

Product Lifecycle Management: Strategic Technology Roadmap Planning

**Fall '09
PLM IAB
Meeting**

Dr. Abram Walton

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Overview

- Research Purpose and Rationale
- Research Findings
- Implications

Purpose of Study

The purpose of this grounded theory study was to examine perceptions of practitioners and leaders from industry, government, and solution providers for concerns about and recommendations for strategic planning and road mapping for PLM initiatives; with the intent of using this information to identify the emerging industry trends that may guide the development of strategic PLM technology roadmaps.

Strategic Road Mapping

Enablers

1. Senior executive support for IT
2. IT involvement in strategy development
3. IT understands the business
4. Business/IT partnership
5. Well-prioritized IT projects
6. IT demonstrates leadership

Inhibitors

1. IT/Business lack close relationships
2. IT does not prioritize well
3. IT fails to meet its commitments
4. IT does not understand business
5. Senior executives do not support IT
6. IT management lacks leadership

Strategic Road Mapping

Strategic Road-mapping requires:

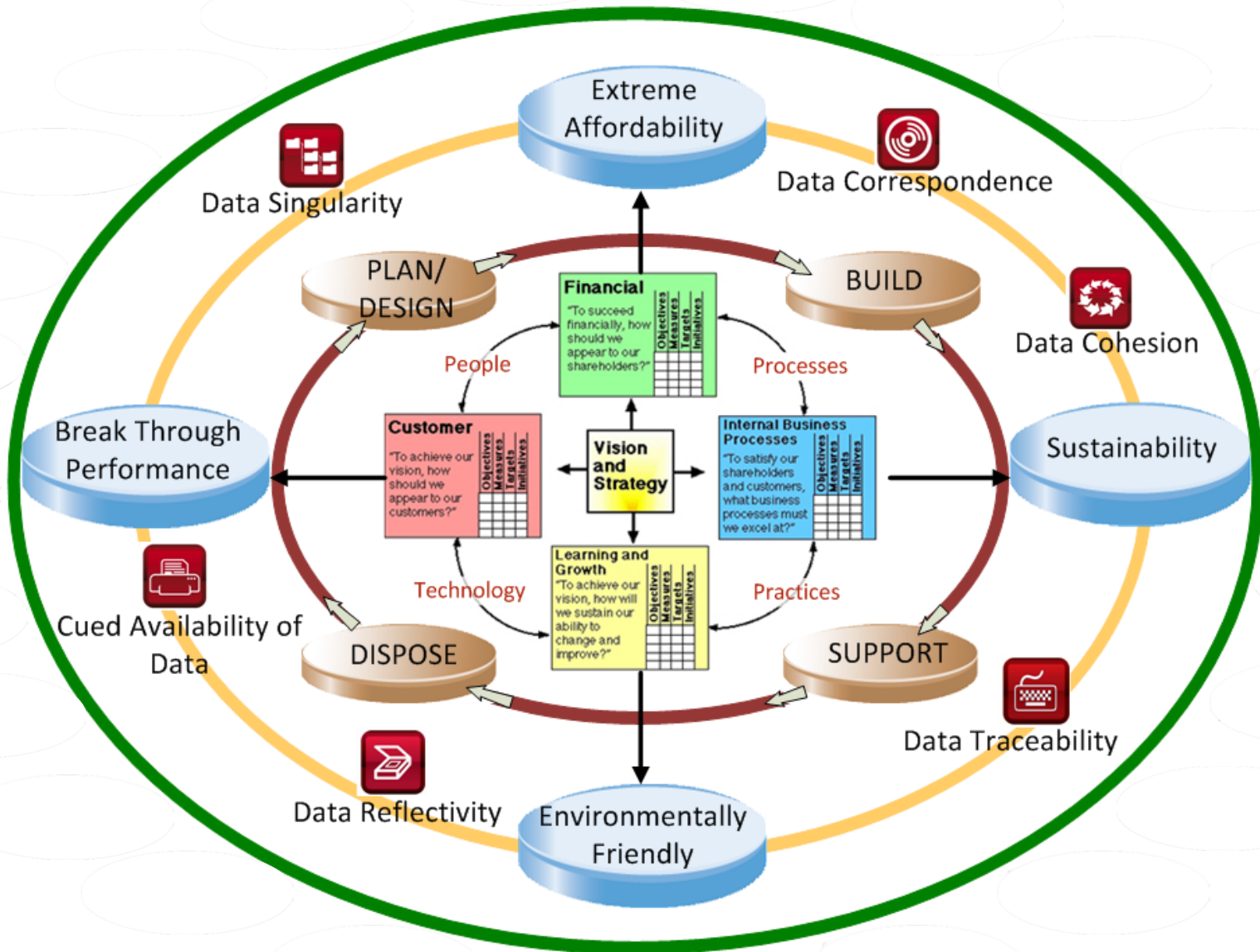
1. A consistent and well understood mission;
2. A vision of the journey and any foreseeable potholes or roadblocks;
3. A shared, strategic plan to traverse the intend route;
4. Specific resources allocated for the journey (money for gas and a car, etc);
5. A commitment to lean principles (i.e., taking the strategic route, not the scenic route; thus removing waste from the trip - unless of course the intent of the trip was to take a scenic detour for photographic purposes).

Research Questions & Scope

1. How should organizations prepare for the future of long-range, Product Lifecycle Management planning in an international environment?
2. What future, international trends do you believe PLM will enable organizations to meet/overcome?
3. How does a company implement PLM advancements to create enduring sustainability (product support and disposal)?
4. How does a company implement PLM advancements to create environmentally friendly products?
5. How does a company implement PLM advancements to meet international (sustainability and environmentally-friendly) product design and manufacturing standards?

Research Outcomes

- 30 1-hour long interviews (stratified sample)
 - 1) They understand the business philosophy of PLM; and
 - 2) They are actively PLMing, not just working with a part of PLM; and
 - 3) They work in a capacity or level within the organization that would enable or require them to strategically foresee future trends in PLM, possible future applications, needed technological advancements, and requirements for successful and competitive implementation.
- 400+ pages of transcripts
- Over 150 categories of statements, examples, hurdles, and strategies
- Over 700 contextually significant and meaningful statements



Analysis of Data

- Coding Framework
 - Future Hurdles and Needs
 - Examples and Lessons Learned
 - Strategies and Best Practices
- Coding Families
 - Business Themes
 - Data Themes
 - Global Themes
 - Organizational Development Themes
 - Cross Functional Team Themes

Theme Results

Ideal PLM

PLM > PDM

Not there yet

Management Awareness and Education

Strategic Roadmap Planning

Silos and Organizational Development

Culture

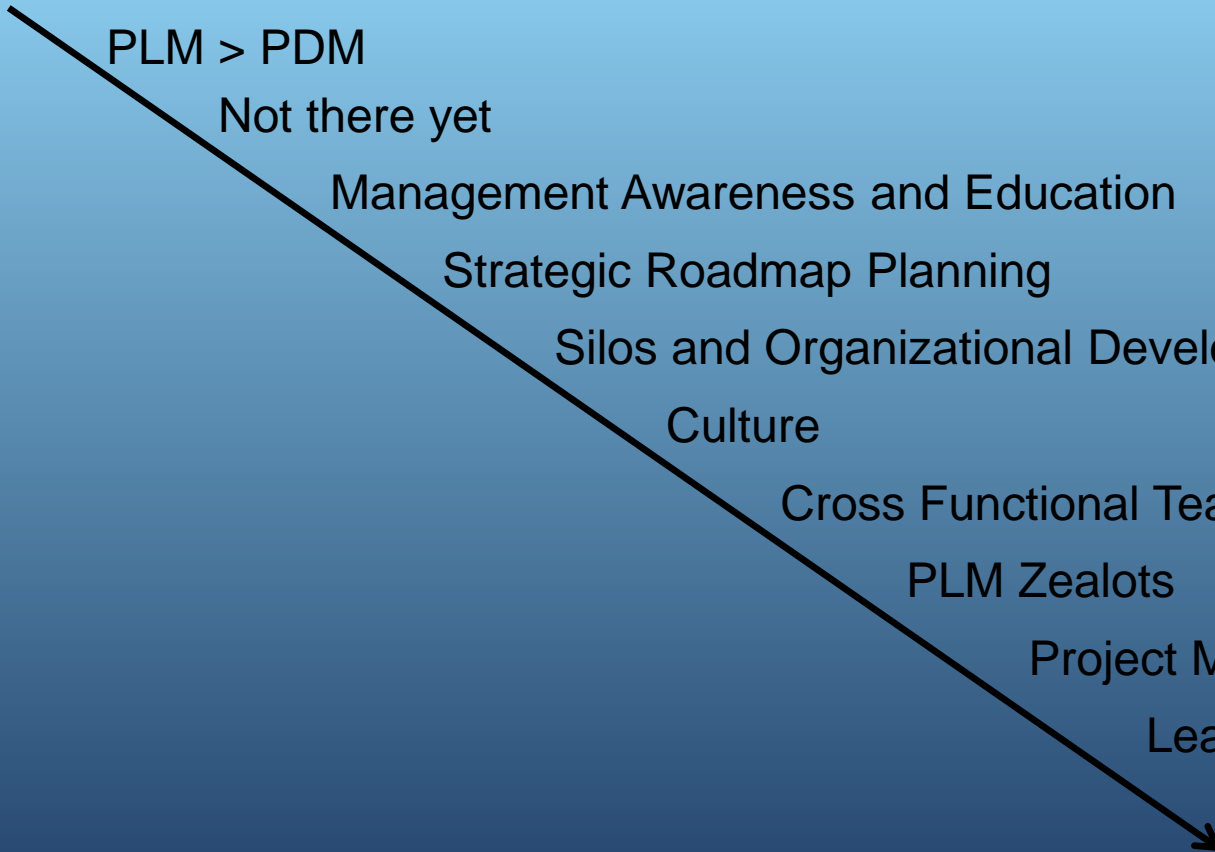
Cross Functional Teams

PLM Zealots

Project Management

Lean Enterprise

Lean Workforce



Ideal PLM

What they don't recognize behind the scenes is what's going on systems wise or data wise with the whole organization. The whole the beauty of it to me is having one source of data and having the information derived from the same source of data automatically updated as the data gets changed or updated. The power is just awesome!

You can have all the other organizations besides manufacturing and design that can use the modeling data or the geometric information. We've got sales real interested in being able to have some light weight version of the model to be able to show the customer as they order the truck, put the truck together. You've got, the parts organization, the service organization, ALL could benefit greatly from having access to the data knowing that the data they have access to is the latest, greatest, most accurate data.

PLM > PDM

- Well PLM is just extending the time rise in both upstream and downstream of the value of managing the data around the product. So we used to call it product data management (PDM), but that really focused on the development cycle of a product versus the maintenance repair and/or the far front-end of innovation

Not There Yet

This is an analogy between Christmas Eve and Christmas Day. Christmas Day you have delivered the swing set put together or whatever and Christmas Eve it is still a bunch of things you need to assemble. And, I think PLM today still, is still a bunch of different things that needs to be assembled. Its better today than it was 10 years ago and it will be better 10 years from now then it was today. But, I still think today that we are making bigger islands and at some point we need to build a continent.

Management Awareness and Education

- Upper management does not understand the organizational changes and commitment required for successful implementation of PLM. This causes a lack of investment in internal training.
- Management doesn't understand that PLM is a cross functional organizational wide initiative, they think it's just a functioned set of tools.
- I think the number one issue that I run into, that I see time and time again, is the perception on the part of management that PLM is an engineering department issue and not an enterprise wide issue (from a CEO regarding his counter-parts).

Management Awareness and Education

- It seems like the senior management is the problem because they're not really as aware of the tools, that they're not building an organizational structure quickly enough to really take advantage of that. A good example of that is internal training. We've been beating our head against the door, sort of a brick wall, to make sure that we reinvest in internal training resources, but it's not supported enough by upper management.

Strategic Roadmap Planning

- Technology roadmaps also include not just the hard technologies but some of the soft technologies and processes that are required, or that you think are going to be required over this very long lifecycle. Don't take the next quarter, or next month, or even next year view of the issues, but really take a five to ten year out-cycle view and develop the corresponding roadmaps that you believe are honestly required. And when I say roadmap, I don't mean just technology infusion or maturity, but mostly, and organizational and process changes.

Silos and Organizational Development

- Given all those technical barriers are removed [from PLM advancements], you still have the people barrier, and that's never going to go away. And that is that it's going to take thought leadership in a company and a vision for people to really get the value out of PLM, because it changes the culture and the fabric of the company and the way they produce products. There's no two ways about it. That's the biggest barrier, if you're going to stay siloed, I don't care how well you can collaborate with the data, you're still siloed.

Culture

- Our issues, in my opinion, are always cultural and organizational. We can pretty much find a technical approach to something, but we don't attack and change the behaviors around it; so be very aware of the new behaviors the introduction of technology can create.
- Just because country-specific cultures are different doesn't mean there's not a way to leverage the differences. It's the company that figures out a way to leverage the strength of multinational variances; those are the ones that are succeeding.

Culture

- It's not about what's in your head as a designer, it's about what's in the collective heads of all the designers. It's about prior art, it's about, lifting the consciousness of the design and development of organizations and manufacturing organizations to what's been done, what their peers have done, and how they can help me in, my pursuit. So it's really about changing the culture.
- [This comment was made by the CEO of a vendor organization] They should start very much without technology to take down some process barriers. There's no reason for manufacturing engineer and product engineering to be segregated the way they typically are in most companies. There's no reason marketing and product development should be as segregated as they are in most companies. The information flow, the overall collaboration between these silos has to be improved.

Global and Cross Functional Teams

- So we've learned from our mistakes and now the PLM strategy is owned by corporate, at the highest level of the corporation. It's very important, and this is the methodology we're using, is to have a cross-functional team or a cross-discipline; people who are subject matter experts in the various organizations. Working collaboratively to be able to understand and communicate to each other the overall requirements and needs of the organization.
- We basically spread people across the world we've sprinkled them with some technology and say "hey tell us how this works out." And we really don't understand virtual teams, or what is the prescription for virtual teams to work well, and what kind of things do we need? For example: Is tele-progress important, do we need to see people's facial features? Because quite frankly, we have, hard wired in our brains, special areas that interprets facial recognition & features.

PLM Zealot Staffing:

Cross Functional Education and Diversity in Training

- Universities are 20 years behind curve in preparing kids for the real cross-functional needs of industry; so it's critical that we understand what PLM Zealots or even practitioners would look like so that we can keep up with the curve if not beat it.
- Even if we do support more internal training on PLM, no one knows what those competencies are or should be. Is it more engineering, more lean, more innovation? What's the difference between my PLM Zealots and my standard or all-star engineers?

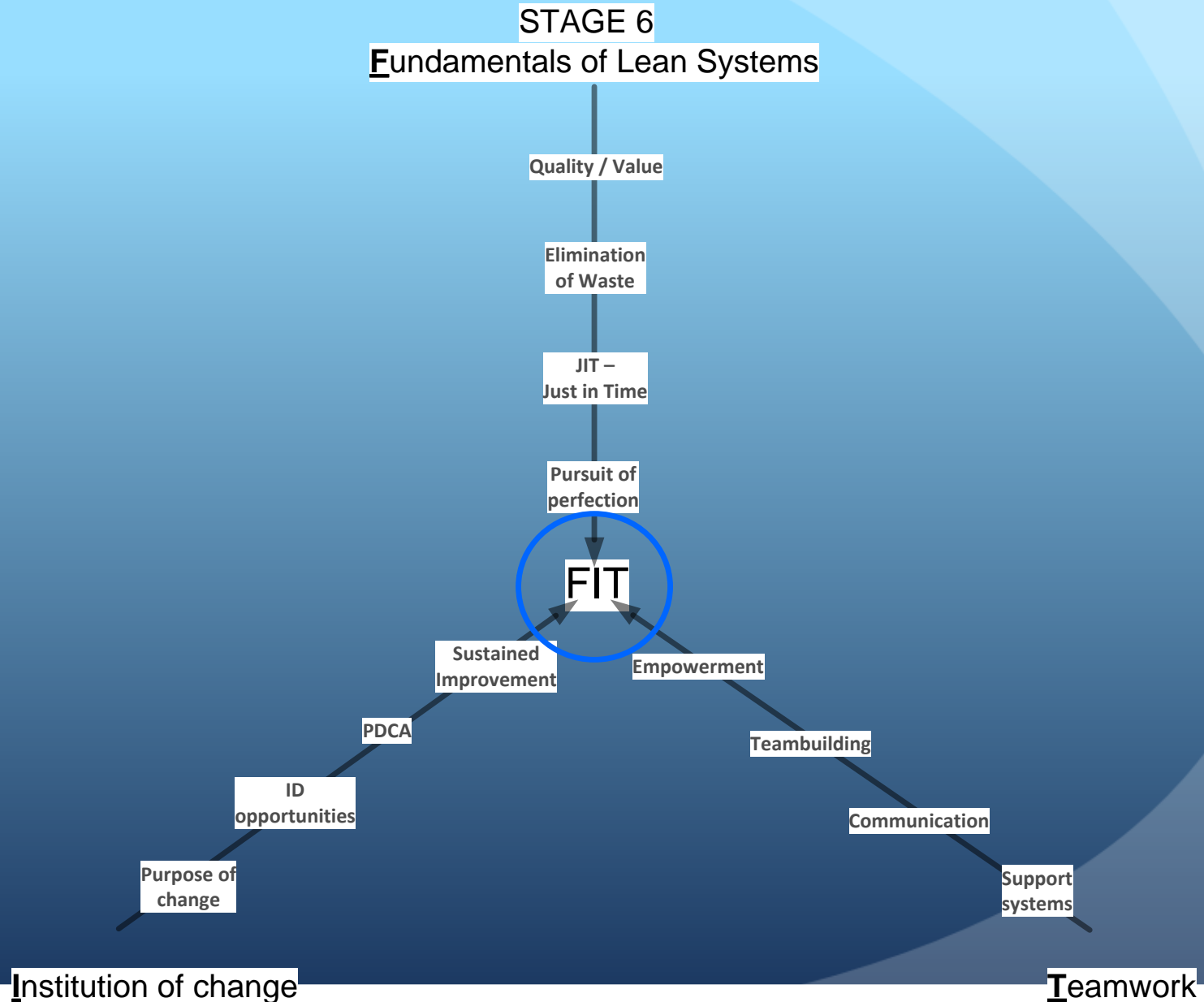
Lean Enterprise

- That should be the strategy. The strategy should not focus on PLM because PLM is now more about; because the suppliers have dominated the discussion, it's more about a set of tools. PLM is not about tools; it's about processes; facilitated by tools. So in my mind, best practices, if you want to be successful with PLM, don't call it PLM; call it lean enterprise.

Summary of Findings

1. Management Awareness and Education
2. Cultural shifts in silos and organizational development
3. Cross functional steering committee and teams
4. Lean Enterprise and continuous improvement

Practical Implications



Value Proposition

PLM enables and requires people to work with peers around the globe with increasingly diverse backgrounds, in a more rapid succession of team formation, performance, and dissolution. The knowledge gains and lessons learned from cross-functional activities necessitate a more intentional, robust, and inclusive system to harness the wisdom of the crowds.

Innovation must become a core competency for PLM to succeed.

Value Proposition

Dialogue about real world examples of successful and failed PLM initiatives to impact:

- The need for cross-functional PLM skill-competency profiling
- Increasing support for cross-functional training
- An innovative, organic approach to process improvement and idea-generation
- PLM increases simulative capabilities, and thus necessitates the need to systematically fill the innovation funnel with more disruptive ideas and technologies

Next Steps

- Research and generate systems and processes which promote innovation as a key competency
- Identify and codify requisite skill competencies for PLM practitioners

Questions