

An integrated concept for project management

Basic models to support integrated project management

The core in Prodevo's project management concept is the Five-times-Five model, [5x5 model] a management model applicable to every project. It is supplemented by six corner stones or basic models, each of which models a key perspective on projects and project management. In total they provide an integrated structure for planning and managing a project. They can be used as a basis for the early planning of a project and as check lists in the daily management of the project.

Use of the basic models: You are welcome to use the models in your daily work with projects and in training. Commercial use is not permitted.

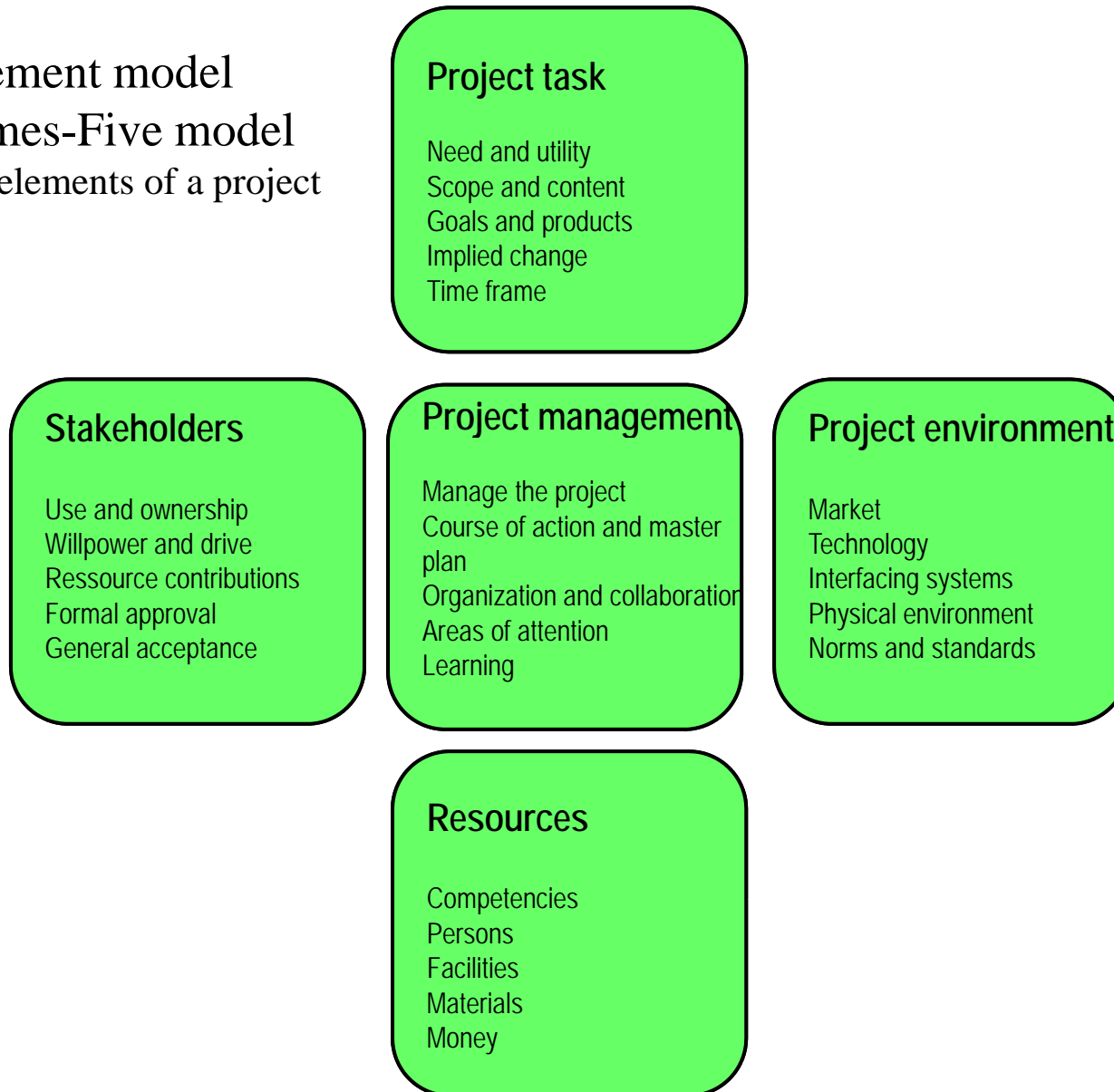
Prodevo ApS, Piet Heins Vej 2, DK 2960 Rungsted Kyst, e-mail: info@prodevo.dk

- ❖ **The Five-times-Five model** shows the generic elements of a project. It can be used as a means for a dialogue in the initial planning of a project and for on-going planning during project execution
- ❖ **The process model** showing work and management processes of a project. It can be used to identify the various activities to take place in the course of a project.
- ❖ **Portrait of the challenges of a project** shows a picture of the project's complexity and thus its challenges. It represents a foundation for forming the project and for developing a master plan
- ❖ **The forming model** indicating the necessary aspects for defining the aim and scope of the project
- ❖ **The organization model** showing a generic pattern of a project's organizational structure and collaboration.
- ❖ **The control model** with control functions and levels
- ❖ **The management model** with the project manager's five focal areas

These seven models form an integrated framework for a number of methods and tools for planning, organizing, controlling and managing projects, and for staging the collaboration among stakeholders. To illustrate we have selected the following key pictures (models).

Model for project planning	18	Dirigibility in the project	40
Stakeholder picture - coalition model	20	Planning and control model	42
Project goals	22	Forward-pointing control	44
The integrated project	24	Impact areas of planning decisions	46
The organizational change process	26	Picture of the project's results, scorecard	48
Course of action	28	Cooperation model for the project team	50
Organizing the project	30	Project management	53
Master plan for coordination and control	38		

The management model
The Five-times-Five model
The five basic elements of a project



Management model of the project - The Five-times-Five model

The Five-times-Five model is the general model of the integrated concept. It consists of five generic elements which every project will consist of, and which are necessary for solving a given task as a project.

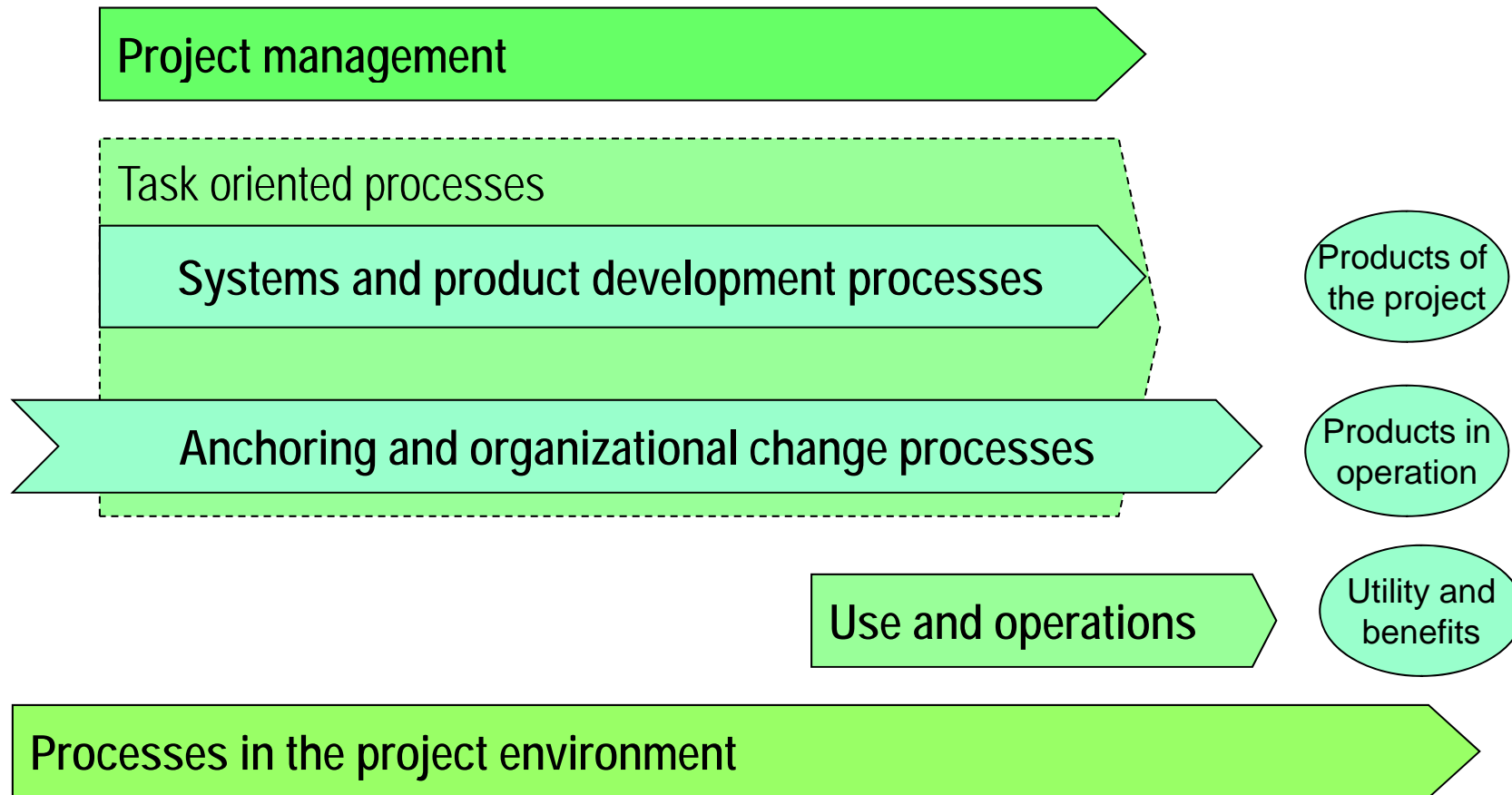
- The project task determines to a large extent the outset for the project, including what outcome is expected
- The project environment expresses conditions for the project, that are beyond the control of project management; nevertheless they identify important interfaces
- Stakeholders (or interested parties) provide the influential and political foundation for the project
- Resources, first of all as competencies (knowledge and know how), are the energy and drive for carrying out the project, and at the same time hold the key to innovative solutions
- Project management includes deciding how the project should be carried out, for example with which resources and interplay with stakeholders, how to stage the collaboration and how to manage the course of actions.

The middle cell (project management) represents the kernel of planning and control activities, while the other four cells take outset in the surroundings of the project. The project task is based on external needs, resources are provided from outside the project, and the result and outcome of the project are to be delivered to stakeholders and the project environment.

The Five-times-Five model is suited for a non-linear, circular planning process. Working in one cell will raise questions and possibilities for other cells. It is possible to start at any cell with loose ideas and proposals. As the planning process moves back and forth from one cell to other cells, the conception of a coherent project plan takes form, ensuring that interdependencies between factors in the various cells are addressed.

The Five-times-Five model forms a foundation for most of the other basic models and can be applied both in the early planning stage and during the project for continuous planning in the light of the many changes and unforeseen events that every project will encounter.

Model of the project's processes



Model of the project's processes

The Five-times-Five model represents a static picture; but projects are carried out during processes. We have identified four main processes:

- Task oriented processes focusing on generation, acceptance and implementation of project solutions
- Processes for using and operating the results of the project (its product)
- Processes in the project environment influencing both the project and its results
- Management processes including activities of the middle cell in the Five-times-Five model.

The model emphasizes that several areas should be addressed in parallel during the project. The model makes a distinction between the task oriented processes and the project management processes.

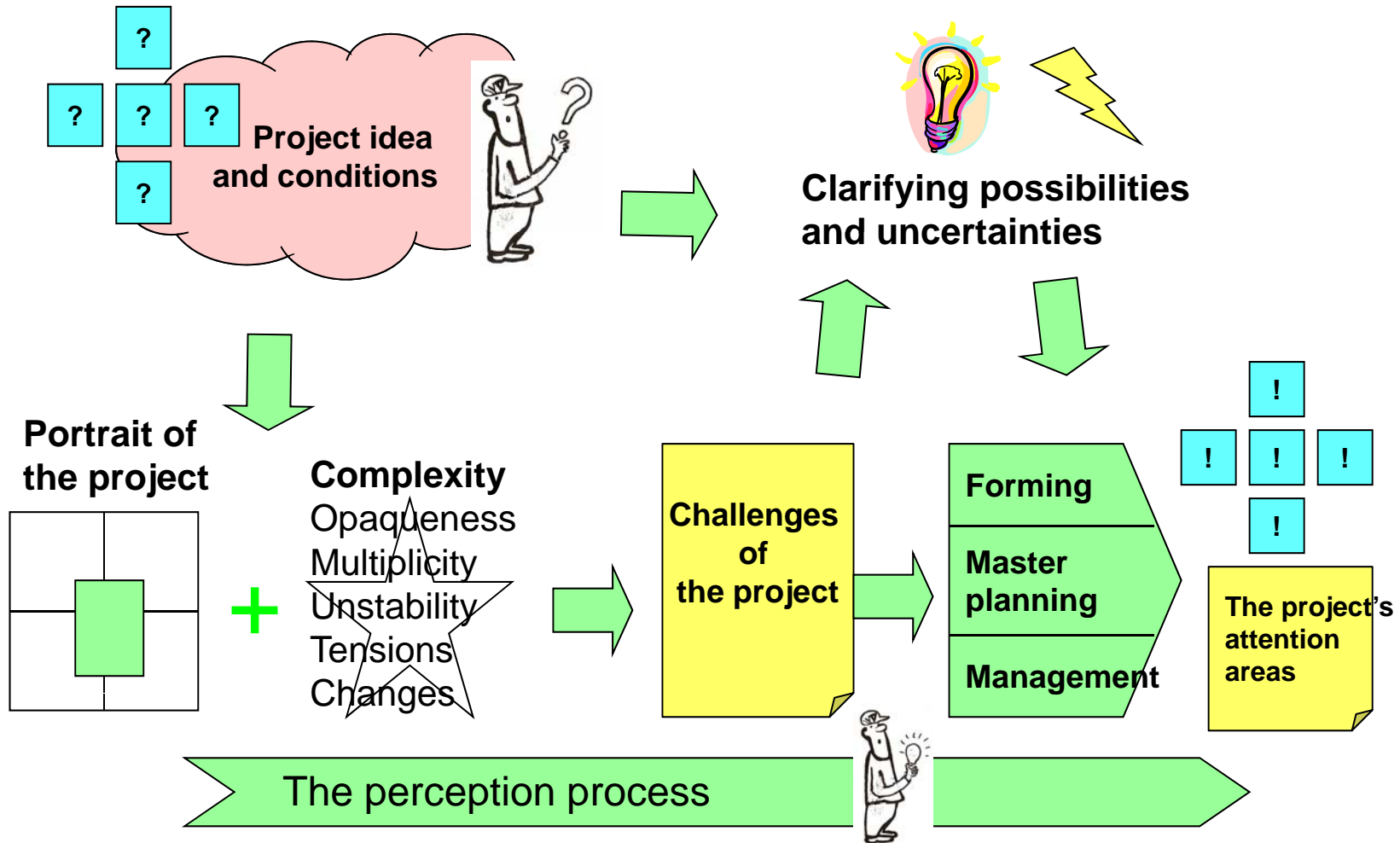
Working with the project task is the dominant process. The process model makes a clear distinction between generation of the project results as one process with its unique characteristics, and the organizational change process during which the results are implemented, understood, accepted and properly taken into use. For this reason we have included two processes in the model for the task oriented process:

- The systems and product development process in which the project solutions are generated and delivered. This process is in particular focused on achieving the product goals.
- The organizational change process in which operations of the receiving organization is changed to include and to apply the solutions of the project. This process seeks to fulfill the utility goals of the project.

The model emphasizes the importance of events and actions taking place in the project environment by including a separate process for the interaction with the surroundings. This suggests to be continuously alert to changes in attitudes of stakeholders, as well as to new opportunities and requirements.

Just like in the case of the Five-times-Five model the four main processes are interdependent. The nature of the task oriented processes, for example the degree of uncertainty and complexity, will influence the content of managerial processes. Similarly, the process for developing the project product will influence the organizational implementation process, for example by being able to visualize early the concept design of the product (system) to stakeholders.

Challenges of the project



Challenges of the project

The management task is determined by the project's complexity and uncertainties calling for special attention. Thus, managing the project does not follow a standardized procedure; but should be carried out and organized in accordance with the specific requirements of the project and its environment.

The complexity makes the project task more difficult to manage and contributes to the uncertainties inside and outside the project. An analysis of the complexity of the project task can be used for describing the degree of difficulty and challenges with respect to managing, organizing, coordination, and communication.

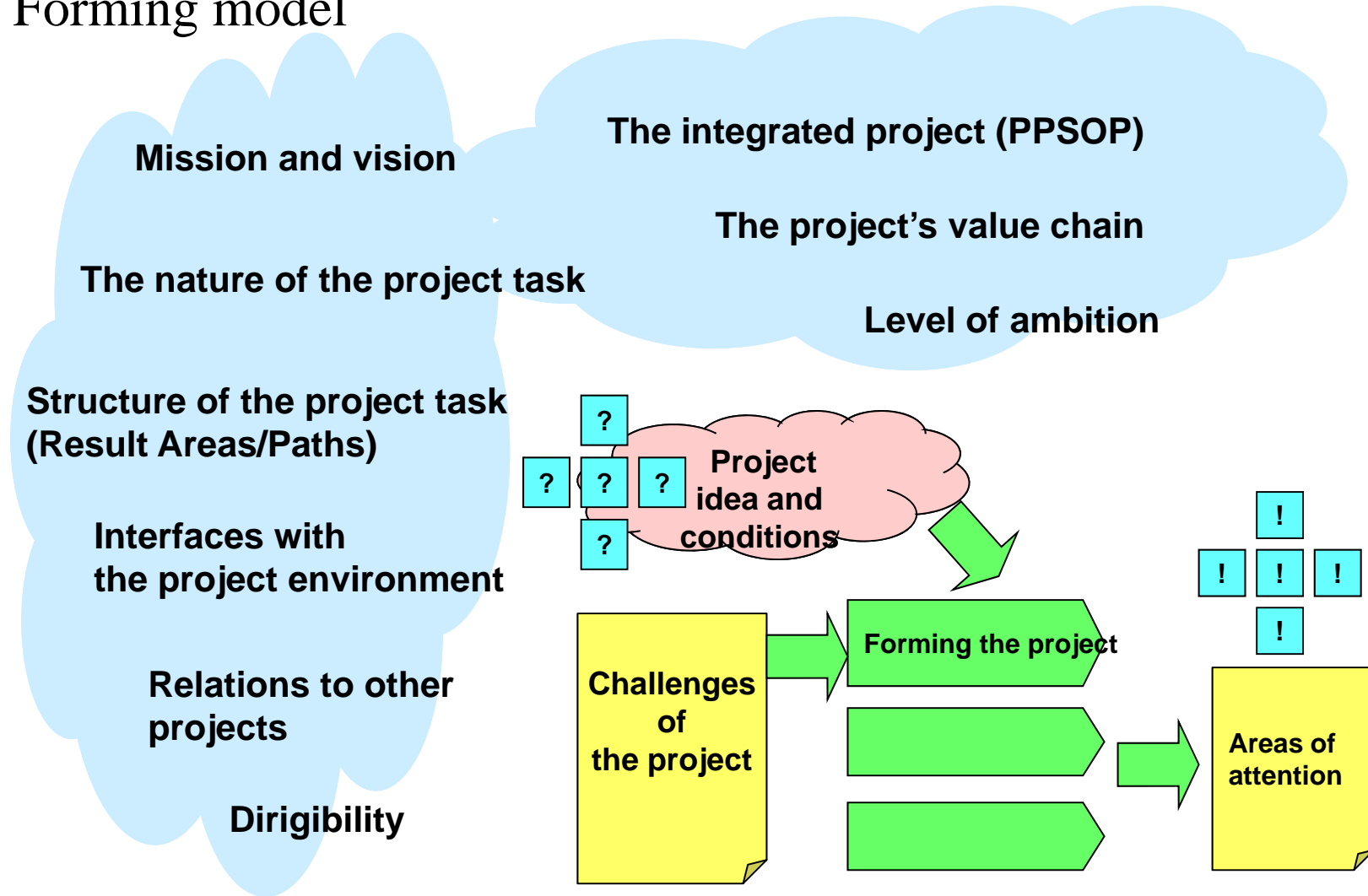
We call these factors the inherent complexities and they represent the project's challenges. In addition, self-inflicted conditions add to the project's complexity, such as time and budget constraints, quality requirements and performance specifications. On the other hand, if properly recognized, they may also point to ways of reducing the complexity.

The challenges represent an important basis for forming the project, for developing a master plan, and for management of the project.

Our message is: Bring the complexities into the open and take them seriously. Identify them and describe them as precise as possible, and use the acquired insight to careful planning of the project, and to create an understanding of the need to change the direction and content during the project. The picture of the project's complexity and uncertainties is the starting point for planning to include the four elements:

- Stage an awareness and learning process as an essential part of the course-of-events
- Make the project and its solutions dirigible and manageable
- Be proactive and exercise proficient project management and change management
- Be aware of the attention areas of the project

Forming model



Forming model

The background for initiating a project is the potential for creating value, either by solving a problem or by exploiting an opportunity. Basically, the mission and utility of the project define and scope the project task. "What is seen depends on the eyes". That is, a project is determined by the persons who define it. Analysis of the problems and the potentials carried out by several persons, and a broad stakeholder analysis can contribute to achieve a comprehensive picture of how extensive the project should be in order to fulfil its mission.

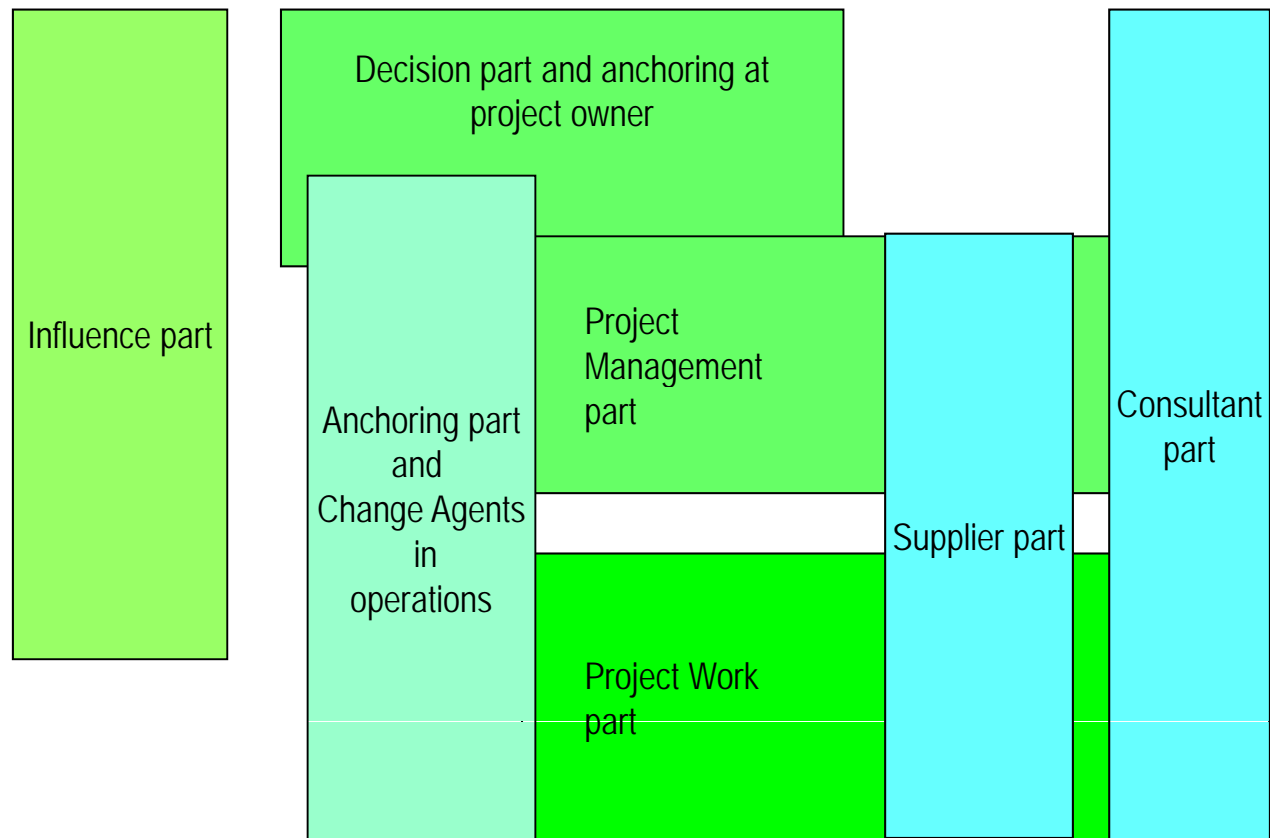
A project should constitute a whole. It may include an entire value chain from producers to end-users of a new product. Another way of ensuring a holistic project task is to use the socio-technical PPSOP model. A project should include changes in processes, their products, the associated systems and facilities, the dedicated organization, and the involved persons.

Many projects are part of a project portfolio or a program, and they are directly related to the corporate strategy. This implies a concern for obtaining synergy by coordination of the solutions of the individual projects and their timing.

A project needs to be structured, based on the architecture of the project itself and of its product. The aim of structuring a project task is to identify all relevant areas and aspects to ensure a comprehensive project. In addition, structuring forms a basis for developing appropriate plans and organizational units.

Experience has shown that a solid effort spent by proficient people on forming a project is the first step for ensuring success in launching a project.

Generic elements of the project organization



Generic elements of the project organization

A project organization indicates who should be involved in the project and which role they should play. In the model we have identified seven generic elements that any project organization will have to deal with:

- Project Management part, i.e. the daily project management
- Decision part, i.e. Project Owner and eventual Steering Committee responsible for the overall decisions made
- Project Work part, i.e. people and team carrying out the task oriented processes
- Anchoring part, i.e. managers/people being responsible for anchoring the project and its results at the customer and end users.
Managers being responsible for change, operations and benefits
- Influence part, i.e. stakeholders influencing the project and being influenced
- Supplier part, i.e. suppliers delivering defined products and services to the project
- Consultant part, i.e. consultants/advisers to owner, project manager and project team

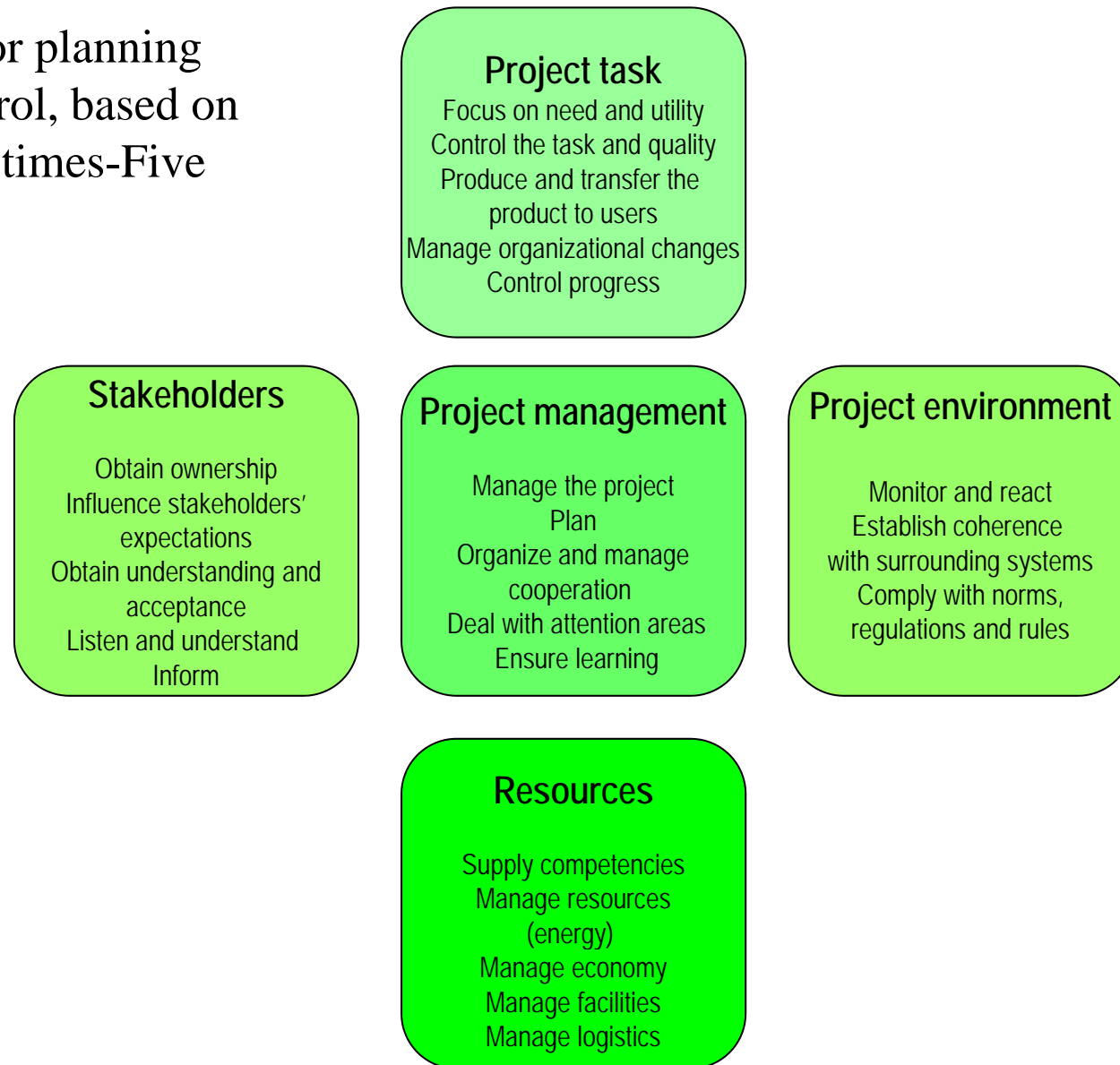
An important feature of the model is its generic nature which allows for customizing the project organization to individual needs. In a specific project the model can be used to identify the importance of the various parts and who should play a role in each part. A specific project organization will emerge.

The specific project organization may be designed in different ways. For example, the management part may consist of either one person, the project manager, or a management group including managers of subprojects and functions..

A feature of the model is that it integrates the project organization and the organization of operations. The project organization is not an isolated island. The anchoring part ensures that the two organizations are tied together. For example, a multi-chord solution may be adopted with Project Owner and Sponsors from the user organization, managers of user areas being responsible for change and operations, and potential users participating in concept design, test and operations planning. The traditional matrix organization does not depict a correct image of the symbiosis sought.

Another issue is the interface between the project organization and the sections providing the needed competence and resources. Here, some form of a matrix organization may serve useful.

Model for planning
and control, based on
the Five-times-Five
model



Model for planning and control, based on the Five-times-Five model

The planning and control model shows the functions and tasks associated with steering the project. It rests on the Five-times-Five model, and this ensures that all elements of a project are dealt with, including stakeholders and factors in the project environment.

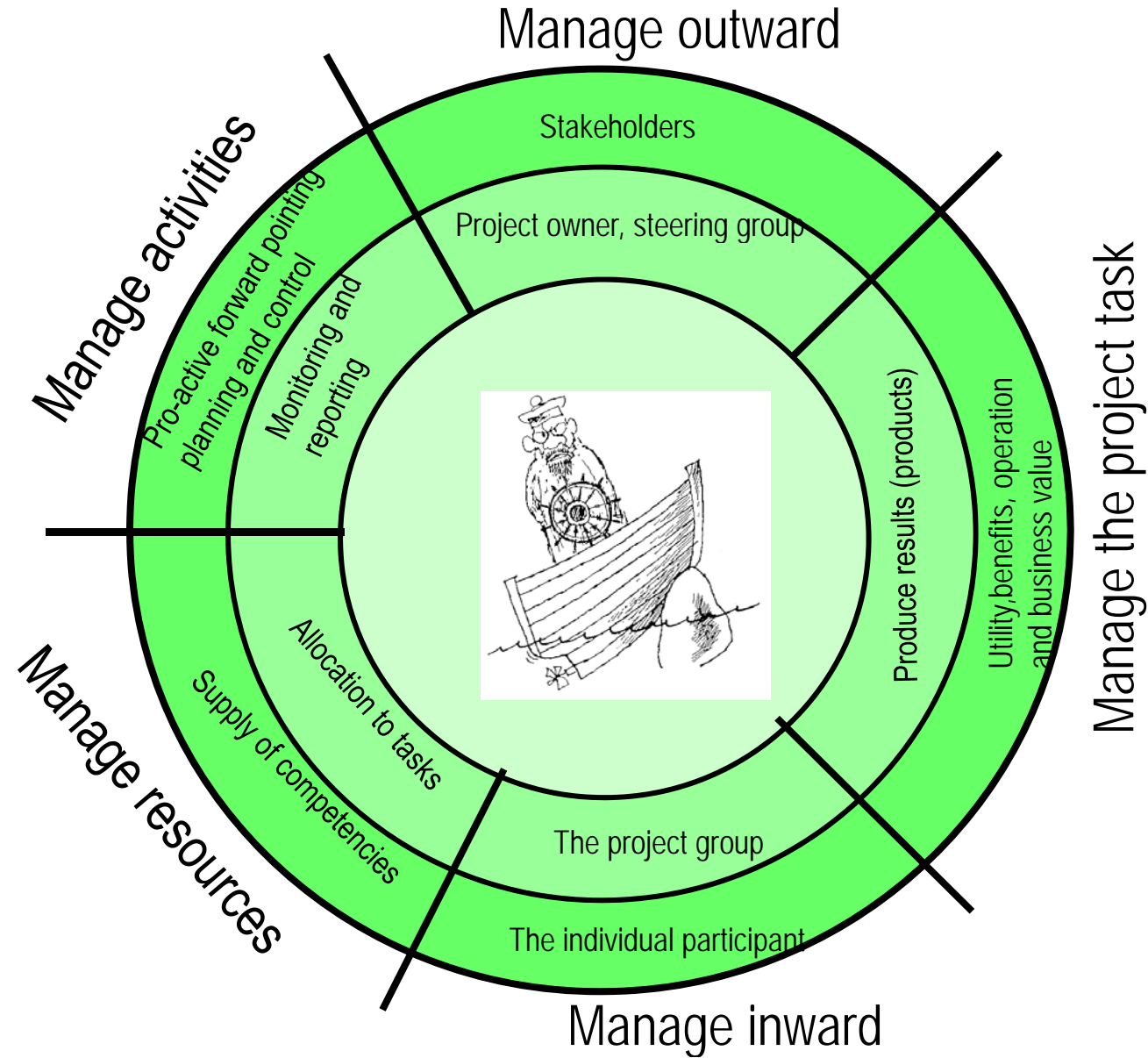
Basically, planning and control entail striving for attaining set goals and to follow a plan, as long as they are relevant. But it also includes reacting to changes in the project environment, for example conditions and assumptions, and to new knowledge and recognition. This may result in readjusting goals and plans.

Planning and control presuppose dirigibility/maneuverability. It is not sufficient just to record deviations from goals and plans. Feasible activities should also be identified which can change the course of events. In light of the inevitable changes during the project in external and internal conditions, e.g. in customers' acknowledged needs, it is essential in the early planning of the project to build in a high degree of maneuverability. This corresponds to developing a degree of preparedness and to providing alternative options, built-in from the start.

The model for planning and control provides a background for issue management, for the project's logbook, control decisions, forward-pointing monitoring, picture of predicted results, and management reporting.

Methods and tools are available addressing each of the management tasks.

The project manager's five management areas



The project manager's five management areas

Clear and well-defined project management. The role of the project manager will vary from project to project and from company to company. In some cases the project manager plays the role as a team leader and takes an active part in carrying out part of project tasks. In other cases she is an “administrative coordinator” taking care of organizing meetings, communication, plans and reports. And some times the project manager is the real driver who is associated with the project both inward and outward.

Instead of focusing on the project manager as the key person, it is often useful to identify requirements to project management as such, realizing that the project may need a management group.

The role of the project manager can be visualized by five types of tasks:

- Manage the task oriented processes aimed at producing holistic project results (products). This implies also focus on implementing the results to the extent that the operational goals are obtained. This role includes also concern for the project environment in which the project results are to function
- Manage outward, i.e. to interact with stakeholders, e.g. customer, commissioning manager, users, and authorities. This role entails stakeholder analysis, seeking coalitions around the project, handling conflicts of interest, disseminating the project goals and results, and obtaining understanding and acceptance
- Manage inward, i.e. to manage the project group, suppliers and consultants. This role includes organizing the various project tasks, cooperation and communication, as well as motivating and committing the group
- Manage resources, i.e. supply relevant competencies to the project, manpower, facilities, money, etc., and to allocate the resources to activities
- Manage activities, i.e. planning and controlling activities during the course of event by focusing on quality, activities, time, resources, economy, documentation, etc.

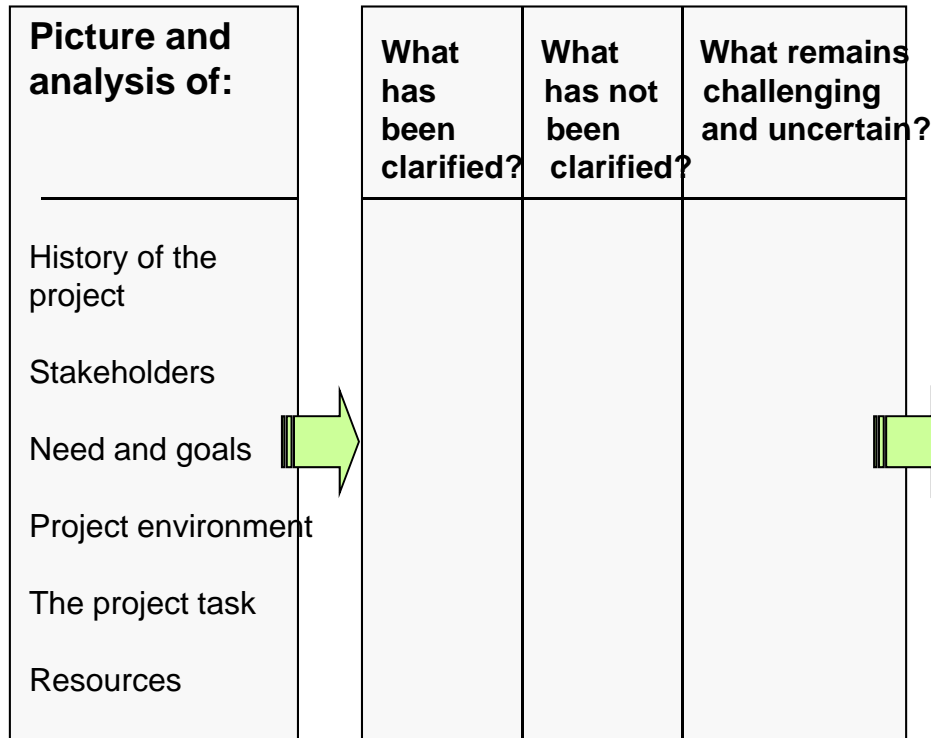
PRODEVO

An integrated concept for project management

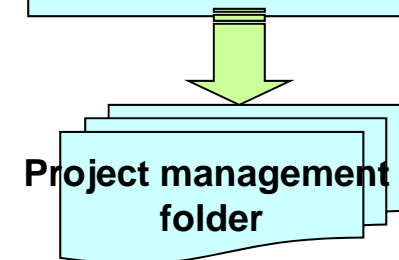
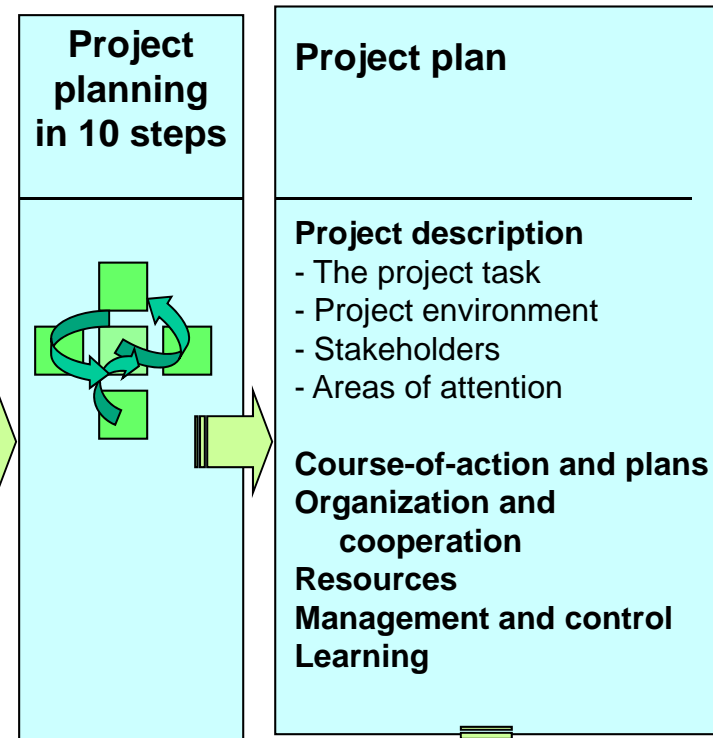
Models for planning, organizing, cooperation,
control and management

Model for project planning	18	Dirigibility in the project	40
Stakeholder picture - coalition model	20	Planning and control model	42
Project goals	22	Forward-pointing control	44
The integrated project	24	Impact areas of planning decisions	46
The organizational change process	26	Picture of the project's results, scorecard	48
Course of action	28	Cooperation model for the project group	50
Organizing the project	30	Project management	53
Master plan for coordination and control	38		

Analysis of the situation



Project planning



Model for project planning

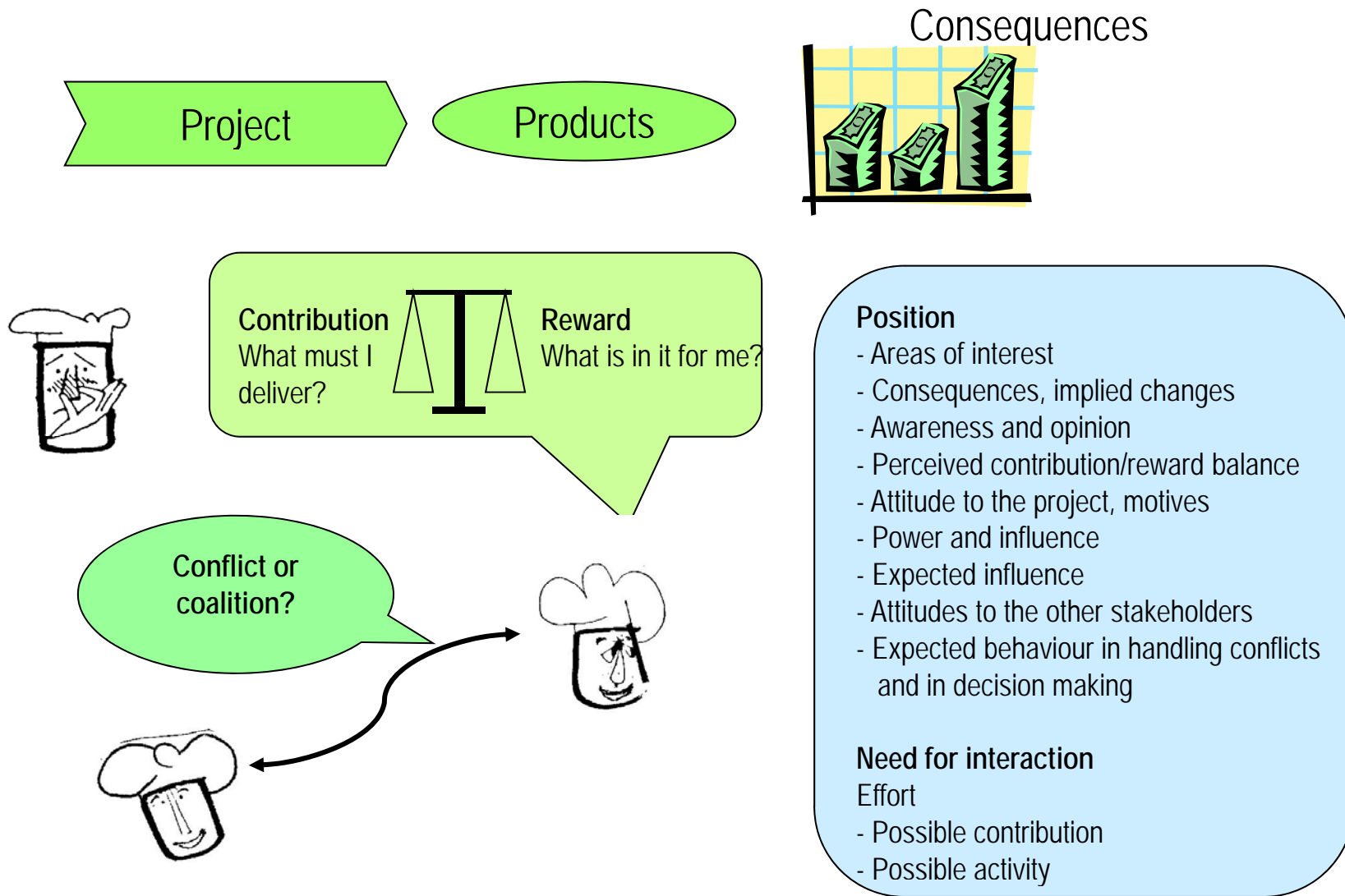
Model for project planning

The model for project planning will lead to an integrated project plan. The Five-times-Five model provides content and structure of the plan. This structure can advantageously be used early in the project formulation handed over to the project organization by the commissioning manager.

Project planning may be guided by ten steps and is partly taken place as planning workshops. Every step relates to elements of the Five-times-Five model and their mutual interaction. Point of departure is an analysis of the situation, the result of which is classified according to what has already been decided on, what remains to be taken action on, and what deserves special attention.

The project plan is expanded to be documented in the so-called "Project Management Folder". During the course of the project this represents the data base for project management.

Stakeholder picture - coalition model



Stakeholder picture - coalition model

The picture of the project's stakeholders is key in the PRODEVO's integrated concept for project management. It provides a basic understanding of the project task and of the origin of the formulated objectives and goals. Also it provides an understanding of the nature and extent of the implementation task of the project's results. This can be used when the project is organized and a strategy for implementation is developed. The stakeholder picture is also used for planning the interaction with stakeholders during the course of the project, of the project's decision making processes, and of the communication around the project.

The stakeholder picture is developed through a stakeholder analysis. It rests on the coalition model that revolves around the balance between stakeholders' expected contribution and reward, to be interpreted in a broad sense.

The stakeholder analysis consists of six elements:

- Identification of stakeholders and their representatives and opinion formers
- Position analysis - analysis of stakeholders' perception of the project and its potential consequences, of the attitude to the other stakeholders, a picture of who has the actual power and influence, and a picture of the stakeholders' expectation with respect to influence
- Analysis of the project's consequences for each stakeholder; this will also provide a picture of the nature of the anchoring and organizational change task
- Analysis of the need to influence the opinion and attitude of the stakeholders, as part of planning the anchoring and organizational change process
- Analysis of congruency of interests with a view to identifying potential coalitions for and against the project
- Analysis of conflicts of interest and areas of tensions, as a basis for planning the decision making process

Project goals

Mission of the project

A description of the utility and benefits that the project should achieve, respectively of the problem to be solved

A picture of the future situation after the completion of the project, a vision

The utility value of the project (objectives)

The desired effect of the product of the project

Can be captured by asking, “Why?”

Answers begin with “In order to ...”

The product targets of the project

The desired functions and attributes of the project product

A picture of the desired product

Can be captured by asking, “How? and What?”

Answers begin with “By means of ...”

Project goals

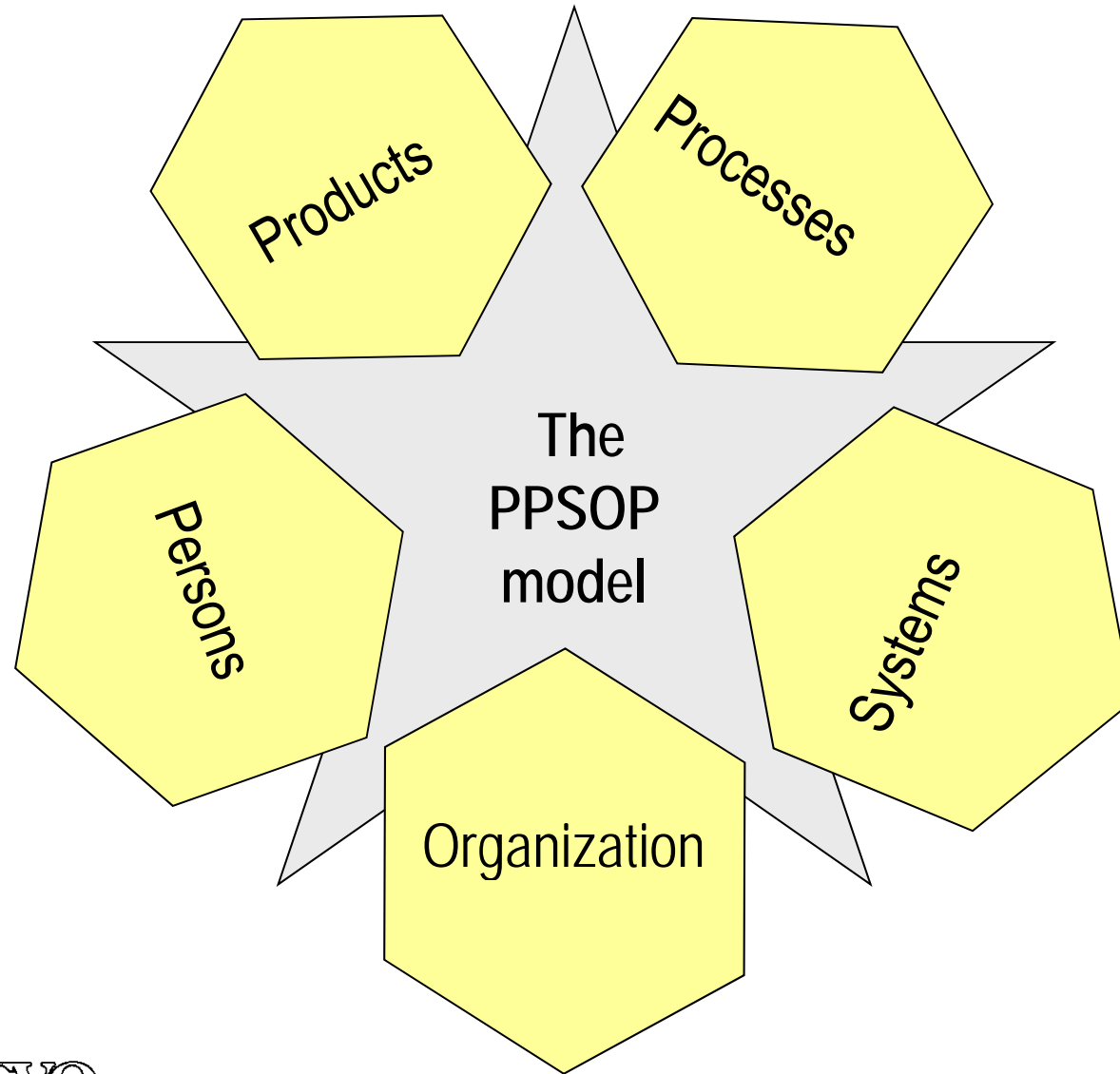
A project is initiated in accordance with its mission, to find a solution to a problem, to exploit an opportunity, to develop a corporate culture, to initiate a societal development, etc.

Utility goals denote the value and benefit that the project should create based on a recognized need. Focus is on creating value and consequences in the environment, for example user value, service value, increased image, net value gains, competence development, quality-of-life related values, and values for society. Utility goals should be visualized in terms of the future benefit of the project for individual stakeholders. For example, manufacturer and seller of a new product look at the competitive position and business economy; users are interested in the operational and business potential, reduced costs and better work environment, etc.

Product targets express the specific requirements of the product of the project, in terms of functional properties and other attributes, e.g. economy. Product targets are off-springs of the utility goals. But other factors should also be considered, for example interplay with other products and systems, physical space, technology and manufacturability.

The term “success criteria” may be used to denote what is required in order for a stakeholder to consider the project as a success, either in terms of the end results or the project process. Answering the question “What will it take to have the most important (most influential) stakeholders to name the project a success?” can capture the key goals in a larger complex of goals and expectations.

The integrated project - Five result areas for the project



The integrated project - Five result areas for the project

The project task should be divided into key elements, called effort areas (result areas). Each effort area should be detailed for each phase. It is important that this decomposition is carried out with due regard to interactions and interfaces as a means for developing an integrated master plan and a set of expected results.

In almost all projects the process for systems and product development and for the organizational change process include renewal and changes of five elements:

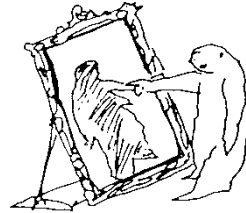
- Products - products and services adapted by operations
- Processes - business processes of operations, that include key and supporting processes necessary for the operating organizational unit to deliver its products and services
- Systems - the technical systems and information systems supporting operations
- Organization - the operating unit's organizational structure, roles and division of tasks, allocation of responsibility, performance measures etc.
- Persons - employees who will have to function in operation when the project has been implemented, often with new competencies required, values, desired behavior and performance norms, incentive schemes etc.

In some projects it is important to focus attention on the business that the project is intended to develop or improve.

One of the five elements may dominate, and this then determines the main content of the project task. But the model can also contribute to establish an overview of the project's result areas and their mutual interdependencies.

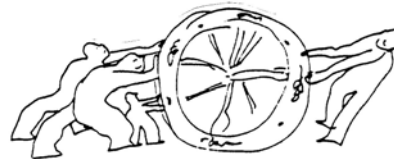
Four tasks in the organizational change process

Understanding the project
and its solutions



Competence development

Acceptance of the project
and its solutions



Change and use
(products, processes, systems, organization)

Understanding
and knowledge.
Will and
commitment

Use and
effectiveness in
operations and
in business
development

Four tasks in the organizational change process

Planning of the organizational change process takes outset in the following questions:

- Which changes are necessary in the organizational unit that will take over the project's result? "From - To"
- With which rhythm should the project's results be implemented and put into operation?
- In which phases is it possible to implement the system to be developed?
- At which tempo can the operating organizational unit deal with the implied organizational changes?

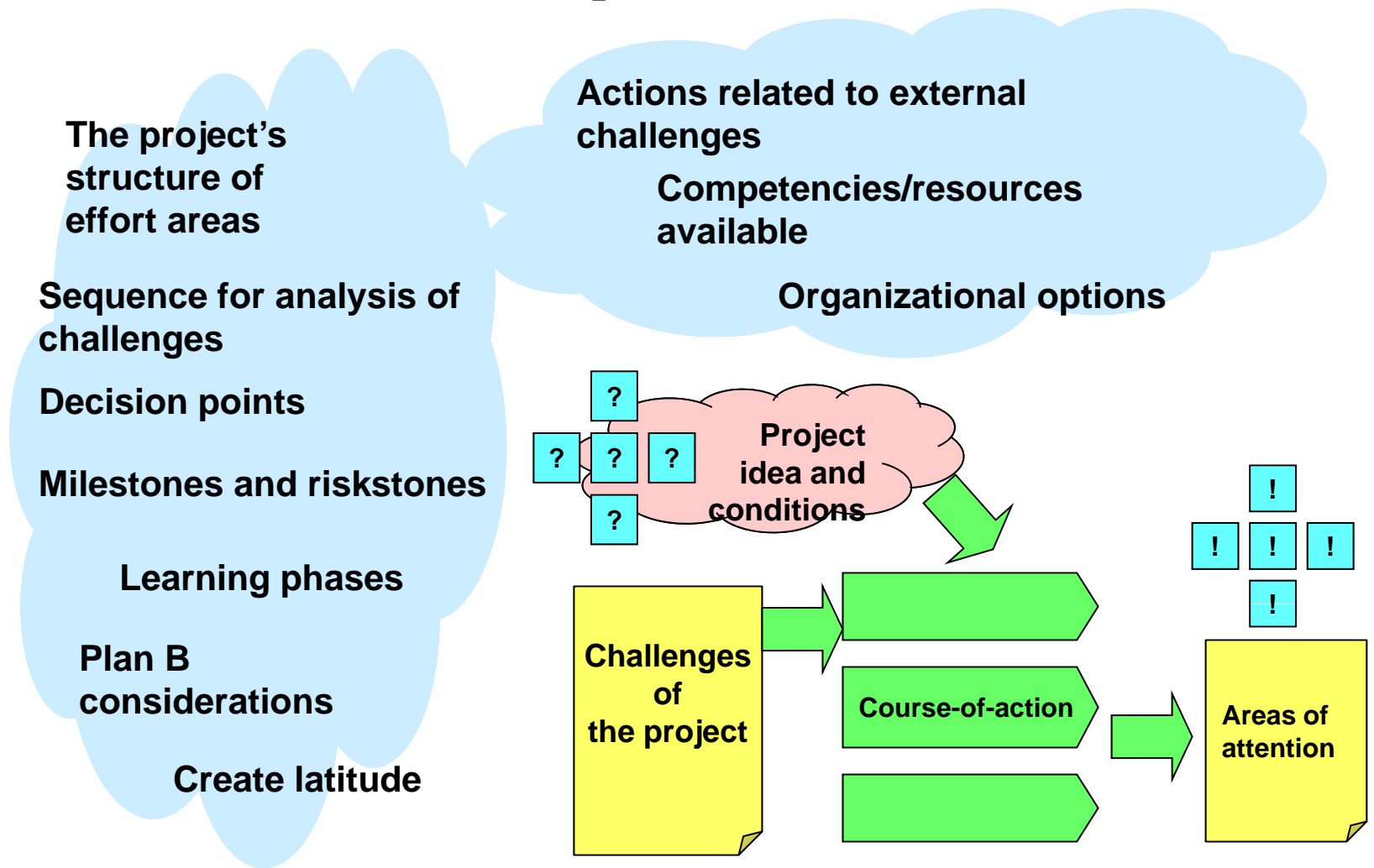
Challenges for the organizational change process often relate to human behavior. Key words are:

- to generate awareness and understanding
- to obtain acceptance
- to acquire competencies for applying the project's products

The process of understanding includes comprehending issues of the problem and its delimitation, identifying possibilities and objectives, and being able to evaluate ideas for solution and their consequences. Often it is a collective learning process with emphasis on developing a common awareness and perception and on communication. Appropriate means include visualization of the solution, either in terms of a model, a prototype, a rehearsal, or a pilot operation.

The process of acceptance is concerned with obtaining acceptance from actors in the project and especially the coming users of the project delimitation, objectives, its products and consequences. Typically this will imply managing tensions and adjustments. Acceptance often rests on the extent to which their concerns have been noted and included. This emphasizes the importance of communication with stakeholders and to make room for dialogue and influence on both solution and course of action.

Course-of-action – Master plans



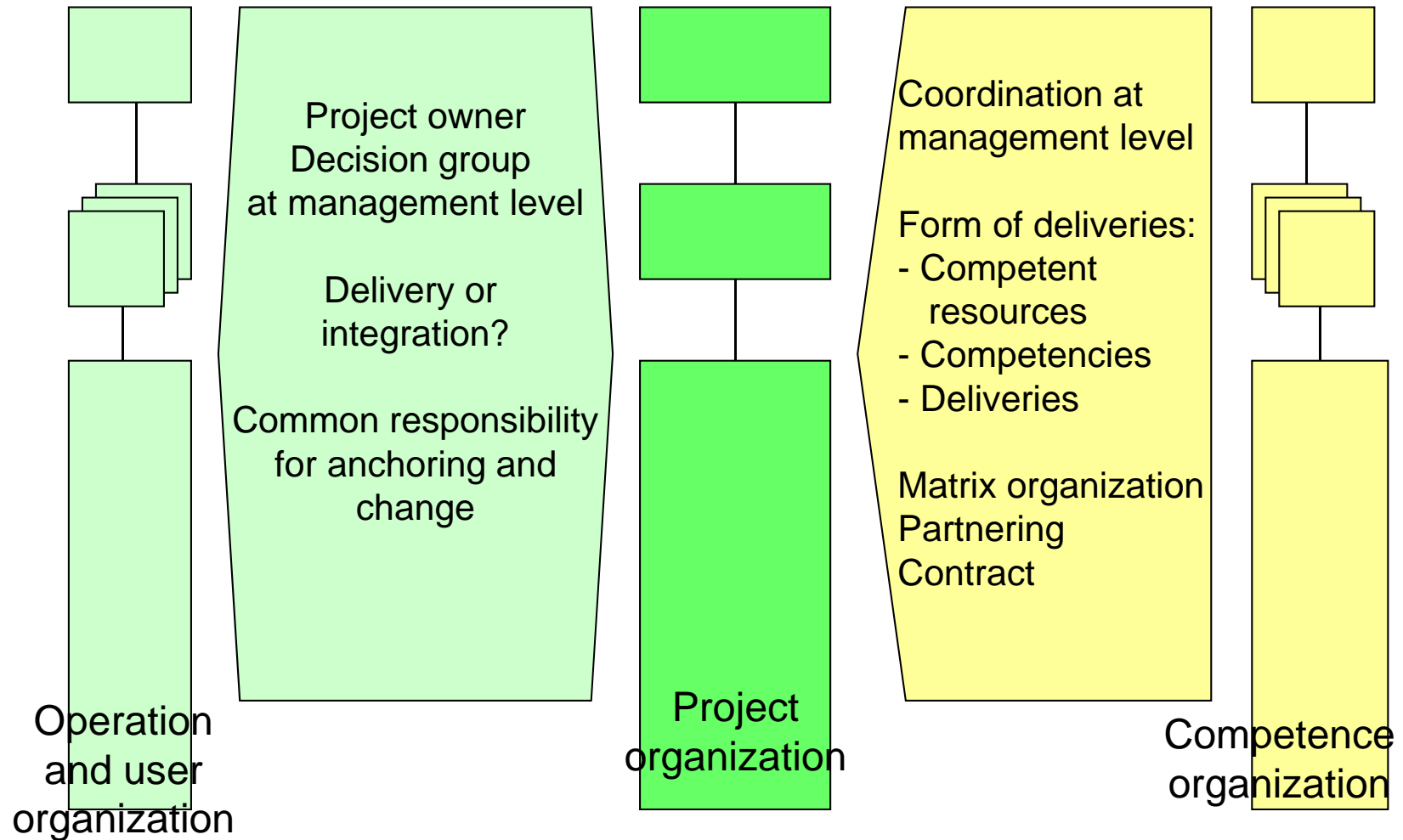
Course-of-action – Master plans

Every project holds its specific set of features and challenges. This implies that planning of the course-of-action and organization of the project should be based on the individual characteristics of the project. These considerations hold one of the keys to success with the project.

In preparing master plans it is possible to draw on experiences of others, expressed in terms of Best Practice and models offered for inspiration and guidance. There is a spectrum of typical course-of-actions and phase models:

- A product-based phase model with milestones and activity plans (road maps). This model assumes a well-known product of the project and a known project process, and may be used for delivery and installation of systems and engineered equipment at customers' site. A standard course-of-action model will be used for every product delivery.
- Industry-based phase model. This model is based on products of the same kind, although there will be differences from project to project. But the project process is in large the same for every project. The model provides a common language for the participating companies and facilitates negotiations and agreements on management of interfaces.
- Concept-based phase model. This model assumes that a conceptual solution of the project product is developed and decided upon early in the project. The model is used for different types of development projects.
- Iterative course-of-action. This model assumes that the project solution for various reasons should be developed in several rounds as an evolutionary process with many prototypes.
Stage-wise deliveries in the form of versions and a gradually more and more developed product. This model is applicable for development projects with unstable environment and changes in requirements of the project product, where it is required to launch frequent new versions, and where the solutions are to be developed via new knowledge and ideas in close interaction with customers.
Development of solution experiments, i.e. tests, models and prototypes. This model is applicable when there is uncertainty about means in terms of what is feasible. This also includes the issue of getting users on board. The plan consists of a number of milestones and riskstones where critical questions and uncertainties are dealt with. In case the uncertainties are located in the technology and business areas, prioritization of uncertainties are used as key to determining the course-of-action. When the uncertainties primarily are located in the organizational and political area, an organizational change strategy is used as basis for the course-of-action.
- Explorative course-of-action. This model assumes that there exists only little knowledge about possibilities and external conditions, and that the final goal and course-of-action are dependent upon acquiring as deep an understanding of these issues as possible. The plan consists of a series of clarification points with preceding experiments and analyses. A hypothetical goal may be defined, but it can be changed during the project. Successive planning is applied dependent on the clarifications. This model may be used when the goal is unclear and mostly take the form of ideas, and when the means are not known.

The project organization – An arena of interplay



The project organization – An arena of interplay

The project organization is often shown as a dedicated organization created for the project task, as a delimited unit with a manager and a project group. This emphasizes the project as an important task and makes explicit who has been assigned to the task. The project organization also serves as a rallying point to stimulate cooperation of the participants.

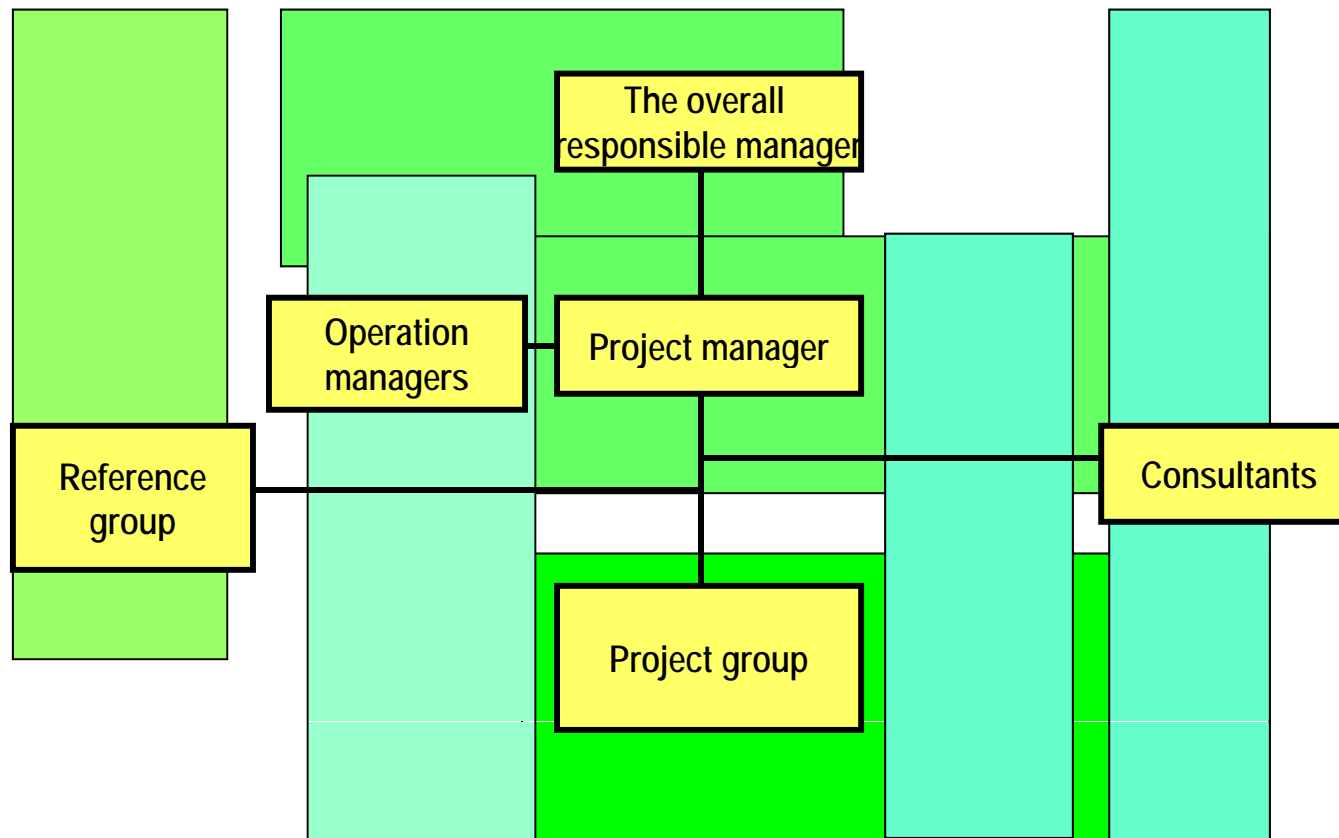
But "participants" should be understood in a broad context, not only as members of the project group. The project draws on competencies, resources and ideas of others. The project results, in the form of products and their application, should be accomplished, owned and used by others. The project organization will be discontinued, but the project results will live in the future. And the experiences and learning gained during the project should be employed in new projects.

Therefore, the project organization should be perceived as "An arena of interplay". This encompasses the interplay with the competence organization, that provides competencies and resources, and includes what the project receives, as well as the experiences gained during the project that is returned to the competence organization. The interplay also includes the user world in its broadest sense and the changes taking place there.

The interplay can take on different forms. Considerations should include a discussion of the degree of integration versus differentiation of the project organization and other organizations. This includes the communication between them with the aim to achieve understanding and acceptance. And the interplay includes staging of communication with and between external stakeholders.

To organize a project based on the idea of "An arena of interplay" implies less emphasis on drawing of organizational charts and more weight on staging a situational communication.

The actual project organization is designed on the basis of the generic model



The actual project organization is designed on the basis of the generic model

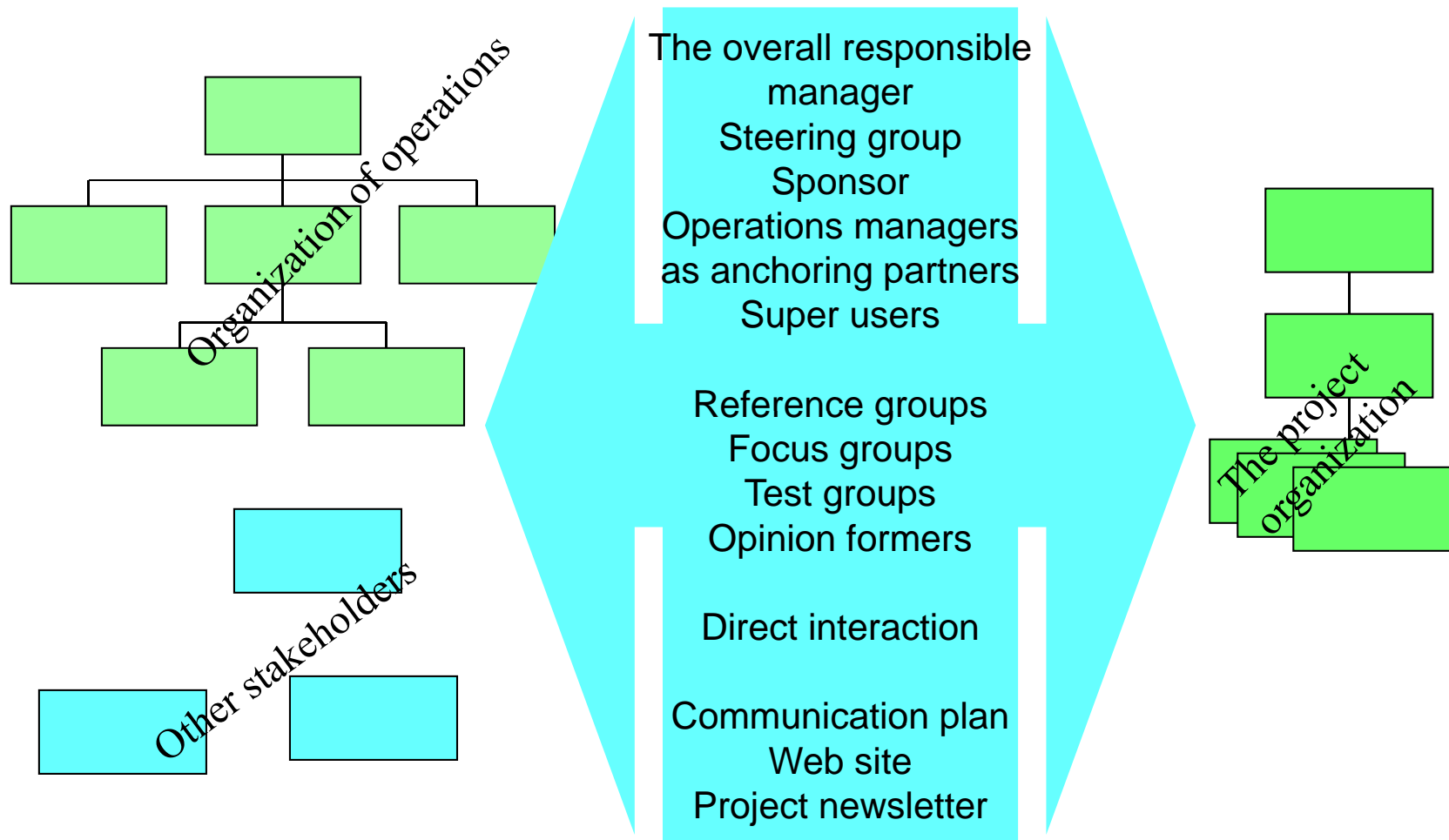
The generic model of the project organization represents a check list with the basic elements that should be addressed in every project when building its organization. Project organizations may be designed in different ways in view of different requirements, as is illustrated by means of an example.

When organizing the project it is useful to distinguish groups from meetings. A group has a common task, and its participants share a common responsibility. The task may be to deliver part of the project's product, to manage a subproject, or to monitor the quality of solutions, to serve as a link to various users, or to make joint decisions.

Meetings are communication means for achieving coordination and collaboration. For example, the project manager and key persons meet to decide on the activities of the project including their coordination; and managers of the company meet to decide on the project. Meetings are arranged with users to inform about the project, to gather information and to test proposed solutions. Persons who meet regularly or ad hoc do not need to form a group.

There has been a tendency to include many groups in the design of a project organization, mainly with the role of achieving better communication, but without a clear responsibility. This should be avoided, because such groups may constitute an unnecessary constraint, and lead to much inertia. Rather, it may be relevant to arrange meetings when there is a need; then participants are selected for the specific occasion. Organizing the project work and its communication should be seen as staging a series of events for addressing the tasks of the project including communication tasks.

Organizing the external cooperation



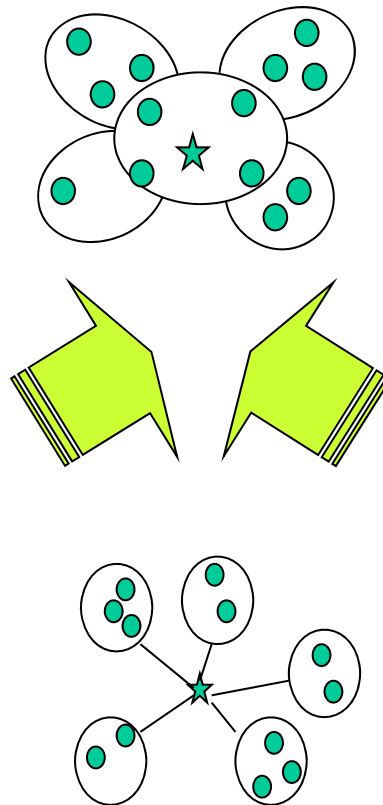
Organizing the external cooperation

The external cooperation is in particular directed towards two main groups of stakeholders, respectively owners and users, on the one hand, and stakeholders who must provide resources, knowledge, and approval during the course of the project, on the other hand. In some projects, for example in construction projects and innovative development projects, it is important to develop and continuously maintain a close collaboration with customer, stakeholders and the overall responsible manager.

Collaboration with owners and users should be established through integrative ties between operations and the project organization. Anchoring the responsibility for using the project products implies that the project organization must involve operations, e.g. by assigning project tasks to operations and by giving room for dialogue and influence.

Organizing the internal cooperation

- Project manager with management know-how
- Visible project manager
- Project meetings
 - Work meetings
 - Steering meetings
 - Social arrangements
- Minutes of meetings
- Continuity in staffing
- Direct personal interaction



- Up-start and planning workshops
- Project handbook
- Project information, communication and web site
- Project room
- Project web site
- Visualization (models, posters)
- Evaluation of performance and process

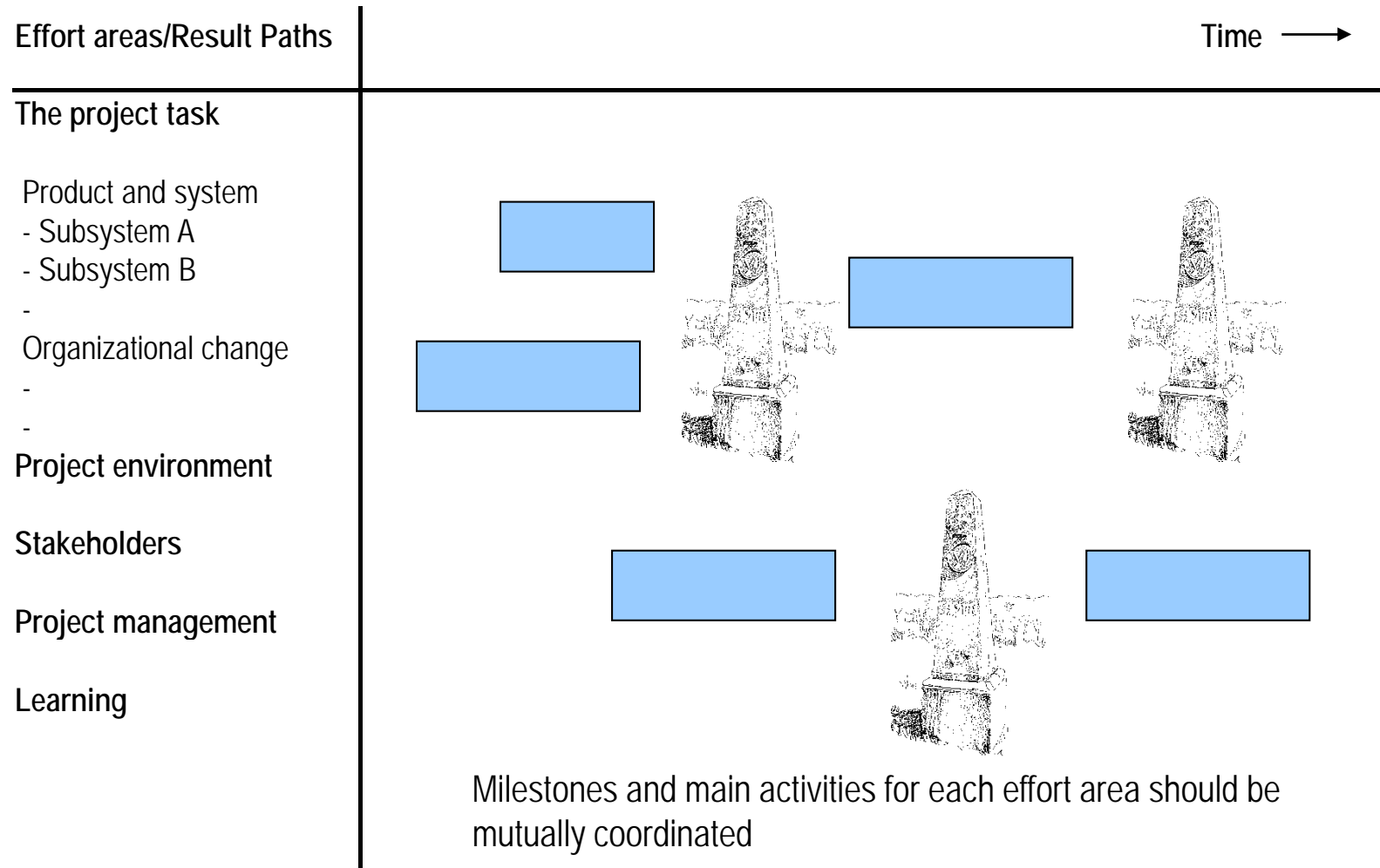
Organizing the internal cooperation

The project organization will make use of a series of different working modes and means of communication.

The more structured and transparent the project task is, the easier it is to develop a plan and division of tasks, and to delegate activities to participants being coordinated by plans and steering meetings.

The more unstructured, opaque and turbulent the project task is, the more necessary it is that participants work closely together with access to direct communication when a need arises, and that they use a project room.

Master plan for coordination and control



Master plan for coordination and control

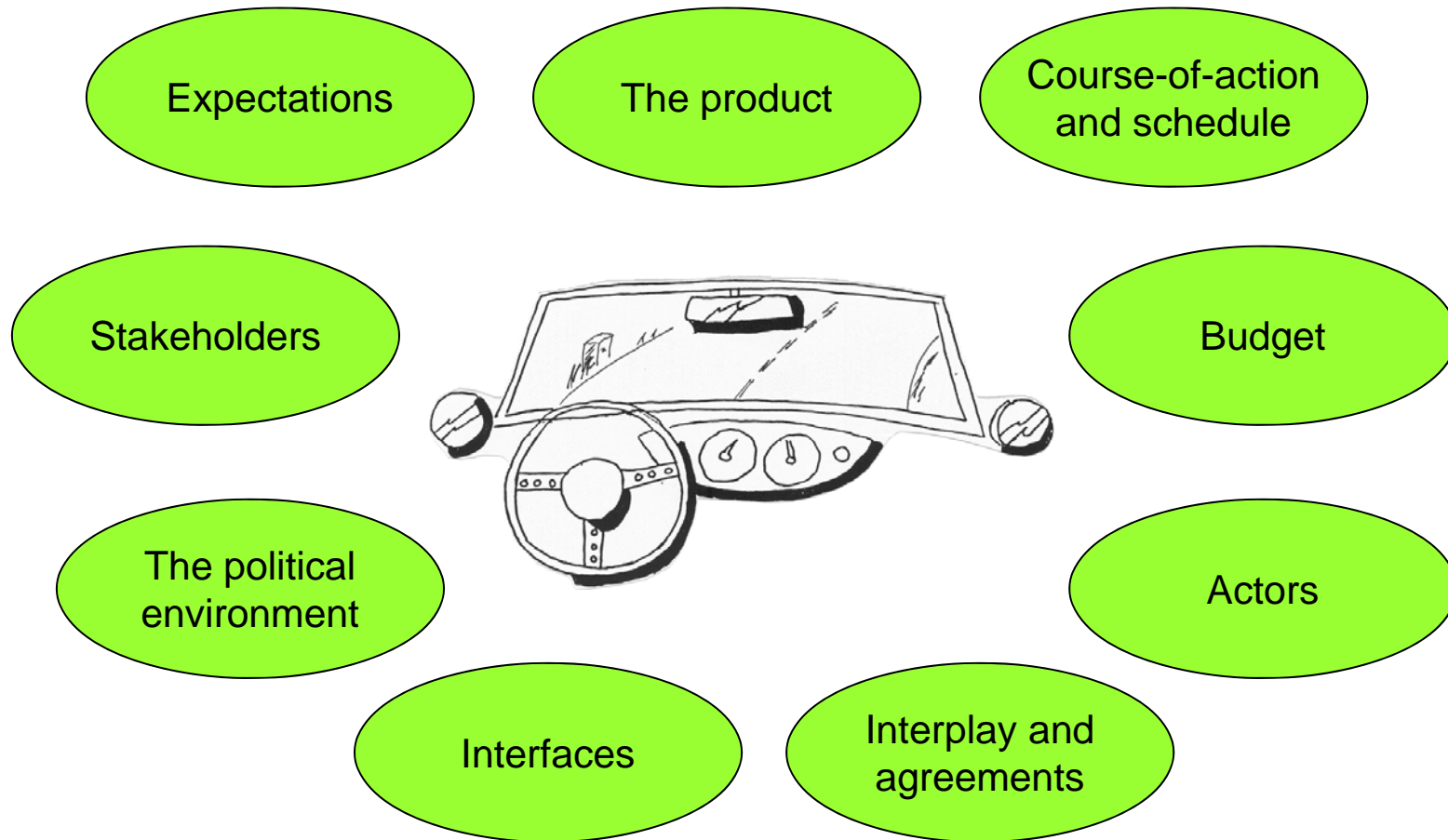
A plan with milestones and activities should be developed for each phase, called "Master plan for coordination and scheduling". It is not a detailed action plan, but an overall plan for each effort area. The plan provides an overview and shows the interdependencies between effort areas and between milestones.

A milestone is an intermediate stage and should be defined by a distinct state or situation, a well-defined event or a distinctly marked results.

A main activity is a major task and delivery that is carried out by a working group, a supplier or a member of the project group. The description of milestones and main activities provides a clear and precise way of delegating project tasks.

The master plan for coordination and control should also indicate assignment of responsibility and roles for effort areas and for milestones.

The project should be dirigible – in several areas



Control requires dirigibility

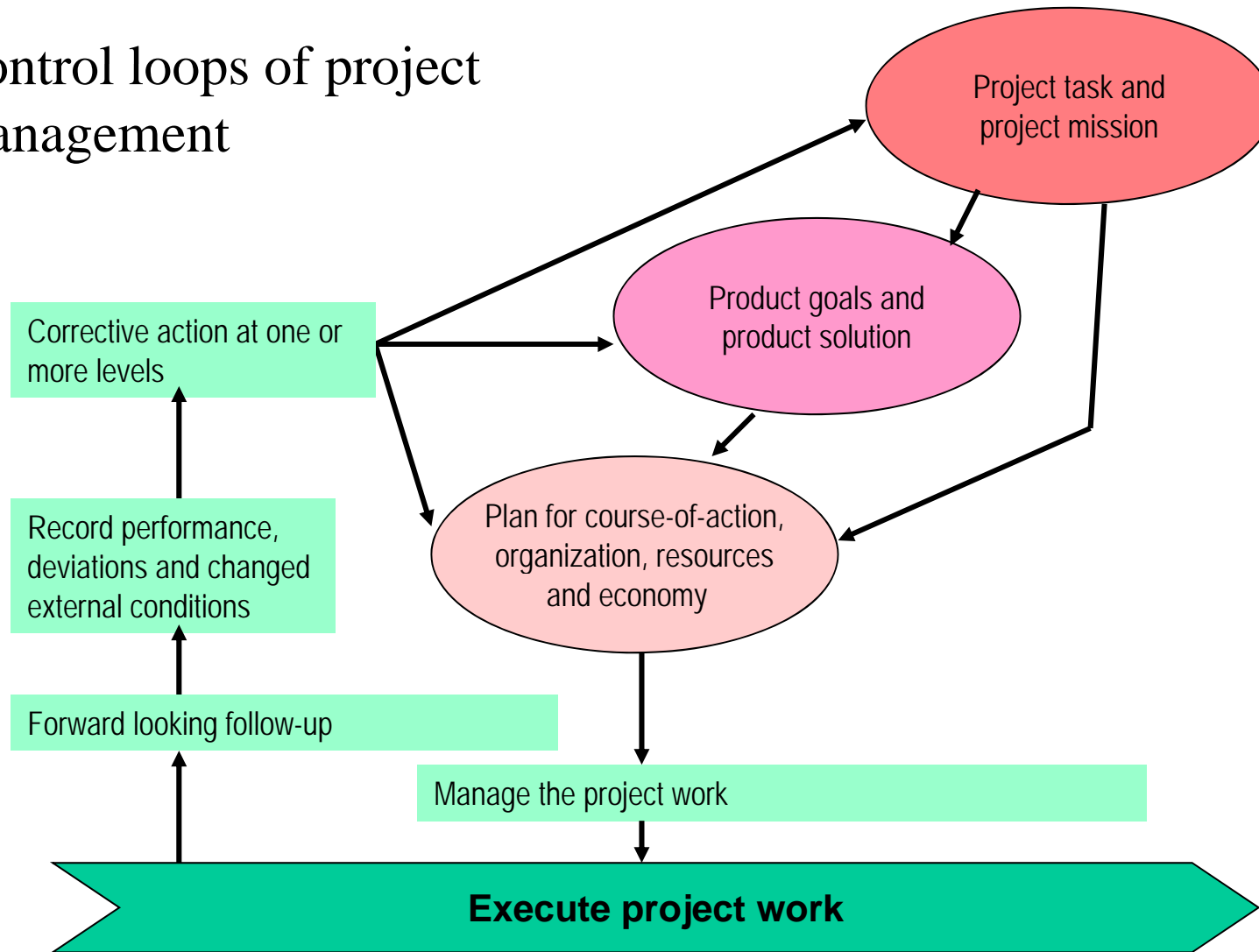
It is not sufficient to observe deviations from goals and plans. Possibilities should also exist for changing the course of events in a proactive and effective way. In view of changes in conditions of the project and in users' perceived needs and wants, it is essential to ask how it is possible to build dirigibility into the project and the plan.

Dirigibility, essentially, is to have alternative options available, conceived already in the planning stage. To achieve dirigibility it is important that these options are identified, considered and selected on the basis of perceived uncertainties. Dirigibility also means room for improvisations. It is also important to maintain a preparedness as long as possible, perhaps to the end of the project. This may sound easier than it is in practice to realize. Especially, design of products is demanding when flexibility is to be built into modules and features. In other words, the planning philosophy is to prepare a plan with built-in options for changes possibly with some costs incurred, and not to develop a committing and invariable action plan and schedule.

Dirigibility in projects should exist in several areas:

- Expectations to benefits and rewards, and the measurement of these results. Expectations should be adjusted during the project, and the actual results be measured
- The product, in terms of prioritizing desired functions and attributes, modular structure, coping with changes during the project, gradual realization in stages
- Course-of-action and time schedule, in terms of time boxes, time buffers in case of major uncertainties, alternative course-of-actions
- Budget, in terms of a budget reserve to meet uncertainties, committing decisions during the project on the basis of cost-benefit considerations, making estimates of completion costs
- Interfaces, for example successive clarification of interfaces between the product and its environment, and between elements of the product. Genuine resolution of interface issues
- Actors, in terms of openness about uncertainties, resolute action, will to develop a joint solution, flexibility with respect to division of tasks and their interfaces
- Interplay and agreements, for example partnering agreements, incentives for achieving a holistic solution, fair dealing with changes
- Stakeholders, in terms of openness with respect to uncertainties, prioritization of wants and requests, and conflicts of interest resolution
- The political environment, in terms of balancing announcements of uncertainties and goals, effective forum for decisions, clear communication about changes and their causes

Control loops of project management



Control loops of project management

Follow-up activities result in observation of deviations from goals and plans and from the assumptions underlying the plans. It should include both already happened deviations and expected deviations. Reactions to such deviations should lead to adjustments, either in the planned course-of-events, activities, time schedule, organization, staffing and resources, budget, in the solution (product and the product goal), or in the project task and utility goals.

This does not imply that it is useless to define goals and scope of the project or to prepare plans. But they have to be adjusted or changed, when this is warranted by external conditions and good reasons. Good control means reacting in due time and making reasonable decisions. If all actors in a project (overall responsible manager, members of the decision group, project manager, members of the project group, and stakeholders) just do what ever they find appropriate, goals and plans quickly become illusory. In essence, goals and plans are mutual agreements, and changes should be made with due respect for the underlying agreements. They should be proposed, justified and decided on. Some changes can be made by the project management within the scope of their authority. More drastic changes, for example in project goals, scope and product goals, should be decided by the overall responsible manager or the commissioning officer.

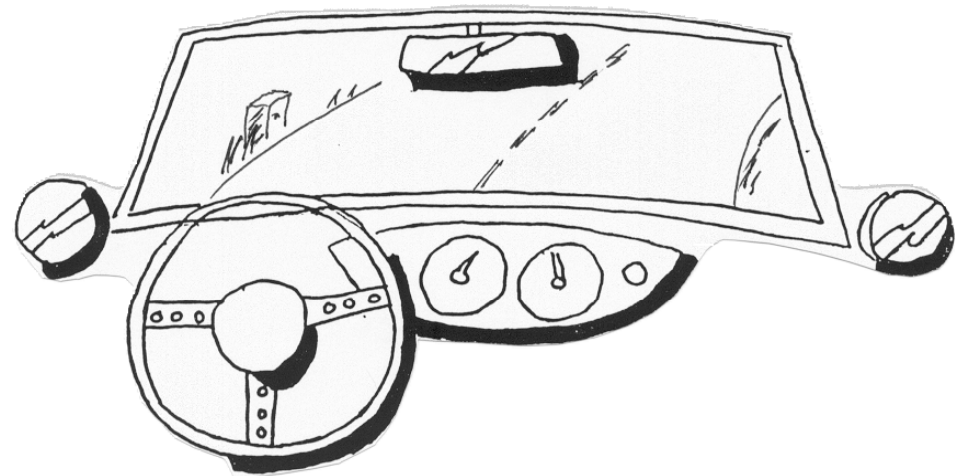
Internal and external uncertainties of the project determine the nature of plans. In the long run the master plan expresses a desired course of events, but there should also be an alternative plan in case of unforeseen events. In the shorter run plans are used to prepare activities and to make them possible, and also to decide and coordinate what should be carried out.

Forward pointing follow-up

- Look at the project's final state and the time beyond that
- Keep an eye on developments and incidents outside the project, but potentially related to the project
- Report the expected final state instead of the planned final state
- Think in terms of chains of commitments - consequences, value, utility for users

You can only change what lies ahead of you

What lies ahead of you determines how far you have reached



Forward pointing follow-up

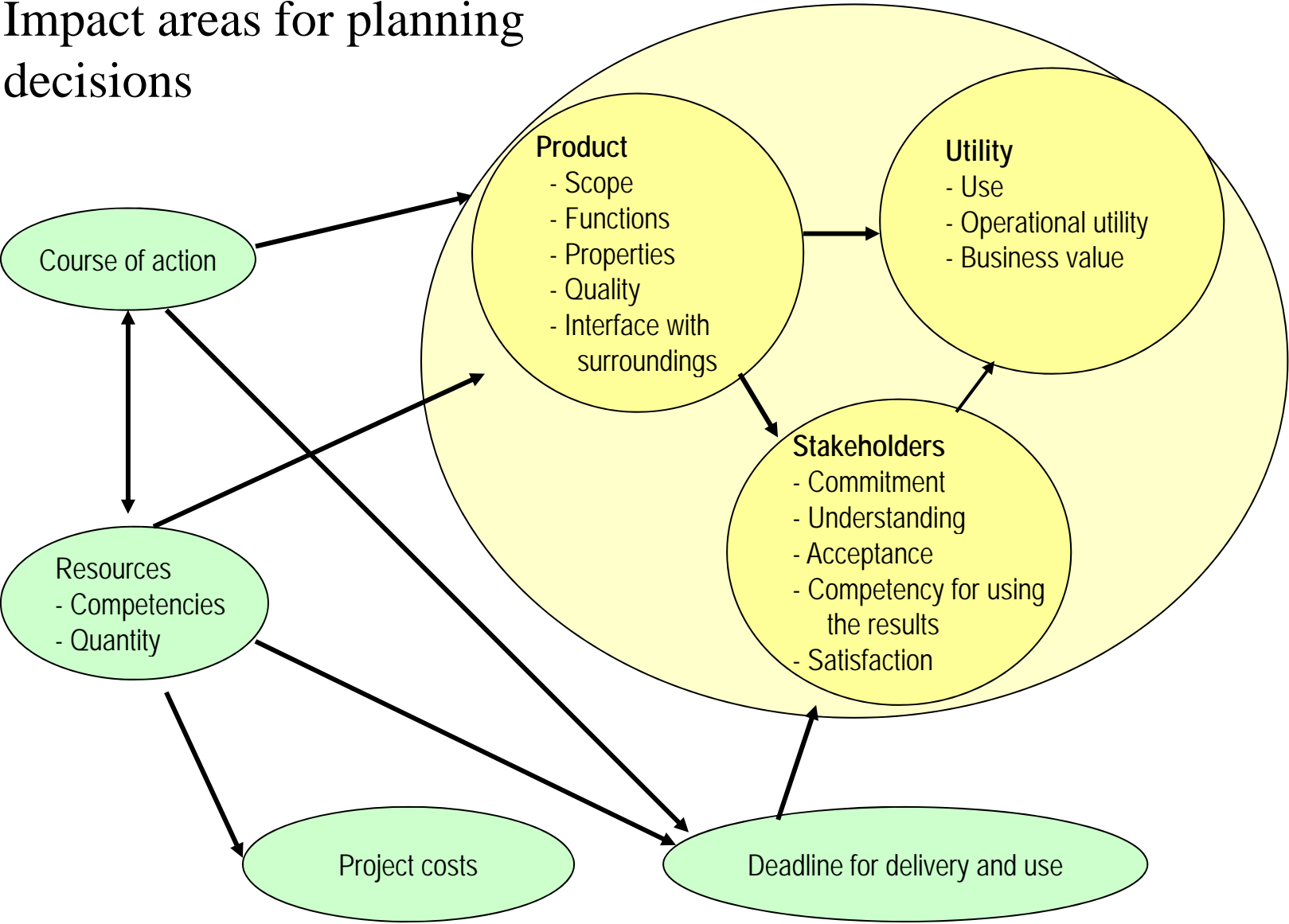
Control and monitoring take outset in the project formulation and the project plan. During the project the management monitors progress in terms of what has been accomplished, what the consumption has been, and what is planned. Traditionally, control and monitoring have focused on the present state expressed in terms of the past. Instead, we want to introduce the notion of forward pointing follow-up to include knowledge of the remaining part of the project. It is often necessary to change plans because of changes in assumptions and of the fact that users' perceptions of need are revised, as they get to know their own situation and the options available. For this reason the performance measures will depend more on what remains to be done than what has actually been accomplished.

The forward pointing follow-up is an essential approach in project management. A variant is the so-called *Chain of Commitments*. It seeks to capture the impact of a decision on future decisions made by others; for example the way in which engineering design determines the shape of a component may impose constraints on production engineering, packaging, logistics, marketing, etc. In this way a decision commits subsequent decisions made by other functions.

Derived from the Five-times-Five model, control and monitoring include the following six areas:

- Foundation, i.e. if the external conditions of the project, its goals and importance still are as originally assumed
- Performance, i.e. if the accomplished results are satisfactory
- Stakeholders' opinion, i.e. if the commissioning manager, customer and users are satisfied with the results so far, the course of events, and the cooperation
- Progress, i.e. how the accomplished results follow the project plan
- Costs, i.e. how the actual consumption in terms of resources, materials and money corresponds with the budget
- Effectiveness and efficiency, i.e. how effective and productive the project is carried out, and how well the cooperation in and around the project organization actually functions

Impact areas for planning decisions



Impact areas for planning decisions

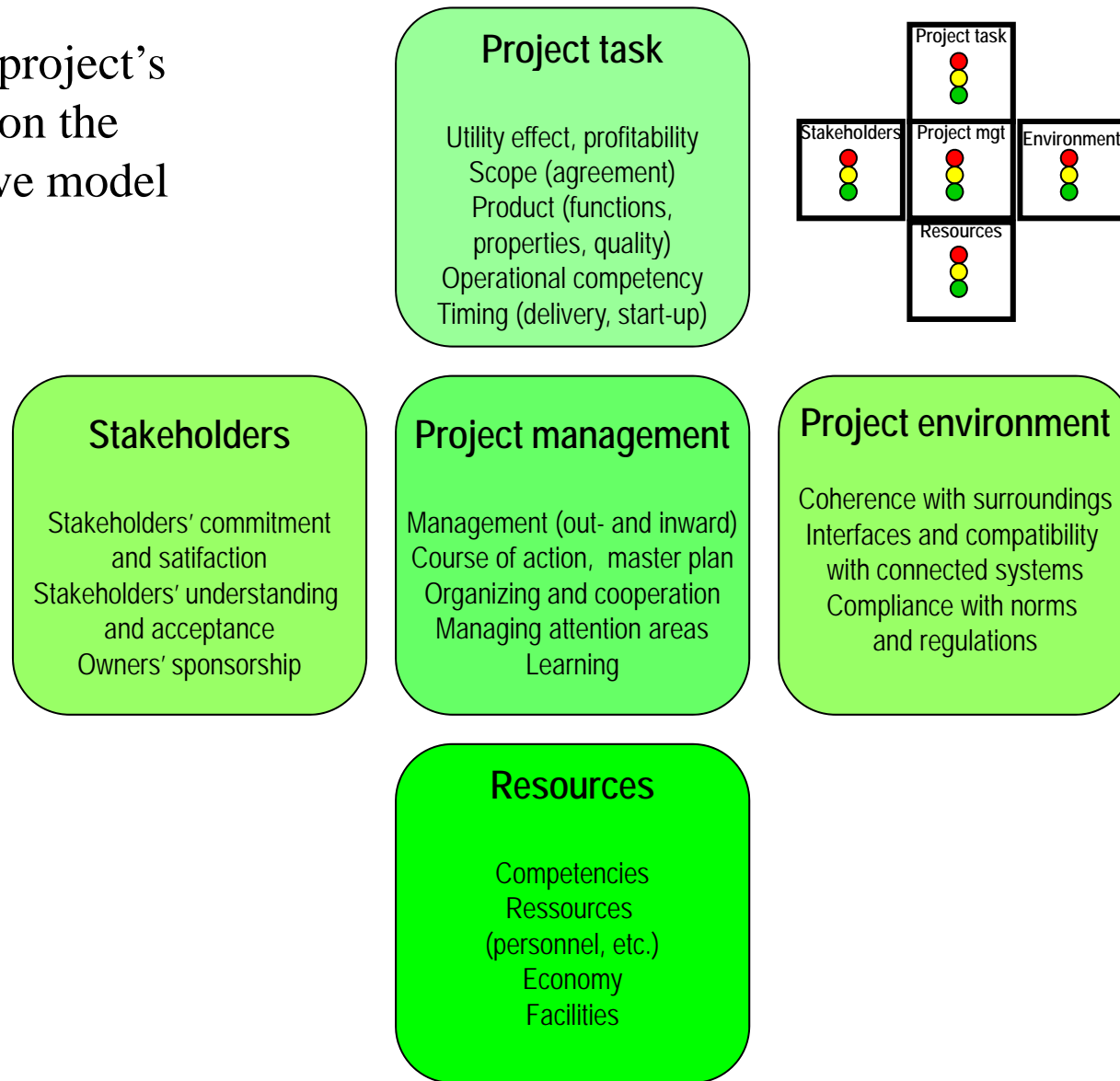
To steer implies making decisions during the project about goals, solutions, quality, course of action, resources, deadlines and costs. Every decision will affect several areas of the project.

The model can be used as a general check list for identifying and analyzing the impact of a decision.

Ideally, decisions are made in view of the Chain of Commitments approach. But often there is a tendency for decision makers to focus primarily on the impact on their own situation. For this reason, important decisions should be made by project management and the project owner.

This model can be extended to the picture of the project's results.

Picture of the project's results, based on the Five-times-Five model



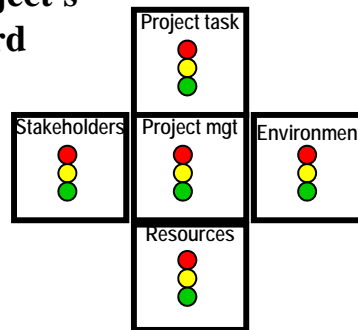
Picture of the project's results, based on the Five-times-Five model

The basic idea behind the proposed picture of the project's results is during the project to draw a picture of the way in which project management perceives the final results of the project. In this way it will supplement the traditional account of the state of the project. The picture is based on the Five-times-Five model which ensures that all relevant elements are included.

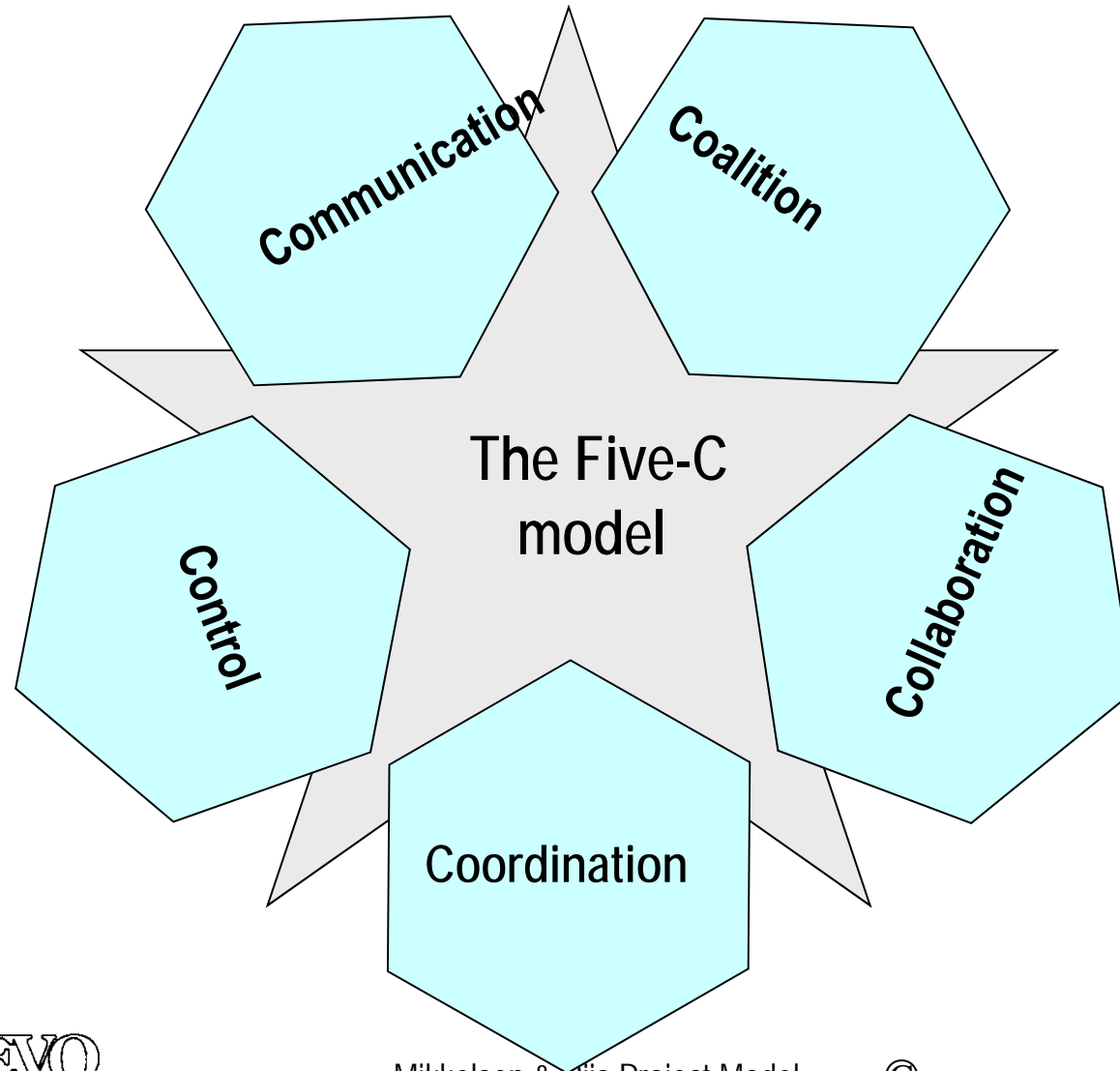
The expected results must obviously be compared with the original goals, plans and budget, or rather their most recent version. This will make it possible to use a simple indication of deviations (red, yellow and green).

The picture of the project's results is closely tied to the project's management report to the company management, to the steering group, and to the overall responsible manager. The management report should be brief, forward looking and identifying deviations and needed action.

The Project's Scorecard



Cooperation model for the project team



Cooperation model for the project team

The foundation for good cooperation in the project organization can be synthesized into five elements - The Five-C Model. They are means for developing internal cooperation and culture in the project organization. The five elements are:

▪ **Collaboration**

- Assist others in doing their best. Openness and dialogue in dealing with other persons.
- Individual contributions are produced within a set of common values. Commitment, initiative and focus on opportunities

▪ **Coordination**

- Attuned goals. Somebody will say "common goals", but this seems rather ambitious when the group also represents a force field of different interests and attitudes. It is important that everybody understands the goals and accepts to do an effort to achieve them.
- Bring about integration. Ensure coherent interfaces between individual activities. Go beyond own and others limits to create synergy and a holistic picture. Understanding of other persons' working areas.

▪ **Communication**

- Information. Inform vigorously and enter into dialogues with others about issues, ideas, solutions and progress.
- Seek information. Ask questions, seek sparring for testing of ideas.

▪ **Coalition**

- Visibility of the group internally and externally. Joint effort.
- Common values. An accepted set of norms and rules for the group culture and behavior in relation to the internal cooperation and external relationships.

▪ **Control**

- Professionalism. Employ relevant methods; willingness to experiment, reflection on experiences
- Management. Clear assignment of the management role(s) in the group. Respect for agreements

A project team is different from other groups in the organization

The task

- The task implies a force field of tensions. Participants view the project from their own position and have their own interests and opinion about expected results
- Participants have their own professional knowledge, know-how and vocabulary. It is difficult to understand other areas of specialization and interfaces between functions, and to communicate holistic solutions
- Every participant, as a professional, is responsible for ensuring quality in own functional area
- Every participant has a functional manager who also is responsible for professionalism and quality in his area
- Customers and the application areas of the project's products are often invisible to some of the participants. They are informed indirectly by other participants

Outward cooperation

- At least one manager, in addition to the project manager, expects work from the individual participant
- The project is a force field of interests. Some participants represent a large group of colleagues and are expected to take care of their points of view, but also to influence them to understand and accept results of the project
- Participants can experience to become unpopular, or the opposite to be given great attention

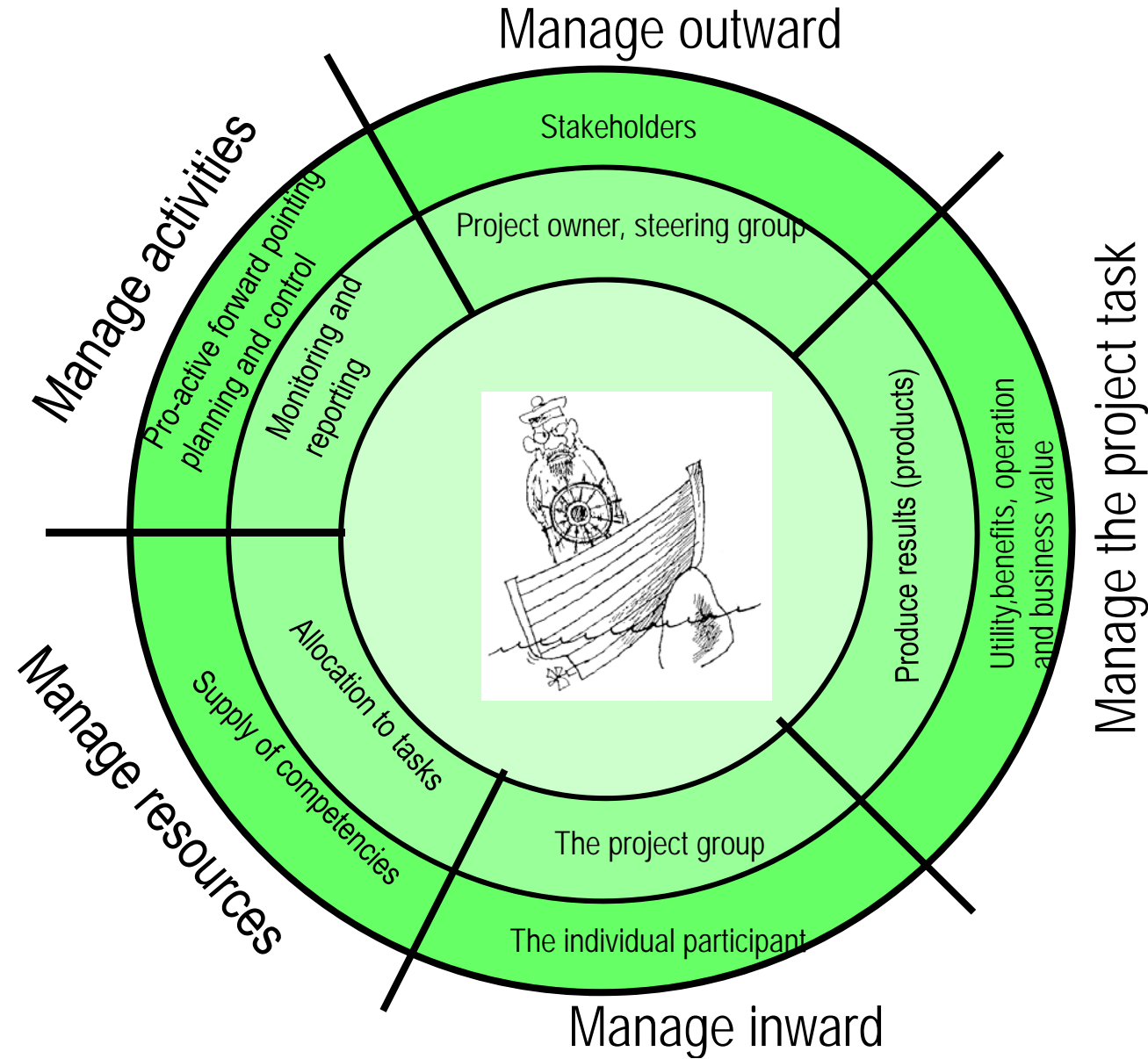
Inward cooperation

- The group has been organized; not all of them have volunteered to become a member of the group
- The cooperation is associated with the project task, and it stops with the task
- The cooperation is on part time. Other tasks have to be carried out in parallel and in other work relationships
- Participants and the group must quickly reach a satisfactory level of performance

Control

- Schedules do not hold for ever. It is often difficult to manage parallel tasks
- Some of the participants may be nervous about the final stages of the project and of their next assignment.

The project manager's five management areas



Project management is more challenging and demanding than management of operations

- Project management is task-oriented. It starts with the task, and it concludes when the task is finished
- The project manager must mobilize the project organization and later on dispose of it when the project concludes - within a relatively short period of time.
- The project organization is an ad hoc group of persons whom the project manager is asked to manage. Some of the participants are associated with the project for only a smaller part of the project duration. Participants are most often on loan from other departments and work only part time on the project.
- The project manager is seldomly assigned the usual symbols of managers, e.g. a separate management office, or a box in the formal organization chart of the company.
- The project manager has to manage the project in a force field of different interests, represented by stakeholders, each of which can influence the project and has individual expectations to the results.
- The project manager is subjected to competition from other project managers. The project manager must be prepared to infringe on the territory of other managers.
- The project manager leads project participants each with a professional background. In their area of specialization they are more competent than the project manager.
- The project manager has the task of developing integrated results that combine different contributions from specialists without being an expert himself.
- Nevertheless it is expected that the project manager knows the technical content of the project and that he is able to answer questions and explain technical details.
- The success of the project manager can not only be measured in terms of the project results (products), its duration and budget; but also by the implemented results and the obtained effect, and the opinion of stakeholders.
- The leadership style of the project manager must be broad and varied. Every project has its unique nature and group of actors. Every phase is unique. The range is often from innovation to operation.