Feature-Driven Development

An Overview

No Silver Bullet

What is the system I am building?

Why FDD?

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

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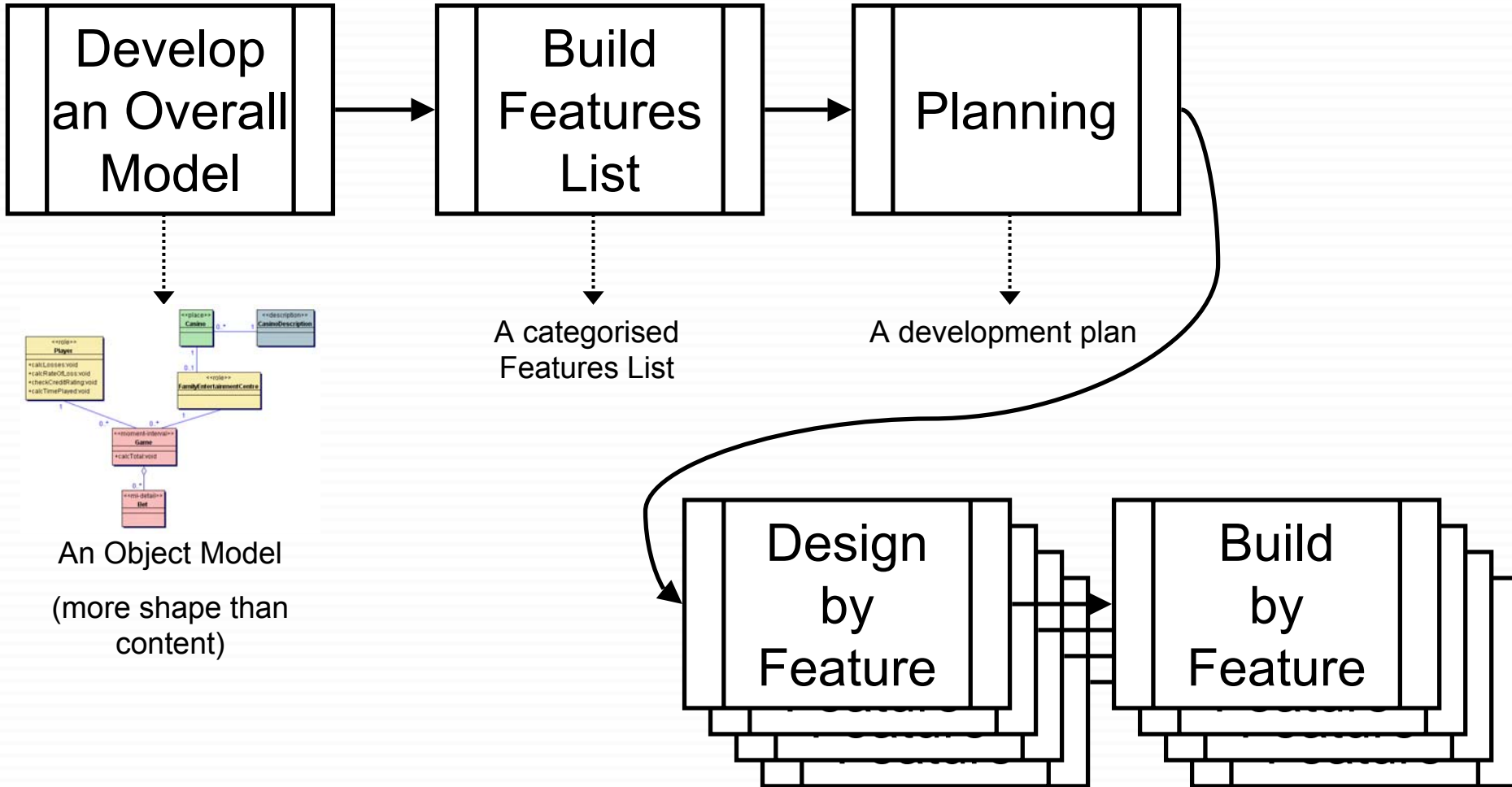**\<action\> the \<result\> \<by|for|of|to\> a(n) \<object\>**

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

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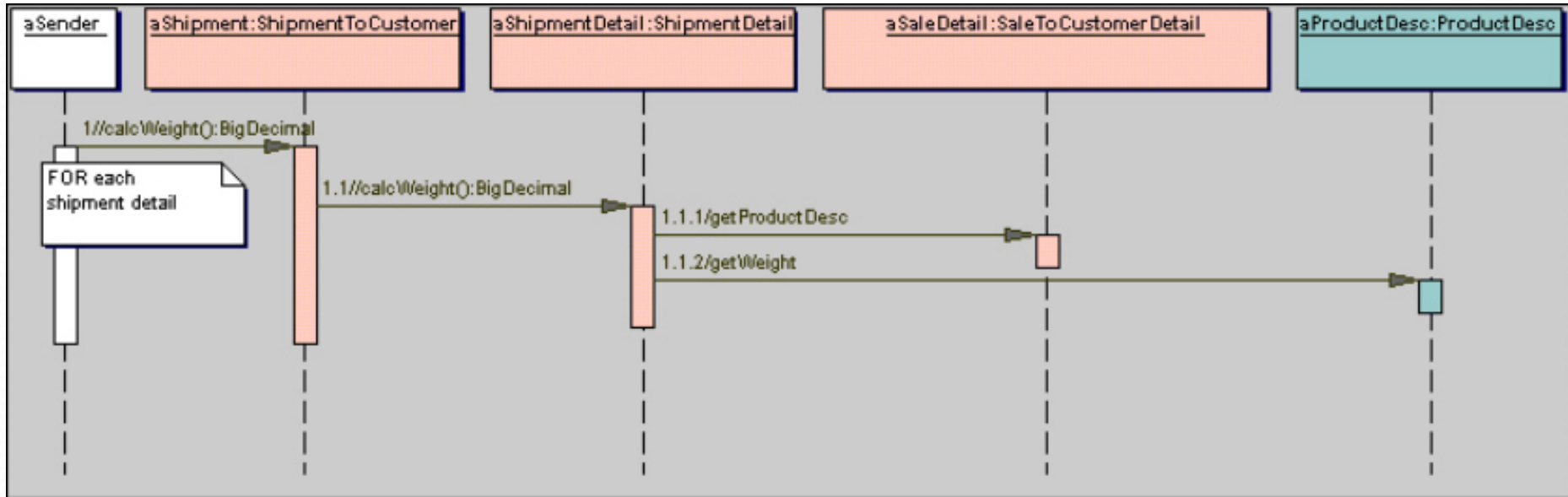
```
Develop
an Overall    →    Build
Model               Features    →    Planning
                    List
```


An Object Model

(more shape than content)

A categorised
Features List

A development plan

Design
by
Feature

→

Build
by
Feature

calcWeight sequence from ProductSaleMgmt.ShipmentToCustomer
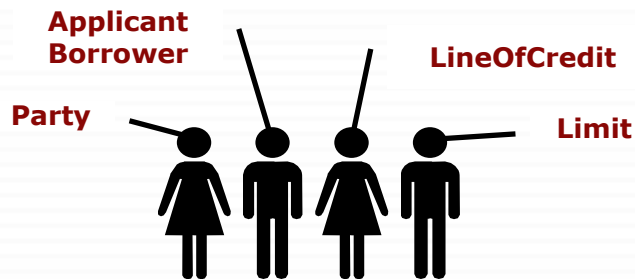Java Modeling in Color with UML: Enterprise Components and Process
ISBN 0-13-011510-X

ObligorGroup
CustomerGroup

Limit

CreditSummary
CreditScrore

Application
ApprovalRequest

Overdraft
Mortgage

LineOfCredit
FinancingPackage

CreditCard
Guarantee

Applicant
Borrower

FinancialStatement

Depositor
Customer

Party
Individual
Organisation

ProductCatalogue

SecurityCommitment
Property

Vehicle
Boat
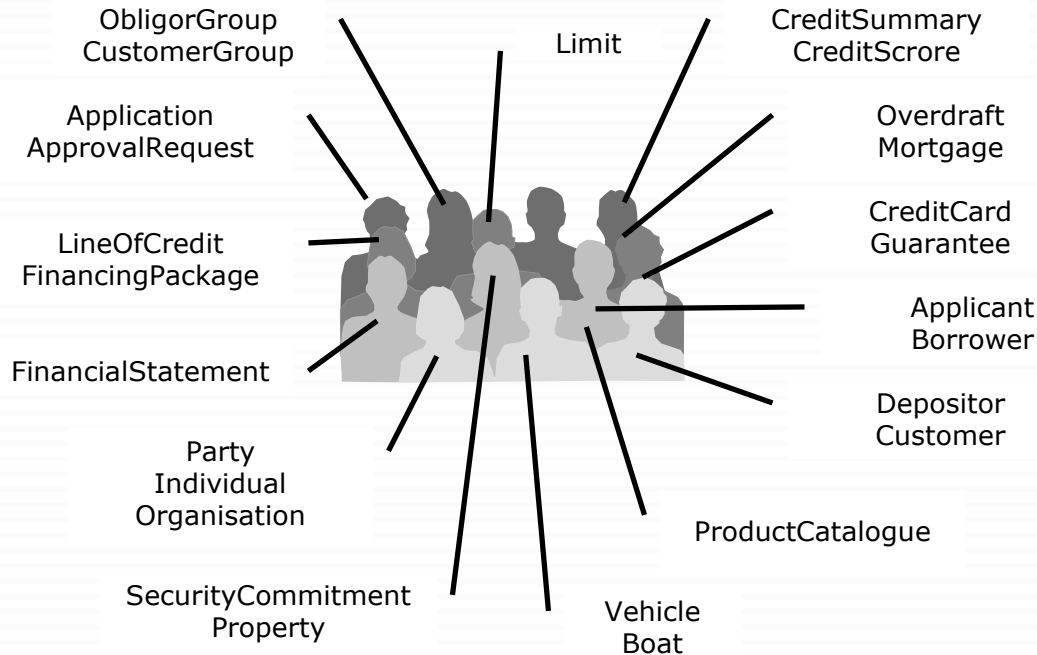
Total *the approved limits* of an applicant

**Applicant
Borrower**

LineOfCredit
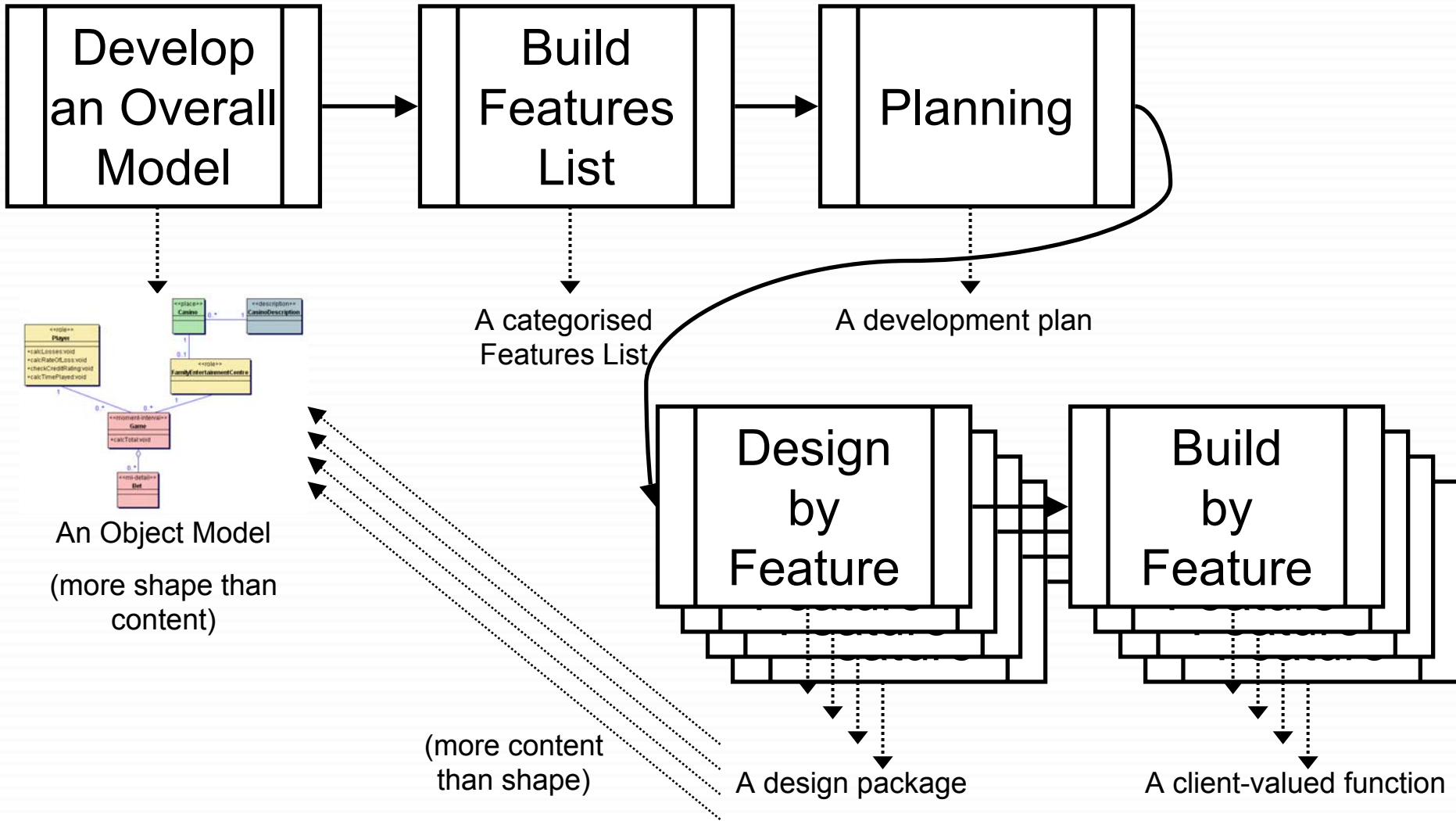
Party

Limit

- A pool of class owners

- Features assigned to CPs

- CP determines likely classes (using knowledge from process #1 and #2)

- Classes owned by developers

- Feature team dynamically forms

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```
[ Develop an Overall Model ]  →  [ Build Features List ]  →  [ Planning ]
        ↓                              ↓                          ↓
   An Object Model            A categorised            A development plan
                              Features List
   (more shape than
      content)
```

An Object Model

(more shape than content)

(more content than shape)

```
[ Design by Feature ]  →  [ Build by Feature ]
        ↓                        ↓
  A design package        A client-valued function
```

"Milestones must be concrete, specific, measurable-events defined with a 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

Domain Walkthrough	Design	Design Inspection	Code	Code Inspection	Promote to Build

1%   40%   3%   45%   10%   1%
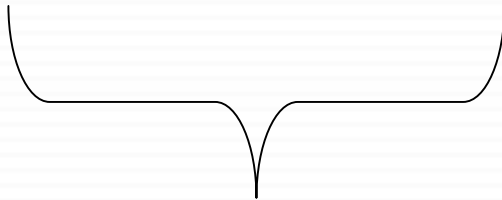
#4: Design by Feature   **#5: Build by Feature**
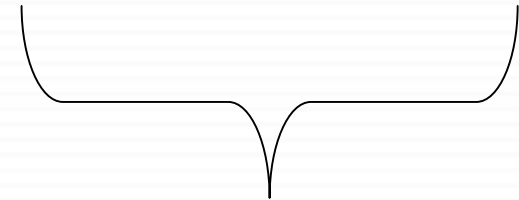
Milestones

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

Weekly Summary

Implementation (MD)

Feature Sets	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 a Loans, HP, LeasingLoans, BlockDiskcouting Line Impl.	7	0	0	0	7	0	100	Mar 1999
Establish a NIF RL Disbursement	8	6	0	0	2	1	25	Mar 1999
Establish a Trade or Gtee Line Implementation	9	0	0	0	9	0	100	Mar 1999
Establish an FX Line Implementation	5	0	0	0	5	0	100	Mar 1999
Establish an OD Line Implementation	13	0	0	0	13	0	100	Mar 1999
New Feature	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

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Overall Status:

- Work in progress
- Attention (i.e., Behind Schedule)
- Completed
- Not yet started

Completion Percentage:

- Progress bar

Completion Status:

- Completed
- MY Targeted Completion Month

PS

Comply with Credit Policy (19)

75%

Nov 2000

Example:

Feature Set: Comply with Credit Policy Work in Progress

PS is the Chief Programmer's initials

(19) there are fourteen features that make up this feature set

Feature Set is 75% complete

Target is to complete in Nov 2000

Graphical Summary Example

Establish Application (AR)

Abort Application	Comply with MAS	Create Application	Register Application	Search for AFL	Validate AFL
SP	SP	SP	SP	SP	SP
(3)	(5)	(14)	(14)	(3)	(7)
100%	100%	100%	100%	100%	100%
May 1998	Aug 1998	May 1998	May 1998	May 1998	May 1998

Establish Facility (FA)

Establish FP	Establish Line
TSB	TSB
(5)	(34)
100%	100%
May 1998	May 1998

Commitment (SC)

Associate to FP	Associate to Line	Establish Commitment
PS	PS	PS
(6)	(3)	(123)
100%	100%	100%
Jul 1998	Jul 1998	Jul 1998

Establish Approval (AA)

Approving an AFL	Comply with Credit Policy	Comply with MAS HLD	Comply with MAS S29	Comply with MAS S34	Comply with MAS S757	Establish CLS User	Generate CAS	Routing for Approval
PR	P S	PS	PS	PS	PS	SP	PR	PR
(22)	(19)	(10)	(33)	(3)	(4)	(13)	(85)	(18)
100%	100%	100%	100%	100%	100%	100%	100%	100%
Oct 1998	Oct 1998	Oct 1998	Oct 1998	Oct 1998	Oct 1998	May 1998	Oct 1998	Sep 1998

Waivers (WR)

Request Waiver
(6)
Oct 1998

Establish Credit Evaluation (CR)

Establish Comments and Recommend	Establish Debt/Equity	Establish Financial Stmts	Establish Funds Flow Stmts	Establish Rel with Other Bank
PS	PS	PS	PS	PS
(130)	(5)	(90)	(11)	(5)
100%	100%	100%	100%	100%
Nov 1998	May 1998	Nov 1998	Aug 1998	Jul 1998

Establish Party (RM)

Establish Details	Establish Financials	Establish Relationships
PR	PR	PR
(61)	(46)	(39)
100%	100%	100%
Jun 1998	Sep 1998	Aug 1998

Outsource

Generate Documents	Terms and Conditions	ToDoList
TSB	SP	NSC
65%	100%	100%
Feb 1999	Sep 1998	Sep 1998

Implementation (MD)

Authorisation	Change Current Account for OD Line	Establish Disbursement Details	Establish Implementation Instruction	Establish Line Implementation Details	Establish a Loans, HP,LeasingLoans, BlockDiskcouting Line Impl.	Establish a NIF RL Disbursement	Establish a Trade or Gtee Line Implementation MD004	Establish a FX Line Implementation	Establish an OD Line Implementation MD002
SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
(15)	(12)	(35)	(27)	(21)	(7)	(8)	(9)	(5)	(13)
		77%	69%	89%	100%	17%	100%	100%	100%
Mar 1999	Mar 1999	Mar 1999	Mar 1999	Mar 1999	Mar 1999	Mar 1999	Mar 1999	Mar 1999	Mar 1999

Trends

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

PD Completed Features on a Weekly basis
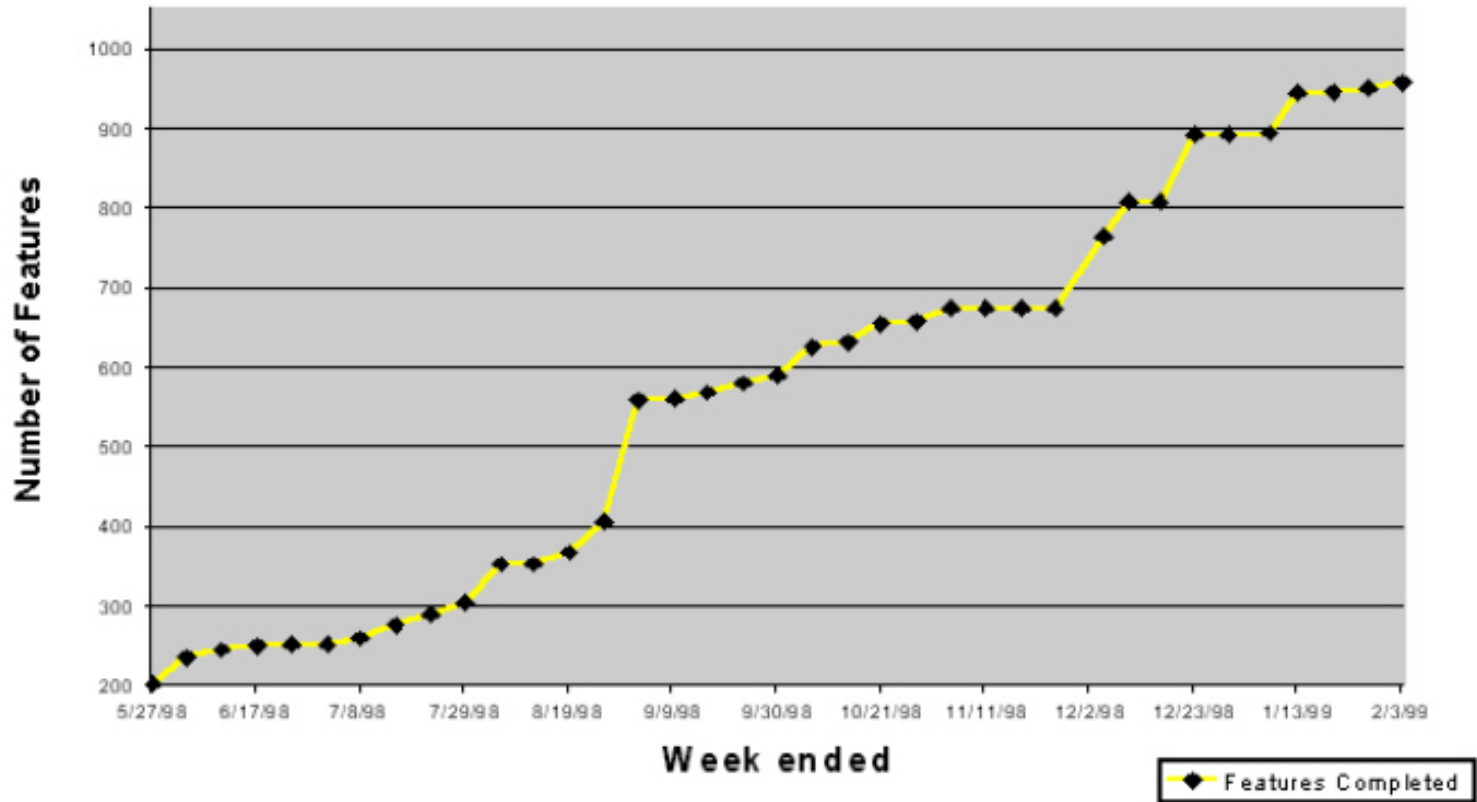
Comply with Diversity Constraints (13)

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, site type hubbing priority, node type hubbing priority, 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**

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Features - Plan View

Implementation (MD)

Authorisation (9)

Id	Description	Chief Prog.	Class Own.	Walkthrough		Design		Design Inspection		Code		Code Inspection		Promote to Build	
				Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
MD125	validate *the transactional limits of a CAO against* an implementation instruction	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	10/02/99		18/02/99		20/02/99	
MD126	set *the status of an* implementation instruction	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	10/02/99		18/02/99		20/02/99	
MD127	specify *the authorising officer of an* implementation instruction	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	10/02/99		18/02/99		20/02/99	
MD128	reject *an implementation instruction authorisation for a set of lines*	CP	ABC	STATUS: Inactive REMARKS: [added by CK: 3/2/99] No longer applicable											
MD129	confirm *an implementation instruction authorisation for a set of lines*	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	10/02/99		18/02/99		20/02/99	
MD130	determine *if all documents are completed for a borrower*	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	05/02/99		08/02/99		10/02/99	
	REMARKS: [added by SL: 3/2/99] Blocked on AS														
MD131	validate the *transactional limits of a CAO against a* disbursement instruction	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	05/02/99		08/02/99		10/02/99	
	REMARKS: [added by SL: 3/2/99] Behind schedule - sick leave														
MD132	submit *for authorisation an* implementation instruction	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	05/02/99	05/02/99	06/02/99	06/02/99	08/02/99	08/02/99
MD133	validate the *drawdown date of an* implementation instruction	CP	ABC	23/12/98	23/12/98	31/01/99	31/01/99	01/02/99	01/02/99	05/02/99	05/02/99	06/02/99	06/02/99	08/02/99	08/02/99

Progress sum for these features in (business) activity "Authorisation": 55%

Expected completion date: Mar 1999

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Develop an Overall Model → Build Features List → Planning

An Object Model

(more shape than content)

A categorised Features List

A development plan

(more content than shape)

Design by Feature

Build by Feature

A design package

A client-valued function