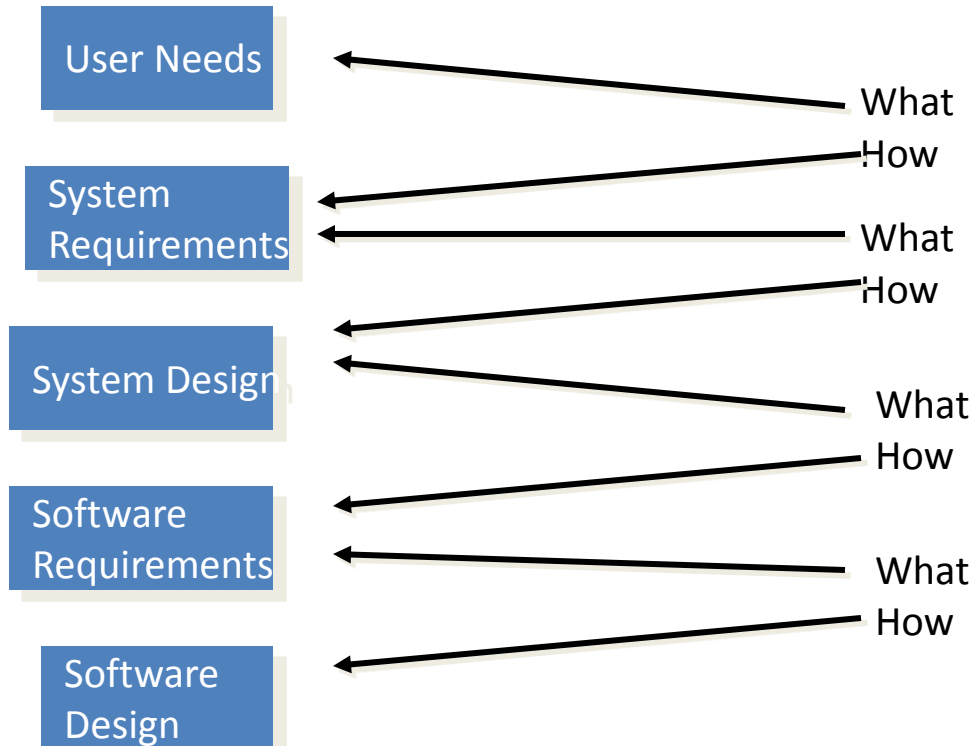


Project as a system, information
& control in organization

Project as a System

- What are Systems?
 - Systems are collections of interrelated parts working together to accomplish one or more objectives
- Dimensions of Complexity
 - Individual, Group, Organization, Multiorganization

What vs. How Dilemma³



Requirements vs. Design

Requirements	Design
Describe what will be delivered	Describe how it will be done
Primary goal of analysis: UNDERSTANDING	Primary goal of design: OPTIMIZATION
There is more than one solution	There is only one (final) solution
Customer interested	Customer not interested (Most of the time) except for external

Setting objectives

- Answering the question '*What do we have to do to have a success?*'
- Need for a *project authority*
 - Sets the project scope
 - Allocates/approves costs
- Could be one person - or a group
 - Project Board
 - Project Management Board
 - Steering committee

Objectives

Informally, the objective of a project can be defined by completing the statement:

***The project will be regarded as a success
if.....***

Focus on *what* will be put in place, rather than *how* activities will be carried out

Objectives should be SMART

- S** – specific, that is, well-defined
- M** – measurable, that is, satisfaction of the objective can be objectively judged
- A** – achievable, that is, it is within the power of the individual or group concerned to meet the target
- R** – relevant, the objective must be relevant to the true purpose of the project
- T** – time constrained: there is a defined point in time by which the objective should be achieved

Goals/sub-objectives

These are steps along the way to achieving the objective. Informally, these can be defined by completing the sentence...

**Objective X will be achieved
IF the following goals are all achieved**

- A.....**
- B.....**
- C..... etc**

Information & control in organization

Five ways organizations typically used are :

Simple structure – one or few managers, direct supervision

Typically found in new, relatively small organizations

Machine bureaucracy – mass-production and assembly lines

Coordination requires standardization of work processes

Divisionalized form – each division has autonomy

Split up work and let each group figure out how to do it

Coordination achieved through standardization of work outputs and measuring performance of divisions

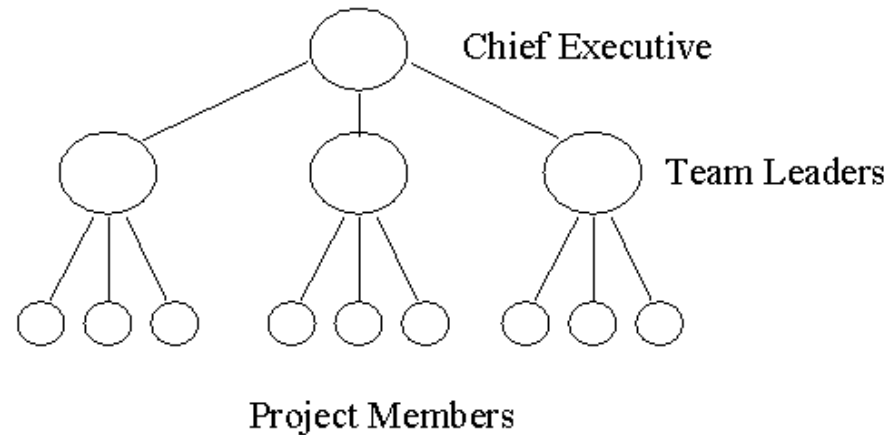
Professional bureaucracy – skilled professionals with autonomy

Coordination achieved through standardization of worker skills

Adhocracy – for innovative or exploratory projects

Coordination achieved through mutual adjustment

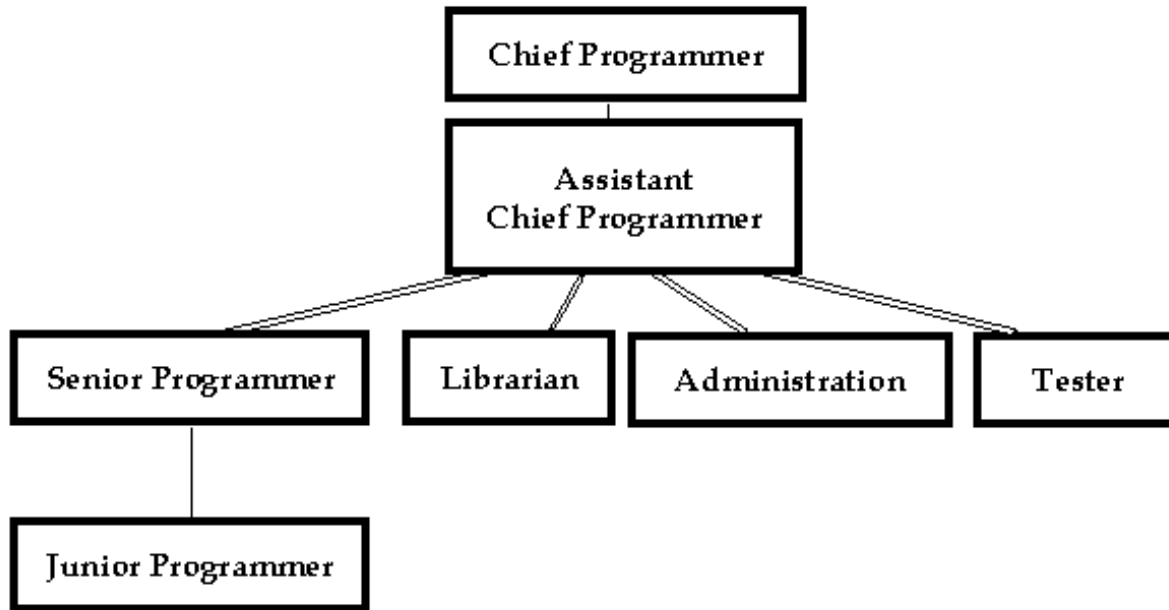
Hierarchical team organization



Large projects often distinguish levels of management:

- Leaf nodes is where most development gets done; rest of tree is management
- Different levels do different kinds of work—a good programmer may not be a good manager
- Status and rewards depend on your level in the organization
- Works well when projects have high degree of certainty, stability and repetition

Chief Programmer Team



- *What do the graphics imply about this team structure?*
- **Chief programmer** makes all important decisions
 - Must be an expert analyst and architect, and a strong leader
- **Assistant Chief Programmer** can stand in for chief, if needed
- **Librarian** takes care of administration and documentation
- Additional developers have specialized roles

Matrix organization

	real-time programming	graphics	databases	QA	testing
project C	X			X	X
project B	X		X	X	X
project A		X	X	X	X

- Organize people in terms of specialties
 - Matrix of projects and specialist groups
 - People from different departments allocated to software development, possibly part-time
- *Pros and cons?*
 - Project structure may not match organizational structure
 - Individuals have multiple bosses
 - Difficult to control a project's progress