO 9000 are really core elements of lean management, such as customer focus, continual improvement, process approaches, etc.. And quality management is a well-established knowledge area of project management according to PMBOK© [3] and analysed for examplein [7].

There is also a link to maturity models [10].

There are some general proposals for lean project management like [4], [5], and [6]. Here we focus on the development of lean project management in the context of project management standards.

II. LEAN PROJECT MANAGEMENT

Based upon definitions of lean management as in [13] and definitions of lean project management as in [4], [5] we say:

Lean project management is based upon the following principles:

- Specify what creates value from the customer´s perspective
- Identify all the steps along the process chain
- Make those processes flow
- Identify waste – based upon needs and expectations of customers
- Eliminate waste – based upon needs and expectations of customers
- Make only what is pulled by the customer
- Strive for perfection by continually removing wastes
- Amplify learning
- Make decisions at the right time
- Empower the team, build integrity
- See the whole.

The identification of waste and the reduction of waste is one of the core issues of lean management. In[16] categories of waste are defined like

- Waiting
- Over-production
- Rework
- Motion
- Over processing
- Inventory
- Transport.

These categories can be used and extended for lean project management:

Lack of effectiveness in projects may be caused for example by

- Ignoring available products, services, standards, etc.
- Ignoring innovations.

Lack of efficiency in projects may be caused for example by

- Communication problems
- Lack of information
- Ignoring information
- Missing skills
- Weak organization: waste of time in non efficient meetings, needless meetings, etc.
- Collecting redundant or even useless information
- Not considering standards.

Waiting in projects may be caused for example by

- Communication problems
- Lack of information
- Lack of resources – internal/external
- Delay of tasks
- Planning errors
- Waiting for approvals, confirmations, licenses, etc.
- Availability of stakeholders.

Over-production in projects may be caused for example by

- Wrong definitions of requirements
- Overlapping and not harmonized processes.

Rework in projects may be caused for example by

- Wrong specifications
- Missing competencies
- Insufficient or not effective control.

Motion in projects may be causes for example by

- Lack of resources – internal/external.

Over processing in projects may be causes for example by

- Overburden of regulations.

Inventory related waste in projects may be caused for example by

- Planning errors
- Lack of resources.

Transport related waste in projects may be caused for example by

- Planning errors
- Lack of resources.

After the identification of requirements and after the derivation of values and waste the next step in the development of lean project management should be the definition of processes and the analysis of processes based on values – value chain management. Such steps are discussed in [14].

III. REDESIGN OF PROJECT MANAGEMENT PROCESSES

Project management according to PMBOK for example is shaped by processes assigned to knowledge areas and process groups. On the way to lean project management these processes should redesigned and extended.

In the 4th edition of PMBOK in project scope management the following processes are defined:

- Collect requirements
- Define scope
- Create work breakdown structure
- Verify scope
- Control scope.

In the recently published 5th edition of PMBOK in project scope management the following processes are defined:

- Plan scope management
- Collect requirements
- Define scope
- Create work breakdown structure
- Validate scope
- Control scope.

In both versions there is a lack in processes dealing harmonizing and balancing requirements. In the 5th edition of PMBOK a "requirements prioritization process" is mentioned on page 110, but this process is not defined. Such processes must be introduced and existing processes must be extended to support lean management and avoid waste.

Processes in all other knowledge areas must also be redesigned to support lean project management. In some knowledge areas this redesign can be organized like in corresponding areas of lean management. Lean project procurement or lean project human resource management for example can follow the paths of lean management.

In the 5th edition of PMBOK there is a new knowledge area on project stakeholder management with the following processes:

- Identify stakeholders
- Plan stakeholder management
- Manage stakeholder engagement
- Control stakeholder engagement.

This new knowledge area is very useful for the development of lean project management, the stakeholders have their values, and they define requirements. Again in this knowledge area we need processes to harmonize, balance, and prioritize requirements.

A classification of stakeholders can help to develop lean project management. There are several ways to classify stakeholders. In the 5th edition of PMBOK there is the following proposal [15 – page 402]:

- **Unaware stakeholders**: Unaware of project and potential impact
- **Resistant stakeholders**:Aware of project and impacts and resistant to change
- **Neutral stakeholders**: Aware of project yet neither supportive nor resistant
- **Supportivestakeholders**: Aware of project and potential impacts and supportive to change
- **Leading stakeholders**: Aware of project and potential impacts and actively engaged in ensuring the project is a success.

In [16] stakeholdersare classified the following way:

- **Power and Interest**: In this classification, stakeholders are grouped as per their power and interest towards the project and its outcome.
- **Power and Influence**: Here, stakeholders are grouped according to their power and level of influence on the project and its outcome.
- **Influence and Impact**: This classification is based on influence and impact of the stakeholders on the project.
- **Power, Urgency and Legitimacy**: Here, stakeholders are classified as per their power, urgency and legitimacy.

Such approaches can be used to develop lean project management.

Another important knowledge area for the development of lean project management is Project Integration Management. Here the harmonization of the redesigned and added processes of the other knowledge areas must be organized. That´s worked out in [14.]

IV. Lean Project Management and Maturity Levels of Projects

Lean project management is related to the maturity of project management. A high level of maturity corresponds to a high level of lean management in projects. Optimized processes according to a maturity model should have a minimal level on waste considered from the lean management perspective. The P3M3 model of OGC [10] considers 5 maturity levels:

- Level 1-awareness of process
- Level 2- repeatable process
- Level3- defined process
- Level4-managed process
- Level5-optimized process

Level 1: Awareness of process. The organization of processes is not well developed and they are not documented.

Level 2: Repeatable Process. Procedures of successfully achieved processes are recorded, in order to be able to repeat them in the future.

Level 3: Defined process:Processes are documented, standardized and integrated

Level 4: Managed process. At this level, standardized processes are more mature, due to some quantitative metrics and techniques that are implemented in the management.

Level 5: Optimized process:Processes are optimized and prepared for changes.

V. Management of Values

Lean management is based upon values. The management of values is a rather new field in project management – but a field with a long tradition for example in industrial engineering – with pioneers like Lawrence D. Miles who introduced Value Analysis at General Electric in the 40th [20],[21].

Value analysis uncovers costs and values of processes and products. Value analysis asks for alternatives that are less expensive and add more value to the customer. The management of values has an additional strategic focus to align an organization to shape processes and to optimize customer value.

According to OGC the Management of Values is based upon seven principles [13],[18]:

1. Align processes and applications with the organization's strategic objectives.
2. Focus on functions that are necessary and sufficient in order to deliver the required outcomes.
3. Balance processes and applications with all key stakeholders, reconciling their objectives to balance benefits and their delivery against the total use of resources, thereby maximizing value.
4. Apply optimization of processes and applications through all stages of the total lifecycle of the project - throughout the investment decision.
5. Tailor the project's environment, size, complexity, criticality and risk.
6. Learn from experience and improve.
7. Assign clear roles and responsibilities and build a supportive culture.

Values are the keys to balance between expenditures and benefits, and to balance between stakeholders.

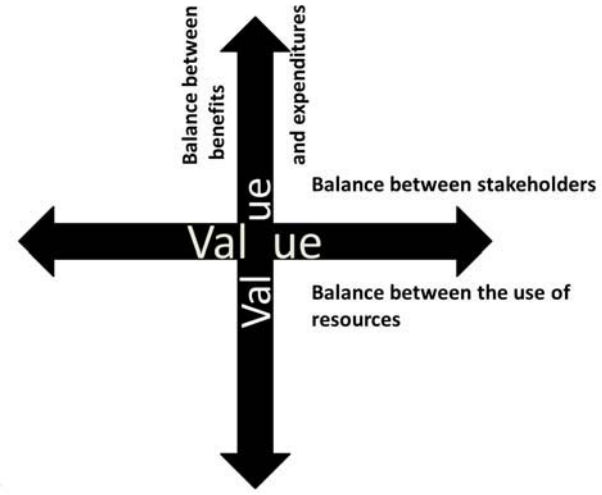

Figure 1. Balances based on Values – adapted from [19]

In the architecture of portfolio, program, and project management according to OGC we have the module "Management of Values" and other modules like "Management of Risks" that support portfolio, program, and project management. These modules are embedded in models like the P3M3 Model of OGC.

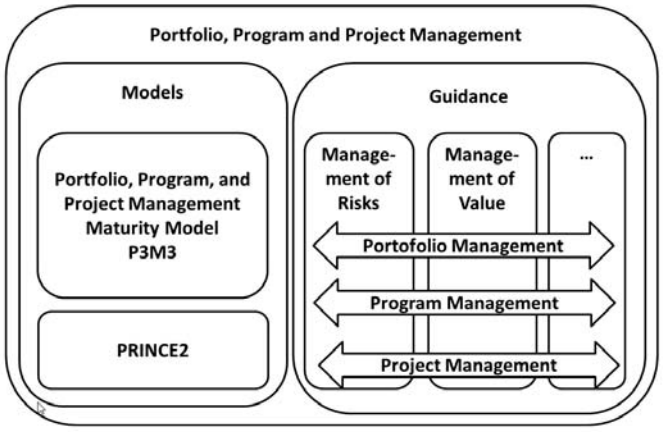

Figure 2. Management of Values – Roles in Project Management [19]

A core message of this concept is that the management of values goes through all the levels of project, program, and portfolio management. Projects contribute to programs and the values delivered by a

project can often only be measured within a program or even a portfolio.

Lean project management can only be developed with strong links to program and portfolio management or within an integrated model like P3M3 of OGC.

VI. FUTURE PERSPECTIVES

The development of lean project management will be shaped by 3 main perspectives:

- Redesign and extension of existing project management standards
- Improved integration of quality management into project management
- Application of supporting methods and tools.

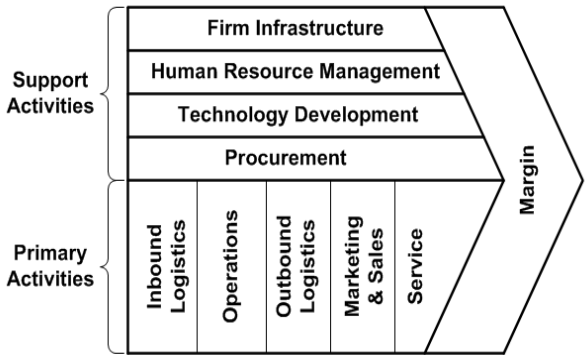

Figure 3. Value chain management according to Porter [22]

Knowledge management for example can support lean project management in many aspects. Access to knowledge can reduce waste and improve performance.

Knowledge management concepts can also be used to improve stakeholder management. Isabelle Kern shows us how knowledge creation can be supported by topic maps created with stakeholders [17].

Lean project management can be supported by value chain management – using the core concepts of value chains as created by Porter in 1985 [22], and also by new software systems for value chain management like eVSM [23].

A value chain disaggregates a firm into its strategically relevant activities in orderto understand the behavior of costs and the existing and potential sourcesof differentiation.

Porter's value chain consists of a "set of activities thatare performed to design, produce and market, deliver and support its product" [22].

Porter distinguishes between:

- primary activities: inbound logistics, operations, outbound logistics,marketing and sales, service in the core value chain creating directly value

and

- support activities: procurement, technology development, human resourcemanagement, firm.

Classical value chain management supported by new software systems will be used to develop lean project management. [14] Software systems allow a detailed description of processes, roles and relations. This is the key to a deeper analysis and to build scenarios and run simulations.

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