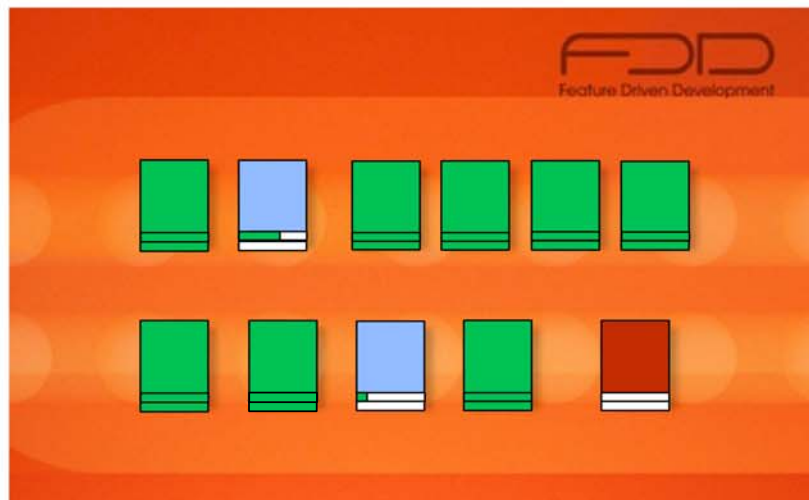




Feature Driven Development

overview



No Silver Bullet

What is the system I am building?

The system is the Project.

Managers must first learn to see, hear, and think about human systems before they can hope to control them. Software projects are human systems.

Why FDD?

- ▶ To enable the reliable delivery of working software in a timely manner with highly accurate and meaningful information to all key roles inside and outside a project

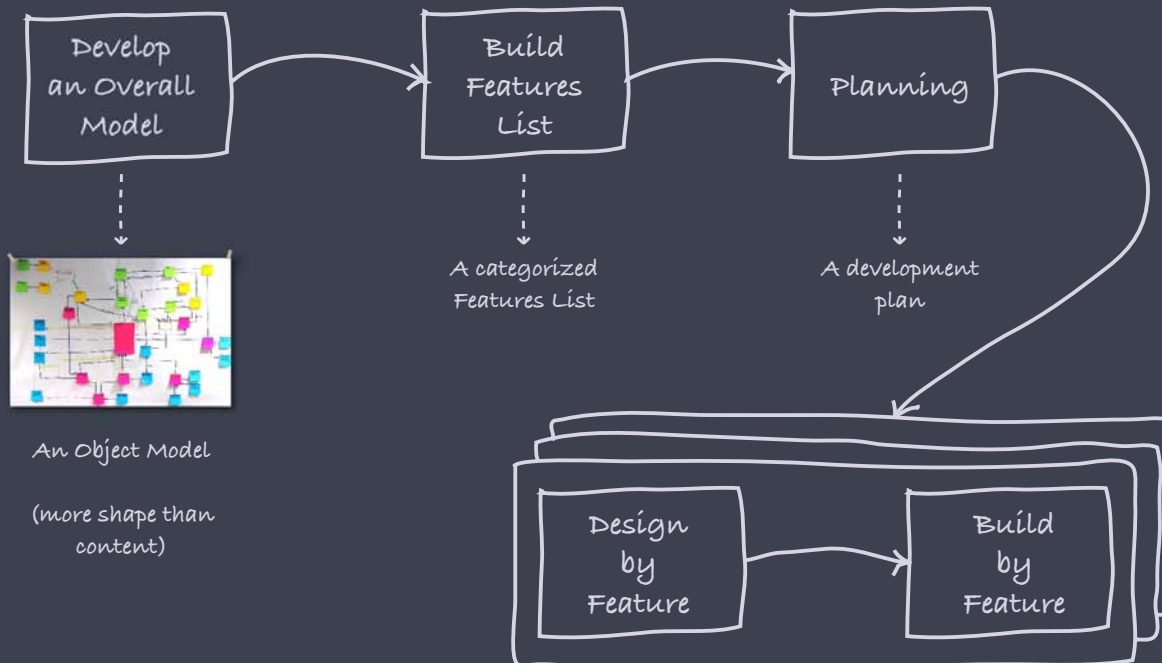
Feature Naming Template

<action> the <result> <by|for|of|to> a(n) <object>

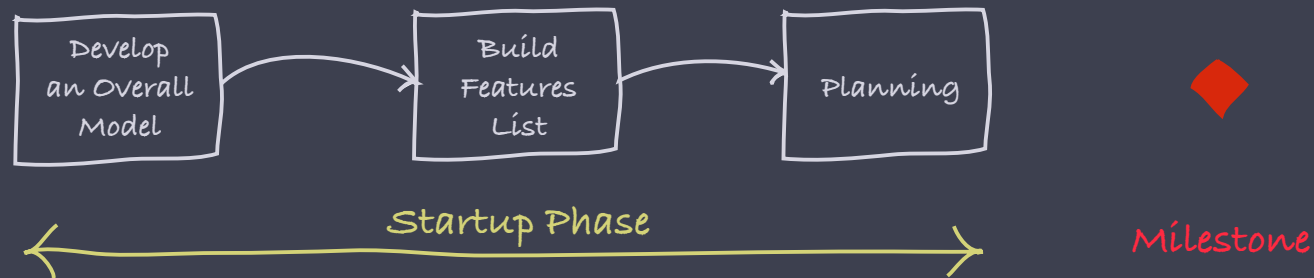
Calculate *the total amount* of a Sale

Calculate *the total quantity sold by a Retail Outlet* for an Item Description

Determine *the most recent Cash Register Assignment* for a Cashier



Initial Processes

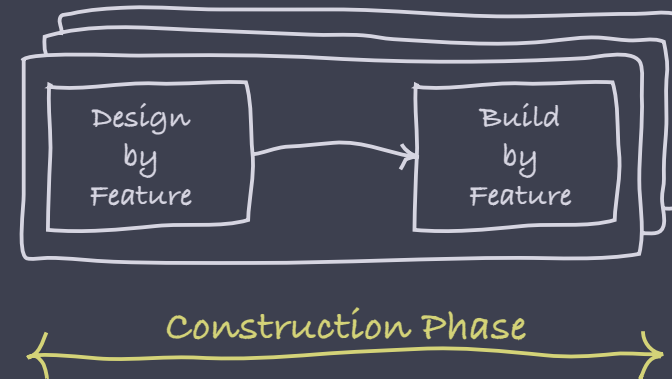


Startup phase contains predictive metrics based on early available indicators

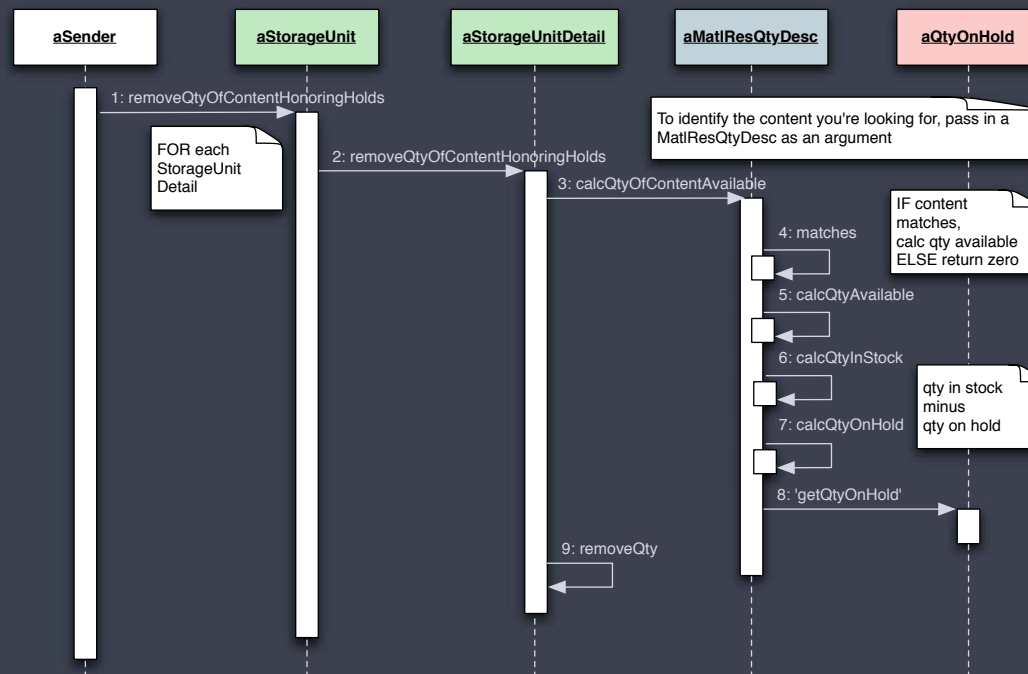
Initial project time estimate determines startup phase duration

Actual startup phase time taken calibrates project time estimate

Establish fixed-price construction after startup phase completed



Reducing the Risk of Fixed-Price



Inventory Management: Remove a quantity of content from a storage unit, honoring holds.

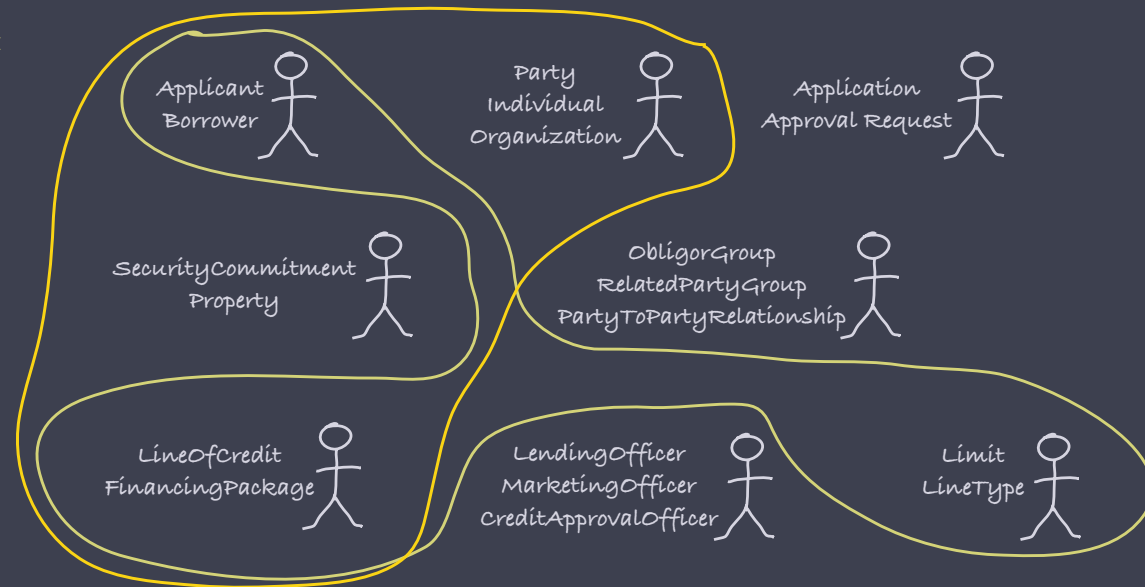
Class Owners

Total the approved limits of an applicant

Applicant, Borrower,
LineOfCredit, Limit

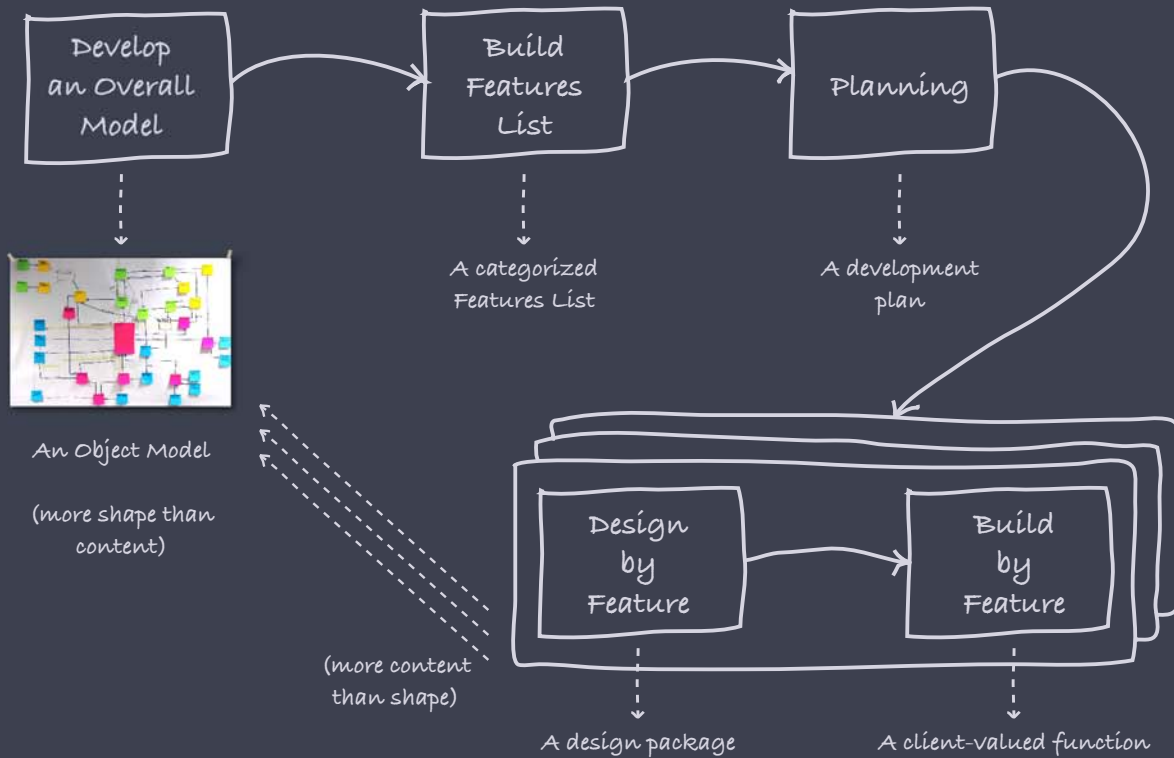
Total the unsecured facilities for a party

Party, Borrower,
LineOfCredit,
SecurityCommitment



Feature Teams

A pool of class owners. Features assigned to CPs. CP determines classes involved.
Classes owned by programmers. Feature team dynamically forms.



Engine-Room Processes

Milestones

- ▶ Milestones must be concrete, specific, measurable events defined with knife-edge sharpness
- ▶ A programmer will rarely lie about milestone progress, if the milestone is so sharp he can't deceive himself
- ▶ Getting the status is hard since subordinate managers have every reason not to share it

Fred Brooks



YDD Process #4: Design By Feature

A per feature activity to produce the feature design package

A number of features are scheduled for development by assigning them to a Chief Programmer. The Chief Programmer selects features for development from his "idea" of assigned features. He may choose multiple features that happen to use the same classes (service developers). Operationally, it is often the case that "sets" of features are scheduled for development at a time by the Chief Programmer. Such a set is called a Chief Programmer Work Package.

The Chief Programmer then forms a Feature Team by identifying the members of the class(es) (developer(s)) likely to be involved in the development of the feature(s) he intends for development. This team then produces the Sequence Diagram(s) for the assigned feature(s). The Chief Programmer then reviews the Object Model based on the contents of the sequence diagram(s). The developer then writes class and method prototypes. A Design Inspection is held.



YDD Process #5: Build By Feature

A per feature activity to produce a completed class-based feature (feature)

Working with the design package, the developer class, service implement the items necessary for their class to support the design for this feature. The code developed is then unit tested and code inspected - the order of which is determined by the Chief Programmer. After a successful code inspection, the code is prepared to be build.

Entry Criteria

- The Design by Feature process has completed. That is, the design package has successfully been inspected.

Domain Walkthrough	Design	Design Inspection	Code	Code Inspection	Promote to Build
1%	40%	3%	45%	10%	1%

This is an optional task based on the complexity of the feature and its interactions.

Study the Collaborated Documents [Feature Team] [Continue]
The feature team studies the referenced document(s) for the feature to be designed, all environment issues, system design, external system interface specifications and any other supporting documentation. This is an optional task based on the complexity of the feature and its interactions.

Develop the Sequence Diagram(s) [Planning Team] [Required]
Developing the Sequence Diagram(s) required for the feature to be designed. The diagram line should be checked into the version control system. Any alternative designs, design decisions, requirements clarifications and notes are also recorded and written up in the design alternatives section of the Design Package.

Review the Object Model [Chief Programmer] [Required]

Promote to the Build [Chief Programmer, Feature Team] [Required]
Classes can only be promoted to the build after a successful code inspection. The Chief Programmer tracks the individual classes being promoted, through feedback from the developer, and to the integration page for the entire feature.

Verification

Code Inspection and Unit Test [Chief Programmer, Feature Team] [Required]
A successful code inspection plus the successful completion of unit test is the verification of the output of this process. The code inspection and unit test tasks are described above.

Milestones

Domain Walkthrough		Design		Design Inspection		Code		Code Inspection		Promote to Build	
Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual

Milestones

Establish Security Commitment (SC)

Business Activities	Total Features	Not Started	In Progress	Behind Schedule	Completed	Inactive	% Completed	Completion Date
Associate to Bank	2	0	0	0	2	0	100	Jul 1998
Associate to FP	6	0	0	0	6	0	100	Jul 1998
Associate to Line	3	0	0	0	3	0	100	Jul 1998
Establish Commitment	123	0	0	0	123	7	100	Jul 1998
New Features	1	0	0	0	1	0	100	Ongoing
Subject Area Total	135	0	0	0	135	7	100	

Implementation (MD)

Business Activities	Total Features	Not Started	In Progress	Behind Schedule	Completed	Inactive	% Completed	Completion Date
Authorisation	15	0	0	13	2	2	51	Mar 1999
Change Current Account for OD Line	12	12	0	0	0	0	0	Mar 1999
Establish Disbursement Details	35	0	0	4	31	1	91	Mar 1999
Establish Implementation Instruction	27	1	0	12	14	1	70	Mar 1999
Establish Line Implementation Details	21	0	0	4	17	0	89	Mar 1999
Establish BlockDiscounting Line Impl.	7	0	0	0	7	0	100	Mar 1999
Establish NIF RL Disbursement	8	6	0	0	2	1	25	Mar 1999
Establish Trade/Guarantee Line Impl.	9	0	0	0	9	0	100	Mar 1999
Establish an FX Line Implementation	5	0	0	0	5	0	100	Mar 1999
Establish OD Line Implementation	13	0	0	0	13	0	100	Mar 1999
New Features	3	0	0	0	3	0	100	Ongoing
Subject Area Total	155	19	0	33	103	5	74	

Progress Summary for Problem Domain

Total Features	Not Started	In Progress	Behind Schedule	Completed	Inactive	% Completed
1013	23	0	33	957	100	96

Actual Data

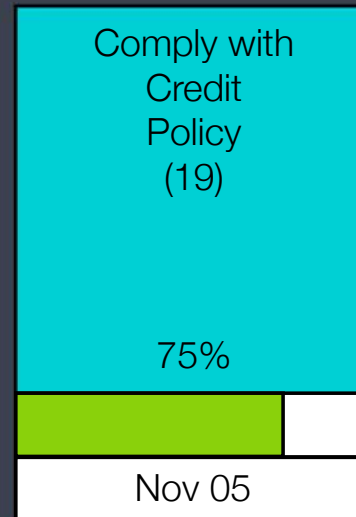
Progress Summary Report

Overall Status

- Not Started
- Work in Progress
- Attention (e.g. behind schedule)
- Completed

Completion Status

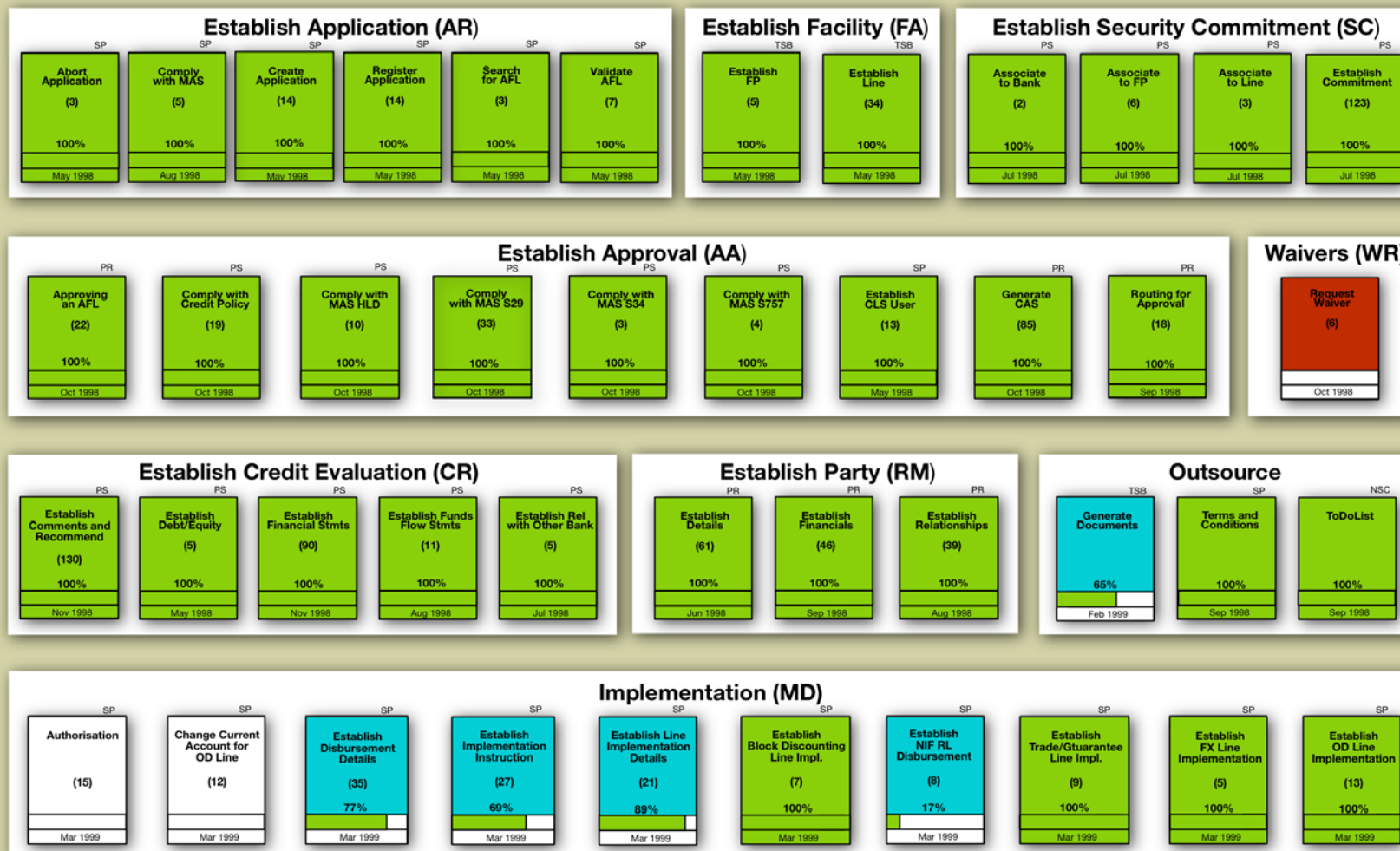
- Completed
- Target Completion Month



Completion Percentage

Progress Bar

Graphical Summary Legend

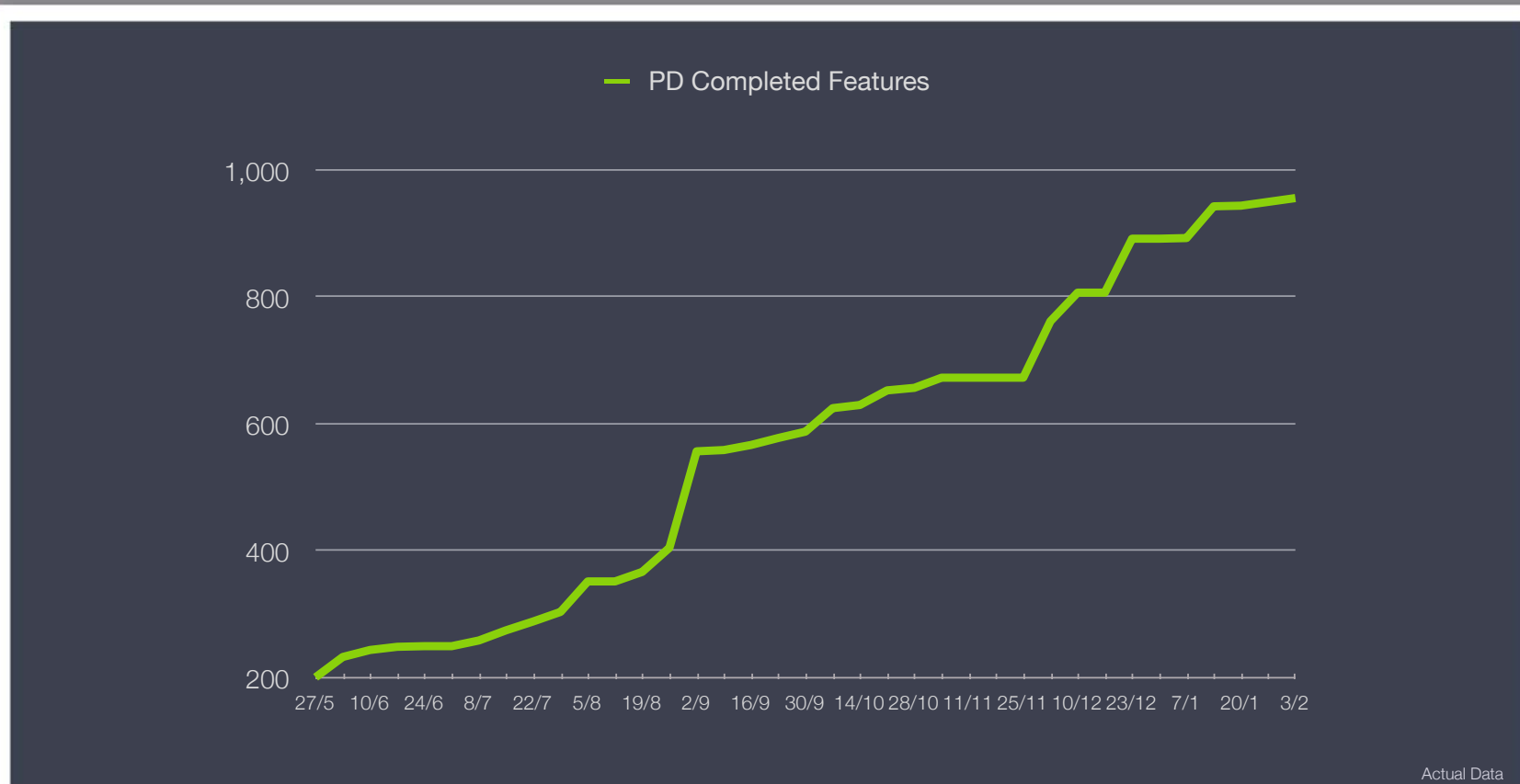


Actual Data

Week ended	Total Features	% Completed	Features Completed	Features Not Started	Features In Progress	Features Behind Schedule	Features Inactive
27-May-98	823	26%	202	588	1	32	25
3-Jun-98	823	29%	234	574	4	11	574
10-Jun-98	823	29%	245	573	0	5	30
17-Jun-98	824	30%	250	573	0	1	30
24-Jun-98	824	30%	251	573	0	0	30
1-Jul-98	824	30%	251	573	0	0	30
8-Jul-98	824	34%	260	475	81	8	40
15-Jul-98	824	37%	276	457	72	19	47
22-Jul-98	825	40%	290	450	85	0	47
29-Jul-98	931	38%	305	534	72	20	55
5-Aug-98	932	41%	353	463	83	33	73
12-Aug-98	1085	38%	353	578	117	37	73
19-Aug-98	1085	44%	368	488	129	100	73
26-Aug-98	1085	46%	406	478	23	178	73
2-Sep-98	1087	53%	558	447	48	34	79
9-Sep-98	1107	54%	560	420	51	76	81
16-Sep-98	1107	57%	568	411	50	78	81
23-Sep-98	1107	57%	579	411	50	67	81
30-Sep-98	1119	57%	589	364	94	72	86
7-Oct-98	1122	62%	626	258	176	62	86
14-Oct-98	1122	65%	631	257	167	67	86

Actual Data

Trend Report



Trend Report

Comply with Diversity Constraints (13)

ID	Description	Walkthrough		Design		Design Inspection		Development		Code Inspection		Promote to Build	
		Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
XP077	determine the diversity requirement for a Pathing Step Context	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP078	determine the diversity category of an IPPC for Diversity Constraints	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP079	determine other end of an IPPC	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP080	determine the diversity category of a pathing point for Diversity Constraints	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP081	remove the must-avoid IPPCs from the list of candidate IPPCs	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP082	sort by diversity category, weighting, and distance the list of candidate IPPCs	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP083	generate the notes for use of a like to avoid Diversity Constraint	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP084	list the diversity items of an IPPC for Diversity Constraints	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP085	list the diversity items of a Pathing Point for Diversity Constraints	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP086	determine if all must haves have been found for Diversity Constraints	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP087	add must have diversity items to a Pathing Step Context	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP088	specify the Diversity Constraints for a Pathing Step Context	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	
XP089	determine the Diversity Constraints for a Pathing Step Context	05/12/2000	05/12/2000	06/12/2000	11/12/2000	07/12/2000	12/12/2000	13/12/2000		14/12/2000		15/12/2000	

Progress sum for these features in business activity "Comply with Diversity Constraints": **44%**
 Expected completion date: **Mar 2001**

Actual Data


Plan View



Actual Data

Plan View On The Wall

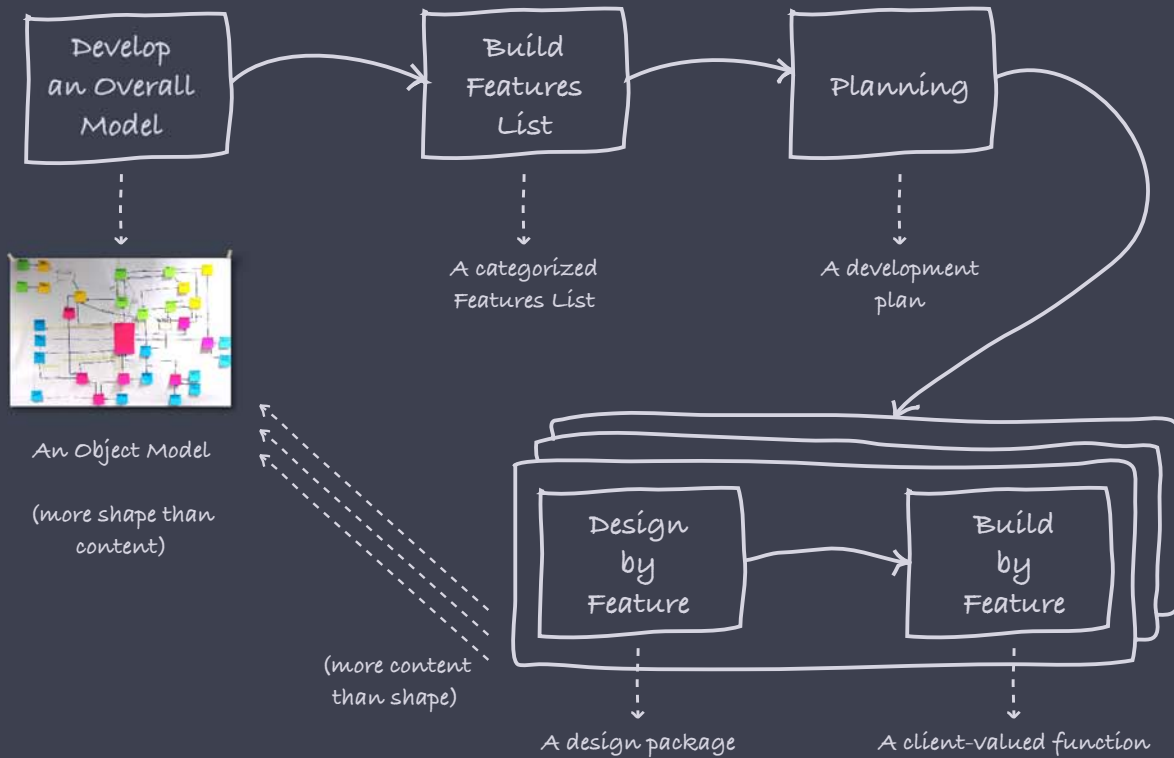
Explode Design Model (19)

ID	Description	Walkthrough		Design		Design Inspection		Development		Code Inspection		Promote to Build	
		Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
DP036	add an Exploded Item to an Exploded Item List	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000	10/10/2000	12/10/2000	12/10/2000	12/10/2000	12/10/2000
DP037	add a List of Exploded Item to an Exploded Item List	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000	10/10/2000	12/10/2000	12/10/2000	12/10/2000	12/10/2000
DP038	iterate through an Exploded Item List	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000	10/10/2000	12/10/2000	12/10/2000	12/10/2000	12/10/2000
DP039	explode the Design Items for a Design Product	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000	10/10/2000	12/10/2000	12/10/2000	12/10/2000	12/10/2000
DP040	determine the list of valid Design Models during an interval for a Design Product	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000		11/10/2000		12/10/2000	
		REMARKS: blocked on domain expert response											
		REMARKS: Still blocked on 											
DP041	determine if a Design Model contains any complex Design Items	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000	10/08/2001	12/10/2000	12/10/2000	12/10/2000	12/10/2000
DP042	determine if a Design Item is complex	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000	10/10/2000	12/10/2000	12/10/2000	12/10/2000	12/10/2000
DP043	explode the Design Items for a simple Design Model	03/10/2000	03/10/2000	05/10/2000	06/10/2000	06/10/2000	09/10/2000	10/10/2000	10/10/2000	12/10/2000	12/10/2000	12/10/2000	12/10/2000
DP044	explode the Design Items for a simple reversible Design Model												
DP045	explode the Design Items for a complex Design Model with one complex Design Item												
DP046	list the Design Models for a complex Design Item												
DP047	explode the Design Items for a complex Design Model with two complex Design Items												
DP048	select each combination of a Pair of Design Model Lists												
DP049	generate an Exploded Item List for a combination selection												
DP050	record the Exploded Item List for a Design Model												
DP051	recall the Exploded Item List for a Design Model												
DP052	explode the Design Items for a complex Design Model with multiple complex Design Items												
DP053	iterate through each combination of multiple Design Model Lists												
DP054	select each combination in user specified order of multiple Design Model Lists												

Progress sum for these features in business activity 'Explode Design Model': 39%
Expected completion date: **Feb 2001**

Actual Data

Plan View - Example For Red



Engine-Room Processes

Resources

- ▶ www.featuredrivendevelopment.com

discussions, articles, FDDI (FDD interchange) specification and XML schema, photos and artwork, ...