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# Leveraging Knowledge Assets For Business Success

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# Workshop Objectives

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- ❑ Discover how and why best practice companies are strategically managing their knowledge assets
- ❑ Learn high-tech and low-tech methods for effectively capturing and leveraging knowledge throughout the NPD process
- ❑ Review the People, Process and Technology requirements for securing competitive advantage from your company's knowledge assets

# Presentation Premise

Companies that effectively leverage their knowledge assets consistently achieve stronger results

- A. They make better product selection decisions
- B. They have a stronger up-front understanding of project risks and necessary mitigation strategies
- C. They more effectively monitor development efforts, responding to problems and opportunities
- D. They receive greater return on investments in physical and intellectual capital



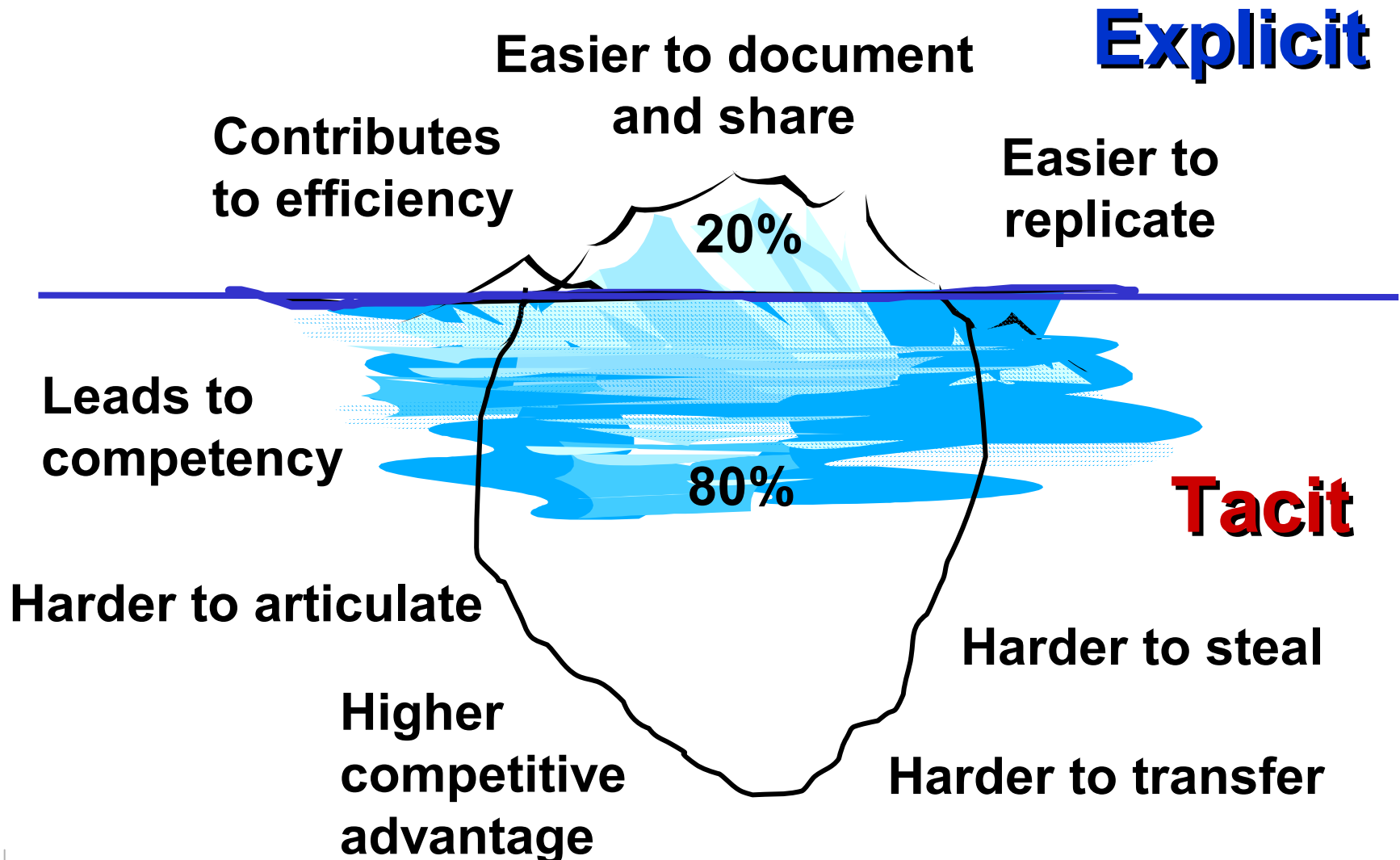
# Knowledge Asset Management Fundamentals

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- ❑ “Knowledge is information in action; its what people need to know to do their jobs”
- ❑ Knowledge Asset Management (KAM) is the process through which “...organizations generate value from their intellectual and knowledge-based assets”
- ❑ KAM involves “...systematic approaches to help information and knowledge flow
  - to the right people
  - at the right time
  - in the right format
  - at the right cost

So they can act more efficiently and effectively”

# The Nature of Knowledge



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Isn't this just another fad?



# What's a Fad?

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- ❑ Many tools and techniques once labeled “fads” are now the standard way work gets done at many leading companies:
  - Teams
  - JIT
  - DFM
- ❑ All of these practices can be misused, but when used appropriately they've provided benefits -- short-term competitive advantage and long-term survival
- ❑ KAM is the same.....

# Business Examples

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- ❑ In June 1995, Ford launched an initiative to make it easier replicate best practices across its multi-national organization. To date:
  - Over 53 Communities of Practices have been formed
  - Resulting in 10,000+ replications/year
  - \$1 billion of actual value added to the company
- ❑ Boeing Aircraft and Missiles established a common repository of engineering drawings, resulting in:
  - Improved configuration control
  - Savings of \$4.5 million.
- ❑ Schlumberger launched InTouch system “to streamline knowledge sharing and remove the clutter in operations”
  - ROI after the first year of operations has been reported at \$200m

# Getting Off on the Right Foot

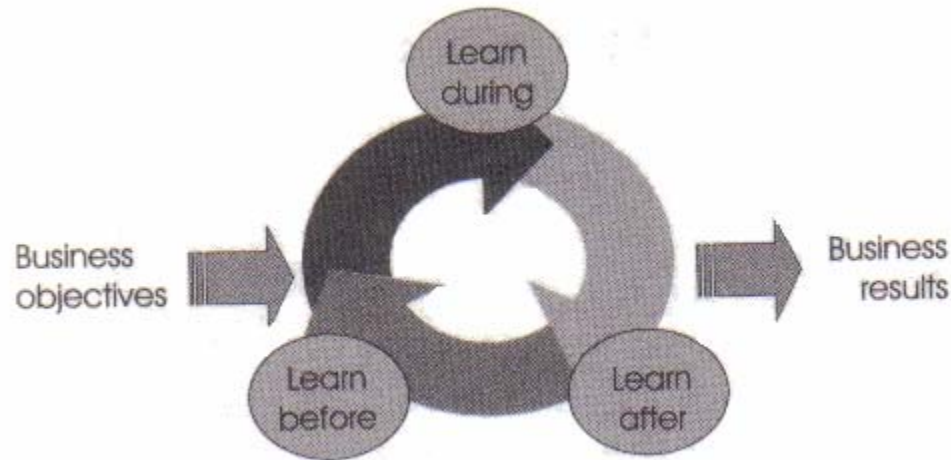
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- ❑ Resist “KM Initiatives” – they often become ends in and of themselves
- ❑ Strategy and implementation should be owned and driven by Business Units, not IT
- ❑ Focus on key business processes
  - What are the “pain points” – where is improvement needed?
  - What are the key business metrics (e.g., lower costs, reduction in re-work, faster TTM)?
  - Can we more effectively utilize knowledge assets in pursuit of these goals?



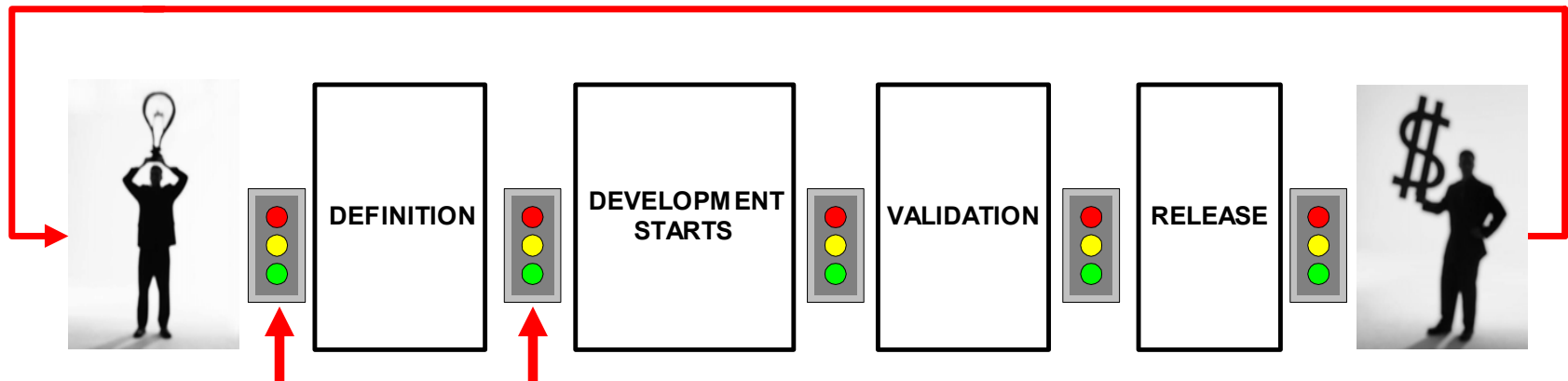
# The Learning Cycle

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Before, during and after a project there are opportunities to leverage the experience of others, and contribute to the organization's knowledge base

# Integrating KAM into NPD

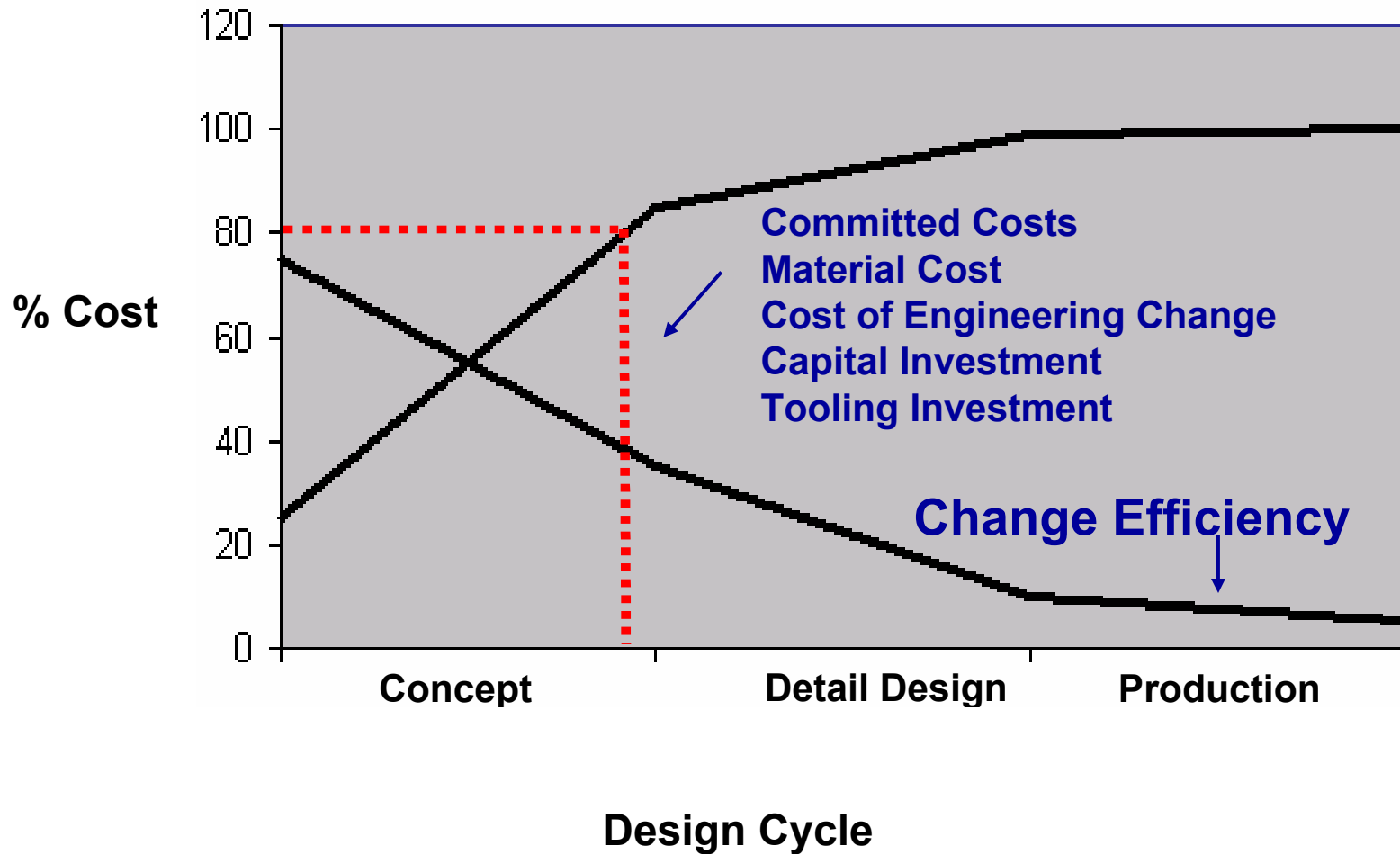


- ❑ Successful teams leverage existing organizational knowledge to reduce project risks, costs and TTM
- ❑ Along the way, these very same teams may create new knowledge
- ❑ Management's role:
  - Create a culture where knowledge sharing and re-use is SOP
  - Ask new teams how they plan to re-use existing technology and how their plans reflect lessons learned – delay project approval for teams that haven't done their homework



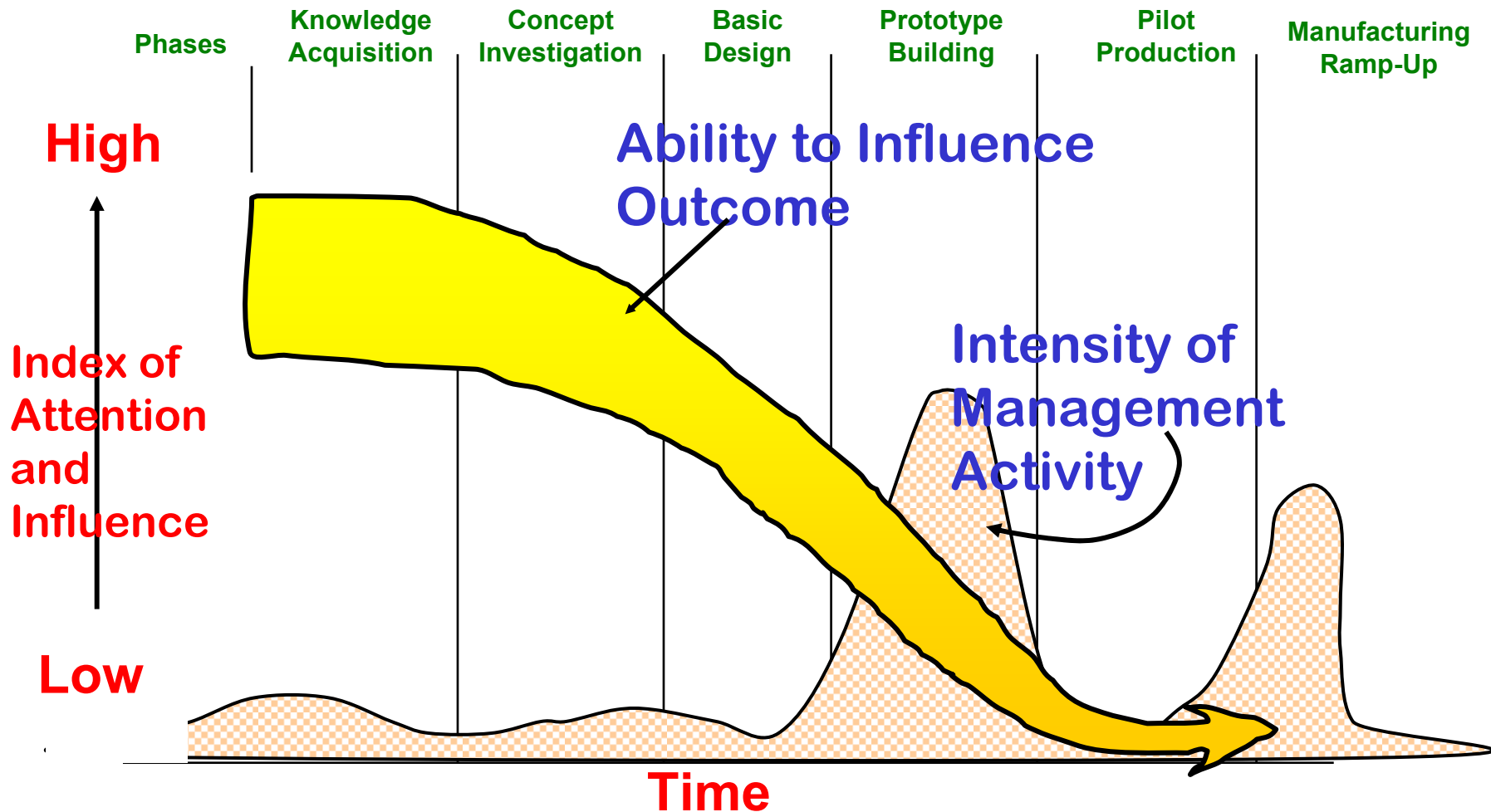
Greatest benefit comes from improving the manner in which new products are selected and planned

# Timing of NPD Cost Commitments



Source: DARPA Rapid Design Exploration and Optimization Project

# Timing and Impact of Management Attention & Influence



Source: R. H. Hayes, S. C. Wheelwright and K. B. Clark, *Dynamic Manufacturing* (New York, The Free Press, 1988), p. 279.

# The Cost of Poor PLM Decisions

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- ❑ “New Product Development and Launch consumes 10 to 20% of revenue every year”<sup>1</sup>
- ❑ “An estimated 46% of all resources allocated by product development and commercialization by US firms are spent on products that are cancelled or fail to yield an adequate financial return
- ❑ For every four products that enter development, only one becomes a commercial success”<sup>2</sup>

<sup>1</sup> O'Marah, “Open Letter to the Board: Where are your R&D Dollars Going” AMR Newsletter, February 2004

<sup>2</sup> R.G. Cooper, Winning at New Products (Reading, MA, Perseus Books, 1993), p. 9.

# Before Starting a Project

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- ❑ Who has done this type of activity before? What can we learn from their experience?
- ❑ Who are the company experts? How can we benefit from their expertise?
- ❑ Is there in-house knowledge we can effectively use?
  - **Latest market and competitive data from the Sales organization**
  - **Customer feedback from Customer Service & Manufacturing as a source of derivative product ideas**
- ❑ Can we re-use technology to reduce risks, costs and time-to-market? – Is re-use a formal requirement?

# During the Project

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- ❑ Where do we need to improve? Who else might have experience/insight we could leverage?
  - ❑ What have we learned which we want to apply going forward?
  - ❑ What have we learned that could benefit others?
    - How do we identify who else would benefit?
    - How do we contact them?
    - Is there a problem to be fixed beyond our scope?
- ⇒ Don't wait for the project completion to capture and gain competitive benefit from project learnings!!

# What is an After Action Review (AAR)?

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- ❑ An AAR is a structured meeting that provides a simple but rigorous approach for analyzing the effectiveness of an event or action
- ❑ Developed by the U.S. Army, AAR's compare what actually occurred to what was planned
- ❑ Key benefits for the military are the ability to collect data from troops on the ground, which is:
  - Shared with other troops real-time
  - Used to revise military processes and procedures
  - Built into military training programs and simulations
- ❑ Used by such diverse companies as Chevron, Ford, Harley Davidson and Sprint

# AAR Process

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An AAR involves several key questions:

- I. What were the desired outcomes?
- II. Did you achieve the desired results?
- III. What accounted for attaining the goal or for variances (+/-)?
- IV. What did you learn?
- V. What are next steps – for the team and for sharing/acting on learning outside of the team?

# SGT York Program Operational Testing Daily After Action Reviews

- Daily reviews of progress
  - Structured test events each day with agreed corrections and scenario
  - Meet each day 5:00 – 6:00 PM (or until we were done!)
  - **Everyone** who had input invited to attend
  - No "side-bars"; all discussion open
  - Total openness; if you have any idea then share it.
  - Agree on and control any configuration changes and next day's objectives and scenarios

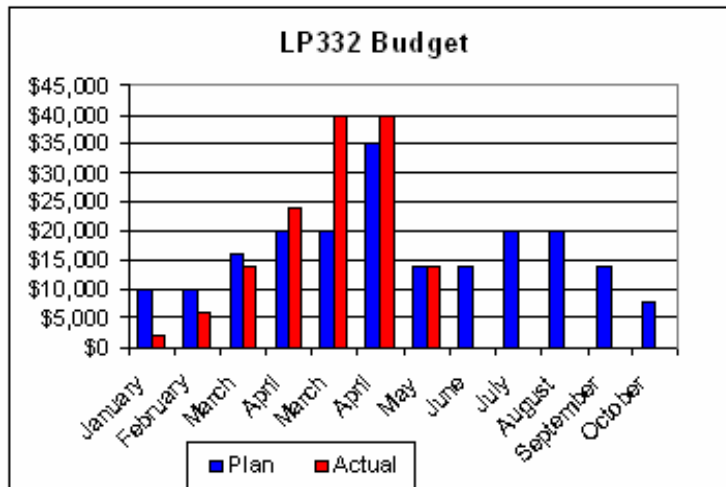
# AAR as A Project Monitoring Template

## LP332 6 wk Review

LP332 Last 6 Weeks (Did)	
Objective	Results
1. Resolve layout resource issue	1. Hired contractor from MDI
2. Determine the cause of Eppy failures at design corners	2. Failures have been linked to contact issues at Defib
3. Confirm customer power requirements	3. Customer would prefer 5 watt part, but would accept 7 watt part
Reasons for Results/Lessons Learned	
1. We had underestimated layout resource requirements. Resource gap should be identified prior to product launch	
2. Tony is working with engineers at DRS running multiple experiments. An unanswered question is why this problem wasn't picked up during pre-tapeout simulations	
3. Although Marketing kept insisting customer wouldn't accept a part greater than 5 watts, this turned out not to be the case. We should have confirmed this earlier on.	

## LP332 Risk Management Matrix

Date	ISSUE/ST AT US	IMPACT	LIKELIHOOD	SEVERITY	OWNER	CONTINGENCY / MITIGATION	DUE DATE
2/28/2010	Eppy test cost design corner. Parts were verified at FA and returned to DRS	Low yield at test time will affect TTR and cost	H	H	DRS	DRS is working with FA to determine the cause of failure	2/28/2010
3/10/2010	4-pin test time issue linked to contact issue at Defib. Output is about 100k per wk vs. demand of 50-100k per wk	Decreased output at Defib is impacting delivery times and customer satisfaction	H	-	DRS	Tony is working with engineers at DRS running multiple experiments	3/10/2010
3/10/2010	Low yield due to board test by QOC by 2 weeks	Board test by QOC by 2 weeks	H	H	DRS	DRS is adding cost to Assembly. Currently collecting and verifying S TATS test data.	3/10/2010
3/10/2010	Multiple layout changes	Delayed shipment	H	H	DRS	DRS is working with FA to determine the cause of failure	3/10/2010
3/10/2010			L	-	DRS	Resource assigned	Closed
LIKELIHOOD OF OCCURRENCE		VALUE				THREAT	VALUE
High likelihood		H				High	H
Moderate likelihood		M				Improvement potential	+
Low likelihood		L				Report	+
						Management review	+
						Final on test workload	-



## LP332 Next 6 Weeks (Do)

Objective	Results
1. Complete experiments at DRS to determine cause of contact issues at Defib	1.
2. Discuss with customer X-grade shipments to compensate for delayed samples	2.
3. Monitor yield at Qual	3.
Reasons for Results/Lessons Learned	
1.	
2.	
3.	

# After the Project

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- ❑ Before the team disbands, formally reflect on final activities and the project as a whole
- ❑ What have we learned which we want to apply to future projects?
- ❑ In hindsight, what should we have done differently?
- ❑ What have we learned that could benefit others in the organization?
  - How do we identify who else would benefit?
  - How do we contact them?
  - Is there a problem to be fixed beyond our scope?

# Capturing & Sharing the Learning

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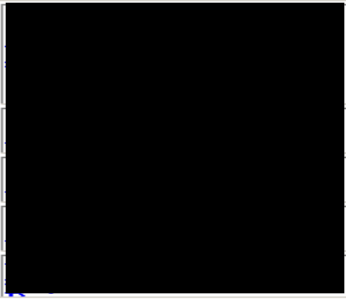
- ❑ Short term strategies:
  - Present results at a brown bag/functional forums
  - Post results on the web, write an article, storyboards...
  - Up-date info in Expert Locator system
  - Resource plan should explicitly involve original team members with derivatives/technology re-use initiatives:
    - Extended team members
    - Mentors/coaches
    - Technical Review Board members

# Capturing & Sharing the Learning

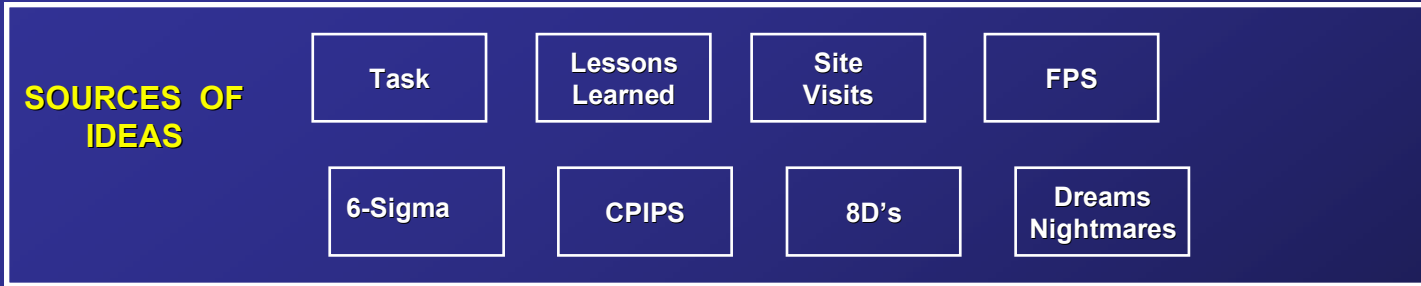
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- ❑ Longer term strategies:
  - Keep a copy of AAR with team materials (e.g., team folder, team website)
  - Develop and maintain project history databases, “lessons learned” library – paper or web enabled
  - Look for opportunities to integrate “lessons learned” into standard work processes
  - Build into standard work process requirement that at the start of a new project, teams review “lessons learned”, consult experienced colleagues

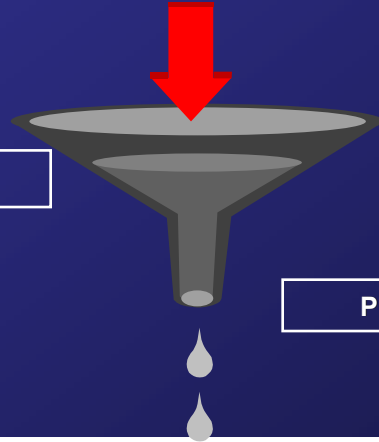
## What Do you do when... The Learning Board

Topic	Link	Contact
<b>Product Definition</b>		
Finalizing the Spec in a New Market without a Lead Customer	<a href="#">331AAR</a>	
Impact of Frozen Specs	ADMC300	
Impact of Spec Changes	<a href="#">53037JST_PSD4</a>	
Working with Flat Specs	<a href="#">MustangAAR</a>	
From Wish List to Practical Specs	<a href="#">53505 AAR</a>	

# Selection and Replication of Proven Practices at Ford



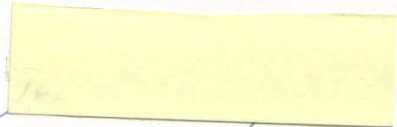
IMPLEMENTATION



PROVEN VALUED PRACTICES

## BEST PRACTICE REPLICATION PROCESS WITH PRESCRIBED ROLES & RESPONSIBILITIES

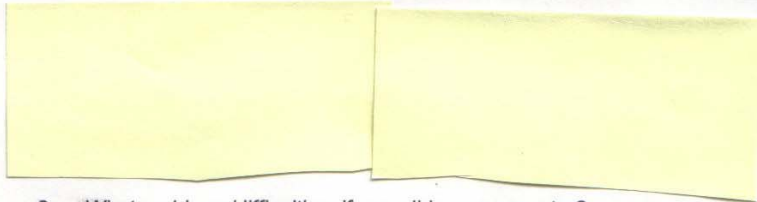




*Catering*

**Function Log**

1. Event: \_\_\_\_\_ Date: \_\_\_\_\_ JO# \_\_\_\_\_
2. Facility Name & Address: \_\_\_\_\_
3. Type of Facility: Conference Center \_\_\_ Hall \_\_\_ Hotel \_\_\_ Religious \_\_\_ Other: \_\_\_\_\_



9. What problems/difficulties, if any, did you encounter?

10. Impact – on customers, event, facility and/or staff?

11. How was the problem resolved?

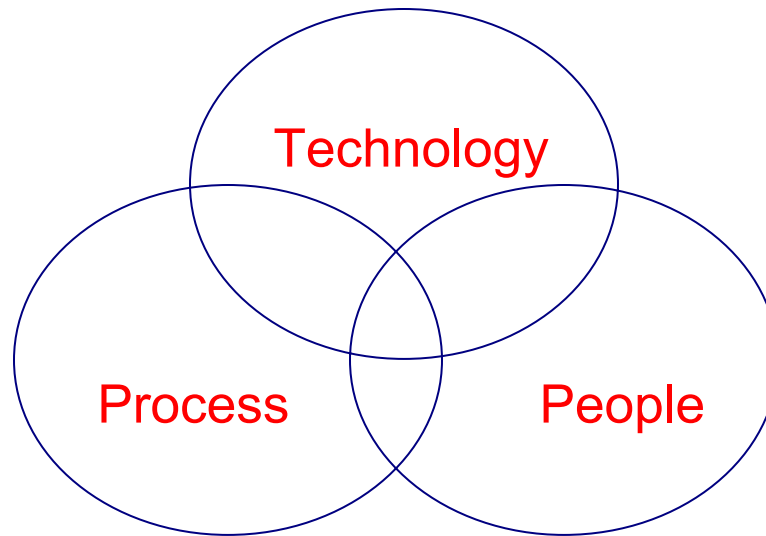
12. What further action, if any, is required?

13. How can we prevent this from happening again?

Completed by: \_\_\_\_\_

# KAM Success Requirements

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- ❑ Technology is an enabler
- ❑ Even more important is attention to people and process issues

# People/Culture Requirements

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- ❑ Does your culture value sharing of information, collaboration and mutual learning?
- ❑ Does Senior Management role model these behaviors?
- ❑ Are your incentive programs aligned with the goals of collaboration and re-use?
- ❑ Do success stories get publicized?
- ❑ Do you provide physical and virtual collaboration space, as well as, time to engage in these activities?
- ❑ Do you facilitate networking (e.g., expert locator systems, functional forums, communities of practice...)

# Process Requirements

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- ❑ Are collaboration, re-use and learning considered “the standard way work get’s done around here”?
- ❑ Is technology re-use a requirement? Is it measured?
- ❑ Are there formal learning points built into the process?
- ❑ Is organizational learning captured and transformed into “best practices”?
- ❑ Does the process require on-going communication and collaboration between R&D, S&M and Mfg?
- ❑ Does the process ensure that your IP is adequately protected?
- ❑ Are KAM activities embedded into standard work-flow vs. being seen as additional work?

# Technology Requirements

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- ❑ Are your systems/tools perceived as user friendly?
- ❑ Although stored in central locations, can information be securely accessed from multiple points of entry – worldwide, multiple platforms and in multiple formats?
- ❑ Are technical and business data bases linked to NPD tools, and organized in the same flow as required by users?
- ❑ Is historical data on projects (e.g., costs, schedules, lessons learned) collected, sorted and then linked to NPD tools?
- ❑ Can development teams securely communicate and collaborate with external partners (e.g., customers, sub-con's)?

# Common NPD Collaboration Tools

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- ❑ Most common – team e-mail lists, may feature e-mail archiving and calendar/schedule tools
- ❑ Team web site
  - Policies and procedures and up-dates
  - Links to document & tool repositories (e.g., text, data, schematics, test programs, cell libraries)
  - Vendor/sub-contractor links
  - Templates
- ❑ Project mgnt tools ranging from Microsoft Project to Dashboards
- ❑ Central source for latest team documents, with revision control & tracking
- ❑ Conferencing tools (e.g., (audio, video, white boarding, etc.) and voting
- ❑ Discussion databases, blogs and Communities of Practice
- ❑ Lessons Learned libraries

# One Size Doesn't Fit All

## Same Time, Same Place

- ❑ Electronic whiteboards
- ❑ Electronic meeting rooms
- ❑ Resources
  - Document repository
  - Calendaring/scheduling
  - Project/task management
  - Voting tools

## Same Time, Different Place

- ❑ E-mail
- ❑ Video and teleconferencing, net meetings
- ❑ Application/whiteboard sharing: view/create
- ❑ File transfer
- ❑ Rotating meeting sites

## Different Time, Same Place

- ❑ Desktop computers, kiosks
- ❑ Blackboards
- ❑ Group rooms
- ❑ Overlapping resources

## Different Time, Different Place

- ❑ Discussion databases
- ❑ E-mail, voice mail, Fax...
- ❑ News feeds
- ❑ Regular meetings
- ❑ Up-front team building