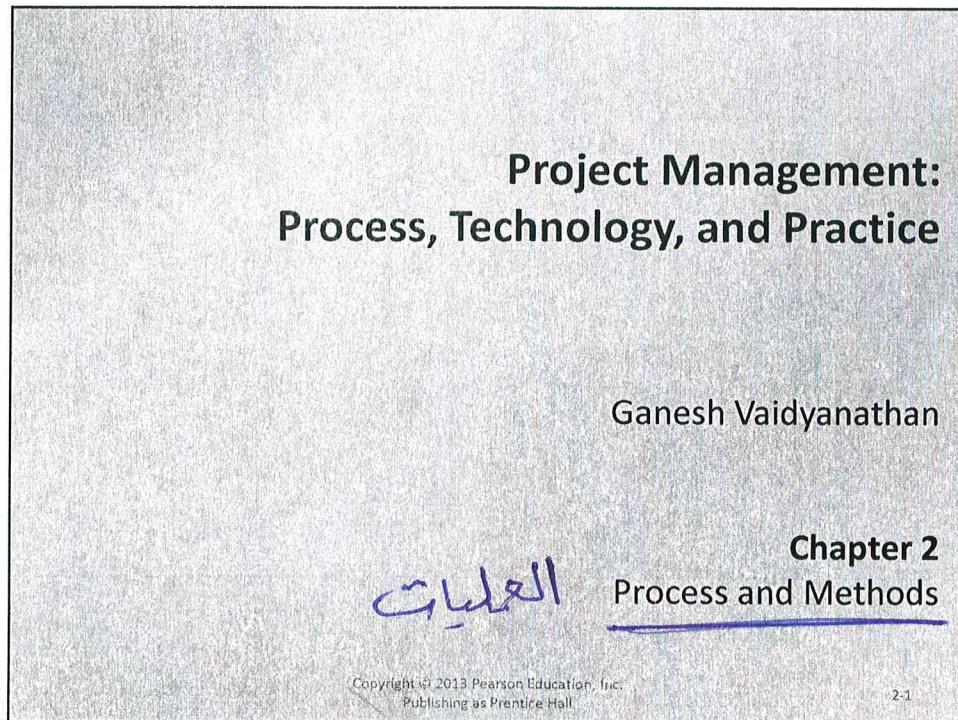


دكتور احمد
ادارة مهارات - ملخصات

2/5/2017

Ch 2



Process and Methods

Learning objectives

- Define project process and how organizations benefit from adopting those processes oriented towards customer satisfaction.
- Understand PMBOK® project management processes and how project activities are mapped to these processes for successful project management.
- Explain what Continuous Improvement Management (CIM) is and how CIM methodology can be used in projects with examples.
- Explain what Six Sigma is and how this process improvement approach is used to find defects and errors of a project with examples.

Ch 2
PMBOK
CIM
Six Sigma

CIM
CMM
CMMI

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-2

Process and Methods

Learning objectives

- Describe the five levels of Capability Maturity Model (CMM) in software projects and understand how organizations can attain the highest software maturity level.
- Describe Software Development Life Cycle (SDLC) and the new paradigms in software projects including extreme programming and agile modeling, their inputs and outputs, and how those software development models can be used effectively in software projects.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-3

Process and Methods

	Initiating	Planning	Executing	Controlling	Closing
Integration Management	Select project; develop project charter; assess process assets; determine resources	General project planning; choose processes and tools; estimate value; determine performance metrics	Execute all activities and manage project progress	Performance measurement; monitoring and control; change control	Project closure; lessons learned added to process assets
Scope Management	Determine objectives	Create scope	Execute with scope in mind	Monitoring and control scope; ensure compliance with scope	
Time Management	Determine initial deliverables	Create work breakdown structure; create schedules, milestones, and critical paths	Manage time	Schedule monitoring and control	
Cost Management	Determine initial estimates	Create initial budget	Manage cost	Cost monitoring and control	Financial closure
Quality Management	Determine quality processes	Determine quality standards	Manage quality	Quality evaluation and control	Final acceptance
Human Resource Management	Define roles and authority	Create organizational structure; form project team	Develop and train resources; manage resources	Resource monitoring and control	Resources to other projects
Communications Management	Identify stakeholders; determine business needs	Kick-off meeting; plan all means of communication	Hold progress meetings and communicate with all stakeholders	Produce performance reports	Value and performance of project; survey satisfaction
Risk Management	Identify initial business risks	Identify all risks; evaluate, and respond	Manage all risks	Risk monitoring and control	
Procurement Management	Determine procurement needs	Determine procurement types	Manage procurements		Audit procurement

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-4

Process and Methods



Process

- Process is a specific ordering of structured work activities that include a beginning, an end, and clearly defined inputs and outputs.
- A business process is a collection of related, structured business activities or tasks in a specific order that produce a specific service or product for a customer.
- A project process is a collection of project related structured activities or tasks. In order for a project to be effective, the activities or tasks have to be structured.
- A structure provides a standardized way of implementing projects leading to project improvement. The project life span is a structured methodology to implement projects and can be considered an overall project process.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-5

Process and Methods

Process and Procedure

- Graduation party process
 - Series of interrelated activities – input to output
 - Make a list of friends
 - Invite them for a party
 - Buy food and beverages
 - Have fun
- Invite friends procedure
 - Buy invitations for the occasion
 - Write friends names correctly
 - Place invitations in envelopes in the right way
 - Address envelopes with return address
 - Attach the correct stamp to each envelope
 - Mail the invitations well in advance

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-6

Process and Methods

Process Improvement

- Is a systematic method to continuously improve how organizations conduct businesses and projects
- When employees of an organization get involved in process management, they work together and make the organization better and more profitable by:
 - satisfying customers
 - producing products with almost no defects
 - eliminating waste, and
 - implementing successful projects.

Project process improvements contribute to the success of projects.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-7

Process and Methods

Process Improvement

- Process improvement has worked well for many organizations in their projects, helping facilitate:
 - better quality,
 - lower cost,
 - faster delivery,
 - better performance, and
 - increased value.
- Continuous Improvement Method (CIM)
- Six Sigma process
- Capability Maturity Model (CMM) process
- Systems Development Life Cycle (SDLC) and other MIS models

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-8

Management Information Systems.

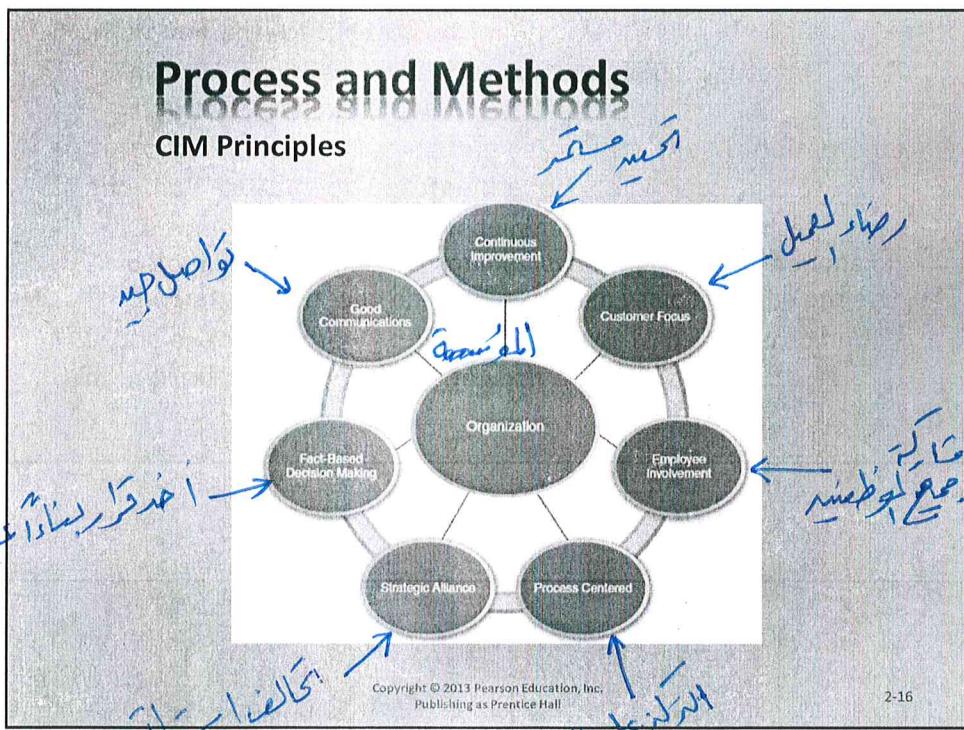
Process and Methods

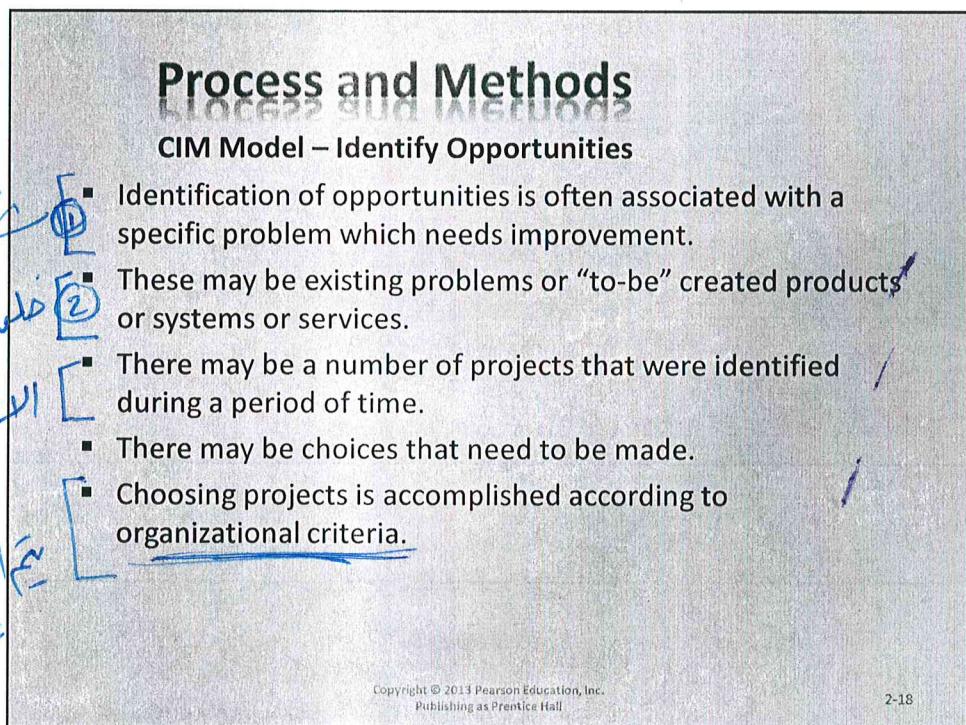
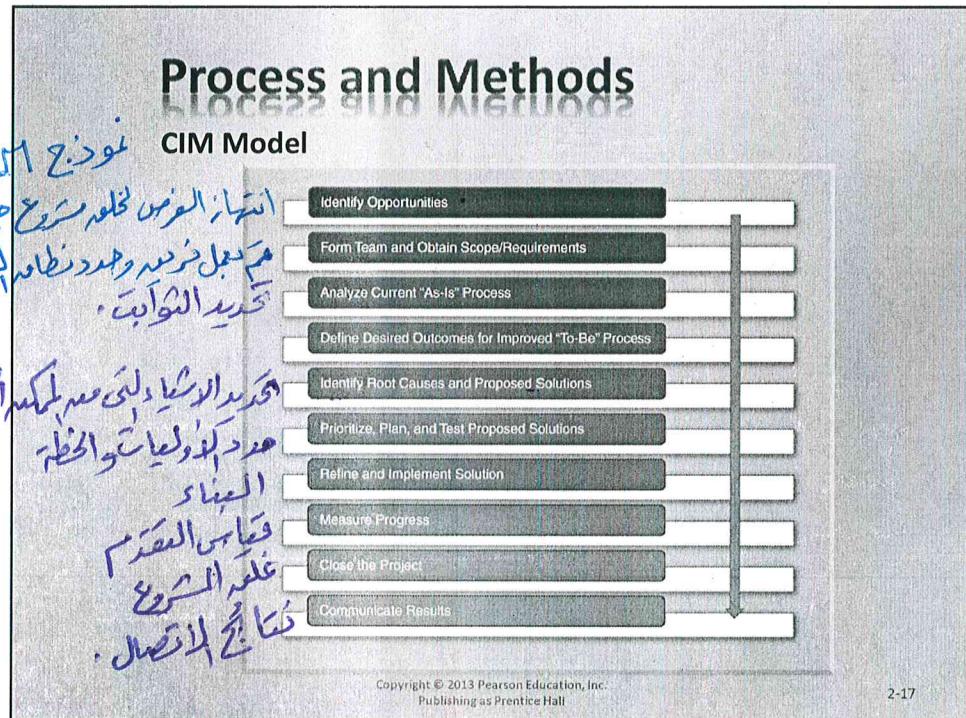
CIM

- Is a methodology—a systematic structured process to implement continuous improvement in quality in projects
- Involves all employees of an organization for continuous improvements of the organization
 - All employees need to be knowledgeable and practice this methodology for its success.
- Customer-centric, meaning that customers, their requirements, and their satisfaction become the focus a project
 - Customers defines project requirements, provides budget, determines schedule, determines level of quality, and are one of the stakeholders who demand maximum value from the project.
- Scope or requirements of a project needs to be adhered and monitored throughout the life span of the project.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-15





Process and Methods

CIM Model – Identify Opportunities

- These criteria may include:
 - Urgency of a project
 - Whether the project may be controlled
 - The difficulty, or complexity of the project
 - Time period of the project
 - The amount of resources required for the project.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-19

Process and Methods

CIM Model – Form Team and Create Scope

- Team formation is critical to the success of a project.
- This process helps to clarify roles and responsibilities and designate initial members of a project.
- Using team resources, requirements from customer need to be analyzed to establish the scope of a project.
- Using the scope of a project, a clear purpose of the project has to be developed.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-20

Process and Methods

CIM Model – Form Team and Create Scope

- This clear, unambiguous project purpose from project scope will be used later to determine:
 - Budget
 - Resources
 - Schedule
 - Performance measures
 - Overall value of a project.
- الميزانية
 الموارد
 جدول المهام
 ماديات لعمليات الـCIM
 القيمة المضافة للمشروع

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-21

Process and Methods

CIM Model – Analyze “as-is” and determine “to-be”

- "As-Is" phase
 - Helps to deduce necessary actions in order to improve the project process
 - Helps to achieve complete understanding of the existing process so that a project team can have the basis to start the "to-be" part of the project that complies with project scope
- تحدد التوابيت
 أقسام خفض تكليل ورام لمشروع
 يجب أن يكون ملحوظ من حيث كثرة يوم
 مرتقب العمل بالتركيز على حلول
 ملحوظ جداً

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-22

Process and Methods

feasibility

CIM Model – Identify root-causes & proposed solutions

- Root cause analysis should include:
 - Technical feasibility, or whether technology exists to implement the proposed system
 - Economic feasibility to establish the cost-effectiveness of the proposed system
 - Legal feasibility that determines legal requirements
 - Operational feasibility, or whether current work practices and procedures are adequate to support the new system
 - Social feasibility to reflect on organizational changes that may affect users of the system, and
 - Project feasibility to determine scope, schedule, budget, performance, and value.

Copyright © 2013 Pearson Education, Inc.
 Publishing as Prentice Hall

2-23

Process and Methods

CIM Model – Implementation, Progress, Closure

- Priorities and planning of a project can be achieved to implement these solutions.
- Progress, performance, and value must be measured, monitored, and controlled at every point of a project.
- Budget and schedule has to be monitored and controlled at every point of a project.
- Project has to be monitored and controlled to adhere to project scope and project requirements at every point of the on-going project.
- Results of projects need to be communicated to all stakeholders on an ongoing basis and should be used for lessons learned from the project.

Copyright © 2013 Pearson Education, Inc.
 Publishing as Prentice Hall

2-24

Ch

Process and Methods

Six Sigma

- Six Sigma is a process improvement approach that is used to find and eliminate errors and defects, reduce cycle times, reduce cost, improve productivity, and meet customer expectations.
- Six Sigma is oriented toward the solution of problems at root cause and prevention of their recurrence. Project management typically is to control potential causes of failure. Since we have recognized that project management is a process, Six Sigma is a potential candidate applicable to project process improvement.
- Six Sigma provides a structured data-driven methodology with tools and techniques that help organizations measure their performance.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-25

Process and Methods

Six Sigma

- Using Six Sigma, organizations can measure the baseline performance of their project, determine the root causes of variations in processes in those projects, and improve their processes to meet and exceed desired performance levels. Six sigma can be used in projects to improve quality performance of projects.
- Six Sigma is a metric-driven methodology.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-26

Process and Methods

Six Sigma

- DMAIC Process
- Define
- Measure
- Analyze
- Design
- Verify

DMAADV Process

- Define
- Measure
- Analyze
- Design
- Verify

Improvement Control

DMAIC is used for projects aimed at improving an existing business process in a project.

DMAADV, another methodology, is used for projects aimed at creating new product or process designs.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-27



Process and Methods

DMAIC

- **Define**
 - This phase is about defining the problem statement of the project.
 - A problem statement is a clear description of project issues that have to be addressed by a project team in order to implement a project effectively and efficiently.
 - This phase is very much like the project initiation phase that we will discuss in detail in later chapters.

في ملخص

بيان المشكلة

بيان المشكلة: هو وصف لبيان المشكلة التي يجب حلها في إطار المهمة أو المهمات التي يراد إنجازها في المدى القريب - كثمرة بذرة

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-28

Process and Methods

DMAIC

Measure

- This phase focuses on the measurement of internal process that impacts factors that are critical to quality.
- All important factors that can be controlled or changed to improve factors that are critical to quality have to be understood clearly.
- For example, in the restaurant delivery system that we discussed before, delivery of subs to the customers may be a function of many factors that are critical to quality.
- Once the relationships are established, data and observations can be collected.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-29

Process and Methods

DMAIC

Analyze

- This phase focuses on why and how defects and errors occur.
- Processes are analyzed to determine the root causes of poor performance and whether the process can be improved or should be redesigned.
- The collected data and observations are used to verify relationships between variables.
- This root cause analysis gives a stable and reasonable approach to find which factors critical to quality need to be improved.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-30

Process and Methods

DMAIC

- **Improve**

- This phase is devoted to idea generation for improvement of factors that are critical to quality.
- Improving processes based on measurements and analysis can ensure that defects are lowered and processes are streamlined.
- Project management techniques are used to plan and implement these ideas.
- We will discuss project management techniques for planning and implementation in later chapters.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-31

Process and Methods

DMAIC

- **Control**

- Control ensures that variances that display in the project process are corrected.
- Controls can be in the form of pilot-runs to determine if the processes are within specifications and then transitioned into project implementation.
- Continued measurement and analysis must ensue to keep processes on track and free of defects to ensure the targeted sigma level.
- The difference in this type of control to project management control is that in this method Statistical Process Control (SPC) technique is employed to monitor the performance of key measures.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-32

Process and Methods

Software Process

*الخطوات المقرنة بالبرمجيات
مثل التخطيط - كتابة الأكواد -
الاختبار - كتابة دليل للفحص*

*مظاهر النمو في المرحلة بحسب
رقم واتجاه البرمجيات المتقدمة*

Part II Software

- **Software Process**
 - A set of activities, methods, practices, and transformations that people use to develop and maintain software and its associated products that include project plans, design documents, code, test cases, and user manuals
- **Software Process Maturity**
 - A potential for growth in capability and indicates both the richness of an organization's software process and the consistency with which it is applied in projects throughout the organization

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-33

Process and Methods

CMM and CMMI

*هو مخرج لبناء البرمجيات
لتحقيق المعايير (زيادة)
نوع العطلات.*

*هو معلم للمعلمات
لتحقيق المعايير والجودة
نوع العطلات.*

*هو مدخل للأدوات
لتحقيق المعايير لتنمية
النفاذ.*

① CMM - Capability Maturity Model

- A model for software implementation used by many organizations to identify best practices that are useful in increasing the maturity of their processes

▪ CMMI - Capability Maturity Model Integration

- Successor of CMM

▪ CMM and CMMI bring in an overall organized strategy to improve software process and efforts.

▪ They show an evolutionary path to achieve project results from process improvement efforts.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-34

Process and Methods

CMM and CMMI

- They provide a roadmap for continuous process improvement .
- They act as guides to the advancement and identify deficiencies in an organization.
- They are not intended to provide a quick fix for projects in trouble.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-35

Process and Methods

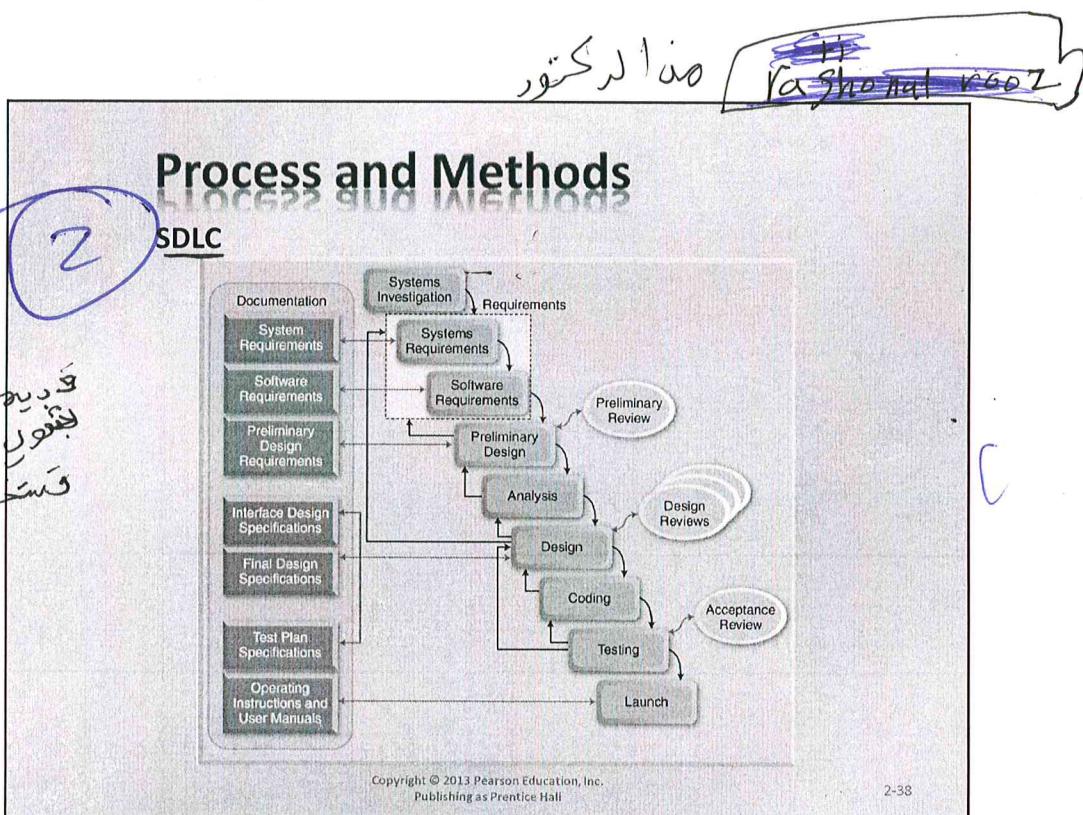
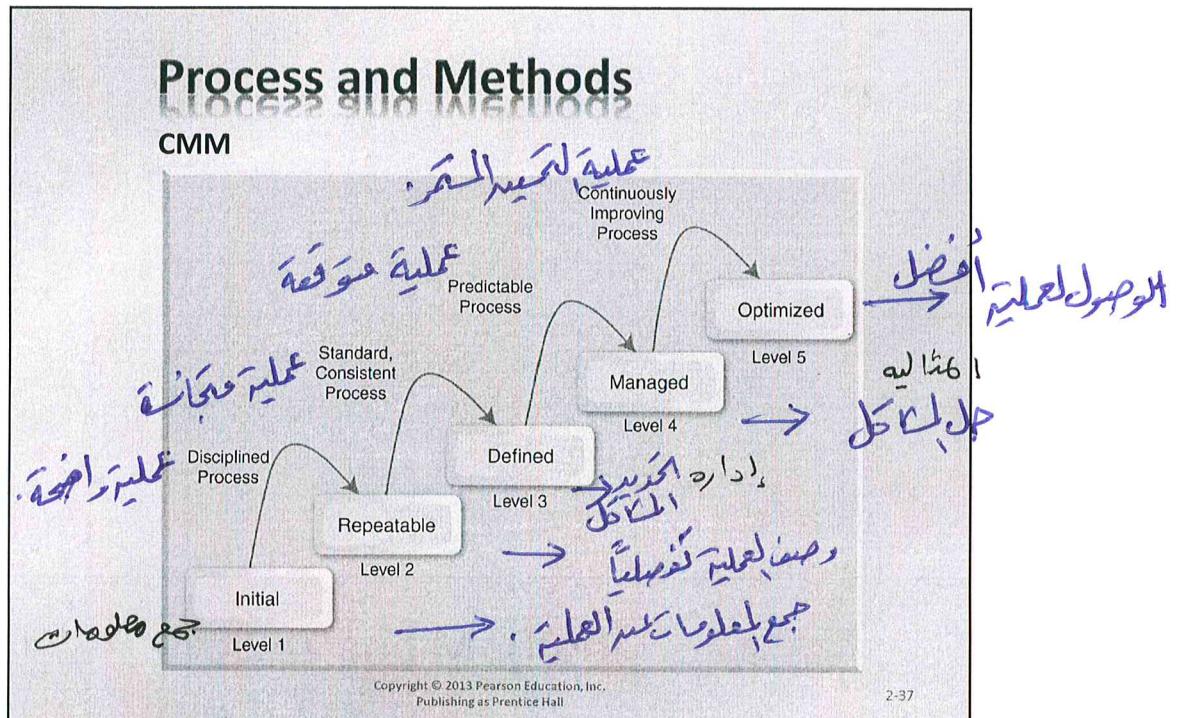
The Benefits of CMM and CMMI

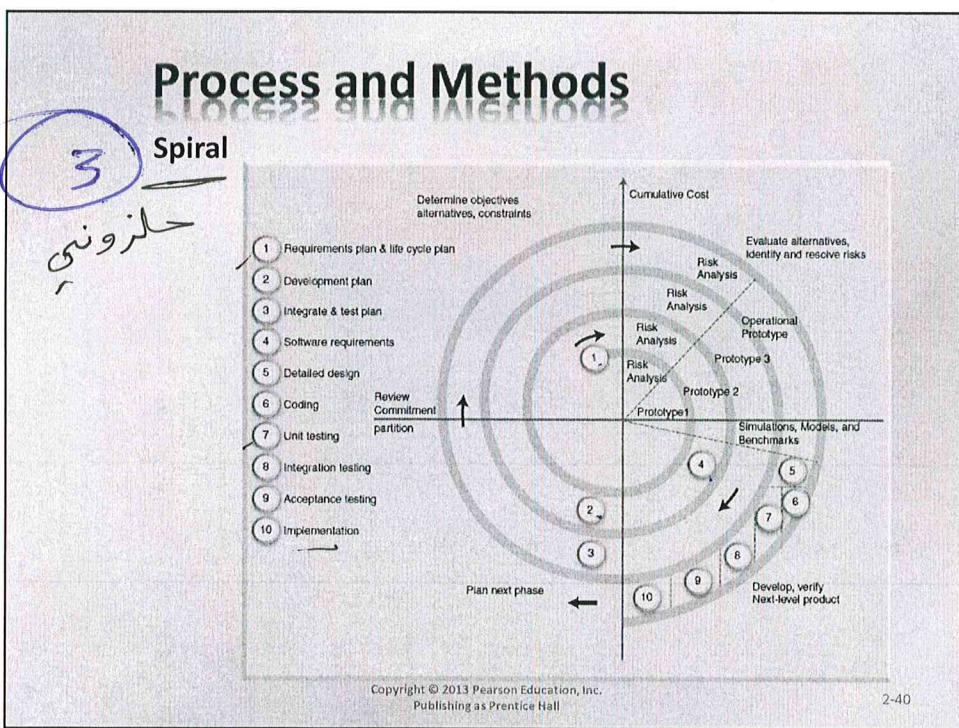
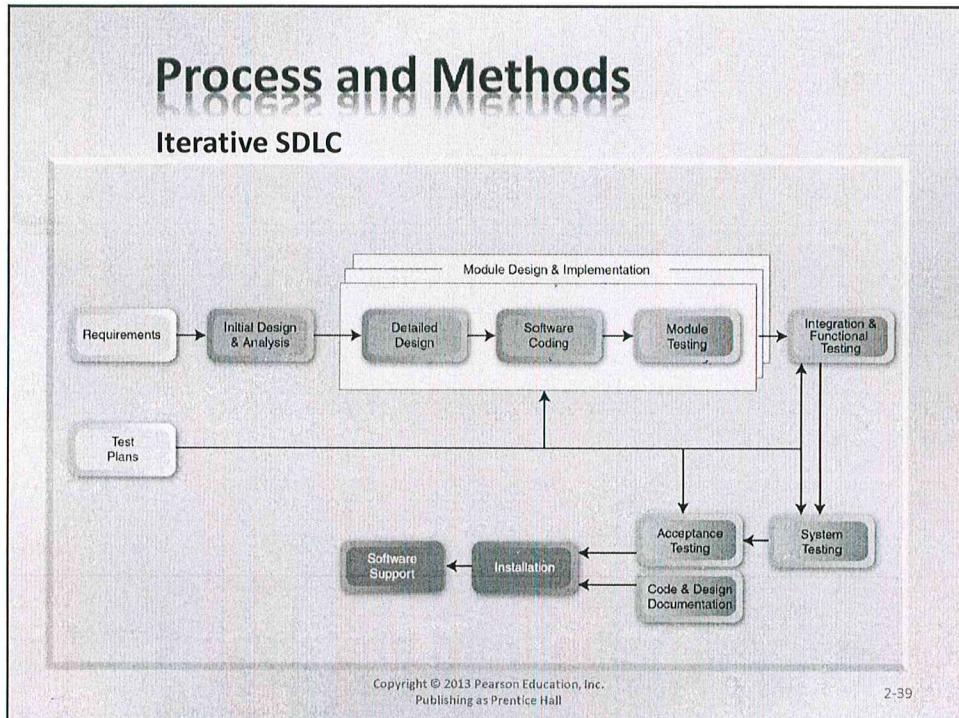
- Provide guidance on how to gain control of their processes to develop and maintain software
- Allow organizations to strategize how to evolve toward a culture of software engineering and management excellence
- Guide software organizations in selecting process improvement strategies by determining current process maturity and identifying the few issues most critical to software quality and process improvement
- Allow organizations to focus on a limited set of activities and work aggressively to achieve them so that organization-wide software processes are enabled to be continuous and lasting gains in software process capability

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-36

- ١- جمع المعلومات عن عمليات التوصيل
- ٢- دراسة عملية التوصيل بالخطوات.
- ٣- تجربة النماذج في عملية التوصيل.
- ٤- حل النماذج أو تطوير حلول لتقديرها.
- ٥- تطوير وتحسين عملية التوصيل.
- هذا عملية التوصيل الفارغ**





العوامل المؤثرة

4

Process and Methods

Unified Process

UP

- The Unified Process (UP) is a software engineering process.
- It is used to develop object-oriented software.
- The Unified Modeling Language (UML) is a core notation incorporated within UP.
- UML is designed to clearly communicate the most essential elements of object-oriented software development projects including requirements, architectures, and design.
- UML is a graphical language for visualizing, specifying, constructing, and documenting object-oriented software.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-41

Process and Methods

Unified Process

- The UML offers a standard way to write the blueprints of an intended system including:
 - business domain specifications
 - system functions
 - programming language statements
 - database schematics, and
 - reusable software components.
- To create specifications, the object-oriented approach and the UML require several interrelated models.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-42

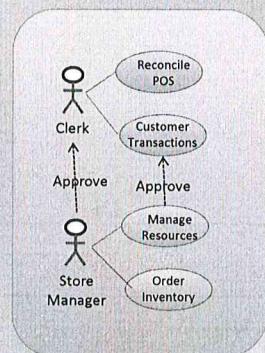
س

م

Process and Methods

Unified Process and Use Case Analysis

- UP is an iterative process and defines four phases including:
 - Inception
 - Acquire Customer requirements and Planning
 - Elaboration
 - Use Case Diagrams
 - Construction
 - Development
 - Time-boxed iterations (e.g. 1 week)
 - Transition
 - Beta testing and Final testing
 - Installation, training, and support



Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-43

Process and Methods

Unified Process

- Agile Unified Process (AUP)
- Basic Unified Process (BUP)
- Enterprise Unified Process (EUP)
- Essential Unified Process (EssUP)
- Open Unified Process (OpenUP)
- Rational Unified Process (RUP)
- Oracle Unified Method (OUM)
- Rational Unified Process-System Engineering (RUP-SE)

Example
of UP
RUP-SE

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-44

Process and Methods

~~Unified Process~~ *Example of UP*

- Rational Unified Process-System Engineering (RUP-SE)
 - Develop software iteratively
 - Manage requirements
 - Use component-based architectures
 - Visually model software
 - Verify software quality
 - Control changes to software

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-45

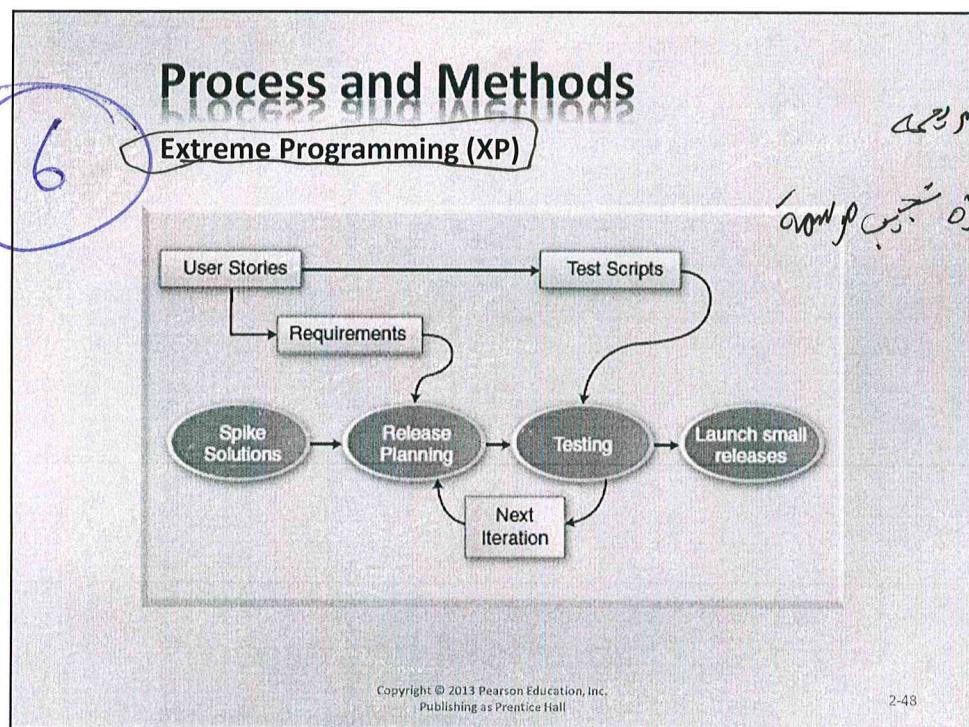
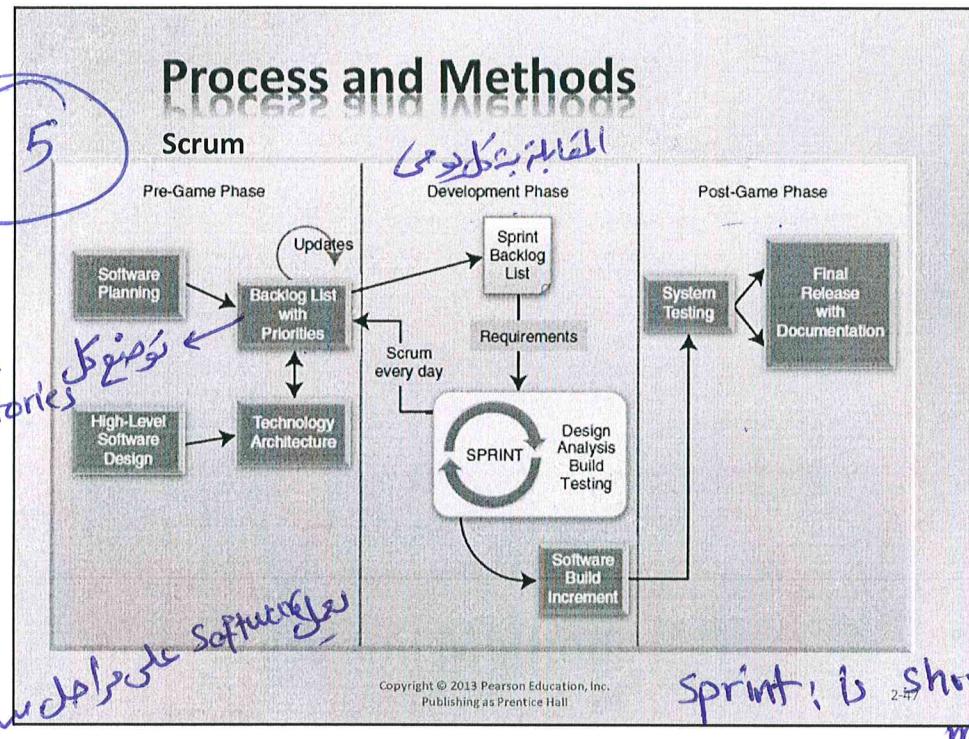
Process and Methods

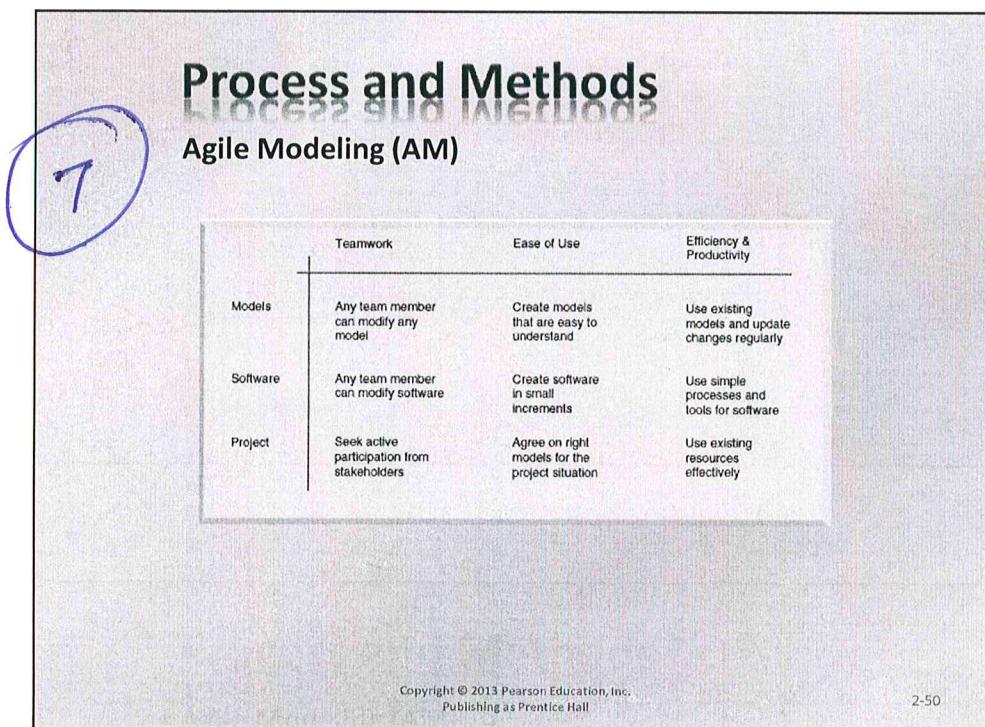
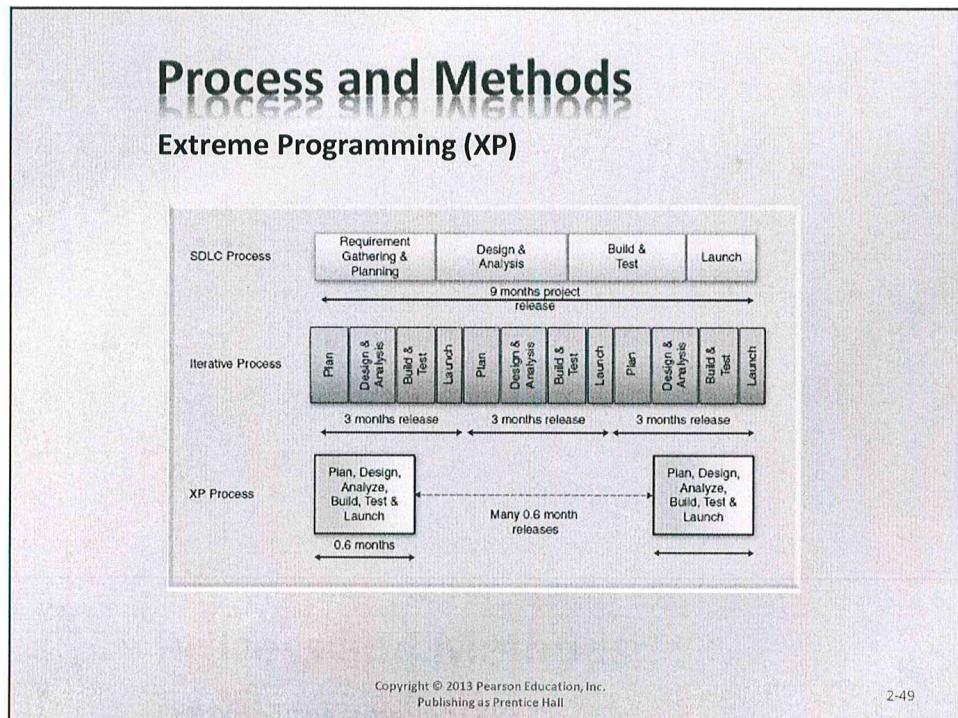
Unified Process

- Horizontal axis represents time, shows the dynamic aspect of the process as it is enacted; expressed in terms of cycles, phases, iterations, and milestones
- Vertical axis represents the static aspect of the process, i.e., how it is described in terms of activities, artifacts, workers

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall

2-45







This work is protected by United States copyright laws and is provided solely for the use of instructors in teaching their courses and assessing student learning. Dissemination or sale of any part of this work (including on the World Wide Web) will destroy the integrity of the work and is not permitted. The work and materials from it should never be made available to students except by instructors using the accompanying text in their classes. All recipients of this work are expected to abide by these restrictions and to honor the intended pedagogical purposes and the needs of other instructors who rely on these materials.

Copyright © 2013 Pearson Education, Inc.
Publishing as Prentice Hall.

1-55