



Title: Management of Software Development

Course:

Year: 1994

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Report No: P94033

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Report No.: See Above

Type: Student Project

Note: This project is in the filing cabinet in the ETM department office.

Abstract: The concept of software engineering, the management of software life cycle are summarized. The case study of software development at Komatsu Dresser Co. Illinois is presented. The database software was successfully developed and was standardized at Komatsu. An interview with a software development company "Knowledge Ware Co., Ltd." based on Atlantic city, Georgia. A senior programmer gave his comments about the type of software development model required in the case of the database development at Komatsu.

**Management of Software Development**

**R. Hendra, M. Martmool, S. Patnaik, C.S. Wu**

**EMP-P9433**

*PART I*  
*(Slides)*



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# Management of Software Development

## OSU Team-3

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## Introduction

### Project Discussions:

- Study the concept of software engineering
- Analyze the different existing models of software development and organization structures
- Case study of customized software development at Komatsu Dresses Co.

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# Software Engineering

## Definition

a group of techniques for a systematic approach to the development, operation, maintenance and retirement of software

- Dr. T. G. Lewis

Dept. of CS, OSU

It depends on the size and complexity of the software

- **Programming-in-the-Small**
  - 2K lines of code
  - single programmer activity
  - e.g.: application program
- **Programming-in-the-Large**
  - upto 64K lines of code
  - group of programmers activity
  - e.g.: word processing package
- **Programming-at-the-Limits**
  - more than 64K lines of code
  - high complexity

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# Software Development

1. Sequential Life-Cycle Models
  - Waterfall Model
2. Nonsequential Life-Cycle Models
  - Prototype Model

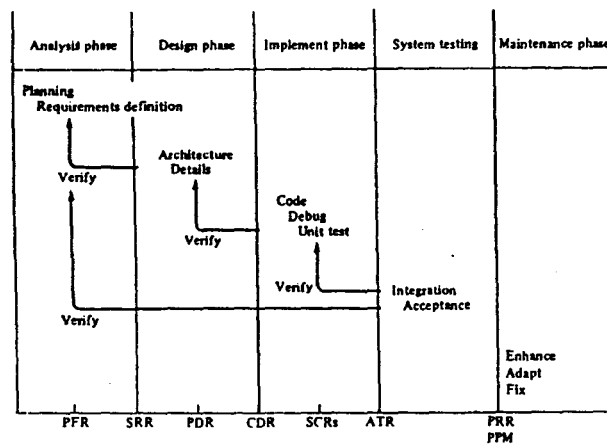
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## Waterfall Model

- The most widely known model
- Consists of a set of discrete activities occurring in a given order
- Phases:
  1. Analysis
  2. Design
  3. Implementation
  4. System Testing
  5. Maintenance

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# Waterfall Model



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# Prototype Model

- Consists of one or more waterfall models
- Evolution through feedback
- Lifecycle phases are compressed, repeated, and often deleted
- Opens the door for immediate feed-back from the user
- Step-wise spiral model

Represents the lifecycle as a series of steps. Each step moves the application closer to its final version



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# Prototype Model

- Step-wise Spiral Model

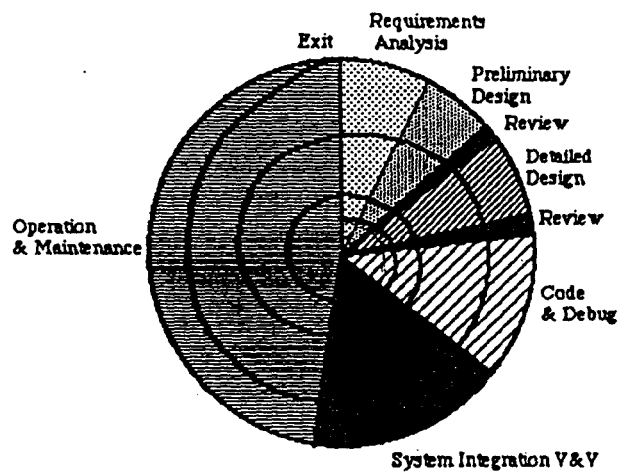


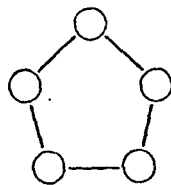
FIGURE 14-1. Spiral model compared to waterfall model

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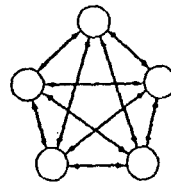
# Organization Structures

1. Democratic Teams

- Decisions made by group consensus
- Group leadership rotates from member to member



(a) Structure



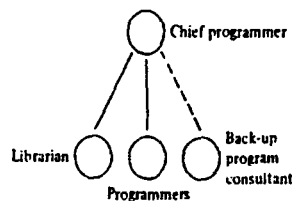
(b) Communication paths

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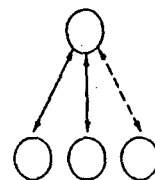
# Organization Structures

## 2. Chief Programmer Teams

- Highly structured
- Chief programmer implements critical parts of the product and makes major technical decisions.



(a) Structure



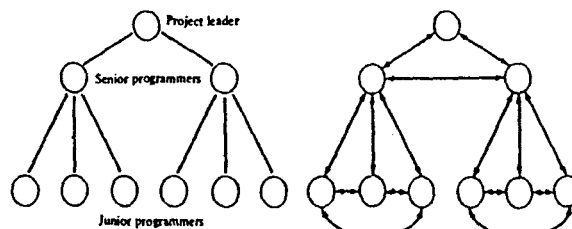
(b) Communication paths

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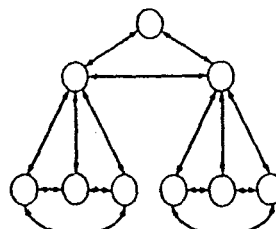
# Organization Structures

## 3. Hierarchical Team Structure

- Middle of the extremes Democratic and Chief Programmer



(a) Structure



(b) Communication paths

## **Introduction:**

The Total Quality Applications Survey System (TQASS) was designed for Komatsu Dresser Company in Peoria, Illinois.

- *Developed by a team of graduate students & faculty.*
- *Customized database in DBase IV for TQM dept. for employee feedback.*

## **The basic requirements of the system:**

- Response survey for total quality initiation.
- Input " *employee response* " survey data through a scanner to generate the database.
- analyze the data and summarize the response.
- generate reports for 140 groups and 20 departments.

TOTAL QUALITY APPLICATIONS SURVEY SUMMARY

Operation: XYZ Dept.

(Change Coming)

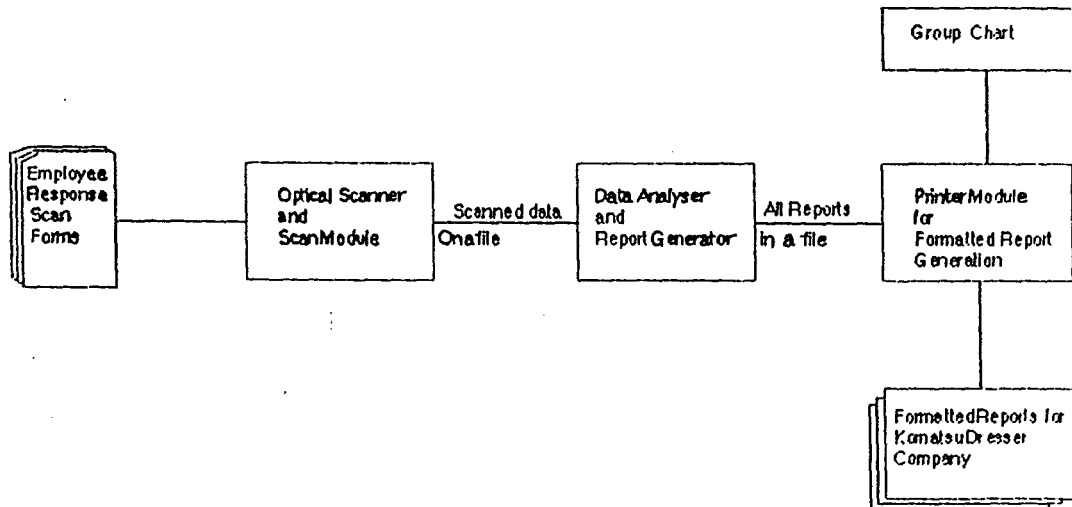
Survey Date:

SURVEY QUESTIONS	PERCENT FAVORABLE					
	Mgmt. Staff	Work Group #1	Work Group #2	Work Group #3	Work Group #4	Total Depart.
	Sample Size	5	8	6	5	6
<b>QUALITY, CUSTOMERS/SUPPLIER RELATIONS</b>						
1. People in my work group understand that an important part of their job is to continuously improve their performance.	100+	100+	92+	111	83	84+
2. In my Division/Plant/Operation, the right amount of emphasis is put on the quality of work we produce.	100	88+	67	88?	67	69
3. In my work group, the right amount of emphasis is put on the quality of work we produce.	89	89+	83+	56	60	73+
4. In my department, more emphasis is placed on quality than output, volume and productivity.	71	55	12	33?	83+	52
5. We, as a work group, know who our external customers are and their expectations of us.	100+	89+	92+	111	83	82+
6. We, as a work group, know who our internal customers are and their expectations of us.	67	67+	75	78+	67	71+
7. I know how the results of our work affects the performance of our internal customers.	89+	78+	75	89+	100+	86+
8. We, as a work group, try hard to satisfy the expectations of our internal customers.	56	78+	67+	78+	100+	76+
9. The work groups who supply our group with material and/or information try hard to satisfy our expectations.	56	22	50	33	33	39

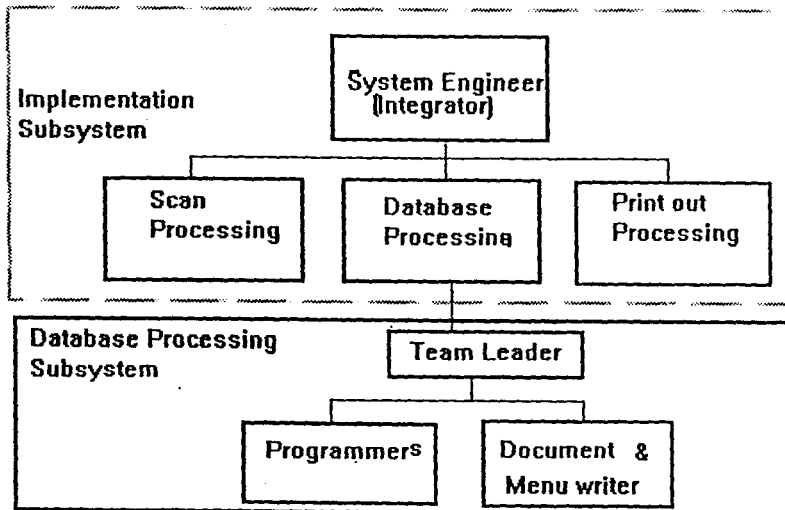
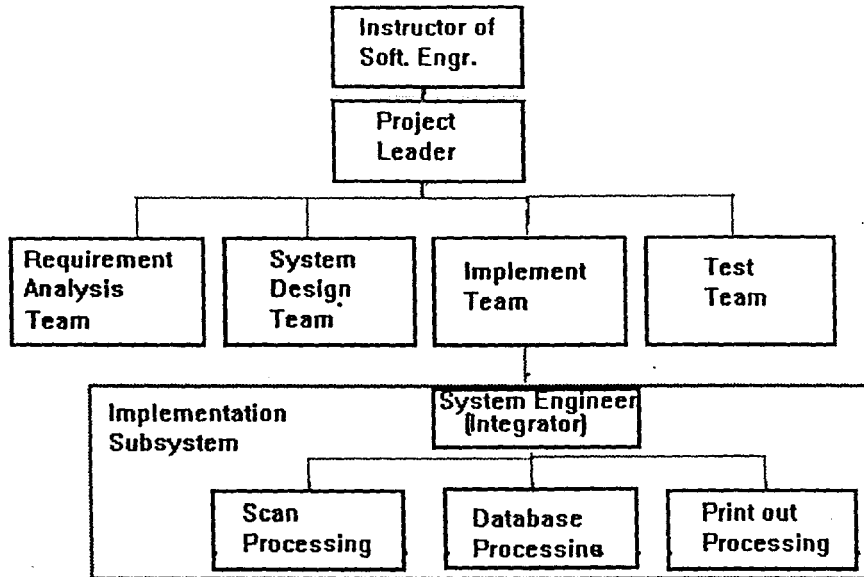
\_\_\_\_\_ 5 Points Above Minimum Average of 80%  
 ..... 15 Points Below Minimum Average of 80%

+ 20% or More Strongly Favorable  
 - 20% or More Strongly Unfavorable  
 ? 20% or More Marked ?

Overview of TQASS



# The TQASS Project Team Organization



### **Fallacies were:**

- **Improper responsibility delegation .**
- **Insufficient requirement's specification caused ambiguity.**
- **Wrong choice of the software increased the cost**
- **The project leader did not have enough power to control team members ( he was their colleague)**

### **Conclusion:**

According to "Knowledge Ware Co." ( software development company )  
the project could have been better if:

- **Detailed requirements specification was provided.**
- **better project organization structure and responsibility delegation.**
- **The leader had more authority**
- **Decision making through consensus**

## Characteristics of the project:

- *Duration was 4 months.*

- *Project Leader was selected by the team and faculty.*

### **-Teams Organization:**

**1. Requirements analysis.**

**2. System Design.**

**Coding.**

**3. Scanning**

**4. Data Processing.**

**5. Output**

**6. Testing.**

- *Similar to a pure P.M. organization structure.*

## ANALYSIS:

### **Project success factors:**

**1. Enthusiasm of the team members and good design abilities.**

**2. The Walkthrough and Inspection meetings.**

**3. Good interaction and communication due to PMIS**

**4. Good Project Legacy.**

