

Redefining Product Development: Managing project to build right solutions in exact time: Sharing lessoned learned

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In today's organization resource are regulated due to cost pressure. Everyone is working smart to best utilize the resources. Building right product which brings success is a huge challenge. Every organization explores best mechanism to build best solution which customers embrace. Challenges are very high to satisfy the need of the diverse customers. Various process and mechanism has to deploy to ensure organization is building right solution with right speed to reach the customer before competitors. Problem with product developments are to say few examples - delivering too little, too late, Building more than we need, Building low priority items, Building right thing wrong, Poor quality of software, wrong resources, Identifying function need late in project etc.

Lot of time waste when team members are staying at office and build the product for the end user where there is no connectivity from developer to actual users. Organization needs to understand customer defined value proposition through which each team member understands the whole picture and starts working on solution required for end users.

Design thinking process helps organization to understand the customer the way they behave and connect with the customer to build the right product, rapidly for the end users. Observing our customers in their natural habitat is a powerful way to understand a day in their lives; in other words, we can begin to empathize and start build product.

Lean product management is about listening to the customer and responding more quickly to develop a solution which customer need. Collect the data rapidly and build the right product rapidly so that it is more data driven product management.

To succeed, grow, thrive, we must be focused on creating real value for customers. We must be fast, agile, quick thinking, and quick acting. We must not only continuously improve our output; we must continuously improve the process of outputting. We must be a leader *and* a fast follower.

We have deployed these practices on a couple of product lines and achieved the results. In this article information will be shared to address below points

- How we have used Lean product management concept to build right product at first place?
- How we have used from Minimum viable product to scale up the large scale product development using Scaled agile framework?
- How we have used lean canvas tool help the discovery and solution process?
- How we have used Lean mindset development tool, how tool can transform teams e.g. VSM tool etc.?

- How we have used design thinking approach to accelerate and built relevant product? How we go much, much deeper on understanding the user and the user experience with the skills of observation and inquiry.
- What are KPI to measure product success e.g. Net Promoter Score, Active usage, Customer benefits
- How cultural transformation: “Plan driven to value driven” model helps to achieve this?
- How Project manager plays role to adapt similar approach to replicate and build product as faster timeline?
- How DevOps and Gamification concepts helped to achieve execution excellence?

Keywords: Minimal Viable product, Lean Canvas, DevOps, Scaled Agile Framework (SAFE)

1. Introduction:

Software product development is highly unpredictable and risky. 75-80% of the projects routinely are late and over budget. Planning accuracy of 20% is considered best practice. However, a successful software product has the potential be considered a “license to print money” with marginal production cost and customers locked in to the vendor.

To succeed, a company must design, build, test and market the product effectively. To maintain high profitability those products or service has to be acceptable by customers. The term product is a central concept in marketing. It designates anything that can be offered to a Market for attention, acquisition, use, or consumption that might satisfy a want or need (Kotler, Armstrong et al. 2010). Products can be physical objects, services, people, places, organizations, ideas, or mixes of these entities.

A “software product” is a *product whose primary component is software* (Kittlaus and Clough 2009).

The stories of failed products, what can we learn from **Segway, Microsoft Zune, Sony Mylo** products? Checked the legality of the product before burning through multimillion\$ of research and development investment? How can we prevent a similar **Segway-sized, Microsoft Zune, Sony Mylo** screw up with your own product?

We have brainstormed and come up with several mind maps to address various product development challenges which can be practically deployed and churn the expected results. We have done several trainings and workshops on this below items to change the mindset of all the employees to get the effective output.

2. Challenges:

The traditional technique is to commission market research, in the form of surveys and/or interviews, and then follow up with professionally facilitated focus groups. Unfortunately, this approach rarely produces the insights and depth of understanding necessary to inspire truly good products.

When used appropriately, this research can be a useful tool, but traditional market research and focus groups have several key limitations. The most significant is that customers rarely can provide the information you need from them via these formats. How do you avoid the problems we outlined above?

What are the challenges with the current product development approach...?

- How can we build products which are profitable and scalable for the organization to sustain?
- Taking too long to push the product into the market?
- Customer involvement is minimal as a result of that acceptance of the features is minimal and time consuming?
- Discovering customer expectation later in the value chain which is an expensive process?
- Customer does not understand technology fully or not able to express what they want, incremental feedback is missing?
- Without establishing customer expectation, product development is scaling up which resultant into gap in expectation vs delivery cause loss of money?
- How to address uncertainties which could become a risk for the product?
- Ability to understanding customer requirement explicit, implicit, tacit requirement.
- Assumption checking is missing and become project risk later period of time?

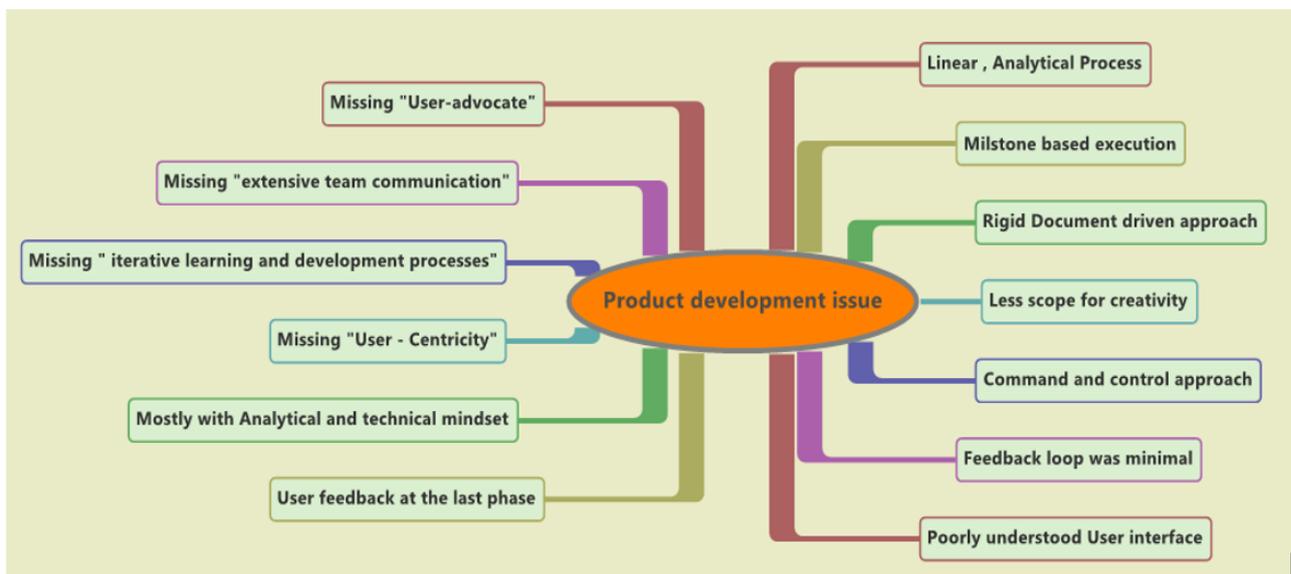


Fig 1: Challenges with sustainable successful product development.

Fig 1: reveals different types of issues with the product development as result product does not bring sustainable revenue to the organization. There could be many more, these are only few to start with.

What we have been observing for last couple of years that there has been significant approach changes are happening in research and development globally where we are operating towards building right product and solution. We are part of this ecosystem where changes are happening. Team members are no more sitting at office and coding

features any more. They have been asked to demonstrate the feature to the customer at customer place or to the customer representative and get the acceptance before scaling up the product. This is a significant transformation process. Business analysis or Product manager is not dictating completely, all team members are participating with customer understanding process. Be it a developers, test engineers, build engineers, document writer or part of customer discovery and understanding process.

3. Approach to Address such Challenges:



Fig 1.a: Parameters to build successful sustainable product to list few.

Fig 1.a: Demonstrates characteristics of successful product development strategies and how we can benefit from this approach. These are few aspects which significantly influenced in any product development.

Why we have many expensive failed product, why we are not taking initiative carefully. This is the thinking process to start with.

To start with we have to discover who is our customer?

Customer
Who is your target customer ?
What problem are you solving ?
What benefit are you offering that your competitor are not ?
Why should customer spend money with you rather than with your competitor?
Do you offer something different from that your competitor offers?
Will people honestly benefit from this advantage?
Will the advantage motivate people to buy from you ?
Do you keep close contact with customers?
How do you build long term value?

The product we build should address a well- understood market problem. Drucker said, “The aim of marketing is to know and understand the customer so well that the product or service fits him and sells itself.” That is, the product should come from a deep understanding of the market of customers.

Few important aspects we have taken care by understanding

- Pains and gains that drives customer
- Customer profile creation
- Customer discovery and validation process(No assumption, that Yes, we know what customer wants)



Fig 2: Few of our customers (Customer discovery and customer validation)

Fig 2: shows us few of our customers for whom we are building our solution. In the world of IOT(Industrial Internet of things),Cloud, Big Data, Mobile devices, Social platform many aspects significantly influencing the way customers are expecting a product or solutions should behave and those are constantly, rapidly changing. Need to relook at customer profile. e.g what business they are operating, what environment they are operating, what they need in general etc.

Let us take few users who uses our products and solutions, the main focus of our business is to provide customers with systems for control, plant optimization, and industry-specific automation applications. The industries served include oil and gas, power, chemicals and pharmaceuticals, pulp and paper, metals and minerals, marine and turbocharging. Turbocharging, Marine, Control Technology (the world's No 1DCS supplier) Measurement Products & Services, and Industrial Solutions (consolidation of O&G, Mining, and Panel Mounted Controller into one business unit).

With best and world class engineering solutions it is difficult to become number 1 until we go and live with these type of end users and build solution for them. Example “Efficient operations are the way to profitability” for most of these customer. Every customer is unique, every business is unique and each operating environment is

different, so solution has to be unique. And that solution will come when we spend time with them show them while building the product.

All our team members had experiencing with these vessels, inside this mines at remote location, inside this cement plant, on top of this oil rigs, inside this operator room. They always share nice story from the field, experience from factory acceptance test.



Fig 3: Be like Zoologist to understand all the animals.

Fig 3: Describe that how we have to be like a zoologist and go to the natural habitants like national park and find what these animals does , how they live and help them to live better.Helping others is much simpler when we have Zoologiast like approach because we know them from heart.We are not prenting that we know them.

Same applies to consumer discovery and understanding process. Facts exist only outside of the building, where customers lives, so the most important aspect of customer discovery is getting out of the building, and face the customers.Product and service has to be build based on the user who uses the solution. Be with them and understand truly. Every one has responsibility to parcticpaite in this journey to effectively build a product which is expected by the end users.

4. User motivation and why they will buy?

Analyze customer behavior and pattern. Based on the input, team provides the solution and checks if customer is engaged. Iterate the same process until customer says wow solution.

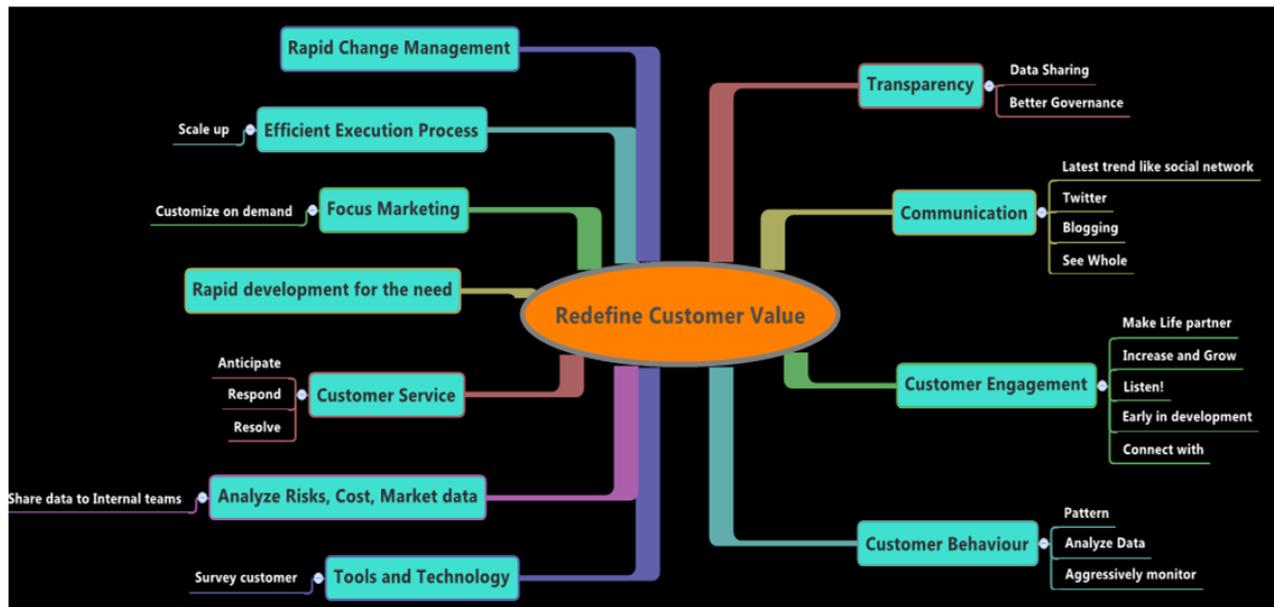


Fig 4: Value Generation

Fig 4: explains about the redefining customer value steps. Most of the time we think we know what customer wants or their needs. All these assumptions sometime convert into risks and potential product failure. It is an expensive process.

Fig 5: demonstrates approach we have tried to improve this situation. We need to fill this below table in A4 size paper where we clearly fill all the points to the product we are working with, this template is developed by Ash Maurya

1. Customer Pain Level (Problem)
2. Ease of Reach (Channel)
3. Price/Gross Margin (Revenue Stream/Cost Structure)
4. Market Size (Customer Segment)

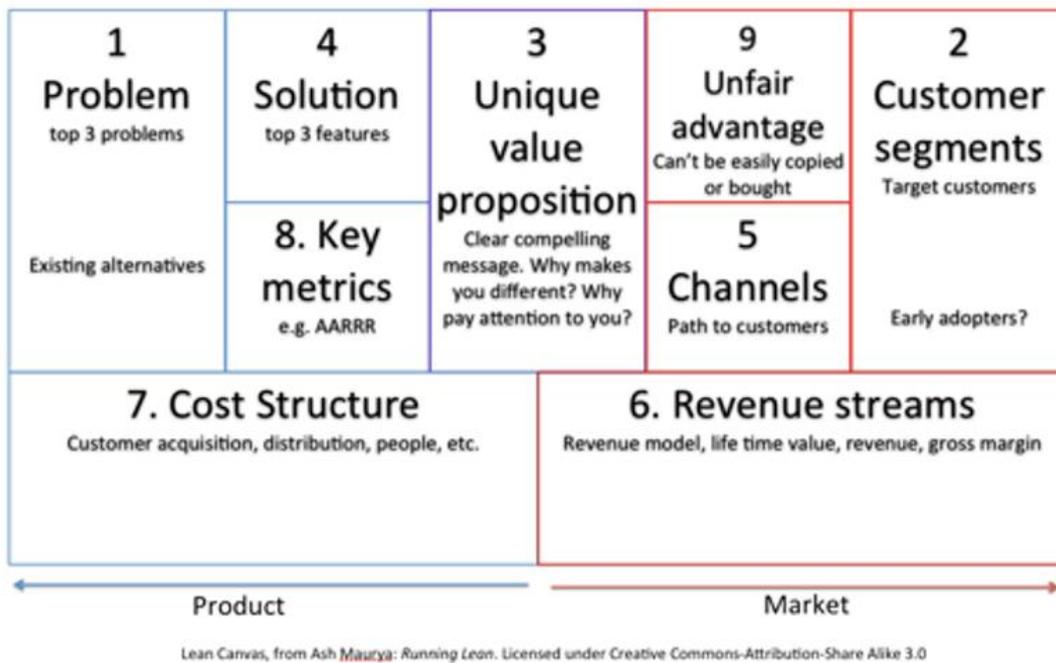


Fig 5 : Lean Canvas Template

Every new product initiative should start with first sketching a set of Lean Canvases according to Ash Maurya.

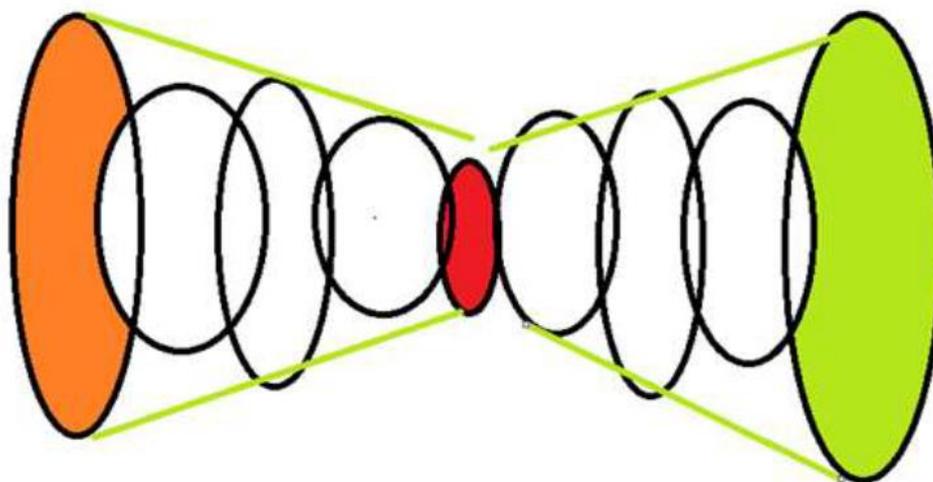


Fig 6: Demonstrates convergent innovation front-end or funnels (identification and Evaluation) with the divergent deployment and exploitation of the innovation (innovation bugle)

Fig 6: Demonstrates generate as many ideas as possible to start with and focus on few which solves customer’s problem effectively. Iterate the same once we get the feedback from the customer. This approach has to apply to the project execution environment.

Fig 6 also shows that the mouth is wide, in that many ideas can begin the process, but more and more ideas will be rejected at each stage as they are shown to be

unworkable for one reason or another. Only the very best ideas—those that are most likely to succeed—will ultimately make it into development.

Divergent thinking is the ability to offer different, unique or variant ideas adherent to one theme while convergent thinking is the ability to find the "correct" solution to the given problem. Design thinking encourages divergent thinking to ideate many solutions (possible or impossible) and then uses convergent thinking to prefer and realize the best resolution.

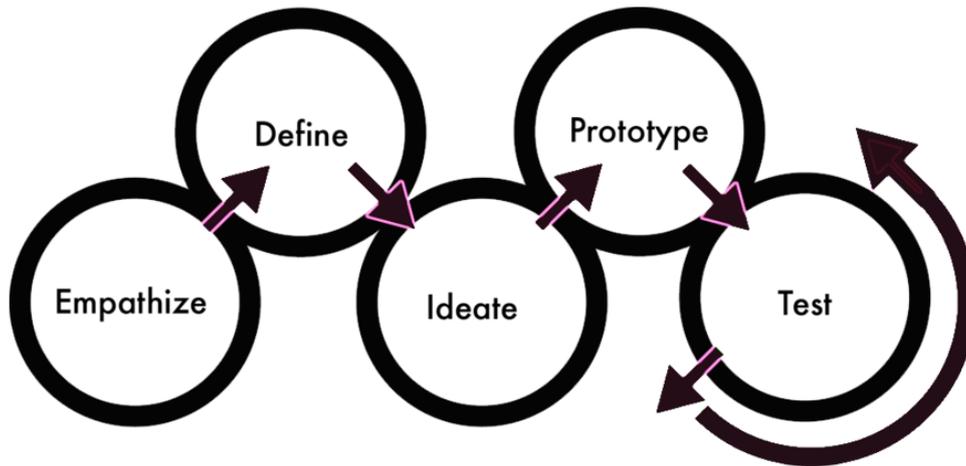


Fig 7: Design thinking process to Problem Finding->Solution Finding->Solution Selection->Solution Implementation (Source: nakeddesignlabs.com)

Fig 7: demonstrates how design should be deployed to discover the right solution and same has to iterate.

With empathy we observe and understand what customer want. Next step we define our point of view and brainstorm with the team. We propose a solution to the customer and take the feedback.

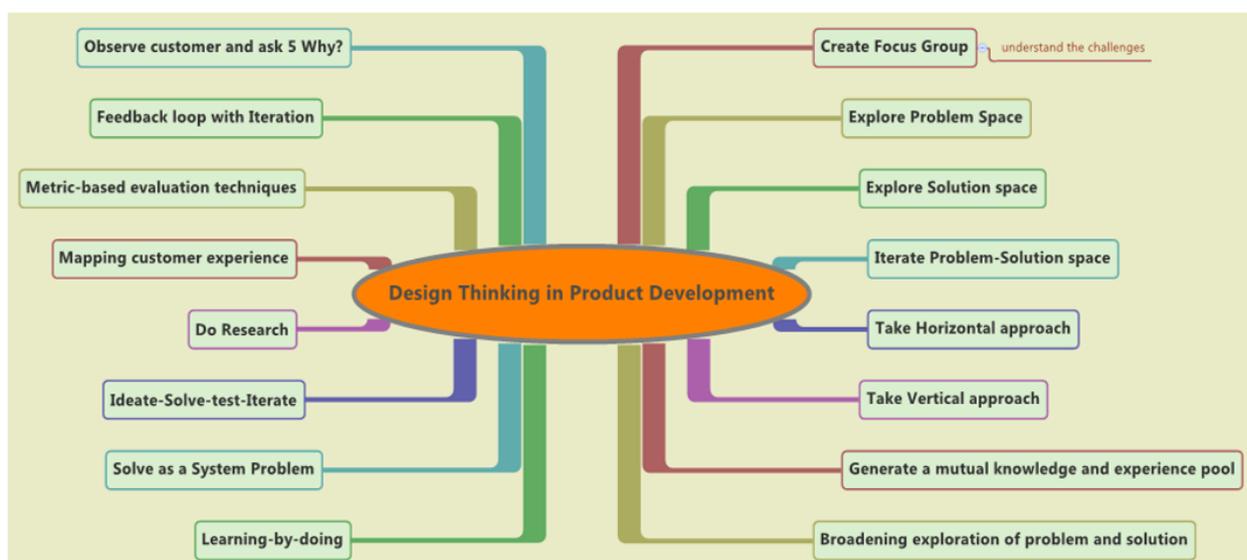


Fig 8: Applying Design Thinking concepts into Product Development.

Fig 8: shows aspects impacts by design thinking which helps team to build a successful and sustainable product. Above diagram captures most of the require activities need to do to build the product. Be it an existing product where incremental features can be added or complete new products.

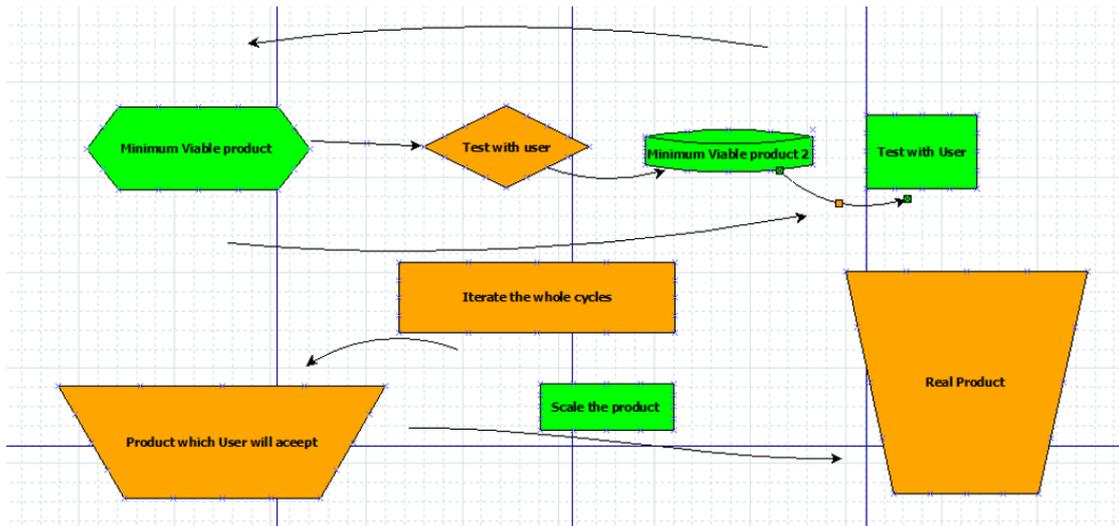


Fig 9: Redefining Product Development cycle

Fig 9 is a very powerful process to build a successful product. Why? This process spend time with customer to understand what they need.

This process iterate until customer satisfied.

Once validation is done this process goes for scaling up the product features with various framework.

Before we go for scaling up a product we have stabilize the concept or product with several rounds of iteration where we are validating the product with the customer with continuous feedback.



Fig 10: Minimal Viable solution: First house where I was Living after Marriage when we were 2 family members with My initial job. Second House where I am living currently With my 6 family Members after 10 years.

5. Minimum Viable Product:

Most of the time we do not use all the features developed in the product. The agile community uses the acronym YAGNI which means “You aren’t gonna need it” to express that we should add capabilities only when we actually need them, never when we just foresee that you need them. Team does not have to think much about extensibility at the initial stage; it has to be an incremental process. It does not require heavy weight process to build minimal viable product and incrementally build it to next level.

With minimum investment how to can we satisfy the need to the end users which user is willing to pay. Those require items with get into the product backlog and team should burn down those features and deliver the solution for the user acceptance test.

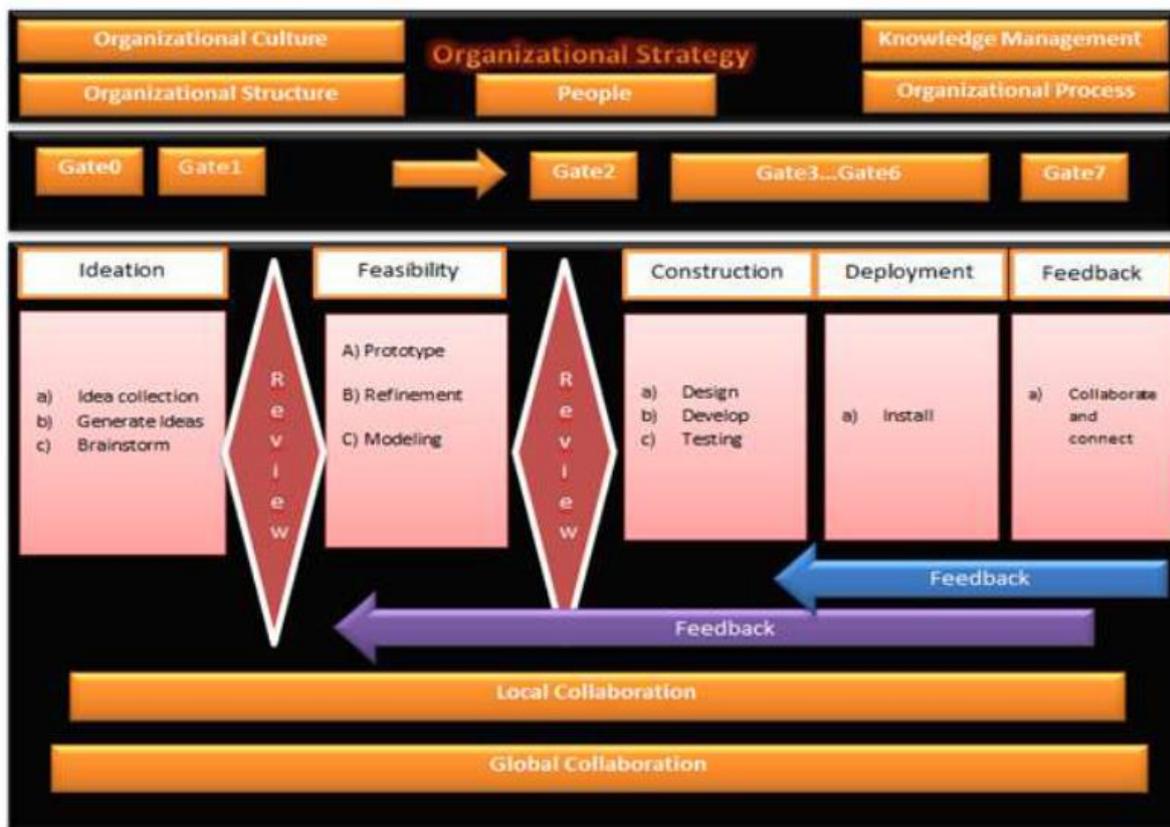


Fig 11: Innovation Framework with Stage Gate Model, Ensuring Idea Flow and Iterating

Fig 11: demonstrates value stream flow which should continue and team focus on identifying waste inside the process and minimize the waste. The ideation process passes through various steps of the journey for the perfect solution. The end to end cycle time has to reduce to push the product into the market as fast as possible.

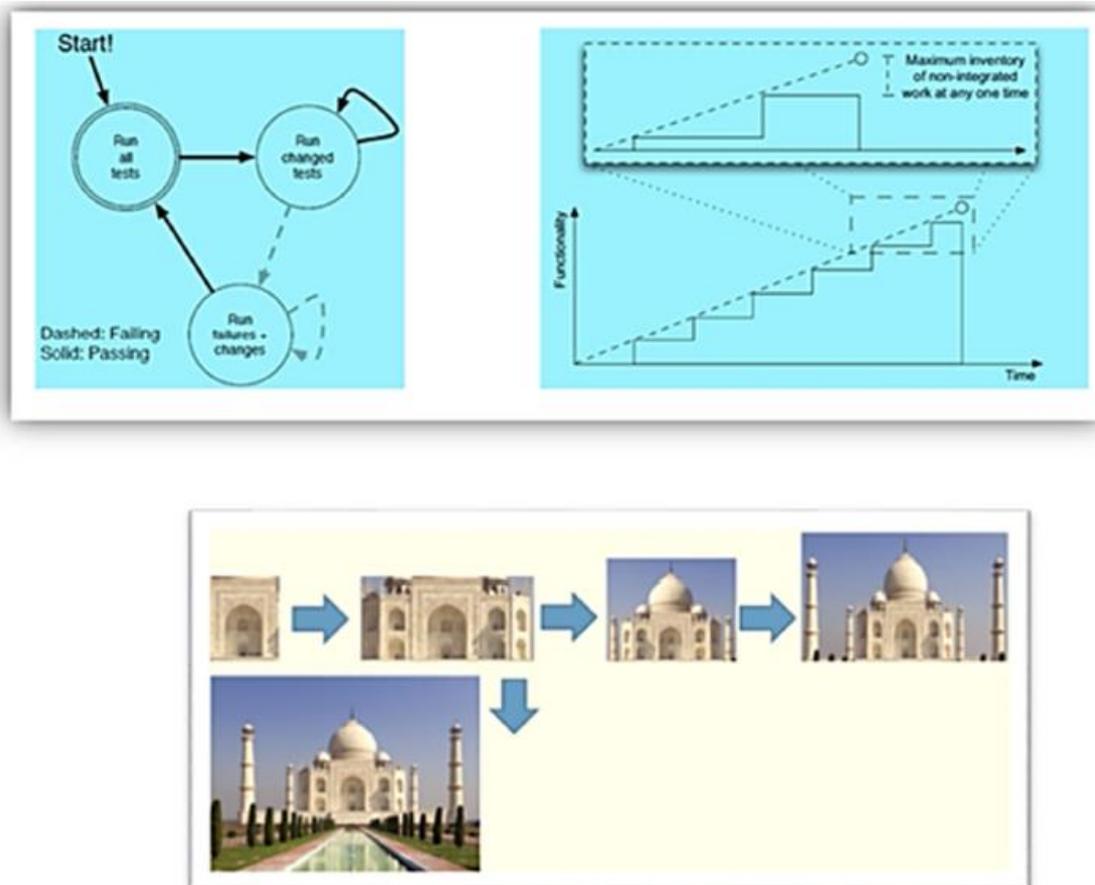


Fig 12: Building and Validating in iteration to ensure right solution (Incremental Development)

Development—building the whole system in small increments—we are never far from an integrated, working code base. This reduces risk, because the inventory of unfinished work remains small. As we’ll learn later on, incremental development also enables effective learning through early feedback based on the customer and developers constantly seeing actual, working software. Team has to build the feature incrementally.

Team is asking “What’s the central business value in this story?”

If it is big, reduce the size and build and test small pieces and ask what next?

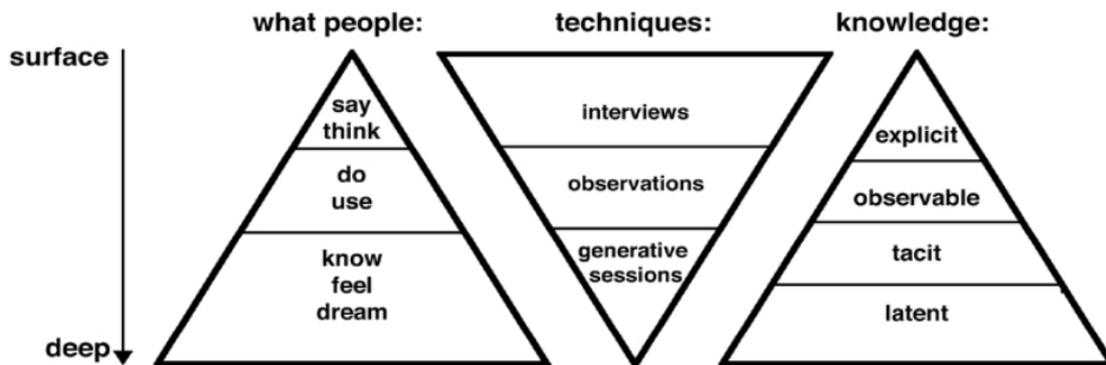


Figure 12: Visser, Stappers & Lugt illustrate the different levels of knowledge about experience are accessed by different techniques. Effective understanding process about customer problem.]

Let us **drill** down to what customer is looking for as most of the time they themselves do not know what they need. There are various techniques to understand customer needs and effectiveness of each approach. The best approach is to work with them and co-create the solution what they need.

Lean talks about employee empowerment, learning about your customers, cross-functional teams, and increased agility, but the system remains focused on producing a known value for a known customer.

The value being created for the customer is *known*. It has already been validated that product x solves problem y for customer profile z. Team needs to discover each customer by working with them.

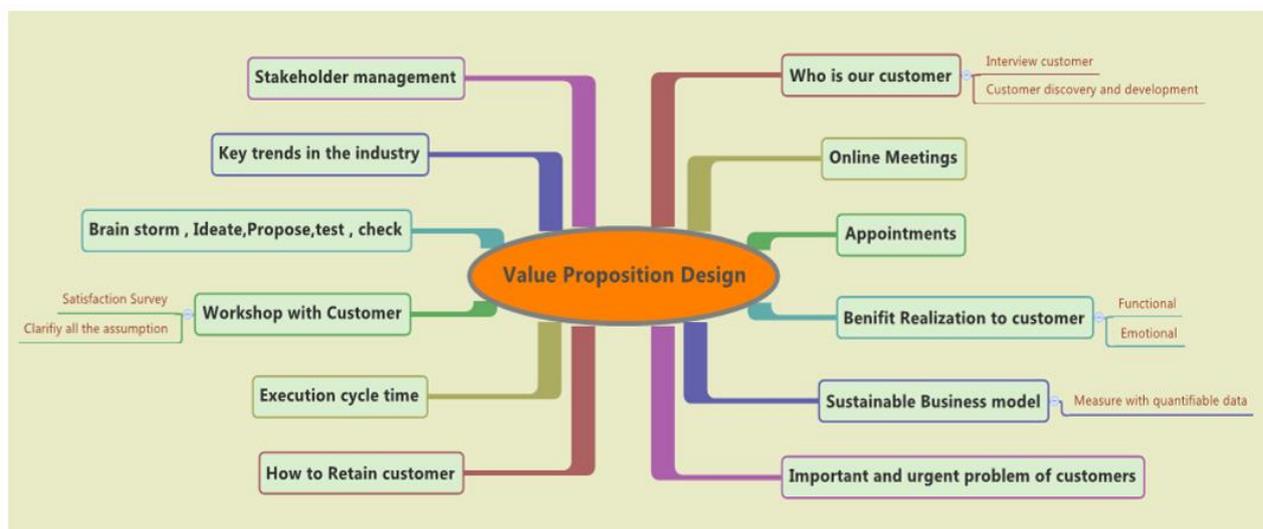


Fig 13: Aspects of Value Proposition Design

Fig 13: demonstrates how we should start the value proposition design for a customer. Once we proposal is complete, the next process will start which is Value delivery execution model.

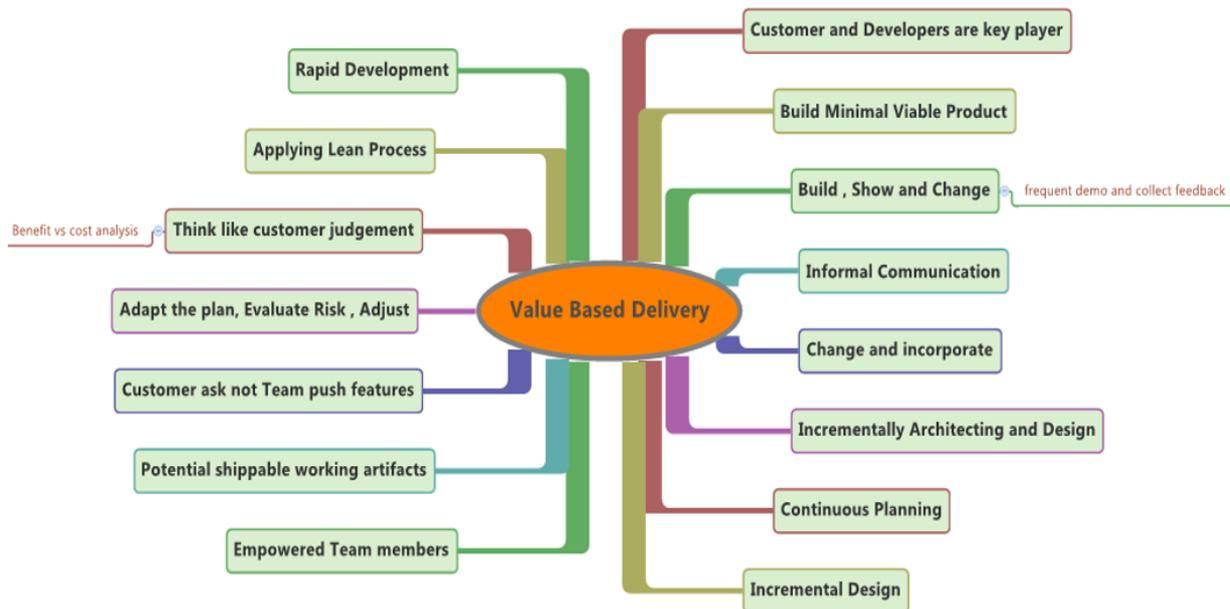


Fig 14: Aspects of Value Based Delivery Model

Customer will receive value when we apply above aspects while developing products or solution. Above value based delivery model is based on the different factors which helps customer to get the incremental features in certain intervals and accept and approves. Same process iterates several times and we discover the required output. It is a co-creation where all team members contributes to build a required product.

6. Market Driven requirement Engineering:

The critical part of the product development is understanding the customer outlook from all perspectives and capture those as a part of product backlog. Prototype these requirements and show it to the end users and get the doneness criteria fulfilled. Most of the time capturing the need is cumbersome process. Over a period of time we have to master on this skill.

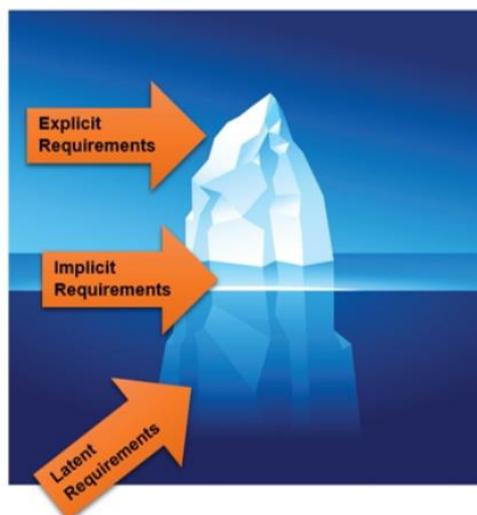


Fig 15: Requirement Engineering: Customer Problem discovery

7. The One Metric That Matters (OMTM):

It is a single number that we care the most about at the current stage of our team. Which particular metrics helps us to make better decision? Not too many things to focus on. Start with only one metric which is critical, important and value adding to the team. Team needs to find out what that one metrics which will value below are the two metrics we focused. As an example let us focus on quarter one to improve the Net promoter score, next quarter let us focus on employee satisfaction status, may be next quarter we take some items from product feature say response time, next defect removal efficient etc. and so on. One item that really matters!

Employee Satisfaction :			Remark
	Are you happy?	Y/N	
Customer Satisfaction			Remark
	Are you happy ?	Y/N	

8. Integrated DevOps model to reduce the product development cycle time:

For rapid execution DevOps helps with various stage releases where various team members are involved to validate the developed product. This process helps product development to reduce the cycle time by discovering various issues earlier in the cycle. This process has significant impact on cultural aspects of the organization. For traditional organization adaption of the process takes some time. For startup everything is new, so adaption process is very high and benefit realization is immediate.

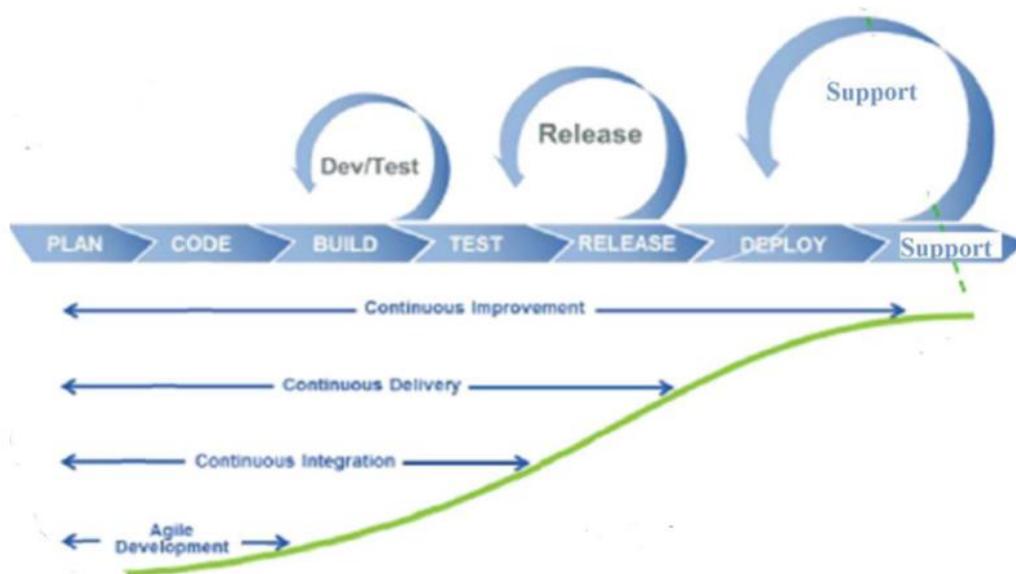


Fig 16: Reduce Execution cycle Time by bringing end users early phase of Development

9. Execution Model during scaling up the product development:

SAFe (Scaled Agile Framework) helps when products go to scaled up mode. Product has become an enterprise solution where many multidisciplinary interdependent teams are contributing to build this product. SAFe structurally define various roles and flow and approach. This helps organization to mobilize the resources, process, frequency of release with interconnected and interdependent teams.

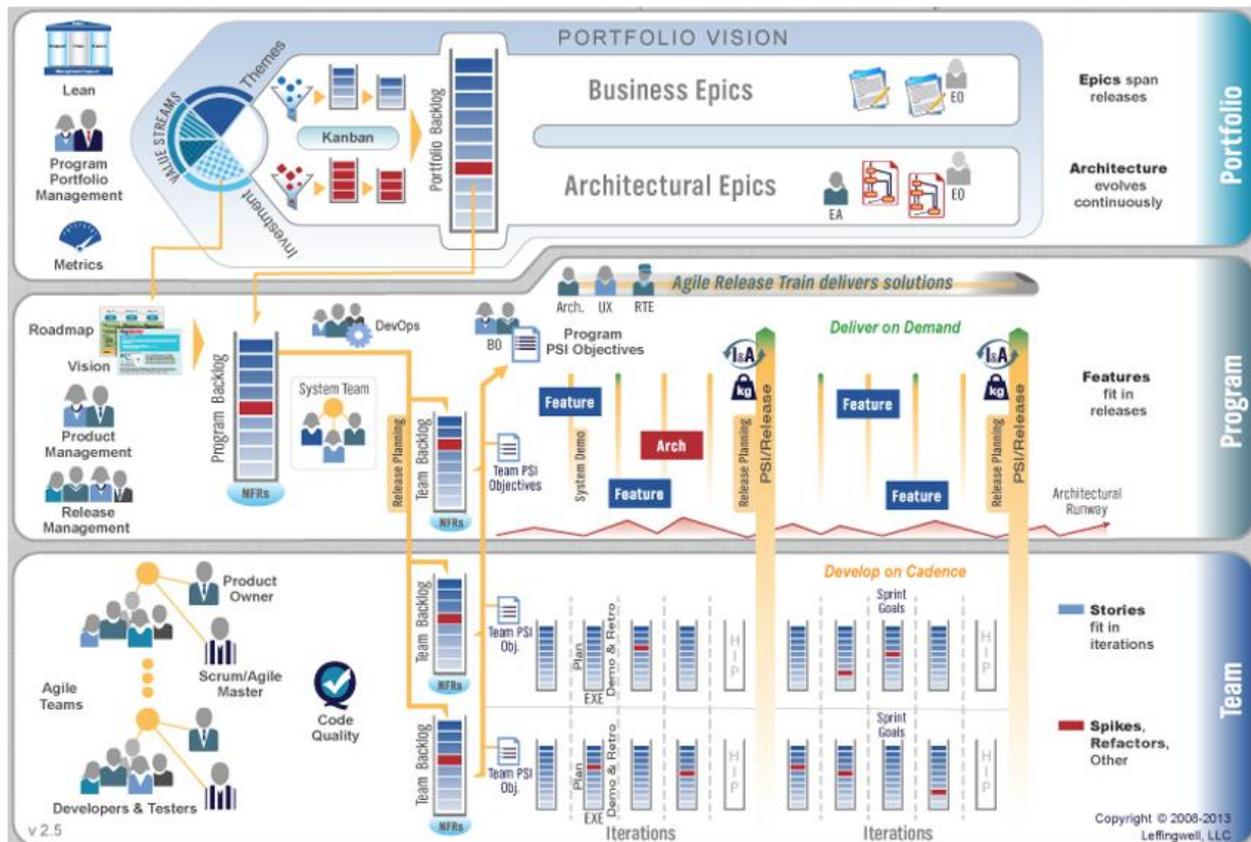


Fig 17: Scaling up the product development at enterprise level involving diversified dependent teams

10. Role of Program Management Office for Strategic Projects:

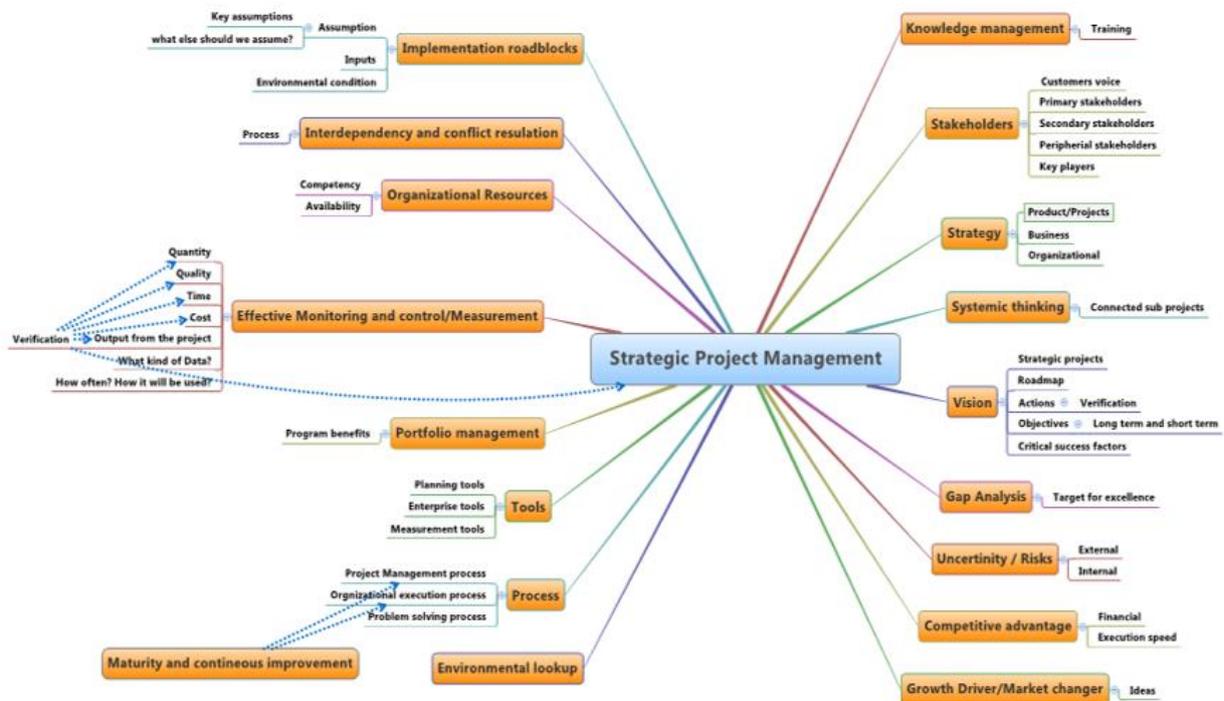


Fig 18: Organizational strategic project management ensuring those projects execute as expected

Fig 18: exhibits where Agile Project manager has to take care about all these aspects for organizational strategic projects by ensuring all these factors and smooth execution of all these elements. Organizational impediment to build a product has to monitor and remove as early as possible. Project management office (PMO) can monitor all these type of projects and ensure all projects adapt agile culture. PMO can coach all the team members to inject agile values and principles into the ecosystem.

11. Gamifying Agile Execution to Increase Engagement:

How can we encourage team to voluntary participate in change initiative where there is much fun and recognition. Gamifying the work environment helps to improve certain target area where it can be deployed for improvement.

The concept of gamification has reached a broad acceptance as a solution for better engagement and improved participation for businesses. Participation and user engagement drive business value. While participation builds lasting relationships and impacts fundamental business objectives, customer engagement will ensure business success.

In the below example we have deployed gamification to improve overall team situation. e.g knowledge level of the team, discovering more critical bugs and giving more and more frequent demo and pointifying all these factors. Celebrate and recognized the monthly winners.

Players	August											
	Tasks Achievemnet points	Demo achievements points	Knowledge share points	Reusable artifacts points	Quality improvement points	Idea Generation	Cultural Event	NPS Rate >9	Total points	Total STAR	Badge	Remark
Shashi	100	100	0	0	200	0	0	0	400	5	1	
Kanu	0	0	0	0	100	0	0	0	100	5	1	
Pala	0	100	0	0	0	0	0	0	100	5	1	
Chandan	100	0	0	0	0	0	0	0	100	5	1	
Susan	0	100	0	0	0	0	0	0	100	5	1	
Amrutha	100	0	0	0	0	0	0	0	100	5	1	
Sunanda	0	100	0	0	0	0	0	0	100	5	1	
Subhashish	0	0	0	0	0	0	0	0	0	5	1	
Abhijit	0	0	0	0	0	0	0	0	0	5	1	
Munai	0	0	0	0	0	0	0	0	0	5	1	
Ashish	0	0	0	0	0	0	0	0	0	5	1	
Jaita	0	0	0	0	0	0	0	0	0	5	1	
Nirmal	0	0	0	0	0	0	0	0	0	5	1	
Sujay	0	0	0	0	0	0	0	0	0	5	1	
Sharthak	0	0	0	0	0	0	0	0	0	5	1	
Soumita	0	0	0	0	0	0	0	0	0	5	1	
Lohitaksha	0	0	0	0	0	0	0	0	0	5	1	

Fig 19: Leaderboard complexity, new level of challenges adding every month.

Demo weight	100	Scrum master/PO		
	200	Customer/External		
Code review, unit test , static code analysis	200	TFS to check		
Finding Bugs	100 points	1-10 bugs	from review, test etc	
	100 points	Critical bugs(1-5)		
	100 points	1-10 test cases		
Task Execution timeline	100	on time		
	Minus (- 50)	delayed		
Knowledge share	200 points			
Idea Generation	500 points	1 - idea approved and Linked to Knowledge share		
Reusability	1 hr = 10 points			
Tasks weight	100 points			Granular work(8 hrs), >10 tasks
	50 points			<10 tasks
	500 points	1 STAR		
	5 STAR	1 Badge		

Fig 20: Game rules and Challenges

12. Conclusion:



Fig 21: Long Term Plan Driven Product Development

Fig 21: Explains various issues with product development approach where everything is planned properly upfront for more than one year ahead. This is no more a realistic practice in today's work, not a sustainable model. Incremental model with customer co-creation is more acceptable and sustainable. Completely new approach is required to develop product in today's dynamic world. Agile framework helps a lot in today's product development communities.

A perfect product comes when we have all the above said process consistently followed. Profit margins ensure as customer product adaptation will be high and marketing through referral will take care of the product selling part.

Check your assumptions and reduce your risks before you get to the expensive part of developing your product by working together (co-create). Take care about your uncertainties by getting all the information about the market, customer, competitor etc. Iterate the cycle (P-D-C-A) cycle.

This approach of product development helps any product irrespective of size of the product. A large company or startup company with similar types of flow has to adapt to make sustainable and profitable products.

Let us ask ourselves, are we really doing all these steps mentioned above religiously. If not then there will be slack in the value chain somewhere.

Every product and product team has to treat themselves as an entrepreneur and run as a startup organization. The culture has to be like start up.

Most of the stable product suffers because of lack of innovation, missing customer connect, incremental complex changes, unused features which pushed to customer, no support to end user, complex upgrades issue, etc.

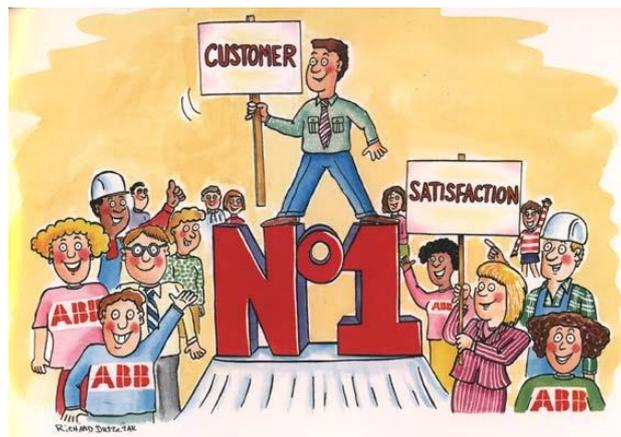
Both employee and customer have to be satisfied at the end of execution cycle then world class product will be born. To ensure this goal we have to practice all these steps mentioned above.

I have captured most of the theme as a mind map where picture talks 1000 words and explained how should we progress in our product development endeavors whatever roles we are in.

Results will be ensured, what we have achieved to mention few

- a) Cycle time reduced by 20%
- b) Defect Removal efficiency for a certain release was above 95%
- c) Net promoter score improve significantly
- d) Technology adaption has increased

Satisfied customer:



Excellent Product:



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