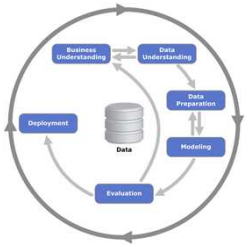
Project Estimating

(26 Sprints)

Richard Frederick, PMP (rfrederick.pmp@gmail.com; 214-755-7035 talk or text; www.linkedin.com/in/rfrederick)



CBDA CERTIFIED IIBA

ISO International Organization for Standardization

ANSI American National Standards Institute

sas

OMG OBJECT MANAGEMENT GROUP

INCOSE International Council on Systems Engineering

IEEE

PMI Project Management Institute

Scaled Agile Framework

IIBA International Institute of Business Analysis

UNIFIED MODELING LANGUAGE

W3COMPUTING A DEVELOPER REFERENCE WEBSITE

Requirements Development Management (RDM) for

Business Data Analytics

(The Language of Data)

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Requirements Agenda

Business Data Analytics "The Language of Data"

01-FOUNDATION

- **LAB-Introductions (Name, Job Title, Objectives)**
- Dashboards and Robots (Data Mining & Machine Learning)
- Requirements and Testing (Four Quadrants)
- What are Structured Language Requirements? (Structured English and Structured Query Language)
- Why Should You Care? (Primary Source of Project Problems)
- How Do They Work? (Discreet Intellectual Property Inventory)
- Types of Requirements (Product, Project, DATA)
- Natural Language Processing (Morphology, Semantics, Syntax and Linguistics)
- OMG-SBVR (Semantics of Business Vocabulary & Rules)
- IEEE-EARS (Easy Approach to Requirements Syntax)
- INCOSE (Rules for Writing Requirements) & QVscribe
- Waterfall and Agile (Assembly Methods)

02-ELICIT

- **LAB-Vision/Scope (Seek to Understand)**

Elicitation Techniques:

- Document Analysis (Low Hanging Fruit)
- Interface Analysis (Navigation & Functionality)
- Benchmarking (Actual Data)
- Brainstorming (Every Idea is a Good Idea until it becomes a Bad Idea)
- Prototyping (Minimum Viable Product)
- Reverse Engineering (Begin with the End in Mind)
- Interview (Thinking Questions)
- Workshop (Group Interviews)
- Observation (What do you See?)
- Survey Questionnaire (Paper equals proof)

03-ANALYZE

- What are Models? (Pictures of Language)
- **LAB-The Language of Modeling (GIVEN pre WHEN process THEN output-result)**
- Types of Models (Context-Structure, Usage, Data Behavior, Process Flow)
- Context-Structure (Vision, Roadmap, Scope WBS)
- Usage (EPIC, UseCase, UserStory, Feature)
- Data Behavior (ERD, JOIN-Denormalization, Star Schema, Dimensional OLAP, Dashboard, Intelligence)
- Data Behavior (Data Dictionary, DataFlow, Data Structure Instance, Data Element Attribute, Data Store)
- Data Behavior (Process Logic, Business Rules)
- Process Flow (Swimlane)

04-DOCUMENT

- Categorization, Organization, Documentation, Integration, Automation
- Making Documents Easy to Read (Fonts & Navigation)
- Document Types (BRD, TRD)
- **LAB-Business Requirement Document (Concept of Operation)**
- Technical Requirement Document (System Specification)

05-VALIDATE

- Validation thru Triangulation (Prep Drills)
- Traceability (Project Unique Identifier)
- Requirements Baseline (ROM Estimate, Planning Estimate, Definitive Estimate)
- **LAB-Estimating Story Points (Complexity and Risk)**
- Lessons Learned (Course Wrap-Up)

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Project Management Agenda

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- INCOSE (Rules for Writing Requirements) & QVscribe
- Waterfall and Agile (Assembly Methods)
- About PowerBI (Business Intelligence)

ENVISION (Initiate)

01-Understand the Business Need

- **Determine BUSINESS OBJECTIVES**
- Background
- Business Objectives
- Success Criteria
- **Assess SITUATION**
- Inventory of Resources
- Requirements, Assumptions, and Constraints
- Risks and Contingencies
- Terminology
- Costs and Benefits
- **LAB-Charter Vision**

PLAN (Increment Zero)

02-Understand the Data

- **Collect INITIAL DATA**
- Data Collection Notes
- **Describe DATA**
- Data Description Notes
- **Explore DATA**
- Data Exploration Notes
- **Verify DATA QUALITY**
- Data Quality Notes
- **LAB-WBS Roadmap**

DEVELOP (Execute)

03-Prepare the Data

- **Select DATA**
- Rationale for Inclusion/Exclusion
- **Clean DATA**
- Data Cleaning Notes
- **Construct DATA**
- Derived Attributes
- Generated Records
- **Integrate DATA**
- Merged Data
- **Format DATA**
- Reformatted Data
- **LAB-Duration Story Points**

04-Model the Data

- **Select MODELING TECHNIQUES**
- Modeling Technique
- Modeling Assumptions
- **Generate TEST DESIGN**
- Test Design
- **Build MODEL**
- Parameter Settings Model
- Model Description
- **Assess MODEL**
- Model Assessment
- Revised Parameter Settings
- **LAB-Risks & Release Schedule**

STABILIZE (Control)

05-Evaluate the Data

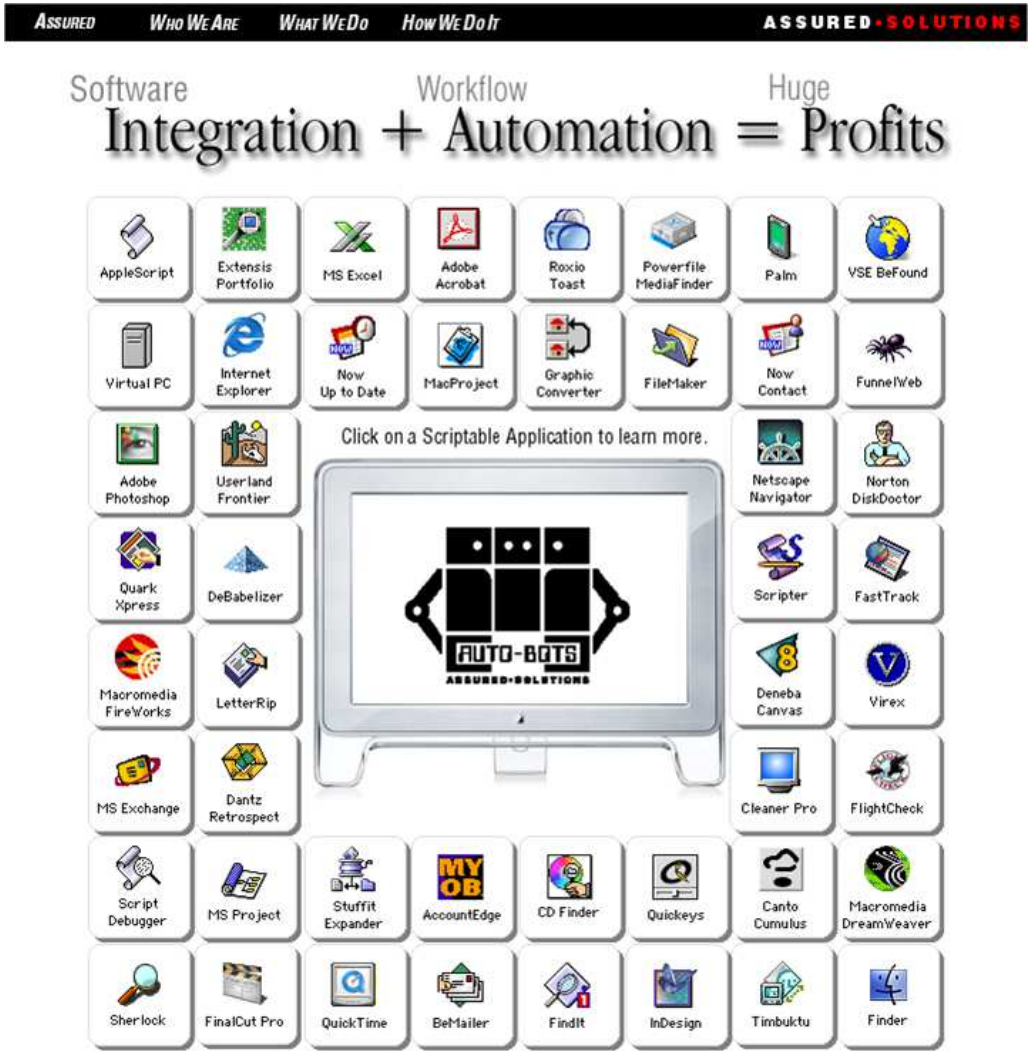
- **Evaluate RESULTS**
- Assess the Results against the Business Success Criteria
- **Review PROCESS**
- Review of Process
- **Determine NEXT STEPS**
- List Possible Actions
- Decision
- **LAB-One Page Project Manager (OPPM)**

DEPLOY (Close)

06-Deploy the Solution

- **Plan DEPLOYMENT**
- Deployment Plan
- **Plan MONITORING & MAINTENANCE**
- Monitoring & Maintenance Plan
- **Produce FINAL REPORT**
- Final Report
- Final Presentation
- **Review PROJECT PLAN**
- Experience Documentation
- **LAB-Lessons Learned (Train the Trainer)**

Assured Solutions

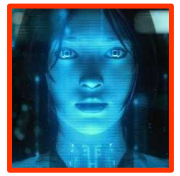


Overview "Seek to Understand"

- Project Estimating (Forecasting)
  - Predicting the Future
- Four Dimensions of Assembly
  - Waterfall Assembly
  - Agile Assembly
  - Sizing User Stories Product Backlog
  - Story Point "Rules of Thumb"
  - 26 Sprints
- Three Planning Stages
  - Discovery
  - Iterative Planning
  - Baseline

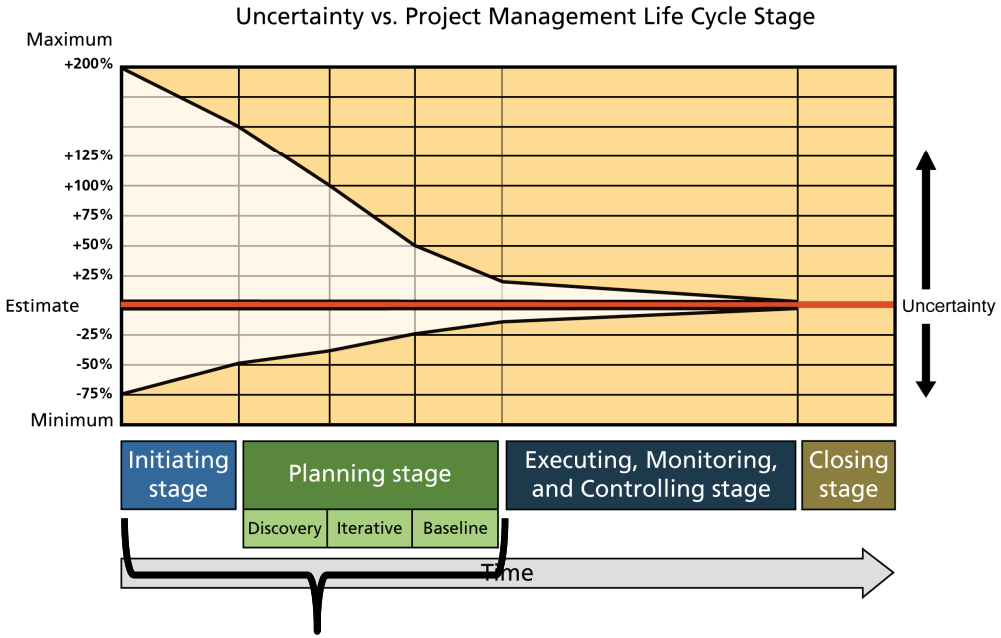




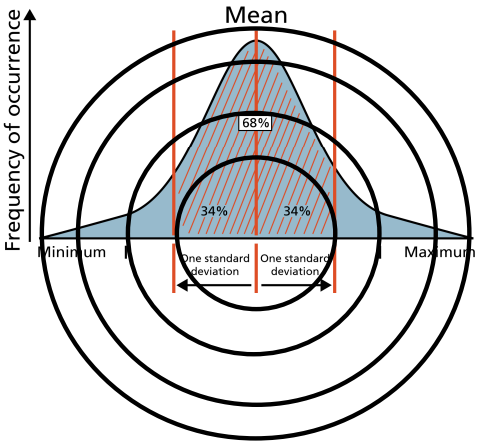



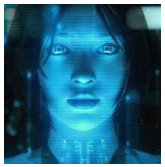
Project Estimating (Forecasting)

Predicting the Future

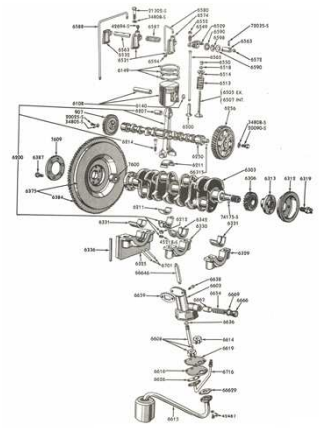


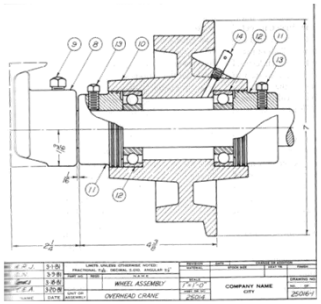
"Increment Zero"



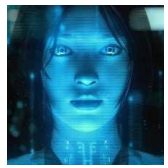


Four Dimensions of Assembly





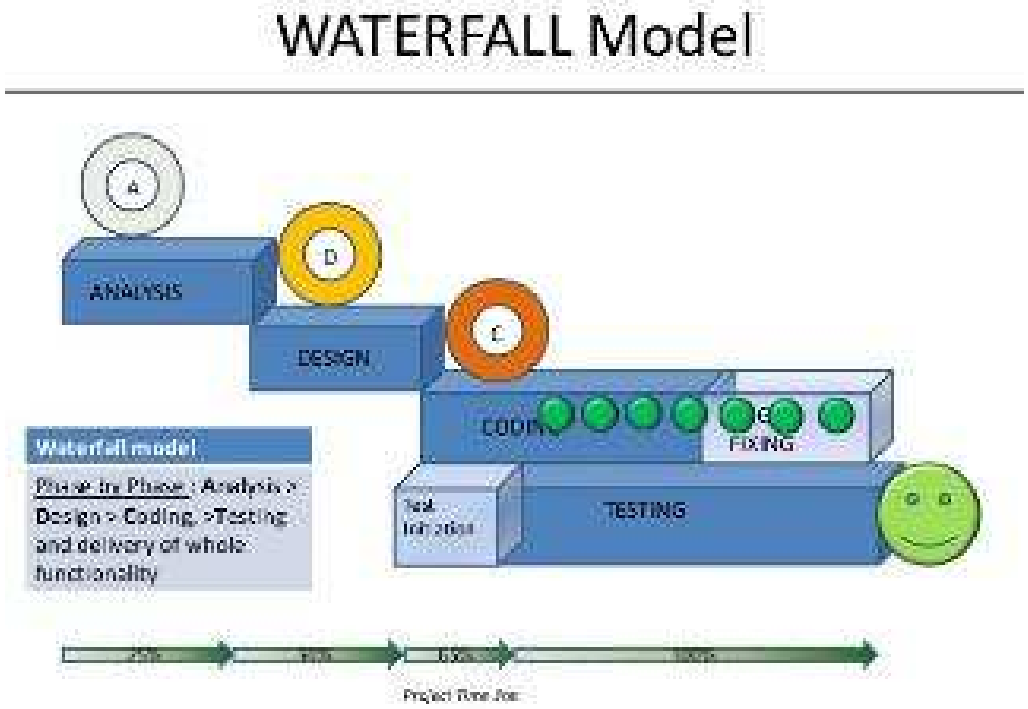
- Assembling "things" requires understanding four key dimensions:
  1. What are the parts you are assembling? This is the SCOPE dimension
  2. How long will it take to assemble them? This is SCHEDULE dimension
  3. How complex is it? This is RISK dimension
  4. How much will you spend? This is COST dimension



Waterfall Assembly

Scope drives Schedule

- Waterfall Assembly has been around for a very long time. It is the assembly method that most everyone uses to **build physical, tangible assets.**
  - With Waterfall, you break down a product into "discrete" individual tangible assets called Work Packages.
  - The idea to figure out exactly what you are going to assemble in the beginning, and then try to "lock-down" the deliverables into a SCOPE Baseline with minimal changes.
- From the SCOPE Baseline, you create the list of assembly tasks and activities (which I call "discrete" transactions for accounting purposes) and arrange them along a SCHEDULE timeline called a "Critical Path."
  - Once you have a SCHEDULE timeline, then you analyze how complex or "risky" the work is to complete.
  - This RISK Analysis is then added as a Contingency Reserve to your project to compensate for any "Surprises."
- Finally, knowing all of this up front allows you to develop a COST Baseline to help track spending.

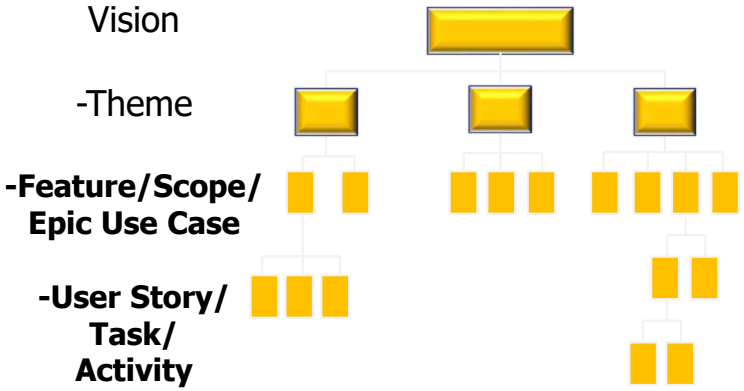


AGILE PLANNING PROCESS = ROADMAP > BACKLOG > RELEASE

Agile Assembly

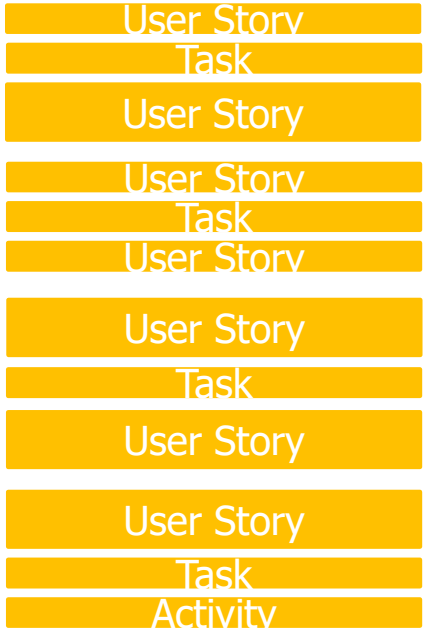
Schedule drives Scope

1. ROADMAP (Structured)



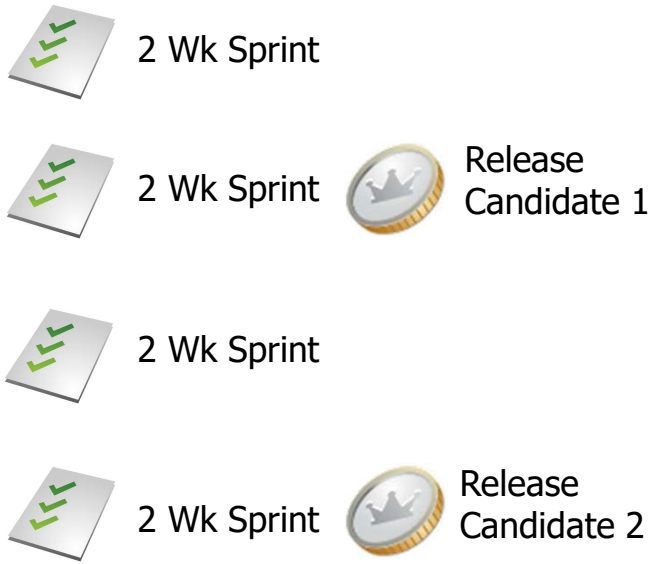
✓ Feature/Scope comprised of User Stories of various **SIZES (aka Story Points)**
✓ Feature/Scope has **Business VALUE** based on Minimized Costs or Maximized Revenues
✓ Feature/Scope has **different PRIORITIES** that must be defined

2. BACKLOG



User Stories and Tasks are placed on the BACKLOG in Order of **SIZE, VALUE, PRIORITY**

3. RELEASE

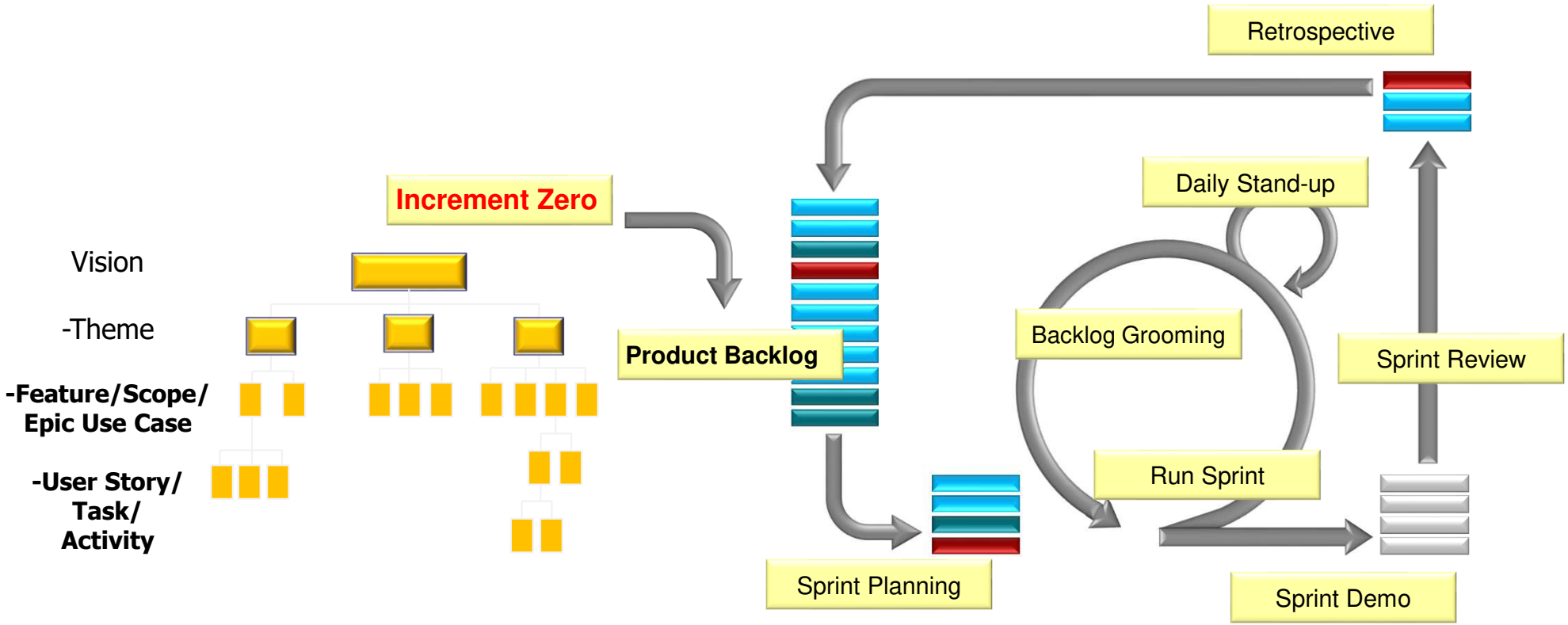


At RELEASE PLANNING, we decide when our PRODUCT will meet Acceptance Criteria and provide **Business VALUE** based **upon Reduced Costs, Increased Revenue or other KPIs.**

Agile Assembly

Schedule drives Scope

1. ROADMAP (Structured) 2. BACKLOG 3. RELEASE



Sizing User Stories

Product Backlog

- A practice used by development teams to assign a relative estimate to user stories
- Teams typically use the Fibonacci sequence to assign point values (1, 2, 3, 5, 8, 13, 20, 40, 100)
- Teams will do it based on Build Complexity and Time Intensity
- No two teams size stories the same!
- Trust the Team!

User Story Estimates		**Build Complexity** (Number of Steps, Number of Decisions)		
		Low	Medium	High
Time Intensity (How Long?)	Low	1	2	5
	Medium	3	13	20
	High	8	40	100

Story Point "Rules of Thumb"

- Two Week Sprint = 10 Business Days
- One Person can complete 5 Story Points per day (25 Story Points per Week or 50 Points per Sprint)
- 5 SP x 5 People x 10 Days = VELOCITY of 250 SP for the Sprint
  - 1 SP = approx. 1.5 hrs.
  - 5 SP = approx. 7.5 hrs.
- **52 Week Calendar Year = 26 Sprints**

User Story Estimates		**Build Complexity** (Number of Steps, Number of Decisions)		
		Low	Medium	High
Time Intensity (How Long?)	Low	1	2	5
	Medium	3	13	20
	High	8	40	100

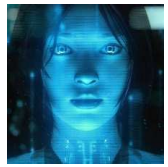
Three Planning Stages

Increment Zero

DISCOVERY Rough Order of Magnitude (ROM Estimate)	ITERATIVE Planning Estimate	BASELINE Definitive Estimate (Forecast)
Experience Based Model: Cost-Plus "CUSTOM"	**Hybrid Model:**	**Data Model: Fixed-Price "ASSEMBLY"**
• **Expert Judgement Estimate** • **Planning Poker Estimate**	• **Bottom-Up Estimate** • **Database Historical Analogous**	• **Data Warehouse Parametric Estimate** • **Monte Carlo Analysis (Intelligent Assistance)**
Implicit Experience & Implicit Data	Implicit Experience & Explicit Data	Explicit Experience & Explicit Data
Less Predictable = Greater Uncertainty (Risk)		More Predictable = Less Uncertainty (Risk)





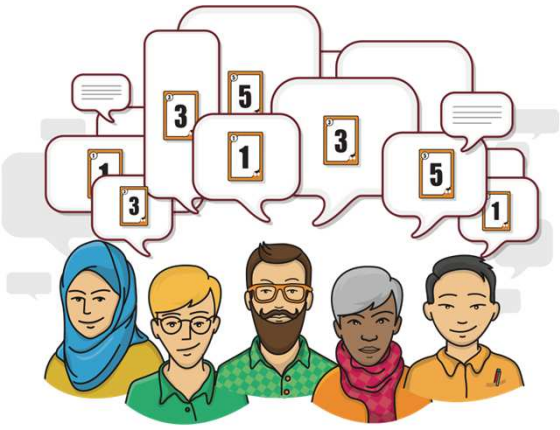
Project Estimating (Forecasting)

Predicting the Future

DISCOVERY Rough Order of Magnitude (ROM Estimate) Experience Based Model: Cost-Plus "CUSTOM"

- **Expert Judgement Estimate**
- **Planning Poker Estimate**
- Implicit Experience &
- Implicit Data
- Less Predictable =
- Greater Uncertainty (Risk)

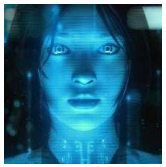
Expert Judgement Estimate



Planning Poker Estimate





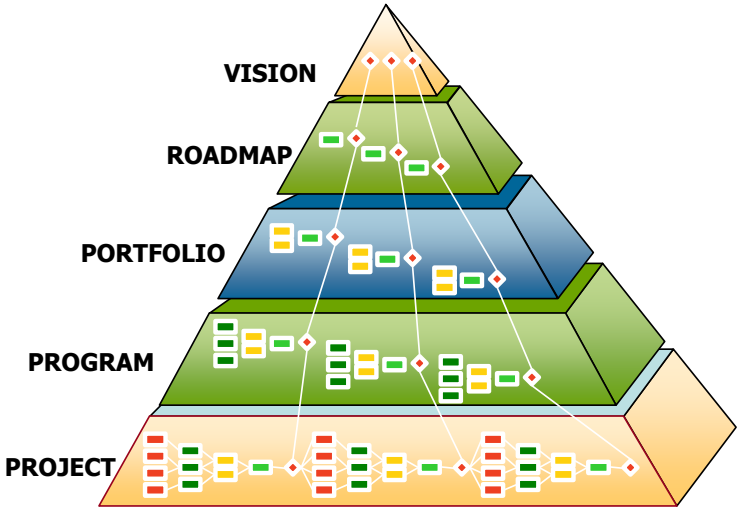



Project Estimating (Forecasting)

Predicting the Future

ITERATIVE Planning: Hybrid Model

- **Bottom-Up Estimate**
- **Database Historical Analogous Estimate**
- Implicit Experience
- Explicit Data



Bottom-Up Estimating

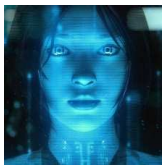


Using Historical Data to Predict the Future

Historical Analogous Estimating





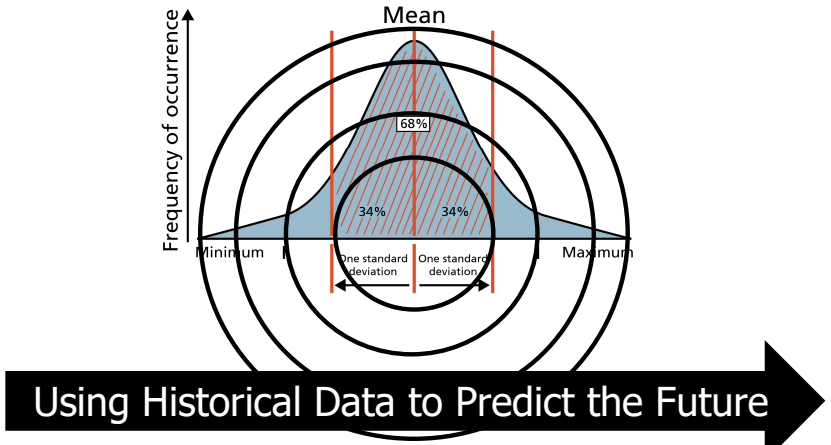
Project Estimating (Forecasting)

Predicting the Future

BASELINE Definitive Estimate (Forecast) Data Model: Fixed-Price "ASSEMBLY"

- **Data Warehouse Parametric Estimate**
- **Monte Carlo Analysis (Intelligent Assistance)**
- Explicit Experience &
- Explicit Data
- More Predictable =
- Less Uncertainty (Risk)

Data Lake Parametric Estimate

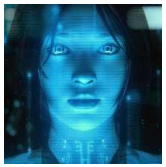


Using Historical Data to Predict the Future

Monte Carlo "Regression" Estimate





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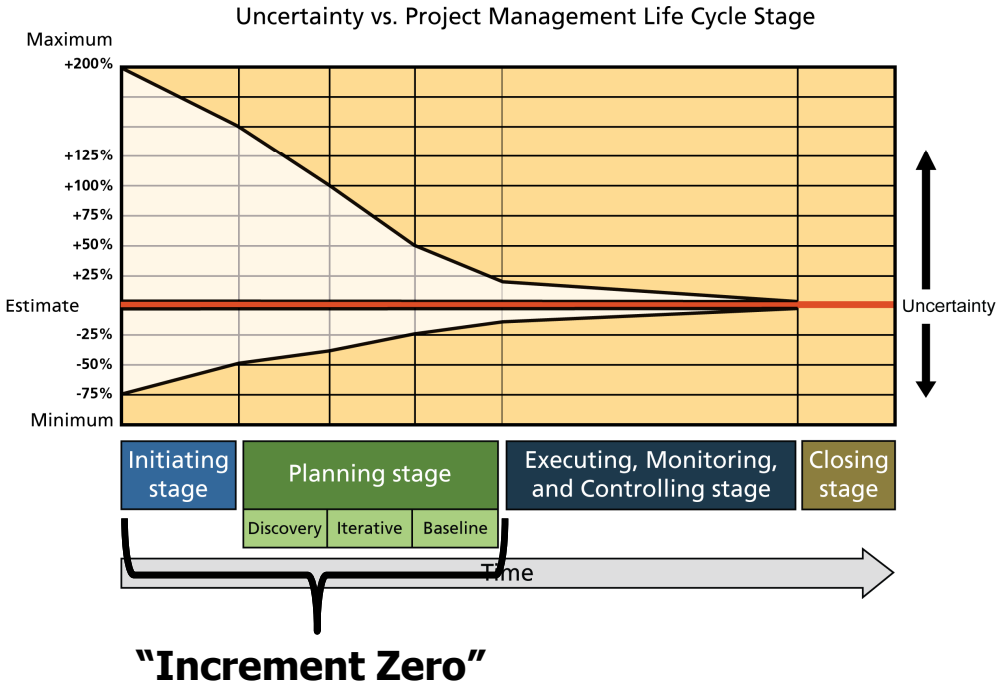

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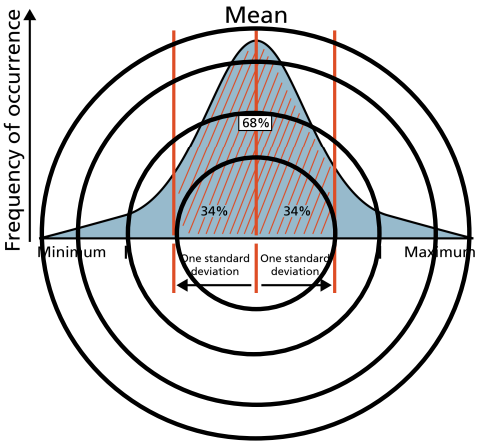

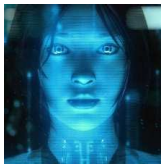

Summary "Train the Trainer"

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- Four Dimensions of Assembly
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  - Sizing User Stories Product Backlog
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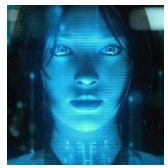

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