Microsoft Israel R&D Center

Building and Running Successful Product Development Teams

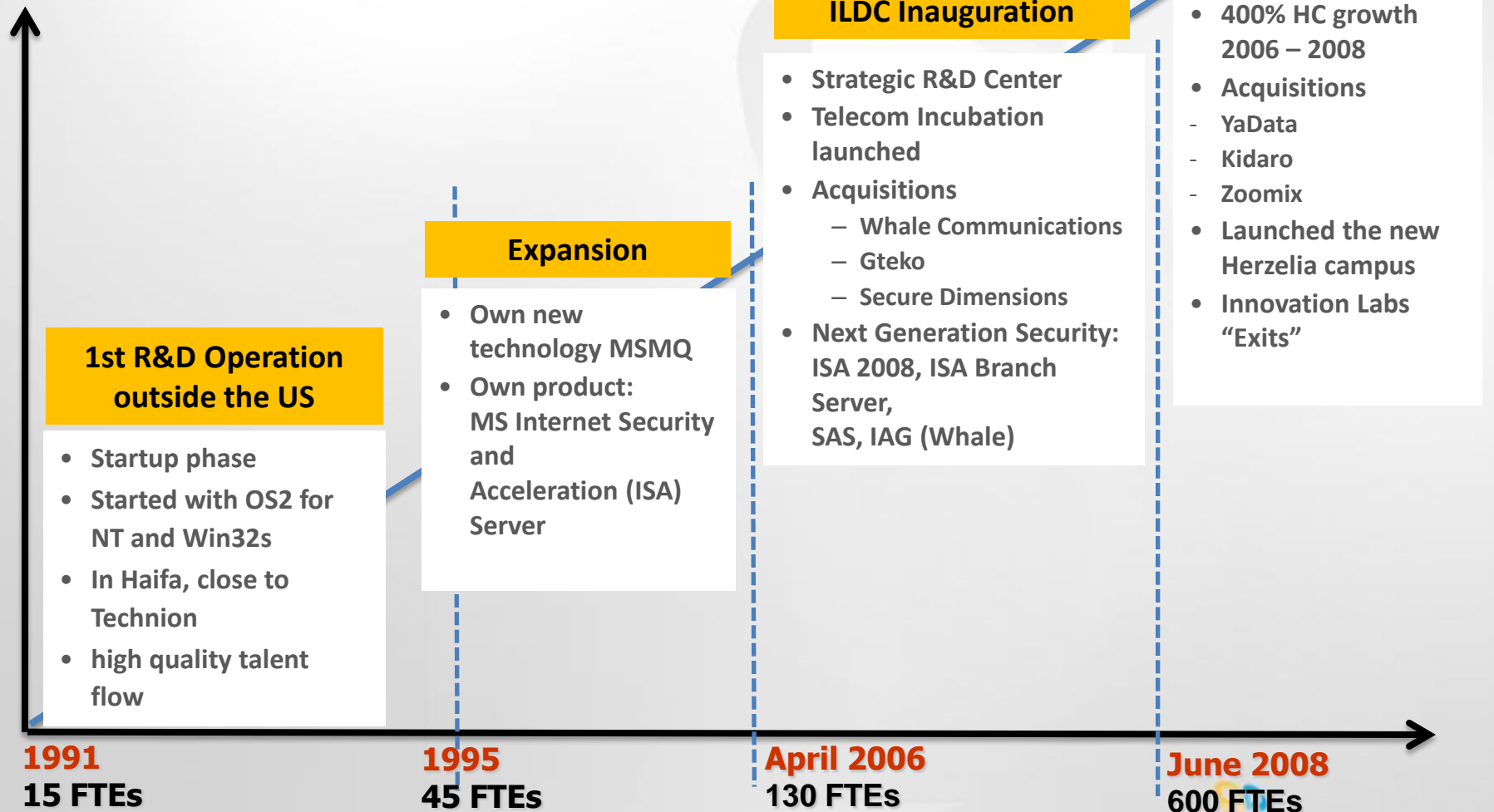Yoram Yaacovi, CTO & GM Technologies

Microsoft Israel Development Center

THE FUTURE
IN YOUR HANDS

Based in part on the book "Organizing Genius" by Warren Bennis and on work by Eran Yariv

ILDC Milestones

ILDC Development

- 3 Focus areas: Security, Telecom, Innovation Labs
- 400% HC growth 2006 – 2008
- Acquisitions
- YaData
- Kidaro
- Zoomix
- Launched the new Herzelia campus
- Innovation Labs "Exits"

ILDC Inauguration

- Strategic R&D Center
- Telecom Incubation launched
- Acquisitions
  - Whale Communications
  - Gteko
  - Secure Dimensions
- Next Generation Security: ISA 2008, ISA Branch Server, SAS, IAG (Whale)

Expansion

- Own new technology MSMQ
- Own product: MS Internet Security and Acceleration (ISA) Server

1st R&D Operation outside the US

- Startup phase
- Started with OS2 for NT and Win32s
- In Haifa, close to Technion
- high quality talent flow

1991
15 FTEs

1995
45 FTEs

April 2006
130 FTEs

June 2008
600 FTEs

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ILDC Milestones (Cont.)

ILDC Stabilization

- **3 Focus areas: Security, Telecom, Online**
- **14 products in Development (12 V1)**
- **Products RTMs (MSE, SMS, MCP,...)**
- **Acquisition of 3DV IP, investment in N-trig**
- **Research Activity**
- **More Innovation Labs "Exits"**

May 2010
550 FTEs

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Agenda

Building and Running Successful Teams*

Product Development At Microsoft

Q&A

Summary

Based in part on the book "Organizing Genius" by Warren Bennis

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Great Groups of the 20th Century

- Troupe Disney

- Xerox PARC

Why Did They Succeed?

- The Bill Clinton Presidency Campaign

- The Manhattan Project

- The Black Mountain Experiment

- The Skunk Works

- Microsoft Windows 95

- Microsoft eBooks Project

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An Environment for Innovation

- Irrationally optimistic and unrealistic
- Driven by Curiosity
- People feel safe to fail
- Go against a "larger than life" enemy
- Characteristics: Laughter, Slogan T-Shirts, Easter eggs, Rituals and "historic" moments, Secretive
- Talented people that are not easily led
- Lack of Experience is an asset, not a liability (*Seymour Cray*)
- Everyone can make a substantial impact
- Manage *for* Creativity

"We encouraged people to work imaginatively, to improvise and try unconventional approaches to problem solving, and then got out of their way"
– Ben Rich, Skunk Works 2nd project manager

"Is management net positive or net negative for creativity? If there's a bottleneck in organizational creativity, might it be at the top of the bottle?"
– Scott Cook, Intuit Founder

Recruiting

- Recruiting is always the most important task of the Leader
- Quality vs. Quantity
  - "You can't pile together enough good people to make a great one" – (Bob Taylor, the leader of PARC)
- Lack of Experience is an asset, not a liability (*Seymour Cray*)
  - Experience tends to make people more realistic, and that's not necessarily a good thing
- Being a part of an Elite
  - The selection process itself builds the group
  - Being asked to join is an honor
- Hire your own "assassins"

Microsoft

- Windows 95
  - An operating system that directly affected the lives of hundreds of millions of people
  - Great Group characteristics
    - An enemy: OS/2 and Windows NT
    - The very active involvement of users/customers
    - Young, informal and talented team
    - The feeling that they are about to change the world
- eBooks
  - Software for reading devices that were not a commercial success
  - But still had tremendous success due to
    - Breakthrough technologies: Digital Rights Management (DRM)
    - Improved Readability with ClearType and Reading Layout
  - Great Group characteristics:
    - An enemy: Adobe
    - Empowerment of people
    - Innovation: more than 70 patents by a relatively small team
    - Collaboration
    - Absolute focus

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Product Development Teams – Key Points

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- **Thanks**: Celebrate and create rewards for shipping products or creating intellectual property

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Microsoft Product Cycle Model

- Combines best elements of Waterfall and Agile
- Created by Microsoft for Product Development Teams
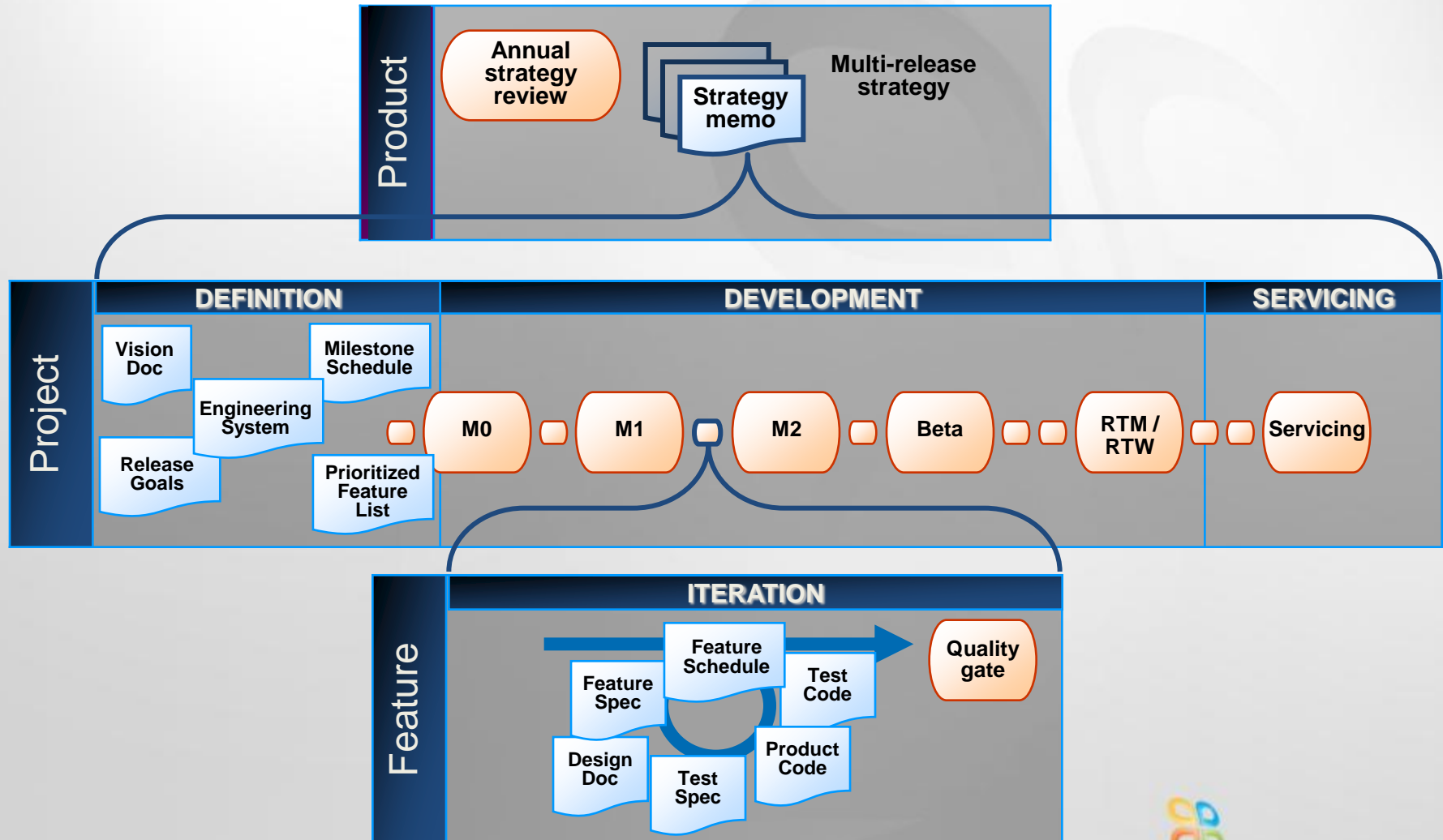- Reflects the reality of making software at Microsoft

- *Agile Development Model*
  - Test often
  - Deliver functional bits of the application as soon as they're ready.

- *Waterfall Development Model*
  - Think Aircrafts
  - Low flexibility
  - Suited to low risk feature sets & performance requirements
  - Well designed for budget & scheduling control

Software PLC workflow

Product
- Annual strategy review
- Strategy memo
- Multi-release strategy

Project

DEFINITION	DEVELOPMENT	SERVICING

- Vision Doc
- Milestone Schedule
- Engineering System
- Release Goals
- Prioritized Feature List

M0 — M1 — M2 — Beta — RTM / RTW — Servicing

Feature

ITERATION
- Feature Spec
- Feature Schedule
- Test Code
- Design Doc
- Test Spec
- Product Code
- Quality gate

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Major Roles

- Product Marketing Manager – product, price, placement
- Program Manager – write specs, project management
- User Experience Design – create user experience, look and feel
- Software Design Engineer – technical design, write code, fix bugs
- Software Design Engineer in Test – design and code test automation
- Software Test Engineer – verify code against design
- Localization – manage worldwide releases
- User Assistance – write/edit text, docs, and help
- Usability – conduct lab and field research
- Operations – manage web services

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Phases of the PCM

PRODUCT CYCLE MODEL

Planning Phase

Marketing
Evaluates market opportunities, determines customer requirements, and identifies key user scenarios
• **Market opportunity document**
• **Market requirements document**
• Brand architecture decisions

Program management
Determines product vision and identifies features
• **Product vision statement**
• **Product vision document**
• Preliminary functional specs

Product design / Usability
Generates basic conceptual designs that explore the product's UI
• Storyboards or rough prototypes

Development / Test
Investigates processes, technologies, and tools

User assistance
Begins the user assistance plan

Localization
Begins the localization plan

Service operations
Reviews potential user traffic estimates and begins to plan infrastructure for deployment

Design Phase

Marketing
Provides feedback on features sets and designs
• **Branding strategy recommendation**

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Completes specifications and master schedule; conducts user visits and other design research
• **Functional specs**
• **Final schedule**

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Creates iterations and prototypes of the UI design

Usability
Completes usability testing on feature prototypes

Development
Finalizes technology decisions
• **Architecture specs**

Test
• **Master test plan**

User assistance
• **UA functional specs**
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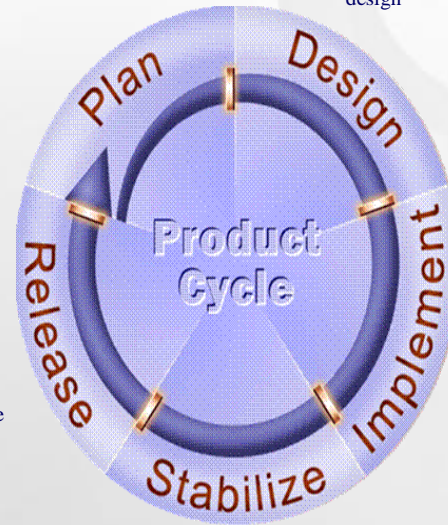• **Content plans**

Localization
Prepares for localization work
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Service operations
Reviews specs and other plans
• **Operations plan**

Implementation Phase

Marketing
Finalizes positioning and messaging, and prepares for product launch
• **Marketing plan**

Program management
Refines and updates functional specs and leads the team through each milestone

Product design
Creates the user interaction elements

Usability
Performs usability testing on prototypes and features as implemented

Development
Writes code and fixes bugs
• **Code complete**
• **Visual freeze**
• Unit tests

Test
Validates functionality

User assistance
Completes the documentation of features and UA content
• **UA content complete**

Localization
Begin product localization work

Service operations
Prepares the server environment

Stabilization Phase

Marketing
Finalizes packaging, promotion, PR, and advertising plans
• **Marketing beta**

Program management
Facilitates triage committee meetings and coordinates beta releases

Product design
Find and fix UI bugs

Usability
Run benchmark studies

Development
Fix bugs
• **Technical beta**
• **RC0**

Test
Validate the product as an entity

User assistance
Conduct legal, privacy, and security reviews

Localization
Continue product localization

Service operations
Begin testing deployment

Release Phase

Marketing
Executes on marketing plan

Program management
Continues to facilitate triage meetings and coordinates release candidates and final product

Product design
Begins planning for the next version

Usability
Conducts field research and prepares for the next version

Development
Builds release candidates and final code
• **RTM/RTW/RTO**

Test
Verifies the stability of the release candidates and final code

User assistance
Finalizes content and begins planning for the next version
• **Final documentation**

Localization
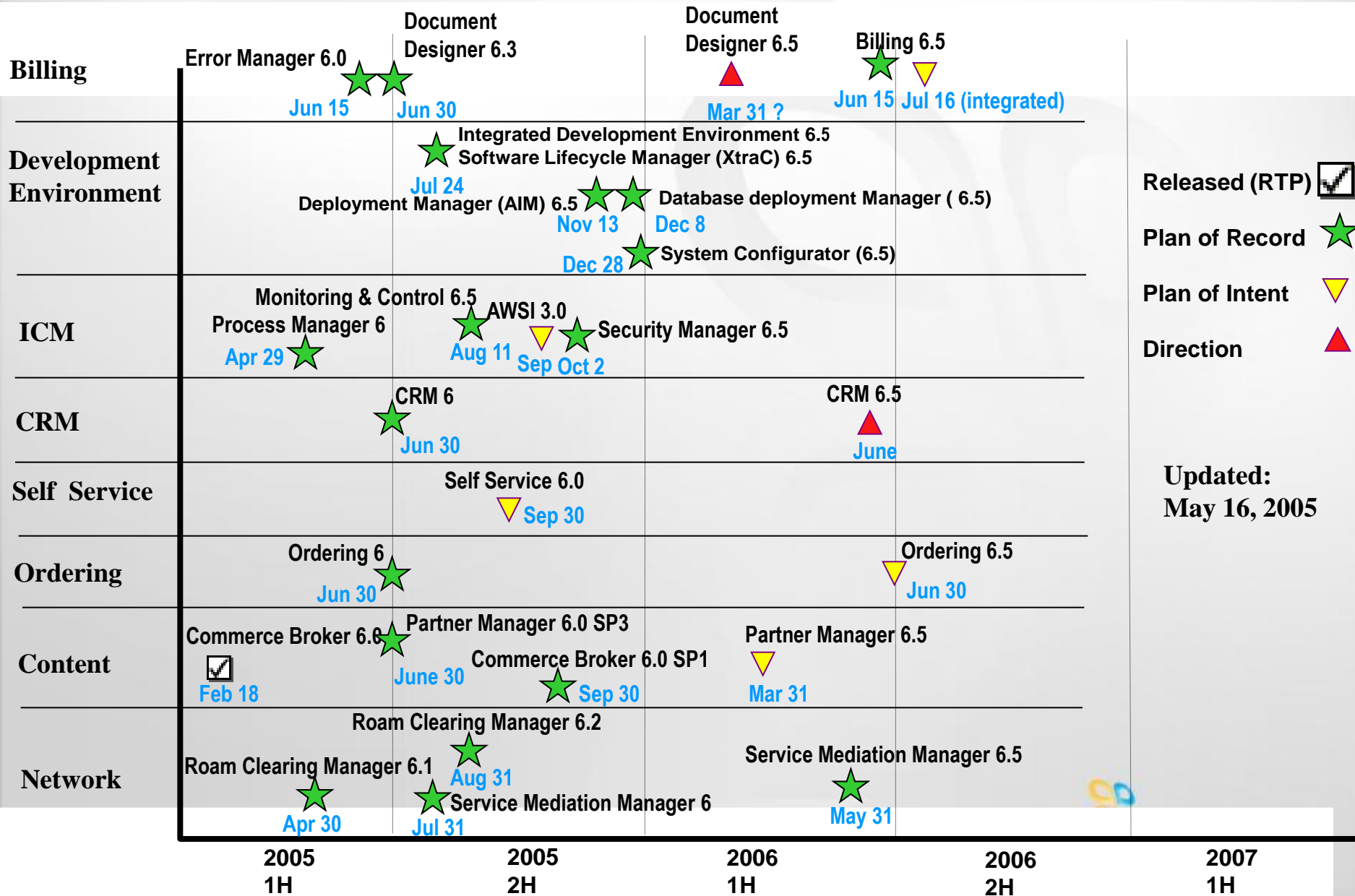Finalizes product localization, including release candidates

Service operations
Posts release candidates and final code to servers

Plan · Design · Implement · Stabilize · Release

Product Cycle

Microsoft **Engineering Excellence**

Exit Criteria for each phase in **bold**.
For more details, see the Engineering Excellence Guide, http://eeg.

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Example: Amdocs Products Timeline

Billing
- Error Manager 6.0 — Jun 15
- Document Designer 6.3 — Jun 30
- Document Designer 6.5 — Mar 31 ?
- Billing 6.5 — Jun 15
- Jul 16 (integrated)

Development Environment
- Integrated Development Environment 6.5 — Jul 24
- Software Lifecycle Manager (XtraC) 6.5
- Deployment Manager (AIM) 6.5 — Nov 13
- Database deployment Manager (6.5) — Dec 8
- System Configurator (6.5) — Dec 28

ICM
- Monitoring & Control 6.5
- Process Manager 6 — Apr 29
- AWSI 3.0 — Aug 11
- Security Manager 6.5 — Sep / Oct 2

CRM
- CRM 6 — Jun 30
- CRM 6.5 — June

Self Service
- Self Service 6.0 — Sep 30

Ordering
- Ordering 6 — Jun 30
- Ordering 6.5 — Jun 30

Content
- Commerce Broker 6.0 — Feb 18
- Partner Manager 6.0 SP3 — June 30
- Commerce Broker 6.0 SP1 — Sep 30
- Partner Manager 6.5 — Mar 31

Network
- Roam Clearing Manager 6.1 — Apr 30
- Roam Clearing Manager 6.2 — Aug 31
- Service Mediation Manager 6 — Jul 31
- Service Mediation Manager 6.5 — May 31

Legend:
- Released (RTP) ☑
- Plan of Record ★
- Plan of Intent ▽
- Direction ▲

Updated: May 16, 2005

Timeline: 2005 1H | 2005 2H | 2006 1H | 2006 2H | 2007 1H

Example: Office Product Development Lifecycle

Definition

Servicing

Planning	Design	Implementation	Verification	Release	Servicing
Define and research planning areas	Build Prototypes	Develop features*	Test the product	Test and triage	Conduct post-mortem
Deliver **High-level Schedule**	Perform Usability Studies	Determine branding and SKUs	Triage and fix bugs	Release Candidates	Support customers
Set up Project Infrastructure	Write One-Page Specs	Manage dependencies	Develop DCRs	Run ship quality tests	Update online help
Deliver **Team Investment Areas**	Prioritize Features	Integrate and stabilize milestone code	Host Partner Programs	Deliver **Golden File Tree**	Analyze Watson and SQM data
	Deliver **Discipline Plans**	Conduct milestone mini-mortems	Release **Betas**	Deliver **Sustained Engineering Transition Checklist**	Release **Hotfixes** and **Service Packs**
		Rebalance schedules	Audit code for TWC		Incorporate feedback into the next design
Vision Document	**Initial Team Schedules**	**Dogfood Release**	**Declare RC0**	**Release to Manufacturing**	**End of Support**

*Feature Development

Planning	Implementation	Verification
Start Feature Crew	Deliver **Feature Code**	Perform Code review
Deliver **Feature Specification**	Deliver Test Automation	Run check-in tests
Deliver **Dev Design Doc**		Test code on a private release build
Deliver **Test Design Spec**		Check code into main branch
Deliver **Detailed Feature Schedule**		
Spec Inspection	**Check-in Test**	**Feature Crew Signoff Build Verification Test**

Note: bottom box is a major deliverable or checkpoint

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Amdocs Products – Gates Status

Dev. Unit	Product Version	SRR	MRR	BRR	TRR	RTP
Billing	Billing	2-Sep-04	12-Jan-05	16-May-05	Jan 06	31-May-06
	Document Designer	May 05	TBD	TBD	TBD	TBD
	Error Manager	TBD	TBD	TBD	TBD	TBD
	Discount Engine & Customer Hierarchy	TBD	TBD	TBD	TBD	TBD
ICM	Security Manager	NA	3-Feb-05	3-Apr-05		2-Oct-05
	Web Services Infrastructure	NA	27-Feb-05	5-May-05		1-Aug-05
	Product Catalog	22-Feb-05	20-May-05	TBD	TBD	TBD
	Monitoring & Control	NA	3-Feb-05	4-Apr-05	20-Jun-05	11-Aug-05
CRM	CRM	2-6 04	May 05	TBD	TBD	TBD
	Process Manager	16-Feb-04	May 05	TBD	TBD	TBD
Self Service	Self Service	TBD	TBD	TBD	TBD	TBD
Ordering	Order Management System	23-Feb-05	10-May-05	TBD	TBD	Q2 - 06
Content	Partner Manager	20-Sep-04	22-Feb-05	31-Aug-05	TBD	31-Mar-06
	Commerce Broker	TBD	TBD	TBD	TBD	TBD
Network	Service Mediation Manager	NA	NA	21-Apr-05	31-Jan-06	31-May-06
	Roam Clearing Manager	TBD	TBD	TBD	TBD	TBD

Performed

Next Milestone

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Engineering Excellence: Drive Talent Development & Business Value

- **Talent development**
  - **Knowledge**: internally developed training curriculum for all engineering disciplines
  - **Resources**: [Best practices handbook](#)for the Software Development Lifecycle

- **Foster a "Pursue of Excellence" Culture**
  - **Annual award program** (*selecting innovative work*)
  - **Global annual Engineering Excellence forum** (*sharing information about best practices)*

- **Business value**
  - **Compliance**: security analysis and quality gates
  - **Tools**: shared internal tools to improve and accelerate development and testing processes

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Tools of the Trade at Microsoft - Development

- Source Management tool with rich history, branches and maintenance mode
- Bug Management tool with rich hierarchy and interface to the Source Management tool
- Build tools
- Analysis tools
  - Static code analysis tool to find suspected coding errors
  - Source Annotations Language (RPC's IDL/ASF)
  - Analyze managed code assemblies. Look for design, localization, performance, correctness and security improvements
- Unit Test: catch bugs early
- BVT: Build Verification Test
- Debugging tools
- Localization tools

* Many of these tools are gradually being replaced by Visual Studio Team Server

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Tools of the Trade at Microsoft - Test

- [Code coverage](#)
- Test Automation
- Specialty testing
  - Stress
  - Performance
  - Long run
  - Security

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Awarding Achievements

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Key Takeaways

Great Groups

- Start with Superb People
- Are optimistic and mission-focused
- Are fueled by a formidable competition/enemy
- Have leaders that give them what they need and free them from the rest
- Are collaborative places
- Ship

Successful Product development Teams

- Clarity of vision, focus, responsibility, milestones and deliverables
- Standard processes
- Empowerment of Feature teams
- The best tools of the trade

Thank You

Code Coverage
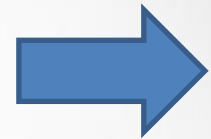
Also available in Visual Studio 2008 under Unit Test
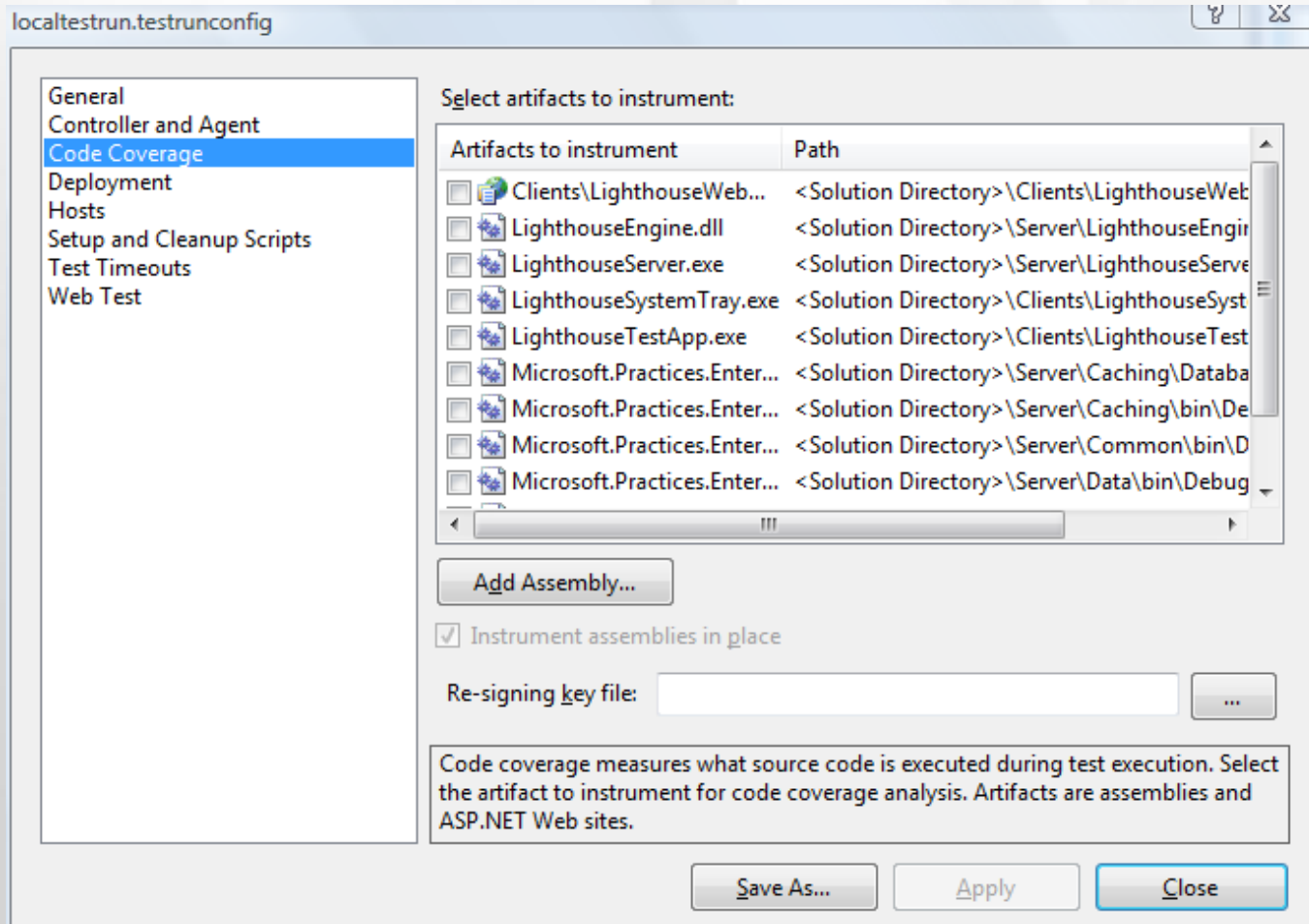
Engineering Excellence Handbook
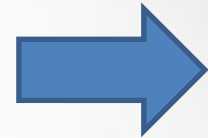
- Single location for documenting your engineering practices
- Highly Searchable

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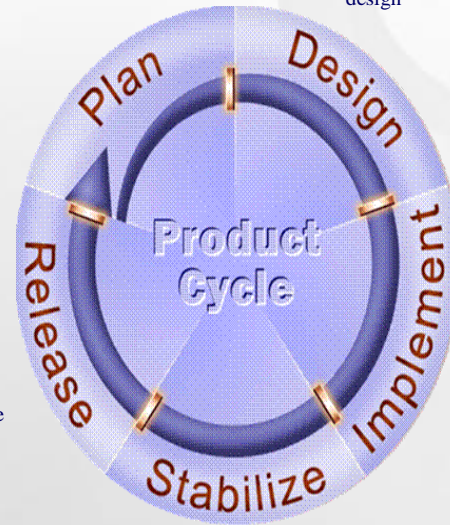• **Content plans**

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Release Phase

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Executes on marketing plan

Program management
Continues to facilitate triage meetings and coordinates release candidates and final product

Product design
Begins planning for the next version

Usability
Conducts field research and prepares for the next version

Development
Builds release candidates and final code
• **RTM/RTW/RTO**

Test
Verifies the stability of the release candidates and final code

User assistance
Finalizes content and begins planning for the next version
• **Final documentation**

Localization
Finalizes product localization, including release candidates

Service operations
Posts release candidates and final code to servers

Stabilization Phase

Marketing
Finalizes packaging, promotion, PR, and advertising plans
• **Marketing beta**

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Facilitates triage committee meetings and coordinates beta releases

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Find and fix UI bugs

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Begin product localization work

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Prepares the server environment

Plan · Design · Implement · Stabilize · Release

Product Cycle

Five requirements for an engineering system

1. Have a documented engineering system
2. Document the engineering system in alignment with one of the product life cycle models (Hardware, Software, or IT)
3. Demonstrate use of the mandatory and expected practices in the Microsoft governance model
4. Have an engineering system that can be viewed by employees
5. Have an engineering system with clear success metrics

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