

**Bahria University-Karachi Campus**

**Software Project Management**

**Fall-2024**


**Week 01**

**Engr. Majid Kaleem**

مدرس: مهندس ماجد کلیم  
جامعہ بحریہ، واقعہ گاہ کراچی

### WEEK 01 - AGENDA

1. Overview of Software Project Management
2. Software Project Lifecycle
3. Key Challenges in Software Project Management
4. Role of a Project Manager

<div>  <b>BAHRIA UNIVERSITY (KARACHI CAMPUS)</b>  <b>Faculty: Engr. Majid Kaleem</b> </div>									
DAY/TIME	8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	12:30-1:30	1:30-2:30	2:30-3:30	3:30-4:30	4:30-5:30
MONDAY		SPM BSE-7B E-201	SPM BSE-7B E-201				DSA BSE-3C E-204		
TUESDAY			SPM BSE-7A E-222	SPM BSE-7A E-222			DSA BSE-3C E-222	DSA BSE-3C E-222	
WEDNESDAY									
THURSDAY			SPM BSE-7A E-210		SPM BSE-7B E-203				
FRIDAY	DSA-LAB BSE-3C Software Application Lab E-211								

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<u>CLASSROOM POLICIES</u>	
☞	MAKE YOUR HABIT TO BE ALREADY IN THE CLASS <b>BEFORE</b> YOUR INSTRUCTOR ARRIVES.
☞	CELL PHONES MUST BE <b>SWITCHED OFF</b> , OTHERWISE YOU WILL BE EXPELLED FROM THE CLASS AND MARKED ABSENT.
☞	ASSIGNMENTS & QUIZZES WILL <b>NOT BE ANNOUNCED!</b> KEEP CHECKING LMS & WEEKLY AGENDA (SCHEDULE) FOR LECTURES SLIDES, ASSIGNMENTS & QUIZZES.
☞	QUIZZES WILL BE CONDUCTED IN THE <b>LAST SESSION</b> HOUR OF THE WEEK.
☞	THERE WILL BE <b>NO EXTENSIONS OR MAKE-UP</b> ASSIGNMENTS & QUIZZES FOR ANY REASON WHATSOEVER.
☞	ASSIGNMENT CONTENTS WILL BE CHECKED FOR <b>PLAGIARISM</b> , AND A SCORE OF <b>ZERO MARK</b> WILL BE AWARDED TO SIMILAR ASSIGNMENTS, NO MATTER WHO THE ACTUAL AUTHOR IS.
☞	ASK QUESTIONS RELATED TO THE LECTURE <b>AT THE END</b> .







































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## CLASSROOM POLICIES

👉 ATTENDANCE IS TOTALLY **YOUR RESPONSIBILITY**, IN CASE OF SHORT ATTENDANCE, I WILL **NOT WRITE** ANY COMMENTS ON YOUR APPLICATION.

👉 FOLLOW THE SEATING PLAN AS SHOWN BELOW:

RIGHTHAND SIDE FACING WHITEBOARD				LEFTHAND SIDE FACING WHITEBOARD			
							
							
							
							
							

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## COURSE LEARNING OUTCOMES (CLOs)

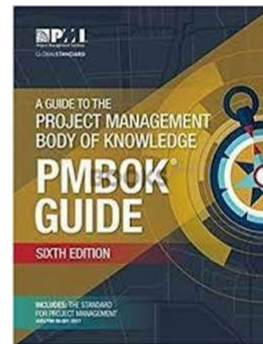
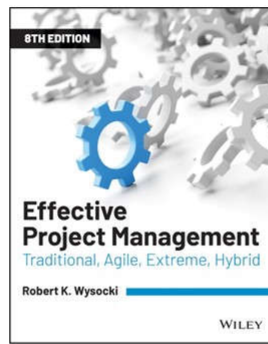
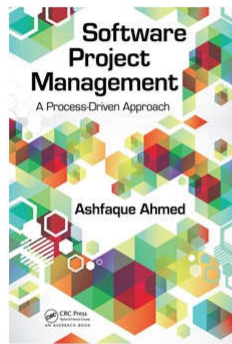
CLO#	COURSE LEARNING OUTCOME (CLO) STATEMENTS	BLOOM'S TAXONOMY	ASSOCIATED PLO
CLO-1	Describe the main concepts of Software Project Management.	C1 (KNOWLEDGE)	PLO-1 (ENG'G KNOWLEDGE)
CLO-2	Compare & explain various SPM techniques involved in the project management life cycle.	C2 (UNDERSTANDING)	PLO-1 (ENG'G KNOWLEDGE)
CLO-3	Apply project management tools and techniques to calculate the size, cost, duration, and efficiency of a project for a given scenario.	C3 (APPLICATION)	PLO-11 (PROJECT MANAGEMENT)
CLO-4	Prepare a comprehensive project management plan to initiate and manage a project.	C5 (SYNTHESIS)	PLO-3 (DESIGN & DEVELOP)
CLO-5	Present clearly and professionally in front of the audience.	A2 (RESPONDING)	PLO-10 (COMMUNICATION)

ASSESSMENT METHOD	COURSE LEARNING OUTCOMES (CLOs)				
	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
ASSIGNMENTS	4 MARKS	4 MARKS	CEP 6 MARKS	PBL 4 + 2 MARKS	
QUIZZES	2 MARKS	2 MARKS	TWO QUIZZES 3+3 MARKS		
MIDTERM EXAM	5 MARKS	5 MARKS	10 MARKS		
FINAL EXAM	20 MARKS	10 MARKS	20 MARKS		
<b>TOTAL (100)</b>	<b>31 Marks</b>	<b>21 Marks</b>	<b>42 Marks</b>	<b>4 Marks</b>	<b>2 Marks</b>

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## RECOMMENDED BOOKS



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## PROFESSIONAL ORGANIZATIONS



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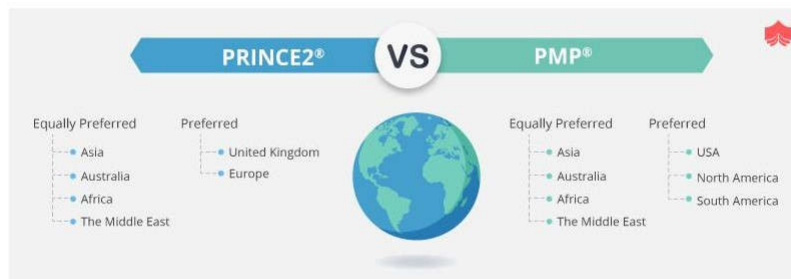
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## PROFESSIONAL ORGANIZATIONS

DIFFERENCE BETWEEN PMP AND PRINCE2	
PMP	PRINCE2
Knowledge-based methodology	Knowledge-based methodology
Based on PMBOK	Official manual is "Managing successful projects with PRINCE2"
Framework is Descriptive and based on knowledge areas like cost, scope, risk factor etc.	Framework is Prescriptive and based on the best current practices in the project environment.
Answers to "How"	Answers questions like "What", "When" & "Who"
Applicable for multiple industries	More focussed to IT Industry

## PROFESSIONAL ORGANIZATIONS



## PROFESSIONAL ORGANIZATIONS

REGION-WISE PREFERENCES OF THE PROJECT MANAGEMENT CERTIFICATION

REGION/ COUNTRY	1ST PREFERENCE	2ND PREFERENCE
 UK	PRINCE2	—
 USA	PMP	PRINCE2
 Asia	PRINCE2/ PMP	PRINCE2/PMP
 Africa	PRINCE2/PMP	PRINCE2/PMP
 Americas	PMP	PRINCE2
 Australasia	PRINCE2	PMP
 Europe	PRINCE2	—
 Middle East	PRINCE2/PMP	PRINCE2/PMP

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## SOFTWARE FOR PRACTICAL WORK



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**IMPORTANT**

***If I'm  
Talking  
You Better  
Be Taking  
Notes.***



## WHAT IS A PROJECT?

- The Project Management Institute (PMI) defines a project as follows:
- “A project is a *temporary endeavor* undertaken to create a *unique product, service, or result*.”
  - **Temporary:** Projects have a specific start and end date. They are not ongoing operations but have a defined timeline.
  - **Endeavor:** Projects involve work, effort, and resources aimed at achieving a specific goal.
  - **Unique:** Projects are distinct and different from routine, repetitive activities. They typically have a one-of-a-kind nature, producing something that hasn't been done before or creating a unique output.
  - **Product, Service, or Result:** Projects can result in the creation of a tangible product, the delivery of a service, or the achievement of a specific outcome or result.

## WHAT IS A PROJECT?

## EXAMPLE

- **Project:** Developing a Custom Inventory Management Mobile App
  - **Temporary:** The project has a defined timeline, starting on January 1st and ending on June 30th, with the goal of delivering the app within this timeframe.
  - **Endeavor:** This project involves a significant endeavor that includes tasks such as gathering client requirements, designing the user interface, coding the app's functionality, conducting rigorous testing, and implementing any necessary changes based on user feedback.

## WHAT IS A PROJECT?

## EXAMPLE

- **Unique:** The mobile app is unique because it is tailored to the client's specific needs. It incorporates their inventory tracking methods, integrates with their existing systems, and provides features customized to their industry.
- **Product:** The tangible product of this project is the mobile application itself. It is a downloadable app available on app stores, allowing users to manage inventory, check product availability, and generate sales reports.



## WHAT IS A PROJECT?

## EXAMPLE

- **Service:** While the primary output is the app, the project also includes the service aspect of providing ongoing technical support and updates to ensure the app continues to function effectively.
- **Result:** The project's goal is to achieve specific results, such as streamlining the client's inventory management process, reducing errors, and improving efficiency. The result is measured by a 20% reduction in inventory-related errors and a 15% increase in overall operational efficiency, as outlined in the project's success criteria.

## WHAT IS SOFTWARE PROJECT MANAGEMENT?

- Software project management is a specialized field within project management that focuses on planning, executing, monitoring, and controlling projects related to software development.
- It involves the application of project management principles and practices to ensure that software projects are completed successfully, on time, within budget, and with the desired quality.

## SOFTWARE PROJECT LIFE CYCLE (SPLC)

- The Software Project Life Cycle is an organized *method* for creating, developing, and testing high-caliber software projects.
- A methodology known as the “**Software Project Life Cycle**” lays out the complete process of developing a software project, *step-by-step*.
- In software development models, this model describes the strategy for every step so that each stage of the software development model may carry out its duty effectively and provide software that satisfies user needs at a reasonable cost and in a certain amount of time.

## SOFTWARE DEVELOPMENT MODELS & SPLC

- The Software Development Models (like Waterfall, V-Model, Agile, etc.) describe *how* the Software Project Life Cycle (SPLC) is *structured and managed*.
- Each model outlines the way the *stages* of the SPLC (such as requirement gathering, design, development, testing, and maintenance) are *executed*, with different methodologies emphasizing various aspects of the cycle.

## FAMOUS SOFTWARE DEVELOPMENT MODELS

1. Waterfall Model
2. V-Model
3. Incremental Model
4. RAD Model
5. Iterative Model
6. Spiral Model
7. Prototype model
8. Agile Model

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## FAMOUS SOFTWARE DEVELOPMENT MODELS

1. **Waterfall Model:** A linear and sequential software development approach where each phase must be completed before moving to the next.
2. **V-Model:** An extension of the Waterfall model that integrates corresponding testing phases alongside each development phase.
3. **Incremental Model:** A development process that divides the project into smaller increments, each delivering a working feature or functionality.
4. **RAD Model:** A rapid prototyping approach that emphasizes quick iterations and user feedback to build functional software with minimal upfront planning.

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## FAMOUS SOFTWARE DEVELOPMENT MODELS

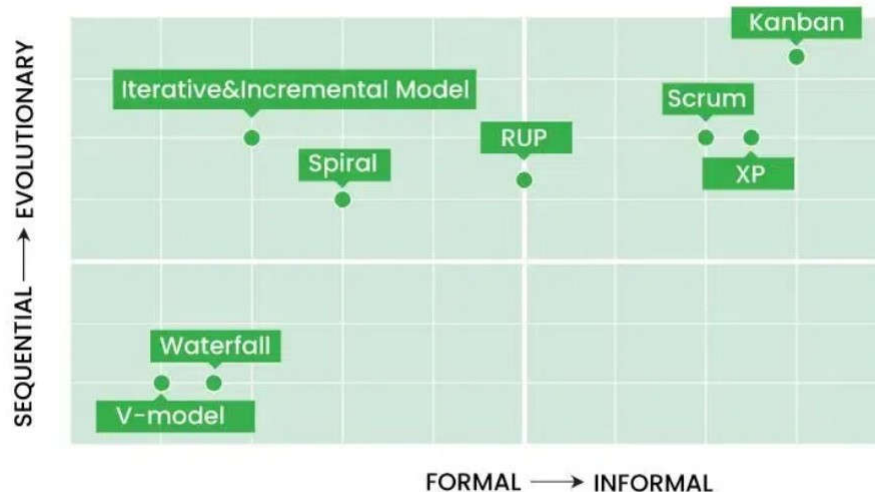
5. **Iterative Model:** A development approach where the software is built and refined through repeated cycles of development, enhancing functionality in each iteration.
6. **Spiral Model:** A risk-driven iterative development model that combines elements of both incremental and prototyping models, with a focus on continuous risk assessment.
7. **Prototype Model:** A model that involves building an initial, simplified version of the software (a prototype) to gather user feedback before full-scale development.
8. **Agile Model:** A flexible, iterative approach to software development that focuses on continuous delivery, collaboration, and adaptation to changing requirements.

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## FAMOUS SOFTWARE DEVELOPMENT MODELS



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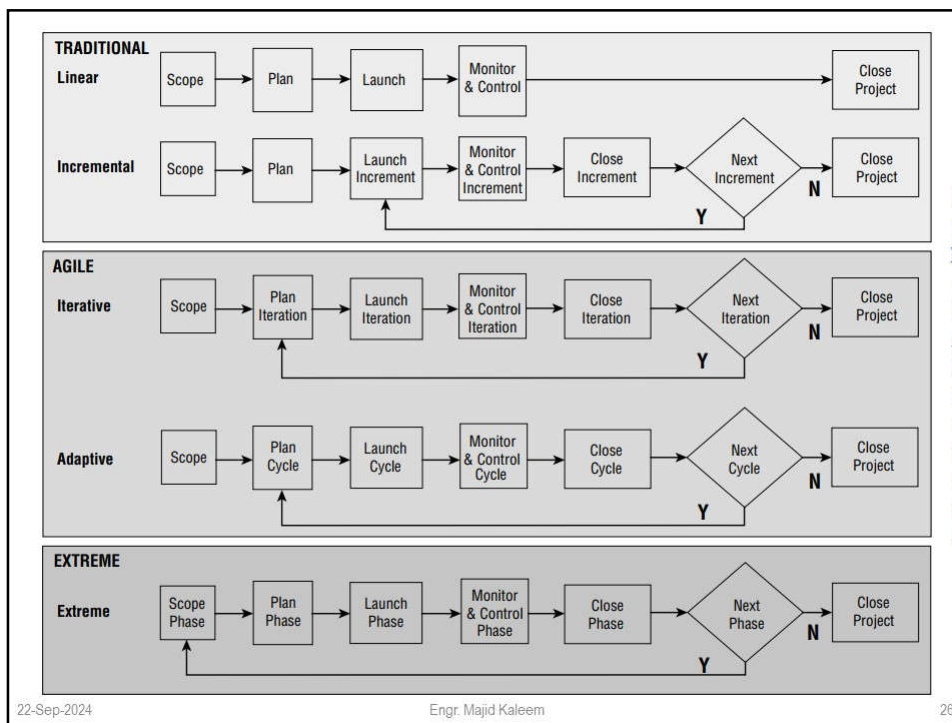
## SDLC vs. SPLC

- Software Development Life Cycle (SDLC):
  - Focuses specifically on the phases involved in *developing* software, such as requirements gathering, design, development, testing, deployment, and maintenance.
  - It deals with the technical processes and methodologies used to build software products.
- Software Project Life Cycle (SPLC):
  - Encompasses a broader scope, including not only the technical aspects of software development (like SDLC) but also the *management* aspects of the project.
  - This includes project initiation, planning, execution, monitoring, and closure, in addition to the SDLC.

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## LINEAR (WATERFALL) PROJECT MANAGEMENT LIFE CYCLE

- **Requirements:** Linear life cycles assume that project requirements are *well-defined* and *stable* from the beginning.
- **Goals:** The goal is to follow a sequential, step-by-step process where each phase (e.g., requirements, design, development, testing, deployment) is completed before moving to the next.
- **Solutions:** Linear life cycles aim to deliver the *entire project* scope as a single, comprehensive solution at the end of the project.

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## INCREMENTAL PROJECT MANAGEMENT LIFE CYCLE

- **Requirements:** Incremental life cycles assume that while some requirements are *stable*, others may *evolve* or change over time.
- **Goals:** The goal is to divide the project into smaller, manageable pieces called “increments” or “phases” and *deliver* them *incrementally*.
- **Solutions:** Each increment represents a *functional subset* of the project scope. The project is delivered incrementally, with each increment building upon the previous ones.

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## ITERATIVE PROJECT MANAGEMENT LIFE CYCLE

- **Requirements:** Iterative life cycles assume that project requirements may *evolve* or become better understood as the *project progresses*.
- **Goals:** The goal is to repeatedly cycle through *phases* of the *project*, refining and expanding on the project's scope and functionality with each iteration.
- **Solutions:** In each iteration, a *portion of the project* is developed, tested, and refined. The project evolves as new insights and requirements emerge.

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## ADAPTIVE (AGILE) PROJECT MANAGEMENT LIFE CYCLE

- **Requirements:** Adaptive life cycles assume that project requirements are *likely to change* and that some may *not be fully understood* at the project's outset.
- **Goals:** The goal is to embrace change and uncertainty by delivering small, valuable increments of the project in short, time-boxed iterations (*sprints*).
- **Solutions:** Adaptive methodologies like Scrum or Kanban focus on delivering the highest-priority features early, continuously gathering feedback, and *adjusting* the project scope and priorities based on customer and *stakeholder input*.

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## EXTREME (XTREME) PROJECT MANAGEMENT LIFE CYCLE

- **Requirements:** Extreme life cycles assume that project requirements are highly dynamic and subject to *rapid change*.
- **Goals:** The goal is to *deliver* the most critical and valuable *features* in a very *short time* frame, often measured in days or weeks.
- **Solutions:** Extreme Programming (XP) is an example of an extreme life cycle, emphasizing close collaboration, frequent releases, automated testing, and other practices to ensure rapid and flexible development.

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## WHEN TO USE?

		SOLUTION	
		Clear	Not Clear
GOAL	Not Clear		
	Clear		

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## LINEAR (WATERFALL) PROJECT MANAGEMENT LIFE CYCLE

- Traditional Project Management

		SOLUTION	
		Clear	Not Clear
GOAL	Not Clear		
	Clear	<b>TPM</b>	

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## WHEN TO USE?

- xPM – Extreme Project Management

		SOLUTION	
		Clear	Not Clear
GOAL	Not Clear		<b>xPM</b>
	Clear	<b>TPM</b>	

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### WHEN TO USE?

- APM – Agile Project Management

		SOLUTION	
		Clear	Not Clear
GOAL	Not Clear		xPM
	Clear	TPM	APM

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### WHEN TO USE?

- Extreme Project Management

		SOLUTION	
		Clear	Not Clear
GOAL	Not Clear	MPx	xPM
	Clear	TPM	APM

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## WHEN TO USE?

### 1. Linear

- Clearly defined solution and requirements
- Not many scope change requests
- Routine and repetitive projects
- Uses established templates

### 2. Incremental

- Same as linear but delivers business value early and often
- Some likelihood of scope change requests

### 3. Iterative

- Unstable or incomplete requirements and functionality
- Learn by doing and by discovery

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## WHEN TO USE?

### 4. Adaptive

- Goal known but solution not known
- Solution highly influenced by expected changes
- New product development and process improvement projects

### 5. Extreme

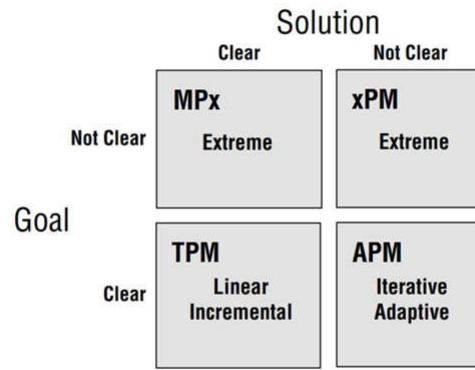
- Goal and solution not known
- Through iteration converge on goal and solution
- Typically for R&D projects

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## WHEN TO USE?

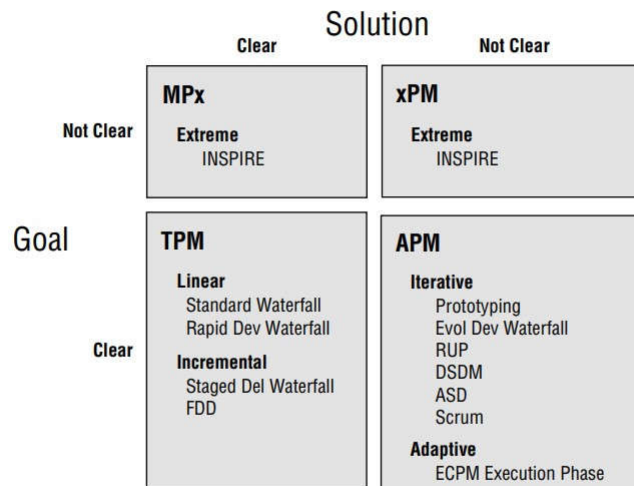


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## WHAT TO USE?



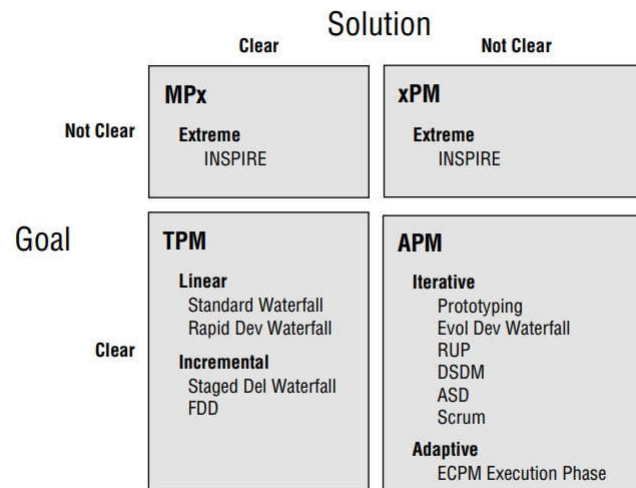
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## EXAMPLES

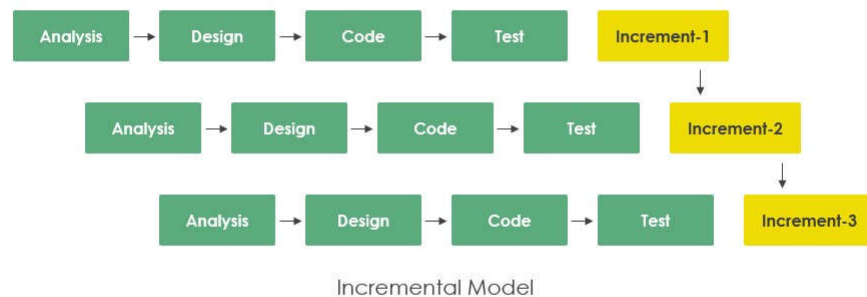


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## MINI-WATERFALLS

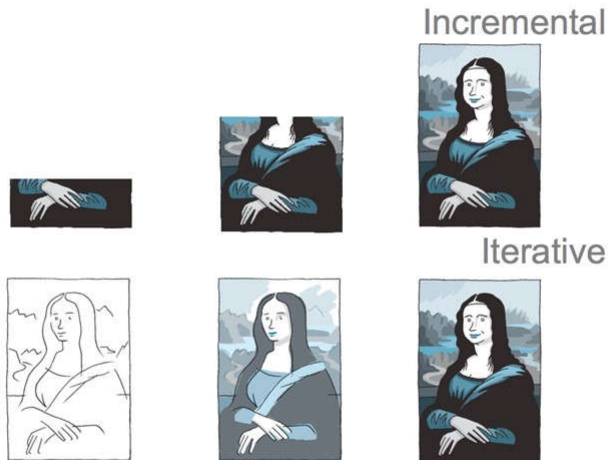


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## ITERATIVE VS. INCREMENTAL APPROACHES



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*To be continued...*

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