Product Engineering

By TOM HALPIN

A tale from the Pet Clinic multi-verse

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Preface

Humans love stories, the urge to tell stories is in our DNA. The eBook can be considered as the novelization of Online Product Engineering Dojo which takes a pioneering role-based story telling approach to help achieve hands-on learning at scale.

The Online Product Engineering Dojo modules are set in the same **Pet Clinic** multi-verse as DXC's Online DevOps Dojo - https://dxc-technology.github.io/about-devops-dojo/.

Both Dojo's place learners in real-world-like scenarios, scenarios where they work with a virtual cast of characters sharing the challenges and aspirations of the **Universal Imports** team as they learn about Product Engineering.

About the Author

Tom recently recognized as a Distinguished Engineer by DXC Technology currently works in an Agile/DevOps enablement role in the Innovation and Automation group of DXC's Delivery organization. He has experience of a variety of sectors including factory automation, supply chain & logistics, lecturing, eLearning & training and finance where he has performed a variety of roles from software development to technical management. Currently Tom is helping teams in DXC to transform how they work to a DevOps model in support of product aligned value streams. Tom has helped incorporate the learnings from these coaching engagements in to DXC’s DevOps & Product Engineering Dojos thus facilitating the scaled adaption of the associated culture, practices and tools across DXC.

Foreword

Dedication

To family members who have come before, are here now and are yet to arrive.

July, 2021

Dojos

This eBook's roots lie in a number of interactive Dojos DXC developed to train it's own employees and then open sourced in order to share with the wider community.

DevOps Dojos

DevOps Dojos became popular since Target, an important U.S.-based retail company, started to introduce such a practice back in 2014 in support of its DevOps transformation. Since then, multiple conference talks, white papers and books have been published about DevOps Dojos.

DXC have been running DevOps Dojos for own employees and customers for some time, however we quickly came to a point where our physical DevOps Dojos were not enough to cover all the needs. Everyone was loving the experience, and to this day the on-site experience still leads to great results. But we had a scalability issue: we could not accommodate everyone we needed to address so we developed an interactive browser based DevOps Dojo for our staff.

Following the success of that effort we released an open source version of our DevOps Dojo - the Online DevOps Dojo.

In parallel we continued to apply the Dojo model to other problem domains.

Product Engineering Dojo

DXC’s customer-centric approach is facilitated by the judicious application of product engineering, underpinned by Agile and DevOps principles.

As a result DXC invests heavily in helping customer-facing teams adopt new approaches like Product Engineering to increase their agility, collaboration and responsiveness to customer needs.

Product engineering embraces concepts of design thinking, which aims to create better products and services by understanding how users interact with them and the conditions under which they are to operate. It emphasizes bidirectional communication, feedback loops, learning from mistakes and experiential approaches.

DXC wanted to provide training to help our people make the cultural shift from a project mindset to a product mindset, to do so we created an interactive browser based **Product Engineering Dojo**. The objective being to help ensure the software applications and integrations we develop, as well as the managed services we provide, are better suited to the needs of the business and the demands of the market.

Open Sourcing

We use the **Product Engineering Dojo** to:

- Train people at scale on Product Engineering.
- Help people prepare for a face-to-face or virtual Product Engineering Dojo or Design Thinking Workshop by learning techniques in advance.
- Provide a product engineering curriculum with interactive modules.
- Provide a browser based way to allow students get knowledge when they need it.
- Share what "good looks like" when answering enquiries in relation to Product Engineering or Design Thinking patterns
- Following on from the success of the Online DevOps Dojo - continue to leverage the story and the characters by extending the story and thus create more learning experiences in effect creating the Pet Clinic multi-verse.

To continue giving something back to the community we also released an open source version of our Product Engineering Dojo - the Online Product Engineering Dojo.

Universal Imports - A Story

Our challenge as coaches was to make the experience engaging. There is nothing better than a good story to engage people, so we created one to support the training.

The modules tell the story of a fictitious group of companies, the "Universal Imports Group" and its employees on their Product Engineering journey. You will meet those employees in subsequent chapters, share their journeys and hopefully gain some insights from those journeys that will help you in your own Product Engineering journey.

Ready to Begin?

Ready to begin? If so go grab a cup of your favorite ☕ or 🍵. Resist the temptation to multi-task, turn off all electronic devices 📱 other than the device you are reading this ebook on, of course.

Let's get started on Product Engineering!

Use the dojo!

Chapter 1 - Welcome

Welcome to the **Online Product Engineering Dojo**.

Thank you for making time to peruse this book. We hope the investment of your time is rewarded with Product Engineering learnings and insights. We further hope that you can apply these learnings in your work and in your team's work.

This book includes **5** chapters:

- Welcome
- Introduction to Product Engineering
- Design Thinking
- Getting Started
- Assessment

Overview

In this Welcome chapter, we will get you started by introducing you to the scenario and the cast of characters. Once you are all set, you can complete the other chapters in the **Online Product Engineering Dojo** at your own pace.

This course is set in the Pet Clinic 🐱🐻🐶🐹🐭🐴🐰🐙🐇🏥 - Multiverse 💥.

We will begin by introducing Universal Imports the group of companies led by the **C**harlie the CEO of Pet Clinic fame and our troupe of characters.

Some of you may already be familiar with **C**harlie and the Pet Clinic crew from the ONLINE DEVOPS DOJO

Product Engineering the final frontier: these are the 🚀 voyages of the Universal Imports Group as they work to introduce Product Engineering ...

The Challenge

Charlie is keen to ensure that the teams working in his group of companies apply the discipline of Product Engineering when designing and developing solutions.

The introduction of Product Engineering is hot on the heels of his initiative to pilot DevOps improvements in the Pet Clinic company.

Details of that initiative and the associated adventures can be found in the ONLINE DEVOPS DOJO.

The group of companies which are collectively known as the **Universal Imports Group** includes the following

- **Daily Mentioner** - a national newspaper.
- **InGen** - a space exploration company.
- **Pet Clinic** - one of a number of online retailing businesses in the group.

All of the companies in the Universal Imports Group rely on software to run their business. Some of this software is purchased, some of it is open source and some of it is developed in-house.

The objective in improving Product Engineering practices in the group is to:

Ensure that any software applications and integrations developed, and any managed services provided will be better suited to the needs of the business and to the demands of the market.

Our Cast

Before we proceed lets take a few minutes to catch up with some of the Pet Clinic crew and to meet some new friends from the other companies in the Universal Imports Group.

We will share in their challenges, opportunities and achievements as our story unfolds.

The **Online Product Engineering Dojo** has several characters which play a role throughout the modules. Some of these characters were originally introduced in the ONLINE DEVOPS DOJO.

Charlie has gathered the following key individuals together from across the group to lead the adoption of Product Engineering in the Universal Imports Group under a program called **Overlook**.

Charlie (CEO)

Charlie is a technology entrepreneur, investor and philanthropist.

Charlie is a serial disruptor, he understands the importance of adaptability and speed.

Being an entrepreneur he has had successes and failures in the past, he expects to have successes and failures in the future.

He views the discipline of Product Engineering as being essential to tilting the scales in favour of future successes.

His motto is to "*Better to fail fast if you are likely to fail at all*" so he is keen to see more work done in the design and prototyping phases of projects.

Miyagi (Product Engineering Mentor)

Miyagi Product Engineering Coach and Mentor hired by Charlie to help increase the use of Product Engineering within the Universal Imports Group.

Miyagi's coaching philosophy is to engage, coach, empower and support the teams he works with to enable those teams to solve problems for themselves.

He finds coaching to be a rewarding experience but on the rare occasions it is not, he de-stresses by doing a little DIY including painting fences, sanding floors and waxing cars.

Miyagi has worked in a number of industry and sectors. He has coached clients in how to design and develop better products at scale.

Miyagi is keen to apply those learnings in the Universal Imports Group and to also learn from the good work in the space already underway across the group.

Adriana (Architect) - InGen - Space Exploration Company

Adriana the **A**rchitect working on the R237 control software for Redrum, InGen's revolutionary rocket designed for suborbital flights.

She caught the space bug as a child watching the lunar landings on a grainy old TV set and is busy pursuing her passion for all things Space with InGen.

Adriana has an interest in all phases of the Product Engineering life cycle but has a particular interest in architecture for testability.

She wants to ensure the rockets InGen plan to send to infinity (figuratively speaking) and beyond return safely.

Pennyworth (Project Manager) - The Daily Mentioner - National Newspaper

Pennyworth a **P**roject Manager from the Daily Mentioner national newspaper is a servant leader, he facilitates the work of the teams on the projects he manages.

A loyal and longstanding confidant of Charlie Pennyworth often acts as Charlie's weather *wayne* pardon the pun on new programs.

Pennyworth works to ensure that new programs become shining examples of best practices and is thus ideally suited to helping on the Overlook program.

Paulo (Product Owner) - Pet Clinic Application

Paulo is an Agile **P**roduct Owner for the Pet Clinic company.

Paulo works with the Pet Clinic business to understand what functionality is needed, why it is needed and when it is needed. He then manages the back log, working with the development team to groom the backlog in response to the evolving business priorities.

Paulo perhaps inspired by his pet cat, John Connor, regularly comments "The backlog has not been written. There is not fate but for what we make for ourselves" much to the bemusement of the team.

Paulo is excited by the increasing focus on Product Engineering.

He is particularly keen to understand more about approaches to ideation, conceptualization and prototyping in the hope of making improvements in the Pet Clinic application development process.

Brenda (Business) - Pet Clinic Application

Brenda works in the Pet Clinic Business. One of her goals is to help grow the company, to that end she works with Paulo and the Pet Clinic development team to introduce new features which will leave Pet Clinic's competitors far behind.

A recent foray by the Pet Clinic into Fair Trade pet products was very successful. To leverage that opportunity to its full potential a number of new business applications/modules will be needed in support of the associated product launches.

Brenda is keen to understand how Product Engineering principles can be applied to those developments to help ensure the right product are developed for the intended users in the most efficient manner possible.

Dan (Developer) - Pet Clinic Application

Dan, one of the Pet Clinic development team. During the Pet Clinics' DevOps transformation Dan focused on test-driven development, continuous integration and continuous delivery pipelines.

Dan has been asked to participate in the Product Engineering Chapter to give a developer's perspective and to help tailor the Product Engineering practices for software development.

Merida (Offering Lead) - Managed Services

Merida, is an offering lead for one of the managed service offerings of the Universal Imports Group.

Merida has been asked to participate in the Product Engineering Chapter to give the perspective of an offering lead and to help tailor the Product Engineering practices for managed services.

Next Steps

☎☎☎ **Call** ☎☎☎ for curious students 👽🐵🐻👦🐱👦🧔👽.

Now that you have decided to read this book there is an optional challenge awaiting you.

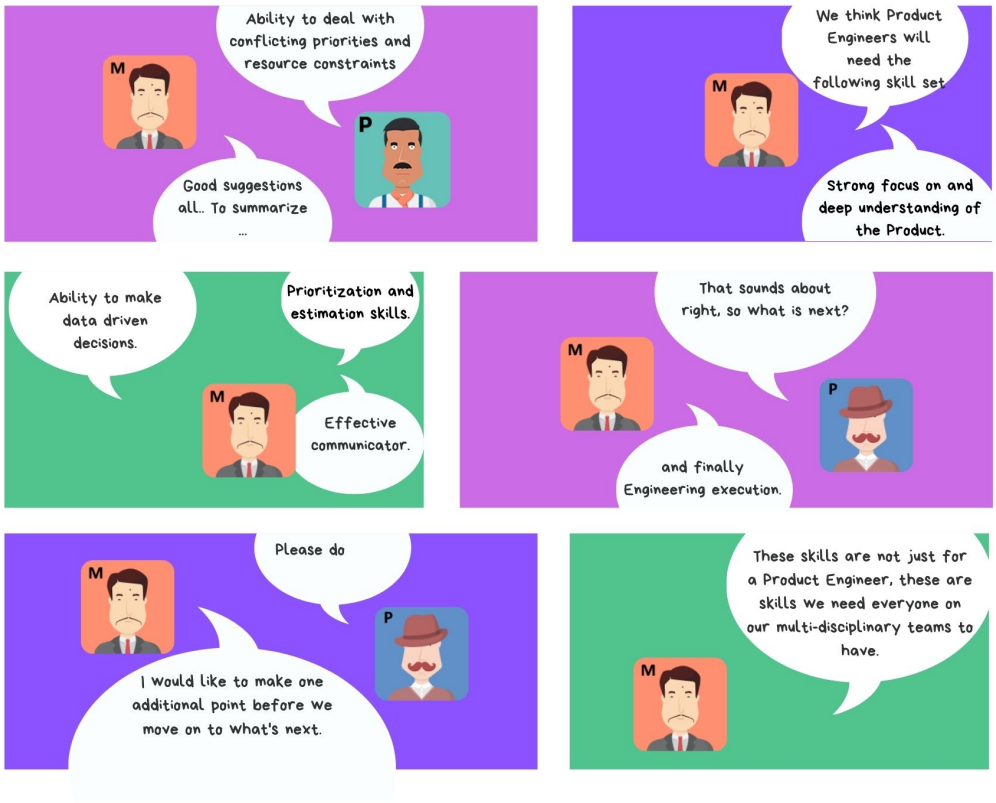
The challenge is to take some time to consider and make some notes as to your current understanding of and on the use of Product Engineering in your team.

The ask is that you review and reflect on those notes upon completion of the **Product Engineering** eBook.

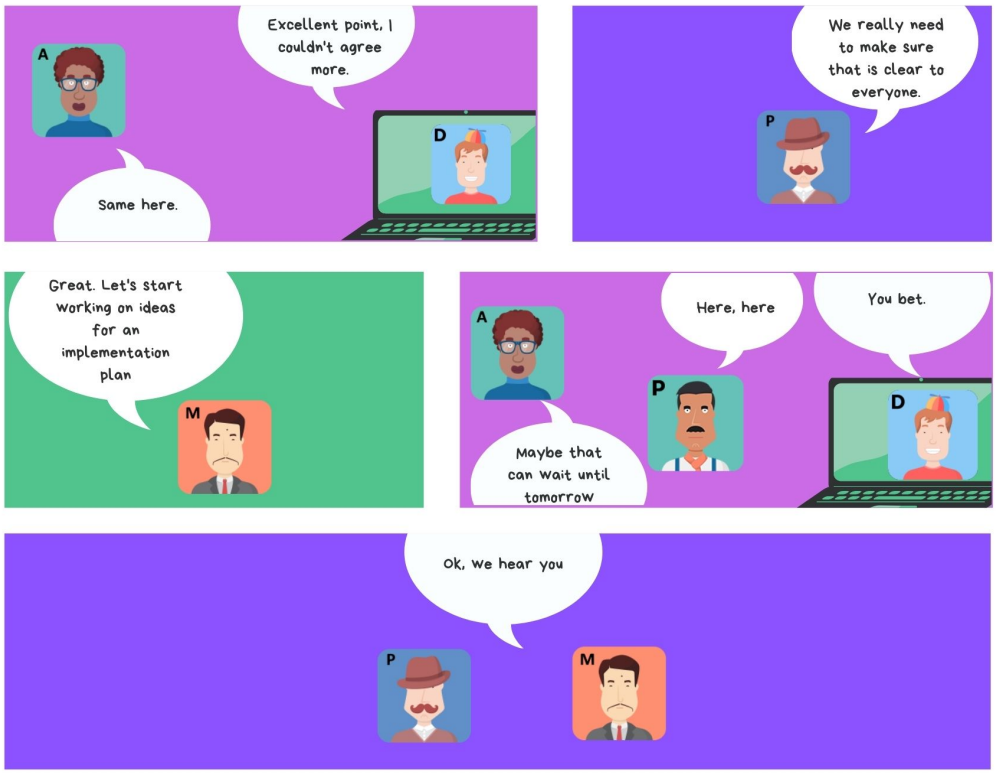
Good luck with the challenge.

Chapter 2 - Introduction to Product Engineering

INTRODUCTION TO PRODUCT ENGINEERING- STRIP 1

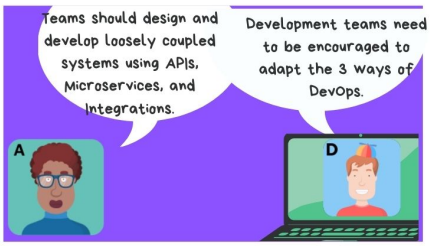


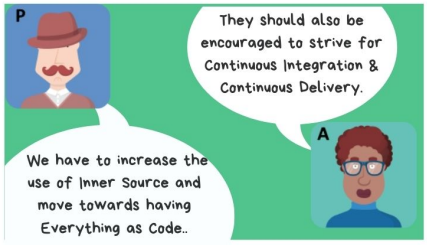
INTRODUCTION TO PRODUCT ENGINEERING- STRIP 1

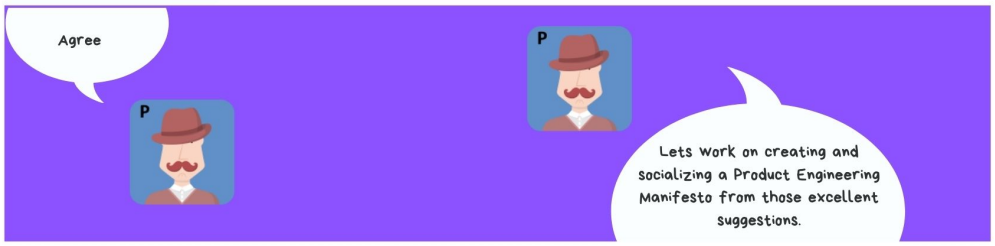


INTRODUCTION TO PRODUCT ENGINEERING- STRIP2

INTRODUCTION TO PRODUCT ENGINEERING- STRIP2







Chapter 3 - Design Thinking

Coming Soon.

Chapter 4 - Getting Started

Purpose

The primary objective of the **Getting Started** chapter is to help you to start assessing, understanding and improving your development team's Product Engineering practices.

Building and fostering product-oriented engineering teams isn’t easy, as the saying goes "*if it was everyone would be doing it*".

Product-oriented engineering teams should not be considered as feature factories. They are capable of and ultimately responsible for so much more than just cutting code.

They need to be

- Empowered stakeholders and custodians of all facets of the product experience.
- Aware of the value proposition of and the impact of the product they are building.
- In constant contact with, and thus in tune with the needs of the customers.
- Focused on continuous improvement and the elimination of waste in all phases of the product development and product lifecycle.
- Plugged into the ideation and design process.
- Committed to the cultural pivot needed to move an organization from a project to a product mindset.

Learning Outcomes

By the end of the chapter you will be able to

- Access your current Product Engineering practices.
- Understand "*Universal Imports Group*'*s*" recommended Product Engineering practices.
- Introduce or improve your Product Engineering practices.
- Create an environment which enables your team to better influence the products they are responsible for.

Opening Scroll

Charlie, the CEO of the Universal Imports Group of companies, sponsored a DevOps Transformation in the Pet Clinic. Details on that initiative can be found at ONLINE DEVOPS DOJO.

The Pet Clinic's DevOps Transformation is starting to deliver results including:

- Improvements in the development team's culture, process and tooling.
- Requested features being made available sooner to the business.
- Increases in quality and operability of the business features deployed.
- Stronger links between business and IT teams.
- Improved experiences for customers with a resulting increase in customer satisfaction.

A recent workshop was held to facilitate the group leaderships' desire to see the learnings from the Pet Clinic's DevOps Transformation applied to the other companies in the Universal Imports Group.

Amongst the attendees were **P**aulo and **B**renda from the Pet Clinic transformation team 🐱🐻🐶🐹🐨🐴🐭🐙🐰🏬; **A**driana from InGen, the group's Space Exploration Company 💥💥💥🚀💥💥💥🚀 and **P**ennyworth from The Daily Mentioner, the group's national newspaper 📰📰📰📰📰📰.

The purpose of the meeting was to brief the representatives from the other companies in the Universal Imports Group on the Pet Clinic's DevOps Transformation with a view to having them champion similar transformation efforts in their respective companies.

One of the main outcomes from the meeting was the general recognition how Lean principles were applied to a relatively complex development environment. This enabled the Pet Clinic team to document, analyze, and improve the processes involved in the delivery of the Pet Clinic application to their customers in the business. The resulting process improvements helped the Pet Clinic team to identify and eliminate waste in their processes.

The team, now faced with the challenge of improving Product Engineering practices within the Universal Imports Group, are considering applying the techniques learnt during the workshop to help scale Product Engineering practices across the Universal Imports Group.

This chapter covers the ensuing discussions and the actions arising from those discussions.

	**Miyagi** Product Engineering Coach and Mentor, tasked with increasing the use of Product Engineering within the Universal Imports Group.
	**Pennyworth** Project Manager from The Daily Mentioner National Newspaper, part of the Universal Imports Group of companies, tasked with chairing the effort.
	**Adriana** Architect from the InGen Space Exploration Company, part of the Universal Imports Group of companies, lending her expertise to the Product Engineering effort.
	**Paulo** Product Owner for the Pet Clinic Application.
	**Brenda** Business representative from the Pet Clinic, who was the main Business champion of the DevOps transformation.

Improving Product Engineering Practices at Scale

The team discusses how to scale the improvement of Product Engineering practices in the Universal Imports Group.

TODO Comic Strip

Build Product Squads

We in the Universal Imports Group want to build the best possible products.

To do that I suggest we should first invest time, energy and budget in to building the best engineering teams that we can. Then we need to make additional investments to support those teams ensuring we foster accountability, creativity and also encourage experimentation.

Stronger engineering teams will build better products.

Miyagi any suggestions as to how we might go about doing this?

The structure and culture I recommend for Product Engineering teams is known as the "Product Squad" which was first popularized by Spotify.

Product squads are cross-functional teams comprised of a small number of developers and a product owner. Product squads own a complete product or a specific functional area of a product line, they are also responsible for developing domain expertise in support of an organizations product portfolio.

I am sure you are thinking that sounds remarkably similar to Agile scrum teams.

It is, the key differentiator being in the squad model is that the squad are fully empowered. They release their work to the business when they deem their work to be ready. More often than not there are no other approvals required.

However with great power comes great responsibility as the squad are on point for

- Writing code.
- Testing the code.
- Testing the functionality.
- Deploying the "live" product.
- Monitoring and supporting the product.
- Managing technical debt.

Makes sense to me. The essence of what you are saying is that we need to empower our teams for success and to trust them to use that power wisely. I think the teams will welcome such an approach.

To do that, we will need to provide our teams some guidance on how to move to a squad model.

Product Squad Enablement

I think any help we provide has to be guided by the Universal Import Groups' **Product Engineering Manifesto** we just created.

We are uncovering better ways of engineering products by doing it and helping others do it.

Through this work we have come to value these 12 principles:

- *Focus on Customers underpinned by a deep empathy for their needs.*
- *Make Data Driven Decisions at all stages of the product life cycle.*
- *Foster a Culture of Experimentation via Ideation, Validation, Realization, Feedback and Iteration.*
- *Engage, Coach, Empower, Support Teams and Team Members.*
- *Value on Practice over Theory, Guidelines over Standards & Culture over Tooling.*
- *Create loosely coupled components supported by APIs, Microservices & Integrations.*
- *Actively work to optimize flow across the entire value stream.*
- *Aim for optimal DevOps - Continuous Integration & Continuous Delivery - per product.*
- *Apply Inner Source Principles supported by an Everything as Code first approach.*
- *Celebrate Success / Learn from Failures.*
- *Everybody's free (to Automate Testing).*
- *Encourage teams to have fun, if they don't enjoy making a product, chances are consumers won't enjoy using it.*

We can't expect teams to hit all those marks out of the gate, but we need to ensure that teams are able to commit time to both Product (building new features) and Engineering (documentation, addressing technical debt, monitoring etc) activities.

Our Product Owners have a key role in ensuring that balance between Product and Engineering work is maintained.

Agreed, we can do that by creating appropriate Feature and Enabler epics in the respective product backlogs and ensuring the squads are given sufficient time to work on both types of epics.

Pop Quiz 1

Question 1

Which of the following are the responsibilities of a Product Engineer?

- [ ]Help shape the product
- [ ]Participate in product development process
- [ ]Understand technical constraints, resources and opportunities
- [ ]Work to achieve practical product/technical tradeoffs
- [ ]Focus on ROI
- [ ]Deliver a mix of products
- [ ]All of the above

Question 2

Which of the following are included in the Skill Set of a Product Engineer?

- [ ]Strong focus on and deep understanding of the Product
- [ ]Make data driven decisions
- [ ]Effective communicator
- [ ]Prioritization and estimation
- [ ]Engineering execution
- [ ]All of the above

Getting Started

The team have agreed to follow a Product Engineering approach using Design Thinking - Empathize, Define, Ideate, Prototype & Test - to Introduce Product Engineering across the Universal Imports Group

Miyagi reminds everyone of the teams' Defined mission statement:

Improve the Product Engineering Practices across the Universal Imports Group

and of their agreed Product:

A set of best practices representing the recommended Product Engineering Practices for the Universal Imports Group and collateral to help teams implement those practices

The team meet. Ideas ebb and flow. Serious amounts of □□□□ and ☕☕☕☕ are consumed.

Deliberations are intense, engaging and heated at times but ultimately rewarding.

The results of those discussions is the following Getting Started with Product Engineering steps for teams across the Universal Imports Group.

- **Teams are to adapt the groups' Product Engineering Manifesto.**

- **Teams are to appoint a champion to spearhead the introduction of Product Engineering.**

A champion is a squad member empowered and willing to lead the introduction of Production Engineering in their squad. They are authorized to facilitate the 'pull' of Product Engineering into the squad whilst ensuring the squad is aligned with both the pivot in the organization's culture and the company’s goals.

- **Champions will participate in a bi-weekly Product Engineering Guild.**

A Guild, another concept introduced by Spotify, is basically a community of interest. Guilds

are where people from different squads can help each other and exchange information on a topic.

- **Communication facilitates flow squads need to work to improve communication pathways.**

Product squads need to continually optimize flow, one of the best ways of doing that is communication with both upstream and downstream stakeholders.

- **Iteration provides a pathway to rapid value creation.**

Product squads focus on delivering a solution that will address the problem at hand as quickly as possible. That solution may not be perfect initially but as the customer and the squad learn more about the problem domain the solution is improved in subsequent iterations.

- **Cherish and encourage direct customer interactions.**

Product squads need to have a clear understanding of customer expectations, wishes and problems, to better influence product direction. They best way to get this understanding is direct customer interactions at all stages of the product lifecycle.

- **Establishing a culture of experimentation is essential.**

Experimentation often drives innovation, high performing squads realize this simple truth and foster a culture of experimentation in the squad. This can be experimenting with new ways of doing things, new tools, new technologies etc. all done with the aim of engineering a better product.

- **Allocate time for both Product and Feature work.**

Squads need to commit time to both Product (building new features) and Engineering (documentation, addressing technical debt, monitoring etc) work. That can often mean going slower when developing features, in order to have the robust engineering and automations in place to enable the squad to go faster in the long run.

- **Celebrate successes, learn from failures and have fun.**

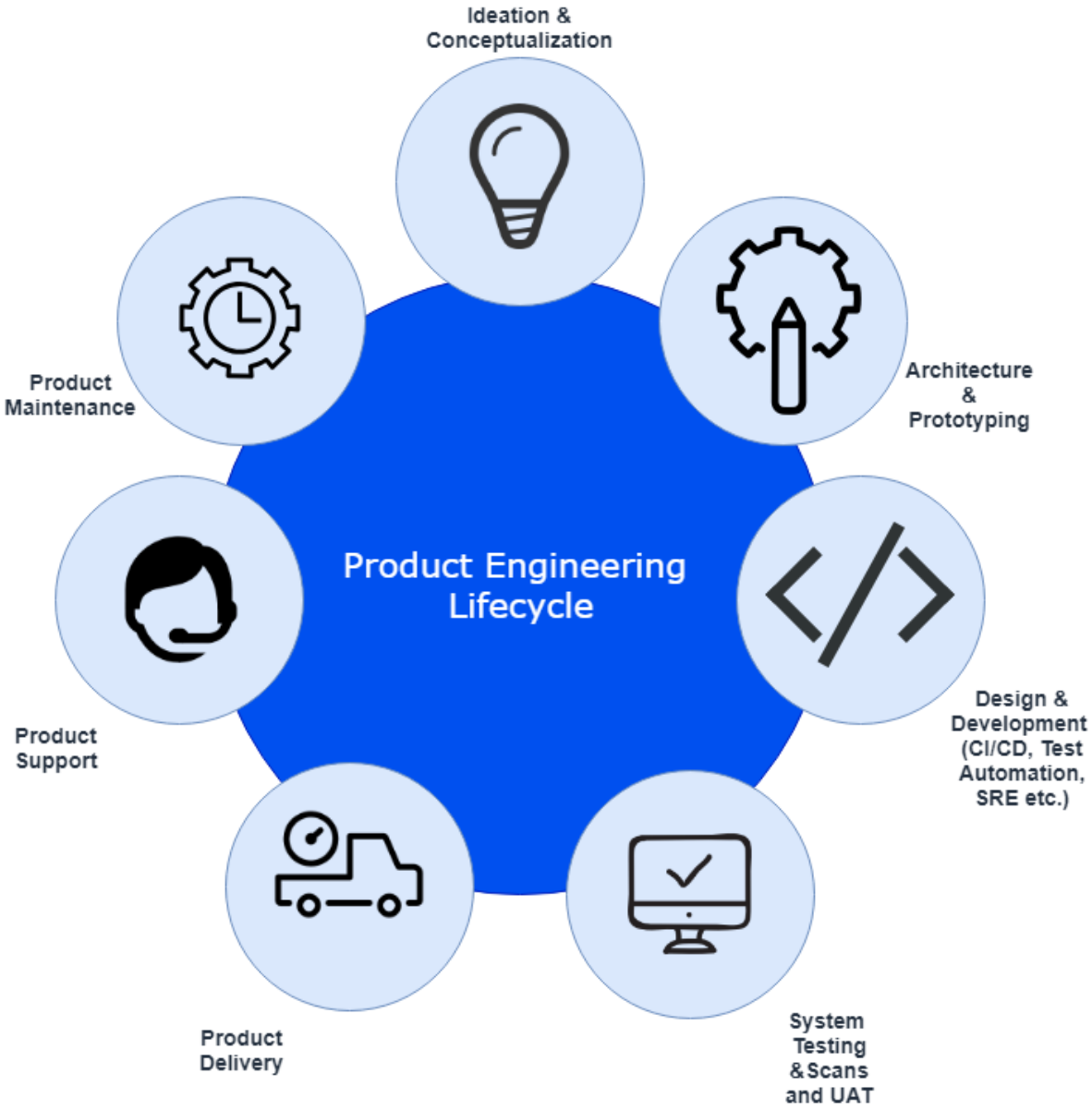
Happy and engaged teams build better products, successes should be celebrated and lessons should be viewed as learning opportunities.

Lifecycle

The team brainstorm Ideas to create a Prototype or "example of good" for Product Engineering Life Cycle which will:

- Enable the companies in the group to create new revenue-generating business models.
- Cover the end-to-end product value chain from ideation through the development process to deployment and after-market product support.
- Use Agile, Lean and DevOps principles to facilitate highly efficient development processes.
- Facilitate value creation at a lower cost base and with a lower cost of ownership.

The team agrees to recommend the following Product Engineering life cycle to share with the teams working to improve their Product Engineering practices:


Ideation &
Conceptualization
Architecture
&
Prototyping
Design &
Development
(CI/CD, Test
Automation,
SRE etc.)
System
Testing
&Scans
and UAT
Product
Delivery
Product
Support
Product
Maintenance
Product Engineering
Lifecycle

Appendix 1 - Assessment

Question 1

Who was appointed as the coach and mentor for the adaption of Product Engineering in the Universal Imports Group?

- [ ]Charlie
- [ ]Paulo
- [ ]Miyagi
- [ ]Adriana
- [ ]Brenda

Question 2

In the Product Engineering Manifesto, which of the following is valued?

- [ ]Theory over Practice
- [ ]Standards over Guidelines
- [ ]Culture over Tooling

Question 3

What is the name given to a squad member empowered and willing to lead the Introduction of Production Engineering in their squad?

- [ ]Champion
- [ ]Mentor
- [ ]Product Owner

Question 4

What is the first phase of the Product Engineering Lifecycle being adapted by the Universal Imports Group?

- [ ]Architecture and Prototyping
- [ ]Product Delivery
- [ ]Ideation and Conceptualization

Question 5

What is the first phase in the Stanford Design Thinking model?

- [ ]Empathize
- [ ]Ideate
- [ ]Define
- [ ]Test
- [ ]Prototype

Question 6

Design Thinking is seen as a means of addressing which identified gap in Universal Imports Group recommended Product Engineering LifecyCle?

- [ ]Product Delivery
- [ ]Product Support
- [ ]Ideation and Conceptualization

Question 7

Which of these is the correct sequence of the phases in the Stanford Design Thinking model?

- [ ]Empathize -> Define -> Ideate -> Prototype -> Test
- [ ]Ideate -> Empathize -> Define -> Prototype -> Test
- [ ]Define -> Empathize -> Ideate -> Prototype -> Test

Question 8

Product Engineering is a discipline that deals with which aspects of a product?

- [ ]Design
- [ ]Testing
- [ ]Delivery
- [ ]Support
- [ ]Development
- [ ]All of the above

Question 9

The cultural pivot required for a successful adaption of Product Engineering requires a shift to which type of mindset?

- [ ]Project
- [ ]Product

Question 10

In which phase of the Product Engineering Lifecycle being adapted by the Universal Imports Group is the product released to the market?

- [ ]Product Support
- [ ]Product Maintenance
- [ ]Product Delivery

Appendix 2 - Answers to Questions

Introduction to Product Engineering

Design Thinking

Getting Started

Pop Quiz 1

Question 1

Which of the following are the responsibilities of a Product Engineer?

The correct answer is **All of the above**

The following are some of the responsibilities of a Product Engineer

- Help shape the product
- Participate in product development process
- Understand technical constraints, resources and opportunities
- Work to achieve practical product/technical tradeoffs
- Focus on ROI
- Deliver a mix of products
    - POCs
    - MVPs
    - Highly scalable systems

Question 2

Which of the following are included in the Skill Set of a Product Engineer?

The correct answer is **All of the above**

The following are skills needed by a Product Engineer

- Strong focus on and deep understanding of the Product
- Make data driven decisions
- Effective communicator
- Prioritization and estimation
- Engineering execution

Assessment

Question 1

Who was appointed as the coach and mentor for the adaption of Product Engineering in the Universal Imports Group?

The correct answer is **Paulo** refer to Chapter 1 - Welcome for more details

Question 2

In the Product Engineering Manifesto, which of the following is valued?

The correct answer is **Culture over Tooling** refer to Chapter 4 - Getting Started for more details

Question 3

What is the name given to a squad member empowered and willing to lead the Introduction of Production Engineering in their squad?

The correct answer is **Champion** refer to Chapter 4 - Getting Started for more details

Question 4

What is the first phase of the Product Engineering Lifecycle being adapted by the Universal Imports Group?

The correct answer is **Ideation and Conceptualization** refer to Chapter 4 - Getting Started for more details

Question 5

What is the first phase in the Stanford Design Thinking model?

The correct answer is **Empathize** refer to Chapter 3 - Design Thinking for more details

Question 6

Design Thinking is seen as a means of addressing which identified gap in Universal Imports Group recommended Product Engineering LifecyCle?

The correct answer is **Ideation and Conceptualization** refer to Chapter 3 - Design Thinking for more details

Question 7

Which of these is the correct sequence of the phases in the Stanford Design Thinking model?

The correct answer is **Empathize -> Define -> Ideate -> Prototype -> Test** refer to Chapter 3 - Design Thinking for more details

Question 8

Product Engineering is a discipline that deals with which aspects of a product?

The correct answer is **All of the above** refer to Chapter 2 - Introduction to Product Engineering for more details

Question 9

The cultural pivot required for a successful adaption of Product Engineering requires a shift to which type of mindset?

The correct answer is **Product** refer to Chapter 2 - Introduction to Product Engineering for more details

Question 10

In which phase of the Product Engineering Lifecycle being adapted by the Universal Imports Group is the product released to the market?

The correct answer is **Product Delivery** refer to Chapter 2 - Introduction to Product Engineering for more details