The concept of Adaptive Product Management will be the key to winning new technology business in the next decade.

Much of the information to be presented today is a compilation of some of my recent research in product development for high-tech industries.

Abstract:

New product development engineers promote agile development and adaptive prototyping as methods to manage unpredictable engineering development. However, project managers reject the business challenges, risks and uncertainties of the adaptive development environment. Adaptive Product Management (APM) bridges the gap between unpredictable, adaptive technology development and predictive, practical product management techniques. The fundamental APM tasks (coordinate quick-draw innovation, collaborate to innovate, enable flexible growth options, and encourage an APM culture) bring value to both product development and project management.

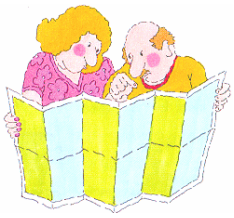
The technical merits and management challenges of using adaptive development in today's customer-centric business environment are discussed. APM forces a product development paradigm shift from execution of known constraints to learning of unknown product potential. A "pull" development strategy creates a lean, value-add product development cycle. APM uses time-phased product demands to map development. APM implementation strategies, best practices and performance control warnings are outlined. Participants will learn how to effectively deploy APM in their organizations and new technology development applications.

Bio:

Vince Socci is a product manager and cross-disciplined engineer (systems, HW, SW). His technology expertise includes embedded systems, sensors and signal processing, power control systems, and diagnostics. Mr. Socci has over 15 years of experience in aerospace, automotive and defense systems. He facilitates business and technology courses for the State University of New York and the University of Phoenix. Mr. Socci holds an MBA in technology management, and MS and BS degrees in electrical engineering. As Principal of On Target Technology Development LLC, Mr. Socci supports clients with technology planning, program management, systems engineering and new product development. He has applied the APM concepts described in this presentation in aerospace, automotive, communications, services management, utility and medical applications. He can be contacted at vsocci@ontargettechnology.com.

Our Roadmap...

- The business of product management
- Fundamentals of Adaptive Product Management (APM)
  - "Quick-Draw Innovation"
  - Collaborate to Innovate
  - Flexible Growth Options
  - Building an APM Culture
- Developing a successful APM business model



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Today's presentation is intended for the technologists that are **developing leading edge products for our ever-changing market**. Take a quick moment to **think of a few products like that** which you are involved in and keep them in your mind as we go through this discussion.

Armchair Entrepreneurs Wanted

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Do you have an idea for a new product or service?

Top business ideas for 2004…

Products	Services
Organic/healthy/natural foods	Pet services
Hot Rod accessories	Data storage
Foot care products	Music education
Men's grooming	In home health care
Online gaming	Search engine optimization

What's Stopping You?

Source: sbinformation.about.com

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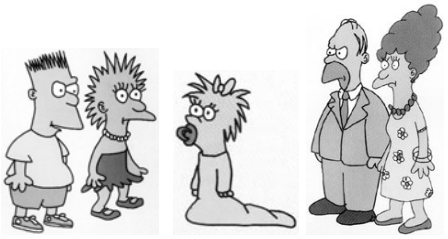
Inaction is the primary reason business ideas fail. They just never get started.

Products Evolve

- Examples
  - Computers/Electronics
  - Automobiles
  - Military weapons
  - Fashion
  - Arts and entertainment
- Why do they evolve?
  - Testing and user feedback
  - Changing demands, market, environment
  - Performance Improvements
  - Technology advancement
  - Capabilities of providers
  - Cost reductions
- Benefits of evolution
  - Realign product with user
  - Better cost/benefit
  - Build/Maintain market



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Think About This ...

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- How does a doctor diagnose your condition?
- Do you shoot for the flag on every golf shot? (Do you make it?)
- Where is the pilot going?
- Why do projects fail? (or get rejected?)
- When do we start making the fastest progress?
- How long do you have to get your product to market?
- What holds us up more – technical development or decision-making?

Moving in small, coordinated steps toward the goal will reduce the overall risk and enable progress.

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This is a chance for you to reflect on your opinions.

My thoughts…

- A doctor does not just right in with his latest surgery. He asks "Where does it hurt" and **he iterates** down to the root cause.
- Although you may always try to hit the flag, you rarely do. We have to make it halfway first. **You pick a place that you have confidence you can reach and confidence you can move forward to the goal.**
- Pilots don't fly toward the final destination. They **break the flight down** into multiple incremental steps. They constantly have to adapt to stay on (or near) the flight path.
- Studies have shown that most **projects fail because of requirements** (lack of, changing, mismanaged) Basically, the developer and the customer need to develop a shared understanding of project objectives. (**New ideas fail because of indecision [never started]. New projects fail because of lack of shared understanding**.)
- I've worked on a lot of product development projects. Without exception, **we always made the best progress in leaps and bounds, once the first unit was shipped**. That's because we got feedback.
- I've always been held up more by technical decision-making than technical development. I needed a method to enhance and enable technical decision-making. **People won't make decisions if they can't perceive the risks**.

All these concepts point to the same improvement recommendation – **Moving in small, coordinated steps toward the goal will reduce the overall risk and enable progress**.

The Realities of Today's Product Developer

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- Product Development is not like building a bridge. It is NOT predictive. (Otherwise, it would be called manufacturing.) Plan to learn!
- Requirements will change. The world is unpredictable.
- Mitigation – Freeze requirements, work on known stuff.
- Development is about learning the unknown, not execution of the known

Real need – Be effective in a world of uncertainty

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I teach project management courses, and I am constantly frustrated by project plans that model a new product development as a step-by-step construction recipe of very precise steps with no opportunity for learning – or recognition that learning is needed.

Developing a product is not like building a bridge

Design is larger component than construction and is tough to plan accurately

Even construction has risk, but it is more recognizable and impact is more predictable.

Development is NOT predictive. (Otherwise, it would be called manufacturing.) Planning is valuable, but it must be adaptive. When we plan projects, we outline an execution plan of known scope and development. We do recognize that unknown problems will surface. So what do we do? We bundle a "management reserve" to handle unplanned learning. M&T have different perspectives. You manage what you know, you develop what you don't. Development is about learning the unknown, not execution of the known. Plan to learn! We need to "learn to plan to learn".

Technology forecasts are a double-edged sword – Believe it and it doesn't come true. Ignore it and you miss opportunity.

Audience Poll: Requirements engineering is not adequately done. Too closed. Need to get some feasibility feedback.

Focus on the people rather than the process. Accept human factors and limits

It is very difficult to see what value a system feature has until you actually use it. Only when you use an early prototype of the product do you really begin to understand what components are valuable and what are not.

Requirements will change. The business world is unpredictable

The Realities of Today's Business Management

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- Design-to-launch cycles (< 9 months)
- Product life cycles (< 2 years)
- Price erosion limits ROI
- Increased competitors bring oversupply and lower margins.
- Innovate to maintain competitiveness and profitability
- Technology is more market-driven than anything else.
- Decentralizing R&D in favor of business units.

Real need – Control in chaos; gain ROI; penetrate market

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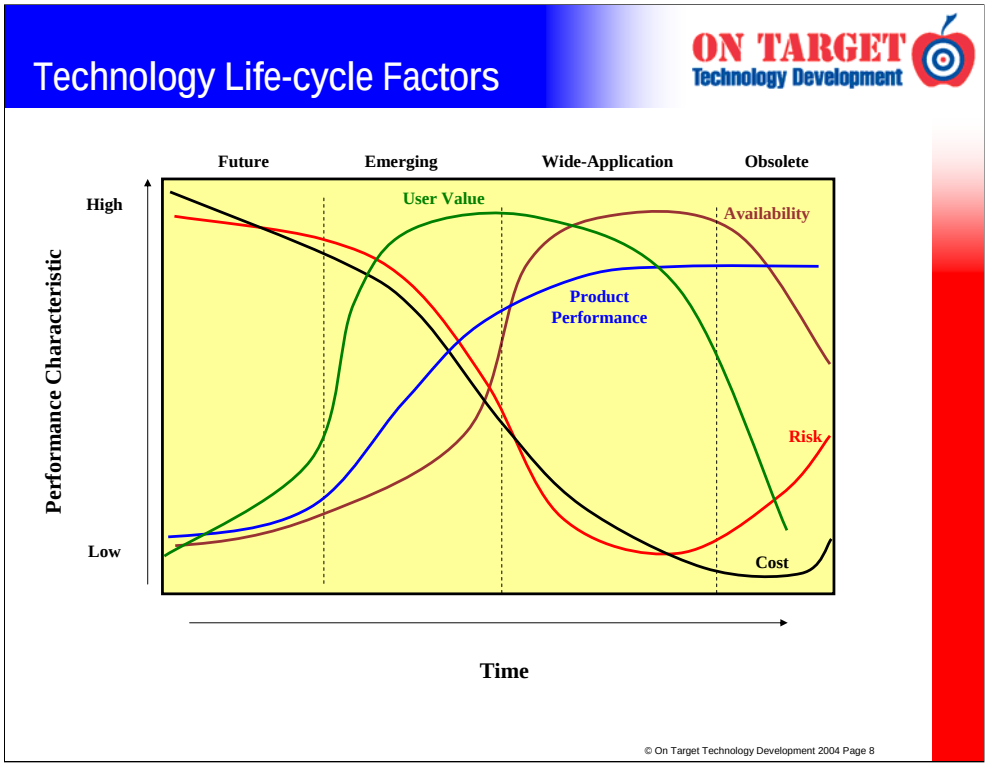
There is less emphasis on long-term research and more focus on short-term product development through incremental, collaborative development

Blurring product differentiation

What is today's customer-centric environment?

More companies are decentralizing their corporate R&D in favor of business units. The smaller the self-sustaining business unit, the better.



This is a general form of the conceptual Technology S-Curve, which technologists have seem a bazillion times. It is primarily applicable with technology where market demand exceeds technology availability.

Consider a timeline relating to a product lifecycle. We can divide the timeline into four phases:

Future – nanotechnology, networked combat

Emerging – stem-cell research, unmanned aircraft

Wide-application – Radar systems, medical diagnostics

Obsolete – 8-tracks, older generations of electronics

Cost follows risk, as you would expect, and it decreases throughout the lifecycle. Interestingly, both of these characteristics increase during obsolescence.

Availability increases with product performance, with a little lag, and decreases toward the end of the life-cycle.

The value perceived by the end user typically leads the performance and availability, until the technology becomes widely available. Once the product becomes readily available, the user value is already decreasing. Availability has a significant time lag compared to User Value.

If you are in a technology development company, then your playground is in the emerging stage. That happens to be where the user value peaks.

Therefore, to take the greatest advantage of market demand, **you need to deliver user value to your customer during the Emerging stage of the technology life-cycle**. Obviously, the technology is not yet completely matured, so we have to learn to deliver and manage immature products to our customers.

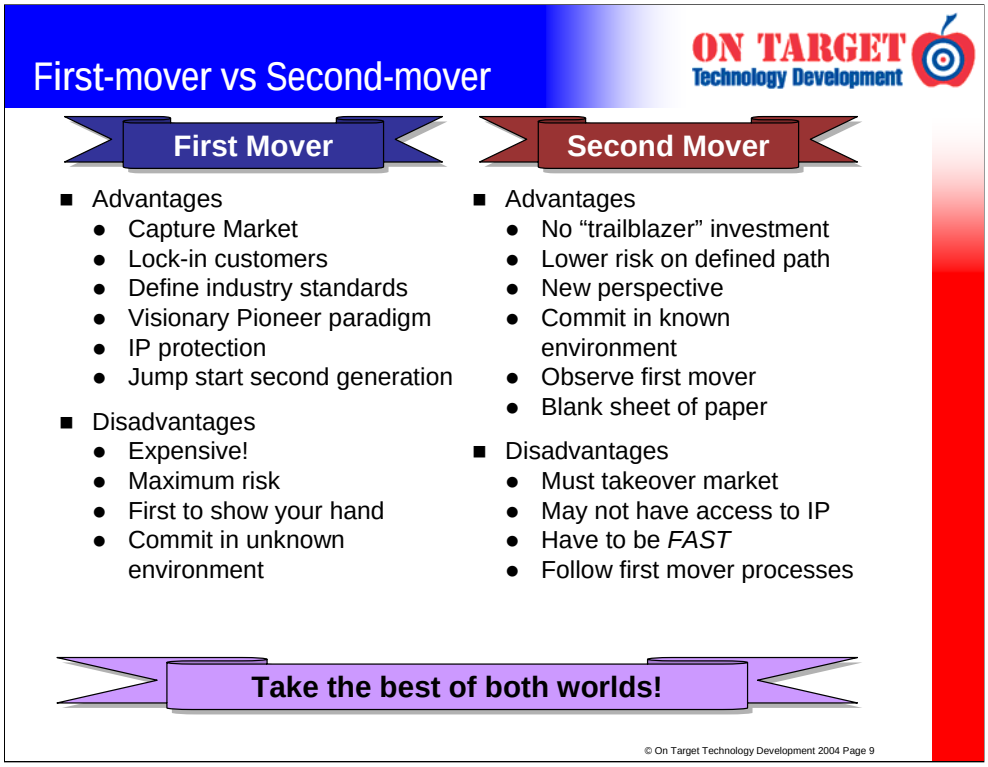
Basis of competition – Functionality to price to convenience

Change agility – Always fast

Revenue generation – Highest right in the middle

APM allows us to exploit the user value curve in the emerging stage. Our company is building a large portfolio of rapidly-developed products in the emerging stage. You need to make hay while the sun shines, and the sun is shining right now, baby.

APM is a great technique to use early in the product lifecycle to energize communication between users and developers. You can use APM to close the gap between user value and product performance. Once the technology is understood, traditional project management techniques will efficiently deliver the final product.



There is a lot of talk in innovation management about the advantages of being a first mover. Then again, there are many discussions of second mover advantage.

First movers – When a technology is in the Future stage, the first mover takes the opportunity to capture the market.

Advantages:

Capture Market – When user demand exceeds available, the market is yours for the taking

Lock-in customers – Demanding customers will choose you, and will stick with you if you serve them well

Define industry standards – New industries demand processes. Who better to define them than you?

Visionary Pioneer paradigm – Technical markets love visionary pioneers.

IP protection – You invested in the development, so protect it and leverage the rights of that ownership

Jump start second generation – Everyone else is catching up with. Don't lose your lead.

Disadvantages:

Expensive! – No doubt that trailblazing is expensive. Every trial and failure costs money

Maximum risk – The future is undefined. You have no best practices or lessons learned to bank on.

First to show your hand – If you are to move, you have to show your cards. The world will see – and your competitors will respond

Commit in unknown environment – In order to make any reasonable progress, you need to commit to a development plan. Will your business commit in an unknown environment?

Second movers – Sometime during the emerging stage, second movers show their hand

Advantages:

No "trailblazer" investment – The trail is already made. You can sprint down the path to enter the market with much less cost.

Lower risk on defined path – Leverage the first-movers work. They have already tested the market and proven where your value can be profitable.

New perspective – The first mover is stuck in their culture. You have a different perspective and can see things that they cannot.

Commit in known environment – Unlike the first mover, you know what you are getting into. It is much easier to develop a business/product/marketing plan when the future is defined.

Observe first mover – Observe the first mover and note what they did well and what went poorly. Model their best practices and use their lessons learned to plan your development.

Blank sheet of paper – First movers will naturally build off their first generation technologies. You can step back with your observations and say "If I was able to start over, how would I do this?"

Disadvantages:

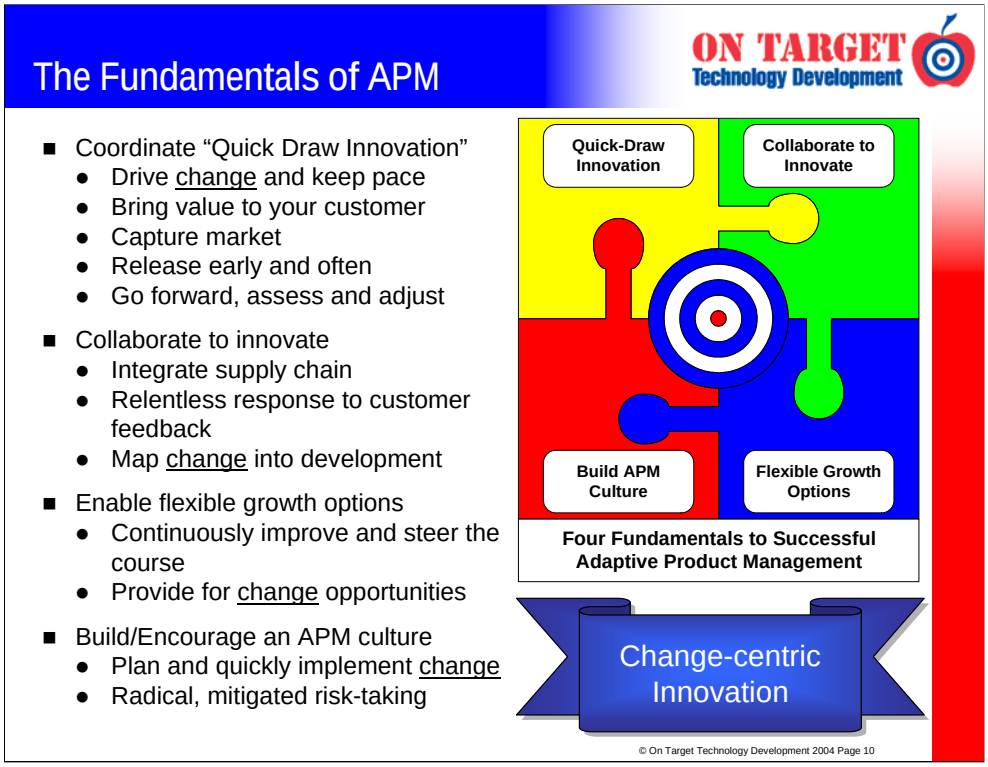
Must takeover market – You have to be aggressive to take the market away from the first mover. Will you be able to leap-frog their product to offer a better value to the customers?

May not have access to IP – If the first mover has protected their IP, you may be locked out. Can you find an innovative way to provide the technology?

Have to be *FAST* – You are starting out in catch-up mode. You have to build a better technology faster than the first mover can provide an incremental improvement.

Follow first mover processes – If the first mover has defined market expectations and engineering processes, you may be expected to follow them. That means you have to change your business and culture to work according to their business and culture.

What cases have your companies experienced as first movers and second movers? Which strategy seemed to work best? Which technologies today are in the first mover stage? Second mover?



I am a wanna-be cowboy, so I find it easy to draw the analogy of competitive innovation to a western shootout. **The fastest gun wins**. Find your target, aim and shoot it. Find your next target, aim and hit that. Do it over and over again. Focus on each target, and defeat it before it defeats you. Remember the technology curves: **The first company that makes user value available captures the market.** The followers have to try to steal that market from the incumbents. Once the first mover captures the market, an adaptive strategy will help maintain it. Historically, first movers DO NOT keep the market. The adaptive second movers do.

Today's innovation leverages the synergies of collaboration. **Visionary companies are using business partnerships with their supply chain** (including their customers) **to bring broader value to the market**. They are able to integrate the upcoming market needs as building blocks into their product roadmap.

Ex. Of integrating customer: **A SW tools company integrated a key customer into their product development**. Result: The customer funded development of an add-on tool that met their development standards. Now that customer standardized on that product and is driving the standard for the industry. Competitors have to follow suit, and actually adopt that customer's development standards through the use of these industry products. The SW company's business is now booming because they leveraged the influence of their customer.

We also need to recognize that our future roadmap is quite blurry. We cannot forecast the future precisely, so **our roadmap loses resolution as we plan further into the future**. Even if we could see the future with high resolution, we couldn't count on it, because it will certainly change. Our market feedback from our quick draw innovation may drive additional changes. Our **success in APM is contingent on our ability to facilitate these changes** and redirect our resources to take advantage of the opportunities these changes present.

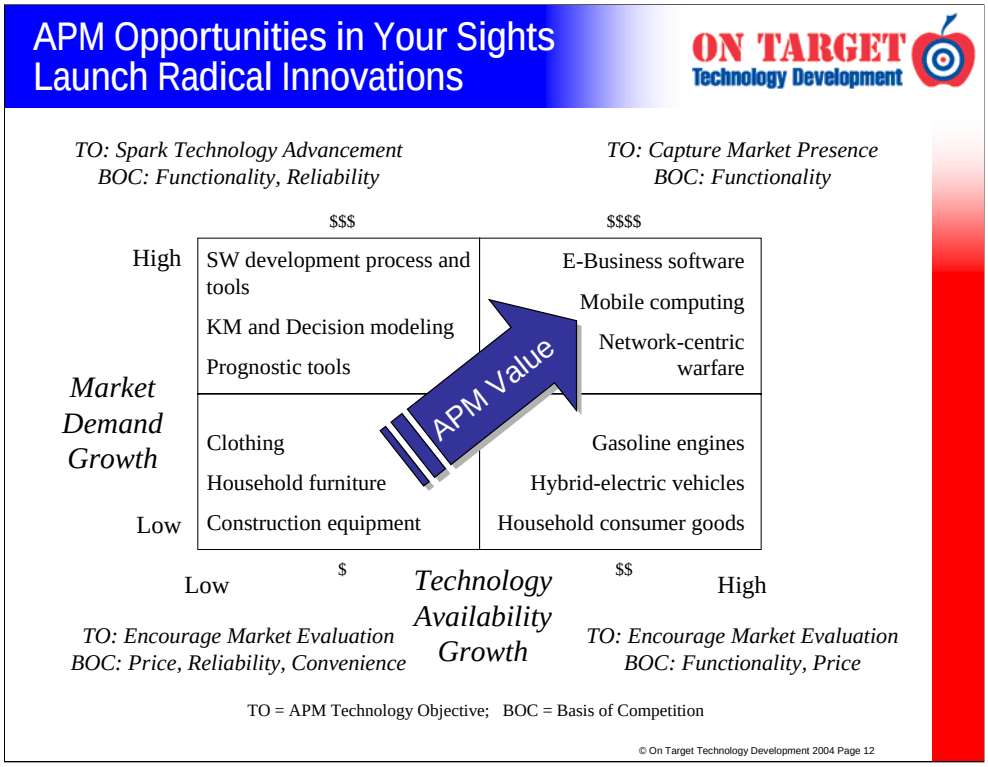
The vehicle we will use to drive APM is our internal business culture. **APM goes against our traditional business behavior** (especially in project management and procurement). Employees are generally afraid to rock the boat because of the potential negative career ramifications. It is difficult to manage changing paths and taking risks. Successful innovation organizations build a culture that welcomes quickly-implemented changes to their product plans and encourages radical, mitigated risk-taking.

"Change" shows up in each of our fundamentals. **APM's entire strategy is based on change**. This is not the overused euphemism of welcoming change. **This is using change as a roadmap – and driver – to pace your product development**.

Change is good. It means you are getting closer to what you want. Welcome it and enable it. Control it, but allow it to guide you.

(Write this down) The successful innovators in the next decade will be those that can drive change into their customer value with minimal cost and schedule impact.

Maybe the big driver IS a speed issue. It seems like we have a hard time developing our products fast enough to meet customer demand. How can we satisfy customer needs faster?



Where on this grid would you put the following:

Telecommunications

Pharmaceuticals – added element of risk

DNA analysis

Stem cell research

Radar systems

Explosive detection

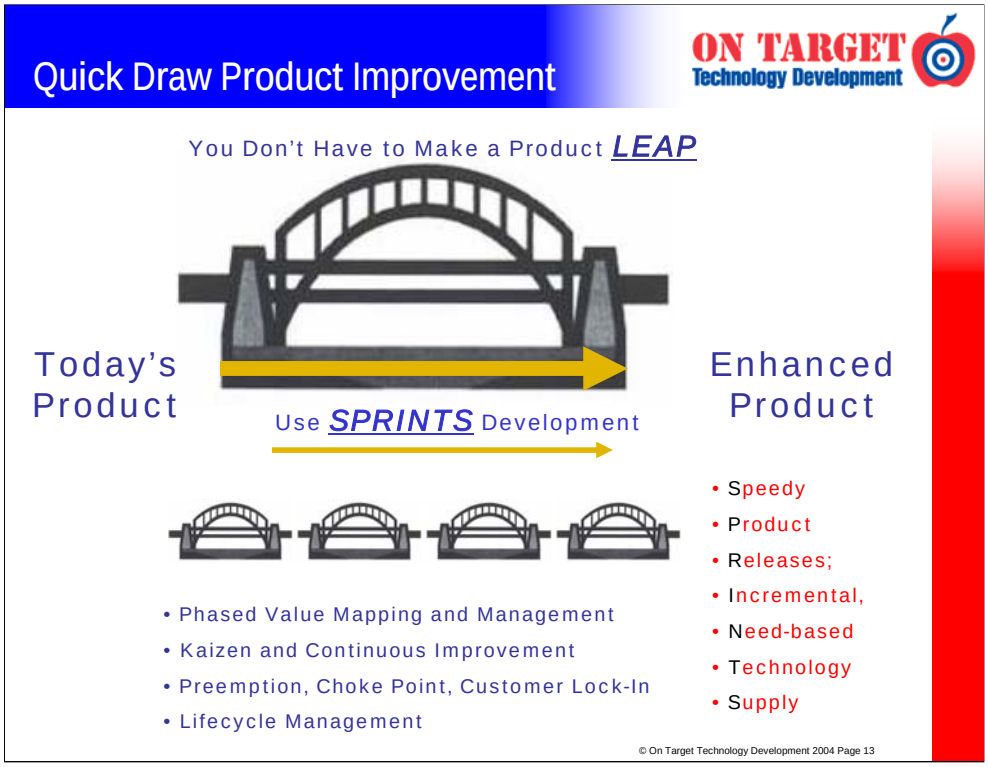
Financial Services

TO: Technology Objective

BOC: Basis of Competition

APM has the most value where the market growth is high and the technology growth is high. APM ensure a coordinated growth between user demands and technology availability.

Where do your products and technologies fit? – List three and map them.



Product marketing has to be change-centric and fast-responding. Market power is measured in your speed to market.

Today's market will not wait for product development. They want to gain value today.

Use short sprints to get quick-turn product value into the market.

This is NOT a stage-gate cycle of product development. S-G holds products as internal hostages while making internal business decisions. By its nature, it narrows and restricts innovation. APM is intended to keep the flow of innovation moving, with lots of tributaries along the way. APM releases products to customers and encourages them to influence product direction. You pull as much feedback as you can from your customers and market, and use it to steer your next quick draw.

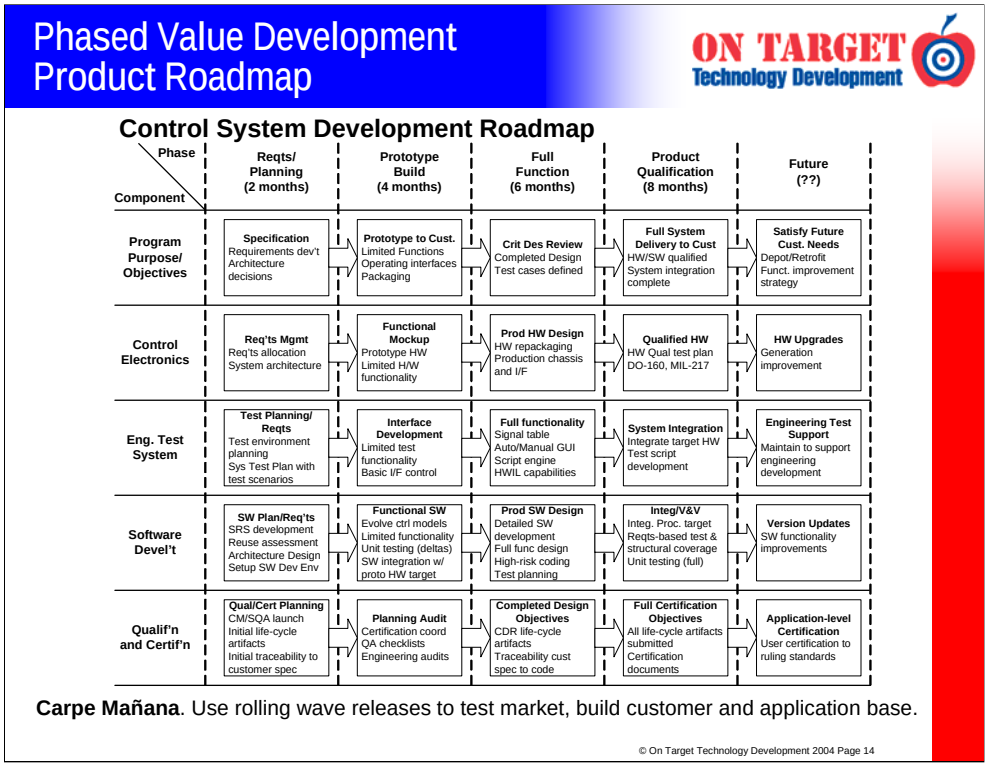
Map product technology based on market value. If it doesn't add market value, it doesn't add product value.

Today's market is like a real-time system. The faster your cycle rate, the more closely you can follow the commanded output.

Quick and crude is better than slow and elegant

Build it and they will come? Not really, but there is some element of truth. The antithesis is true – don't build it and they won't come.

A better, more precise version for APM: "Invite them to help you build it. Remodel and expand often."



Recommend an adaptive product development roadmap to manage product growth. Stakeholder input is needed to define the performance requirements. The following diagram shows the proposed multi-phase technology development roadmap. The roadmap offers several benefits, including:

Early feasibility evaluation with proof-of-concept and prototype phases. Requirements communication and coordination. Risk avoidance through concurrent development

Flexibility to implement changes. Constant feedback, evolution and enhancement to meet the needs of the users. Full life-cycle support to maintain courseware configuration with vehicle upgrades

Project managers have learned that you shouldn't manage projects that are any larger than they have to be. Detailed project plans suck! You try to describe all your tasks in excruciating detail. You don't accommodate a blurry future. This roadmap approach slices the project up into small projects of different resolution. The team can pursue visible goals, then adjust their aim for the next phase.

The development of the roadmap requires the collaboration, coordination and cooperation of project management and product development. Management makes business decisions (e.g. which user function are important when) and engineers make technical decisions (how many hours it will take to develop each function).

After-action reviews for each prototype (to encourage self-improvement)

Keep communication at the technical level. Disengage management from technical decision-making (similar to XP)

Breakdown the product architecture into manageable chunks. This simpler the architecture, the easier it is do introduce changes.

Align your precision of management with the manageability of each phase. Manage the details of your current phase, but keep future phases at a high level. You have to plan the future products and predict the future market through binoculars that have a limited zoom capability.

Carpe Diem (Seize the Day) – Capture today's opportunity

Carpe Manana (Seize Tomorrow) – Capture tomorrow's opportunity today. Recognize that today's learning will breed tomorrow's opportunity. Make it easy to meet tomorrow's needs. Capture the market today. Satisfy it tomorrow.

You may question this approach and wonder if the customer would be willing to pay for rolling wave product releases. (After all, early releases are non-compliant.)

First, you have to get the users on your side by delivering true value in each release. (That could be a basic interface architecture to enable them to move forward.)

Second, you need to have a procurement contracting approach that supports it. (Milestone payments, IDIQ, rolling budget, etc.)

This form implements all APM fundamentals. The phases provide quick-draw innovation; the coordinated functional components support collaboration; each block of effort enables growth options in future phases; and development processes are integrated into the culture.

Microsoft learns a lot every time they release a product. The consumers are the primary product test team. Microsoft has mastered the application of customer feedback. Sure, we may get upset with all the bugs in a new release of Windows; but Microsoft is using the customer base to help them discover the bugs. Then they respond quickly to our problems.

What Really Matters?
The Customer!

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- APM across your supply chain is the business equivalent of rapid prototyping and concurrent engineering
- Product releases are immeasurably your best form of "communication" with your customer – MUCH better than documentation and demonstration
- Today's marketplace is a real-time system where high-speed feedback drives successful products
- APM enables feedback from the end (next) user.
- Design methods for your customer to experience and use your product
- Mitigate unpredictable constraints
- Gain customer confidence with a roadmap to meet their needs

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Product releases are your best form of "communication" with your customer. (**Tell me in a document, I'll forget; show me in a demonstration, I'll understand; let me use your product, I'll tell you what value I get from it**)

Why have Agile SW development, evolutionary development, incremental dev become so popular? Because it enables feedback from the end (next) user.

We all do adaptive product development when we continuously try to improve our products. However, until we look at our product improvement from the perspective of a roadmap to meet customer needs, we are not doing adaptive product management. **A key aspect of product management is steering the direction of your product development to add true value, from your customer's point of view.**

Example of listening to customer needs: Unmet need of business traveler – time. Car rental companies have "walk up" service. Hotel credit card check-in and key.

Let's Go Psycho – Two Minds are Better Than One

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- What is the nation's most popular sandwich?
- Inability to see your own assumptions (Robert Burns Syndrome)
- Ego involvement with your own creation (Frankenstein Syndrome)

- You cannot evaluate your own product, or requirements for it – you need to get input from the outside.
- Use the market to evaluate your product and provide the guidelines for improvement
- Same benefit holds true for development reviews

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For many years, Subway was the #1 franchising business in America. Why? – Because sandwich shops are cheap, easy, and profitable.

Sandwich shop venture – Create a sandwich shop that sells the nation's single-most-favorite sandwich.

What do you think that sandwich is?

Two pieces of bread, with something in between is the way of life for most of us at most meals. It's quick, convenient and usually nutritious. Without a doubt, the most popular sandwich is the one with a slab of ground beef between two slices of bread or a bun. This is, of course, the ever popular hamburger. Add a slice of cheese, it's a cheeseburger.

Most people choose something else when asked for America's favorite sandwich. Turkey, roast beef, peanut butter and jelly are popular choices. Why don't we normally think of a hamburger? Because is doesn't fit our normal assumption of what a sandwich is. We weren't thinking broadly enough. We didn't understand the requirements of the venture.

Why is the divorce rate over 50% in America? It's a requirements problem! When you are in the dating scene, you are in "evaluation mode". You try out all the products; you are drawn to certain features; and you hone in your requirements. We say "love is blind" because people see only the good parts, and not the bad parts, or their partner. When you get married, you think you know all the requirements, and you are sure Mr. or Miss Right meet them. Then you get a chance to play with your product and try out all the features and you realize you wanted something different. My wife and I are fortunate in that we understand our requirements, and therefore enjoy a happy marriage. Most people want to return their spouses for an upgrade.

Innovators are horrible judges of their own work. Even if they create a monster, it is still hot-stuff to them. In the product management world, the most important judge of your product is the market. So if you do create a monster that the market doesn't appreciate it, you need to discover that early and adapt it to something the market desires.

You also should never perform design reviews on your own product. You can't see your failures. Insist on a reviewer that is unfamiliar with your work. New perspectives help you see the wrinkles in your work.

Enable Flexible Growth Options

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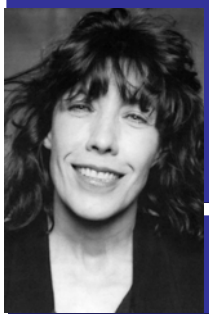
The road to success is always under construction.



Lily Tomlin

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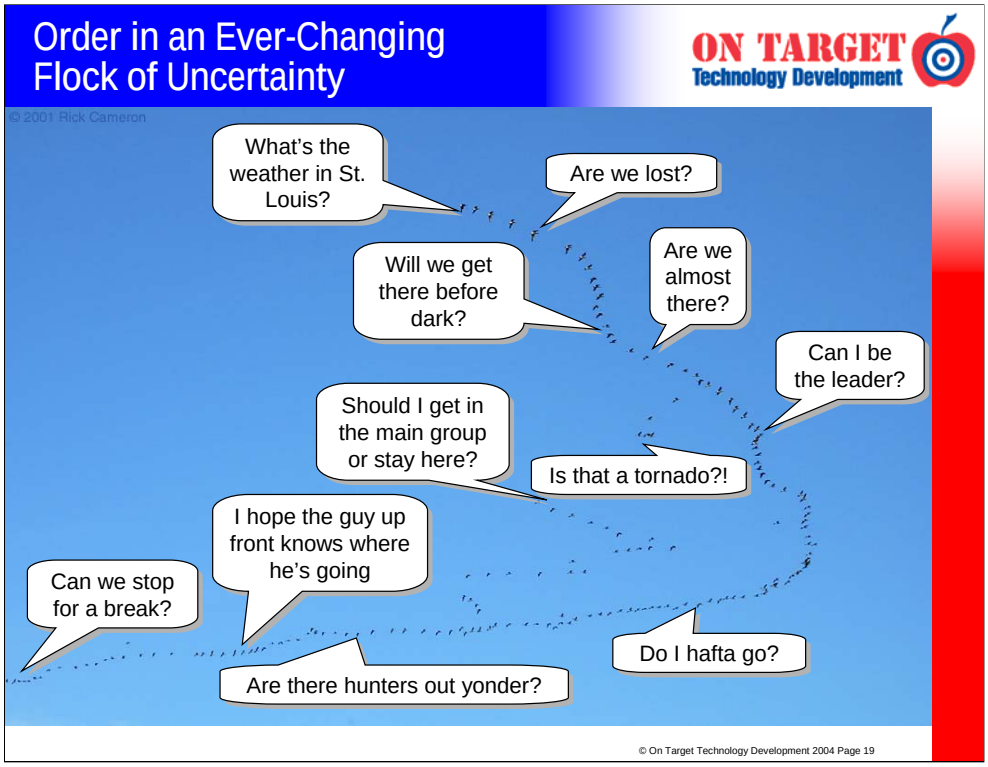

Product development lies in a world of uncertainty. You don't know what you are in for. Plan what you can and be prepared to adapt.

Adapt to the Unknown

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- Planning is no substitute for real-world experience
- There are always imponderables –
  Ponder the imponderables
- Product managers need to be able to adapt to ever-changing situations
- A priori understanding of the business situation is important, but also develop plans to cope with reality and adapt to situational changes.
- "40% of software development is spent fixing (debug) – Dan Freedman, President of Ethnotec

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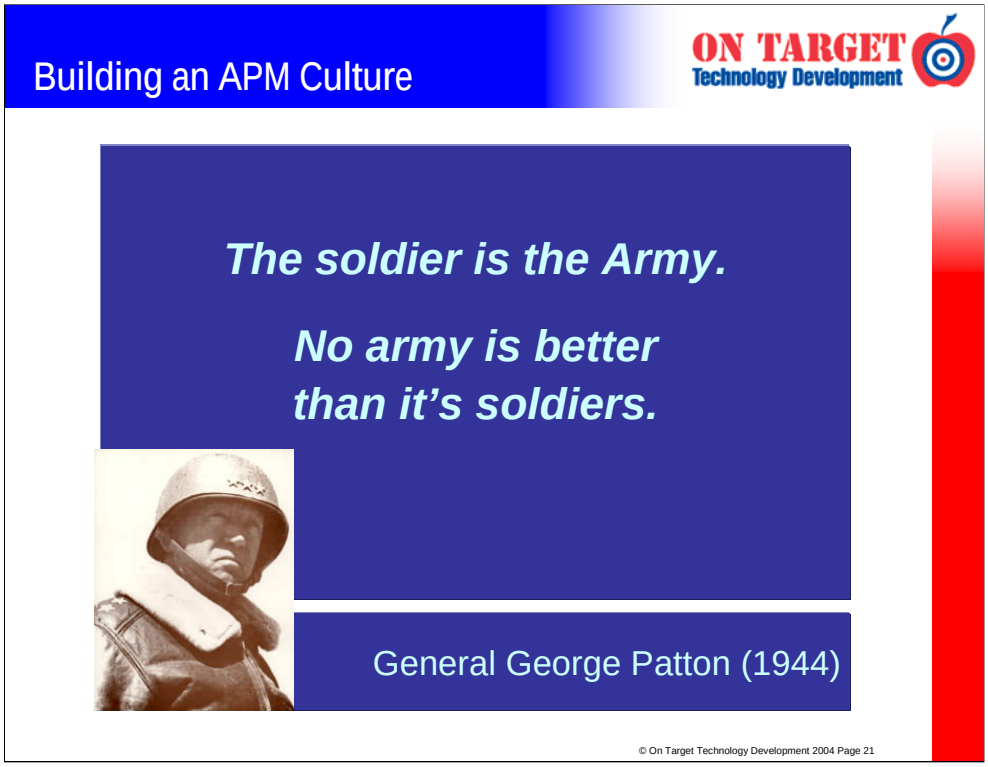
Reacting to the unpredictable is subjective and tends to slow organizations down. You need to be able to assess ever-changing situations with objective analysis and make knowledge-based decisions to move forward.

Don't be afraid to throw work out or kill products and projects. Sometimes you have to stop the bleeding early, and put that same entrepreneurial drive into one of your other market races. This is a tough decision. You can make the decision much easier if you use an objective decision system. This decision is analogous to a stock investment.



No organization is better than the people who run it and execute the directives of management.

You are not in the XYZ product business, you are in the people business.

If we want our business organization to behave a certain way, we need to train, discipline and prepare our employees, as Patton did to for his soldiers.

Recipe for an APM Culture

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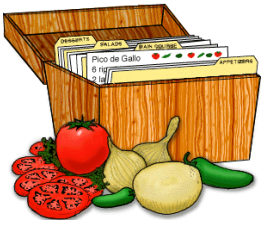
- Welcome failure! (while manageable), Acknowledge uncertainty, but emerge order
- Paced by external deliveries, learn from them if they fail
- Deburden risk, building blocks of learning the unknown
- Action-based roles, decision models
- Build an APM IPT with non-conflicting roles
  - Business Unit Manager – Financial
  - Program Manager – Contractual
  - Product Manager – Market/Technology
- Replace Command-Control management with Leadership-Collaborate management
- Build business processes that support APM
- Unified mission – Get the product into the customer's hands. They won't embrace your product by hearing about it. They have to use it to love it.
- Carpe Manana – Communicate your roadmaps



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Edison did not invent the light bulb. He did, however, improve upon an existing incandescent bulb. Edison's improvements made it practical and allowed the bulb to burn long enough to light a home. He recognized that his value came from his thousands of attempts to improve it. His persistency is what made him extraordinary.

Carpe Diem (seize the day) – Take today's opportunity

Carpe Manana (seize tomorrow) – Recognize that today's learning will breed tomorrow's opportunity. Do what you can today to enable tomorrow's opportunities.

How can we implement an APM business model?

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I'm not looking for Mrs. Right, I'm looking for Mrs. Right Freakin' Now!

Gary the Rat

- Paradigm shift from doing the *best* thing to doing *some*thing
- Management commitment – it is too easy to cave in to the "risks"
- Customer coordination – let them feel part of the innovation.
  - Find an unmet need – fast
  - Fix their failures
- Keep development ahead of your customer
- Make the charter match the role – Product manager is a different role than project manger or business unit manager

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We ship prior to completion of product qualification – because we think that with our accelerated testing, we will find the problems earlier (we can put on the cycles faster)

Project managers are responsible for getting a project done within well-defined constraints. – on-time, to-spec and within budget. A product manager has to respect the business constraints but recognize that the market is never constrained.

Funding strategy – Use high-level, phased budgets, rolling-wave detailed plans. Use milestones to adapt plans and make decisions.

* Do not push milestones to the rights. That is a notorious cause of schedule/cost slip. If you have issues that are preventing you from achieving a milestone, table them now. It's better to take the hit sooner than later.

Why don't we use APM?

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- Why don't we release early?
  - fear of failure (business impact and job impact)
  - fear of loss of reputation
  - costs of recall/repair/liability risks
- Our procurement structure prohibits ambiguity
- Project Management traditionally does not support sandboxing
- No business rationale to invest in uncertain opportunities
- We don't know how to implement it into our business processes

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Learn to field test your product. The first bungee cord developer didn't just tie one on and jump off a bridge. Make your customer part of the release process.

Ambiguity – that's why everything is so slow

Same issues as risk of innovation

APM systems can become bloated if you don't know when to stop building. It is a great technique to use early in the product lifecycle to energize communication between users and developers. But once the technology is understood, traditional project management techniques will efficiently deliver the final product.

Progress is only made through risk-taking

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You miss every shot you don't take.

Wayne Gretzky

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APM Success Stories ...
... and Failure Nightmares

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Successes	***Failures***	***Discriminators***
Microsoft Windows (Q,C,G,A)	Macintosh (Q) Linux (C)	Continuous flow of funding; constant customer testing and feedback. Linux is improving Q, G, A, and is achieving APM!
PC Systems (Q,C,G,A)	Gaming Systems (Q)	Logistics and compatibility; integrated supply chain support; latest and greatest syndrome; upgrading
Palm Pilot (Q,C,G,A)	Apple Newton (Q)	Newton (first PDA) developed in isolation, didn't respond to customer needs/feedback, no followup to adapt to change.
Internet News (Q,C,G,A)	Newspapers (-)	Print media is unable to adapt to user need of immediate news; e-news is adapting to meet need for availability, portability and easy-to-read screens.
Your Business	Your Business	Commitment to a steady business strategy; Risk acceptance/management; Instilling an APM culture; Enabling an Integrated Product Development Team

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Looking at these discriminators, you can see some of the "best practices" of APM.

What can we learn from Microsoft? You can win a HUGE customer base with a half-assed product. Windows worked like crap when it first came out. Some schools of thought believe that it still works like crap. Why did Microsoft succeed? They built a following of a divergent product early. They kept feeding the product until it grew into what the customer base wanted.

Why could Linux fail? Nobody is feeding it. When software products stop growing new and better versions, the product fades away. But there is still hope!

Consistent business strategy and adaptive culture are NOT conflicting interests. Strategy describes the characteristics of your destination. A pilot flying from NY to LA may get rerouted and have to adapt, but she still wants to get to LA.

The Challenges of APM

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- Fixed-price contracts assume a predictive process.
- Customer and developer need a closer relationship
- Responsiveness will be key to cost management
- How can you quickly make a tangible, operable prototype
- Competitors are watching – and planning
- Infrastructures are usually tuned for a waterfall model
- Differences in government and commercial procurement
- APM requires “rubberband constraints”
- If your situation is fully predictable, use a predictable development methodology. (APM is not always best.)

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Fixed-price contracts assume a predictive process. Each party will share risk in an adaptive project. Traditional methods also bear risks.

Customer and developer need a closer relationship

Responsiveness will be key to cost management

How can you quickly make a tangible, operable prototype

The mechanics and logistics of incremental releases can be overwhelming. You should lean up that process (using ABC, etc.) to minimize impact of change.

As you are taking incremental steps, your competitors are planning radical innovations. They can read your route and predict your future position.This means you have to move faster than they do.

Product development infrastructures are usually tuned for a waterfall model

Differences in government and commercial procurement

Traditional PM is about management of constraints. APM requires “rubberband constraints” (scope, cost and schedule are interdependent)

Challenges Ahead

- Leveraging evolutionary development trend
- Decision-making that supports incremental value-add
- Enabling an adaptive culture in the organization
- What are your Top-3 problems with adopting an APM business model?

1.
2.
3.

THAT is what we will have to fix next!

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If we think of the concept of APM as a product, let's practice what we preach. Tell me the top 3 problems you have with moving forward using APM.

That's what we will have to fix next.

1) **Customer support and funding of rolling-wave releases (quantify delivered value)**
2) **Procurement and contract processes (quantify delivered value)**
3) **IPT and project management processes**

Summary

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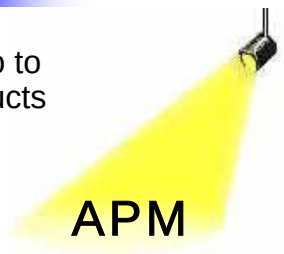
Technology Development



- Success for the next decade will go to those that can quickly deliver products and continuously evolve them with customer-centric changes
- Go forward, adapt, overcome, and go forward again – fast
- Build momentum with value-chain collaboration
- Continuous exploration and product improvement
- Instill a culture that encourages APM and discourages complacency

If you are in the technology business, you are in the change business

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Additional Information

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Comparisons

- APM is different from other development methodologies
- Incremental and Agile Product Development
  - Bottoms Up
  - Inside Out
- Project Management typically is
  - Top Down
  - Outside In
- APM plans product development like project management, but executes it like product development

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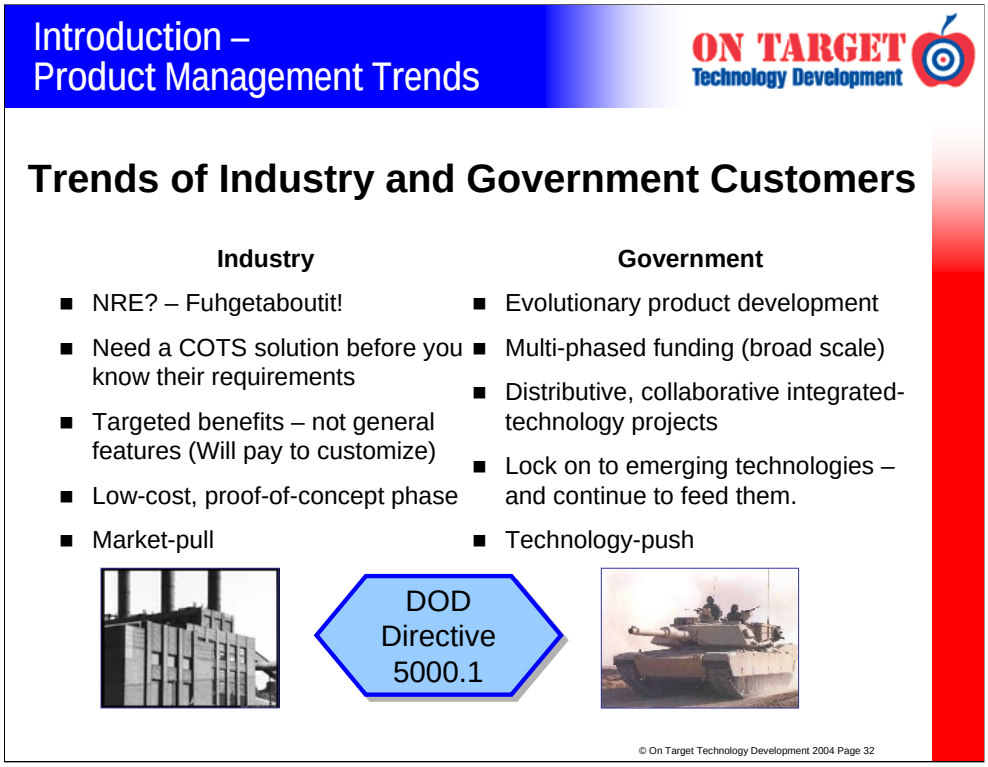

Both are willing to change providers to get the best available solution.

Even if you have the technology available in-house – if you don't have it released externally in the form of a product that adds value to these organizations, you will never even be considered as a supplier.

SBIR programs are successful, because companies can take baby steps

Fed govt recognizes the need for phased development. They now have an "Evolutionary Product Acquisition" program

The DoD has released DoD Directive 5000.1 and DoD Instruction 5000.2, making Evolutionary Acquisition and Spiral Development a *mandatory procedure!*

The companies that fit their business model to the acquisition model will gain the most funding. It's a mandatory procedure – you do the math.

These trends align with the APM business model we will discuss today.

Prototypes and product demos are VERY critical

The Realities of Today's Product Developer

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- Product Development is not like building a bridge. It is NOT predictive. (Otherwise, it would be called manufacturing.) Plan to learn!
- Technology forecasts are a double-edged sword
- It is very difficult to see what value a system feature has until you actually use it.
- Requirements will change. The business world is unpredictable

Development is about learning the unknown, not execution of the known

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I teach project management courses, and I am constantly frustrated by project plans that model a new product development as a step-by-step construction recipe of very precise steps with no opportunity for learning – or recognition that learning is needed.

Developing a product is not like building a bridge

Design is larger component than construction and is tough to plan accurately

Even construction has risk, but it is more recognizable and impact is more predictable.

Development is NOT predictive. (Otherwise, it would be called manufacturing.) Planning is valuable, but it must be adaptive. When we plan projects, we outline an execution plan of known scope and development. We do recognize that unknown problems will surface. So what do we do? We bundle a "management reserve" to handle unplanned learning. M&T have different perspectives. You manage what you know, you develop what you don't. Development is about learning the unknown, not execution of the known. Plan to learn! We need to "learn to plan to learn".

Technology forecasts are a double-edged sword – Believe it and it doesn't come true. Ignore it and you miss opportunity.

Requirements engineering is not adequately done. Too closed. Need to get some feasibility feedback.

Focus on the people rather than the process. Accept human factors and limits

It is very difficult to see what value a system feature has until you actually use it. Only when you use an early prototype of the product do you really begin to understand what components are valuable and what are not.

Requirements will change. The business world is unpredictable

The Realities of Today's Business Competition

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- Design-to-launch cycles (< 9 months)
- Product life cycles (< 2 years)
- Severe price erosion
- Increased competitors bring oversupply and lower margins.
- Innovate to maintain competitiveness and profitability
- Technology is more market-driven than anything else.
- Decentralizing R&D in favor of business units.

Uncertain and ever-changing market drivers demand supply-chain collaborative innovation

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There is less emphasis on long-term research and more focus on short-term product development through incremental, collaborative development

Blurring product differentiation

What is today's customer-centric environment?

More companies are decentralizing their corporate R&D in favor of business units. The smaller the self-sustaining business unit, the better.

Celebrity Boxing: The Engineer vs. the Business Manager

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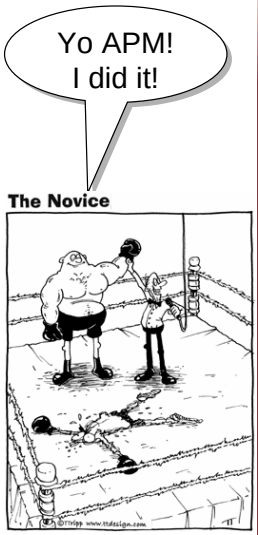
- Engineering – Optimizing in Uncertainty
  - Environment – Unpredictable, technical uncertainties
  - Desire - Agile prototyping, experimentation
  - Risk mitigation - Freeze requirements, minimize technical commitment, build credibility by completing understood areas
  - Measurement – On-time, to-spec, under budget
- Business Management – Controlling in Chaos
  - Environment – Business exposure, Objective strategy/goals
  - Desire – Small project team, stable constraints and assumptions, predictive performance
  - Risk mitigation – Minimize business commitment, build %complete with understood areas
  - Measurement – Project metrics, short-term ROI
- Marketplace – Buying the Unavailable
  - Environment – Unpredictable, much uncertainty
  - Desire – Customer-centric, product pull
  - Risk mitigation – Saturate supply



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Those realities, and the approaches used for each of those roles are constantly at battle.

Engineers need flexibility to work in a unpredictable technical world.

Management wants to nail down business constraints.

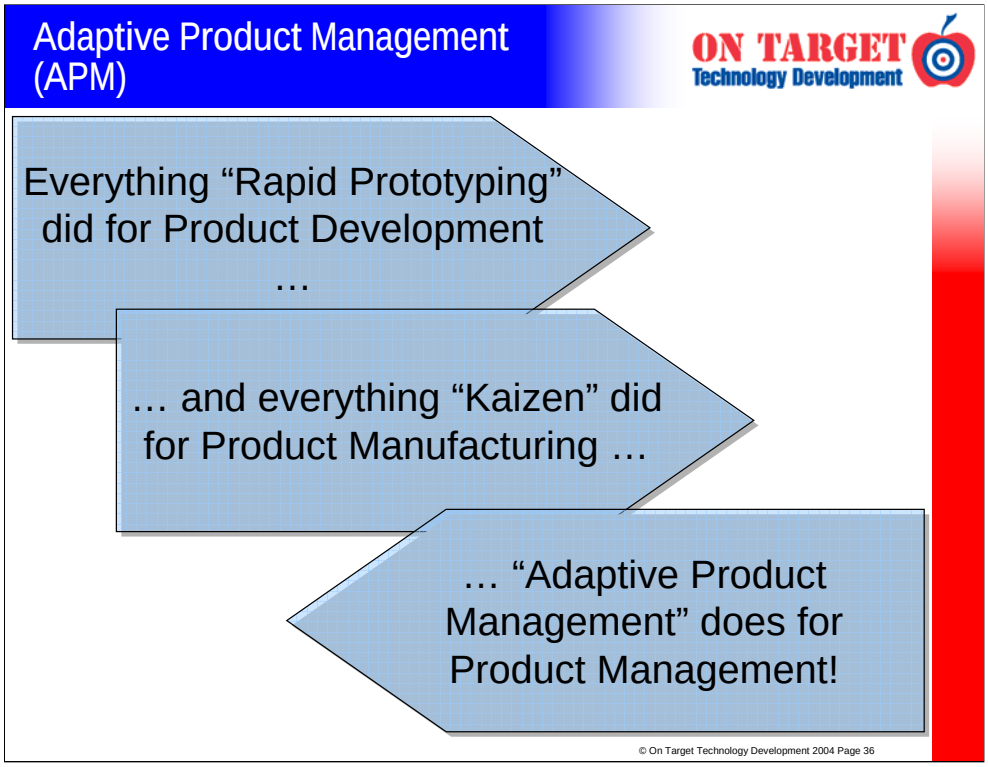
The Market demands the best, even when it is not yet available.

Both engineering and business management use sandbagging to minimize commitments. This essentially lowers expectations. The subsequent performance works to achieve these lower expectations. This fear of risk and resistance to change strangle innovation.

So … who wins the battle?

<click>

Whoever is able to dive in and adapt to meet the customer needs. APM supports that methodology.



Adaptive Product Management bridges the gap between unpredictable, uncertain technology development and predictive, practical business management techniques.

It takes the best of RP from internal engineering development and applies it to the supply chain.

It also employs the continuous improvement benefits of manufacturing processes to the business of product development.

Above All Else – Move Quickly

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Go forward

General George Patton

- Standing still - you take more losses; Pushing forward - you minimize losses
- No need for big leaps, just baby steps
- Opportunity is missed by standing still
- Step forward, adapt, steer the course
  - Get to market faster.
  - Get customers on board faster.
  - Get feedback faster.
- First to market gets all the chips, second gets spillover, third gets eaten
- Effortless transition for service industries (lower cost of infrastructure)

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It's been proven in business as well as in battle that if you stand and wait for everything to be perfect, you will lose.

The winner is the one who keeps moving forward.

-You get to market first

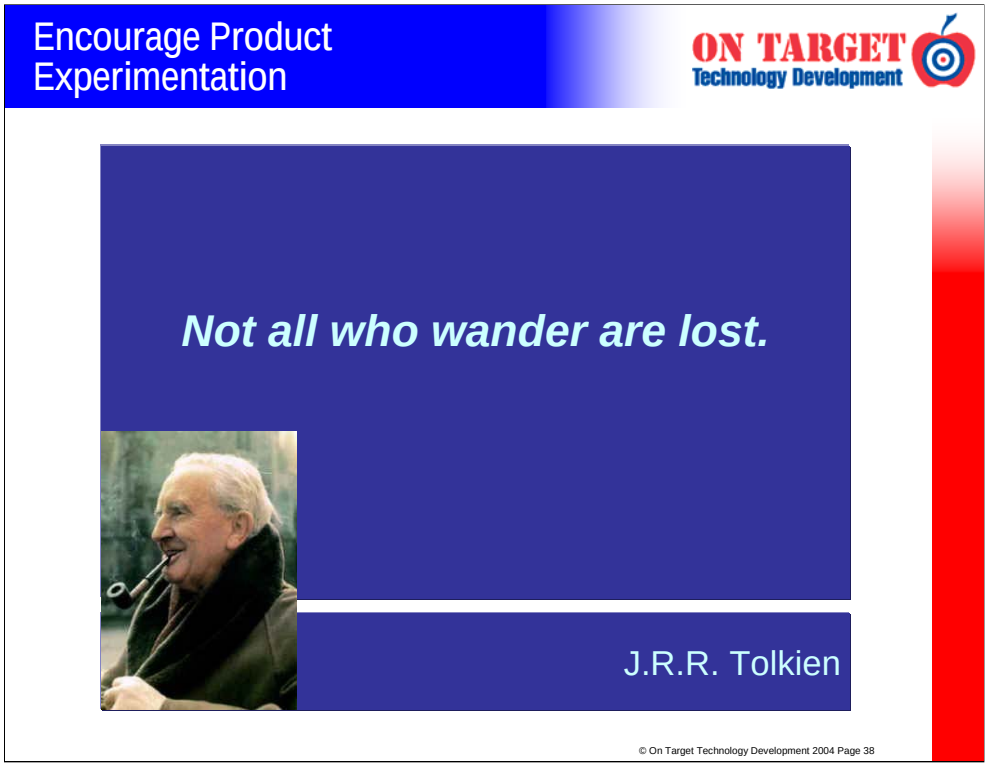
-You lock in customers

-You use their feedback to drive your next product generation

-Rinse and repeat; over and over

The change cycle becomes more difficult when you have a lot of WIP, inventory and fixed resources. (e.g. too much invested in early prototypes, spooling up too much too early) You need to lean all that stuff down.

Service industries have an easy transition to adaptive culture, because there is very little infrastructure and inventory that needs to change. The cycle time is zero.



In order to expand your market and discover competitive value, you need to break free from the flock and explore uncharted territory. Some portion of your product R&D should be in exploration and experimentation. That is how you will find unrecognized and unanticipated product value.

Allow Developers to *S-T-R-E-T-C-H* their Creative Limits and Explore

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Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity

Patton

- Allow team to explore the creative application of the technology
- What causes your employees' to fear initiative?
- Why are they afraid to submit R&D project ideas?
- We limit our developers' inventions by obstacles and inaction
- Exploit, encourage and reward individual initiative
- *Example: Disruptive Technology*

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This concept has had the greatest effect on me during my project management training courses

People generally fear standing up, taking initiative and pushing a radical idea. Why does it happen on your team? Reasons may include ridicule, rejection, inaction, lack of support, no champion – or if your organization does decided to move forward with it, a fear of failure, "it's your job on the line", company commitment, investment, etc. In general, it is easier for people to work in the known status quo – fat, dumb and happy.

How do you measure your employees performance? Probably by the success of meeting project objectives. We've already discussed how this approach builds a constrained box around your development and prohibits creative exploration.

How many creative ideas for new technology do you get from your employees? In what form do they come? How substantiated are they? I will go out on a limb and say that every one of you employees has one or more wonderful ideas for new products or technologies. Many of these are lucrative opportunities for the business. Why haven't we taken action on them? Some of the reasons we have discovered are:

1) The inventor has to be motivated to take the first initiative. (Should be self-motivated, but the obstacles discussed above may prevent that).
2) The idea has to be articulated by the inventor in the form approved by the company (Do they know how? Is it overwhelming?)
3) The idea has to be presented to management (Why are they afraid, intimidated?)
4) The idea has to be analyzed, evaluated and decided upon (Perpetual black hole) – Inventors can come up with the idea, but have difficulty with the objective business evaluation. Yet, our typical response is "Show me the business case, and we may be able to support it." It a technologist is unfamiliar with building the business case, s/he may just shelve the idea and not risk exposing a weakness. Business case development should be a collaborative effort of the inventor, management, and subject experts.
5) Those that we decide to pursue have to be planned, executed and managed. The inventor typically wants to dive into the product development, not mess around with project planning.

There are a variety of reasons we fear radical innovation. In the future and emerging lifecycle periods, we fear the unknown. In the wide application period, we fear the entry burden, in the obsolescence period, we fear the future marker. Disruptive technology is a form of radical innovation. We find a creative way to apply a new technology to an existing market or an existing technology to a new market. Disruptive technology growth requires a different type of innovation culture than sustaining technology growth.

Building Blocks – Explore the Unknown with a Known Objective

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- Talk to the user – prototype user interfaces and get feedback early
- Build what you know, Explore what you don't
- High-level application to low-level functionality
  - Design application in, not feature out
  - Define key functions, needs, markets, industries, etc.
- Resolve high risk areas early – The goal of prototyping is to learn what you DON'T know. Enable user learning.
- Use risk-mitigating experimentation to remove obstacles.
- As people work with prototypes, functional problems become imminently visible, bugs become apparent, and issues demand correction.
- *That's how you move forward!*

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Talk to the user – prototype user interfaces and get feedback early

Prototype what you know and challenge what you don't

High-level application design to low-level functionality design

Design application in, not feature out – Agile software development and eXtreme Programming suggest inside out development. APM is outside in.

Resolve high risk areas early (traditionally, we do the easy, predictable stuff first {to gain %complete} then try to rush the hard, unpredictable stuff at the end.)

You don't know everything up front. Your goal up front is to build a joint understanding of everyone's needs and expectations.

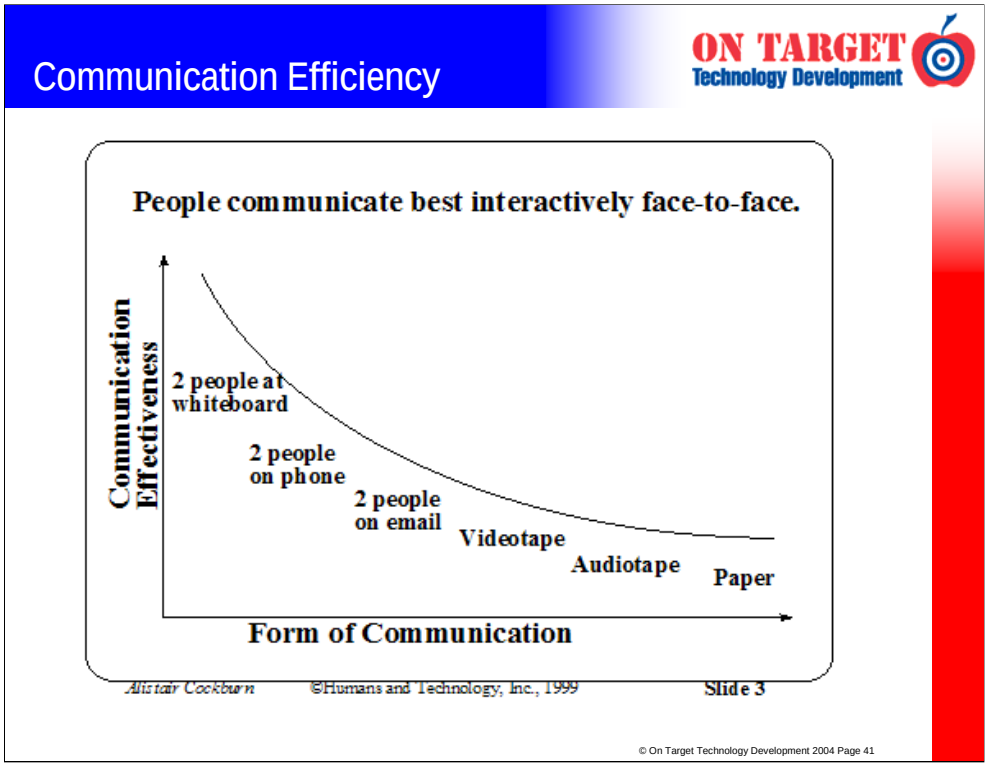
We tend to do what we know, in order to make measurable progress. But, when we save what we don't know until last, we maintain our risk exposure throughout the program, and tack on schedule/cost overruns at the end. By focusing on what we don't know up front, we:

1) get early feedback

2) mitigate risks early

3) expose problems while we have the project slack to manage them

As people work with prototypes, functional problems become imminently visible, bugs become apparent, and issues demand correction.



So the second idea of the day is that as you remove those characteristics of two people at the whiteboard, you reduce the efficiency and effectiveness of the communication session.

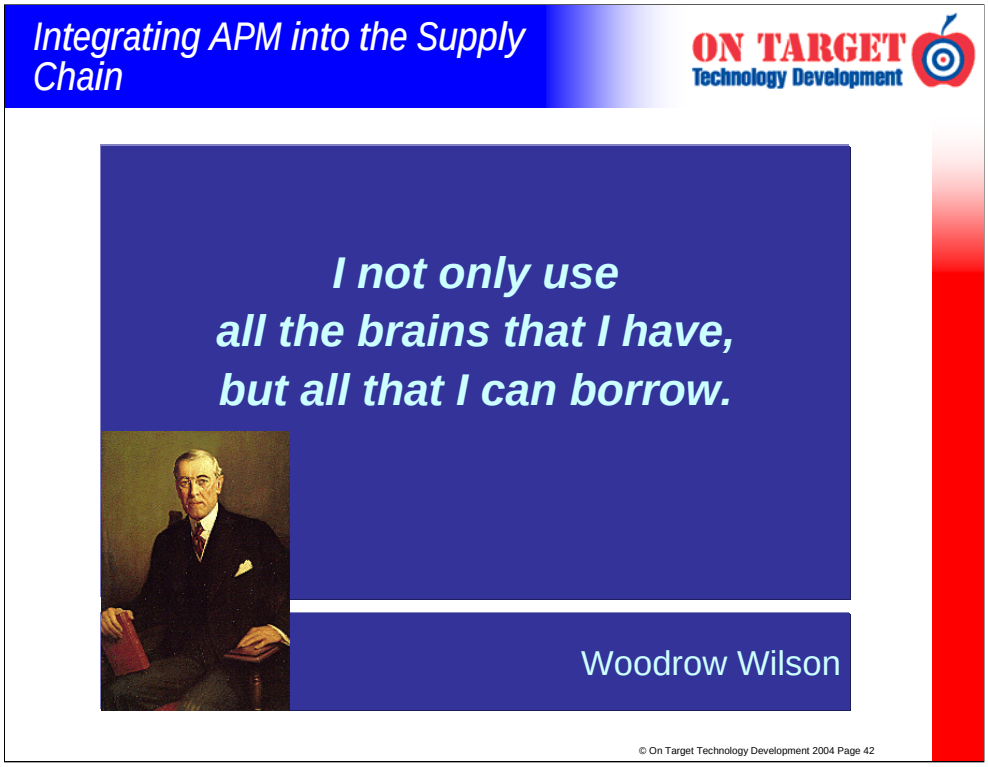
That is what the graph shows. Take away part proximity, and you get video conferencing, and many of us have experienced how hard it is to collaborate over a video link. You lose 3dimensionality, the visual proximity that gives non-verbal cues. Back up one step further, put people on the phone and you lose all visual cues. Go to email and you lose tonal inflection, and timing. Go to videotape to get visuals back but lose question-and-answer. Go to audiotape and lose visuals again.

Go to paper and guess what? You've lost almost everything. The writer has to, very laboriously, I should note, guess who the audience is, guess their level of experience, guess what they understand, guess what their questions will be, and guess what the best answers to those questions are. What are the odds of them getting all that right? Very small. And expensive.

But how do we demand that people communicate on a project? Written text and drawings! In the light of this communications model, that is clearly absurb - and yet we do it. We demand that people communicate in the slowest, least effective medium, and downplay the most effective medium.

So if this theory is any good, we should be able to draw a prediction from it. All right, here is the prediction I get from looking at this graph. How should we create archival documentation of a design decision? Back up the curve to highest archivable communication medium, and we find Videotape.

(from Alistair Cockburn's SCUM talk 1999)



Woodrow Wilson recognized the power of collaboration. He knew that he did not know everything and tried to leverage the knowledge of the people he worked with.

Multi-Directional Innovation

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We can always learn from each other

Patton (to a junior officer)

- The best authority on how to get a job done is the person who has to do the job
- Collaborative innovation helps you get better, faster through value-based, targeted design
- Collaborative R&D broadens technical capabilities and market opportunities
- Multi-directional innovation develops supply-chain relationships
- No animosity from “subject matter experts” – Everyone is a mentor
- Need to be aggressive with IP protection
- When the customer can influence your innovation, you have captured that customer.

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The most innovative ideas come from those that are not stuck in a rut.

Sources of product innovation are becoming more diverse. Customers and suppliers are initiating and influencing innovation within an organization. R&D has become more team oriented, less permanent and more flexible.

As team-oriented innovation develops, the need for aggressive IP protection will follow. Team members are great until they tick each other off. When your business relationships dissolve, make sure you hold onto your IP.

Building an APM Integrated Product Development Team

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- Common, cross-functional goals that align with the APM fundamentals (marketing, finance, engineering, programs)
- Cooperation and synergy across the value-chain
- Provide would-be entrepreneurs the guidance and support they need to bring radical ideas to action
- Define roles & authority to make decisions and take action
- Learn to recognize APM opportunities
  - Market demands
  - Technology growth
- Avoid conflicting Prod Mgr roles
  - Project
  - Business
  - Technology

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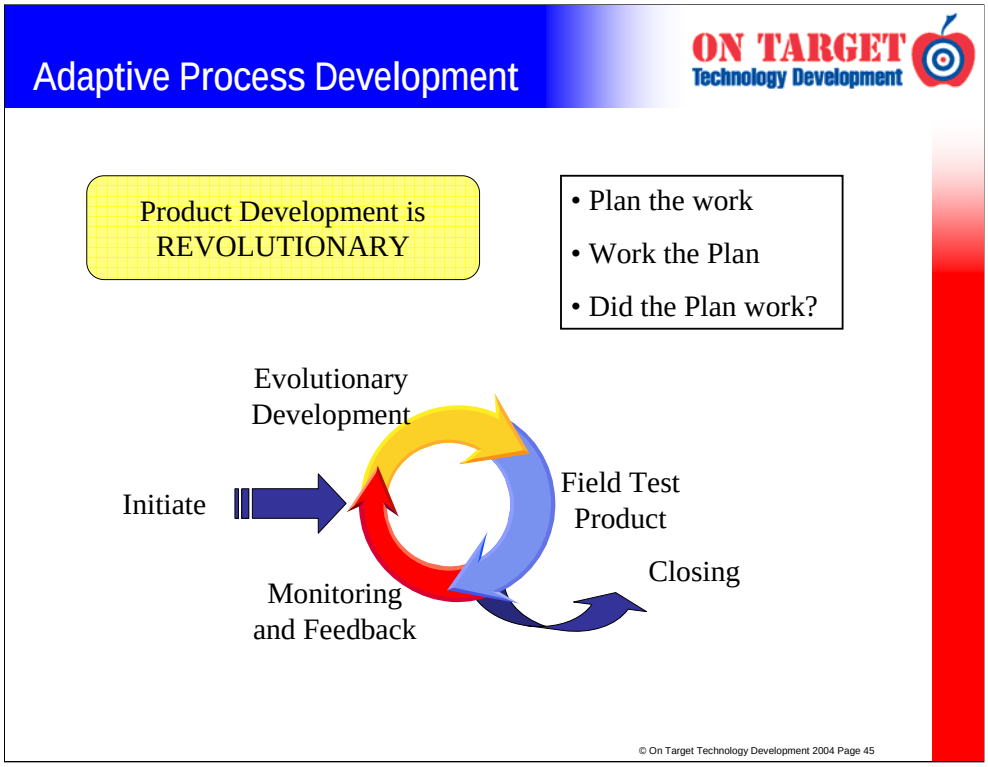
The business value of Integrated Project Teams (IPT) has been proven. The objectives and roles of an Integrated Project Team are perfectly aligned with the objectives and roles of an Integrated Product Team. I recommend that you use the same integrated team approach from the perspective of your product development.

In my experience with IPT's, the greatest benefit we have obtained was in the area of effective change management. That benefit has never been more needed than with APM.

NASCAR drafting – the principle of coopetition.



Plan/Do/Check/Act cycle

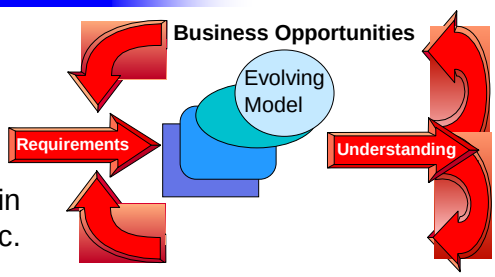
See what works and what doesn't.
Participate yourself. You have to be on the battlefield to know how the battle is going.

Become "enlightened" about the aspects you don't understand

Adaptive is NOT incremental. It is low-risk revolution. APM is about mitigating risks by enabling:
-**Quick feedback**
-**Flexible growth and development**
-**Open market influence**
-**Multiple voices**

Incremental is a bottom-up, inside-out integration. APM is a top-down, outside-in evolution.

Leveraging Change in APM



- Change WILL happen
- Encourage & facilitate it
- Change helps progress – in organizations, markets, etc.
- Change always impacts budget and schedule, so make implementation as effective as possible.
- Traditionally, it delays product releases and causes
  - Missed opportunity (late to market, deferred revenue)
  - Additional costs (rework, documentation, approvals)
  - Higher risks (cancellation, compatibility, logistics)
- In APM, change is handled as building blocks to the product roadmap – the development process is driven by change.

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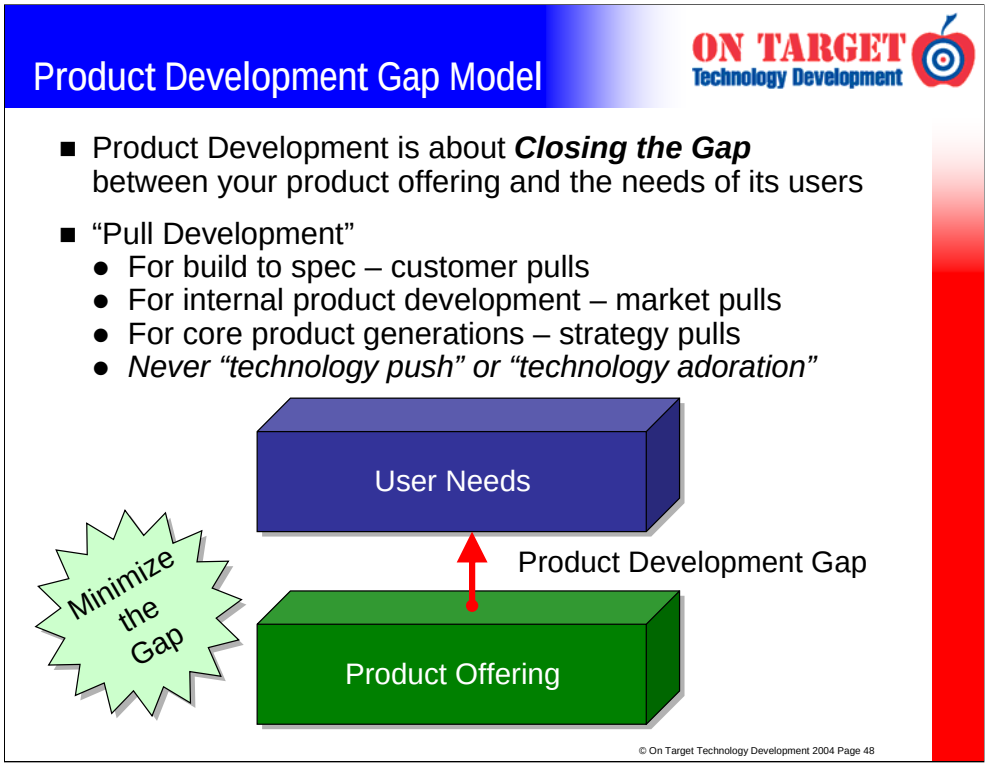
True innovators take radical risks to revolutionize their companies. Successful product managers relentlessly mitigate these radical risks. These radical risks are the seeds that grow the company.

Traditional project management tolerates changes, and tries to control it. Today's product manager thrives off it, and uses it as an enabler of product growth.

It's great to dream big and have elaborate visions of where we want to be in the future.

One of the first things I learned as a small business owner was to "think big, but act small". The path to big success is a bunch of small steps.

Suppose you want to lose 50 pounds. How would you do it?



The purpose of technology development is to close the gap between a user need and available technology to satisfy it. We are pulled a variety of ways to close that gap

"Pull Development"

For build to spec – customer pulls

For internal product development – market pulls

For core product generations – strategy pulls

Never technology push or technology adoration

The smaller the gap, the easier it is to make the jump. Therefore, implement smaller gaps through adaptive increments.

APM Case Study – Telecom industry / Verizon

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verizon

- Telecom sees changes in market (mobile), technology (convergence), requirements (VoIP) and regulations (FCC)
- Verizon has seen a loss in profits over the last few years
  - Declining % of marketplace (more competitors)
  - Profit opportunities move across segments (land to wireless)
  - Short-term financial mitigation (downsize)
  - Long-term business mitigation (adapt strategies)
- Presence in many market segments; so Verizon can adapt and manipulate offerings for changing demands
  - Wireless; Long-distance; High-speed Internet; Cable TV; VoIP
  - Different competitors in each segment – tough to generalize
- Verizon must adapt offerings to combat increased competitors.

1) How are Q, C, G, and A important in the telecom industry?
2) How can Verizon use APM to maintain strong segments (wireless), regain lost ones (land, cable), and penetrate new ones (VoIP)?

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Verizon remains #1 compared to the other competitors overall, however, their percentage of the marketplace has sharply declined. They get compared to cable, who does not offer wireless services, but who offer the other services that Verizon offers. They get compared to AT&T who does not provide cable television services and whose high speed Internet product is slowly gaining entrance into residential homes. They get compared to MCI who does not offer wireless services or high speed Internet. So the comparison is sort of skewed. When you actually look at the figures from 2000 until now, the company has experienced a steady loss in profits. The wireless sector is what is keeping the company afloat. Verizon has the largest wireless network operating right now. The company is still holding the #3 position for long distance service in the United States. Although they are the overall leaders for telecommunications service, they are not the number 1 provider for each segment of service, nor is Verizon holding the market share like it did in the past.

Competitors:

Wireless – AT&T

Long-distance – AT&T, MCI

Internet – Time Warner

Cable – Time Warner

VoIP - Vonage

Will VoiceWing be able to take on VoIP market share?

Where is VoIP in the APM applicability matrix?

APM Simulation

- Excel cash flow model
- Successful product, failed product

APM Simulation

		Traditional	APM6	APM9	APM12	APM15
Baseline Prod Dev Budget		$1,000,000	$500,000	$250,000	$250,000	$150,000
Baseline Schedule (months)		12	6	3	3	3
Labor Budget		100%	100%	100%	100%	100%
Product Return (per month)		$100,000	$50,000	$100,000	$150,000	$175,000
Annual Dev/Maint Costs	15%	$150,000	$75,000	$37,500	$37,500	$22,500
Early Release Insight		0%	0%	50%	75%	N/A
Monthly labor rate		$83,333	$83,333	$89,583	$92,708	$62,500
Total budget (incl maint)		$1,000,000	$1,234,375			
Failure Detect/Act (months)		3				
Revenue during Failure		$0				

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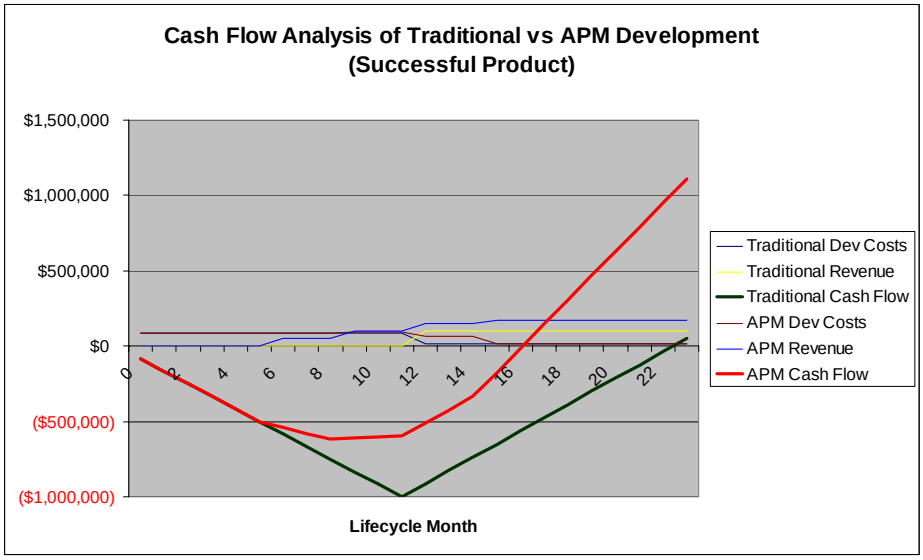
Successful Product Cash Flow



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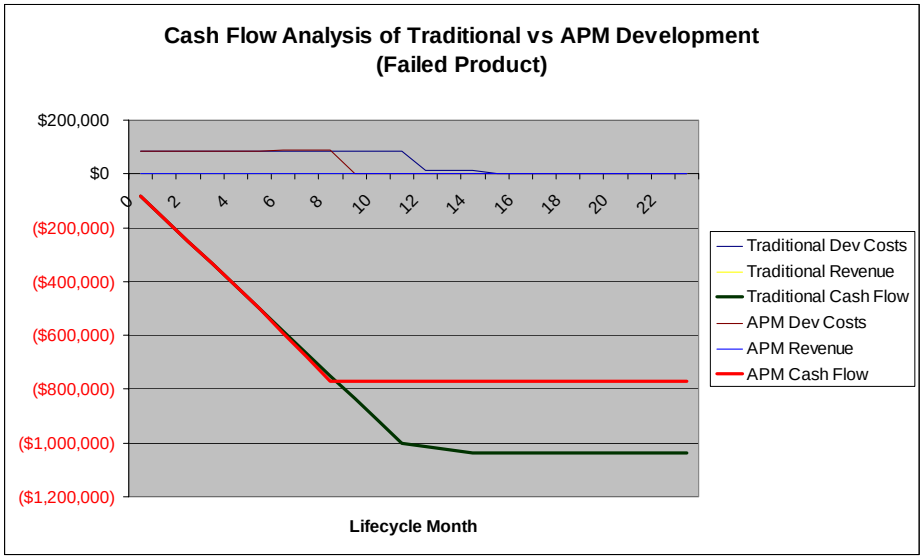
Failed Product Cash Flow



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APM Simulation

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I skate to where the puck is going to be, not where it has been

Wayne Gretzky

- APM Highlights
  - Less cash exposure
  - Equal “out of pocket” investment
  - Much higher return
  - Becomes self-funding
  - Increased market penetration
  - Lower risk of failure
- Additional benefits
  - Pre-emptive market share
  - Choke point
  - Customer lock-in

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Additional benefits that show up in simulation:

-Pre-emptive market share – First to market captures the “awaiting market”. Late entries get what is left over. APM helps first movers to hold onto the market.

-Choke point – Early entries can capture the most influential characteristics and hold onto them as a choke point. For household Internet, the choke point is the cable (or DSL) line coming into the home. Microsoft tried to take advantage of the Operating Systems chokepoint in PC software and fell under a lot of scrutiny.

-Customer lock-in – Once a customer established your new technology product into their infrastructure, they are less likely to change (due to transition efforts/costs). You don’t want them to feel like they are locked in (in that case, they will feel constrained and leave), but you want to make it as easy as possible for them to stay with you. One way to do that is through continuous improvement guided by their feedback. You will adapt the product to meet their needs.

APM lowers your risk because it lowers your exposure

I skate to where the puck is going to be, not to where it has been

Fortune Cookies for Adaptive Product Managers

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- The secret of getting ahead is getting started.
- Many a false step is made by standing still
- A journey of a thousand miles starts with a single step
- Your greatest riches will be found spending time with friends
- You will help your friends succeed through their own failures.
- You can to do what others cannot, because they don't know they can
- You will put yourself out of business before your competitors do
- Work backward from your imagination, not forward from your past.
- The unbeaten path is rich with fruit
- Time is today's currency.
- Failure is the mother of success (fail fast)
- It is better to deal with problems before they arise.

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All fortune cookies are positive and inspirational. You never get a bad fortune cookie, such as "Hey, those guys that you owe money to are waiting outside with a pipe wrench.". (There was that time after my Kung Po chicken dinner where I opened the fortune cookie and it said "That wasn't chicken". But that was a fluke)

History is an innovator's worst enemy.

Manage through the windshield, not the rearview mirror

Many a false step is made by standing still.

Do you know the biggest cause of new product failure? Inaction.

Do you know the reason businesses lose the most product proposals? They lose not to a competitor, but to "no decision".

How often has a lack of a decision stalled your product development efforts?

Why is it so hard to make decisions? People are afraid to take on even a moderate level of risk. The way to get past this hurdle is to reduce the risk of making the decision. Reduce the risk by taking smaller steps

There is a current trend to collaborate R&D across your supply chain. What are some of the benefits? Shared costs, shared risks, solidified relationships, plus all the benefits of collaboration.

We need to build a better path to our customers by focusing on their future needs and selling them the benefit of what we do to satisfy what they don't think they can.

Notes

- Collaboration – Product development and project management are social activities. Managers in each of these elements consistently say that communication skills are most important
- Case study slides
  - Verizon – adapt to changing telecom
  - Bell Labs – Did not adapt, turned into a shadow of itself
- Demos
  - Mr. Potato Head
  - Pics of engine compartment of Venture and Jeep.
    – Show depressions for growth options
- Terminology page at beginning – get consistent definitions and objectives.

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Notes

- Why not APM?
  - Financial – break up phases into different line items
  - Downstream too unclear – Plan to level of detail that makes you comfortable, but be willing to change.
  - Can't see downstream risks – Pull them upstream
    - Known knowns – can be pushed downstream
    - Known unknowns – pull upstream
    - Unknown unknowns – need to reveal early and pull upstream. Plan accordingly.
  - Having known knowns pile up downstream is good for resource management. When people/$/equipment become available (even for a short time), they can work on those. Traditionally, the unknowns pile up downstream and we only allow select "experts" to work on them. This drags out the schedule.

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