



# A New Software Process for a Brand New Company

1<sup>st</sup> April - Seminar at UNINA

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# My Message to You Today

- The Perfect Software Process doesn't exist.
- Final Customers must drive your decisions.
- A New Company need a New Process...

...maybe with your help!

# Numonyx

- **GENEVA, March 31, 2008** – Numonyx B.V. officially became a new semiconductor company today, focusing on delivering innovative memory solutions using combinations of leading NOR, NAND and RAM memory technologies as well as new Phase Change Memory (PCM). The new company starts as the leading dedicated memory specialist serving customers who make a variety of consumer and industrial devices including cellular phones, MP3 players, digital cameras, ultra-mobile computers and other high-tech equipment.



# A Distinguished History, A Promising Future

- With 40 years of combined experience from Intel and STMicroelectronics, Numonyx is receiving a substantial worldwide patent portfolio from Intel and STMicroelectronics. The patents and applications cover a variety of technologies including flash memory and PCM, graphics, cell phones, storage media, processors, semiconductor manufacturing and packaging, and various consumer devices. Numonyx also brings a history of breakthroughs and milestones including seven generations of Multi-level Cell (MLC) technologies. “Our broad portfolio of intellectual property, patents and expertise will serve as the cornerstone for Numonyx,” continued Harrison. “We intend to build on this rich history with even more innovation.”
- Headquartered in Switzerland and incorporated in the Netherlands, Numonyx has approximately 7,000 employees worldwide with facilities in USA, Italy, China, Israel, Singapore, Malaysia, and Philippines. Bank financing for the new venture is being provided by Intesa Sanpaolo s.p.a and Unicredit Banca d'Impresa s.p.a.

# Software for Embedded and Wireless

# Embedded System

An **embedded system** is a special-purpose computer system, which is completely encapsulated by the device it controls. An embedded system has specific requirements and performs pre-defined tasks, unlike a general-purpose personal computer.

An **embedded operating system** is an operating system for embedded systems. These operating systems are designed to be very compact and efficient, forsaking many functionalities that non-embedded computer operating systems provide and which may not be used by the specialized applications they run.

<http://en.wikipedia.org>

# The Embedded Software Value Chain

- Who does What?
- What is an Original Equipment Manufacturer (OEM)?
- What is the Added Value that the OEM is selling?
- What is the Value Chain of the final product?

# Case Study 1: Nokia N96



## NOKIA product... but who does what?

- **OS:** Symbian
- **BSP:** CPU vendor (e.g. TI, STM)
- **Camera Driver:** vendor (e.g. STM, Micron)
- **Mass Storage Driver:** vendor (e.g. Numonyx)
- **Integration:** platform vendor (e.g. EMP)
- **Application:** Nokia



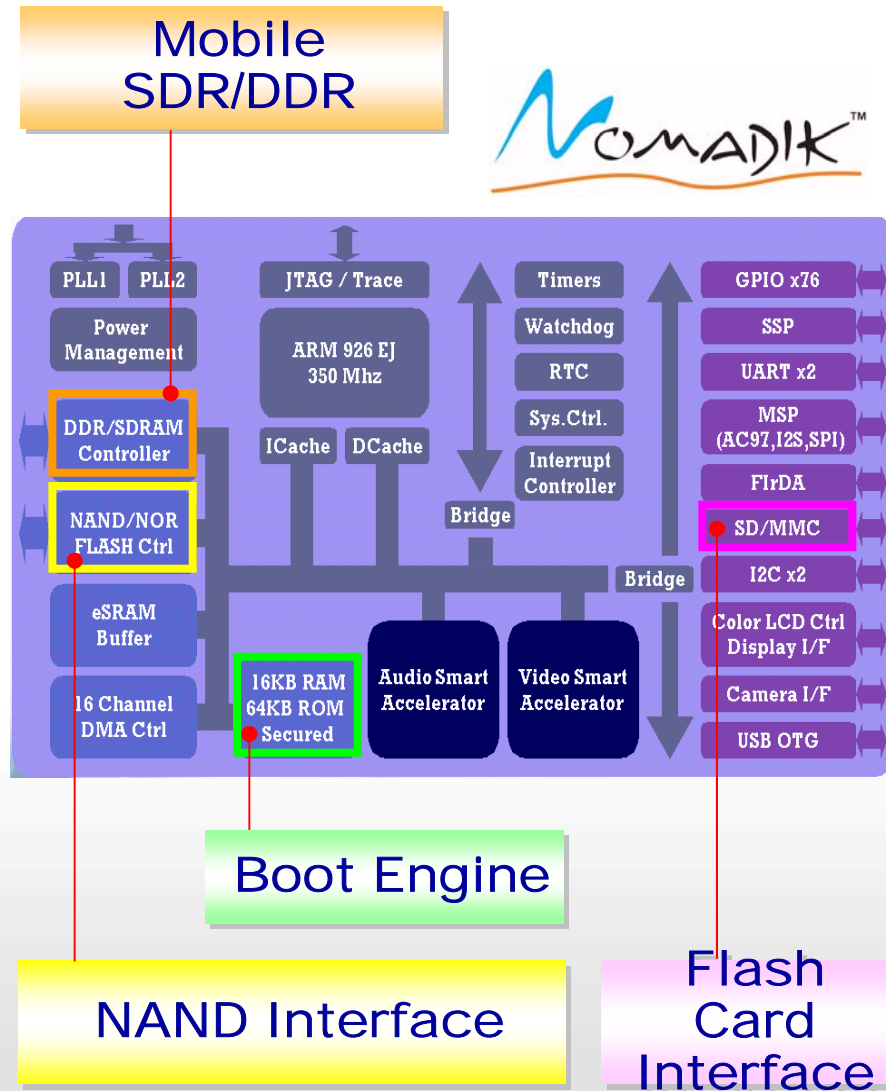
## Case Study 2: NAND Flash driver

Porting ***STM Flash Translation Layer*** in ***Symbian 9.1*** in order to:

- ✓ increase Wear Leveling performance;
- ✓ support all STM NAND Flash families.

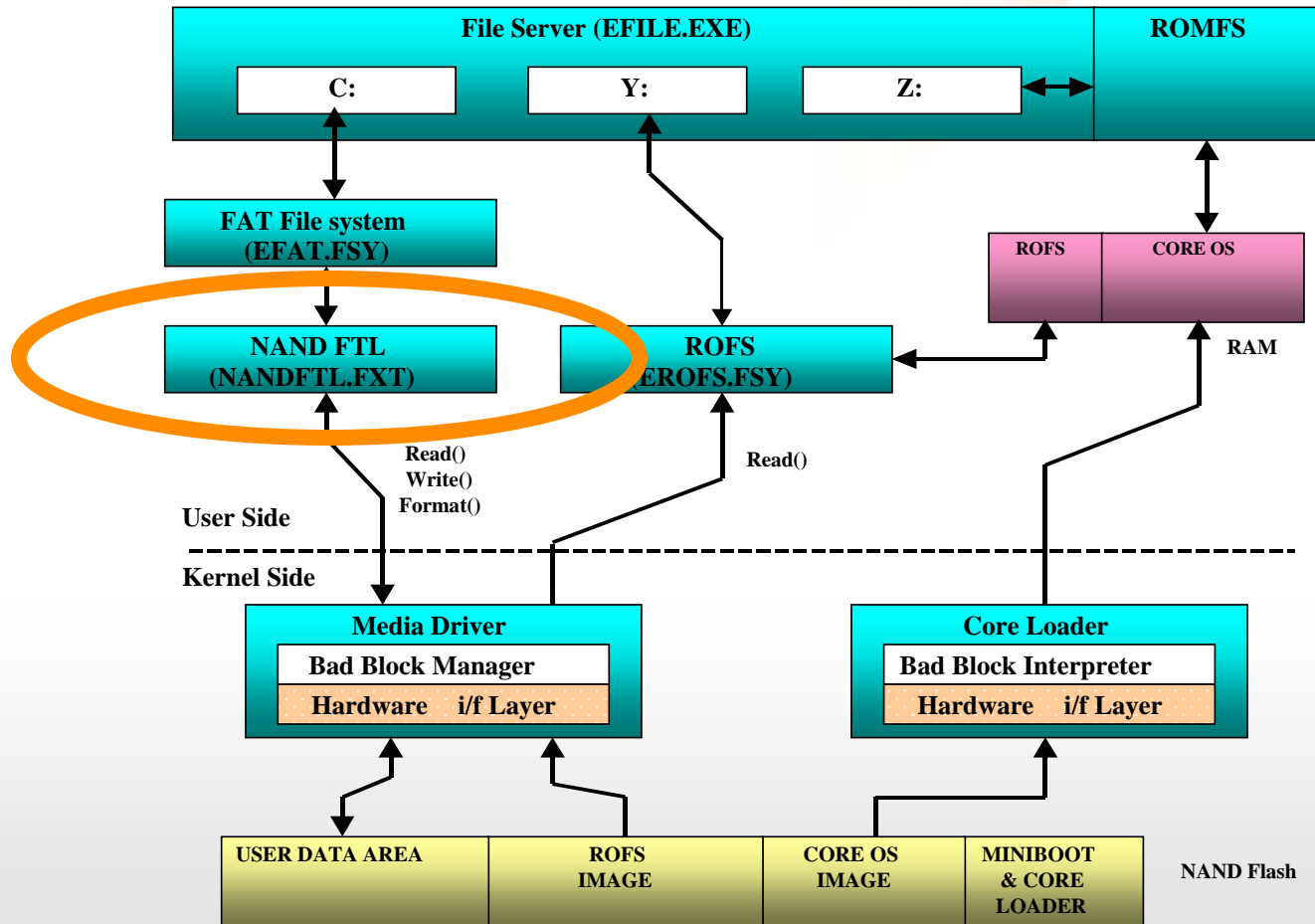
**symbian**

# Nomadik Architecture



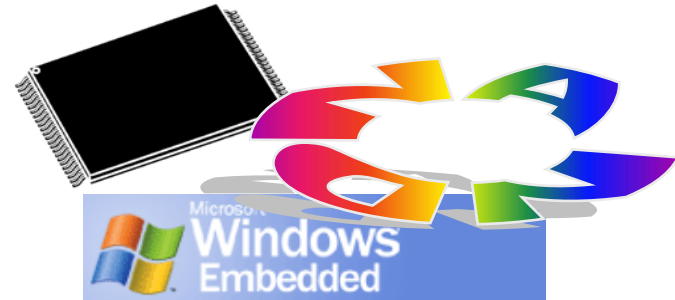
- **ARM926 CPU (350MHz)**
  - ◆ 32b RISC, 16b Thumb, Java, & MAC
- **SMART ACCELERATORS**
  - ◆ Audio DSP and Video HW+SW Hybrid
- **SYSTEM MEMORY**
  - ◆ 48KB RAM and 64KB ROM
- **MEMORY CONTROLLER**
  - ◆ 133MHz DDR-SDRAM / SDRAM
  - ◆ 133MHz FLASH (NAND & NOR)
- **PERIPHERAL SET**
  - ◆ Interfaces for Cameras & CMOS Sensors
  - ◆ USB OTG, MMC / SD / MS, LCD
- **SYSTEM & PERIPHERAL CONTROL**
  - ◆ DMAs, I-Controllers, Timers, RTC, JTAG
- **POWER MANAGEMENT UNIT**
  - ◆ RUN, IDLE, DOZE, SLEEP modes

# NAND Flash in Symbian : Architecture

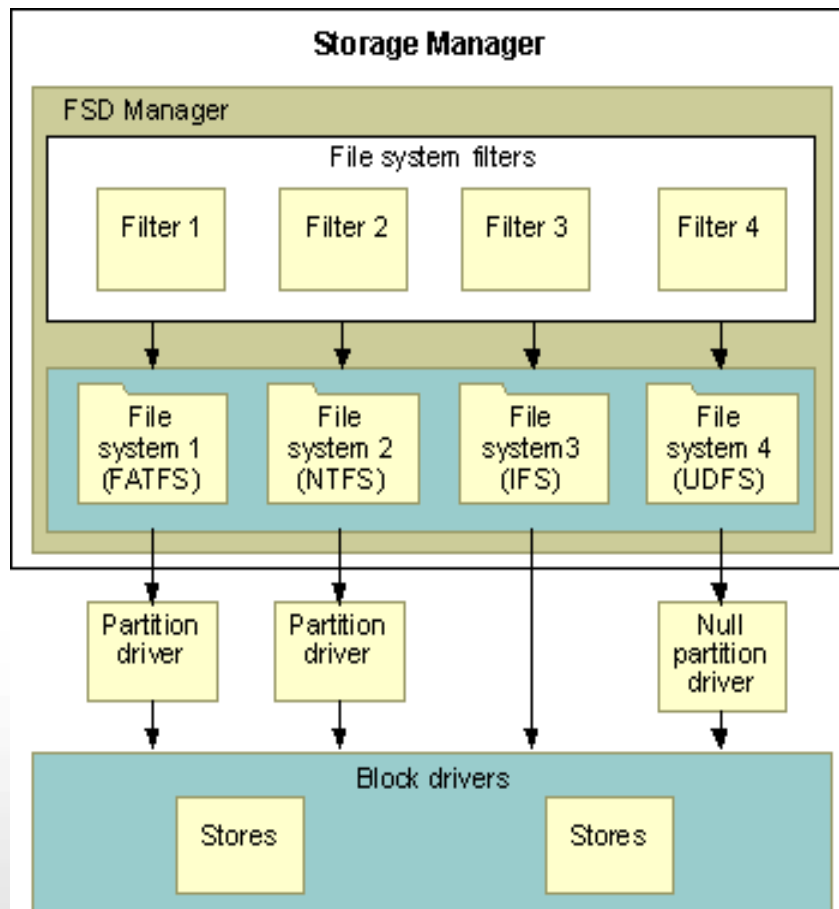


# Case Study: Win CE 4.2 Support

- ✓ Design, implementation and testing of a new driver for WinCE that can support all STM NAND Flash Memories.



# Storage Manager Architecture

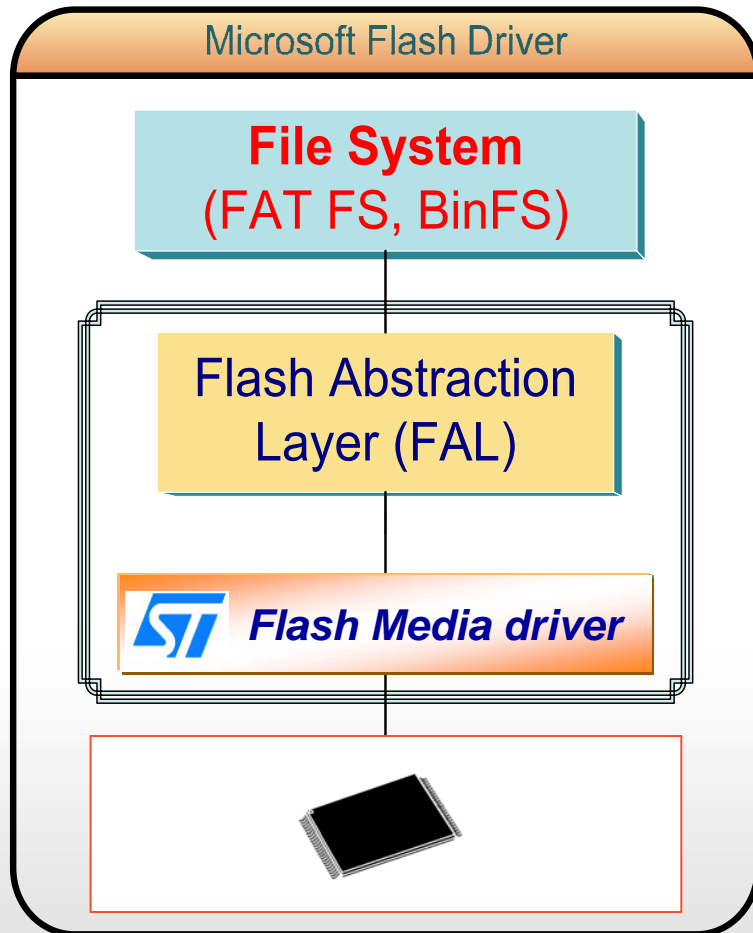


The **Storage Manager** filters the disk I/O. It traps any call and perform encryption, compression, and virus scanning before getting to the appropriate file system. Then, the file system sends commands to the **Partition Driver** or directly down to the **Block Drivers** for execution.

A **File System Filter** is a DLL that exports file system entry points. These entry points map to the standard file system functions, such as CreateFile and CreateDirectory.

The **Partition Manager** manages, loads, and unloads logical partitions on a storage device

# STM Solution



## *FMD Interface*

FMD_Init	FMD_Deinit
FMD_GetInfo	FMD_ReadSector
FMD_WriteSector	FMD_IsBlockBad
FMD_MarkBlockBad	FMD_EraseBlock
FMD_PowerUp	FMD_PowerDown
FMD_OEMIoControl	FMD_GetBlockInfo

# STMicroelectronics Development Process

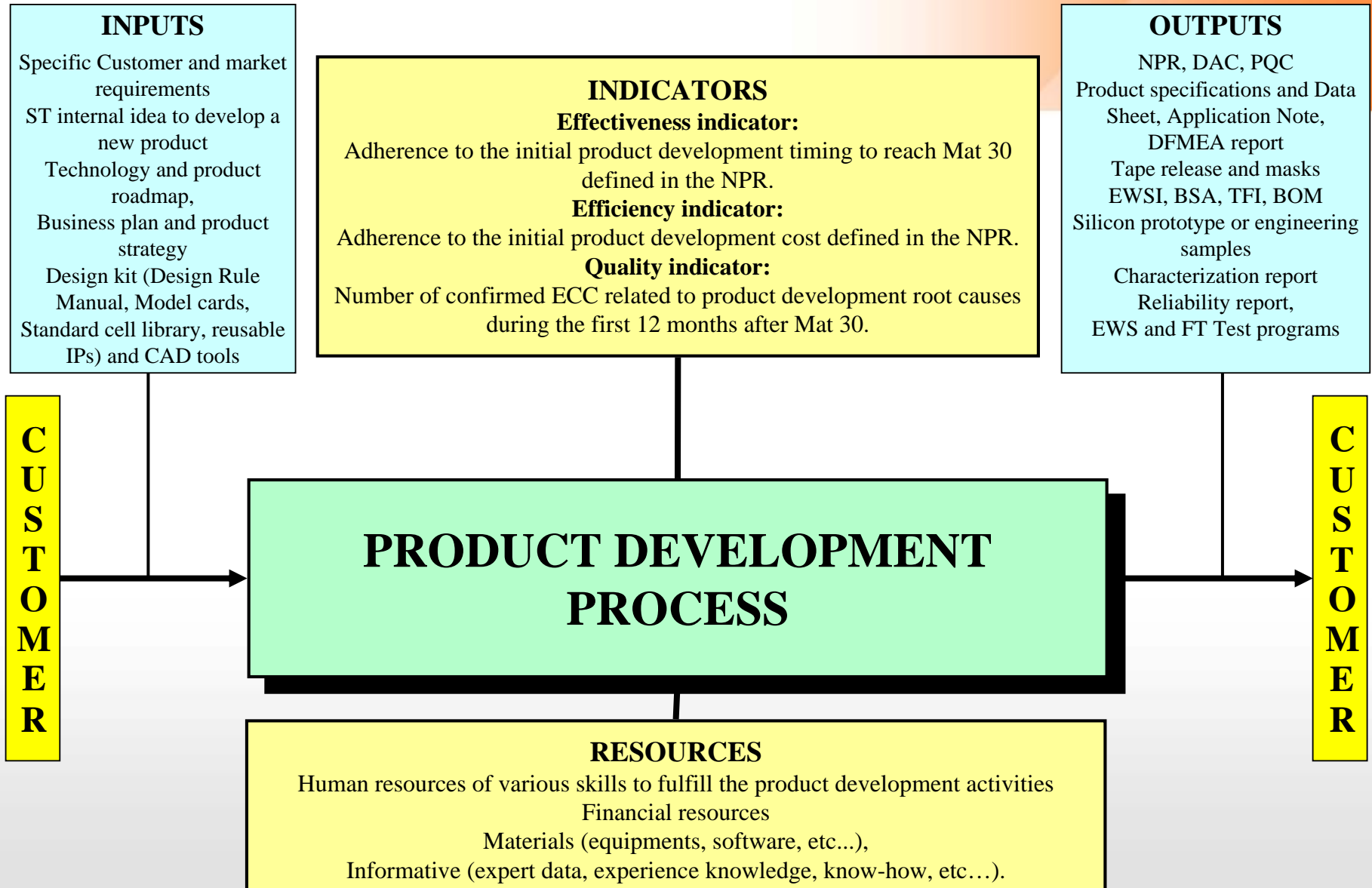
## Customer Focus

# STM: Company Profile

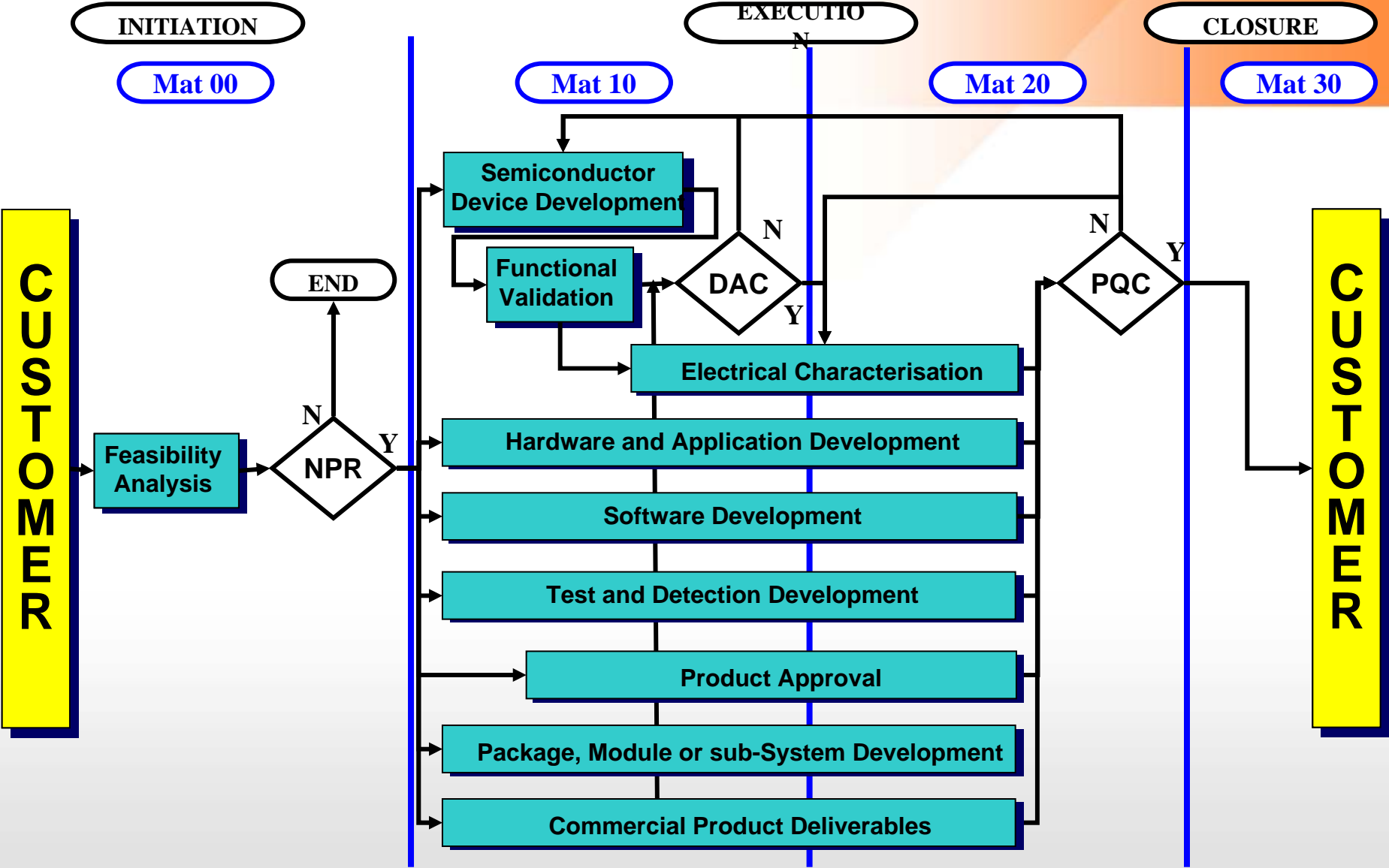
- Customer is a Partner
- Serve the Market
- Objective: Maximize Margin
- Focus on Application Specific Integrated Circuit (ASIC)



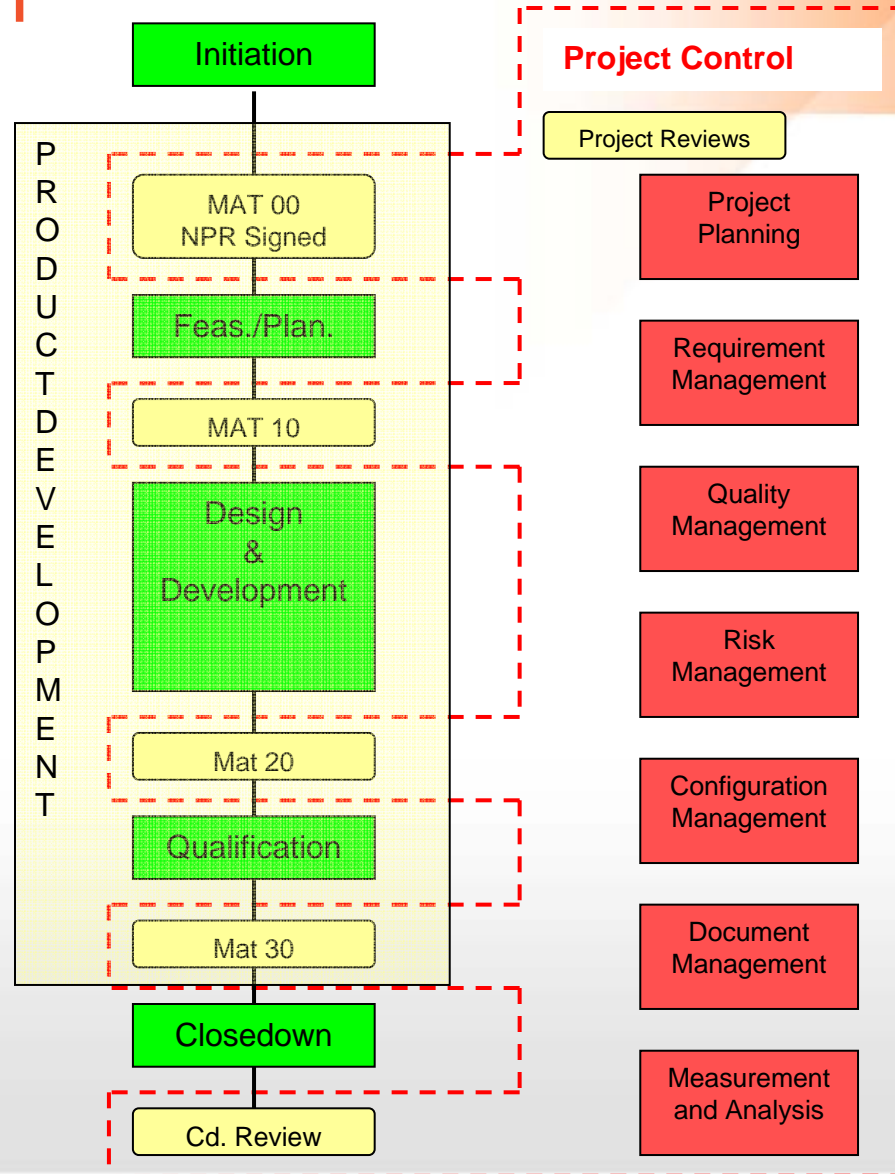
# Product Development Process



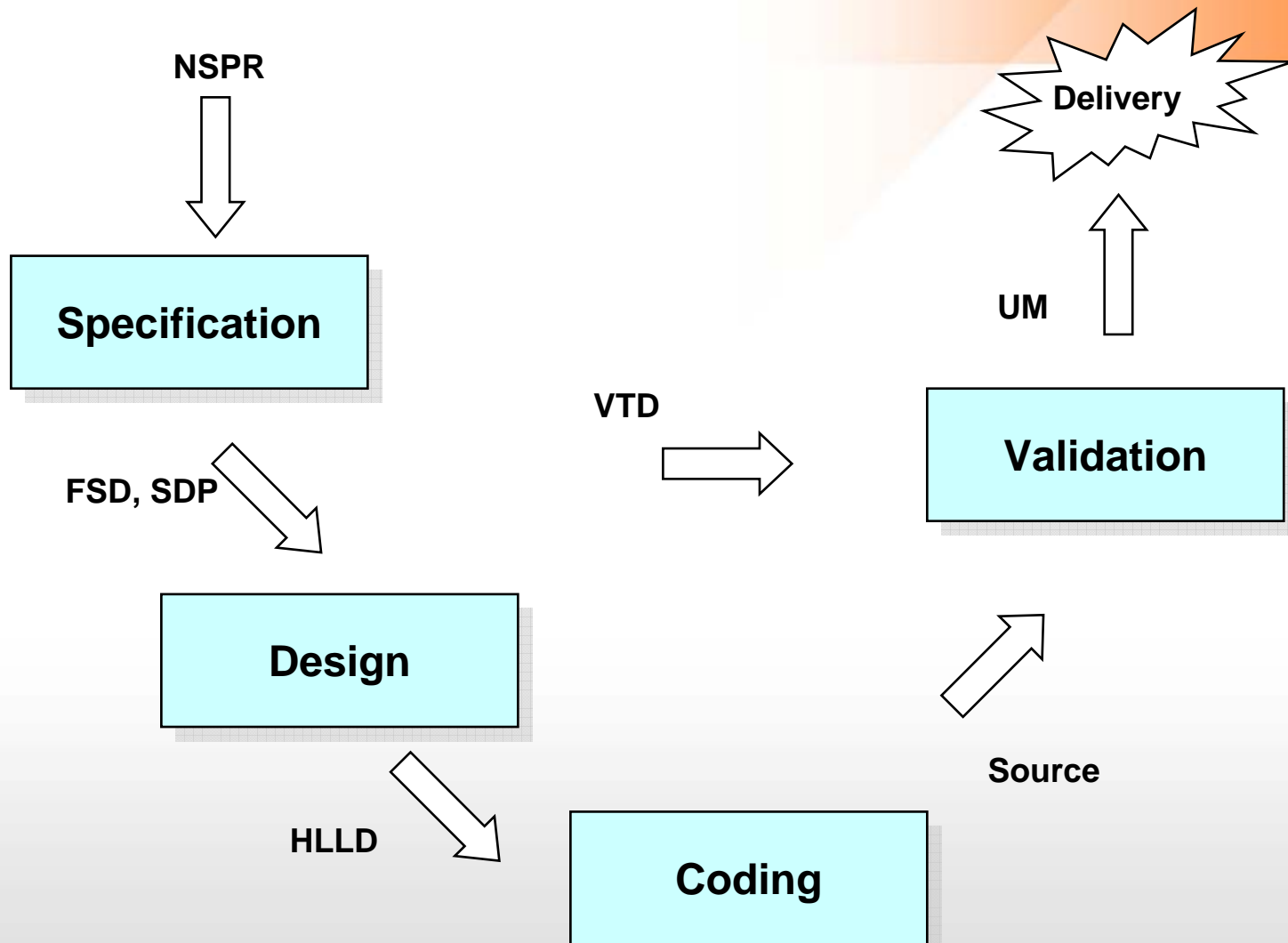
# Product Development Process – Top View



# SW Process 1



# SW Process 2



# Intel Development Process

I'm my Enemy

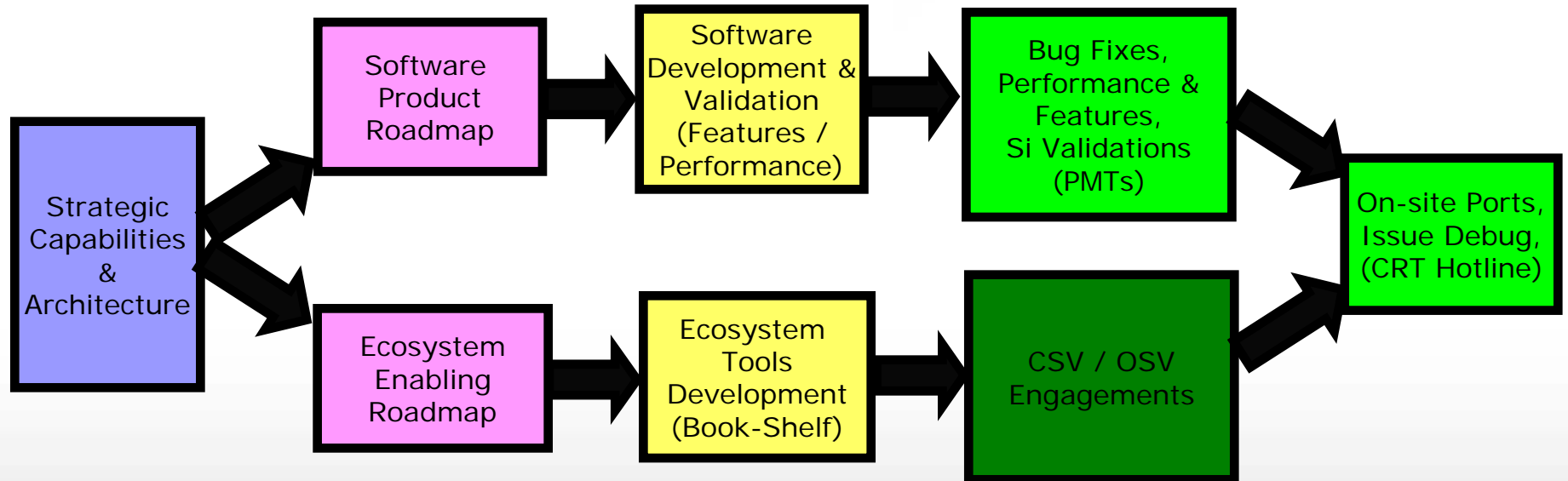
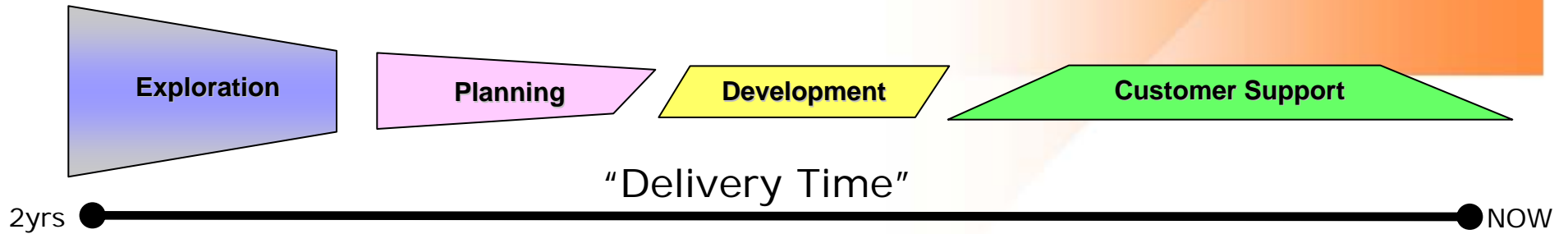
# INTEL: Company Profile

- 1<sup>st</sup> Silicon Vendor in the World: Billions of Customer
- Lead the Market
- Objective: Maximize Margin
- Focus on General Purpose Processor

# INTEL: Life Cycle



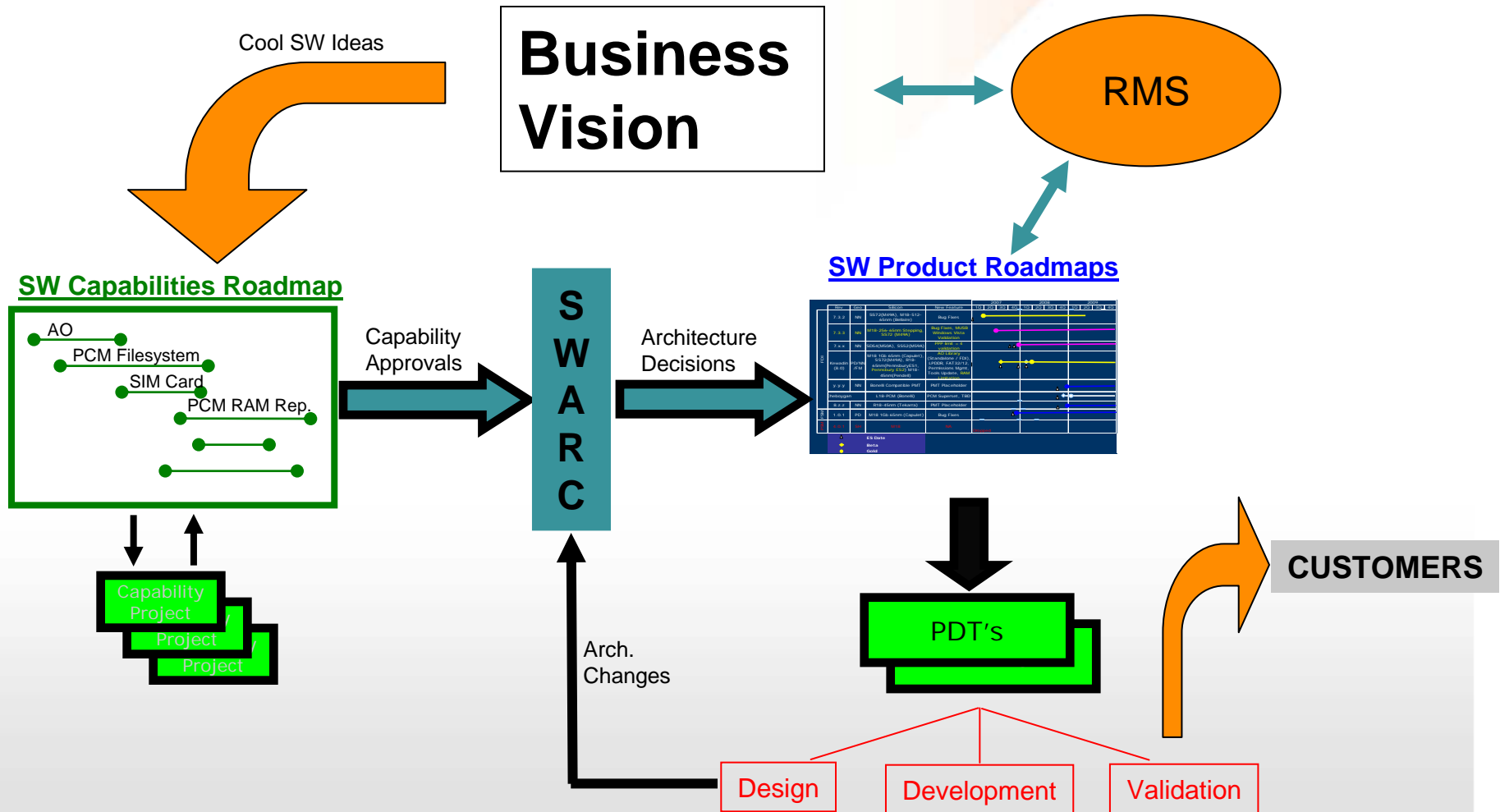
# SW Deliverables and the PLC



**The SW organization is responsible for deliverables mapped to each phase of the PLC, for all Flash products/markets.**



# Capabilities/Architecture Management



# Numonyx Development Process

Faster than Market

# Numonyx: Company Profile

- New Company
- Leader in the Flash Market
- Objective: Maximize Profit
- Focus on Non Volatile Memories

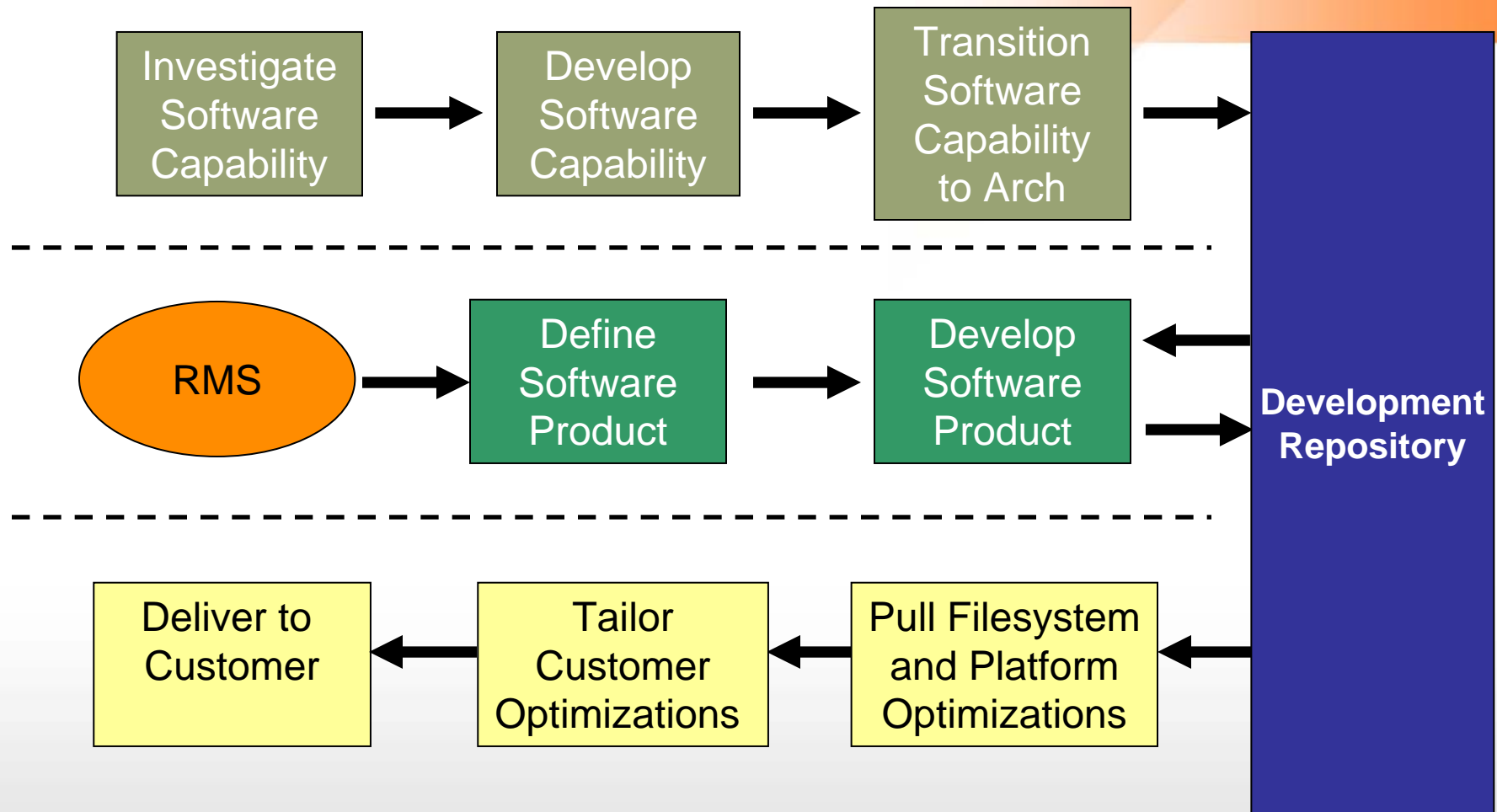
# Numonyx Process

- Need to be identified
- Should use the best from Intel and STM
- Will not be Intel or STM process
- Will be the Numonyx process

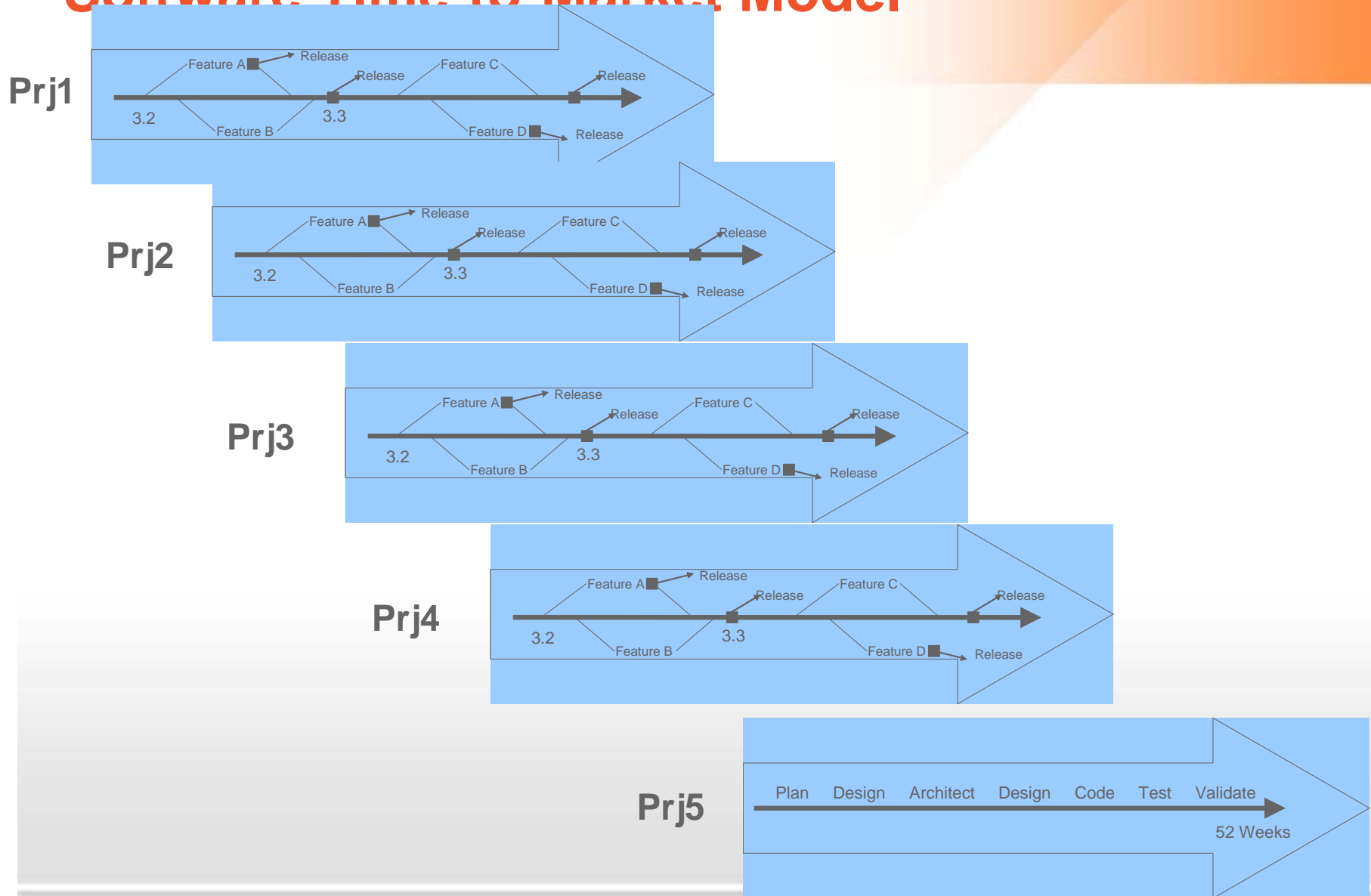


We are brainstorming...

# Software Development



# Software Time-to-Market Model



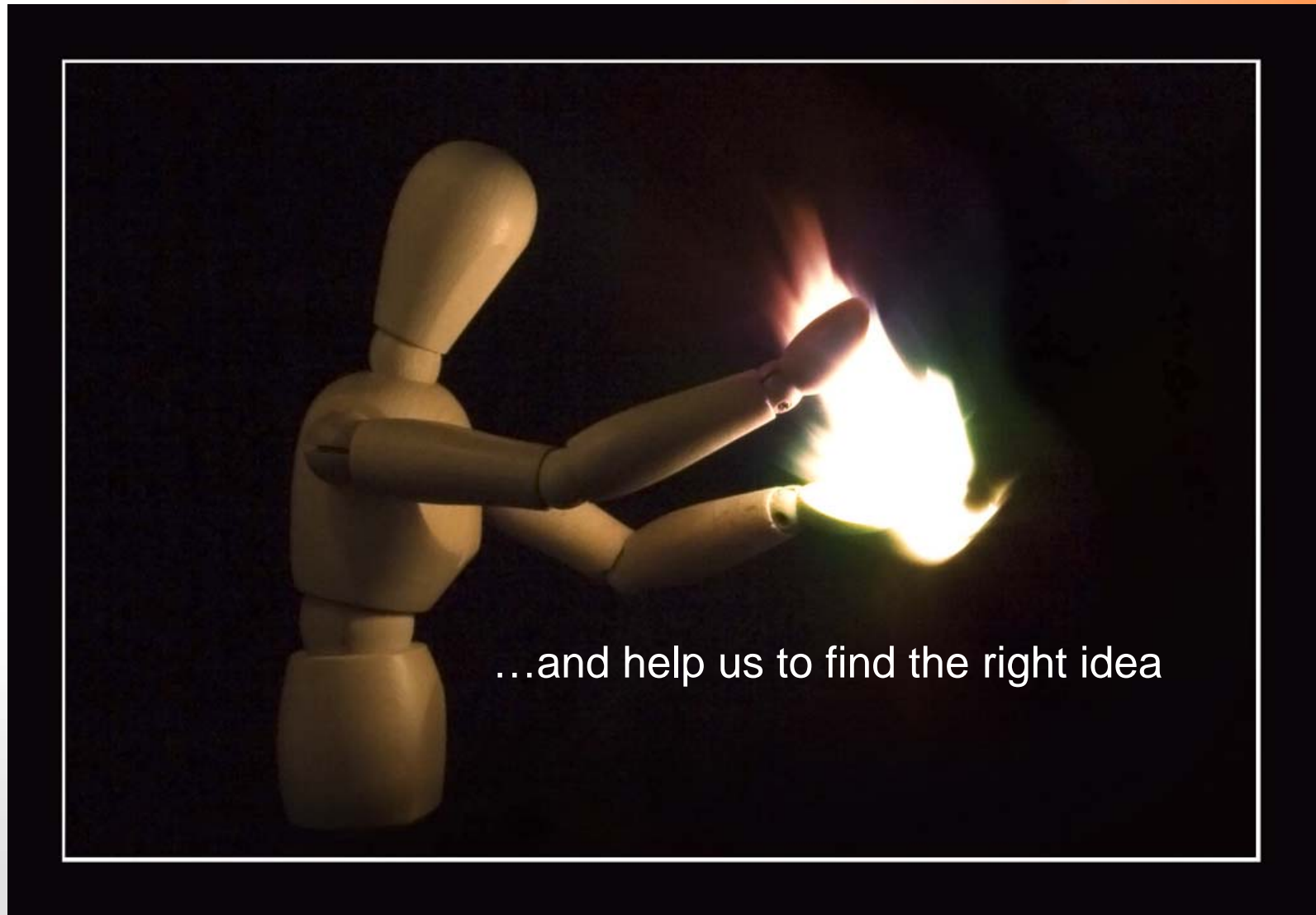
# My Message to You Today

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- **Final Customers must drive your decisions.**
- **A New Company need a New Process...**

**...need your help!**



Thanks...



...and help us to find the right idea