Managing people

- Managing people working as individuals and in groups

Objectives

- To explain some of the issues involved in selecting and retaining staff
- To describe factors that influence individual motivation
- To discuss key issues of team working including composition, cohesiveness and communications
- To introduce the people capability maturity model (P-CMM) - a framework for enhancing the capabilities of people in an organisation

Topics covered

- Selecting staff
- Motivating people
- Managing groups
- The people capability maturity model

People in the process

- People are an organisation's most important assets.
- The tasks of a manager are essentially people-oriented. Unless there is some understanding of people, management will be unsuccessful.
- Poor people management is an important contributor to project failure.

People management factors

- Consistency
  - Team members should all be treated in a comparable way without favourites or discrimination.
- Respect
  - Different team members have different skills and these differences should be respected.
- Inclusion
  - Involve all team members and make sure that people's views are considered.
- Honesty
  - You should always be honest about what is going well and what is going badly in a project.

Selecting staff

- An important project management task is team selection.
- Information on selection comes from:
  - Information provided by the candidates.
  - Information gained by interviewing and talking with candidates.
  - Recommendations and comments from other people who know or who have worked with the candidates.

Staff selection case study 1

Alice is a software project manager working in a company that develops alarm systems. This company wishes to enter the growing market of assistive technology to help elderly and disabled people live independently. Alice has been asked to lead a team of 6 developers than can develop new products based around the company's alarm technology. Her first role is to select team members either from software engineers already in the company or from outside.

To help select a team, Alice first assesses the skills that she will need: These are:

1. Experience with existing alarm technology as it is reused
2. User interface design experience because the users are untrained and may be disabled and hence need facilities such as variable font sizes, etc.
3. Ideally, someone who has experience of designing assistive technology systems. Otherwise, someone with experience of interfacing to hardware units as all systems being developed involve some hardware control.

General purpose development skills.

Staff selection case study 2

The next stage is to try and find people from within the company with the necessary skills. However, the company has expanded significantly and has few staff available. The best that Alice can negotiate is to have help from an alarm expert (Fred) for 2 days/week. She therefore decides to advertise for new project staff, listing the attributes that she'd like:

1. Programming experience in C. She has decided to develop all the assistive technology control software in C.
2. Experience in user interface design. A UI designer is essential but there may not be a need for a full-time appointment.
3. Experience in hardware interfacing with C and using remote development systems. All the devices used have complex hardware interfaces.
4. Experience of working with hardware engineers. At times, it will be necessary to build completely new hardware.

A sympathetic personality so that they can relate to and work with elderly people who are providing requirements for and are testing the system.

Lessons

- Managers in a company may not wish to lose people to a new project. Part-time involvement may be inevitable.
- Skills such as UI design and hardware interfacing are in short supply.
- Recent graduates may not have specific skills but may be a way of introducing new skills.
- Technical proficiency may be less important than social skills.

Staff selection factors 1

Application domain experien(	For a project to develop a su ccessful system, the developers must understand the application domain. It is essential that some members of a development team have some domain experience.
Platform experience	This may be significant if low-level programming is involved. Otherwise, not usually a critical attribute.
Programming language experience	This is normally only significant for short duration projects where there is not enough time to learn a new language. While learning a language itself is not difficult, it takes several months to become proficient in using the associated libraries and components.
Problem solving ability	This is very important for software engineers who constantly have to solve technical problems. However, it is almost impossible to judge without knowing the work of the potential team member.

Staff selection factors 2

Educational background	This may provide an indicator of the basic fundamentals that the candidate should know and of their ability to learn. This factor becomes increasingly irrelevant as engineers gain experience across a range of projects.
Communication ability	This is important because of the need for project staff to communicate orally and in writing with other engineers, managers and customers.
Adaptability	Adaptability may be judged by looking at the different types of experience that candidates have had. This is an important attribute as it indicates an ability to learn.
Attitude	Project staff should have a positive attitude to their work and should be willing to learn new skills. This is an important attribute but often very difficult to assess.
Personality	This is an important attribute but difficult to assess. Candidates must be reasonably compatible with other team members. No particular type of personality is more or less suited to software engineering.

Motivating people

- An important role of a manager is to motivate the people working on a project.
- Motivation is a complex issue but it appears that their are different types of motivation based on:
  - Basic needs (e.g. food, sleep, etc.);
  - Personal needs (e.g. respect, self-esteem);
  - Social needs (e.g. to be accepted as part of a group).

Human needs hierarchy

Need satisfaction

- Social
  - Provide communal facilities;
  - Allow informal communications.
- Esteem
  - Recognition of achievements;
  - Appropriate rewards.
- Self-realization
  - Training - people want to learn more;
  - Responsibility.

Individual motivation

Alice's assistive technology project starts well. Good working relationships develop within the team and creative new ideas are developed. However, some months into the project, Alice notices that Dorothy, the hardware design expert starts coming into work late, the quality of her work deteriorates and, increasingly, she does not appear to be communicating with other members of the team. Alice talks about the problem with other team members to try to find out if Dorothy's personal circumstances have changed and if this might be affecting her work. They don't know of anything so Alice decides to talk with Dorothy to try to understand the problem.

After denying that there is a problem, Dorothy admits that she seems to have lost interest in the job. She expected a job where she would develop and use her hardware interfacing skills. However, she is basically working as a C programmer with other team members and she is concerned that she is not developing her interfacing skills. She is worried that she will find it difficult to find a job after this project that involves hardware interfacing. Because she does not want to upset the team by revealing that she is thinking about the next project, she has decided that it is best to minimise conversation with them.

Personality types

- The needs hierarchy is almost certainly an over-simplification of motivation in practice.
- Motivation should also take into account different personality types:
  - Task-oriented;
  - Self-oriented;
  - Interaction-oriented.

Personality types

- Task-oriented.
  - The motivation for doing the work is the work itself;
- Self-oriented.
  - The work is a means to an end which is the achievement of individual goals - e.g. to get rich, to play tennis, to travel etc.;
- Interaction-oriented
  - The principal motivation is the presence and actions of co-workers. People go to work because they like to go to work.

Motivation balance

- Individual motivations are made up of elements of each class.
- The balance can change depending on personal circumstances and external events.
- However, people are not just motivated by personal factors but also by being part of a group and culture.
- People go to work because they are motivated by the people that they work with.

Managing groups

- Most software engineering is a group activity
  - The development schedule for most non-trivial software projects is such that they cannot be completed by one person working alone.
- Group interaction is a key determinant of group performance.
- Flexibility in group composition is limited
  - Managers must do the best they can with available people.

Factors influencing group working

- Group composition.
- Group cohesiveness.
- Group communications.
- Group organisation.

Group composition

- Group composed of members who share the same motivation can be problematic
  - Task-oriented - everyone wants to do their own thing;
  - Self-oriented - everyone wants to be the boss;
  - Interaction-oriented - too much chatting, not enough work.
- An effective group has a balance of all types.
- This can be difficult to achieve software engineers are often task-oriented.
- Interaction-oriented people are very important as they can detect and defuse tensions that arise.

Group composition

In creating a group for assistive technology development, Alice is aware of the importance of selecting members with complementary personalities. When interviewing people, she tried to assess whether they were task oriented, self-oriented and interaction oriented. She felt that she was primarily a self-oriented type as she felt that this project was a way in which she would be noticed by senior management and promoted. She therefore looked for 1 or perhaps 2 interaction-oriented personalities with the remainder task oriented. The final assessment that she arrived at was:

Alice – self-oriented
Brian – task-oriented
Bob – task-oriented
Carol – interaction-oriented
Dorothy – self-oriented
Ed – interaction-oriented
Fred – task-oriented

Group leadership

- Leadership depends on respect not titular status.
- There may be both a technical and an administrative leader.
- Democratic leadership is more effective that autocratic leadership.

Group cohesiveness

- In a cohesive group, members consider the group to be more important than any individual in it.
- The advantages of a cohesive group are:
  - Group quality standards can be developed;
  - Group members work closely together so inhibitions caused by ignorance are reduced;
  - Team members learn from each other and get to know each other's work;
  - Egoless programming where members strive to improve each other's programs can be practised.

Team spirit

Alice is an experienced project manager and understands the importance of creating a cohesive group. As the product development is new, she takes the opportunity of involving all group members in the product specification and design by getting them to discuss possible technology with elderly members of their families and to bring these to the weekly group lunch. The group lunch is an opportunity for all team members to meet informally, talk around issues of concern and, generally, get to know each other.

The lunch is organised as an information session where Alice tells the group members what she knows about organisational news, policies, strategies, etc. Each team member then briefly summarises what they have been doing and the group then discusses some general topic such as new product ideas from elderly relatives.

Every few months, Alice organises an 'away day' for the group where the team spend two days on 'technology updating'. Each team members prepares an update on some relevant technology and presents it to the group. This is an off-site meeting in a good hotel and plenty time is scheduled for discussion and social interaction.

Developing cohesiveness

- Cohesiveness is influenced by factors such as the organisational culture and the personalities in the group.
- Cohesiveness can be encouraged through
  - Social events;
  - Developing a group identity and territory;
  - Explicit team-building activities.
- Openness with information is a simple way of ensuring all group members feel part of the group.

Group loyalties

- Group members tend to be loyal to cohesive groups.
- 'Groupthink' is preservation of group irrespective of technical or organizational considerations.
- Management should act positively to avoid groupthink by forcing external involvement with each group.

Group communications

- Good communications are essential for effective group working.
- Information must be exchanged on the status of work, design decisions and changes to previous decisions.
- Good communications also strengthens group cohesion as it promotes understanding.

Group communications

- Group size
  - The larger the group, the harder it is for people to communicate with other group members.
- Group structure
  - Communication is better in informally structured groups than in hierarchically structured groups.
- Group composition
  - Communication is better when there are different personality types in a group and when groups are mixed rather than single sex.
- The physical work environment
  - Good workplace organisation can help encourage communications.

Group organisation

- Small software engineering groups are usually organised informally without a rigid structure.
- For large projects, there may be a hierarchical structure where different groups are responsible for different sub-projects.

Informal groups

- The group acts as a whole and comes to a consensus on decisions affecting the system.
- The group leader serves as the external interface of the group but does not allocate specific work items.
- Rather, work is discussed by the group as a whole and tasks are allocated according to ability and experience.
- This approach is successful for groups where all members are experienced and competent.

Extreme programming groups

- Extreme programming groups are variants of an informal, democratic organisation.
- In extreme programming groups, some ‘management’ decisions are devolved to group members.
- Programmers work in pairs and take a collective responsibility for code that is developed.

Chief programmer teams

- Consist of a kernel of specialists helped by others added to the project as required.
- The motivation behind their development is the wide difference in ability in different programmers.
- Chief programmer teams provide a supporting environment for very able programmers to be responsible for most of the system development.

Problems

- This chief programmer approach, in different forms, has been successful in some settings.
- However, it suffers from a number of problems
  - Talented designers and programmers are hard to find. Without exceptional people in these roles, the approach will fail;
  - Other group members may resent the chief programmer taking the credit for success so may deliberately undermine his/her role;
  - There is a high project risk as the project will fail if both the chief and deputy programmer are unavailable.
  - The organisational structures and grades in a company may be unable to accommodate this type of group.

Working environments

- The physical workplace provision has an important effect on individual productivity and satisfaction
  - Comfort;
  - Privacy;
  - Facilities.
- Health and safety considerations must be taken into account
  - Lighting;
  - Heating;
  - Furniture.

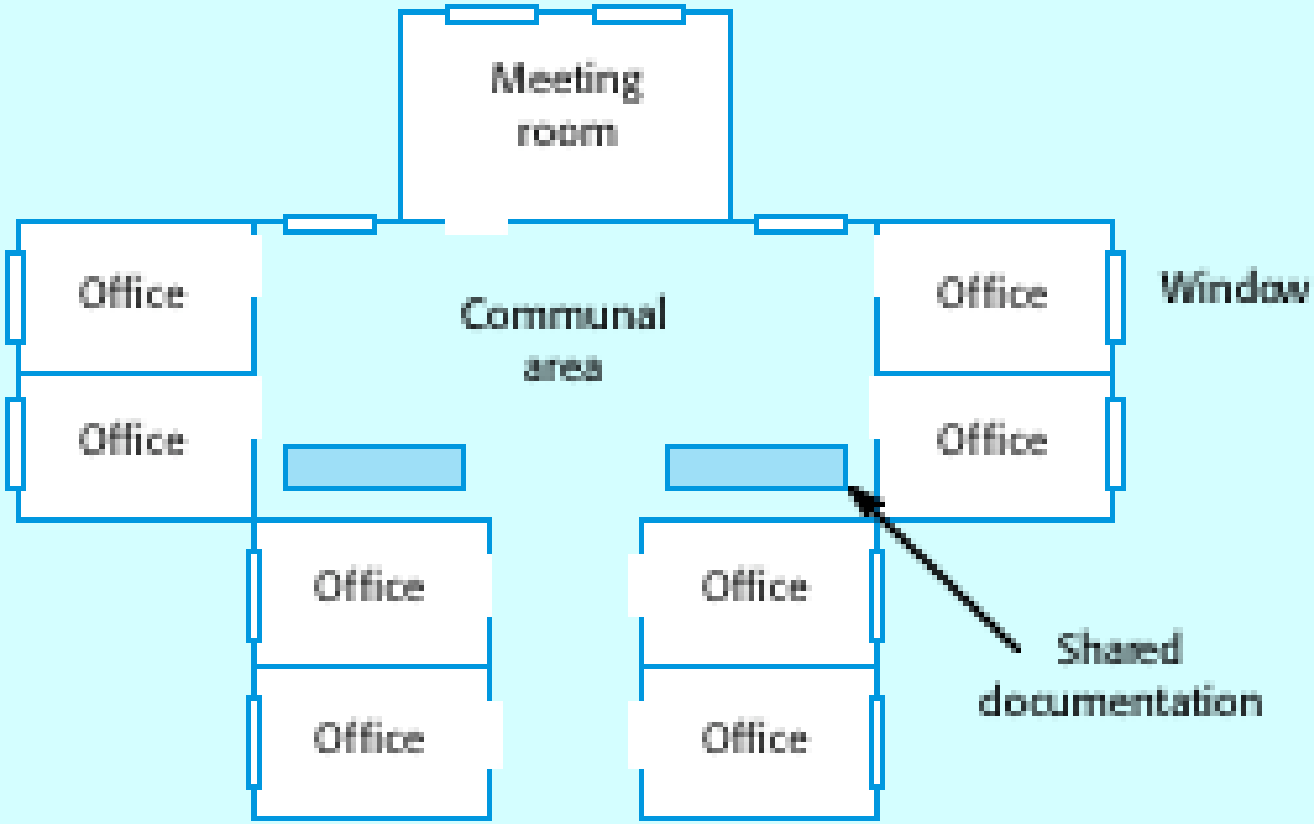
Environmental factors

- Privacy - each engineer requires an area for uninterrupted work.
- Outside awareness - people prefer to work in natural light.
- Personalization - individuals adopt different working practices and like to organize their environment in different ways.

Workspace organisation

- Workspaces should provide private spaces where people can work without interruption
  - Providing individual offices for staff has been shown to increase productivity.
- However, teams working together also require spaces where formal and informal meetings can be held.

Office layout



The People Capability Maturity Model

- Intended as a framework for managing the development of people involved in software development.

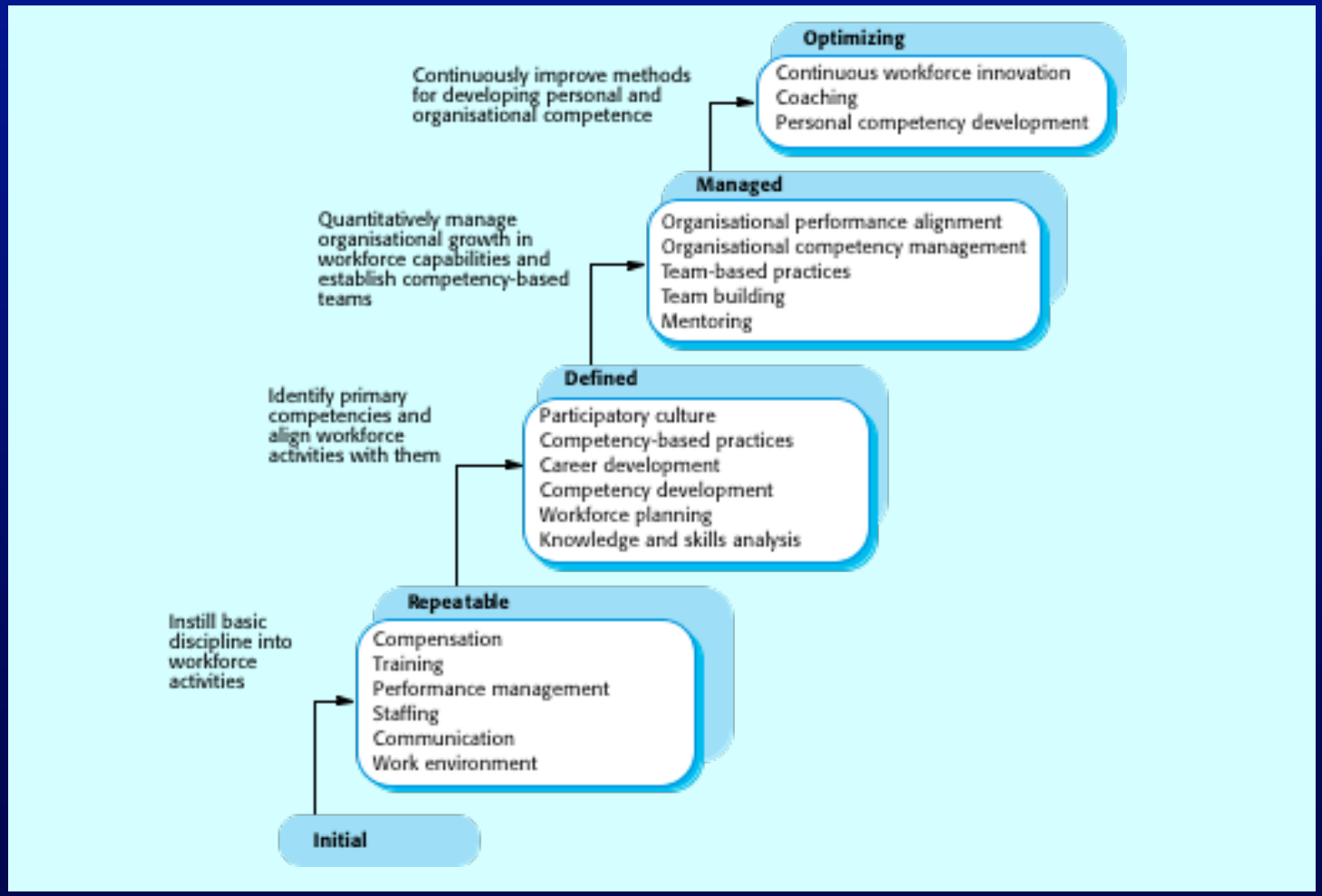
P-CMM Objectives

- To improve organisational capability by improving workforce capability.
- To ensure that software development capability is not reliant on a small number of individuals.
- To align the motivation of individuals with that of the organisation.
- To help retain people with critical knowledge and skills.

P-CMM levels

- Five stage model
  - Initial. Ad-hoc people management
  - Repeatable. Policies developed for capability improvement
  - Defined. Standardised people management across the organisation
  - Managed. Quantitative goals for people management in place
  - Optimizing. Continuous focus on improving individual competence and workforce motivation

The people capability model



Key points

- Staff selection factors include education, domain experience, adaptability and personality.
- People are motivated by interaction, recognition and personal development.
- Software development groups should be small and cohesive. Leaders should be competent and should have administrative and technical support.

Key points

- Group communications are affected by status, group size, group organisation and the gender and personality composition of the group
- Working environments should include spaces for interaction and spaces for private working.
- The People Capability Maturity Model is a framework for improving the capabilities of staff in an organisation.