



Welcome!

Function Point Analysis and Agile Methodology ~ Dan Horvath

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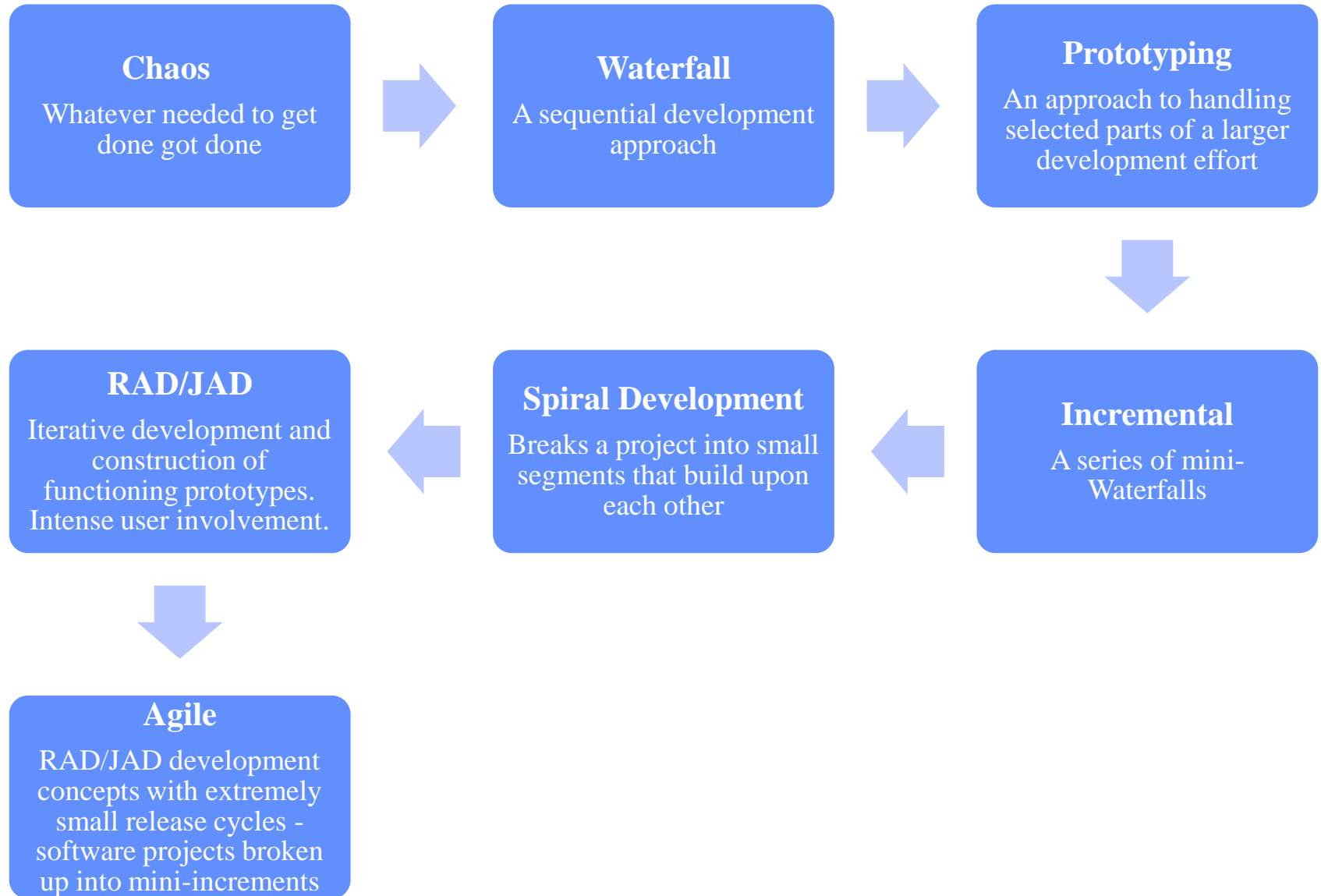
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Presentation Objectives

- Describe the history and definitions related to Agile Software Development
- Define a “Project”
- Provide Examples of Function Point Counts
- Present the impact on Key Measures - Considerations and Recommendations

The Evolution of Software Development Methodologies



Agile Software Development Definitions

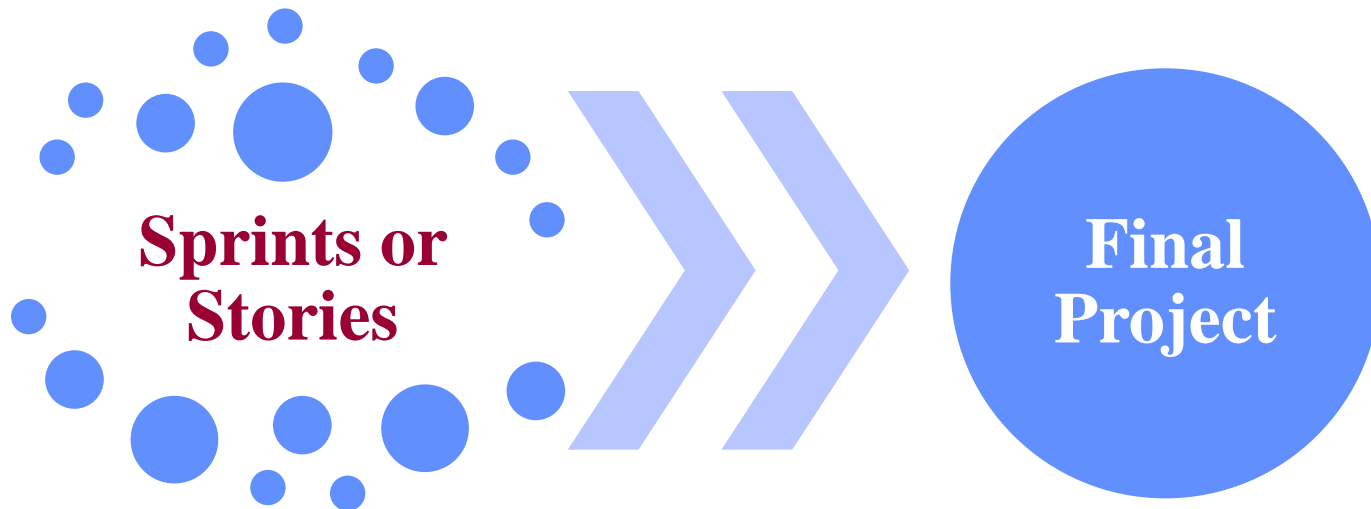
- Agile considered next evolutionary step of RAD
- Agile Manifesto published in 2001
 - Highest priority is to satisfy the customer through early and continuous delivery of valuable software
 - Welcome changing requirements, even late in development
 - *Deliver working software frequently*
 - Business people and developers work together
 - Teams are self-organizing
- Agile described as a type of RAD methodology that favors small projects with team-oriented development groups and close customer contact and involvement

Definition of a Project

- *“A temporary endeavor, having a defined beginning and end, undertaken to meet unique, specific objectives, for the purpose of causing changes or adding value” - Project Management Institute**
- Traditional waterfall methodologies fit the definition of a project as a temporary endeavor
- For Agile development, a project may consist of one or more “stories” or “sprints” required to produce the final result

* Note: A Guide to the Project Management Body of Knowledge (PMBOK®) Guide – Fourth Edition

Function Points Provide Value Throughout the Complete Development Cycle



**Function Points
to measure
Sprints or Stories**

**Function Points
to measure the
completed project**

Software Metrics / Function Point Analysis (FPA) closely linked with Project Management and Software Development Methodology

Examples of Function Point Counts

- Function Point Analysis (FPA) provides the base measurement of several metrics
- FPA may be performed for a sprint (functionality developed) or for an entire project (functionality delivered)
- **Examples demonstrate FPA in Agile development:**

Example 1: Sprint 1: Data & Maintenance Functions added
Sprint 2: Report added

Example 2: Sprint 1: Data & Maintenance Functions added
Sprint 2: Changes to Sprint 1 Data & Maintenance Functions and new Report added

Summary: Development or Enhancement Project Example
Regardless of Methodology

Example 1: Sprint 1- Data & Maintenance Functions Added; Sprint 2- Report Added

Sprint 1 Function Point Count - Data and Maintenance Functions Added

Function	Type and Complexity	Unadjusted Function Points
Human Resource File	ILF, Average	10
Human Resource Maint – add	EI, Average	4
Human Resource Maint – chg	EI, Average	4
Human Resource Maint – del	EI, Low	3
TOTAL		21

Sprint 2 Report Function is Added

Function	Type and Complexity	Unadjusted Function Points
Human Resource Report	EQ, Average	4
TOTAL		4

Example 2: Sprint 1- Data & Maintenance Functions Added; Sprint 2- Data & Maintenance Functions Changed and Report Added

Sprint 1 Function Point Count – Data and Maintenance Functions Added

Function	Type and Complexity	Unadjusted Function Points
Human Resource File	ILF, Average	10
Human Resource Maint – add	EI, Average	4
Human Resource Maint – chg	EI, Average	4
Human Resource Maint – del	EI, Low	3
TOTAL		21

Example 2 (Continued)

Sprint 2 Data and Maintenance Functions Changed; Report Function is Added

Function	Type and Complexity	Unadjusted Function Points
Human Resource File	ILF, Average	10
Human Resource Maint – add	EI, Average	4
Human Resource Maint – chg	EI, Average	4
Human Resource Maint – del	EI, Low	3
Human Resource Report	EQ, Average	4
TOTAL		25

Summary: Development or Enhancement Project Example Regardless of Methodology

Function	Type and Complexity	Unadjusted Function Points
Human Resource File	ILF, Average	10
Human Resource Maint – add	EI, Average	4
Human Resource Maint – chg	EI, Average	4
Human Resource Maint – del	EI, Low	3
Human Resource Report	EQ, Average	4
TOTAL		25

The project count represents the delivered functionality of the project

Discussion of Examples

Example	Sprint 1 FPs	Sprint 2 FPs	Total of Sprint FPs
Example 1	21	4	25
Example 2	21	25	46
Delivered Project FPs			25

- **Example 1**: Sprint 1 and Sprint 2 added together equal the total function points for the project (the delivered functionality)
- **Example 2**: The sum of the Agile sprint counts is greater than the delivered FPs - some of the functions would be counted twice as part of sizing the sprint

Key Measures – Some Questions

- How Productive are we?
- How good is our software quality?
- What are my estimates?
 - How much effort?
 - How much should it cost?
 - How long should it take?

Whether to count and measure by sprint or by project (developed or delivered) depends on the goals of the metrics program

Key Questions and their Measures

Measurement Question	Agile Measures Examples	Final Delivered Project Measure Examples
How productive are we?	Sprint FPs ÷ Sprint Hours	Delivered FPs ÷ Total Project Hours
How good is our software?	Sprint Production Defects ÷ Sprint FPs	Total Production Defects ÷ Project FPs
How many hours will be required to deliver?	Sprint ROM FPs ÷ Historical Sprint productivity rate	Project ROM FPs ÷ historical project productivity rate
How much should it cost?	Sprint ROM FPs * Historical \$/Sprint FP	Project ROM FPs * Historical \$/Project FP

Measures for Project Examples

Example 1

Example 1	Effort Hours	Defects	FP's
Sprint 1	1,000	5	21
Sprint 2	250	1	4
Example 1 Project Totals	1,250	6	25

Example 2

Example 2	Effort Hours	Defects	FP's
Sprint 1	1,000	5	21
Sprint 2	1,450	7	25
Example 2 Project Totals	2,450	12	25

Key Measures – How Productive Are We?

- For Waterfall methodology
 - Function points delivered and effort hours typically measured from requirements definition through first implementation
- For Agile methodology
 - Measures productivity of sprints (FPs/Sprint Hours)
 - Measures productivity of total project (FPs/Project Hours)

Example	Productivity Measure
Example 1/Sprint 1	21 FPs / 1,000 hours = 0.021 FP/hr.
Example 1/Sprint 2	4 FPs / 250 hours = 0.016 FP/hr.
Example 1 Summary	25 FPs / 1,250 hours = 0.020 FP/hr.
Example 2/Sprint 1	21 FPs / 1,000 hours = 0.021 FP/hr.
Example 2/Sprint 2	25 FPs / 1,450 hours = 0.017 FP/hr.
Example 2 Summary	25 FPs / 2,450 hours = 0.010 FP/hr.

Key Measures – How Good is our Software?

- Quality metrics are often evaluated at 30, 60 or 90 days after initial implementation
- Example 2 shows functions counted more than once – need to determine impact on quality measures
- Care must be taken to ensure that Quality and Productivity metrics accurately reflect the measurement objectives

Example	Quality
Example 1/Sprint 1	5 defects / 21 FPs = 0.24 defects/FP
Example 1/Sprint 2	1 defect / 4 FPs = 0.25 defects/FP
Example 1 Summary	6 defects / 25 FPs = 0.24 defects/FP
Example 2/Sprint 1	5 defects / 21 FPs = 0.24 defects/FP
Example 2/Sprint 2	7 defects / 25 FPs = 0.28 defects/FP
Example 2 Summary	12 defects / 25 FPs = 0.48 defects/FP

Key Measures – What are my Estimates?

- For both Waterfall and Agile projects, estimation metrics typically determined prior to start of project development
- For Agile projects, objectives may be determined at the beginning of a story or sprint, rather than at the beginning of all development
- Consider Rough Order of Magnitude (ROM) Counts for determining contents of a Time Box or staffing alternatives

Key Measures - Recommendations

- By analyzing the data and creating an historical repository an organization can use measurement to measure and predict a projects productivity, cost, quality and schedule,
- With this information organizations may be better able to choose the most appropriate methodology for the project
- Development methods need not be an impediment to measuring the project
- Some considerations need to be addressed depending on how the project is defined, the goals and objectives
 - i.e. whether to count by sprint or by project depends on the goals of the metrics program

Thank you!

Questions?

Comments?

Experiences to Share?