

# Cloud Engineering - Chofer at Toyota

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Cloud & DevEx

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# The Toyota Way



There is no "best", only "better"

– Akio Toyoda

# Toyota Production System (TPS)

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- **Core principles**

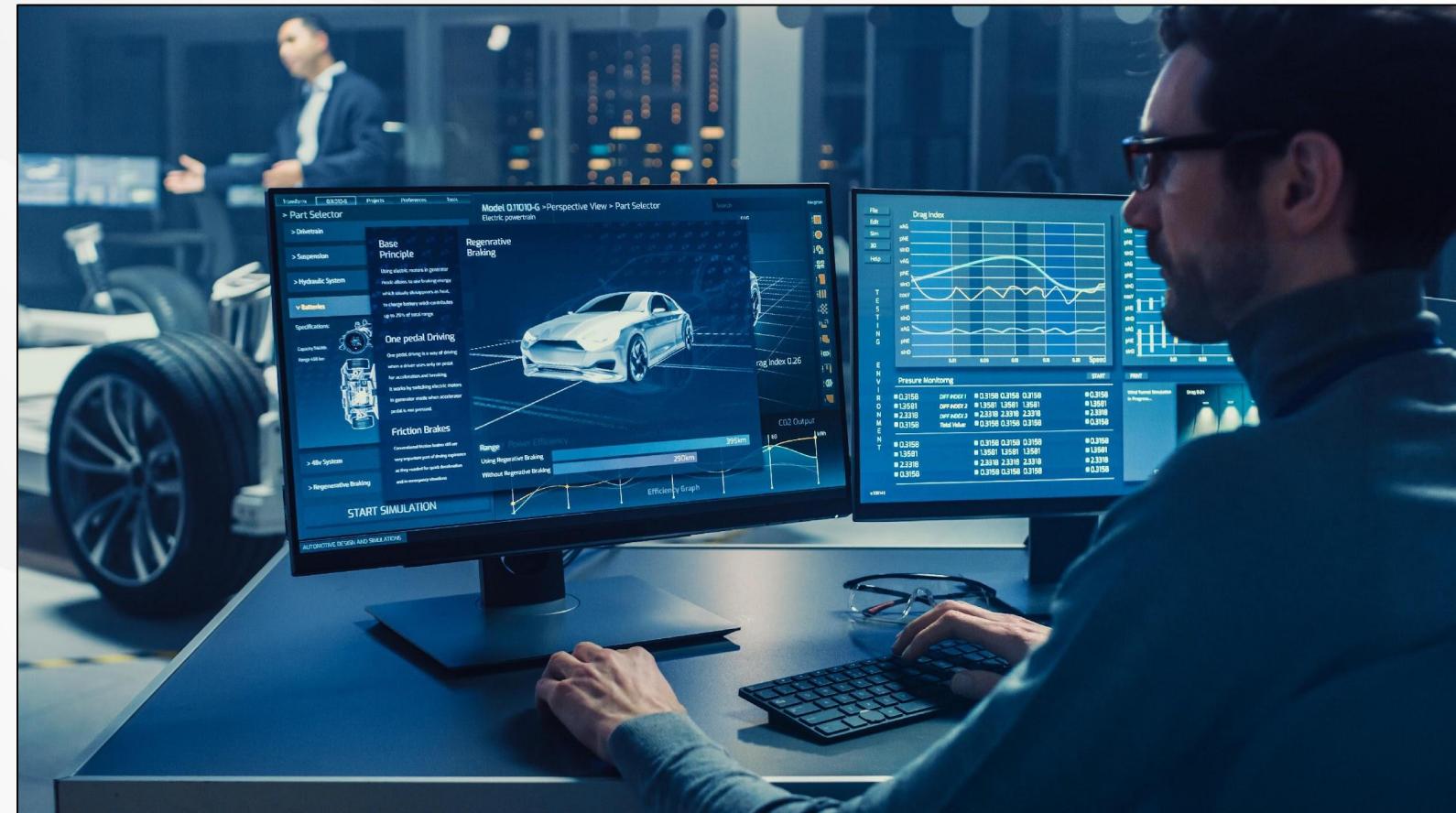
★★★ High Quality

⌚ Low Cost

⌚ Shortest lead-time

- **Core purpose**

- Eliminate waste
- Continuous Improvement



# The need for a journey

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- Market demand
- Role of software
- Richer features



*Toyota Way –Genchi Genbutsu and Kaizen  
– Go & see first-hand and Improve continuously*

# Organic growth of Software

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- Siloed systems
- Locally optimized lifecycles
- Large number of applications

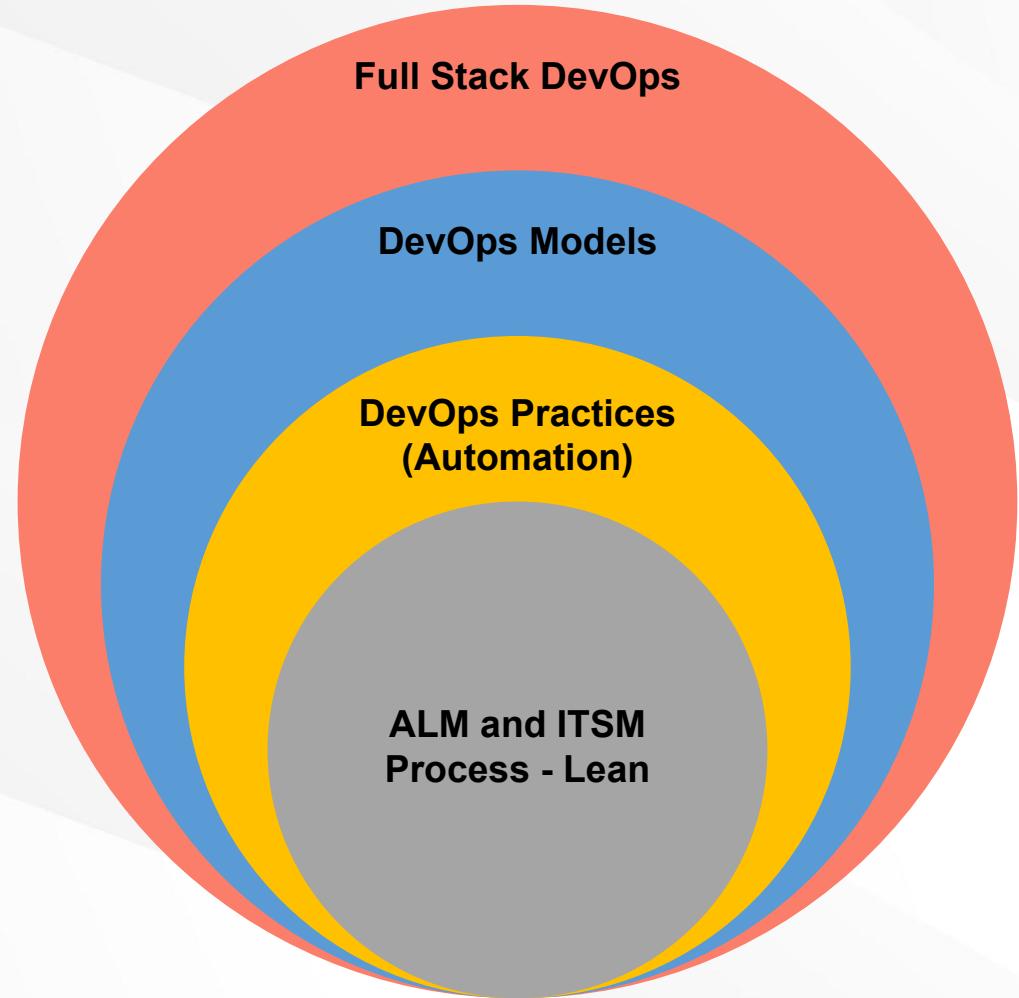


*Toyota Way – Eliminate Muda  
Muda is waste*

# Implementing the Toyota Way - DevOps

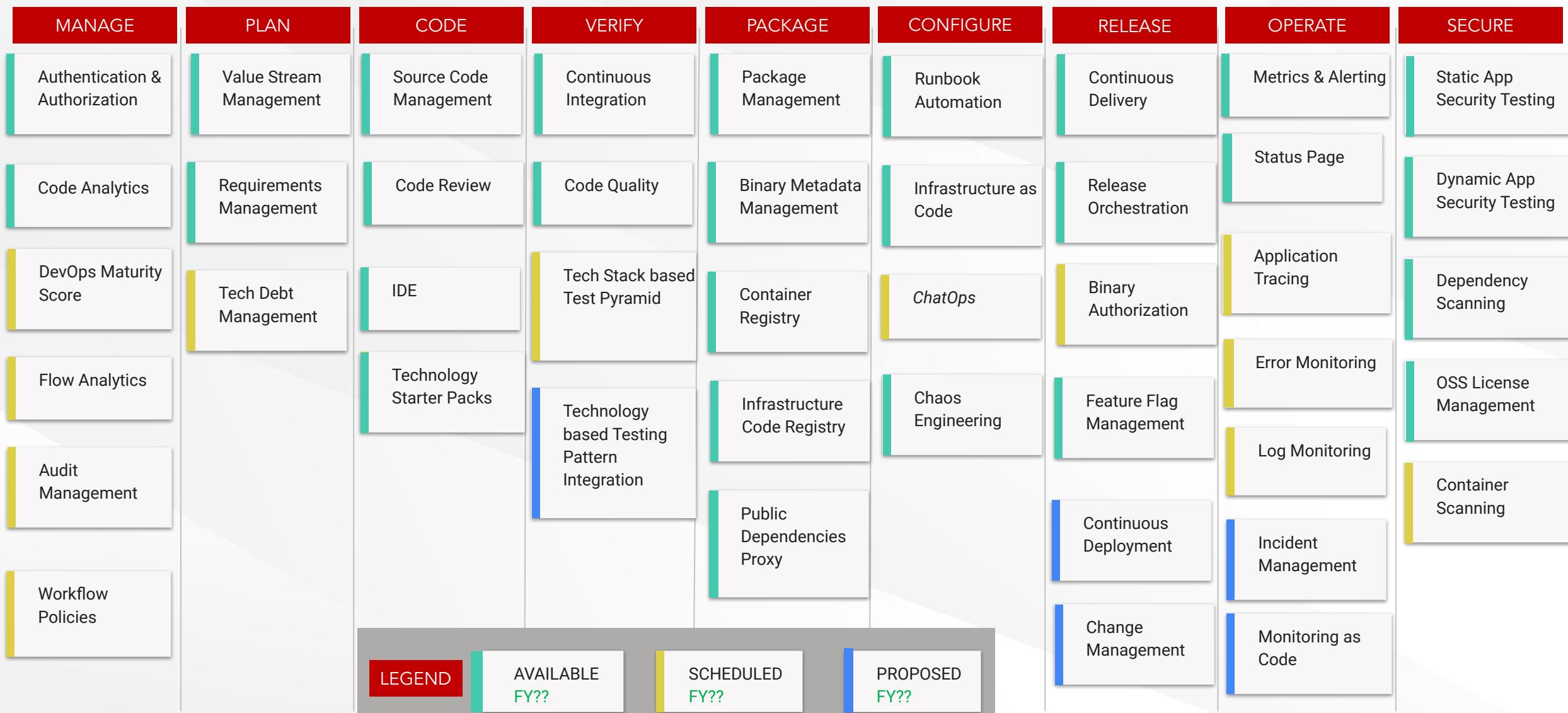
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- Planning the process
- Order of **CAMS** at Toyota
  - Automation
  - Measurement
  - Culture
  - Sharing



# Planning the process

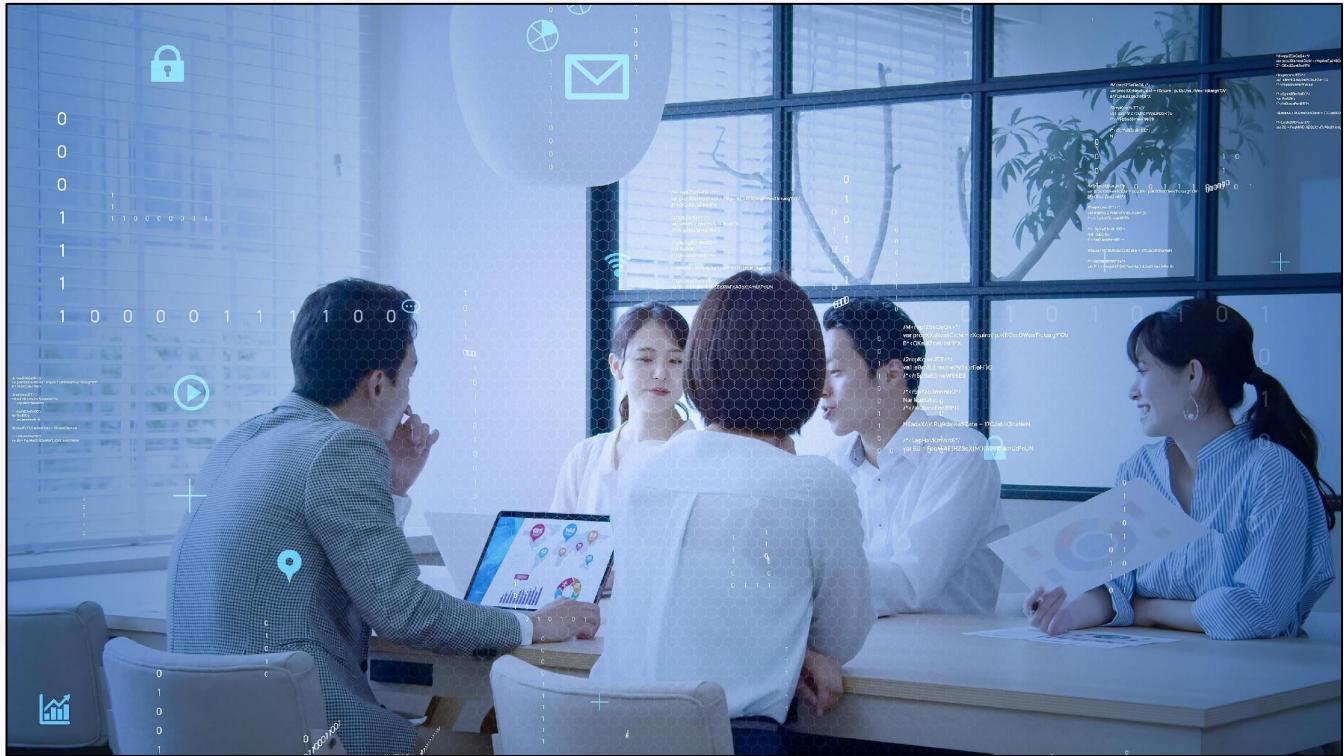
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# First objectives

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- Scope - Cloud vs. On-prem
- Vision
  - Velocity of adoption
  - Reliability
  - Cost-Efficiency
- Tools



# Road to DevOps

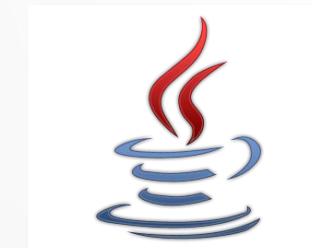
## Tools



# Tool chain – CI

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- Scalable build workers
- Flexible build engine
- Heterogenous repository
- Security tools



# Rush to production

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★☆☆ Low Quality

\_wallet High cost

⌚ Inefficient lead time

*Toyota Way*  
*Genchi Genbutsu*  
*Kaizen*



# Challenge

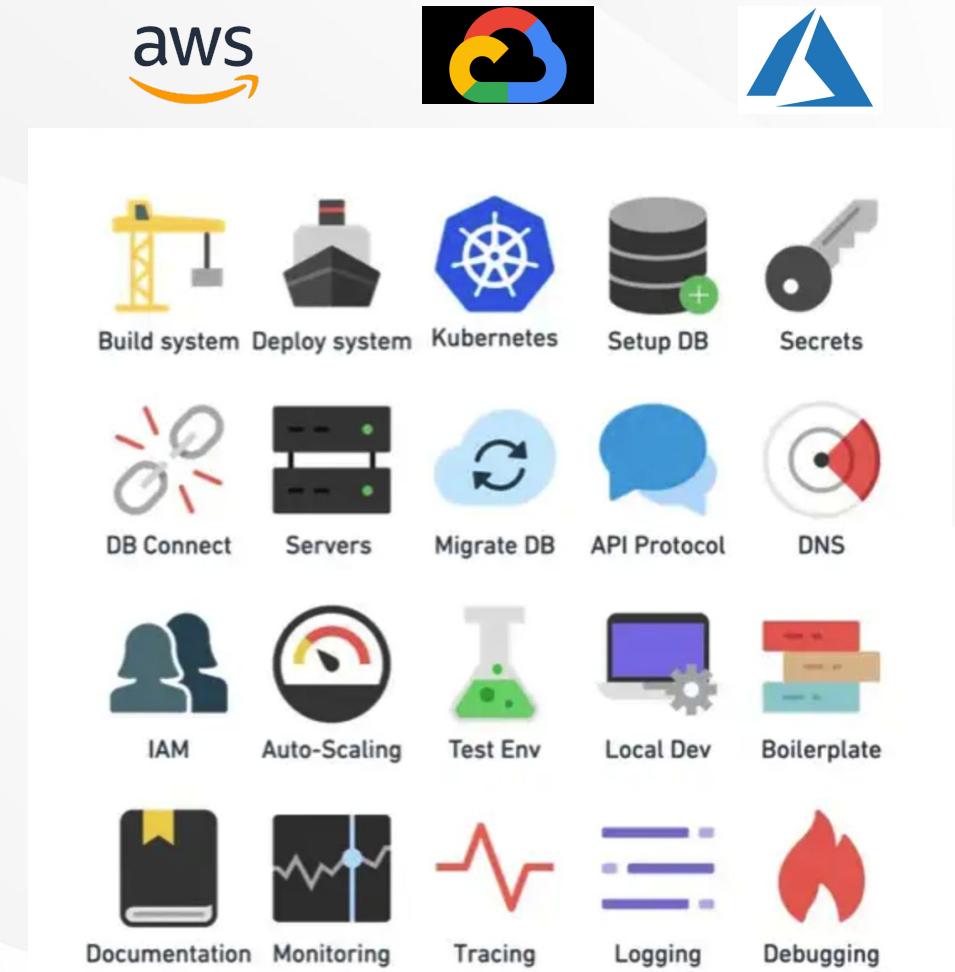
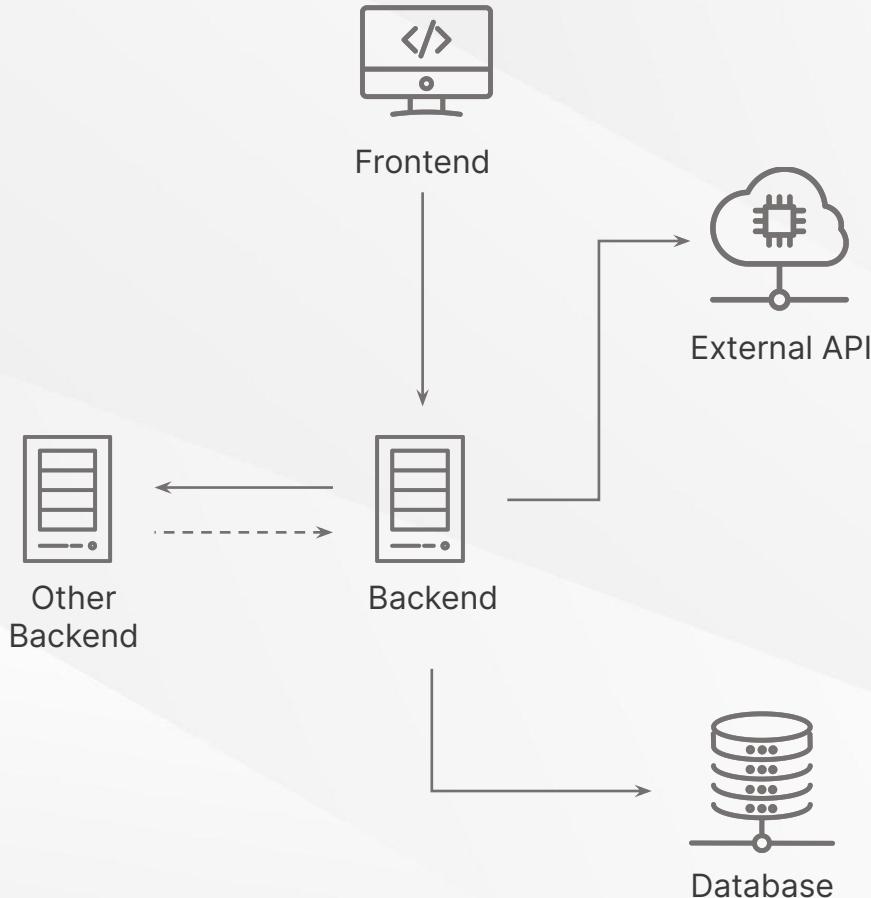
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- Modern software is richer
- Lots of moving parts
- Slow to build



# Genchi Genbutsu: Dev role expected vs actual

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# Toyota Way – Kaizen (continuous improvement)

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Make it simple for product teams to produce high-quality digital products that matter.



# SUCCESS

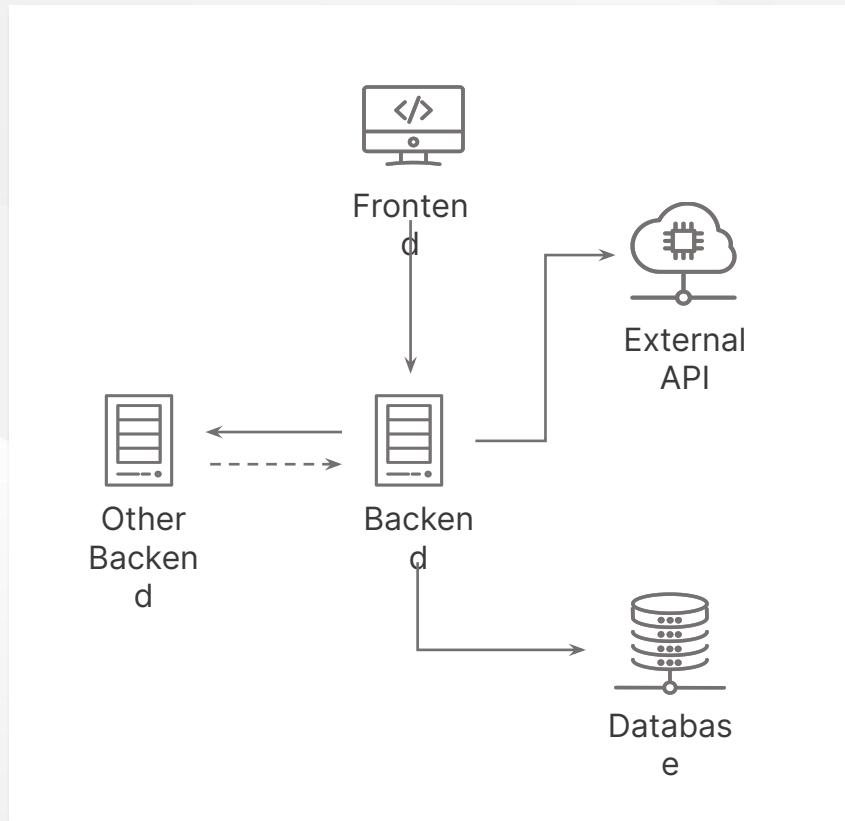
Culture



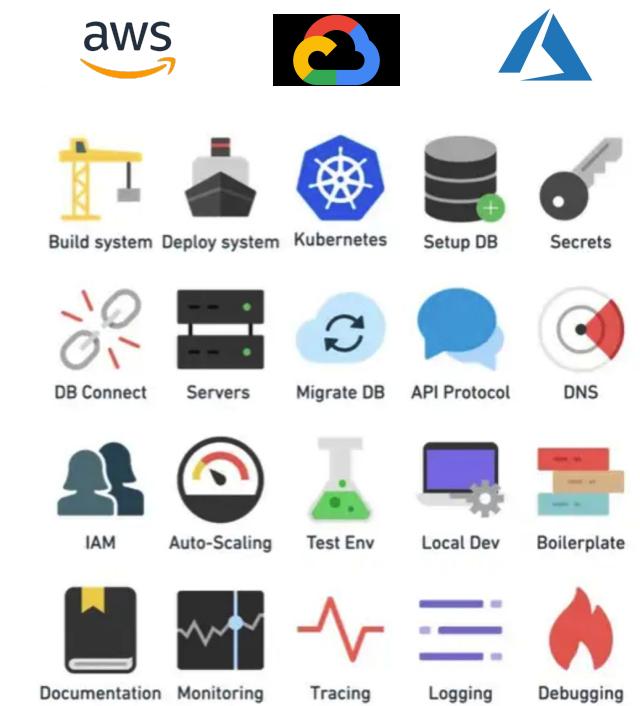
# 2 Platform approach

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Digital business platform  
(owned by application team)

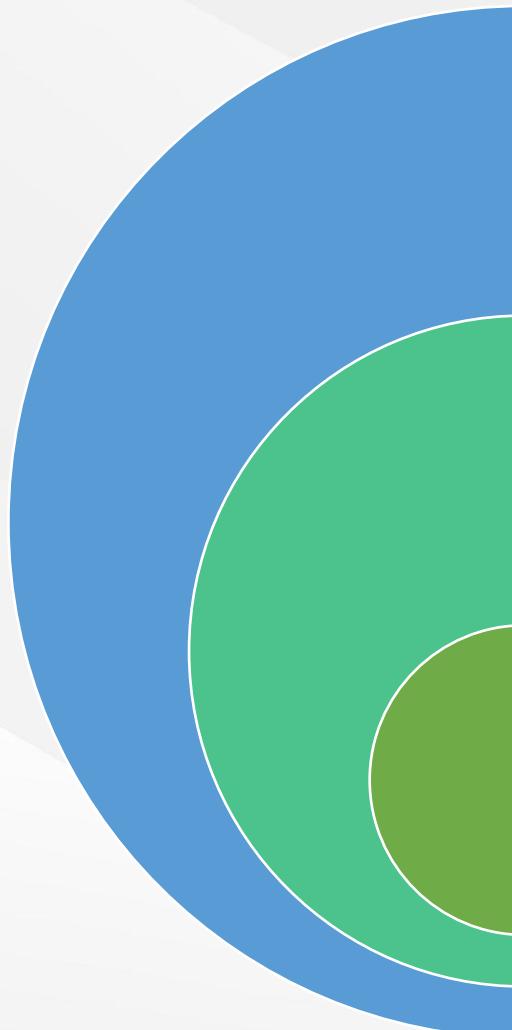


Foundational technology platform  
(provided by platform team)



# Platform team composition - Products & services

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## Key Products

- Blueprints
  - accelerate teams to shift-left
  - hook measurements
- Self-service portal
  - frictionless self-service adoption

## Key Services

- SRE review - Day 2 focus, measure
- Specialists like Cloud Economists, Principal engineers – Kaizen opportunities, FinOps etc.

## Guiding principles

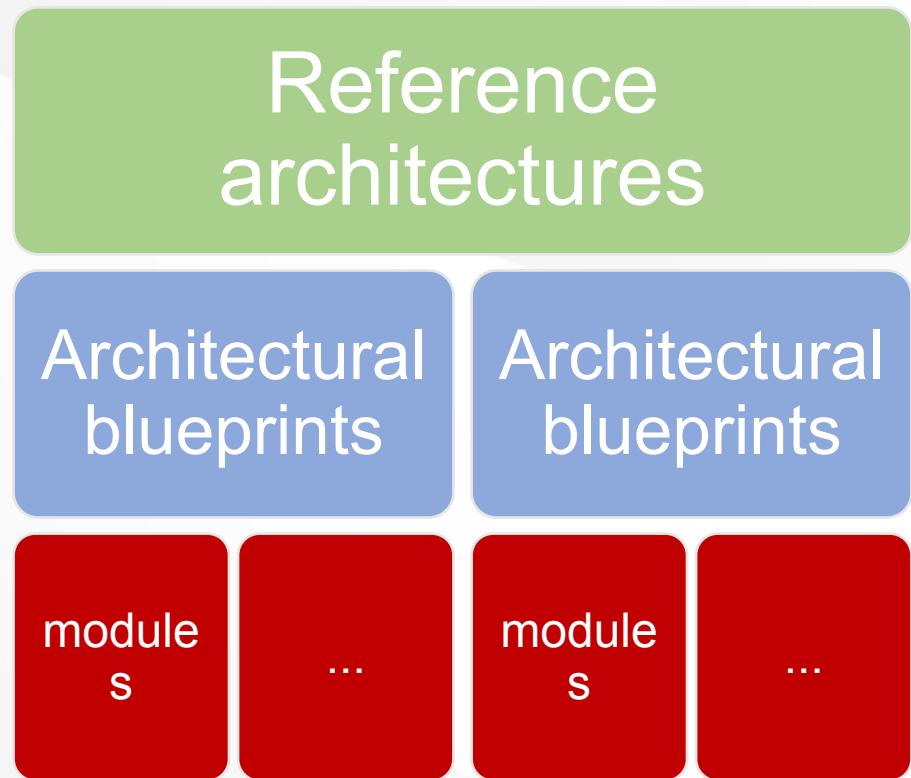
- Inner source
- Self-service
- Community driven
- API based

# Blueprints

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- Opinionated and supported path to build something.
- Examples:
  - Module
    - Terraform for S3
  - Architectural blueprint - SPA
    - S3 with CF + WAF + observability hooks + failover hooks
    - CI/CD pipelines
  - Reference architecture
    - Angular app + CF + WAF + CI/CD + lambda AuthN/Z + RUM metrics + logging + tracing + failover

Value to  
app teams



# Self-service portal

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Self-service blueprints



Software Catalog



Education and training



Economics and FinOps



SRE and Metrics

# Blueprints on self-service portal: Chofer

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## Key measurements

1. Rate of adoption
2. Rate of drop
3. Friction points



Good Quality



Cost efficient



Improved lead time

The Chofer Cloud Portal interface displays several blueprint categories:

- COTS Infrastructure**: Allows creating COTS Application infrastructure.
- ECS Blueprint for Containerized Apps**: Provision containerized application using AWS ECS on Fargate. NOTE (!): Requires AWS Infra Live structure.
- ECS Schedule Batch Job**: Allows creating ECS schedule batch job blueprint. NOTE (!): AWS account where you want to deploy the blueprint.
- Single Page Application (SPA)**: Can be used to provision any SPA solution leveraging Amazon CloudFront and Amazon S3. NOTE (!): Requires AWS Infra Live structure.

A central panel shows the **WA Score 41/45**. It includes a summary of TMNA best practices and security standards built in, and a breakdown of scores across pillars:

Pillar	Score	Scored Pillars
Operational Excellence	3/4	3
Security	8/8	8
Reliability	10/12	10
Performance Efficiency	8/8	8
Cost Optimization	4/5	4
[TMNA] Security Accreditation	8/8	8

The total score is calculated by summing the number of satisfied WA pillar considerations (by blueprint) across all pillars and placing that over the sum of the number of applicable WA pillar considerations across all pillars. This gives a holistic view of the blueprints architectural alignment at a quick glance. [Learn more about this blueprint](#)

Be sure to check **Pillars** section of the WA assessment for this Blueprint to boost your WA

Technology of choice:



Backstage

# Guided and Community based training

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## Key measurements

1. Number of clicks
2. Rate of new content
3. Time spent
4. Feedback items

The image shows a screenshot of the Chofer Cloud Portal. On the left, there's a sidebar with navigation links: Home, TechDocs, Blueprints, Cost Center, Blogs, Training (which is highlighted), and FAQs. A red 'Search' bar is at the top. At the bottom of the sidebar, there are notifications for 'Kishore Jonna...' and a message icon. The main content area has a dark background with a blurred image of a car interior. The title 'Training' is at the top, followed by the sub-section 'CloudEd'. Below that is a paragraph about CloudEd and a 'GO TO CLOUD.ED >' button. To the right are three video thumbnails: 'UPDATE ACCOUNT DETAILS IN CAM', 'HOW TO GET ACCESS TO GITHUB', and 'WHAT IS GITHUB?'. Below this is a section titled '"How to" videos and tutorials' with tabs for 'GETTING STARTED' (which is selected), 'ONBOARDING', and 'COST CENTER'. Under 'GETTING STARTED', there are four video thumbnails: 'WELCOME TO CHOFER', 'AWS CLOUD ESSENTIALS', 'GETTING STARTED WITH AWS SERVICES', and 'AZURE BEST PRACTICES FOR TMNA'.

# Insights with single pane of glass

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## Key measurements

1. No. of metrics
2. Freq of update
3. No. of dimensions
4. # of personas

★★★ High Quality

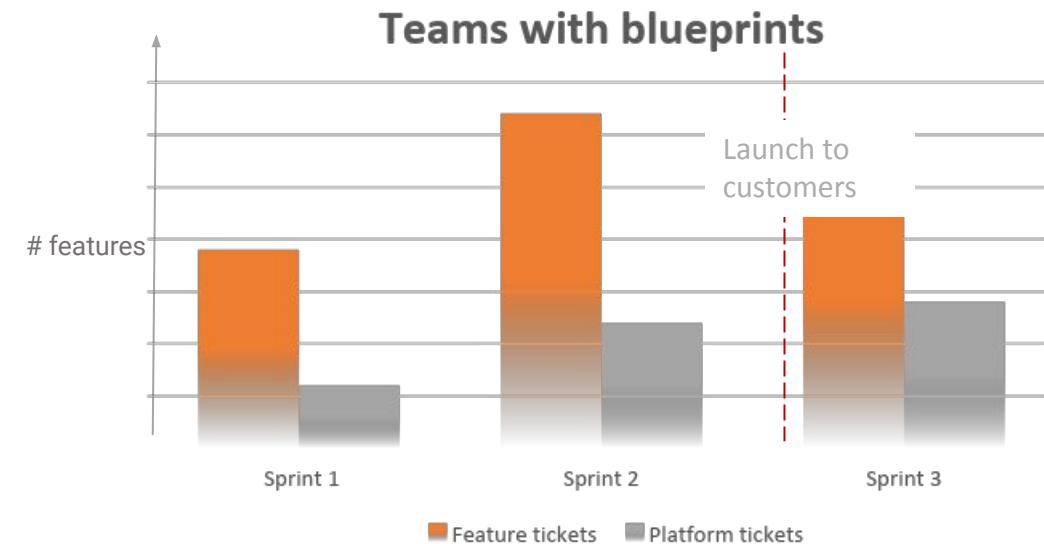
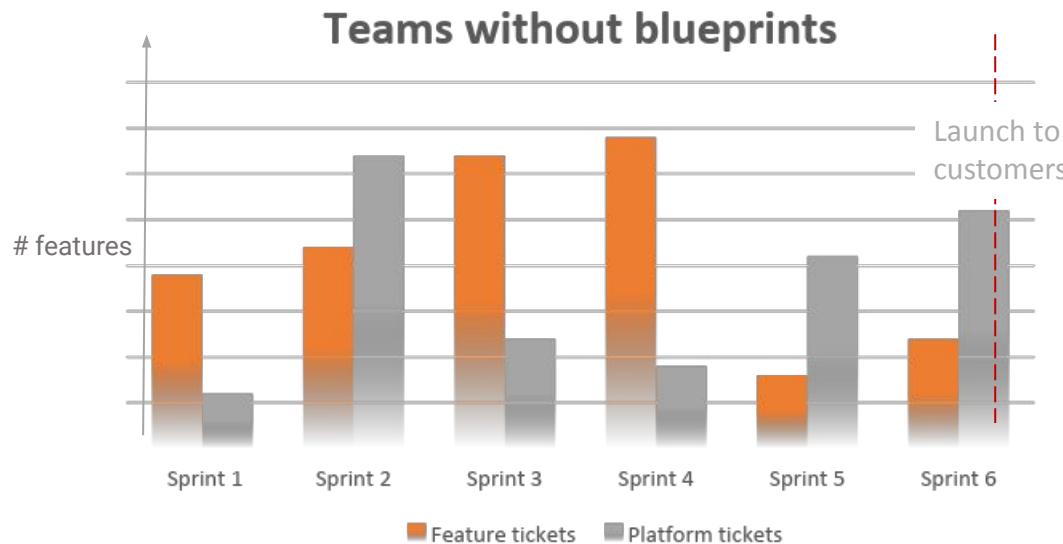
💰 Cost efficient

⌚ Efficient lead time

The Chofer Cloud Portal dashboard features a dark-themed header with the Chofer logo and tagline "Chauffeuring the next gen developer experience". Below the header is a navigation bar with links to Home, TechDocs, Blueprints, Cost Center, Blogs, Training, and FAQs. A search bar is also present. The main content area includes a call-to-action button for "Get a Head Start exploring published blueprints" and a link to "PUBLISHED BLUEPRINTS >". Another button encourages users to "Explore the Golden Images" with a link to "THESE ARE GOLDEN, INDEED >". The dashboard is divided into several sections: "Insights Horizon" with dropdown menus for Business Unit L2, L3, and Account IDs; a "Security score" card showing an A- grade and 96% completion; a "Spend rate" chart for June, July, and August with a total of \$1300; and a "Budget remaining" card showing a balance of \$1200.

# Team productivity blueprints vs. no blueprints

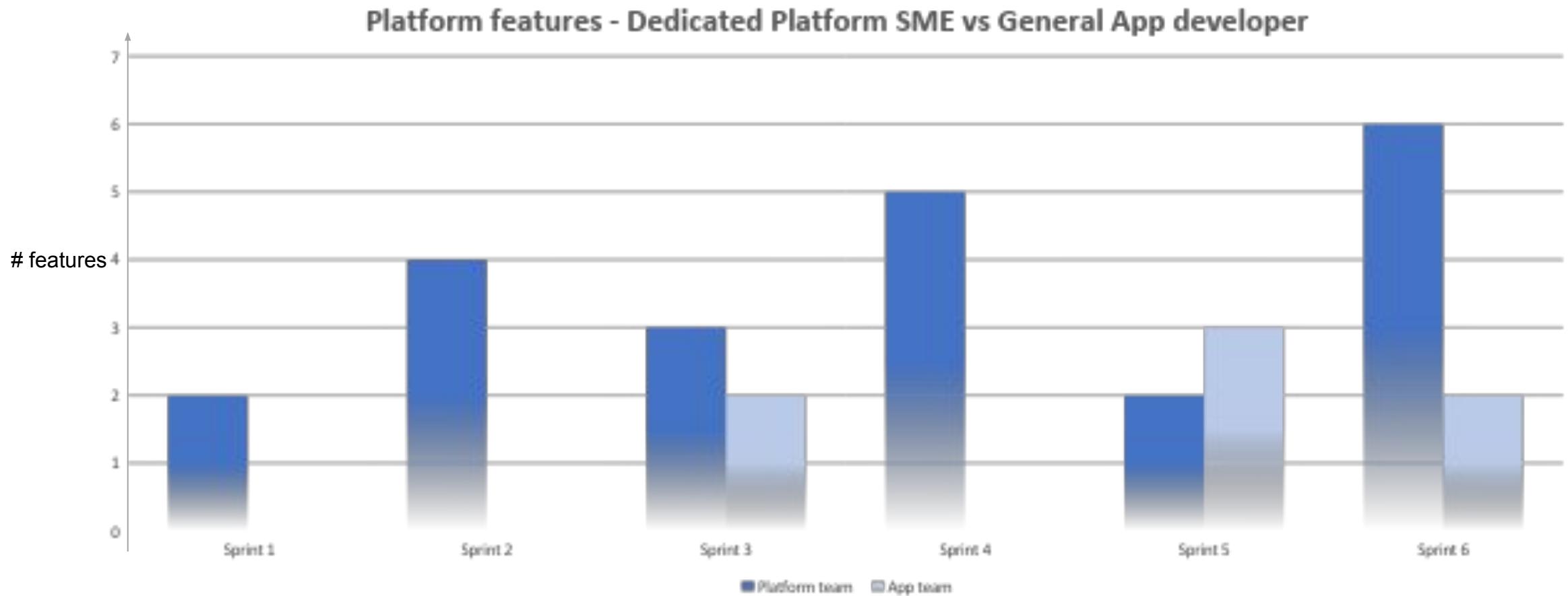
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**Conclusion:** Using well architected blueprints shortened lead time by ~8 weeks

# Velocity of platform features

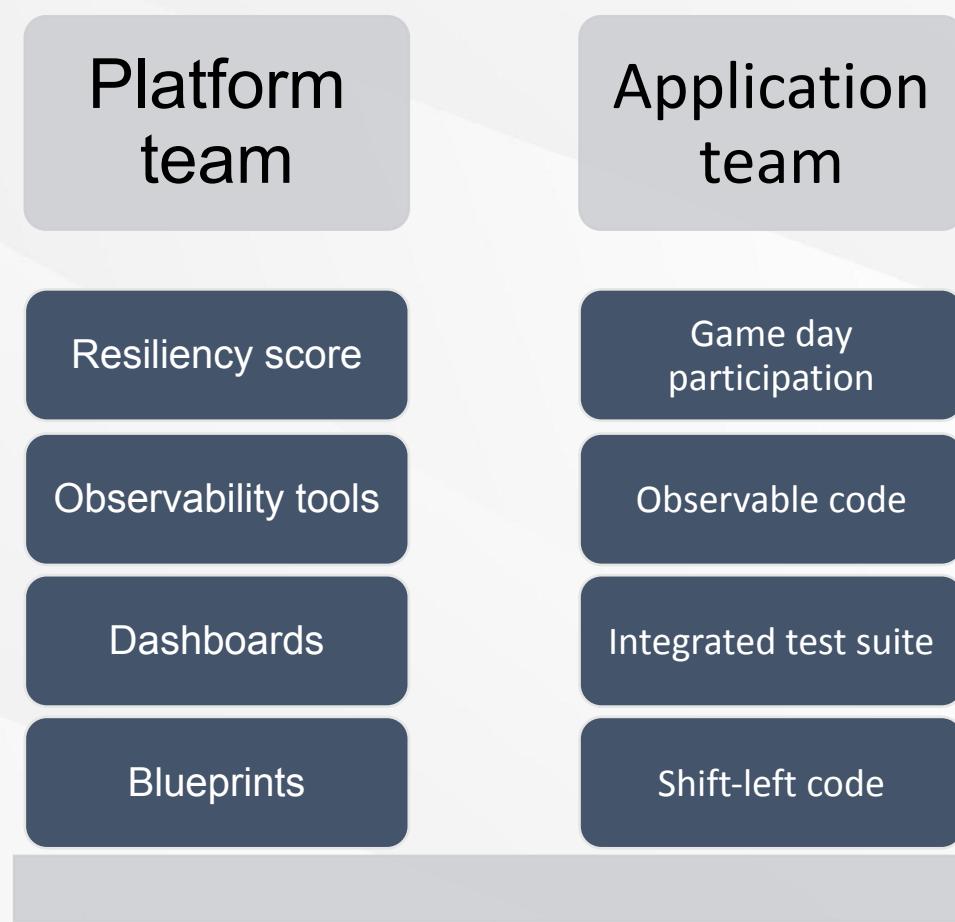
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**Conclusion:** Lead time for well-architected platform features is shorter with dedicated teams by ~6 weeks

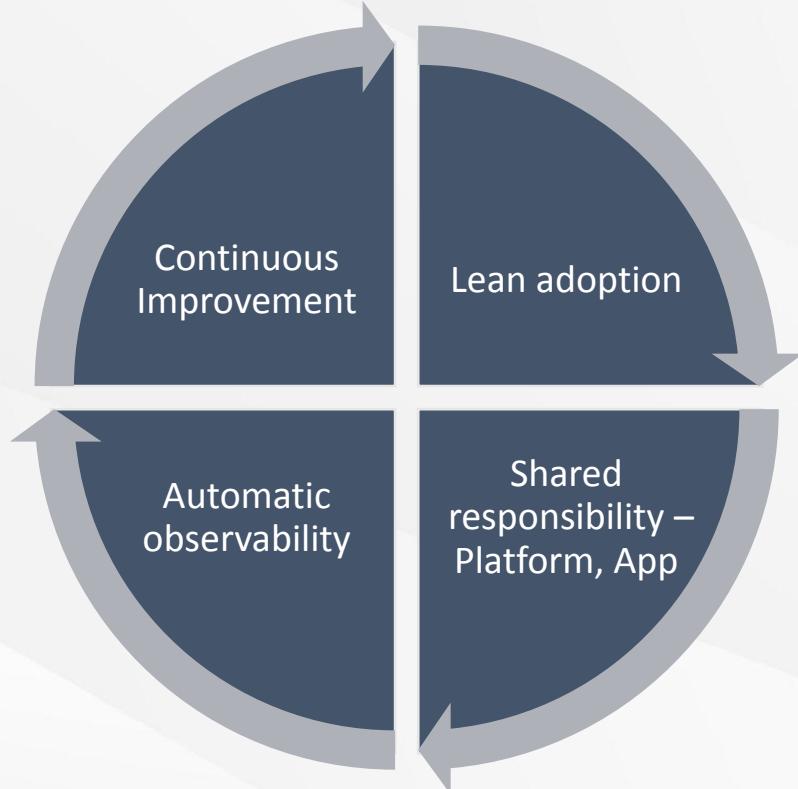
# Shared responsibility model

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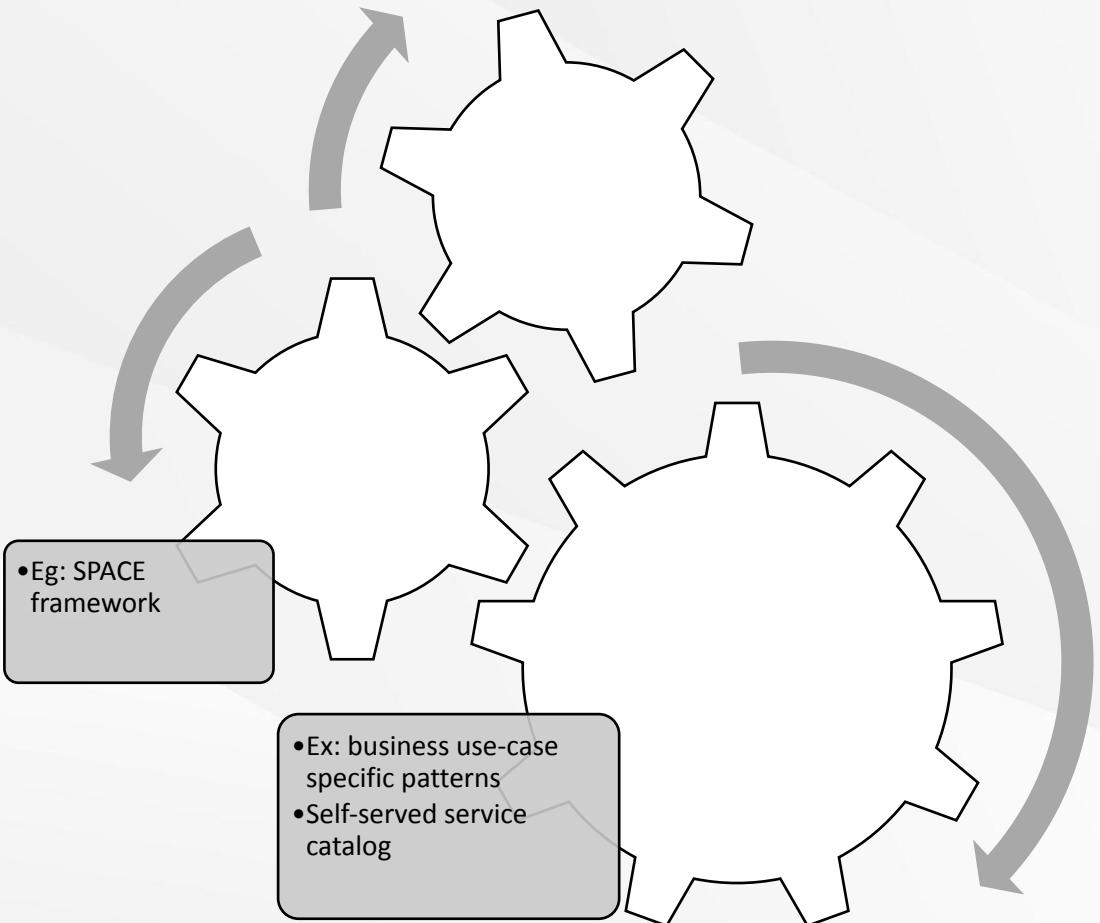
# Summary

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# Make best better ...

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# Thank you

Contact:

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We are hiring : <https://careers.toyota.com>

