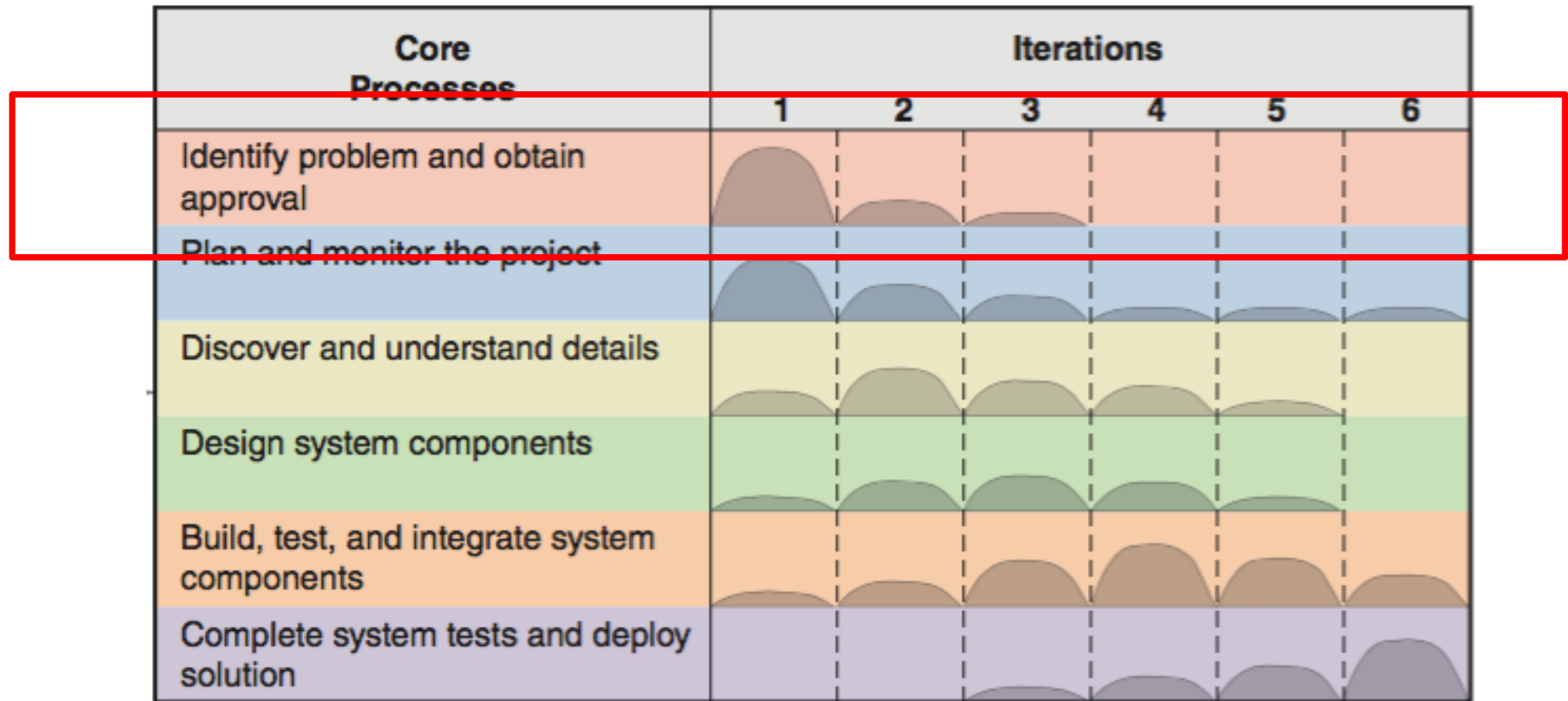# Project Management II

Today's Plan

First steps of a project
- Identifying the problem and Obtaining Approval

Feasibility analysis

Cost-benefit analysis

Core Process 1: Identify the problem and obtain approval

Reasons for an Information System Project

Responding to an opportunity

Resolving a problem

Responding to an external directive

Accurately defining the problem

System Vision Document
- ◦ problem description
- ◦ anticipated business benefits
- ◦ system capabilities

Building a System Vision Document

1. Review the business needs

2. Develop a list of business benefits

3. Identify the new system's ability to support the realization of these benefits

RMO's System Vision Document

Obtaining Approval

Quantify Project Approval Factors
- Estimate time needed for project completion
- Estimate cost for the project and the system
- Identify the anticipated benefits from deployment of the new system

Estimated time for project completion

Where do we get information to (roughly) estimate this?

- scoping document
- amount of effort required
- gross estimates of:
  - team size
  - time frame

Time Estimate for RMO CSMS project

Time Estimate for the New CSMS Project			
Subsystem	**Functional requirements**	**Iterations required**	**Estimated time**
Sales subsystem*	15	5	20 weeks
Order Fulfillment subsystem*	12	5	20 weeks
Customer Account subsystem**	10	4	15 weeks
Marketing subsystem**	6	3	13 weeks
Reporting subsystem**	7	3	12 weeks
Total development time (2 teams)			40 weeks
Final hardening and acceptance testing		2	8 weeks
Total project time			48 weeks

*Assigned to Tiger team
**Assigned to Cougar team

Estimated Cost for Project and System

Need to itemize all costs, which can include:

- salaries
- equipment
- facilities
- utilities
- training
- travel
- licenses
- …

Exercise

For RMO example, what are the sources of cost?

Exercise

For RMO example, what are the sources of cost?
- Costs to develop the system?
- Costs to maintain the system?

Development and Operating costs for RMO System

Summary of Development Costs for CSMS	
Expense category	**Amount**
Salaries/wages (includes benefits costs) (1 PM, 8 analysts, 1 support)	$936,000.00
Equipment/installation	$308,000.00
Training	$78,000.00
Facilities	$57,000.00
Utilities	$97,000.00
Travel/miscellaneous	$87,000.00
Licenses	$18,000.00
Total	**$1,581,000.00**

Development and Operating costs for RMO System

Summary of Estimated Annual Operating Costs for CSMS	
Recurring expense	**Amount**
Connectivity/hosting	$156,000.00
Programming	$75,000.00
Help desk	$90,000.00
Total	**$321,000.00**

Anticipated Benefits from the Deployment of the New System

What are the business benefits?
◦ estimate their value

Common sources of increased revenue, or lowered costs:
◦ new markets with new products, services, locations
◦ increased market share
◦ reduced staffing needs
◦ decreased operating costs
◦ decreased error rates
◦ reduced inventory losses
◦ collecting accounts more quickly

Anticipated benefits of RMO system

What are possible benefits of new system?

Estimated Annual Benefits for RMO System

Estimated Annual Benefits for CSMS	
Benefit or cost saving	**Amount**
Recapture/prevention of lost sales	$200,000.00
Increase sales to existing customers	$300,000.00
Sales to new customers	$350,000.00**
Increased efficiency in order processing	$50,000.00
Reduction of data center and equipment costs because of hosting	$146,000.00
Total	**$1,046,000.00**

**plus 8% annual growth

Cost-benefit Analysis

Tangible costs
- ◦ personnel costs
- ◦ equipment costs
- ◦ supporting materials
- ◦ converting to new system

Intangible costs
- ◦ loss of customer good will
- ◦ staff stress and distress
- ◦ confusion with suppliers with new processes

Cost-benefit Analysis

Tangible benefits:
- Reduced cost
- Increased efficiency

Intangible benefits
- improved work practices
- employee morale
- ease of customer access to account details online
- up to date product information online
- increase loyalty of customers

Cost-benefit Analysis

There are many ways to compute the cost-benefit analysis
- Break even point
- Payback period

Five-year cost/benefit analysis for CSMS

	A	B	C	D	E	F	G	H
1				**RMO Cost/Benefit Analysis for CSMS**				
2		Category	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
3	1	Value of benefits		$1,046,000	$1,074,000	$1,104,240	$1,136,899	$1,172,171
4	2	Development costs	-$1,581,000					
5	3	Annual expenses		-$321,000	-$321,000	-$321,000	-$321,000	-$321,000
6	4	Net benefit/costs	-$1,581,000	$725,000	$753,000	$783,240	$815,899	$851,171
7	5	Discount factor	1.0000	0.9434	0.8900	0.8396	0.7921	0.7473
8	6	Net present value	-$1,581,000	$683,965	$670,170	$657,608	$646,274	$636,080
9	7	Cumulative NPV	-$1,581,000	-$897,035	-$226,865	$430,743	$1,077,017	$1,713,097
10	8	Payback period	2 years +	226865 / (226865+430743) = .35			or 2 years + 128 days (.35*365)	

Determine Project Risk and Feasibility

Identify risks

Eliminate and/or ameliorate risks

Establish plans to prevent risks from interfering with success

Kinds of risk and feasibilities

Organizational

Technological

Resource

Schedule

Organizational Risks and Feasibility

Can depend on company culture

Sources of risk:
- computer phobia
- perceived loss of control by staff or management
- shift in political or organizational power due to new system
- Fear of change
- Fear of loss of employment
- Reversal of long-standing work procedures

Organizational Risks and Feasibility

How do we mitigate (reduce) organizational risks?

Technological Risks and Feasibility

What are technological requirements of the new system?

What expertise is available?

Technological Risks and Feasibility

What are some technological risks of RMO system?

How do we mitigate these technological risks

Resource Risks and Feasibility

Resources:
- team members
- computer resources
- physical resources
- support staff

Resource Risks and Feasibility

What are some sources of resource risks?

How do we avoid/minimize them?

Scheduling Risks and Feasibility

Project scheduling is risky

- ◦ assumptions
- ◦ estimates
- ◦ unknowns
- ◦ management-imposed constraints
- ◦ organizational schedule (start of season/term)

Scheduling Risks and Feasibility

What are some scheduling risks for RMO?

How can we avoid them?

Documenting and Tracking Risk

List all known risks

Identify:
- Nature of risk
- Likelihood of risk
- Impact of risk

Build a Risk Management Framework

Risk Management Framework

Risk	Likelihood	Impact Rating
Magnitude 8 earthquake destroys Vancouver	very low	very high
Miss my bus	medium	low
Run out of coffee at home	very low	very high

Risk Management Framework

	Low	Impact		High
High				
	Miss my bus			
Likelihood			Run out of coffee at home	
Low				Mag. 8 earthquake

Risk Management

How do you track anticipated risks?

How do you deal with them:
- eliminate
- mitigate
- share them
- deal with them

Activities of Core Process 2: Plan and Monitor the Project
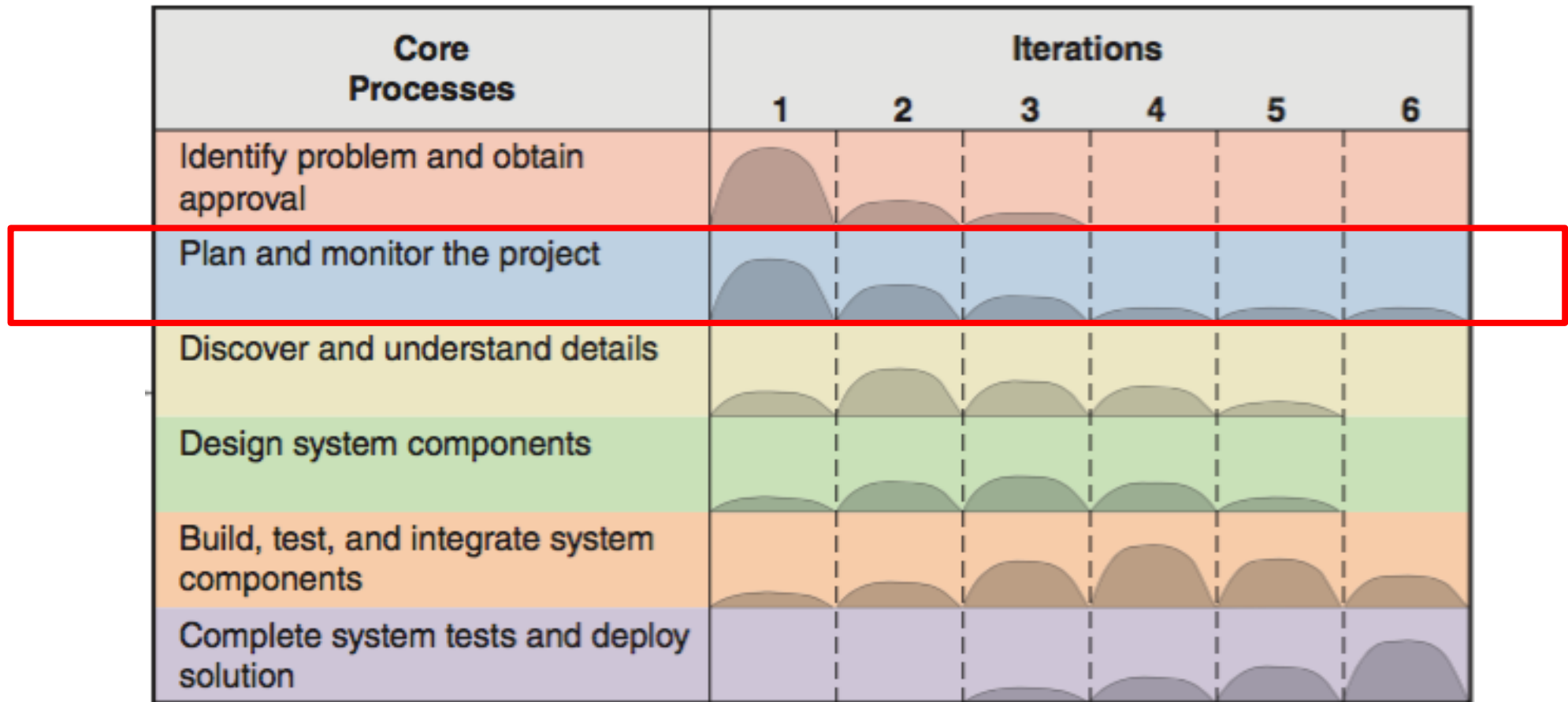
Planning and Monitoring Activities

Establish Project Environment

Schedule the work

Staff and allocate resources

Evaluate work processes

Monitor progress and make corrections

Establish Project Environment

Recording and Communicating
- Internal
- External

Work Environment
- Support
- Facilities
- Tools

Processes and Procedures

Schedule the Work

For predictive projects:
- detailed and complete schedule
- cover the entire project

For adaptive projects:
- project scheduling is done throughout the life of the project
- in the first phase develop a *project iteration schedule*
- for each iteration
  - create a detailed work schedule
  - review each iteration and adjust as needed

CSMS Sales Subsystem Project Iteration schedule

Project Iteration Schedule for the CSMS Sales Subsystem		
Iteration	**Time estimate**	**Use cases assigned to iteration**
1	4 weeks	1. Search for item. 2. View detailed descriptions. 3. View rotating (3-D) images. 4. Compare item characteristics.
2	4 weeks	5. View comments and ratings. 6. Search comments and ratings for friends. 7. View accessory combinations (images). 8. Save item + accessories as "combo."
3	5 weeks	9. Add item (or combo) to shopping cart. 10. Remove item (or combo) from shopping cart. 11. Add item (or combo) to "on reserve" cart. 12. Remove item (or combo) from "on reserve" cart.
4	4 weeks	13. Check out active cart. 14. Create and process store sale. 15. Create and process phone sale.
5	3 weeks	16. Clean up, final test, harden site, tune database, etc.
Total	20 weeks	

Schedule the Work

To develop a Work Schedule:

1. develop a work breakdown schedule (WBS)

2. estimate effort and identify dependencies

3. create a schedule using a Gantt chart

Work Breakdown Structure

Definition: a list or hierarchy of activities and tasks that is used to estimate the work to be done and to create a detailed work schedule.

Gantt Chart

A kind of bar chart that is used for project scheduling

Takes into account:
- estimated time needed for a task
- dependencies

A visual representation of time needed is generated

Identify dependencies

Kinds of dependency:
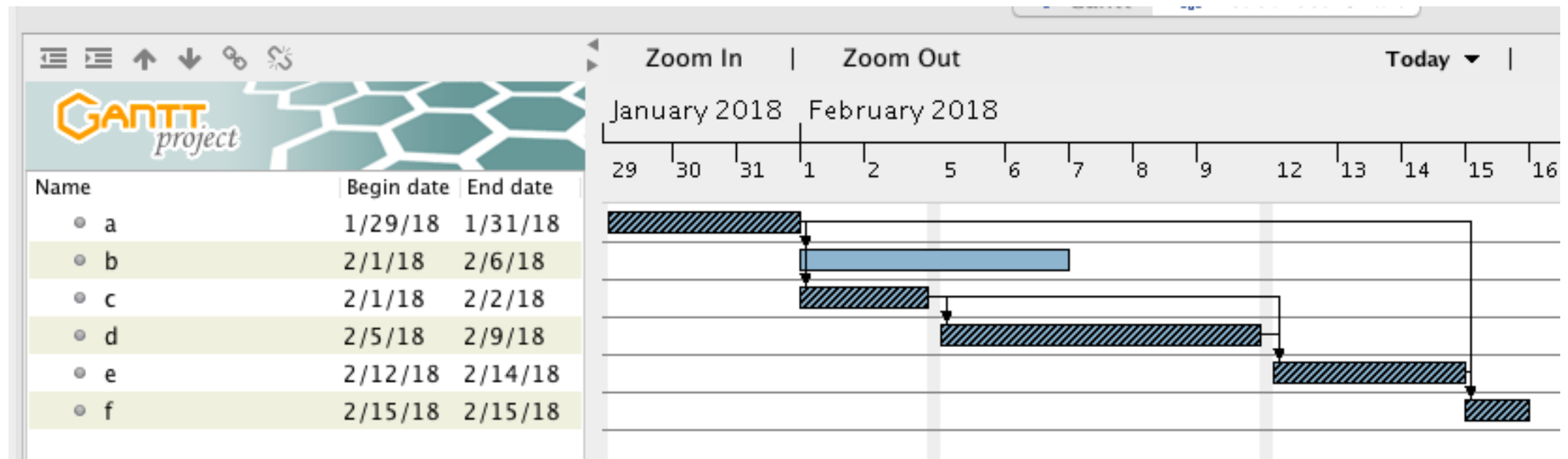- finish-start
- start-start
- finish-finish

For each task:
- identify the dependencies

Build a Gantt chart

Gantt Chart

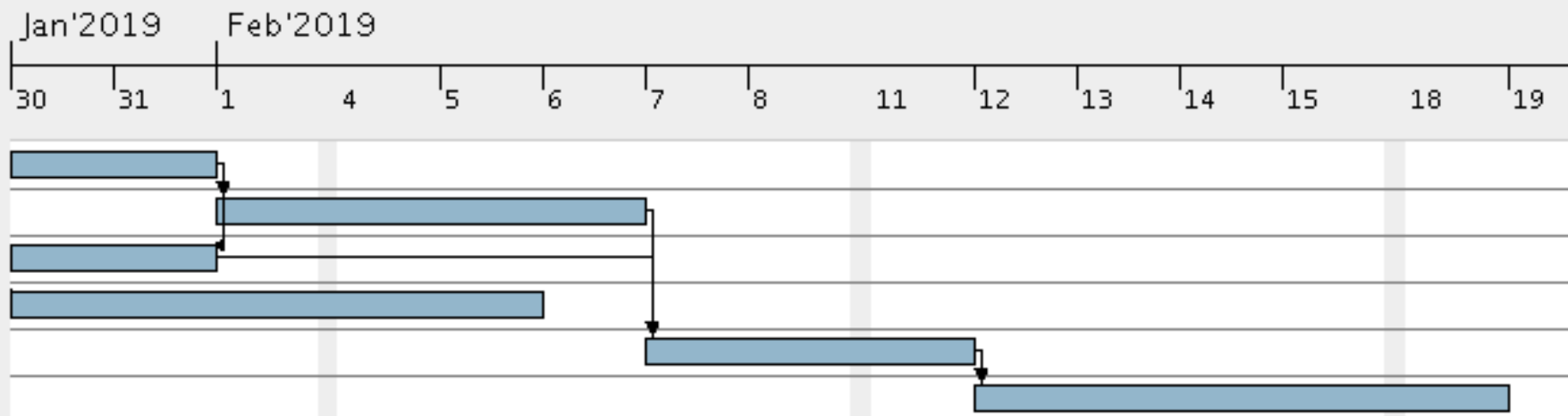| Activity	Predecessor	Time Estimate
a	--	3
b	a	4
c	a	2
d	c	5
e	c,d	3
f	e	5

Gantt Chart

Gantt Chart

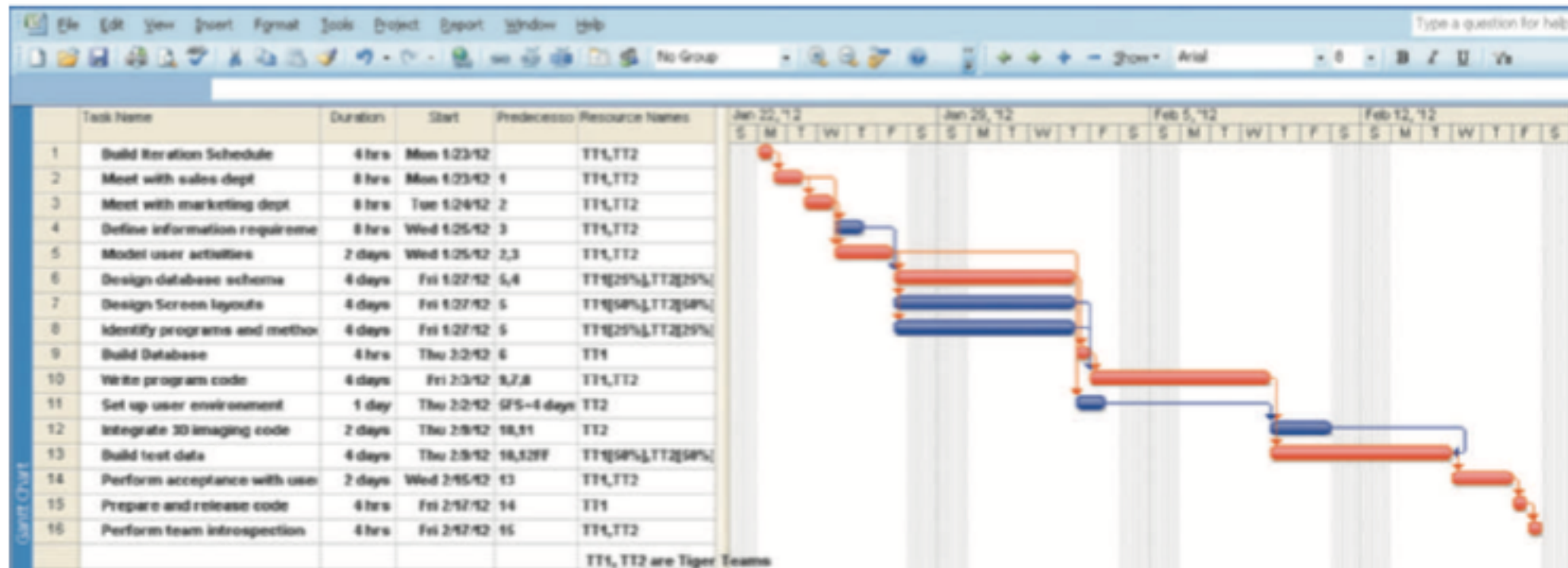| Activity	Time Estimate	Depends on	Type
a	2	--	
b	4	a	Finish-start
c	2	a	Finish-finish
d	5	c	Start-start
e	3	c	Finish-start
f	5	e	Finish-start
e	2	b	Finish-start

Project Plan document

Let's talk about:
- Team Charter
- Metrics
- Project Plan

Create an iteration schedule

Staff and Allocate Resources

Develop a resource plan

Identify and request technical staff

Identify and request user staff
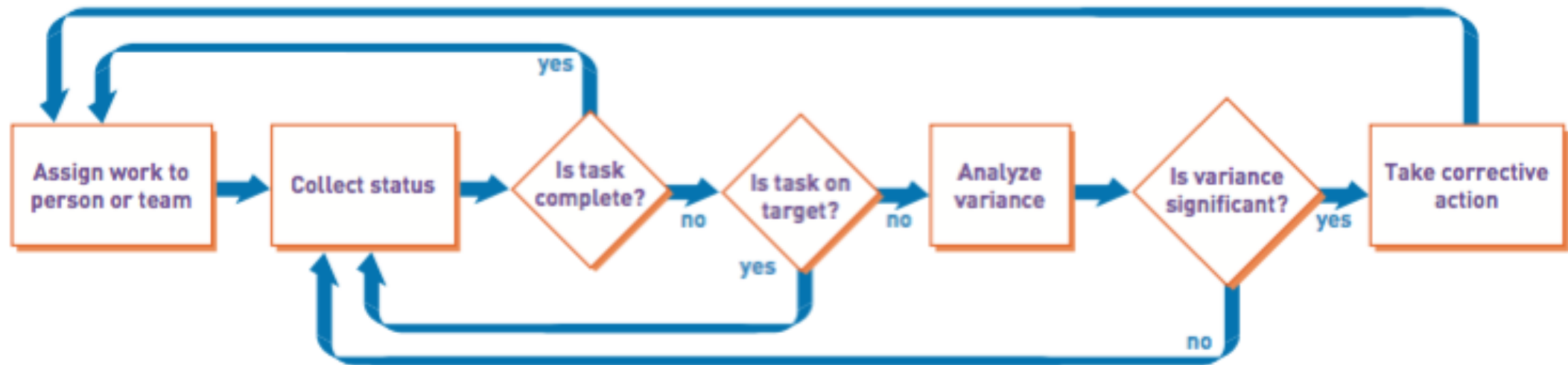
Organize project team into work groups

Conduct preliminary training and team-building exercises

Evaluate Work Processes

Very important process for iterative projects

- retrospective meeting
  - a meeting to determine what was successful, and what can be improved next iteration
  - done for each iteration

Monitor Project Progress and Make Corrections

Practice Activities

Summary

We've seen:

- first two core processes:
  - identify the problem and get approval
  - plan and monitor the project
- tools and techniques we can use to help us plan a project

Readings

Chapter 2: Investigating System Requirements

FURPs:
- https://en.wikipedia.org/wiki/FURPS

Architectural Requirements:
- https://www.ibm.com/developerworks/rational/library/4706.html#N100A7

Intro to gathering requirements:
- http://www.codemag.com/article/0102061

Requirements Gathering:
- http://usabilitygeek.com/requirements-gathering-user-experience-pt1/

Software Requirements:
- https://www.tutorialspoint.com/software_engineering/software_requirements.htm