



Application Modernisation and Cloud Migration Journey

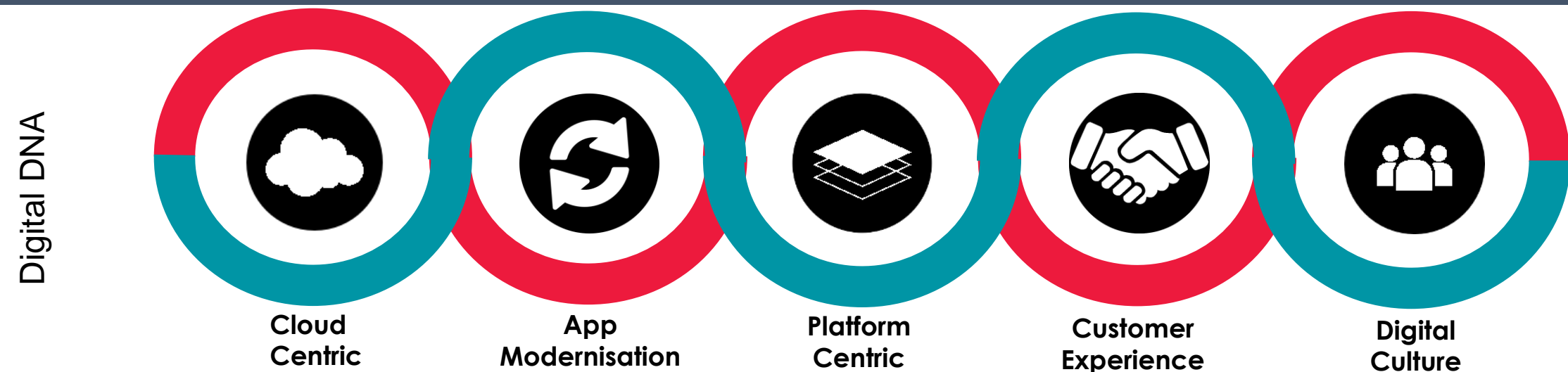
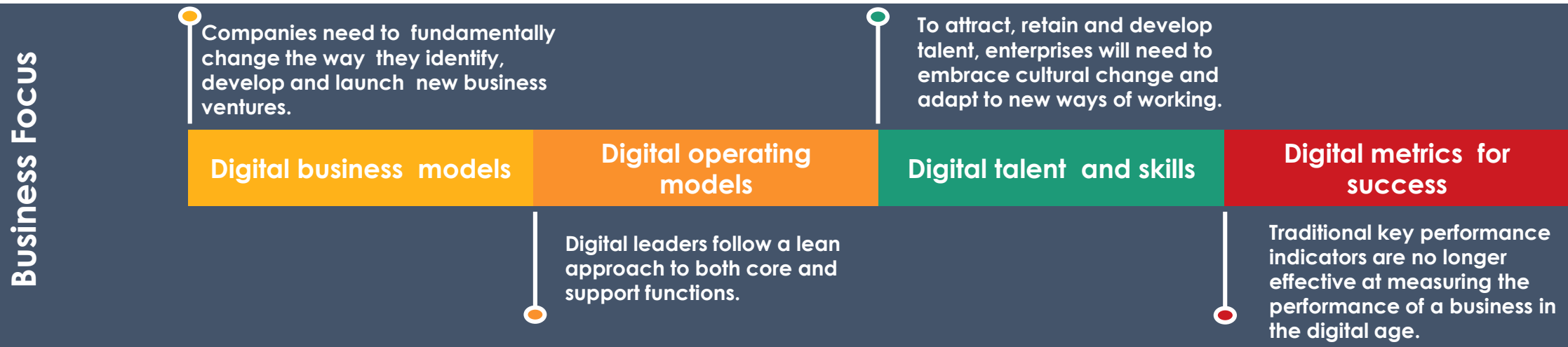
Srirengan Kumar, Director, Chief Architect Office, NCS



It all begins with
Digital
Transformation



Digital Enterprise: How to survive disruption and thrive in the digital age

- Disruption may not be bankrupting incumbents
- To succeed in the digital era, one needs to become digital enterprise
- To rethink every aspect of doing business, using technology and changing corporate culture



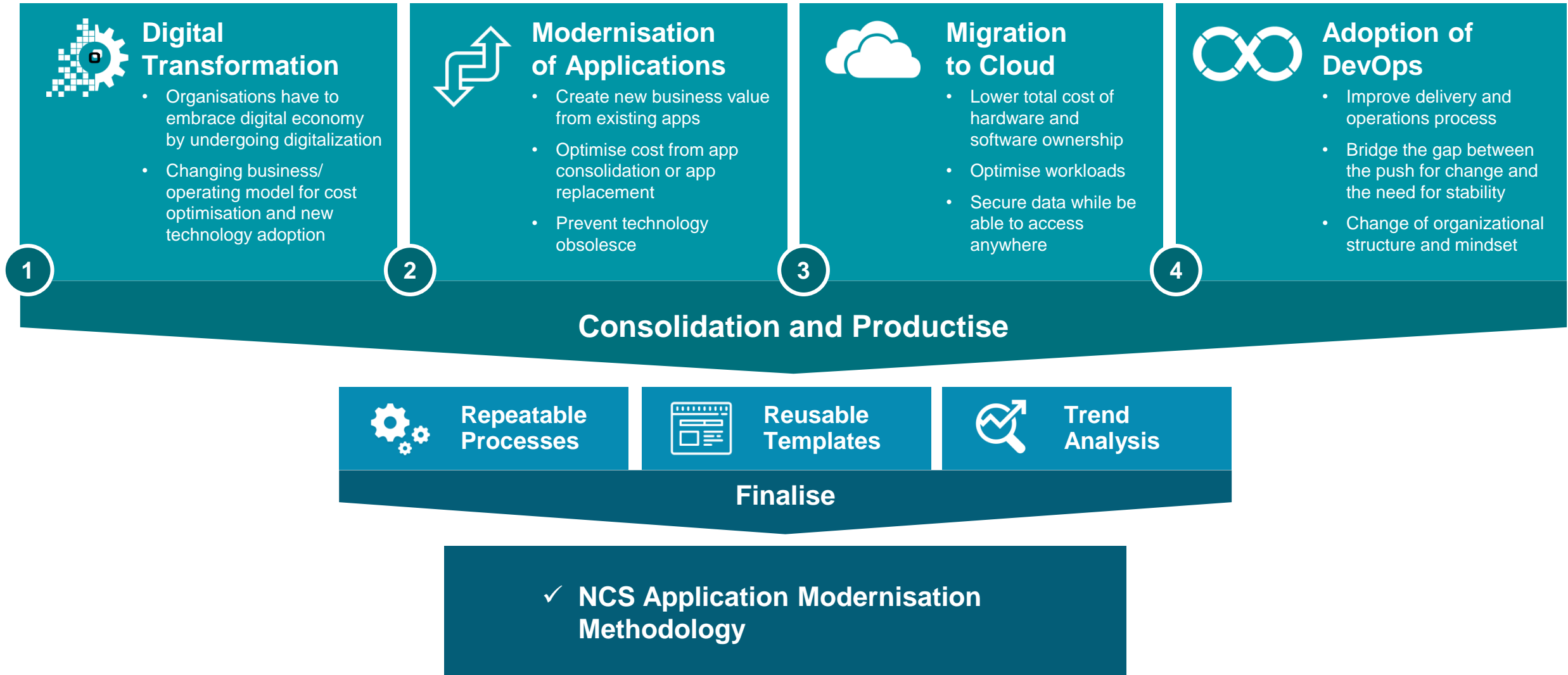
What is Application Modernisation and Cloud Migration?

Both initiatives have similarities and can be inherently related to each other

	 Application Modernisation	 Cloud Migration
Motivation	Driver : Mainly business demands from fast changing competitive landscape	Driver : Typically driven from technology standpoint to reduce reliance on on-premise hosting
	Focus : This requires the business to look at how to take the legacy application create new business value	Focus : How to optimize workload to best make use of the cloud hosting environment and services
	Outcome : Optimised application set with modern technologies and architecture that may end up in the cloud depending on the business demands	Outcome : The migrated applications to cloud may undergo some degree of modernisation to make it suitable for residing in the cloud
Activities	<ol style="list-style-type: none">1. Strategise and Plan2. Analyse3. Design4. Build5. Operate	<ol style="list-style-type: none">1. Assess and Discover2. Design3. Migrate4. Manage and Optimise





Lessons learnt from NCS experiences

The trends and lessons learnt from past projects has culminated into the following NCS developed frameworks and methodologies



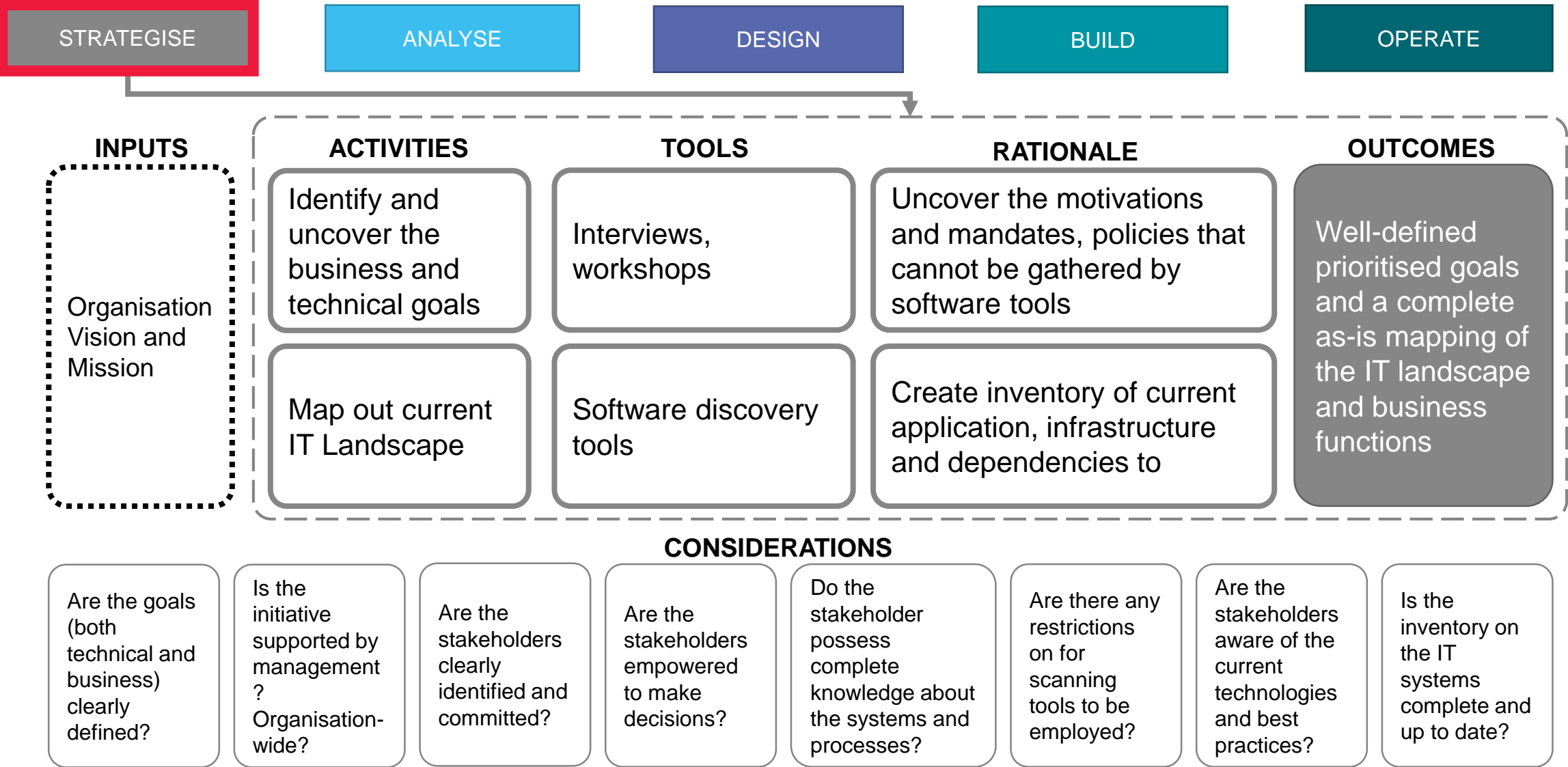
Key Steps in App Modernisation

Any organisation undertaking the app modernisation journey should consider adopting the following steps for a systemic and iterative approach to ensure a successful implementation

	STRATEGISE		ANALYSE		DESIGN		BUILD		OPERATE	
 Process	<ul style="list-style-type: none"> Discover business and technical goals Assess current IT landscape 	GOALS and IT LANDSCAPE	<ul style="list-style-type: none"> Identify broad strokes approach for apps Rationalise and prioritise apps 	MODERNISATION STRATEGY	<ul style="list-style-type: none"> Design architecture to meet business goals 	ARCHITECTURE, MODERNISATION APPROACH AND ROADMAP	<ul style="list-style-type: none"> Execute the design in iterations Codevelop to skill up and scale up 	MODERNISED APPLICATION	<ul style="list-style-type: none"> Intelligently optimize application DevOps 	MODERNISED APPLICATION
 Expertise	<ul style="list-style-type: none"> Consultant Business Analyst Architect SME(DevOps, Security, Apps, Data and Infra) 		<ul style="list-style-type: none"> Consultant Business Analyst Architect SME(DevOps, Security, Apps, Data and Infra) 		<ul style="list-style-type: none"> Consultant Business Analyst Architect SME(DevOps, Security, Apps, Data and Infra) 		<ul style="list-style-type: none"> Developers Business Analyst Architect SME(DevOps, Security, Apps, Data and Infra) 		<ul style="list-style-type: none"> Project Team DevOps Team 	
 Facilities	<ul style="list-style-type: none"> Education Labs 		<ul style="list-style-type: none"> Education Labs 		<ul style="list-style-type: none"> Education Labs Prototyping Labs 		<ul style="list-style-type: none"> Education Labs Prototyping Labs Co-development Labs 		<ul style="list-style-type: none"> Application Maintenance Facilities 	
 Tools	<ul style="list-style-type: none"> Discovery Tools Interviews Workshops 		<ul style="list-style-type: none"> Analysis Tools 		<ul style="list-style-type: none"> Design Tools Design Patterns 		<ul style="list-style-type: none"> DevOps Toolset Automated Testing 		<ul style="list-style-type: none"> DevOps Toolset Automated Testing AI Assisted AMS 	

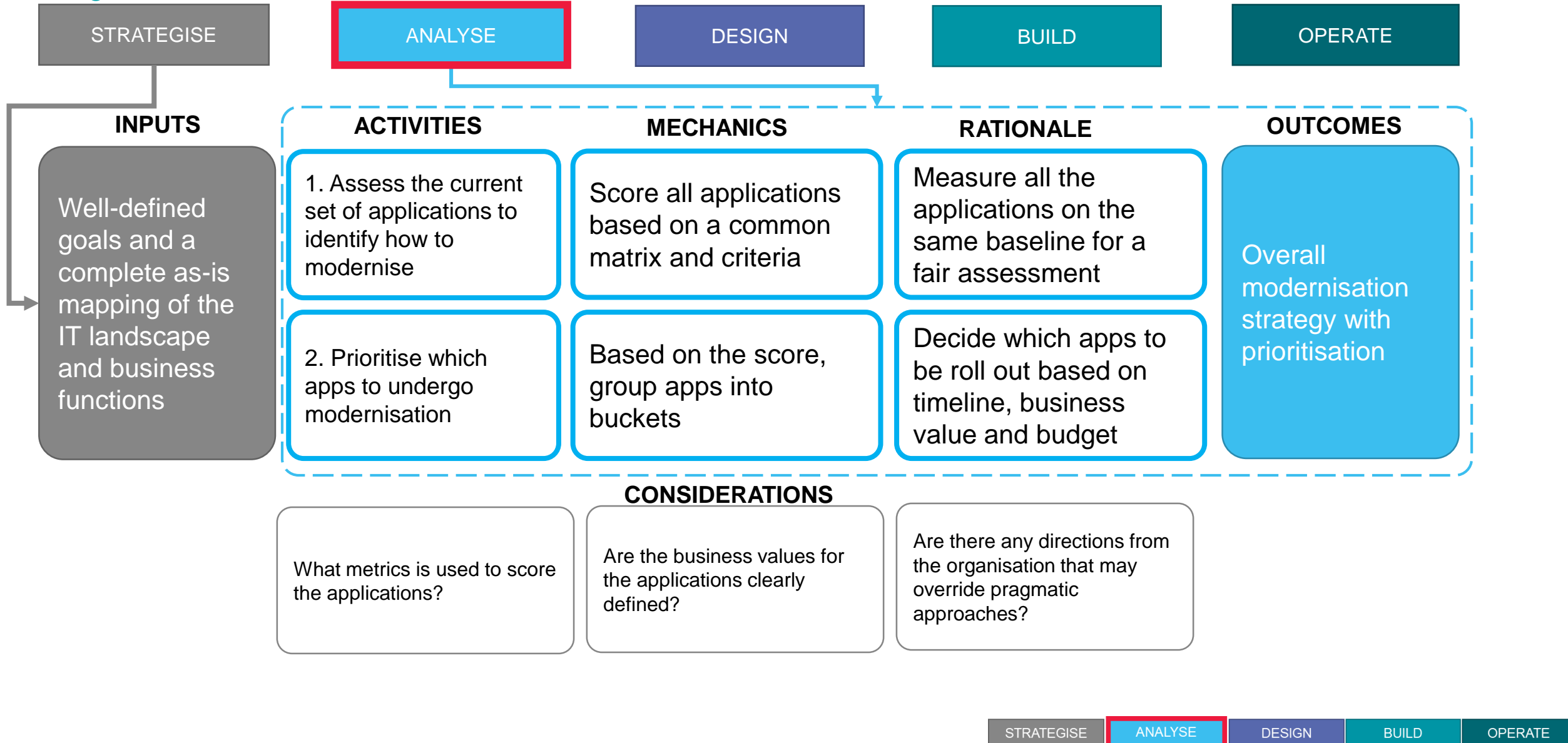
An Application Modernisation Framework - Strategise

Understanding the motivations for modernisation and current IT landscape that will help to shape the solution and approaches



An Application Modernisation Framework - Analyse

Identify which apps to be modernized first is especially important when there are factors such as time, budget and business value to be considered



Application Modernisation Framework - Analyse

Deciding what modernisation or migration strategies best suits your apps and organisation depends on factors that have been uncovered during the strategise stage

STRATEGISE

ANALYSE

DESIGN

BUILD

OPERATE

Rehost

Use Case

- VM migration, an almost one to one replication of OS, middleware etc. with very little to no code change

Considerations

- Timeline does not allow for other approaches
- Current application architecture still able to meet business demands

Replatform

Use Case

- Migration of applications while leveraging on cloud services instead of licensed middleware

Considerations

- Make use of cloud services to reduce reliance on middleware i.e. application service, data services

Refactor

Use Case

- Changing the application from monolithic to a serverless architecture i.e. containerisation with microservices

Considerations

- Application architecture does not meet business demand e.g. elastic demand, frequent functional changes

Remain

Use Case

- An application that is current enough still able to meet its functional requirements or if the application is too cost prohibitive to move

Considerations

- Current business needs are met
- Financially not viable to modernise the application
- Application too sensitive to change
- App is proprietary

Replace

Use Case:

- An application that can be replaced by more cost effective solution such as a newer bespoke application or COTS or even a SaaS application

Considerations

- App can be replaced with COTS with similar or better functionality at lower cost
- Technical skillset is scarce in maintaining the app

Retire

Use Case

- When the application usage has reached the end of its useful life and is decommissioned to free up resources

Considerations

- Current App is no longer financially viable to maintain and no business demand

STRATEGISE

ANALYSE

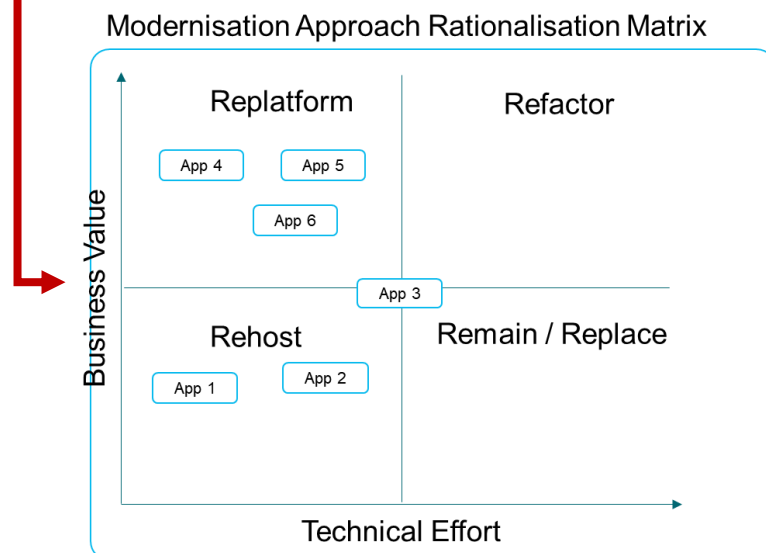
DESIGN

BUILD

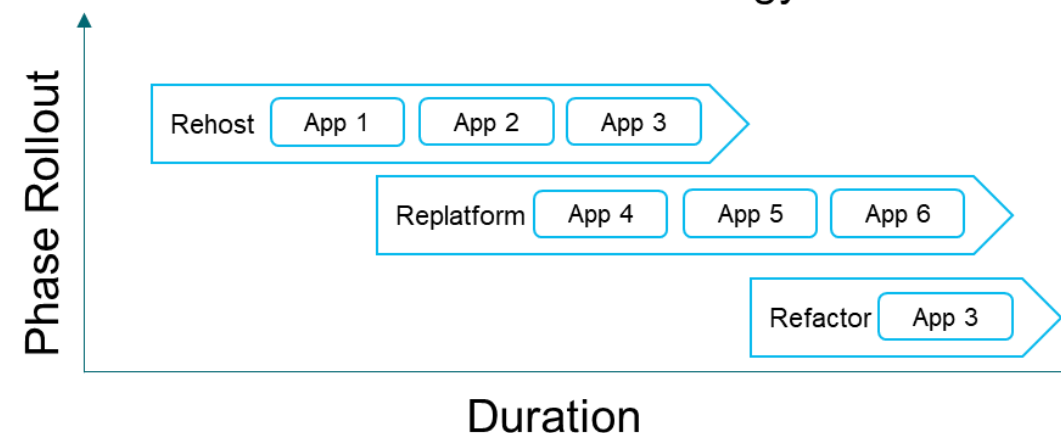
OPERATE

An Application Modernisation Framework - Analyse

Identify which apps to be modernized first is especially important when there are factors such as time, budget and business value to be considered

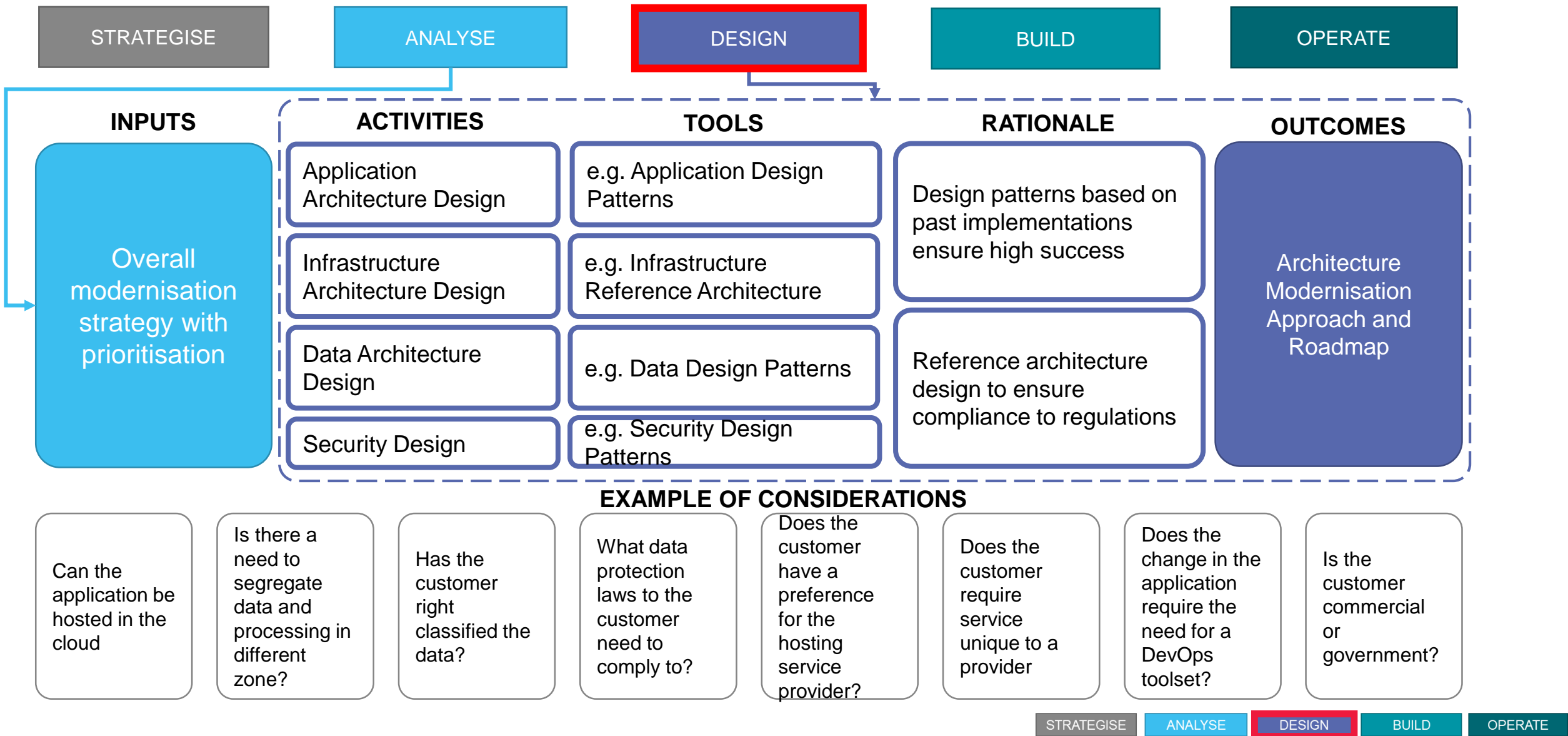


Example need to change definition – check CPF Modernisation Strategy



NCS Application Modernisation Framework - Design

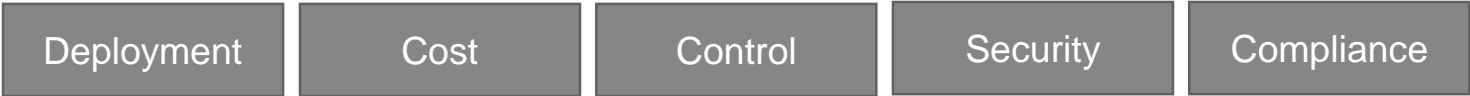
After identifying the various migration strategies, there is a need to identify the suitable design solutions to best fit the targeted applications and the targeted hosted environment



NCS Application Modernisation Framework – Design

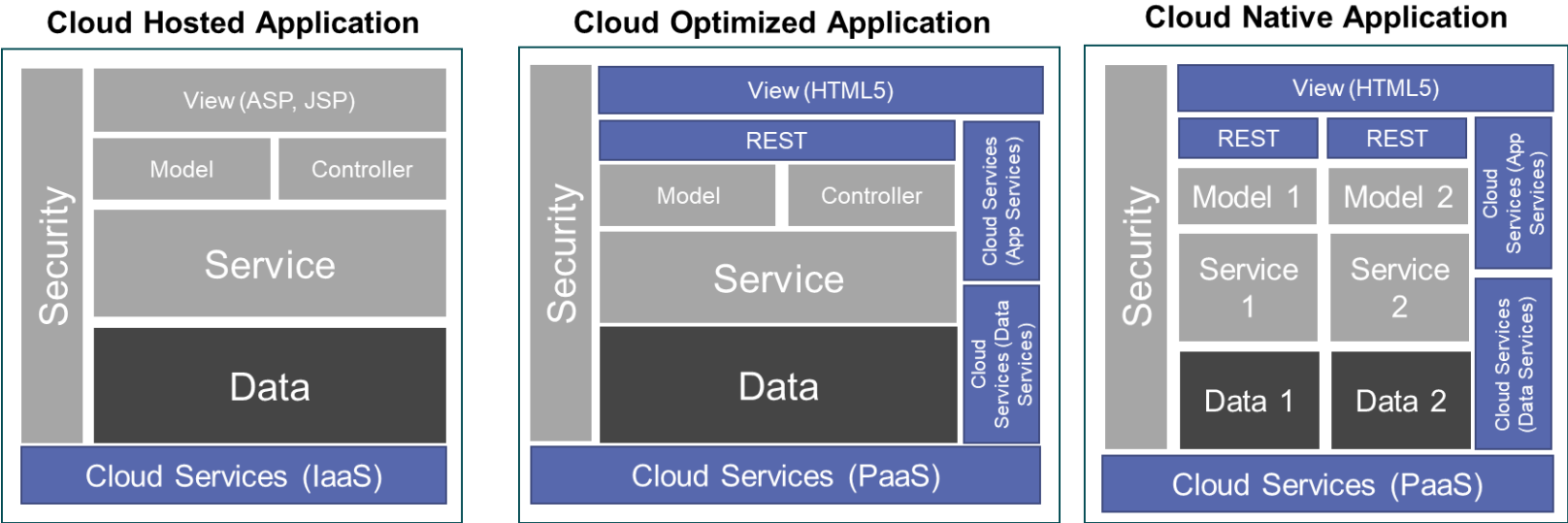
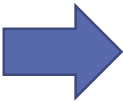
Application Architecture Design – Consideration for on-premise / cloud and application design

Factors to drive Cloud / On-Premise Decision



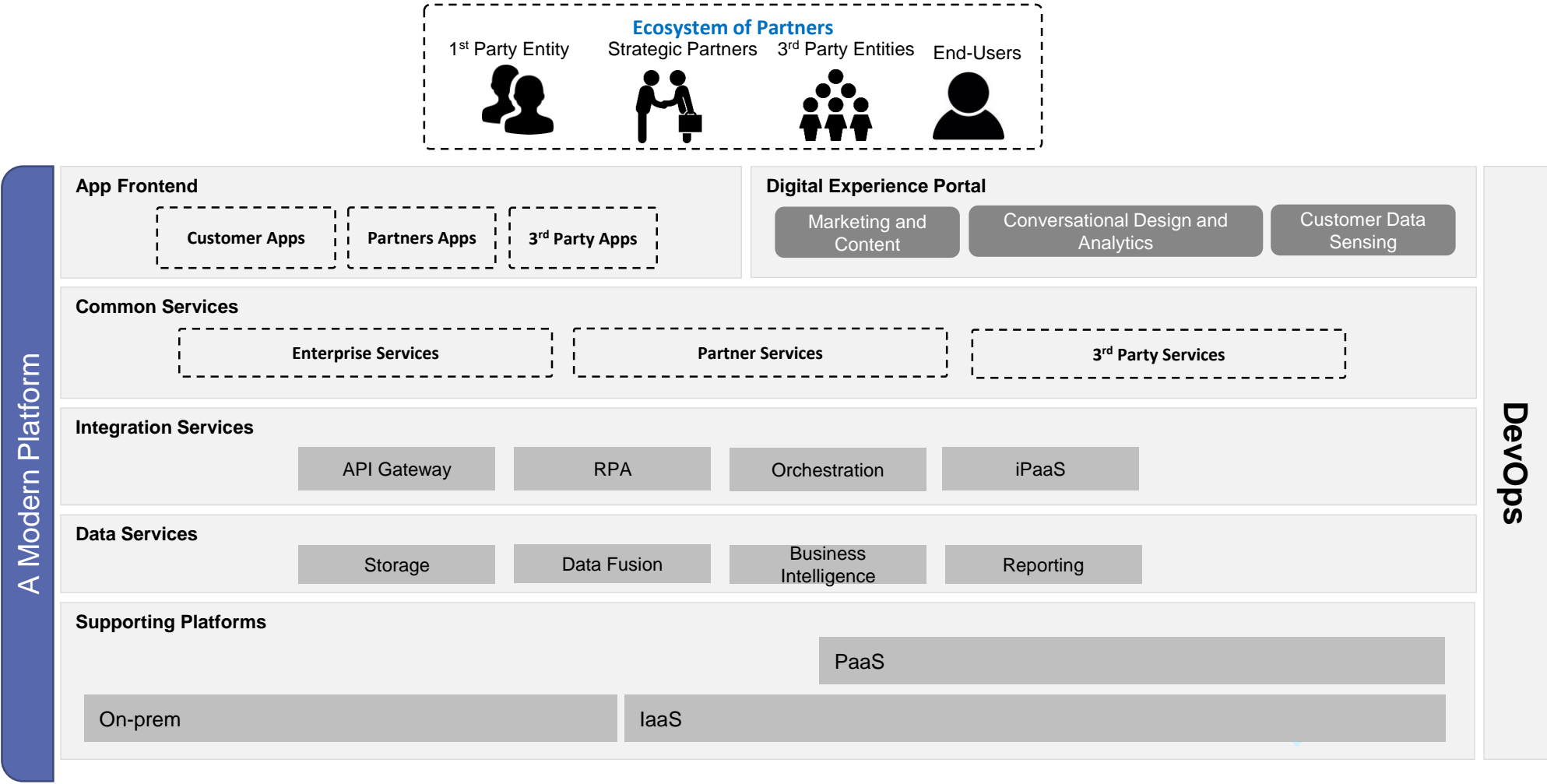
Example of Cloud Services / Capabilities

- Compute
- Database
- Storage
- Security
- Disaster Recovery
- Management Tools
- IoT
- DevOps
- Analytics
- Networking and Content Delivery Network (CDN)
- Intelligence
- Hybrid Cloud Capabilities
- Compliance and governance



NCS Application Modernisation Framework – Design

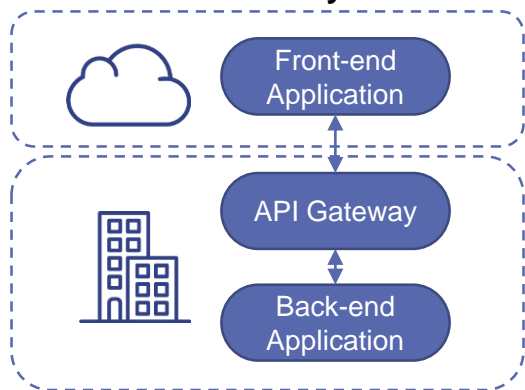
Application Architecture Design – To ensure that the application architecture can continue to support changes in the customer’s organisation, an example of a platform-centric architecture could be proposed in the design



NCS Application Modernisation Framework – Design

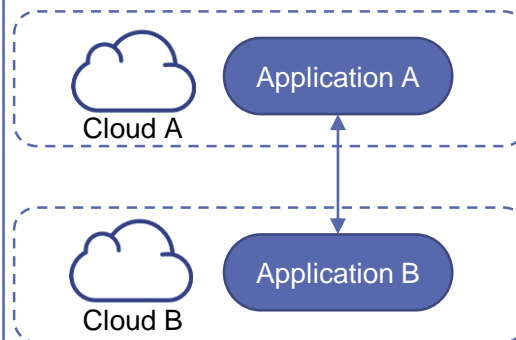
Infrastructure Architecture Design – Picking the right Multi-cloud / Hybrid Cloud Design Patterns to suit business and technical requirements

1. Tiered Hybrid



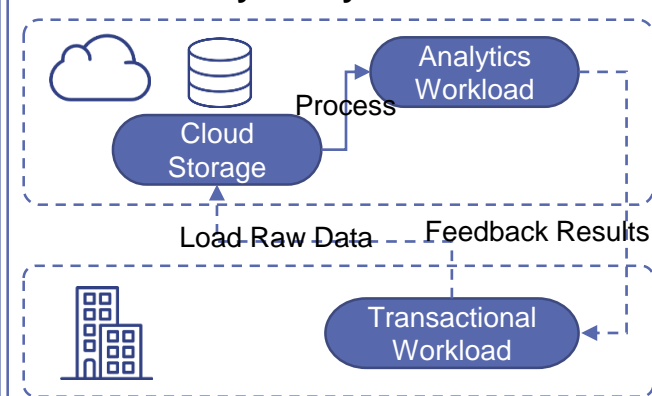
- Front end apps are exposed directly to users on the cloud,
- Backend apps are situated in on-premise for security and control

2. Partitioned Multi-cloud



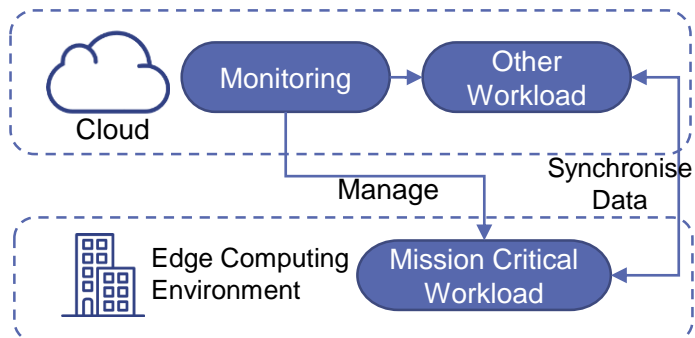
- Avoid committing to a single vendor.
- Optimised workload deployment deploying workloads
- Choose the best services that each provider has to offer

3. Analytics Hybrid / Cloud



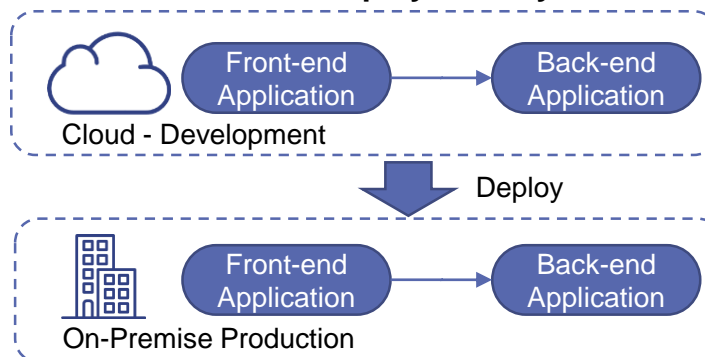
- Transaction system are run on-premise for greater security and control.
- Analytics processing will run on cloud on ad-hoc basis and shut down when not needed

4. Edge Hybrid



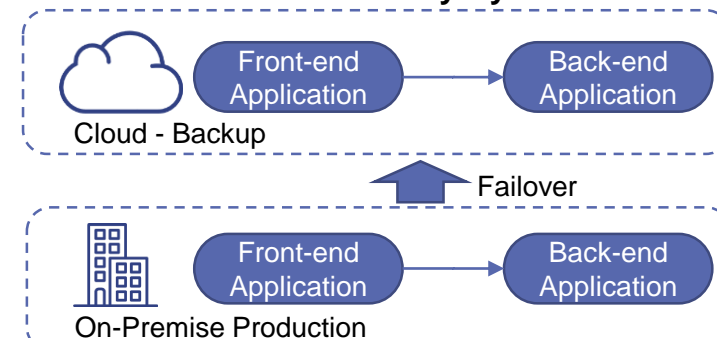
For running time sensitive or mission critical applications and yet internet connectivity is not reliable. Other workloads (non-critical) are run on the cloud and sync asynchronously

5. Redundant Deployment Hybrid



Regulatory constraints might require that you keep data in a specific country. An application might require access to hardware devices that are available only locally

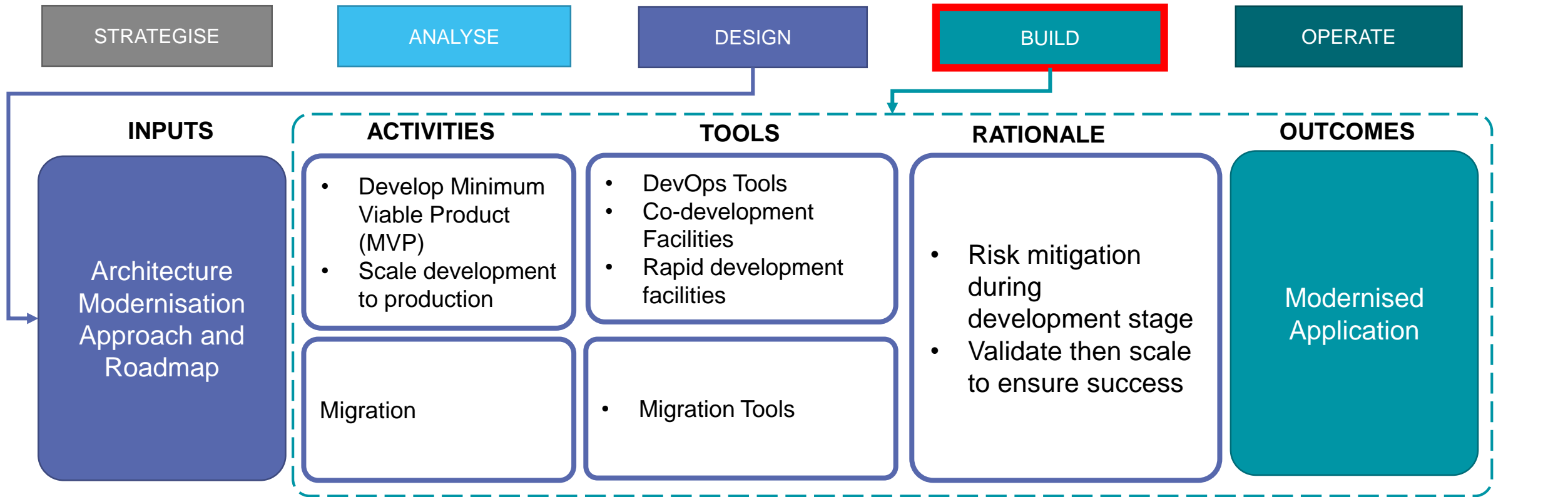
6. Business Continuity Hybrid / Cloud



Disaster recovery to multiple geographical locations, minimize downtime and reduce DR site cost

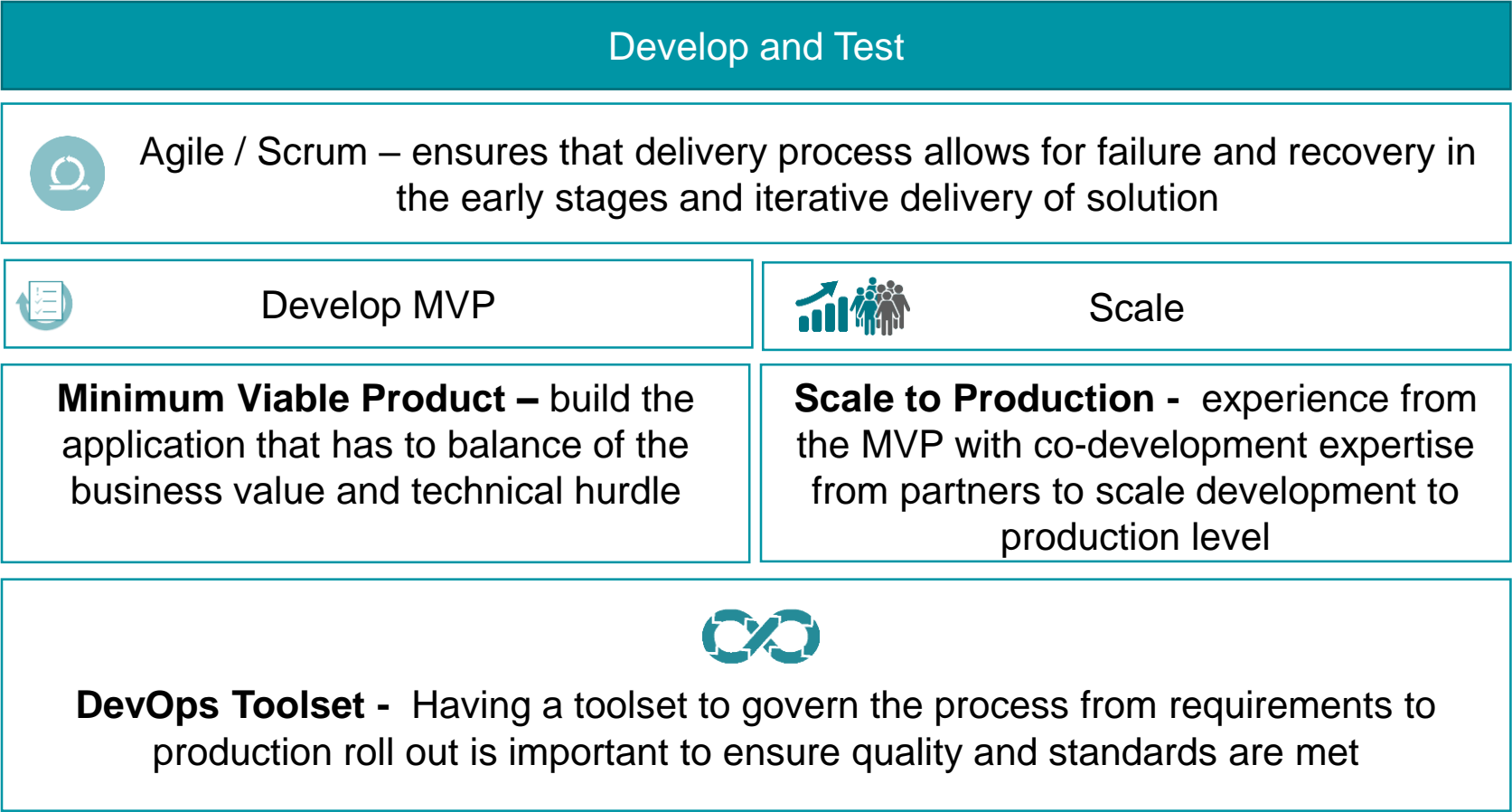
NCS Application Modernisation Framework - Build

Understanding the motivations for modernisation and current IT landscape that will help to shape the solution and approaches



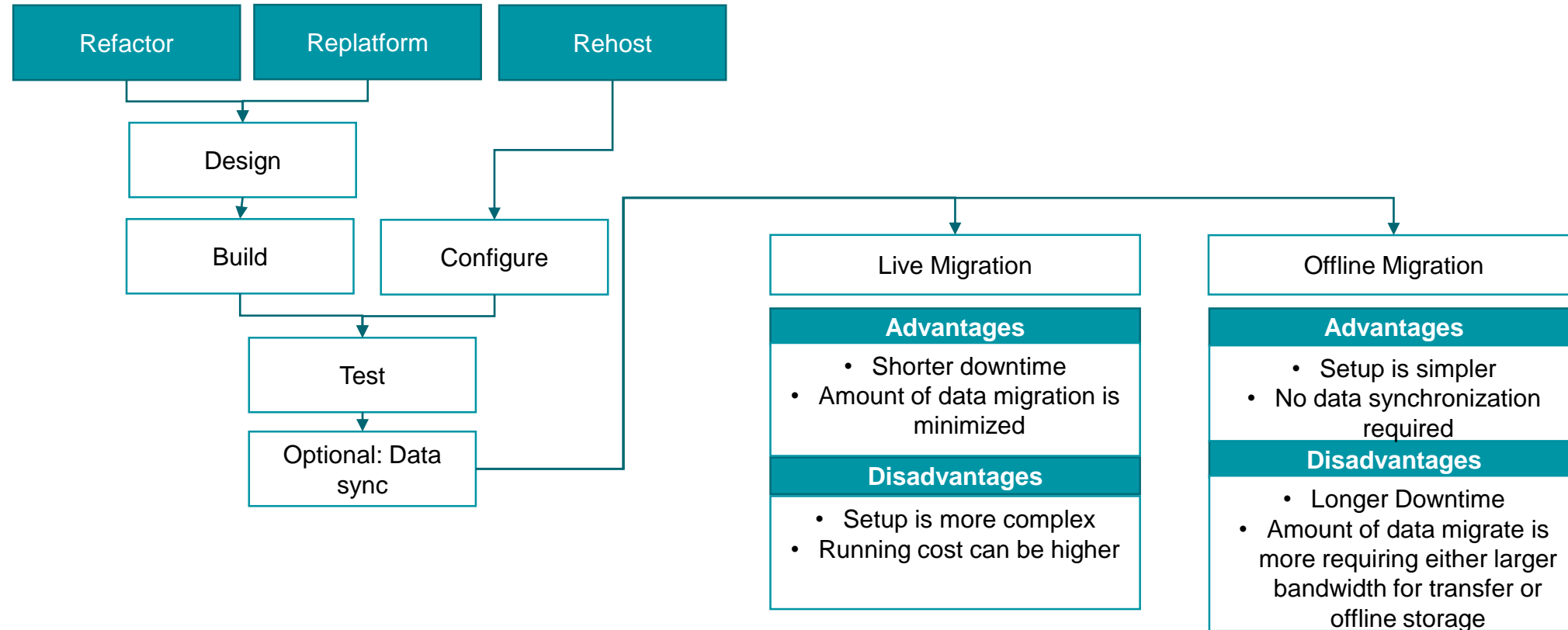
NCS Application Modernisation Framework - Build

Develop and Test – it is important to start small when facing a large modernisation effort, like picking a most viable product to use it as a benchmark for the modernisation effort, then test to validate before bring it to production scale.



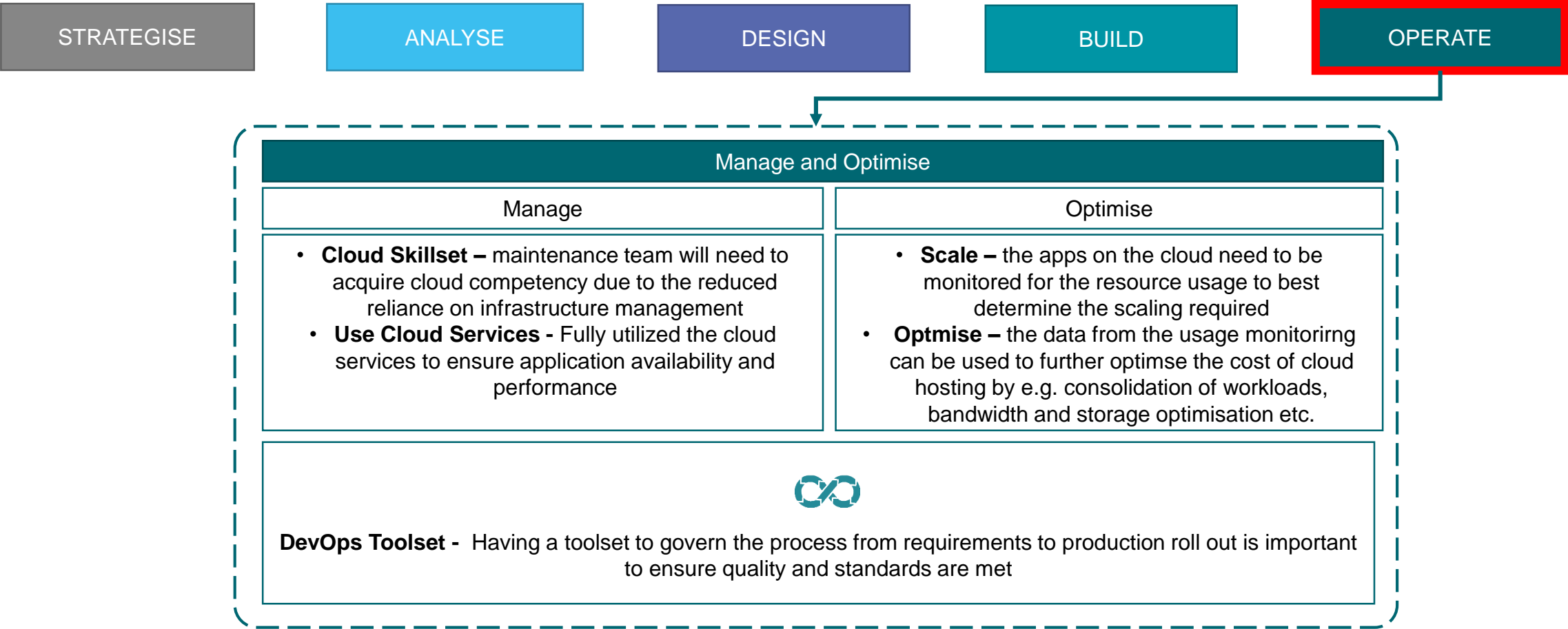
NCS Application Modernisation Framework - Build

Migration – when the application is finally ready to move the migration to the cloud will depend on factors like downtime, capacity of data to be migrated, data synchronization requirements etc.



NCS Application Modernisation Framework - Operate

Understanding the motivations for modernisation and current IT landscape that will help to shape the solution and approaches

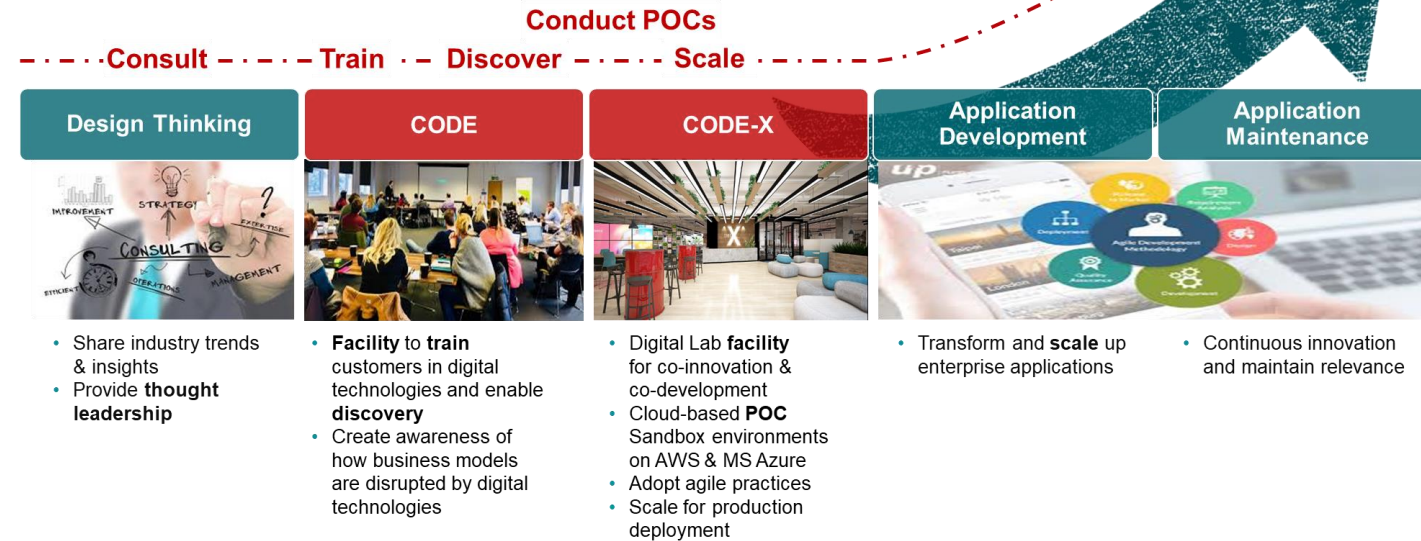
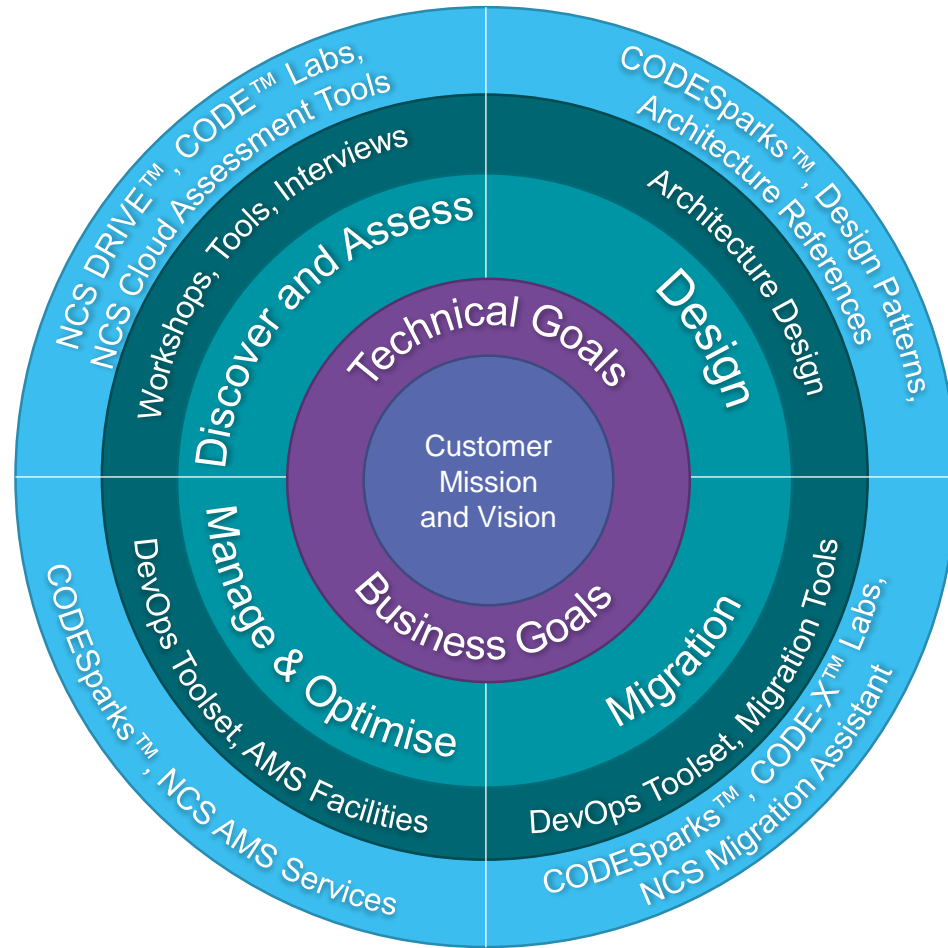




NCS Application Modernisation Service Portfolio

NCS Application Modernisation Service Portfolio

To drive your organization's transformation initiatives, NCS will embark on a Digital Journey with you leveraging NCS's end-to-end digital services



Visit our booth to find out more