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# The Solution Architect As Product Manager

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# The Solution Architect As Product Manager

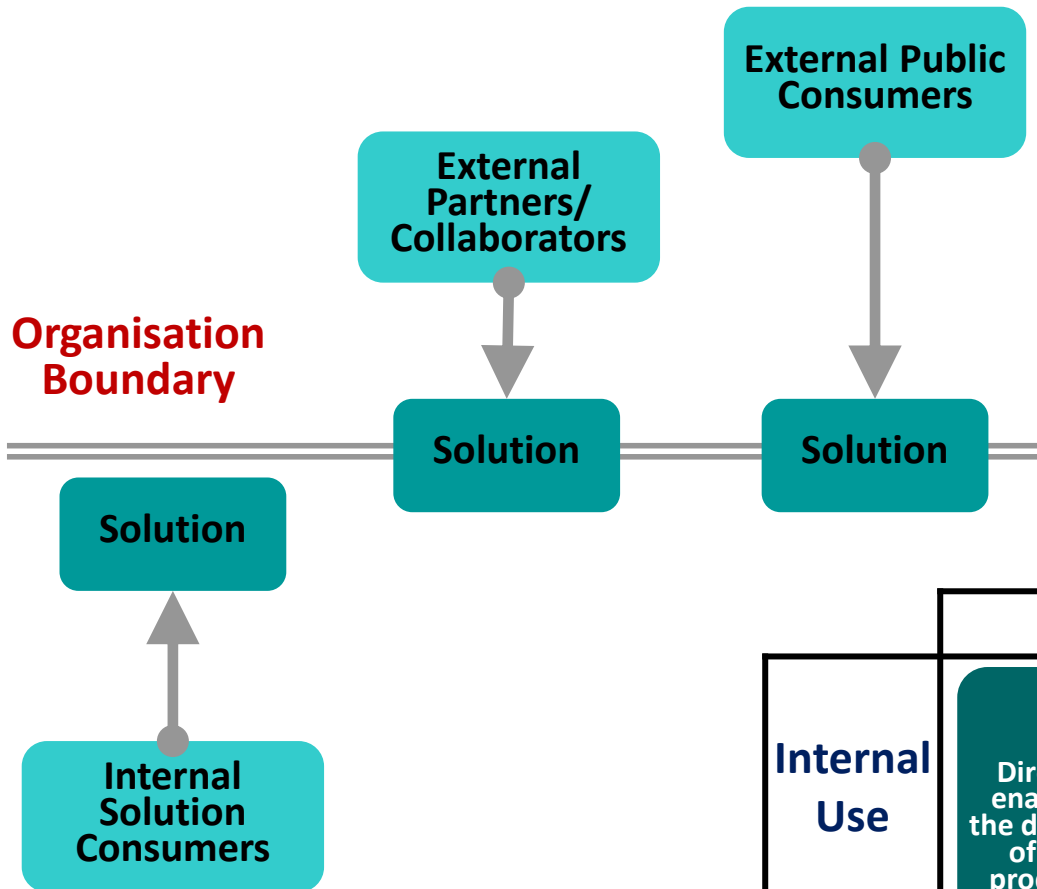
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# Topics

- Classes Of Solutions And Target Solution Consumers
- Product Design Approaches And Methodologies
  - Product Design Approaches And Methodologies
  - New Product Development (NPD) Stage Gate
  - Agile Stage Gate
  - eTOM (enhanced Telecom Operations Map)
  - Pragmatic Framework
- Outputs From The Solution Design Process
- Application Of Product Development Processes To Solution Architecture
- Core, Extended And Supporting Product/Solution/Service Management And Development Capabilities And Practices

# Classes Of Solutions And Target Solution Consumers



- Internal solutions can be part of or support the operation and use of external products and services, either directly or indirectly

	Direct	Indirect
Internal Use	Directly enabling the delivery of the product/ service	Indirectly enabling the delivery of the product/ service
External Use	Is the product/ service	Part of the product/ service support/ usage ecosystem

# Classes Of Solutions And Target Solution Consumers

- The process by which organisations develop externally facing commercial products, services and solution is different to that used to design and implement internal solutions

# Internal Solution Architecture And External Product Management

- The internal organisation market is clearly different from the external – internal solution consumers do not have the same explicit choice as external consumers
  - Internal solution consumers exist to perform specific roles
  - They do not have an explicit choice about the solution they use – but they can resist their introduction in many ways
  - Technology solutions exist to assist these specific roles and are more prescriptive
  - A sales function is (apparently) not explicitly needed to promote the product/service/solution
- However, there is no reason why the internal solution selection and design process should not attempt to mirror that used successfully externally
  - Treat internal solution consumers as customers
  - Sell products/services/solutions to them to increase their rate of use
  - Measure the success of a solution based on modified metrics such as market penetration/share – level of use/level of satisfaction
  - Use product development and management concepts and approaches to assist with the solution design and select process

# Internal/External Product/Solution/Service Differences

## • **External Products/ Solutions/Services**

- Commercial objective to be a means to make money and generate a positive return on investment
- Speculative endeavour designed to meet market need at a delivery costs and product price that generates a return
- May need to be differentiated from alternatives and competitors
- Need to be located at the intersection of what is perceived to be needed or useful, what works, what customers will buy and where customers will view company as a credible provider – Product Market Fit (PMF)

## • **Internal Products/ Solutions/Services**

- Objectives are to support the operation of the organisation by reducing cost, improving efficiency, increasing automation or meet new obligations
- Typical alternatives are to perform the work manually or continue to use existing

# New External Product/Solution/Service Development

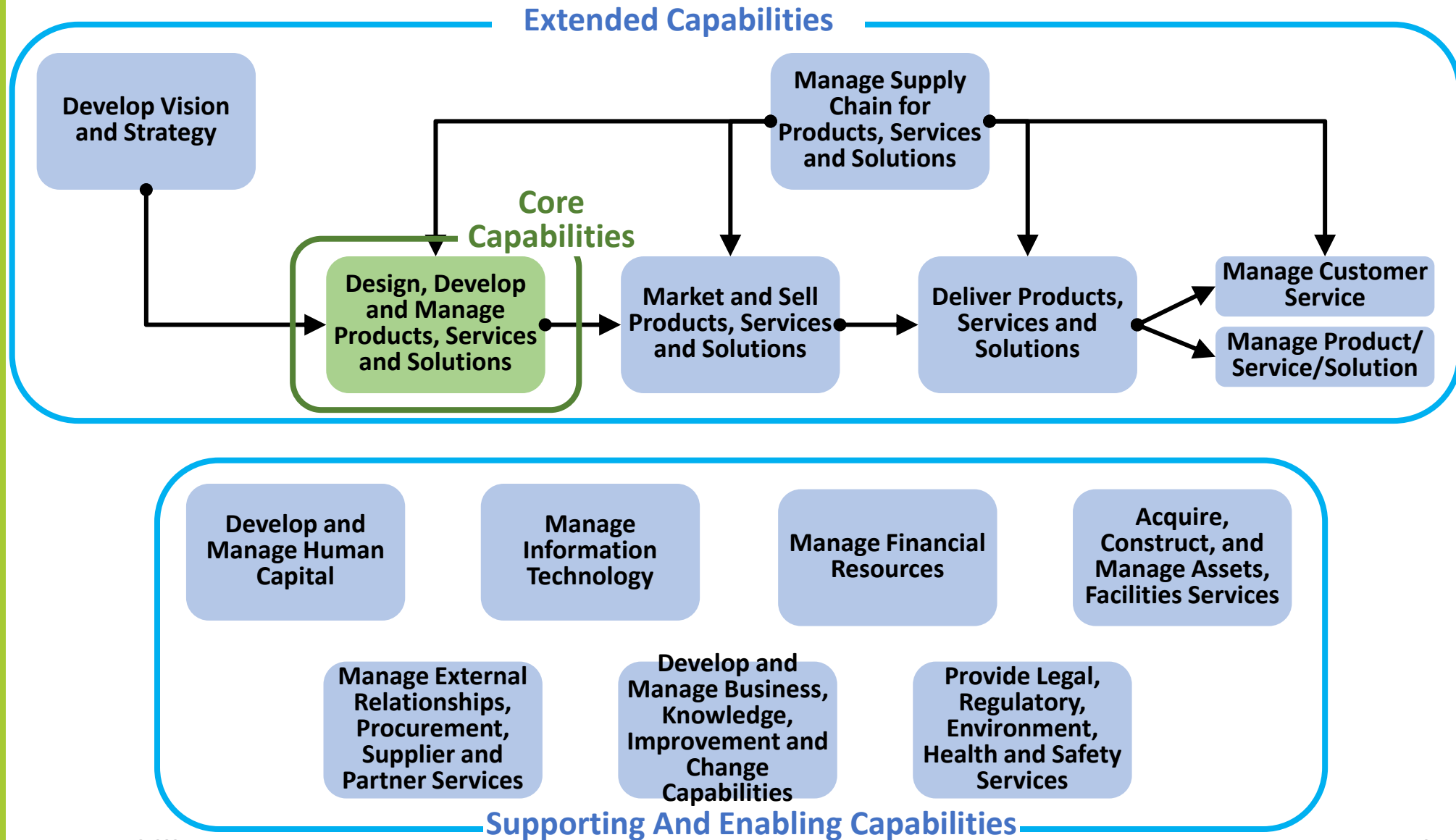
- New external product/solution/service development generally starts with partial and imperfect knowledge of:
  - The consumer and market needs
  - What is needed to fulfil the need in a way that generates a positive return
  - The technologies required to create and support the delivery and operation the product/solution/service
- Internal product/solution/service development starts with less uncertainty:
  - The need is more well-known
  - The range of technology options is more narrow



# Public Service External Products/Solutions/Services

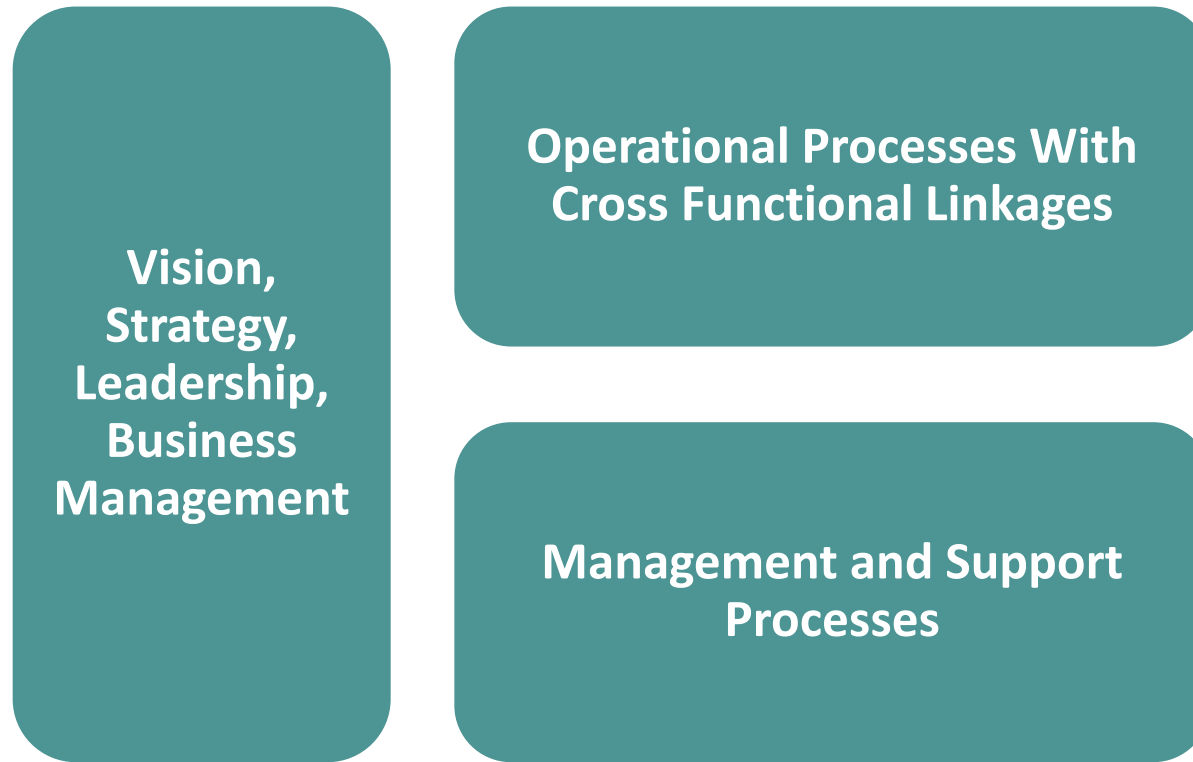
- Public service entities comprise a special case of external Product/Solution/Service development
- Public service entities are typically monopoly providers of services
- Services to be provided are typically mandated
- Products/solutions are developed to be the means by which those mandated services are delivered

# Core, Extended And Supporting Product/Solution/Service Management And Development Capability Groups

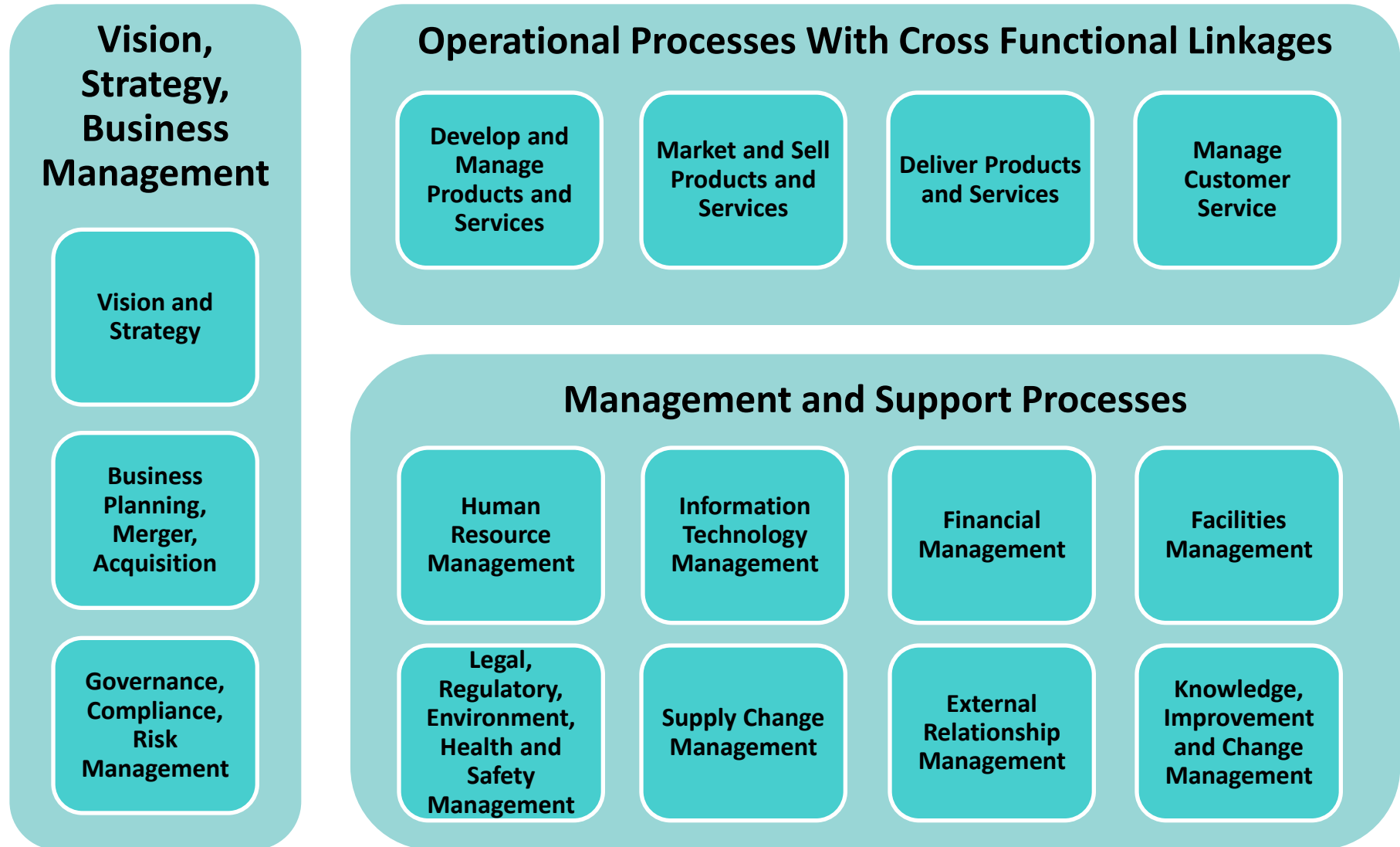


# Enterprise Business Process Model – Common Structure

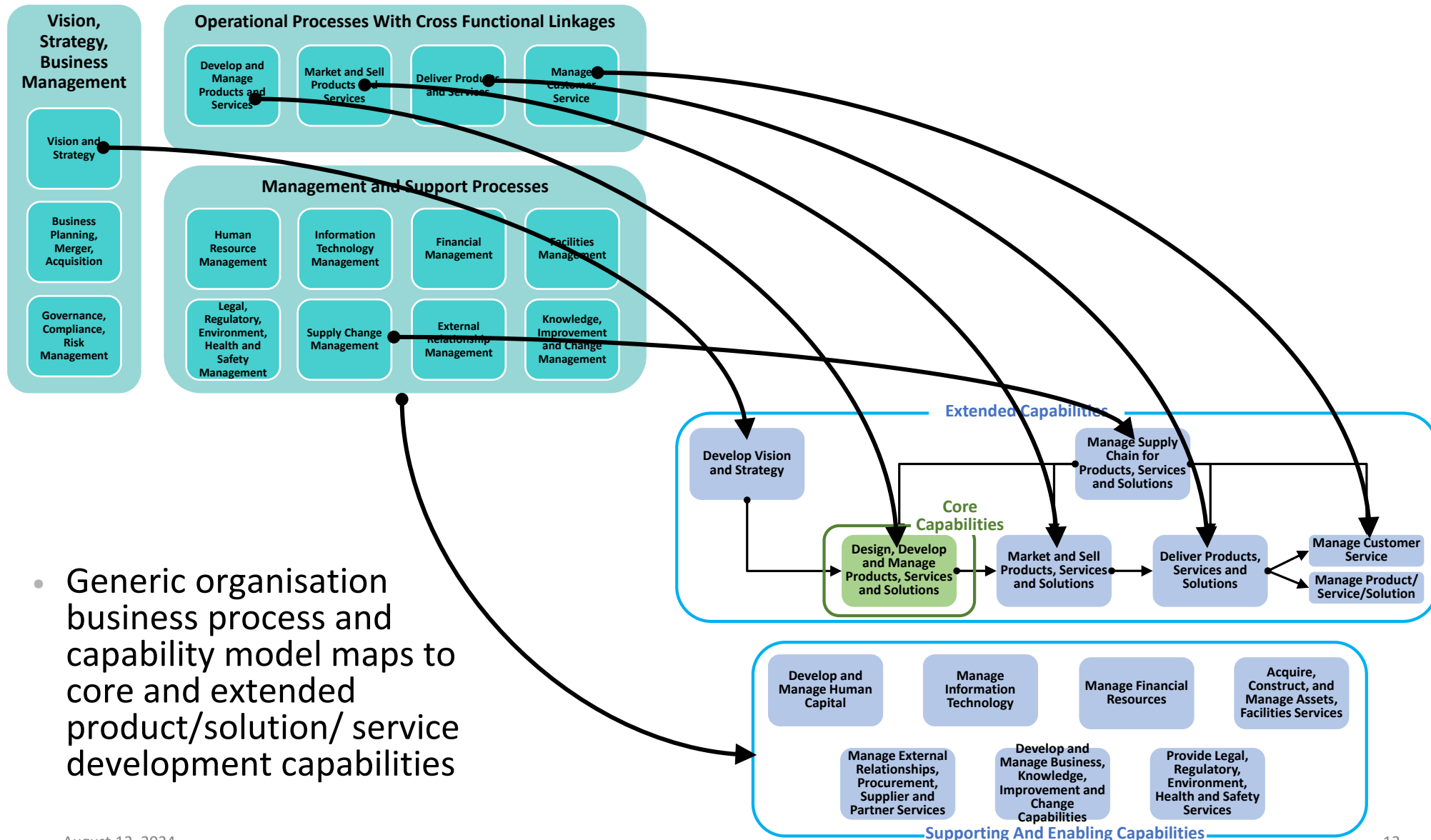
- Generally business process models have a core three pillar structure



# Sample Enterprise Business Process Models – Common Structure



# Business Process Models And Core, Extended And Supporting Product Management



- Generic organisation business process and capability model maps to core and extended product/solution/ service development capabilities

# External Products/Services/Solutions

- External products/services/solutions generally consist of a collection of core and extended elements
- External products/services/solutions can be once-off or continuous, physical or intangible
- At a minimum, the support of the ordering and delivery of the external products/services/solutions and the management of their ongoing support will be provided by technology solutions
- At a maximum, the external products/services/solutions will consist entirely or almost entirely of technology solutions
- The design/development/creation of external products/services/solutions typically follows a (rigorous) product development process
- The design of supporting technology solutions typically follows a less rigorous process

# External Products/Services/Solutions

**External Product/Service Consumers**

**External Solution Design/Delivery Activities**

**Design, Develop  
and Manage  
Products,  
Services and  
Solutions**

**Market and  
Sell Products,  
Services and  
Solutions**

**Deliver  
Products,  
Services and  
Solutions**

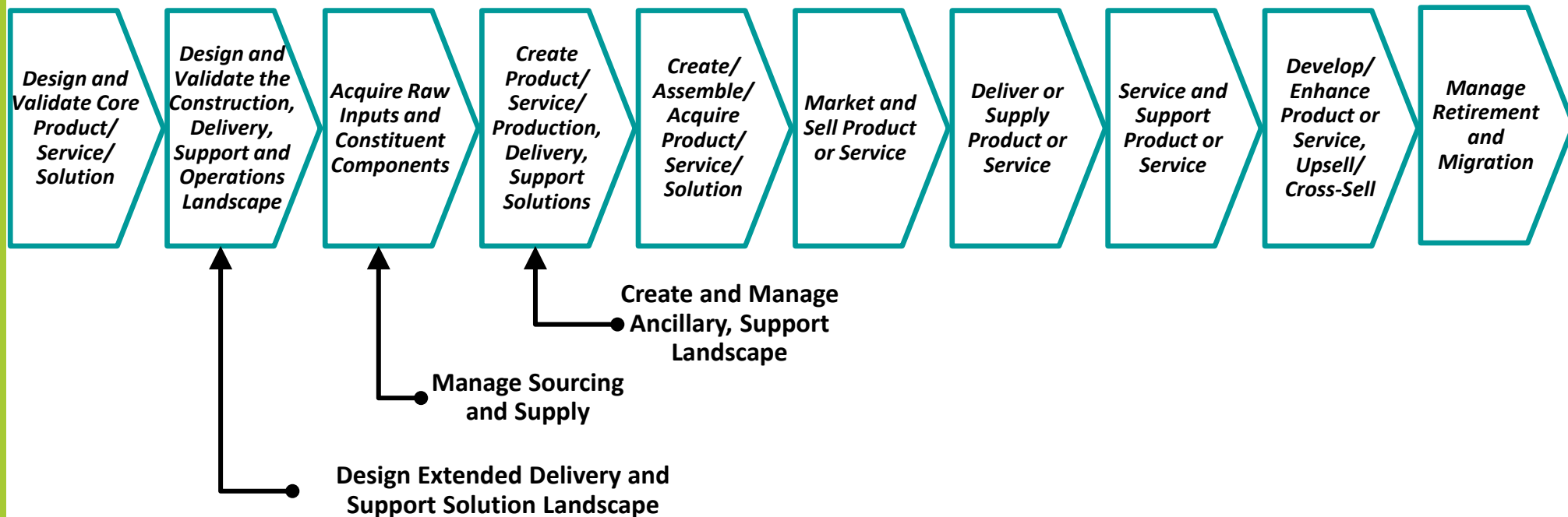
**Manage  
Customer Service**

**Manage  
Product/Solution/Service  
Lifecycle**

**Internal Solution Design**

# External Products/Services/Solutions

- Customers acquire/use externally offered products/services/solutions
- The development of products/services/solutions is not just concerned with the core offering: the design process encompasses a value chain of activities

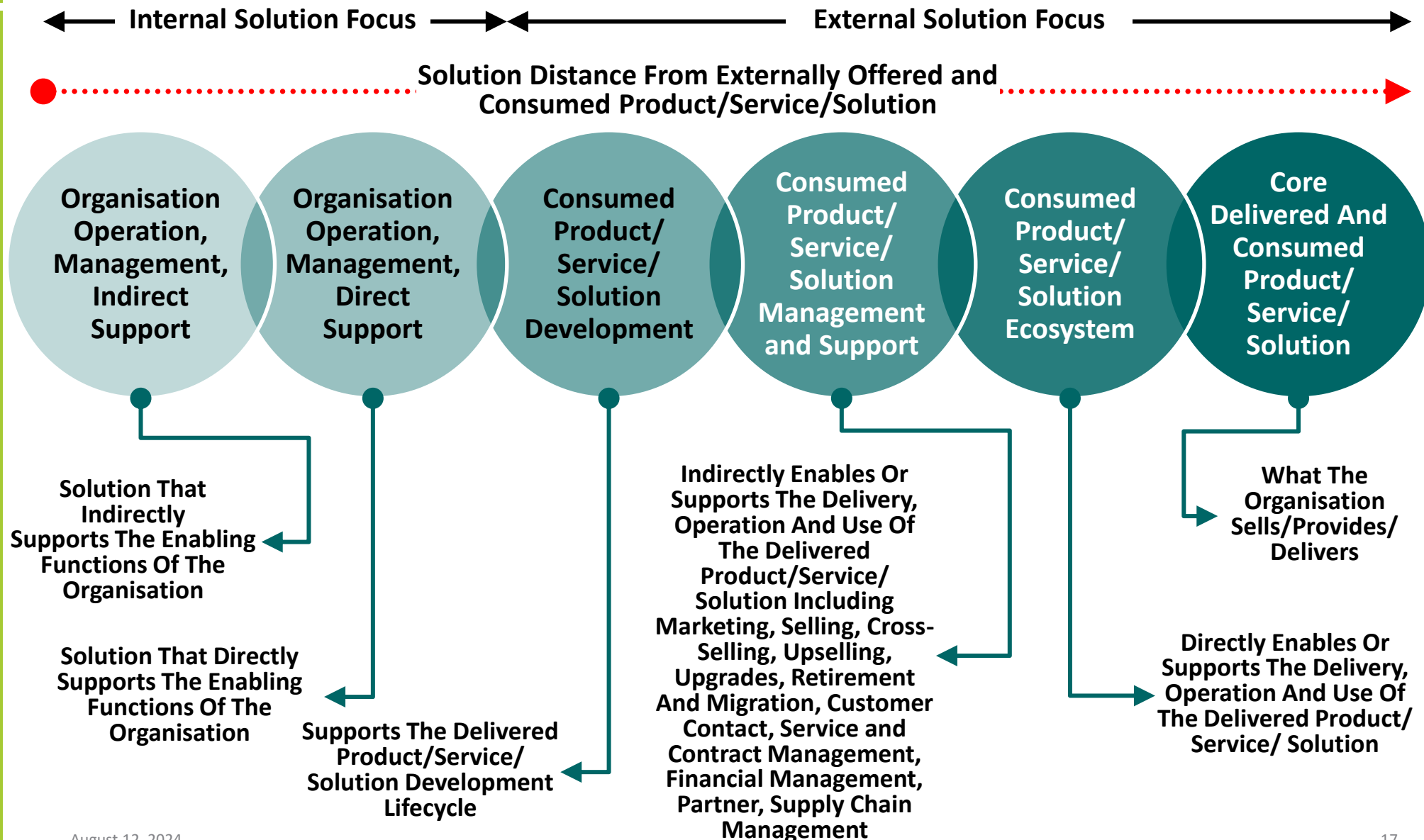




# Value Chain

- The value chain is the series of primary activities and their associated business processes that act on the raw inputs and work towards creating and providing the finished product or service to the target customer
- Value added is the cost at which the product or service is sold/delivered/operated or provided less the input costs

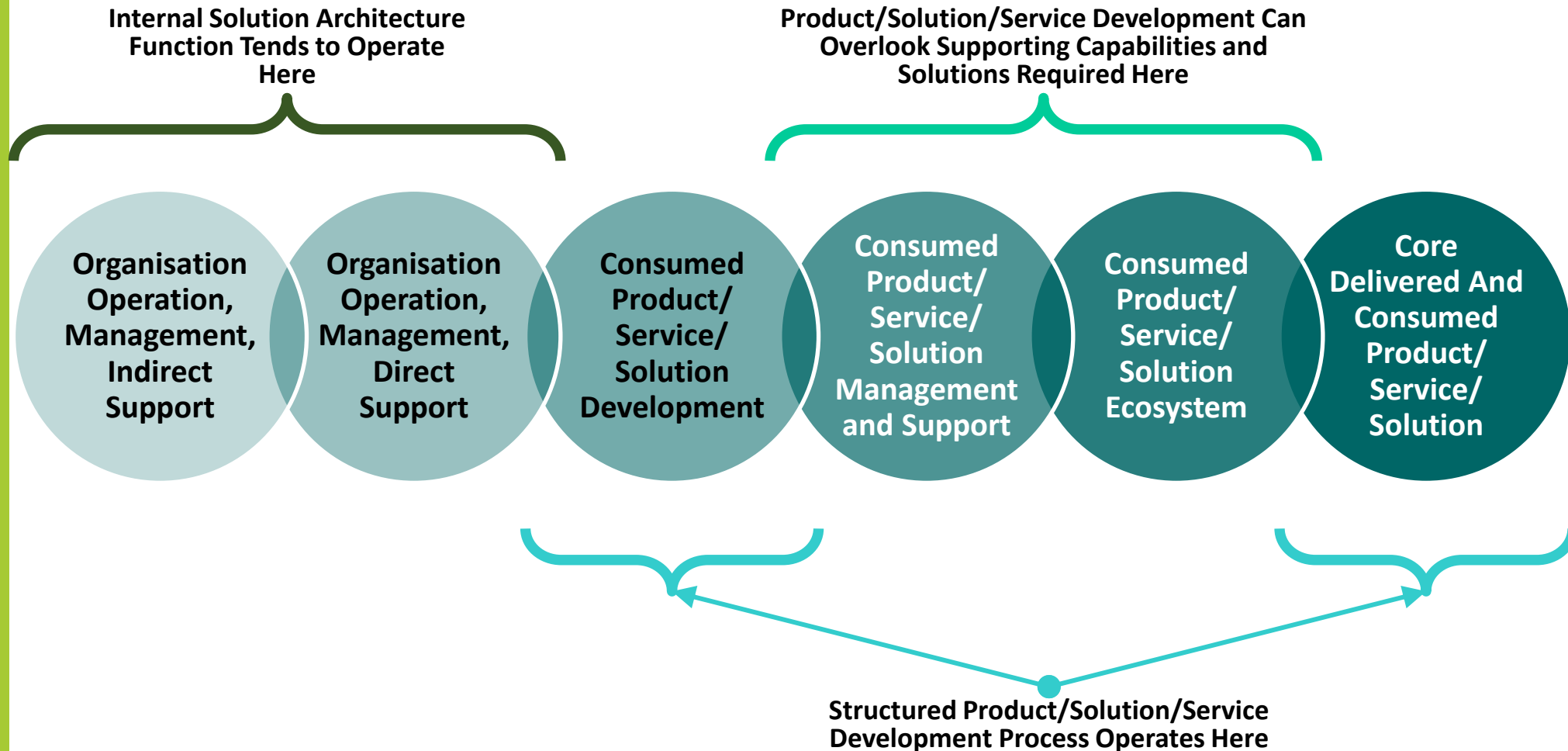
# Spectrum Of Solutions



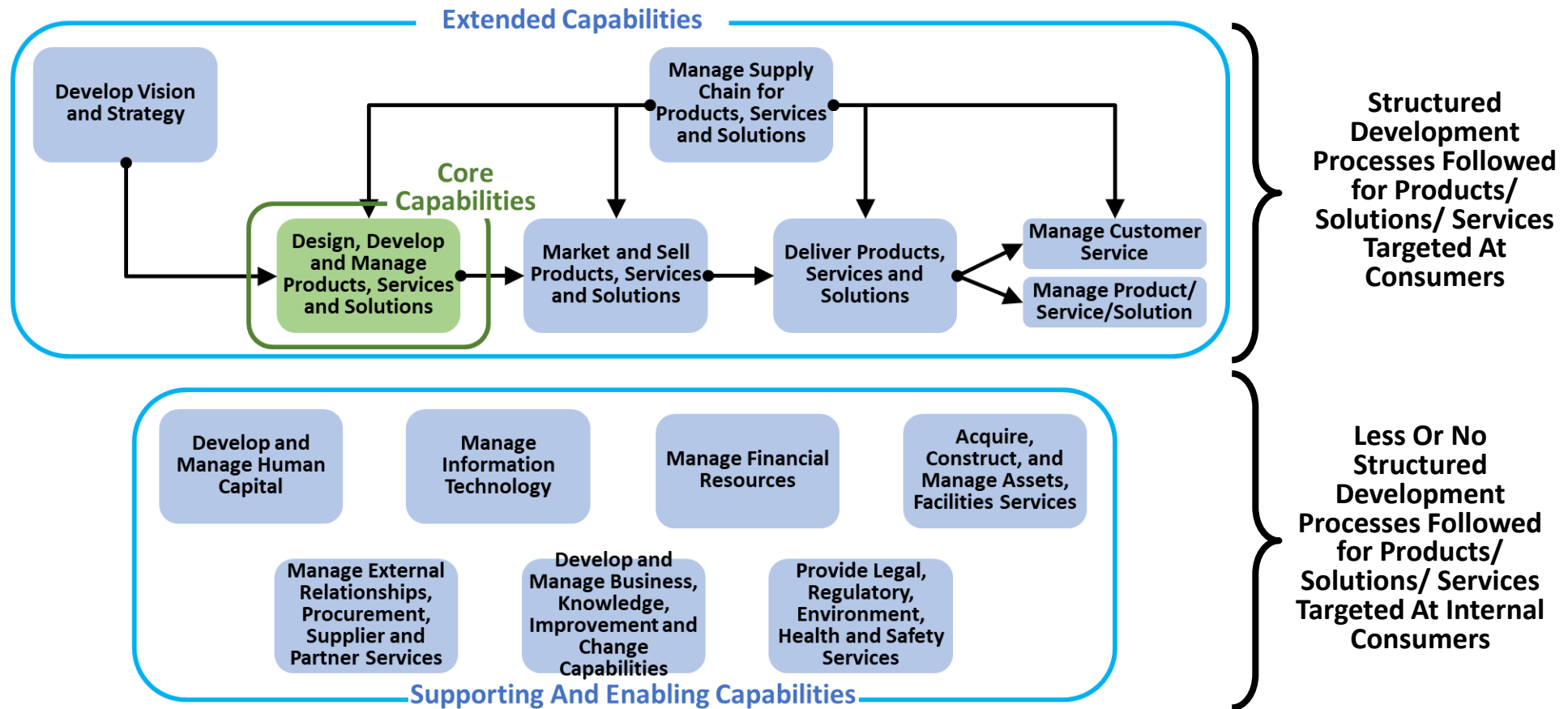
# Spectrum Of Solutions

- Solutions can be placed on a spectrum from one end where the external solutions are those the organisation directly sells/provides to solutions that are part of the external solution ecosystem to the other end where the solutions are used internally to directly or indirectly enable the support functions to operate

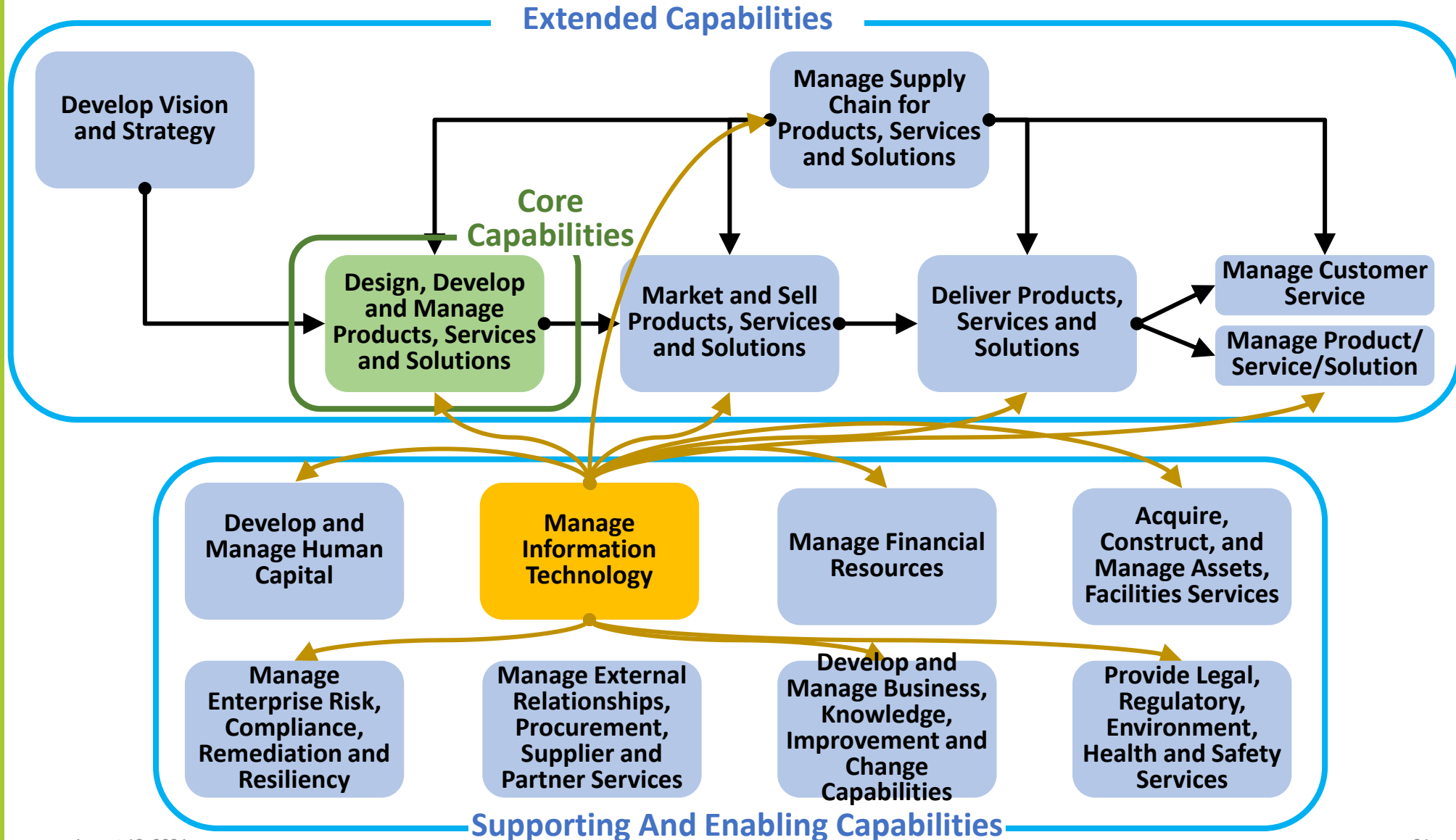
# Spectrum Of Solutions



# Different Approaches To Production, Service and Solution Design And Delivery



# (IT Function) Solution Deployment



# (IT Function) Solution Deployment

- The IT function acquires, designs, configures, customises technology solutions for use across the organisation, aim at both internal and external consumers
- Not all technology solutions the organisation deploys and uses are overseen by the IT function
- An increasing number of technology solutions bypass the IT function solution delivery process and are selected and deployed in an uncontrolled way

# Adopting External Product/Solution/Service Processes For Internal Use

- External product/solution/service tends to follow a rigorous process
- Internal solution design and development tends to use a much less rigorous and well-defined process



# Product Design Approaches And Methodologies

# NPD (New Product Development) Process

- NPD process play a core role in the product/solution/service development process
- Being good at NPD means being good at:
  1. Having a defined NPD strategy with a focus on research and development and an overall organisation product/solution/service strategy
  2. Having an organisation innovation culture with active management support and associated investment encouraging product/solution/service development thinking and collaboration with external partners, customers and suppliers
  3. Continuously performing market research and product/solution/service demand to understand landscape of needs, option and alternatives
  4. Having a defined process for new concept assessment against consumer needs and product/solution/service innovation
  5. Having a process to manage, balance, prioritise, suspend and terminate portfolio of innovation activities and initiatives
  6. Having an NPD process incorporating stages and gates to push new product/solution/service design, development and adoption
  7. Tracking, measuring and evaluating product/solution/service performance evaluation with defined metrics and acting on results

# NPD Process Components And Effectiveness Factors

- Two key aspects of New Product Development
  - ***Process components*** – constituents of good NPD
  - ***Effectiveness factors*** – what identifies organisations that are good at NPD

# NPD Process Components And Effectiveness Factors

**NPD Strategy**

**Organisation Innovation Culture**

**Continuously Market Research**

**Defined Process For New Concept Assessment**

**Active Innovation Portfolio Management**

**NPD Process**

**NPD Metrics and Actioning**

**Active resource (re)allocation based on continuously adjustment of priorities grounded in rational factors**

**Effective market research, analysis and decision-making**

**Effective management of relationships with and collaboration with potential partners, suppliers and consumers including communications and contract lifecycle management**

**Effective testing of product/service/solution hypotheses against rational factors**

**Effective identification, understanding and management of actual product/service/solution risks**

**Elastic and responsive new product/service/solution process from idea-to-launch with regular reviews of achievements and delays and results/feedback analysis**

**Active reduction of time to introduction to minimise likelihood for drift from organisation strategy, consumer need and market circumstances**

**Active financial management including understanding of actual costs and realistic assessment of value delivered**

**Effective and capable team including engaged leadership**

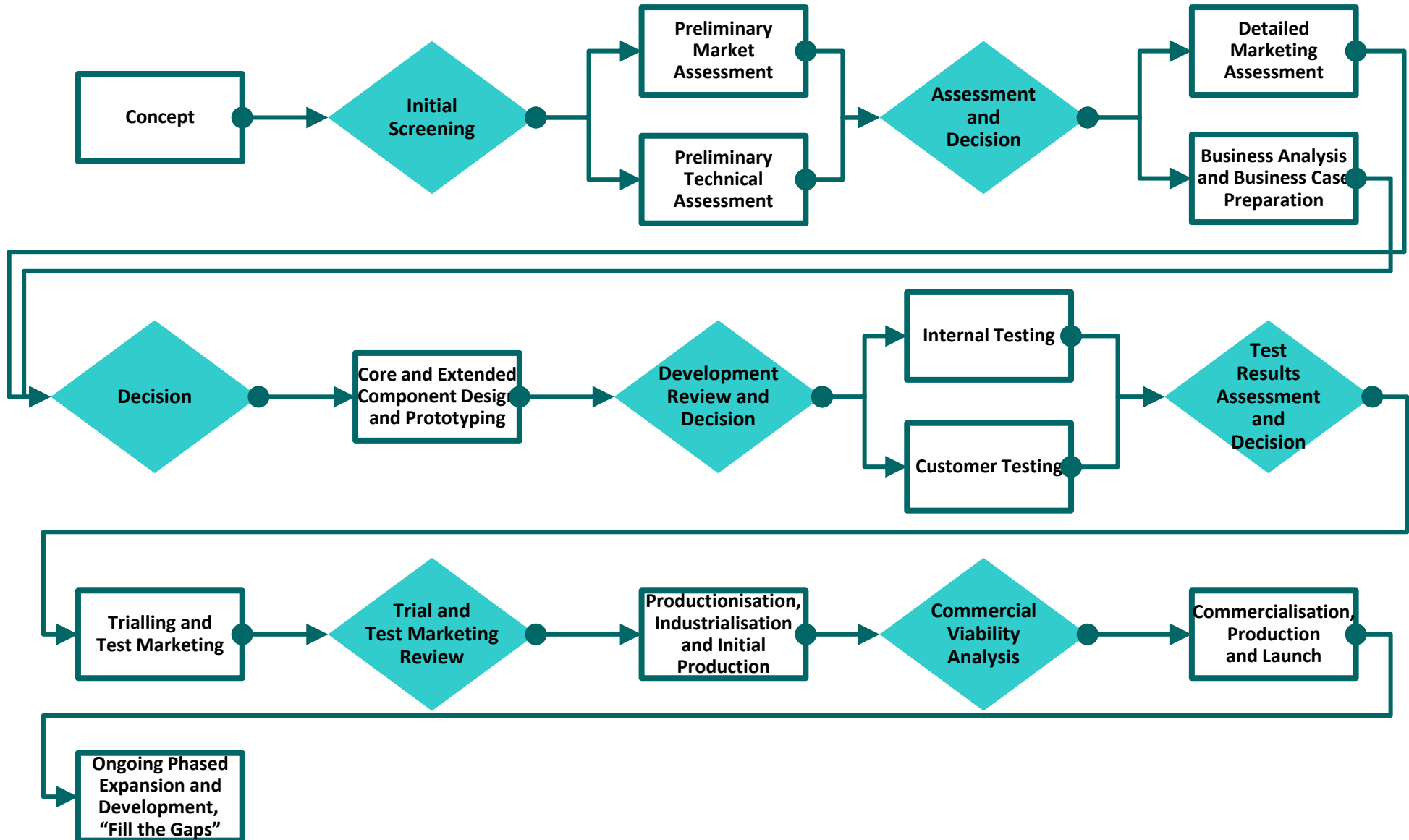
# Product Design And Development Approaches And Methodologies

- Many approaches and methodologies to product development such as (but not limited to):
  - **Agile Stage Gate** \*
  - **eTOM (enhanced Telecom Operations Map)** \*
  - Front-End Innovation (FEI)
  - Global Enterprise Technology System (GETS)
  - Multidisciplinary Design Optimisation (MDO)
  - New Concept Development (NCD)
  - **New Product Development (NPD) Stage Gate** \*
  - **Pragmatic Framework** \*
  - Product Management Lifecycle (PLM)
  - Technology Acquisition Stage Gate (TASG)
  - Technology Development Process (TDP)
  - Technology Realisation and Commercialisation (TRC)
  - Technology Stage Gate (TechSG)
- This is not intended to be an exhaustive analysis of product design and development approaches and methodologies
- Stage Gate process is probably the oldest and most well-know
- \* Covered in more detail

# Product Design Approaches And Methodologies

- Product design approaches and methodologies are all largely variants and extensions of the original Stage Gate process

# Typical High-Level View Of NPD Stage Gate Process



# NPD Gates And Gatekeepers

- The gates within the NPD process are points at the end of states where go/kill decision are based
  - Gates are not progress review checkpoints – they are concerned with the survival of the fittest solutions and the death of the rest
- Effective gates are central to the success of an operational product/solution/service development process
- The decisions should be based on the latest information available on a product/solution/service development
- The outputs from the state are reviewed and a decision is made to progress with the right developments only and stop investing in those that fail
- Gates are effectively the quality control checkpoints in the system
- If a solution passes a gate, this is implicitly a decision to allocate the needed resources
- One objective of gates is to ensure that the right developments are proceeded with and that they are done in the right way
- The gatekeeping practices that accompany the gates are core to the performance and success of the product/solution/service development process



# Potential NPD Gate Issues

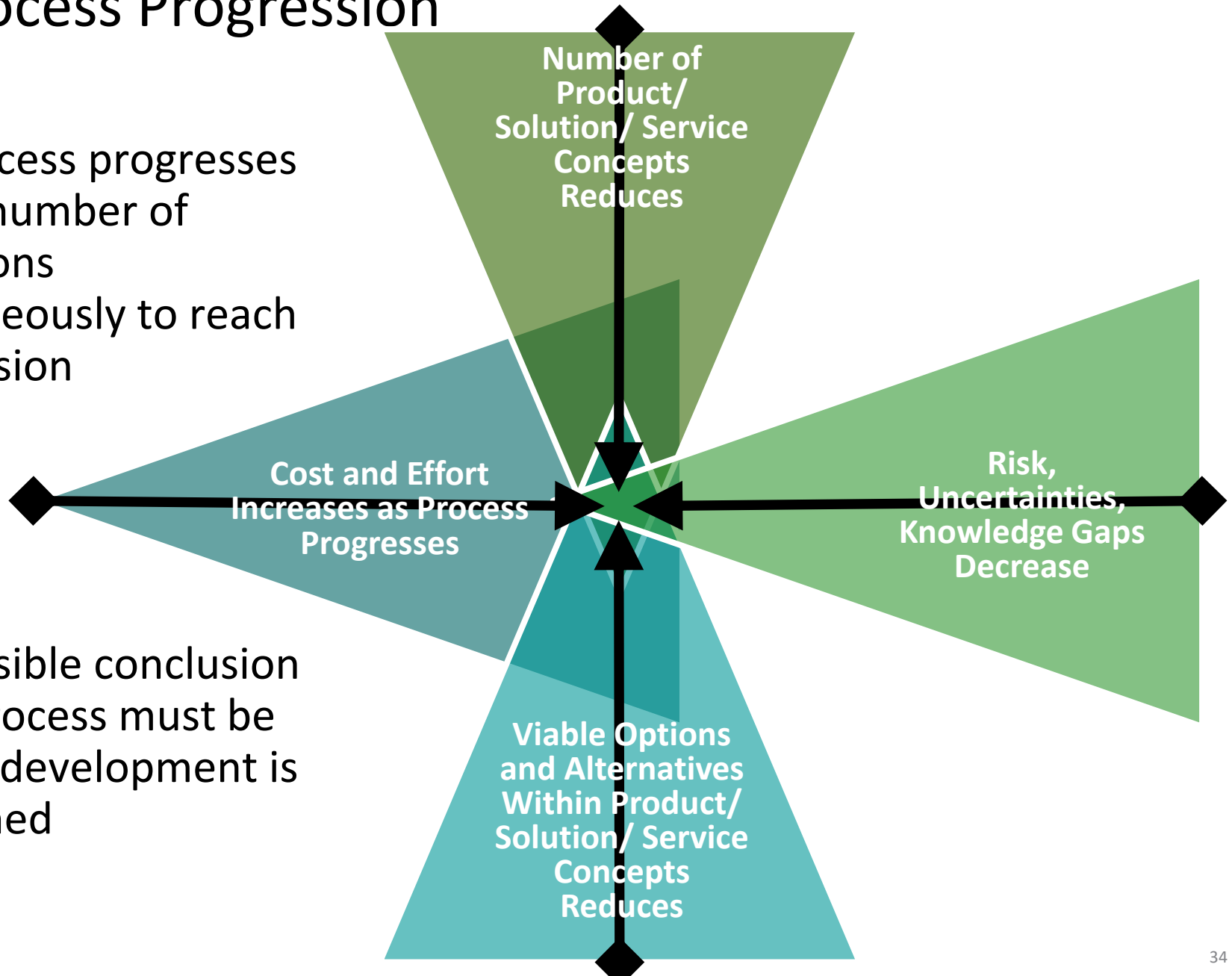
- Key gate meeting participants do not attend and do not delegate
- Insufficient preparation for gate decision meetings
- No decisions made at gate meetings
- Decisions made to proceed but no resources committed
- Informal go/no-go evaluation factors lacking rigour
- Senior decision-makers exert undue influence
- Beloved and cherished projects get favourable treatment
- Kill decisions bypassed
- ***Gate failure = management failure***

# NPD Process – Typical Characteristics

- Each stage in the NPD process aims to minimise the work done, information gathered and results and outputs generated while maximising the outcomes needed to make an effective decision at the subsequent gate
- Each stage involves greater effort being expended than the previous one and consequently incurs greater cost
- Each stage narrows options, reduces risk, adds knowledge, decreases uncertainties and eliminate concepts that fail to pass gate decision-making
- Each stage combines technical and non-technical – business, marketing, sales – activities in parallel
- Gates incorporate real go/no-go decisions with gatekeepers who are empowered to make decisions based on agreed and structured evaluation factors

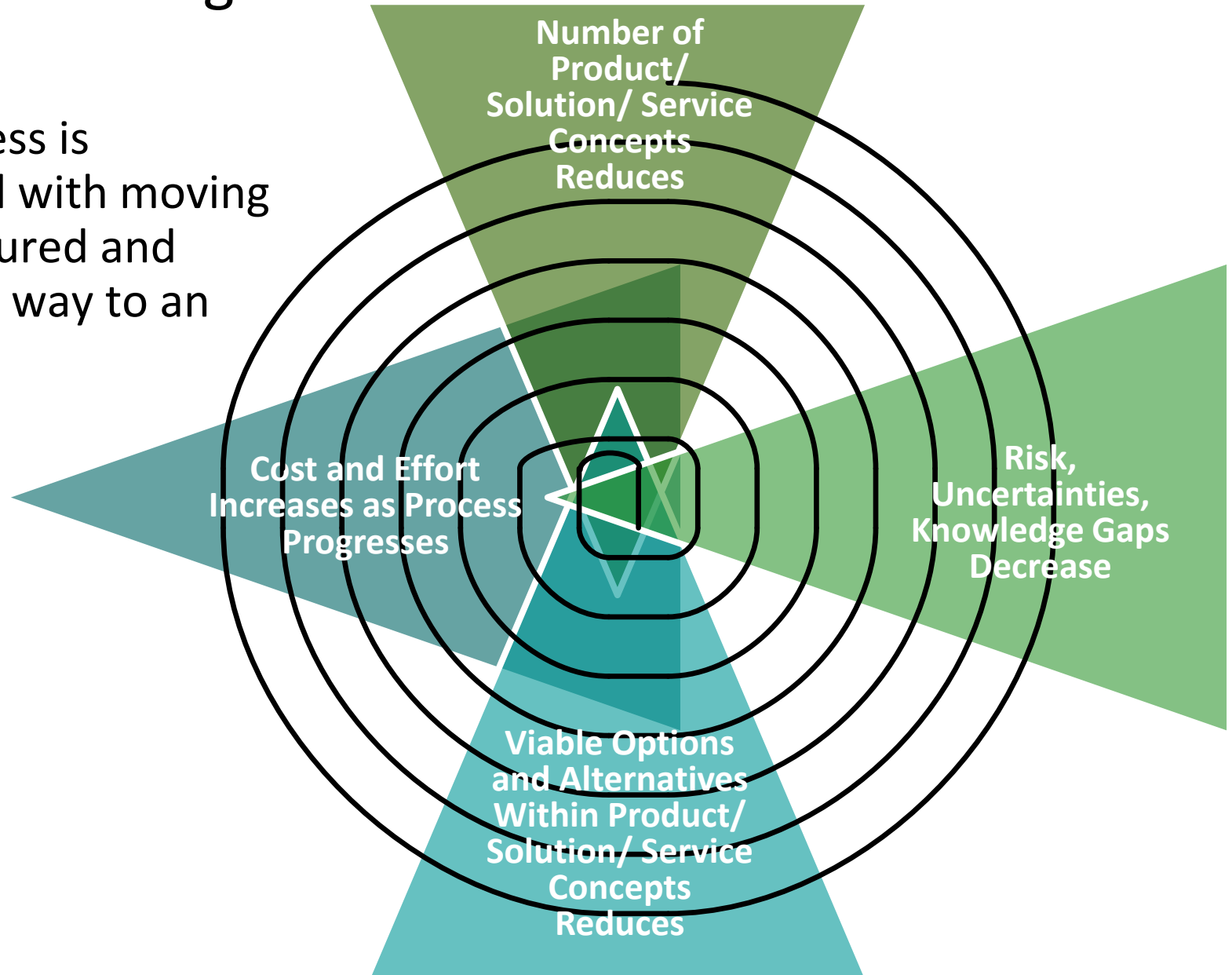
# NPD Process Progression

- NPD process progresses along a number of dimensions simultaneously to reach a conclusion
- One possible conclusion of the process must be that the development is abandoned

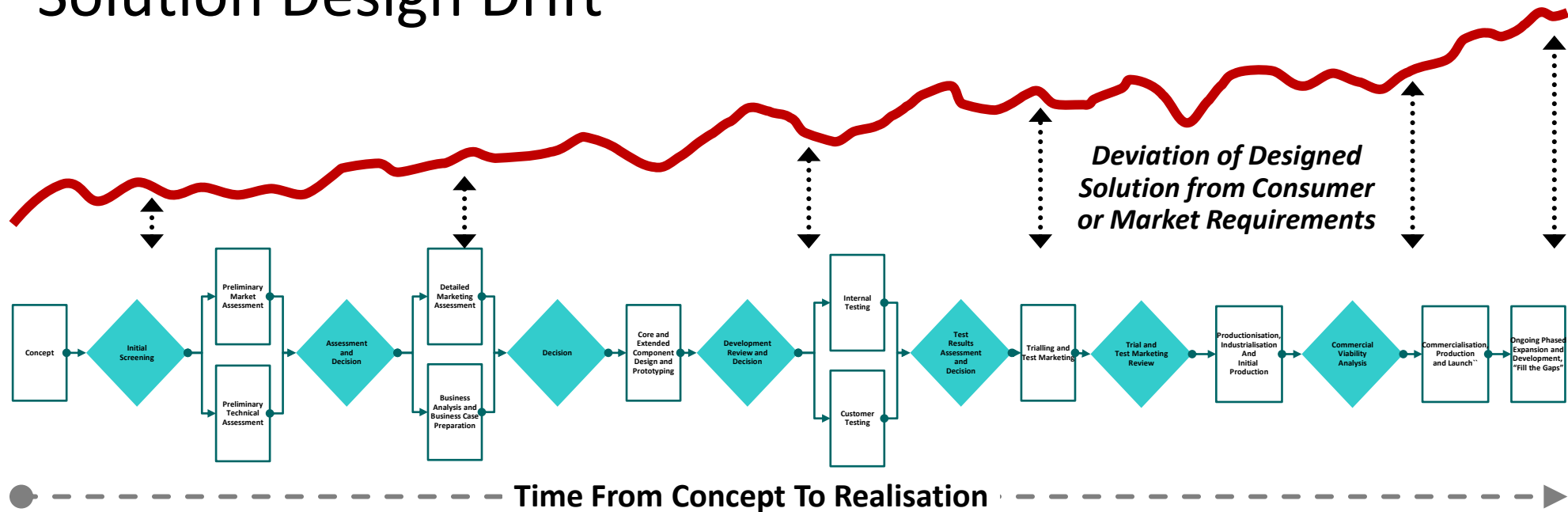


# NPD Process Progression

- NPD process is concerned with moving in a structured and controlled way to an ending



# Solution Design Drift

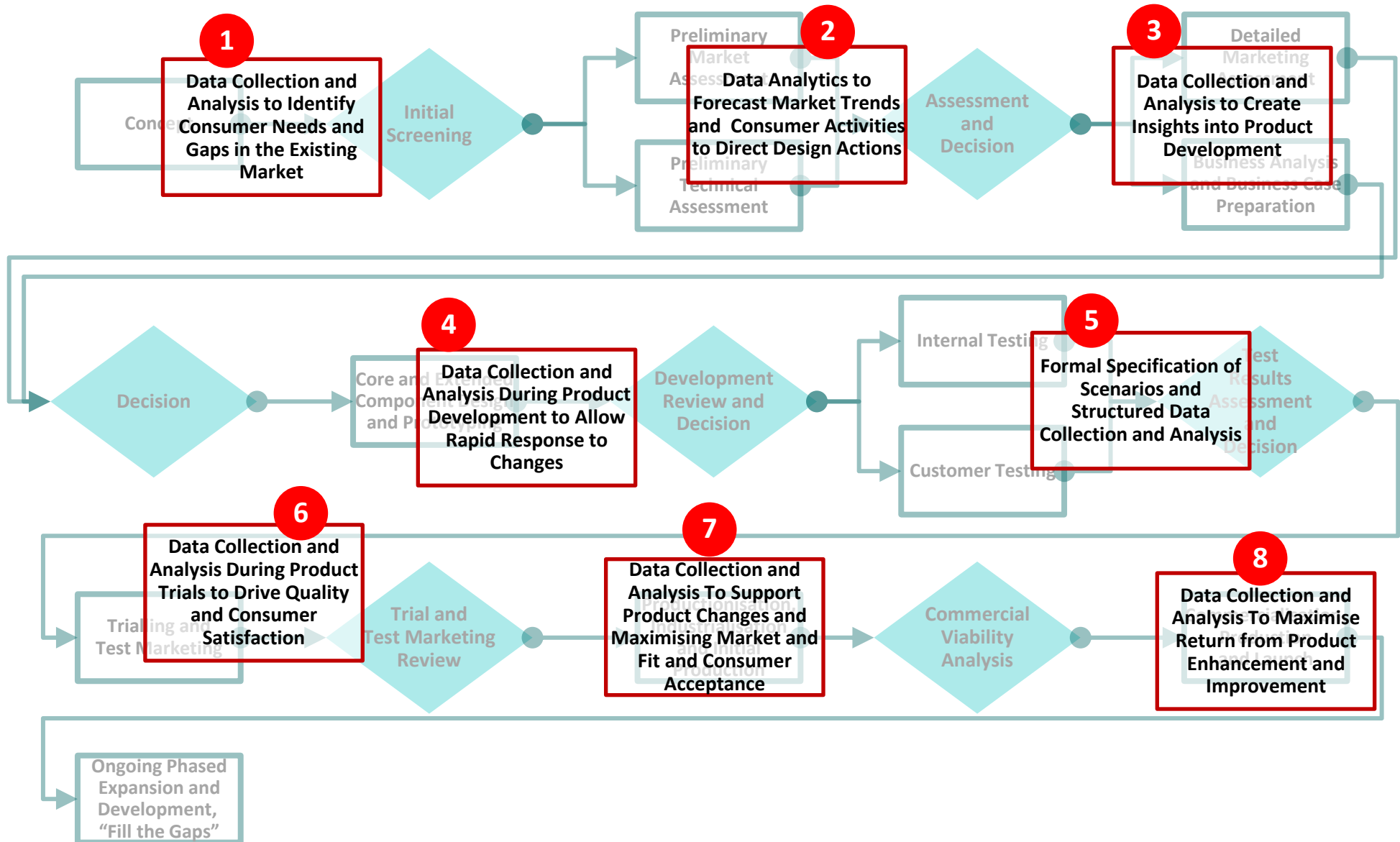


- The longer the duration from solution design to realisation the greater the chance of solution drift due to many factors such as:
  - What is being designed is no longer what the consumer or market needs
  - Economic conditions might change the basis for the proposed solution
  - Supply chain issues might affect solution delivery
  - Competitive landscape might change and undermine the solution design
  - Embedded technology changes or newer technology options available
- The more volatile the market the greater the chance of solution design drift and the greater the speed of the drift
- Compressing design timescales reduces the size and impact of this drift

# Data Driven Development (DDD)

- DDD is an extension to the standard NPD process with the formal inclusion of data collection, analysis and decision-making, reducing the role of subjectivity and intuition in the NPD process
- DDD overlays and extends core NPD process stages and activities with formal data processes
- Effective DDD means defining the data to be collected at various stages, collecting quality and accurate data, analysing it and making objective and impartial data-lead decisions

# DDD Overlay On NPD Stage Gate Process

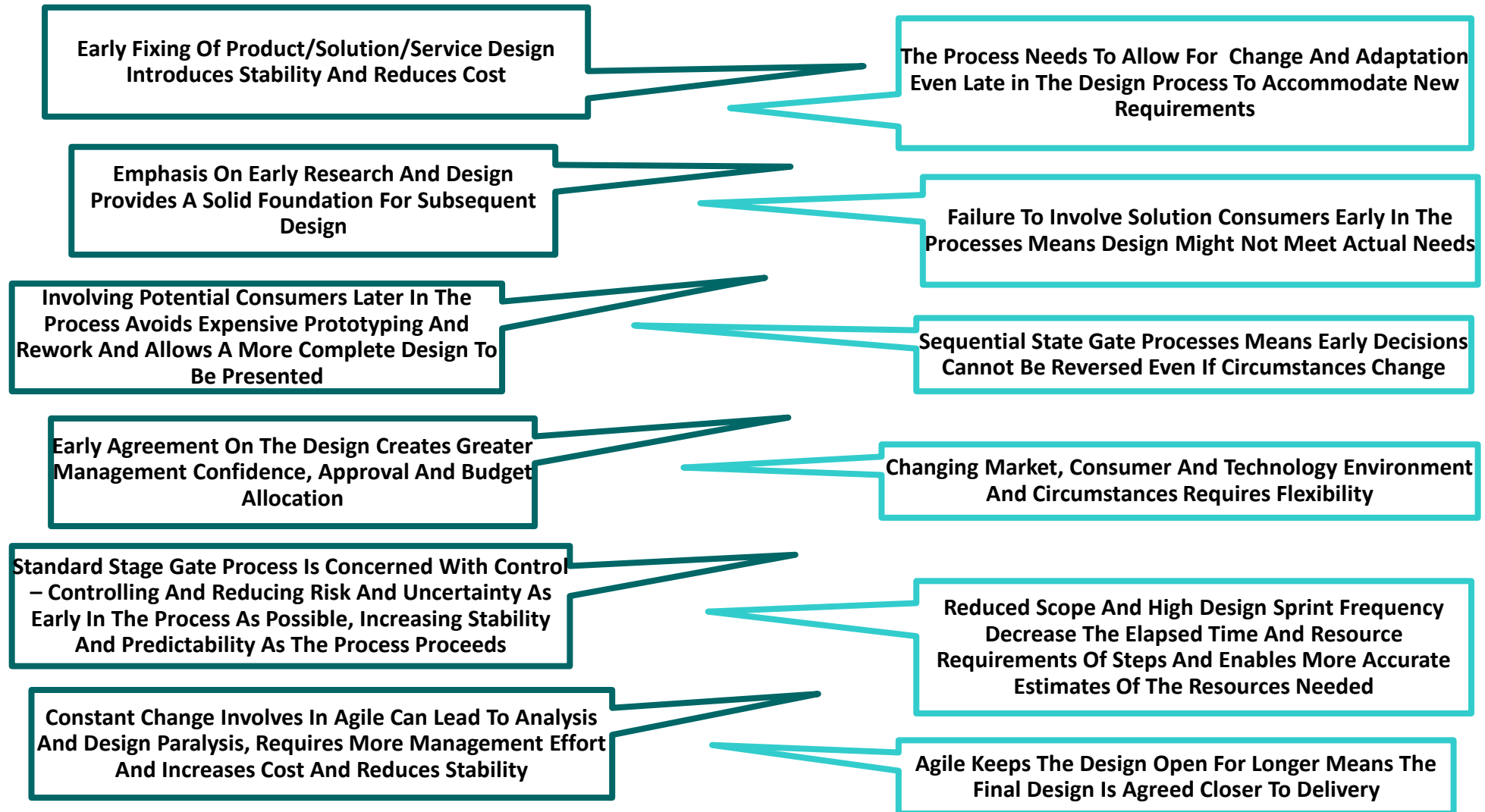


# Agile Concerns With Standard Stage Gate Process

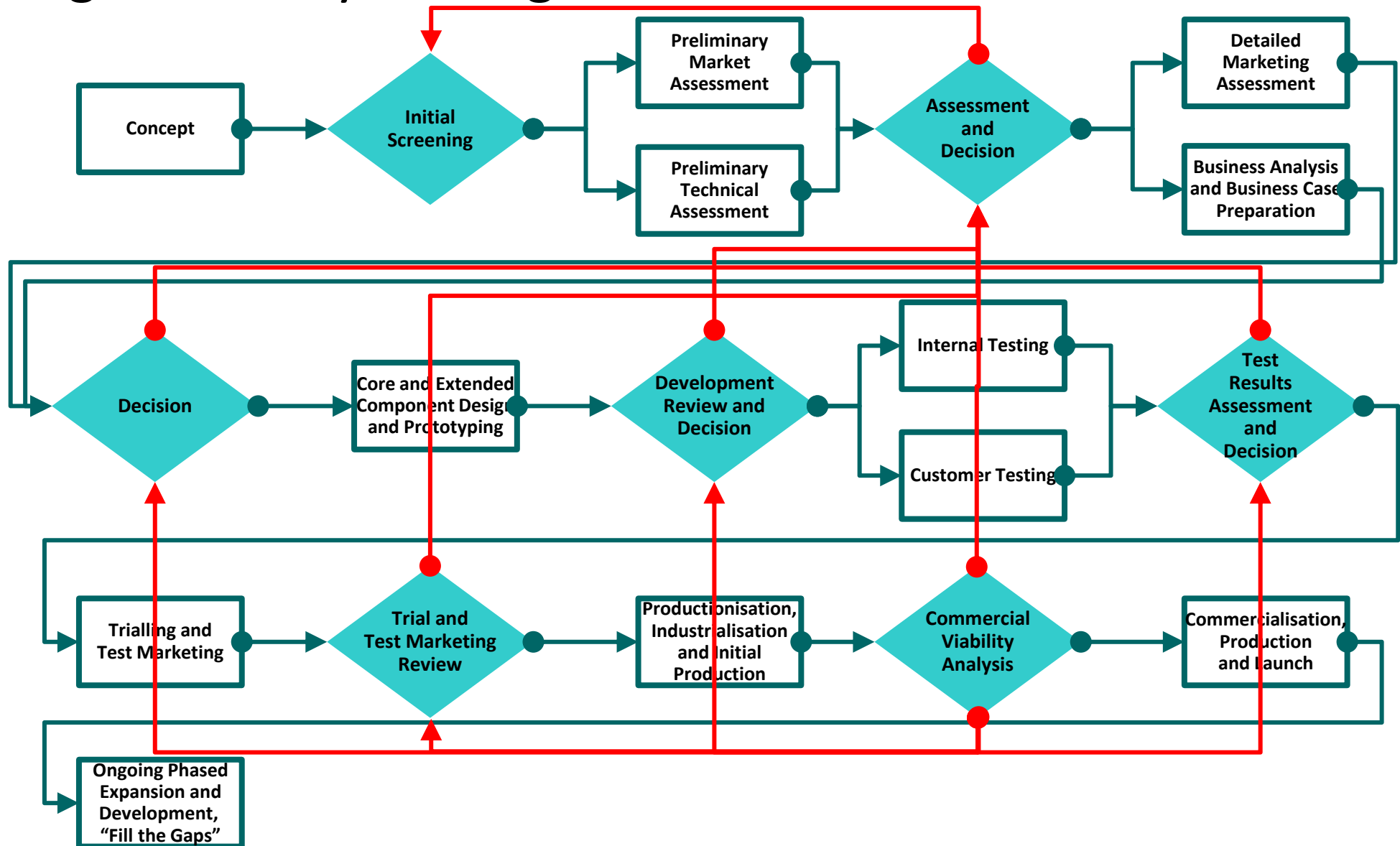
- The standard Stage Gate process is concerned with control – controlling and reducing risk and uncertainty as early in the process as possible, increasing stability and predictability as the process proceeds
- The standard Stage Gate process is (largely) linear and sequential with subsequent work building on previous work and only starting when previous stages have been completed and gates have been passed
- Standard Stage Gate is not designed to be reversible – previous decisions are not intended to be reviewed and changed
- Design decisions can be embedded early in the process and frozen thereafter, reducing the opportunity for subsequent modification
- Consumer involvement occurs quite late in the Stage Gate process
- The standard Stage Gate process works well for stable and predictable business environment and does not meet the need for dynamic and high velocity innovation



# Agile Vs Standard Stage Gate



# Agile Overlay Of Stage Gate Process



# Agile Overlay Of Stage Gate Process

- Introducing agile into the Standard Stage Gate process allows designs to be revisited
- This introduces complexity that can approach chaos into the process that needs to be managed assertively
- Risk that the Product/Solution/Service design process never ends
- Process visibility and progress can be opaque
- Agile emphasis on deliverables at the expense of documentation can lead to future problems that need to be managed

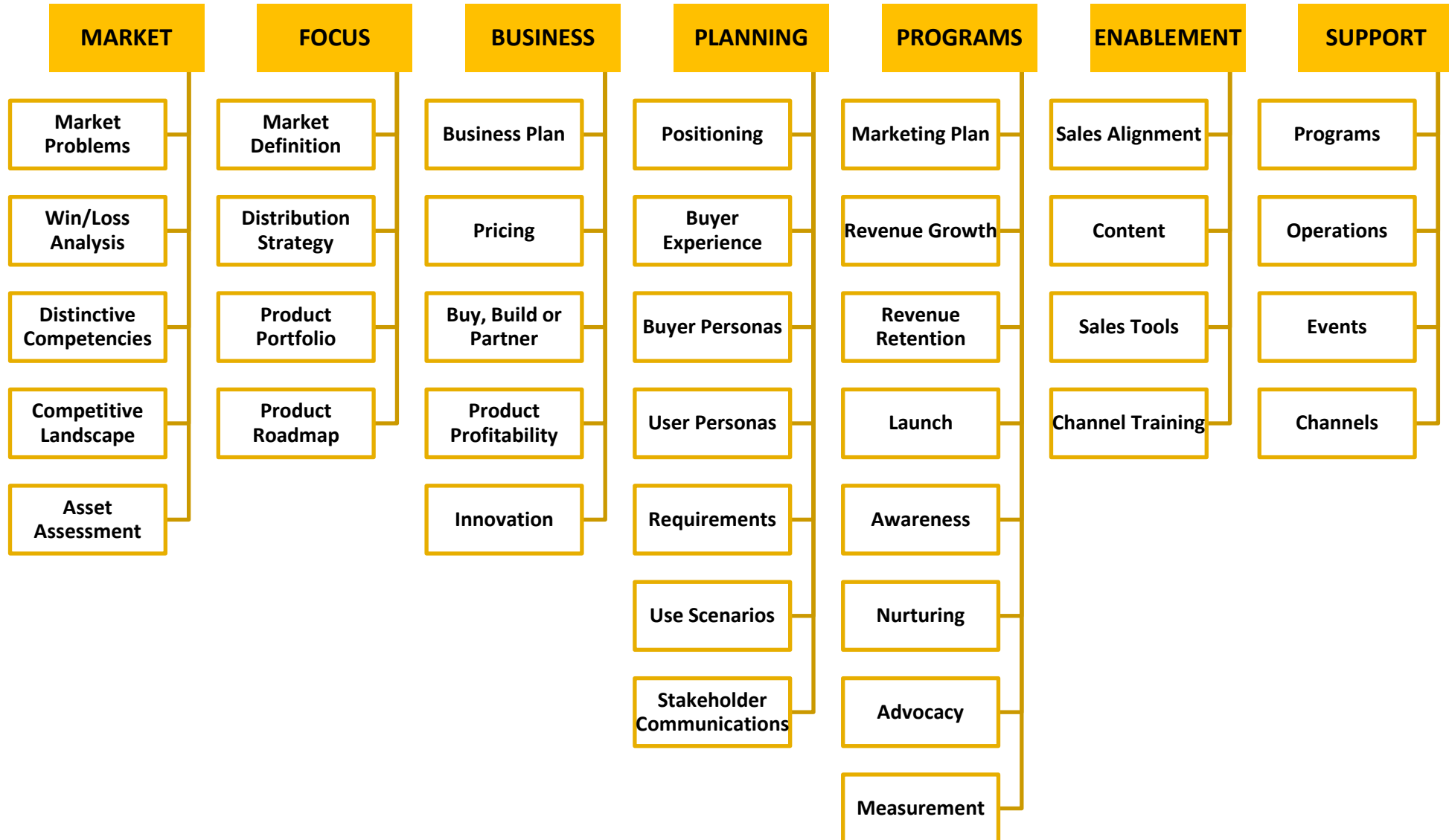
# Agile Stage Gate

- The standard Stage Gate process is concerned with control – controlling and reducing risk and uncertainty as early in the process as possible, increasing stability and predictability as the process proceeds
- Agile seek to accept uncertainty and the need for change even late in the process
- The standard Stage Gate process is (largely) linear and sequential with subsequent work building on previous work and only starting when previous stages have been completed and gates have been passed
- Standard Stage Gate is not designed to be reversible – previous decisions are not intended to be reversed
- The Product/Solution/Service development process is essentially directional if not linear – the process must move from idea to delivery
- The process must also reject unsatisfactory and undeliverable concepts – endless rework will not make a bad idea good

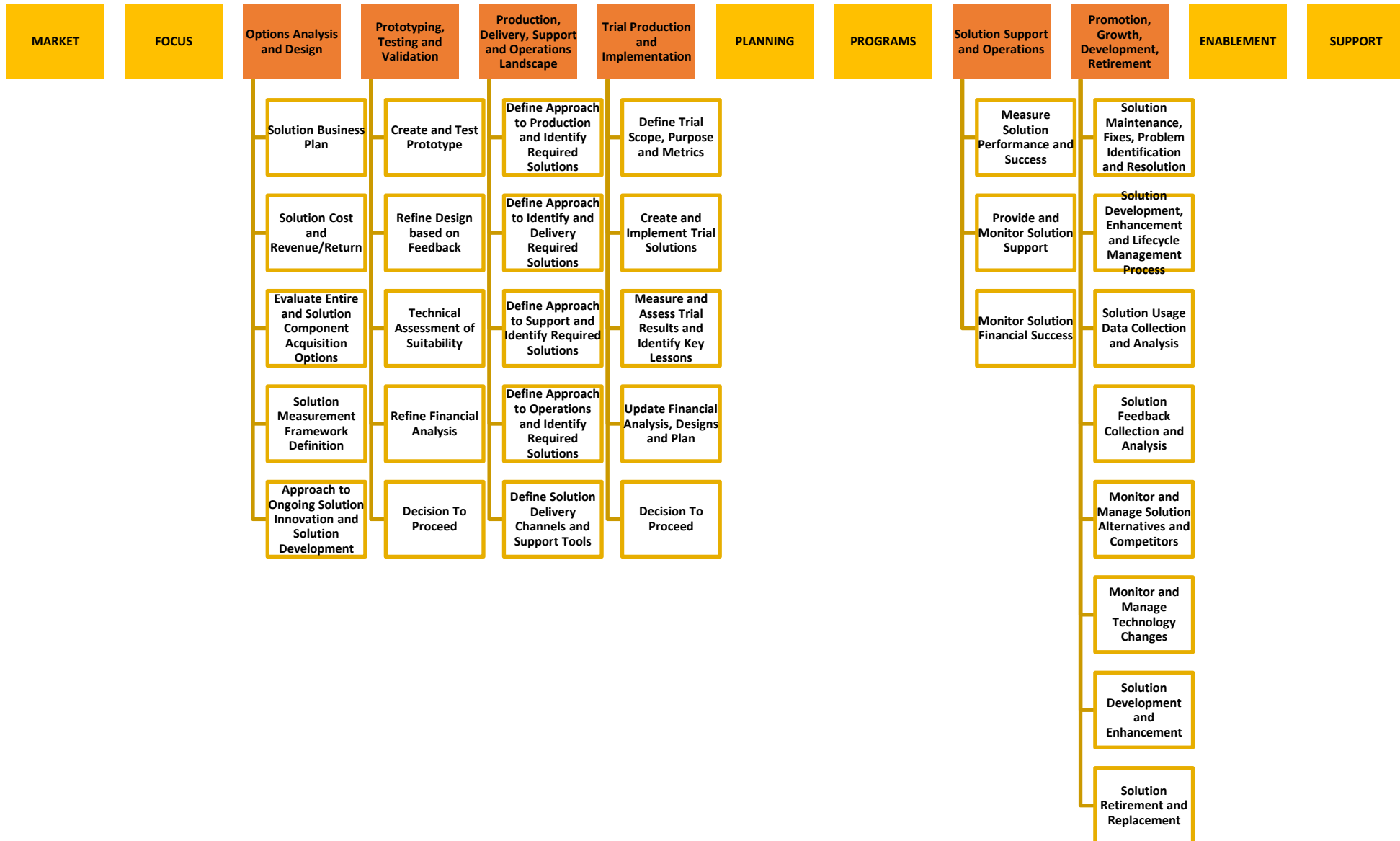
# Pragmatic Framework

- Pragmatic Institute develops and maintains the Pragmatic Framework -  
<https://www.pragmaticinstitute.com/product/framework/>
  - that is a view of the activities required to construct and market products consumers want to buy and use
- It is focused on external Products/Solutions/Services
- Elements can be adopted for internal solution architecture

# Pragmatic Framework



# Pragmatic Framework – Potential Gaps



# Pragmatic Framework – Potential Gaps

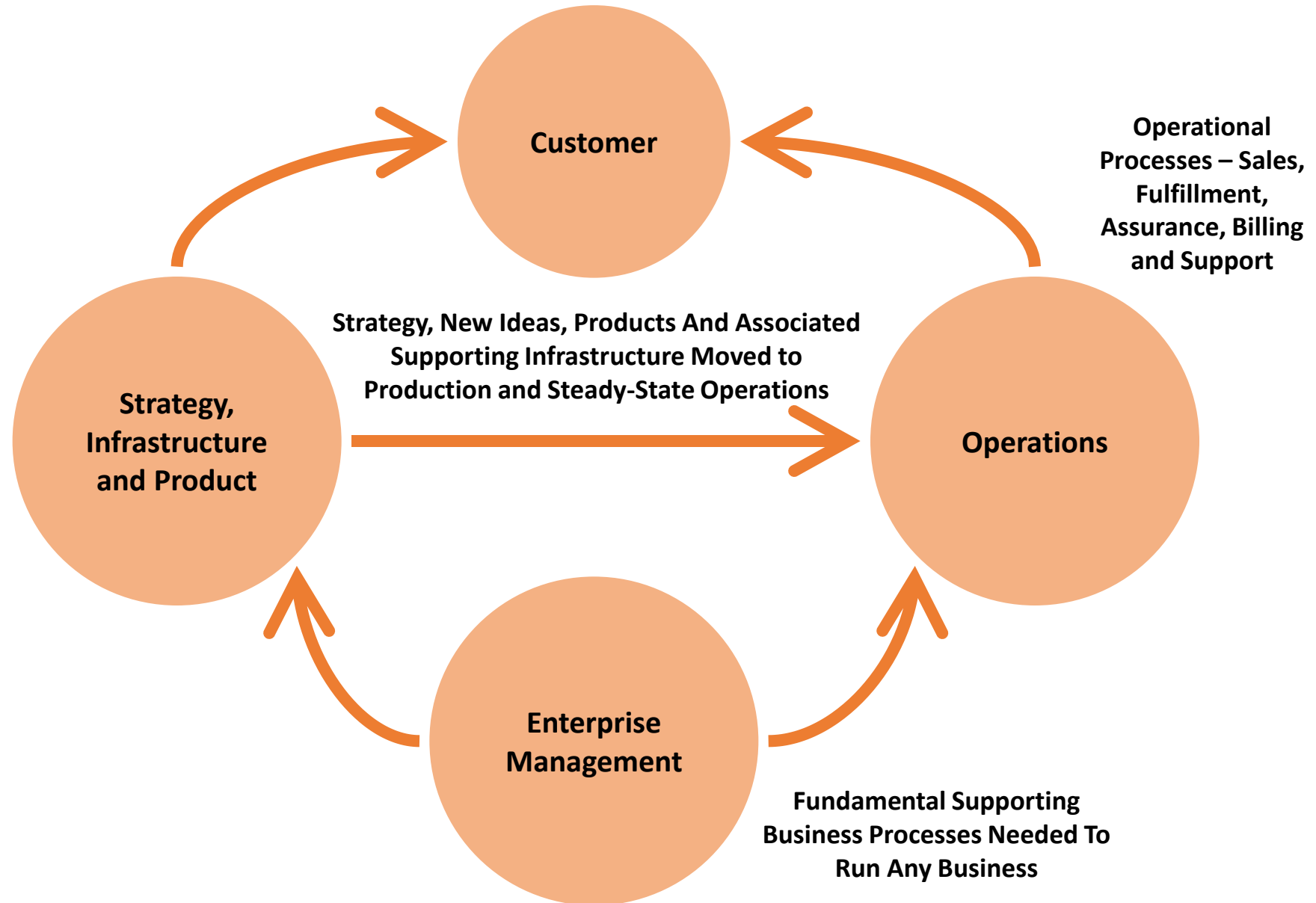
- While the Pragmatic Framework is comprehensive, it contains gaps in the following areas:
  - Options Analysis and Design
  - Prototyping, Testing and Validation
  - Production, Delivery, Support and Operations Landscape
  - Trial Production and Implementation
  - Solution Support and Operations
  - Promotion, Growth, Development, Retirement



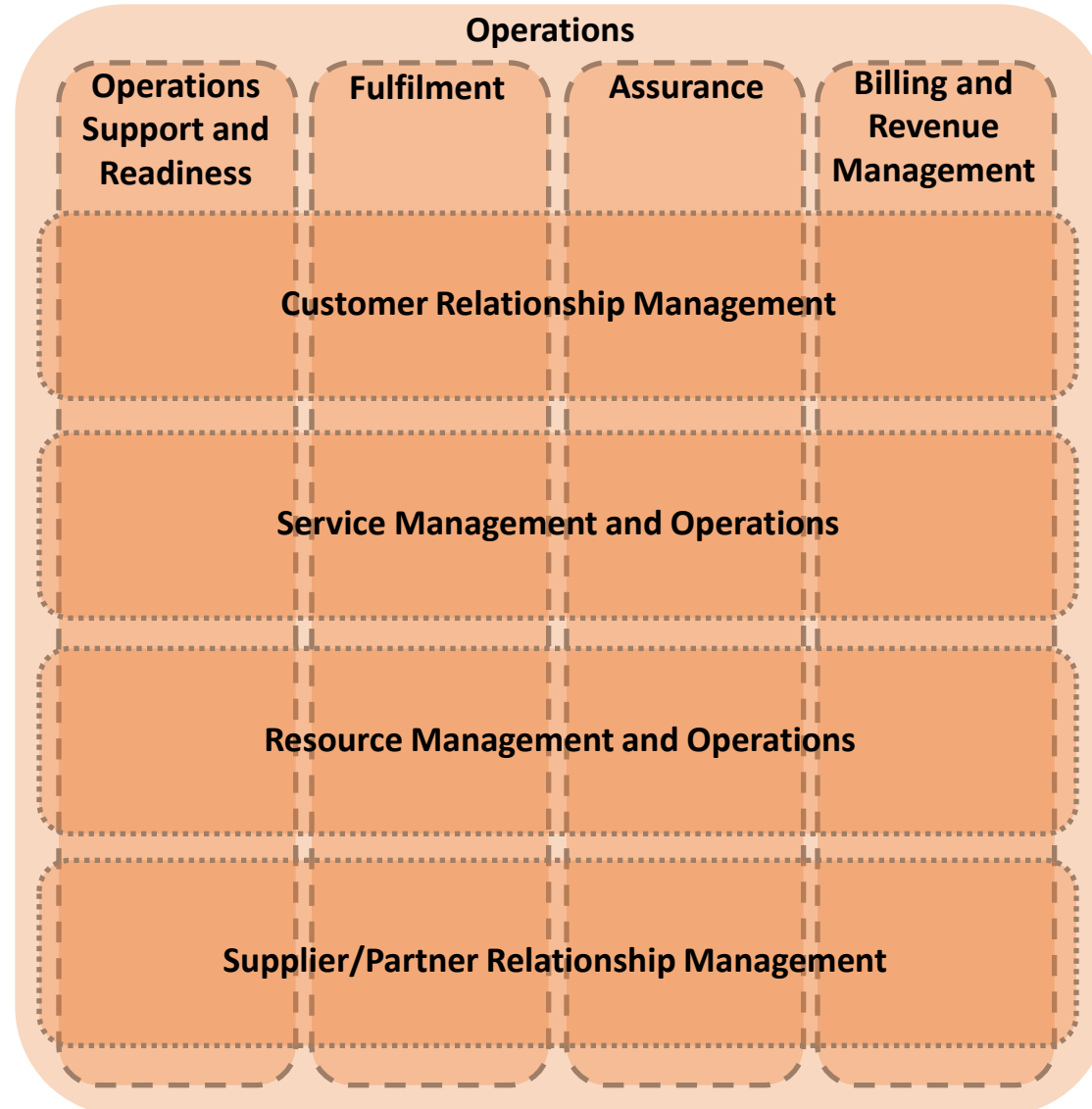
# eTOM (enhanced Telecom Operations Map)

- Provides a detailed process framework for a telecoms utility companies that can be adopted by non-telecoms organisations moving to solutions as a service operating model
  - Developed by TM Forum - [www.tmforum.org](http://www.tmforum.org)
  - eTOM - <http://www.tmforum.org/BusinessProcessFramework/1647/home.html>
- Reference framework that classifies and defines the business activities used by a company involved in delivering (online) services
  - three major process areas:
    - **Strategy, Infrastructure and Product** – concerned with planning and lifecycle management
    - **Operations** – concerned the core of operational management
    - **Enterprise Management** – concerned corporate or business support management
- Offers the potential for non-telecoms companies to learn from an effective operational framework

# eTOM Business Process Framework Overview

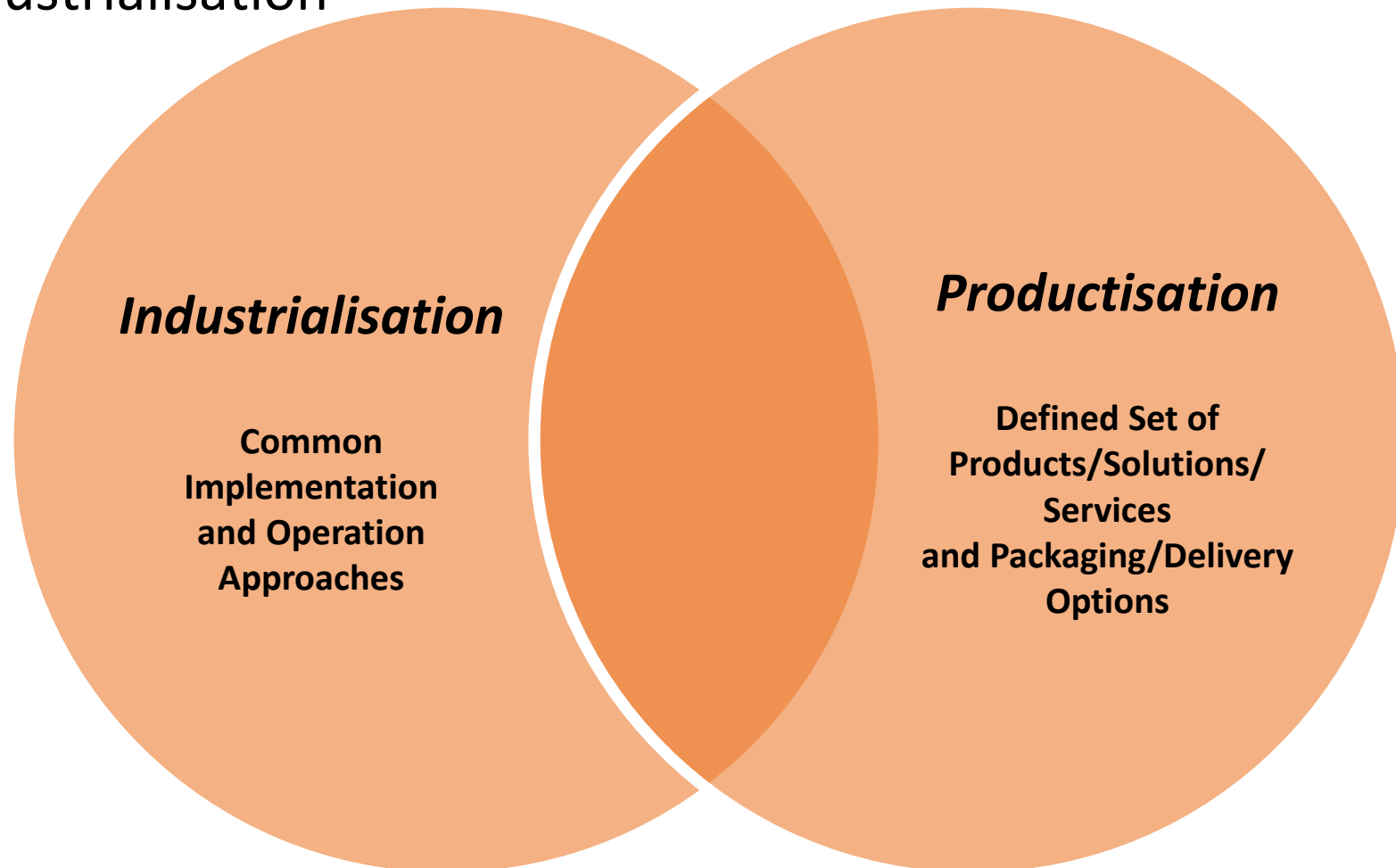


# eTOM Business Process Framework - Detail



# Achieving the Potential – New Product/Service/Solution Innovation Industrialisation and Productisation

- Productisation is a pre-requisite for and an enabler of industrialisation



# Product, Solution and Service Lifecycle Management (PSSLM)

- PSSLM is concerned with the functions and processes need to define, plan, design, build, deliver, maintenance, manage revise and retirement of all products, solutions and services in the organisation's portfolio
  - Enable the organisation strategic and business product/solution/service vision
  - Drive internal and customer-oriented processes to meet market demand and customer expectations

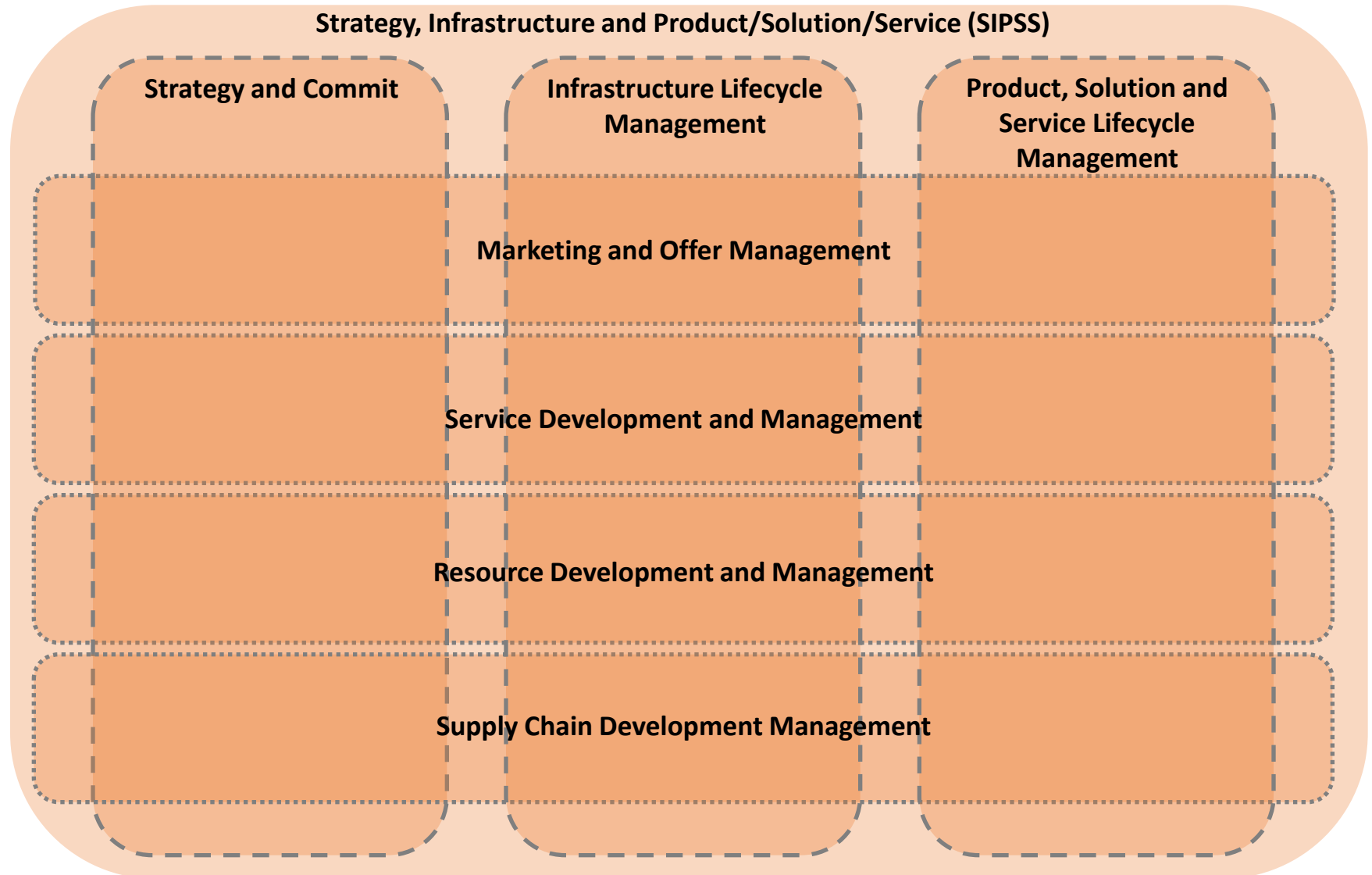
# Product, Solution and Service Lifecycle Management (PSSLM)

- PSSLM belongs within Strategy, Infrastructure and Product/Solution/Service (SIPSS) function
- Responsibilities of SIPSS function
  - Develop strategy
  - Commit to the organisation
  - Build and resources infrastructure - supports the delivery products, solutions and services themselves and their associated functional processes
  - Develop and manage products, solutions and services
  - Develop and manage the supply chain

# Strategy, Infrastructure and Product/Solution/Service (SIPSS) Function

- Innovation – development of new products/services/solutions lie in SIPSS function
- SIPSS divided into
  - Horizontal functional groups
    - Marketing and Offer Management
    - Service Development and Management
    - Resource Development and Management
    - Supply Chain Development Management
  - Vertical process views
    - Strategy and Commit
    - Infrastructure Lifecycle Management
    - Product, Solution and Service Lifecycle Management

# Strategy, Infrastructure and Product/Solution/Service (SIPSS) - Horizontal Process Functions and Vertical Process Views

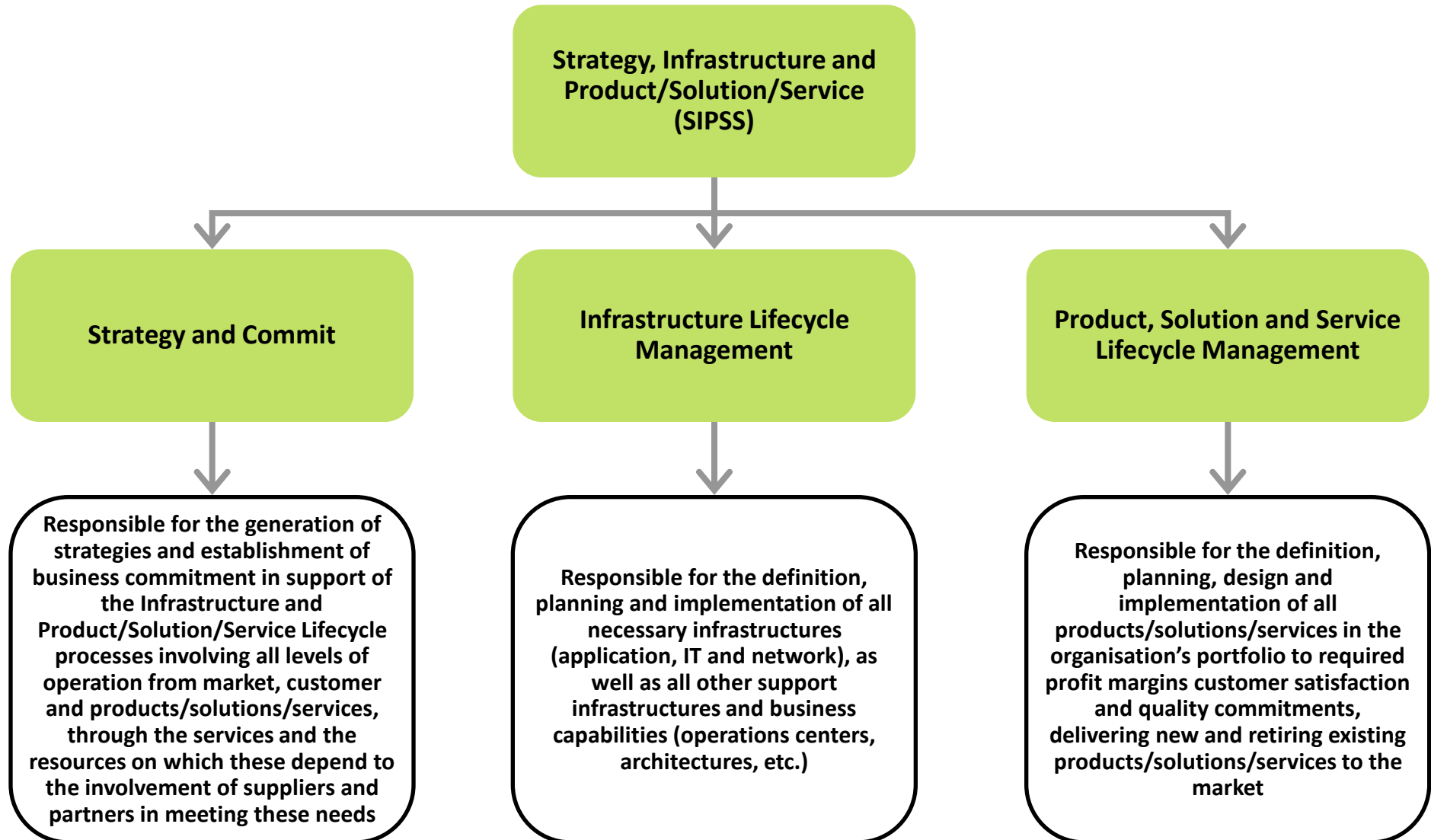




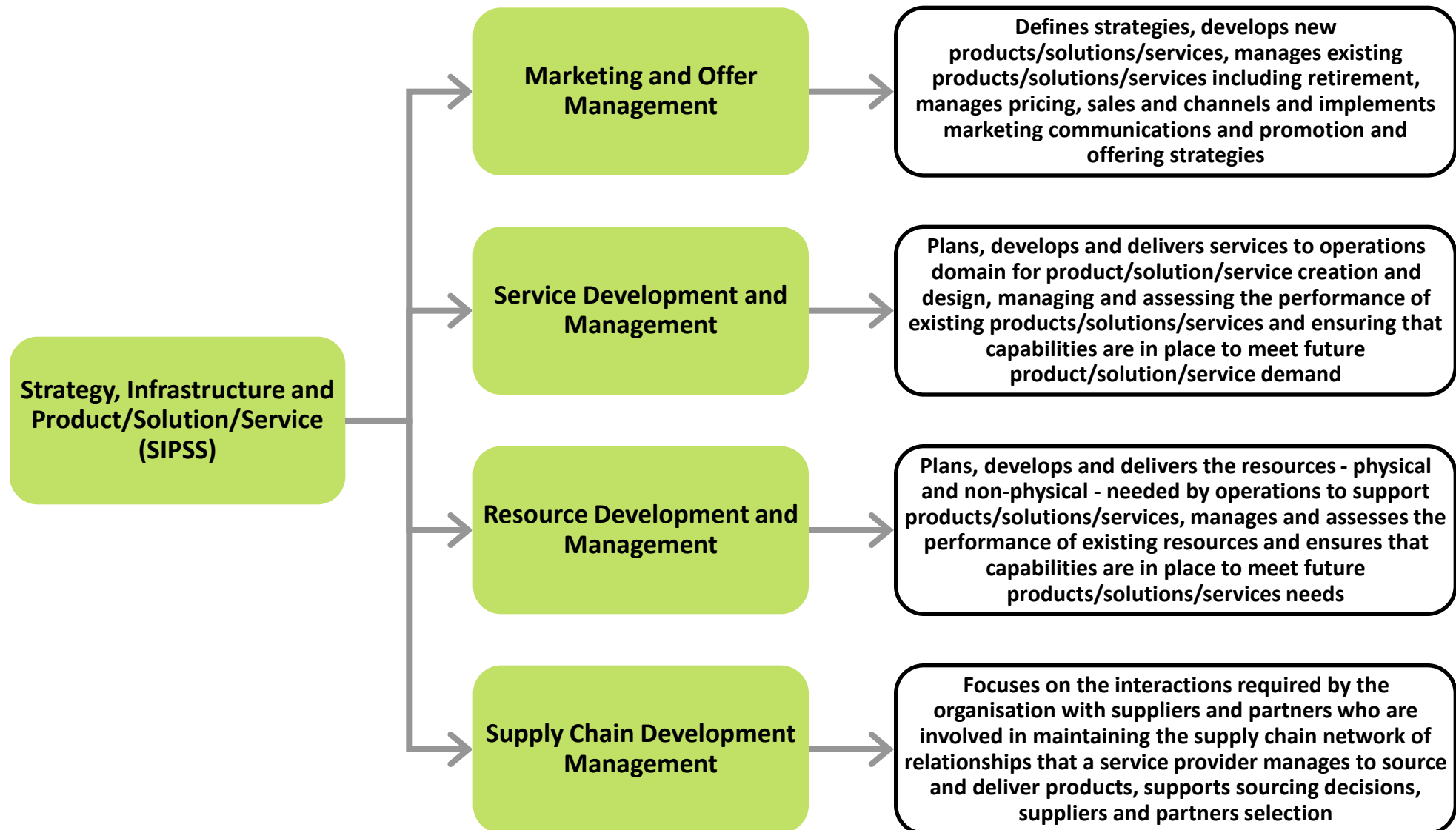
# Strategy, Infrastructure and Product/Solution/Service (SIPSS) - Horizontal Process Function Details



# SIPSS – Vertical Process Views



# SIPSS - Horizontal Process Functional Groups

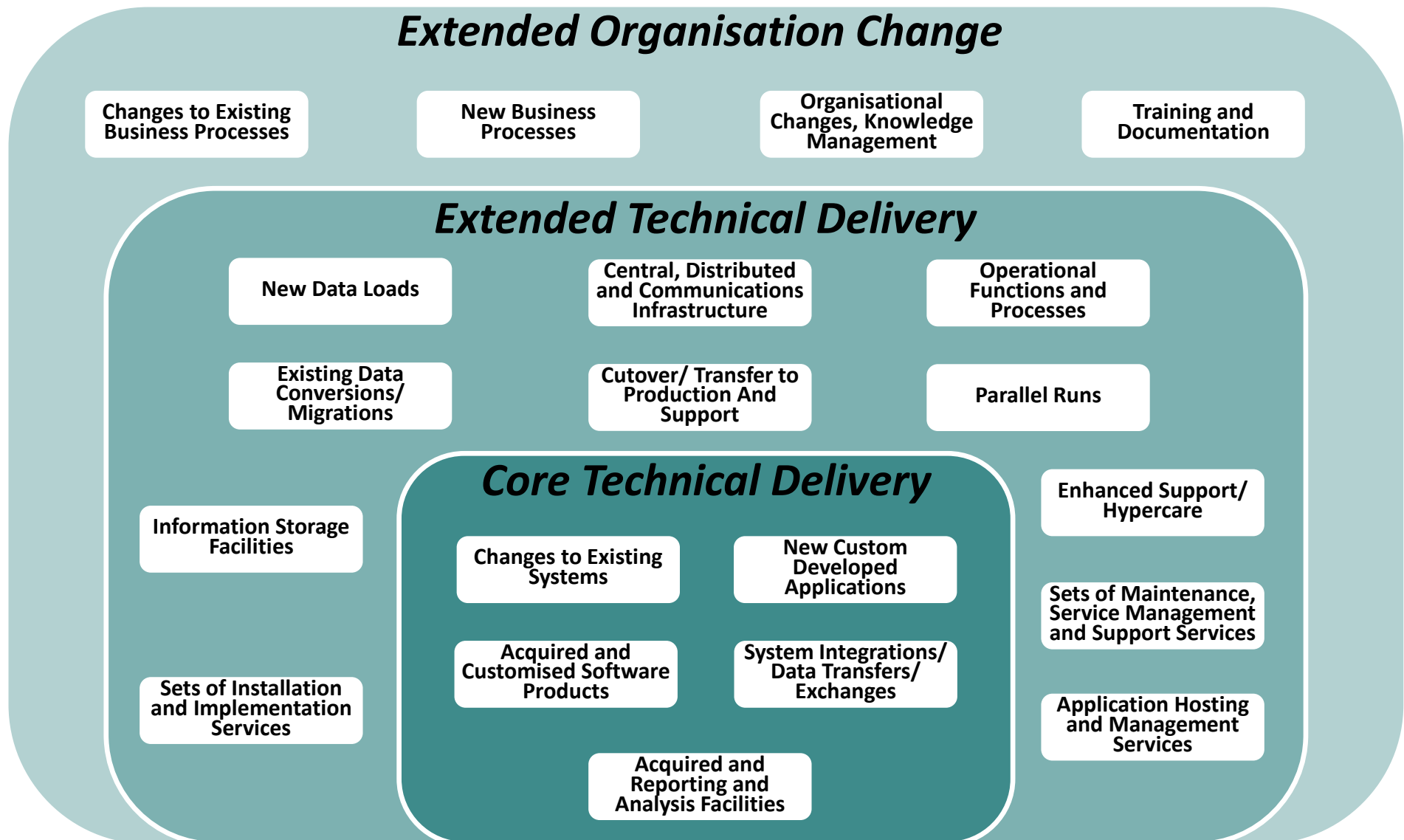


# Outputs From The Solution Design Process

# Outputs From The Solution Design Process

- The purpose of the solution design process is to create a complete end-to-end solution design covering all the components that have to be delivered to create a usable, operable, supportable, maintainable solution that can be used in multiple ways:
  - Create realistic and achievable implementation schedule
  - Understand the likely delivery costs and required resources
  - Understand solution options and their implications
  - Understand possible solution delivery phases
  - Pass to technical delivery teams to create low-level technical designs

# Outputs From The Solution Design Process



# Outputs From The Solution Design Process

- The output from the solution design process is the set of core and extended components of specific types required to deliver an operable and usable solution combined into an integrated and unified target
- The complete solution is:

$$\sum_{\substack{i = \text{Solution} \\ \text{Component} \\ \text{Type 1}}}^N \sum_{\substack{j = \text{Solution} \\ \text{Component 1}}}^M \text{Solution Component}_{ij}$$

# Solution Phases

- Completion solution will be delivered in phases
- Composition of the solution deliver phases may change dynamically in response to consumer, business and market feedback

- The complete solution over all its delivery phases is:

$$\begin{aligned}
 & \sum_{\substack{i = \text{Solution} \\ \text{Component} \\ \text{Type 1}}}^{N1} \sum_{\substack{j = \text{Solution} \\ \text{Component 1}}}^{M1} \textit{Solution Component}_{ij} \\
 + & \sum_{\substack{i = \text{Solution} \\ \text{Component} \\ \text{Type 1}}}^{N2} \sum_{\substack{j = \text{Solution} \\ \text{Component 1}}}^{M2} \textit{Solution Component}_{ij} \\
 + & \sum_{\substack{i = \text{Solution} \\ \text{Component} \\ \text{Type 1}}}^{N3} \sum_{\substack{j = \text{Solution} \\ \text{Component 1}}}^{M3} \textit{Solution Component}_{ij}
 \end{aligned}$$



# Solution Component Specific Design And Delivery Issues – 1/5

Solution Component Type	Description	Solution Design Considerations	Some Questions, Issues and Concerns
<b>Changes to Existing Systems</b>	Modifications and enhancements to existing IT systems, either custom developed or acquired products, that will form part of the overall solution, including the definition of the scope of the work.	<ul style="list-style-type: none"> <li>• What (is the minimum number of) existing systems need to be changed to accommodate the new solution?</li> <li>• Can the proposed work be done outside those existing systems?</li> <li>• What are the options for making the required changes?</li> </ul>	<ul style="list-style-type: none"> <li>• Ease of changing</li> <li>• Ability to change</li> <li>• Availability of skills and ability to make changes</li> <li>• Existing change backlog</li> <li>• What are the impacts and dependencies on other activities?</li> <li>• Can the changes be avoided or minimised both in number and size</li> <li>• How long will the changes take and how much will they cost?</li> </ul>
<b>New Custom Developed Applications</b>	New custom developed IT applications that will form part of the overall solution, including the definition of the scope of the work.	<ul style="list-style-type: none"> <li>• What (is the minimum number of) new custom applications are needed?</li> <li>• Can the proposed work be done outside those proposed new applications?</li> <li>• What are the options for the new developments?</li> </ul>	<ul style="list-style-type: none"> <li>• Are customised applications required?</li> <li>• What development and deployment platform should be used?</li> <li>• Availability of skills and ability to develop new applications</li> <li>• What is the long-term support and maintenance plan?</li> <li>• How will then be interfaced with and used?</li> <li>• How long will the new applications take and how much will they cost?</li> </ul>
<b>Acquired and Configured/ Customised Software Products</b>	Packaged IT applications that are configured and customised that will form part of the overall solution, including any product acquisition and supplier and product evaluation and selection.	<ul style="list-style-type: none"> <li>• What (is the minimum number of) new software applications are needed?</li> <li>• What are the product options?</li> <li>• Can existing products be reused?</li> <li>• What are the configuration and customisation options?</li> </ul>	<ul style="list-style-type: none"> <li>• What is the process for procuring products from suppliers?</li> <li>• How good a fit is the proposed product?</li> <li>• How easily and quickly can the products be implemented and customised and what skills are needed?</li> <li>• How are the customisations supported and maintained?</li> <li>• What are the application and data integration issues?</li> <li>• Are the products hosted internally or externally?</li> <li>• What infrastructure is needed to run the product?</li> <li>• How much will they cost to acquire and operate?</li> <li>• Availability of skills and ability to develop new applications</li> </ul>
<b>System Integrations/ Data Transfers/ Exchanges</b>	Scheduled and ad hoc data transfers and exchanges of different types such, as batch or real time, between solution components including data transformations or application-level integrations such as application interfaces, remote calls, messaging interfaces or services with associated results and data being communicated. This also includes the infrastructures required to enable and support this and its management.	<ul style="list-style-type: none"> <li>• What (is the minimum number of) new and changes to existing data integrations are needed?</li> <li>• What integration approaches and tools should be used?</li> <li>• Can existing integrations and tools be reused?</li> </ul>	<ul style="list-style-type: none"> <li>• How many integration, data transfers and exchanges are needed?</li> <li>• What is their format and content?</li> <li>• What transfer approach(es) are proposed?</li> <li>• Does the integration infrastructure already exist?</li> <li>• What integration tools are being proposed?</li> <li>• What is the proposed frequency of integrations and are they scheduled or unscheduled?</li> <li>• Who initiates the integration?</li> <li>• What is the number of integration transactions and the volumes of data?</li> </ul>

# Solution Component Specific Design And Delivery Issues – 2/5

Solution Component Type	Description	Solution Design Considerations	Some Questions, Issues and Concerns
<b>Reporting and Analysis Facilities</b>	Reporting and analysis facilities including the implementation and configuration and customisation of any underlying toolsets, associated reporting tools and data structures, specific report and analyses and related functionality.	<ul style="list-style-type: none"> <li>• What reports and analyses are needed?</li> <li>• What (new and existing) tools are needed?</li> <li>• What data is needed for reporting and analysis?</li> <li>• How will reports and analyses be accessed and distributed?</li> <li>• How repeatable and reproducible will reports and analyses be?</li> <li>• Who can access what reports and analyses and the underlying data?</li> </ul>	<ul style="list-style-type: none"> <li>• Can existing reporting, visualisation and analytics facilities be used or are new ones required?</li> <li>• How will reporting and analytics be deployed</li> <li>• Can existing data reporting structures (data warehouses, data marts) be used or are new ones required?</li> <li>• What data extraction, transformation and load facilities are required to enable and support reporting and analytics?</li> <li>• How many data sources will be used for reporting</li> <li>• How much reporting and analysis is required?</li> </ul>
<b>Sets of Installation and Implementation Services</b>	Services acquired from third party suppliers to install, implement, configure and get operational hardware and software components of the solution, including the specification of these services.	<ul style="list-style-type: none"> <li>• What needs to be installed and where?</li> <li>• What are the installation options?</li> </ul>	<ul style="list-style-type: none"> <li>• What solution components require installation and implementation?</li> <li>• From whom will the services be procured?</li> <li>• What handover will be required?</li> <li>• What long-term support arrangements will be required?</li> <li>• How long with the installation and implementation take?</li> </ul>
<b>Information Storage Facilities</b>	Internally installed data storage infrastructure, either existing or new, or externally provided data storage facilities including their installation, customisation and provision of data access. This includes any data storage software such as database management systems and other elements.	<ul style="list-style-type: none"> <li>• What data of what types will be stored?</li> <li>• What applications are storing data?</li> <li>• What data security is required?</li> </ul>	<ul style="list-style-type: none"> <li>• How many data storage facilities – hardware and software - will be required?</li> <li>• Where will they be located?</li> <li>• Are they existing or new facilities?</li> <li>• If they are new, what are the provisioning issues, requirements and costs?</li> <li>• What are the expected data volumes and throughputs?</li> <li>• What is the approach to data backup, recovery, retention and archival?</li> </ul>
<b>Existing Data Conversions/ Migrations</b>	Migration of data held in old systems to the new solution, including data transfer and aggregation/transformation and the design and specification of associated target data structures.	<ul style="list-style-type: none"> <li>• What is the proposed approach to the migration(s) and conversion(s)?</li> <li>• How complex will the migration(s) and conversion(s) be?</li> <li>• Who will perform the migration(s) and conversion(s)?</li> </ul>	<ul style="list-style-type: none"> <li>• How much data needs to be migrated?</li> <li>• How well-defined is the source data?</li> <li>• What are the data quality and transformation requirements and issues?</li> <li>• What data conversion/migration facilities are available?</li> </ul>

# Solution Component Specific Design And Delivery Issues – 3/5

Solution Component Type	Description	Solution Design Considerations	Some Questions, Issues and Concerns
<b>New Data Loads</b>	Modifications and enhancements to existing IT systems, either custom developed or acquired products, that will form part of the overall solution, including the definition of the scope of the work.	<ul style="list-style-type: none"> <li>• What is the proposed approach to the new data loads?</li> <li>• How complex will the new data loads be?</li> <li>• Who will perform the new data loads?</li> </ul>	<ul style="list-style-type: none"> <li>• How much new data is required to make the solution usable?</li> <li>• Where will the data come from and how much processing is required to make it usable?</li> <li>• What is the approach to data governance and management?</li> <li>• What is the approach to master and reference data management?</li> </ul>
<b>Central, Distributed and Communications Infrastructure</b>	Information technology infrastructure, either installed on-premises or in co-located or outsourced facilities or provided by an XaaS arrangement, of any type, dedicated or shared, that is required to allow components of the solution to operate.	<ul style="list-style-type: none"> <li>• What is the proposed approach to the design and sourcing of the communications infrastructure?</li> <li>• How complex will the new communications infrastructure?</li> <li>• Who will provide and configure the communications infrastructure?</li> </ul>	<ul style="list-style-type: none"> <li>• What technology infrastructure is required?</li> <li>• Where will the infrastructure be located?</li> <li>• How much existing infrastructure can be reused?</li> <li>• What infrastructure installation and configuration services are required?</li> </ul>
<b>Cutover/ Transfer to Production And Support</b>	Sets of services required to put the solution and its constituent components into production including organisational readiness, go live preparation and operations acceptance testing.	<ul style="list-style-type: none"> <li>• Who will manage service transition?</li> <li>• Will there be multiple phased transitions over time?</li> <li>• How long will service transition take?</li> </ul>	<ul style="list-style-type: none"> <li>• What is the approach to transferring the solution to production?</li> <li>• What is the approach to organisation change management?</li> </ul>
<b>Operational Functions and Processes</b>	Service management processes required to enable the solution to operate including incident, problem, change, service request, asset and other processes and the resourcing of the support and operational functions. This includes the implementation of new operational processes and the integration of the solution into existing processes.	<ul style="list-style-type: none"> <li>• What will the approach to service management be?</li> <li>• Who will perform the required levels of service management?</li> </ul>	<ul style="list-style-type: none"> <li>• What service management processes need to be updated to accommodate the operation of the solution?</li> <li>• Who will made the service management process changes?</li> <li>• What changes – training, staffing, new structures - need to be made the operational functions to accommodate the solution?</li> <li>• Who will made the operational function changes?</li> </ul>

# Solution Component Specific Design And Delivery Issues – 4/5

Solution Component Type	Description	Solution Design Considerations	Some Questions, Issues and Concerns
<b>Enhanced Support/Hypercare</b>	Immediately after the solution goes live, an enhanced level of support may be required for a defined interval or until defined exit criteria have been met. This includes the definition of the hypercare required and how long it should last.	<ul style="list-style-type: none"> <li>What will the approach to initial hypercare be?</li> <li>Who will perform the hypercare?</li> </ul>	<ul style="list-style-type: none"> <li>What level of enhanced support will be required after the solution goes live?</li> <li>What will be the approach to providing enhanced support?</li> <li>How long will enhanced support be required for?</li> <li>What are the exit deciding factors to stop the enhanced support?</li> <li>Who will provide enhanced support?</li> </ul>
<b>Sets of Maintenance, Service Management and Support Services</b>	Different solution components will require different types of maintenance and support arrangements. These services may be provided internally or acquired from external suppliers. This includes the design and specification of the support and maintenance arrangement and their acquisition from third parties and the implementation of the arrangements.	<ul style="list-style-type: none"> <li>What will the approach to solution component maintenance, support and management?</li> <li>What maintenance, support and management services will be insourced and outsourced?</li> <li>What service levels will be required?</li> <li>How automated will component maintenance be?</li> <li>How will upgrades be handled?</li> </ul>	<ul style="list-style-type: none"> <li>What solution components will require maintenance services?</li> <li>Who will provide the maintenance services?</li> <li>What is the scope and extent of the maintenance services?</li> <li>What maintenance service transition is required?</li> <li>How will the maintenance services be managed and reported on?</li> <li>What solution components will require support services?</li> <li>Who will provide the support services?</li> <li>What is the scope and extent of the support services?</li> <li>What support service transition is required?</li> <li>How will the support services be managed and reported on?</li> </ul>
<b>Application Hosting and Management Services</b>	Some of the solution components may be hosted outside the organisation either through cloud service providers or outsourcing arrangements. This includes the design and specification of the hosting services and their acquisition.	<ul style="list-style-type: none"> <li>What are the options for externally hosted solution components?</li> <li>What will the selection evaluation factors be?</li> <li>What will the approach be to integration?</li> <li>How will security be handled?</li> </ul>	<ul style="list-style-type: none"> <li>What solution components will be hosted externally?</li> <li>Who will provide the hosting services?</li> <li>What connectivity will be required to the hosting service provider(s)?</li> <li>How will security be managed?</li> <li>What hosting model(s) will be adopted?</li> <li>How will the hosting services be managed and reported on?</li> </ul>
<b>Parallel Runs</b>	If the solution replaces or extends an existing solution, the old and new solutions may need to operate in parallel for a defined interval or until defined exit criteria have been met. This includes the definition of the parallel run processes, the exit criteria and the additional resources needed to perform the parallel runs.	<ul style="list-style-type: none"> <li>What will the approach be to the parallel operation of the existing and new be, if needed?</li> </ul>	<ul style="list-style-type: none"> <li>How long will parallel runs be?</li> <li>How will the results of the parallel run(s) be evaluated?</li> <li>What will be the evaluation factors used to exit the parallel run(s)?</li> <li>What resources will be required to perform the parallel run(s)?</li> </ul>

# Solution Component Specific Design And Delivery Issues – 5/5

Solution Component Type	Description	Solution Design Considerations	Some Questions, Issues and Concerns
<b>Changes to Existing Business Processes</b>	Solutions exist to enable business processes to be operated. Existing business processes may need to be redesigned to take advantage of or to efficiently use the facilities of the solution and its components. This includes the redesign of the processes, the implementation of those changes and any process or standards documentation and training required.	<ul style="list-style-type: none"> <li>Is there an inventory of business processes that need to be changed?</li> <li>What are the options for business process change?</li> </ul>	<ul style="list-style-type: none"> <li>What existing business processes will need to be changed to support the use the solution?</li> <li>Who will design, validate and implement the changed business processes?</li> <li>What training will be required in the changed business processes?</li> <li>What additional material will be required to support the changed business processes?</li> </ul>
<b>New Business Processes</b>	New business processes may need to be defined, either entirely new ones or ones to replace existing processes, to operate the solution. This includes the redesign of the processes, the implementation of those changes and any process or standards documentation and training required.	<ul style="list-style-type: none"> <li>Is there an inventory of new business processes that need to be created?</li> <li>What are the options for implementing and operating the required new business processes?</li> </ul>	<ul style="list-style-type: none"> <li>What new business processes will need to be implemented to support the use the solution?</li> <li>Which existing business processes will be replaced by the new processes, if any?</li> <li>Who will design, validate and implement the new business processes?</li> <li>What training will be required in the new business processes?</li> <li>What additional material will be required to support the new business processes?</li> </ul>
<b>Organisational Changes, Knowledge Management</b>	Organisation changes may be required to operate the solution. This can include additional resources or redeployment of existing resources, new role types, new organisation structures and new locations. This includes the design of these organisation changes. New knowledge management facilities may be required to support the business operation and use of the solution.	<ul style="list-style-type: none"> <li>Who will be responsible for defining and agreeing the required organisation changes?</li> <li>What are the options for implementing and operating organisation changes?</li> </ul>	<ul style="list-style-type: none"> <li>What organisational changes – new or changed functions, new locations, new or changed roles – will be required to enable the effective use of the solution?</li> <li>What effort will be required to implement the changes?</li> <li>What approach to organisation change management will be adopted?</li> <li>What approach to knowledge management will be adopted?</li> <li>What knowledge management facilities will be required?</li> <li>How will knowledge management be initially loaded with information?</li> </ul>
<b>Training and Documentation</b>	Training and supporting documentation may be required across some or all of the solution components at different levels and aimed at different solution consumer types, both business and operational.	<ul style="list-style-type: none"> <li>Who will be responsible for defining and agreeing the required training and documentation?</li> <li>What are the options for sourcing the training and documentation?</li> </ul>	<ul style="list-style-type: none"> <li>How much training of what types and formats will be required?</li> <li>What approach to training will be adopted?</li> <li>What documentation of what types will be required?</li> </ul>

# Application Of Product Development Processes To Solution Architecture

# Product Management And Solution Architecture

- Solution architecture can use the product management approach in two ways:
  1. To ensure that the process to design the solution takes account of the wider solution operational and deployment landscape
    - Treat the solution design and implementation as a more commercial exercise that regards internal solution consumers as customers
  2. To manage the process for deciding which solutions should proceed to implementation using a rational stage-gate process

# Internal Solution Design And Delivery And The Stage/Gate Process

- When used internally within organisations, the stage/gate process typically operates in a much-reduced format
  - Gates are treated largely as progress review checkpoints – they are not concerned with the survival of the fittest solutions and the cancellation of the rest
  - There tends not to be any portfolio solution assessment



# Solution Delivery Of The Internal IT Function Needs To Mirror That Of The Organisation

**IT Function Delivering Solutions to Other Business Functions**

## **Manage Information Technology**

**Develop Vision  
and Strategy**

**Manage Supply  
Chain for  
Products, Services  
and Solutions**

**Design, Develop  
and Manage  
Products, Services  
and Solutions**

**Market and Sell  
Products, Services  
and Solutions**

**Deliver Products,  
Services and  
Solutions**

**Manage Customer  
Service**

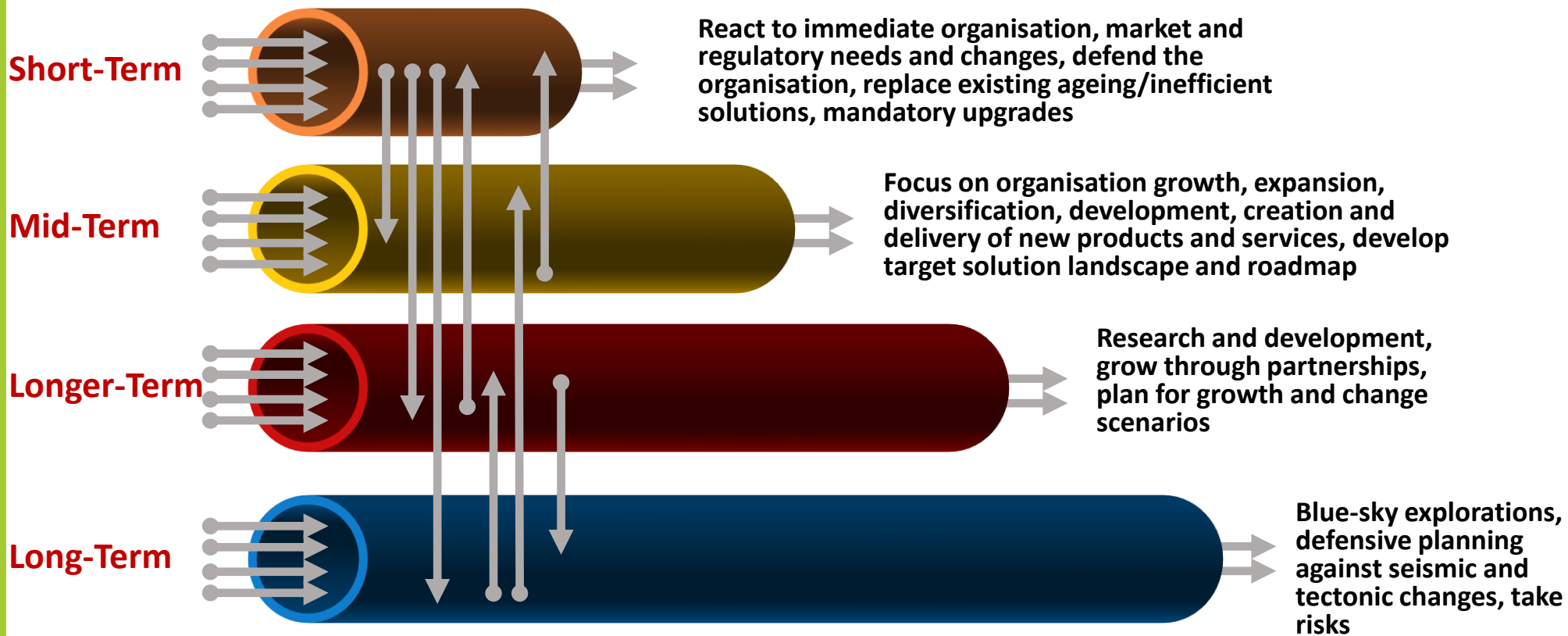
**IT Function Delivering Solutions to Other Business Functions**

# Solution Pipelines And Horizons

- Need structured process to manage the pipelines of solutions needed by the organisation
- The sum of the solution pipelines represent the portfolio of current and future solution
- The pipeline process is also concerned with allocating sufficient resources to long-term research and speculative solution identification
- Use production development and management concepts and approaches to assist with managing the solution design and selection process
- One of the concerns regarding the product development stage gate process is that too many projects pass gates with too few resources to move the portfolio of projects forward

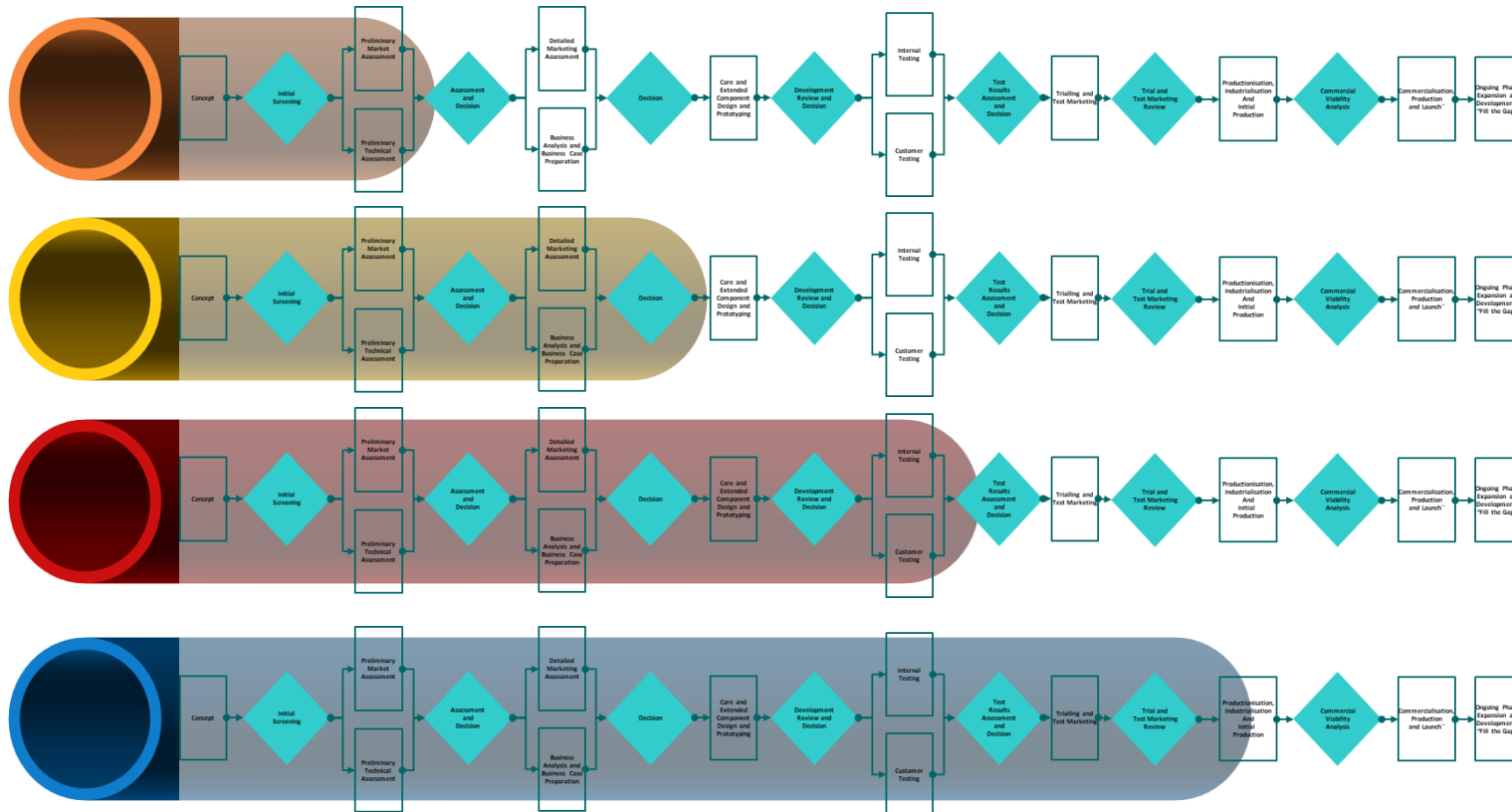
# Solution Pipelines

- Solution architecture function needs to maintain multiple solution pipelines, each with different timelines reflecting solution implementation priorities
- Not all solutions reach the end of their pipeline and are implemented
- Solutions can move between pipelines as priorities change

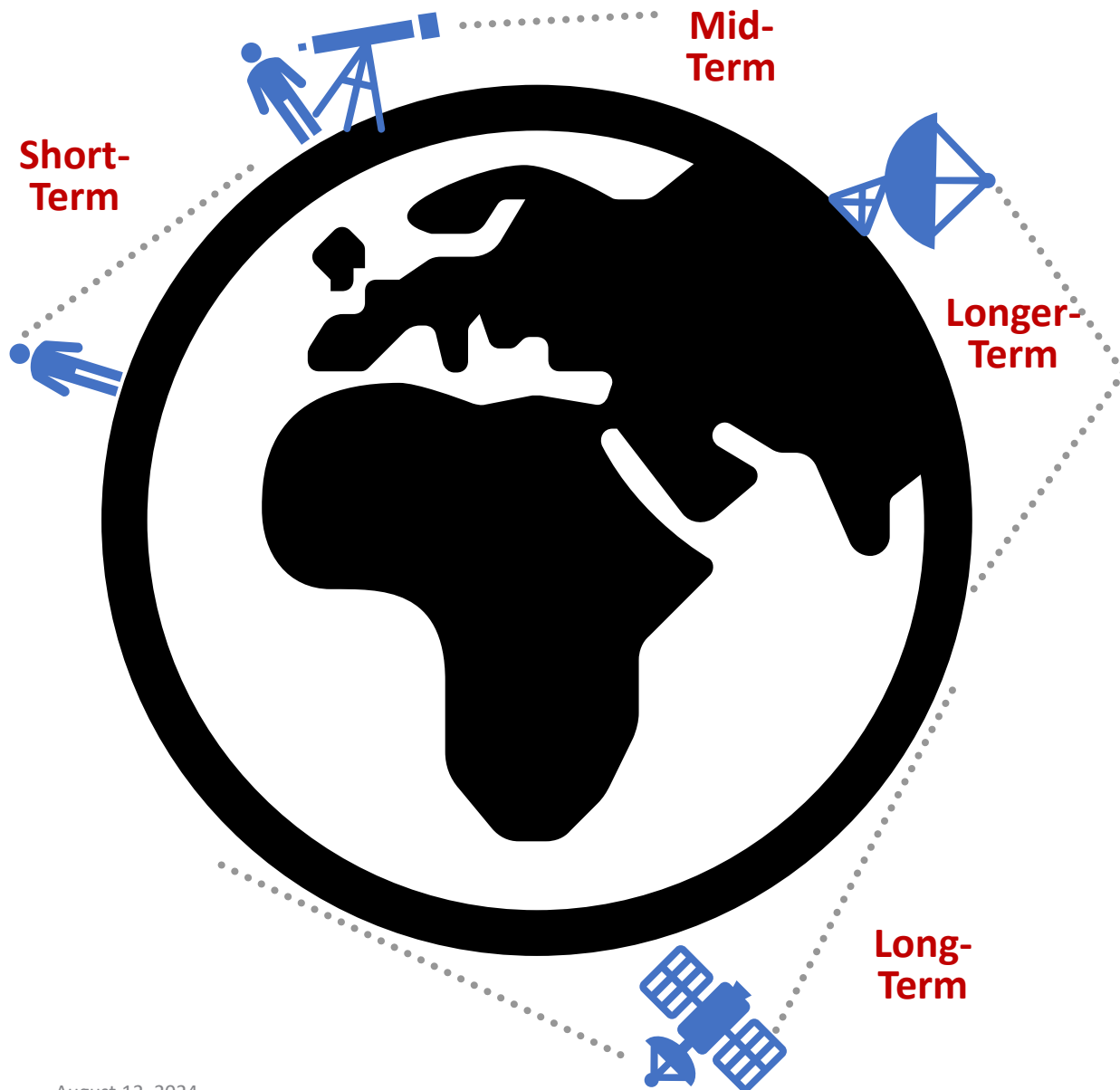


# Applying Stage Gate Processes To Solution Pipelines

- A structured product stage gate process can be used to manage the prioritisation of projects within and across the various solution pipelines



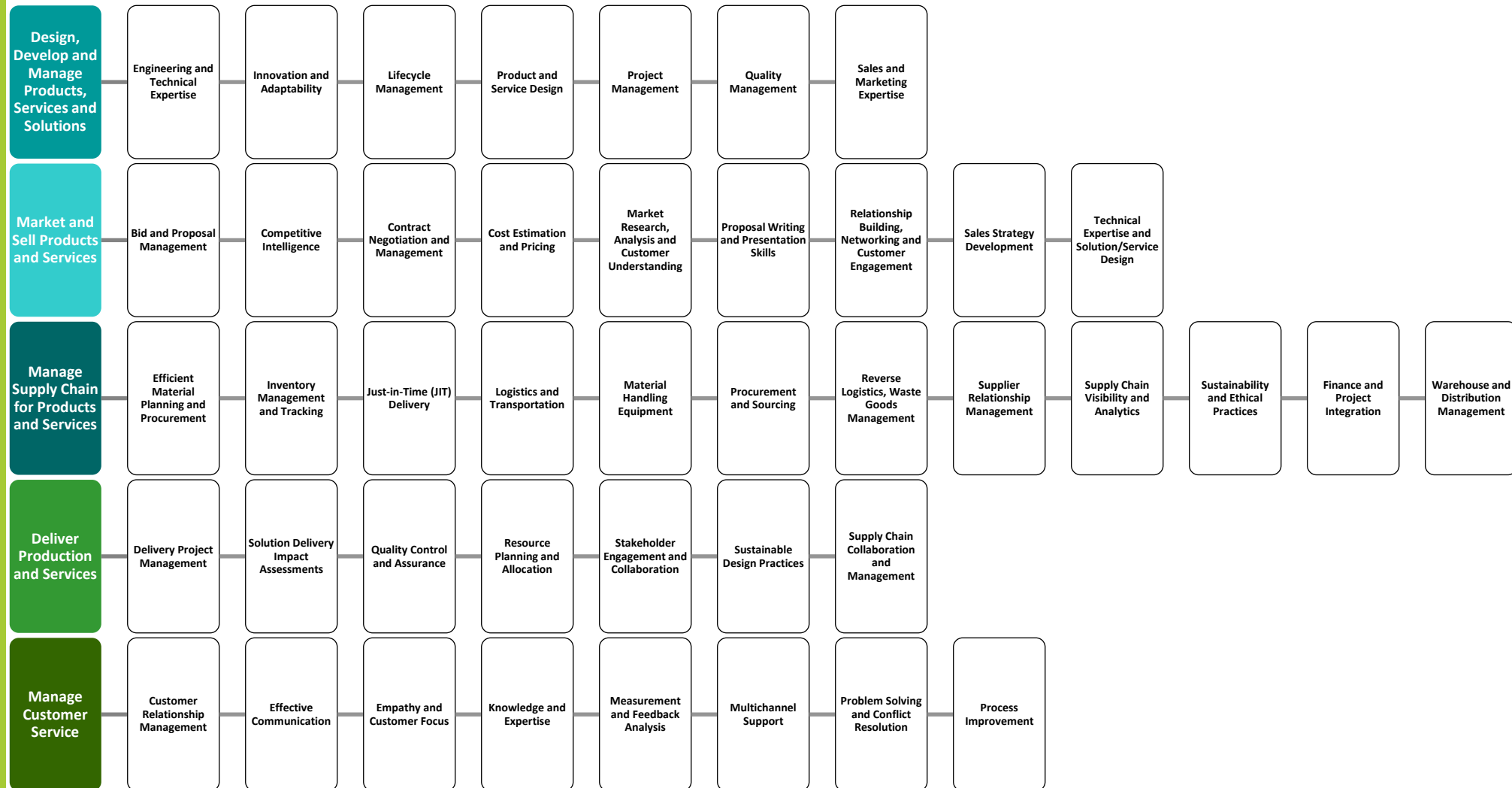
# Solution Horizons



- Solution pipelines apply to different time horizons
- Multiple balances are required between short term anticipation, to planned diversification, new relationships and strategy development to investment in research and planning to long-term risk taking and experimentation

# Core, Extended And Supporting Product/Solution/Service Management And Development Capabilities And Practices

# Core, Extended And Supporting Product/Solution/Service Management And Development Capabilities And Practices



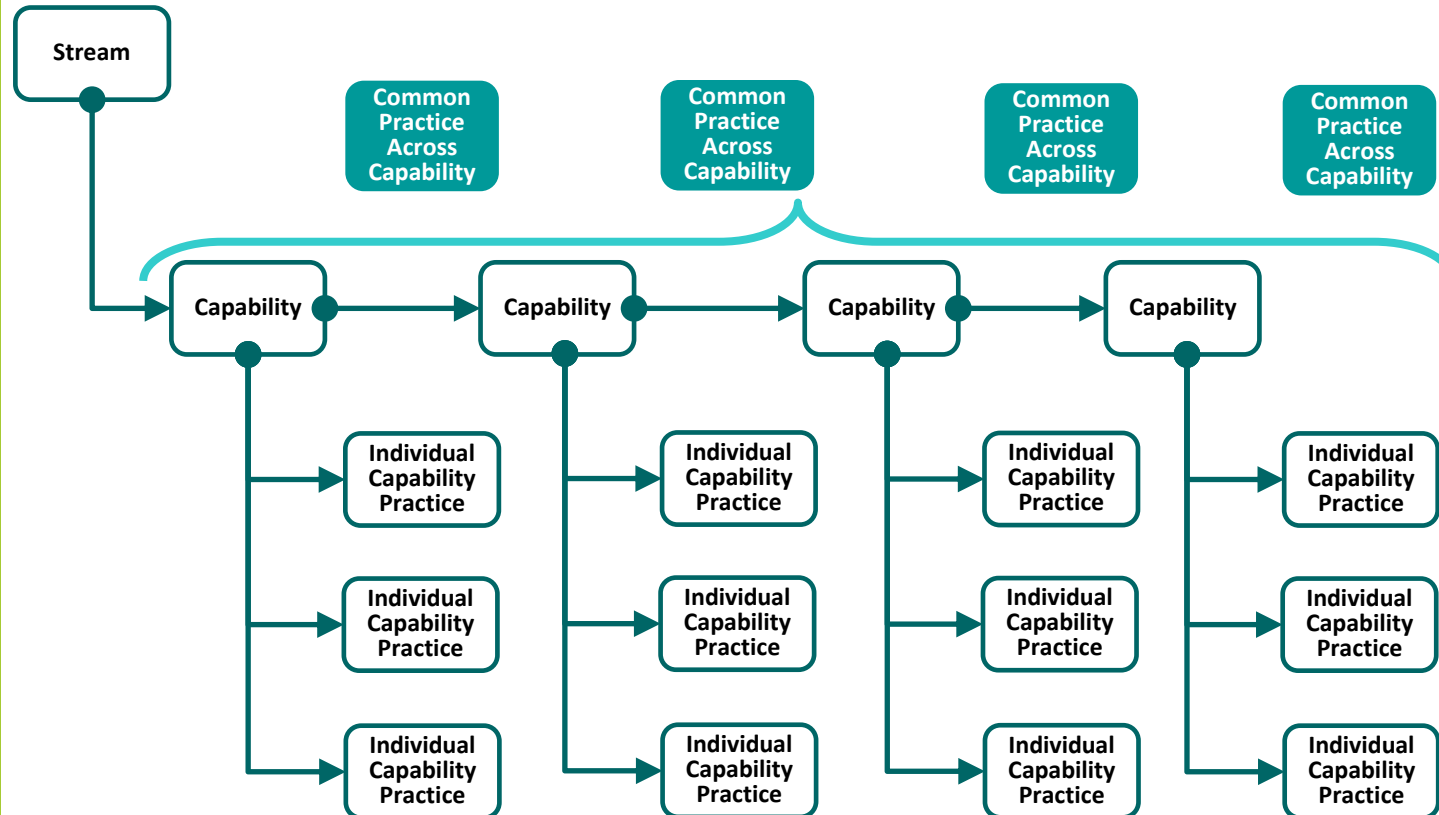
# Core, Extended And Supporting Product/Solution/Service Management And Development Capabilities And Practices

- These describe the key generic capabilities required across the major capability groups:
  - Design, Develop and Manage Products, Services and Solutions
  - Market and Sell Products and Services
  - Manage Supply Chain for Products and Services
  - Deliver Production and Services
  - Manage Customer Service
- This presents an alternative view of the capabilities required to be good at the spectrum of solution design and delivery-related activities
- This approach is intended to be comprehensive and detailed





# Structure Of Streams, Capabilities And Practices

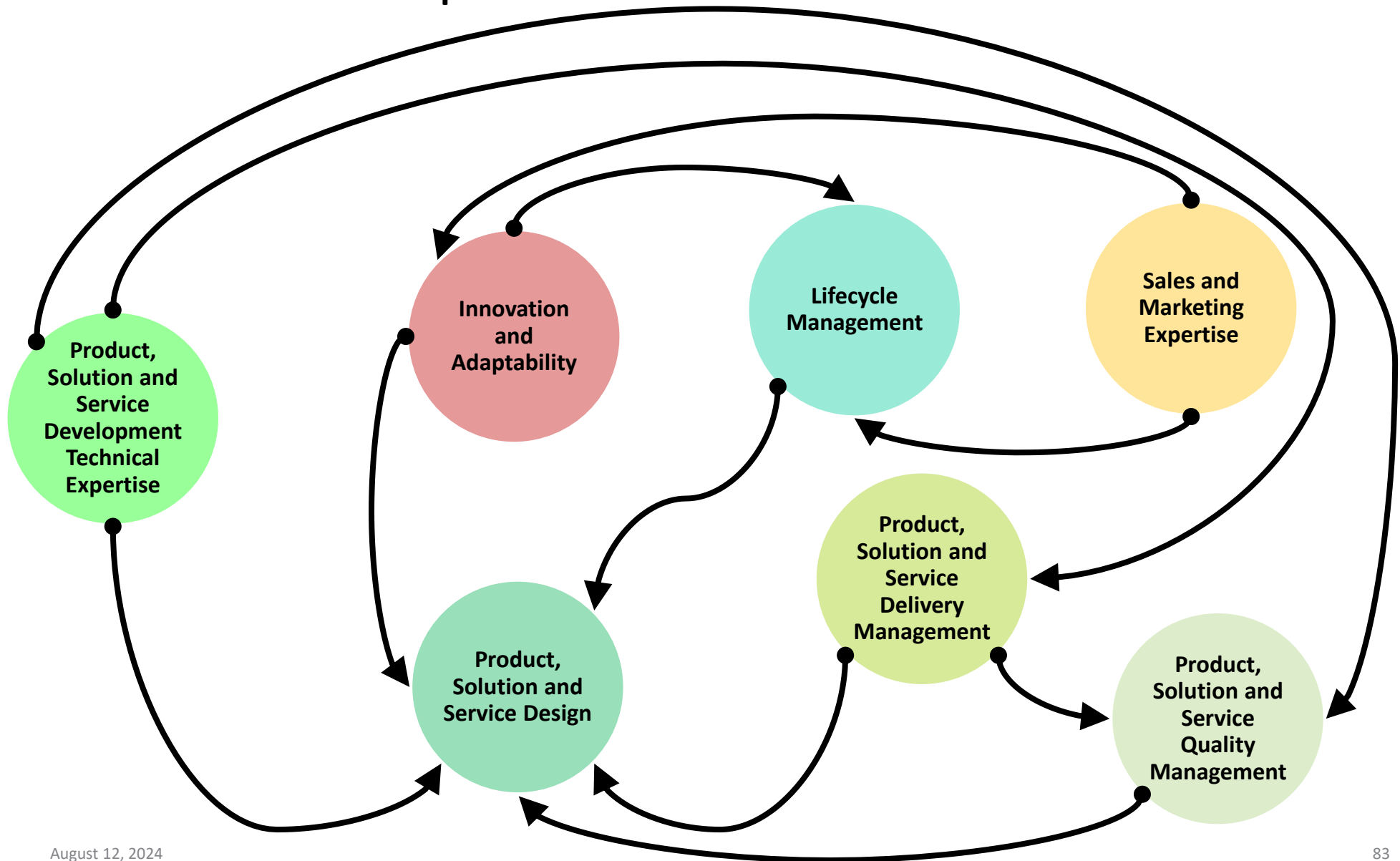


- Each capability within each stream has a defined set of practices that comprise what is required within that capability
- The practices for each capability are initially listed in isolation
- The important cross-capability practices can then be identified

# Design, Develop and Manage Products, Services and Solutions Capabilities and Practices

- This expands the capability ***Design, Develop and Manage Products, Services and Solutions*** capability group into its constituent capabilities and practices and provides more detail on the
- This is the core solution design capabilities within the extended set of solution-related capability groups

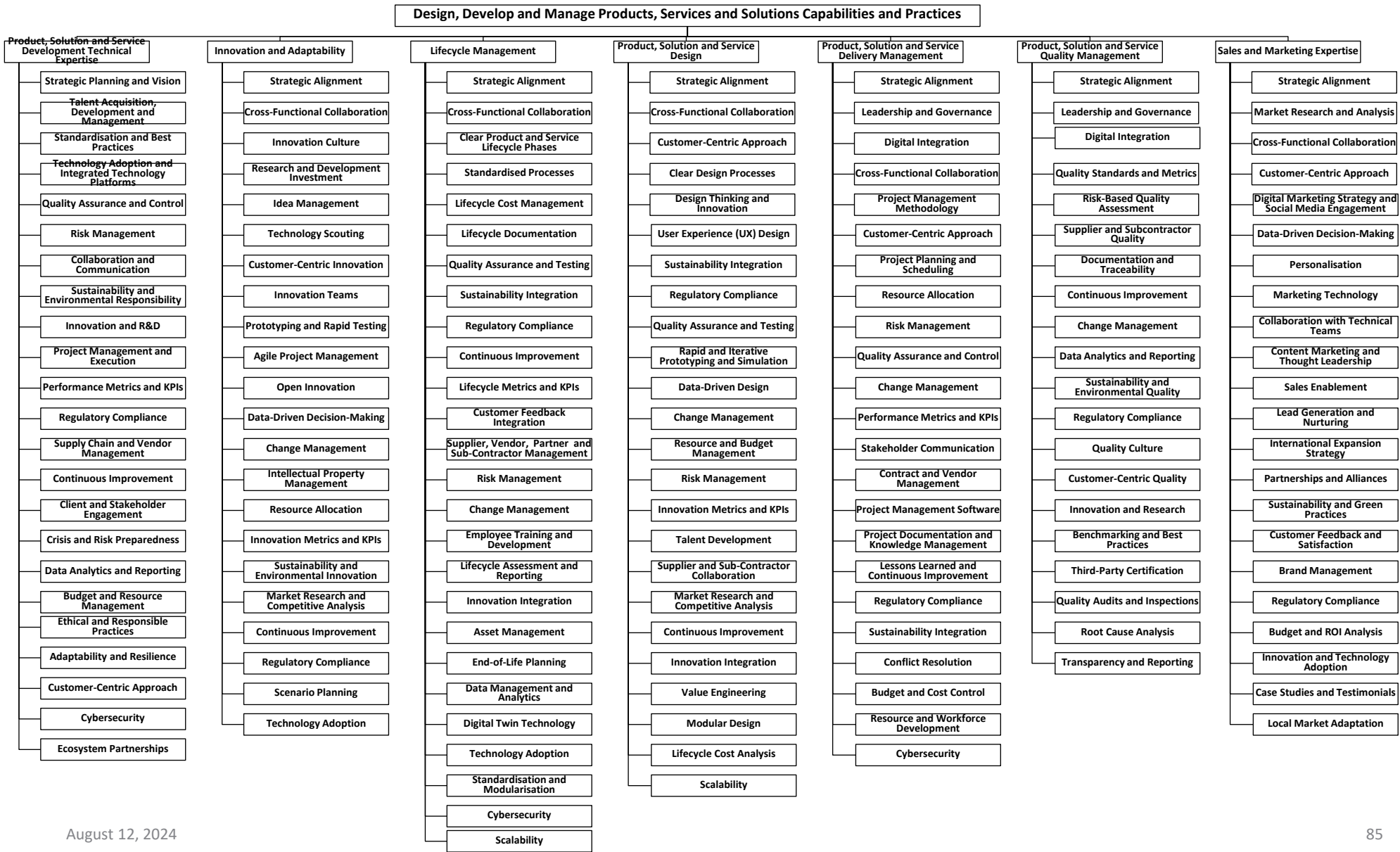
# ***Design, Develop and Manage Products, Services and Solutions Capabilities***



# Core Solution Management And Development Capabilities Generalised Model

- Generalised model consists of the following key capability areas:
  1. Product, Solution and Service Development Technical Expertise
  2. Innovation and Adaptability
  3. Lifecycle Management
  4. Product, Solution and Service Design
  5. Product, Solution and Service Delivery Management
  6. Product, Solution and Service Quality Management
  7. Sales and Marketing Expertise
- This is a logical view - these are not discrete capabilities – there are overlaps
- There are many ways to define key capabilities – this is one way
  - Focus on the substance and content of the capabilities rather than on the superficial structure
- This represents a set of skills, capabilities, talents and proficiencies an organisation needs to possess to

# Design, Develop and Manage Products, Services and Solutions Capabilities and Practices



# Design, Develop and Manage Products, Services and Solutions Capabilities and Practices

- Generalised and comprehensive set of capabilities and their constituent practices
- A framework such as this can be used for both external and internal solution development
- It can be used to identify those practices that are relevant to your organisation and its solution delivery circumstances – internal or external, the importance of those practices and their current state of implementation and operation

# Design, Develop and Manage Products, Services and Solutions Capabilities and Practices Assessment

- An assessment can identify what practices to focus on establishing or improving
- You can map phased target future state(s) and define the activities and tasks required to achieve them
- You can then look at acquiring and implementing technologies that support the efficient operation of those practices





# Practices Within Capability – *Product, Solution and Service Development Technical Expertise*

<b>Strategic Planning and Vision</b>	Develop a clear and forward-looking strategy for the Engineering and Technical Expertise capability that aligns with the company's overall goals and market demands and define a vision for digital transformation within your industry
<b>Talent Acquisition, Development and Management</b>	Recruit, develop and retain top engineering and technical talent and foster and provide a culture of continuous learning and skill development/professional development to keep your team up to date with the latest industry trends
<b>Standardisation and Best Practices</b>	Establish standardised processes and best practices for design, construction and operation across subsidiaries, ensure knowledge sharing and transfer between different units, stay updated on global product and solution design and development standards, best practices and industry benchmarks and align your operations with these standards to ensure consistency and quality across subsidiaries, ensure that innovative solutions can be scaled up and standardised for broader use across different subsidiaries and regions and develop clear implementation guidelines
<b>Technology Adoption and Integrated Technology Platforms</b>	Stay current with emerging technologies in product and solution design and development and engineering and invest in digital tools) and other software that streamline processes
<b>Quality Assurance and Control</b>	Implement rigorous quality control processes to ensure high standards in product and solution design and development and operations and continuously monitor and improve quality
<b>Risk Management</b>	Develop robust risk assessment and mitigation strategies for product and solution design and development and operational phases and ensure compliance with local regulations and safety standards
<b>Collaboration and Communication</b>	Foster strong communication, knowledge sharing, cross-functional teamwork and collaboration between subsidiaries, departments and sub-contractors and use project management tools and software for efficient communication
<b>Sustainability and Environmental Responsibility</b>	Incorporate sustainable product and solution design and development practices and stay informed of and compliant with environmental regulations and certifications and aim for green certifications
<b>Innovation and R&amp;D</b>	Invest in research and development to stay at the forefront of industry innovation and encourage teams to propose and pilot new technologies and methods to test and validate new technologies and processes before full-scale implementation and collect data and feedback to refine and improve your innovations
<b>Project Management and Execution</b>	Implement efficient project management processes to ensure projects are delivered on time and within budget
<b>Performance Metrics and KPIs</b>	Define key performance indicators (KPIs) to measure the effectiveness of the Engineering and Technical Expertise function and regularly assess and report on these metrics
<b>Regulatory Compliance</b>	Stay up-to-date with local, national and international regulations and ensure all projects and operations comply with legal requirements
<b>Supply Chain and Vendor Management</b>	Establish strong relationships with sub-contractors and suppliers and implement vendor evaluation and management processes
<b>Continuous Improvement</b>	Encourage a culture of continuous improvement and learning and regularly review and optimise processes and practices
<b>Client and Stakeholder Engagement</b>	Keep clients and stakeholders informed and engaged throughout the project lifecycle and seek feedback to drive improvements
<b>Crisis and Risk Preparedness</b>	Develop contingency plans for crisis situations, such as natural disasters or unexpected delays
<b>Data Analytics and Reporting</b>	Utilise data analytics to make informed decisions and identify trends insights into product and solution design and development processes, cost management and project performance and create insightful reports for better decision-making
<b>Budget and Resource Management</b>	Efficiently allocate resources and manage budgets for different projects and monitor financial performance closely and design cost-effective solutions and monitor costs carefully to ensure a competitive edge in the market
<b>Ethical and Responsible Practices</b>	Uphold ethical and responsible business practices, such as fair labour, diversity and community engagement
<b>Adaptability and Resilience</b>	Be prepared to adapt to changing market conditions, technological advancements and unforeseen challenges
<b>Customer-Centric Approach</b>	Focus on understanding and meeting the needs of your customers and use customer feedback to improve your products and services continually
<b>Cybersecurity</b>	Invest in robust cybersecurity measures to protect sensitive project data and intellectual property
<b>Ecosystem Partnerships</b>	Collaborate with technology providers, startups and industry associations to gain insights and access cutting-edge solutions

# Practices Within Capability – *Innovation and Adaptability*

<b>Strategic Alignment</b>	Develop a clear strategic vision that emphasises innovation, research and adaptability as core elements of your organisation's culture and business model and ensure that the Innovation and Adaptability capability aligns with your function's strategic goals and the broader company's mission and overarching company objectives
<b>Cross-Functional Collaboration</b>	Foster collaboration and information sharing between your function and other departments, such as R&D, Operations and Marketing
<b>Innovation Culture</b>	Cultivate an innovation-focused culture that encourages engineers, architects, project managers and other teams to generate and explore new ideas, take calculated risks and learn from failures
<b>Research and Development Investment</b>	Allocate a dedicated budget for research and development initiatives, including the exploration of new product and solution materials, methods and technologies and establish a dedicated Research and Development team with expertise in product and solution technology and emerging opportunities and challenges
<b>Idea Management</b>	Implement an idea management system to capture, evaluate and prioritise innovative ideas from employees and stakeholders
<b>Technology Scouting</b>	Regularly scan the market for emerging technologies, materials and product and solution creation methods that can enhance your products and services
<b>Customer-Centric Innovation</b>	Engage with customers to understand their evolving needs and preferences and use this feedback to drive innovation in product and service design
<b>Innovation Teams</b>	Form dedicated innovation teams or task forces responsible for researching, testing and implementing innovative solutions
<b>Prototyping and Rapid Testing</b>	Develop a process for rapid prototyping and testing of new product and service concepts to validate their feasibility and desirability
<b>Agile Project Management</b>	Adopt agile methodologies to improve project flexibility and responsiveness to change during the design and development phases
<b>Open Innovation</b>	Foster a culture of open innovation and explore collaborations and opportunities for co-innovation with external partners, startups, universities and research institutions to leverage their expertise and technologies, set up innovation labs or centres to experiment with new technologies and product and solution design and development methods
<b>Data-Driven Decision-Making</b>	Utilise data analytics to inform product and service design decisions, customer feedback analysis and performance tracking
<b>Change Management</b>	Develop a structured change management strategy to ensure a smooth transition when implementing new technologies, processes, or products
<b>Intellectual Property Management</b>	Implement clear policies for managing intellectual property generated through innovation, including patents and licensing
<b>Resource Allocation</b>	Allocate resources, such as funding and talent, to support innovation efforts effectively and prioritise projects based on strategic goals
<b>Innovation Metrics and KPIs</b>	Define and track key performance indicators (KPIs) to measure the success and impact of innovation initiatives and R&D efforts and regularly review and refine your approach based on these metrics
<b>Sustainability and Environmental Innovation</b>	Incorporate sustainability and environmental considerations such as green and eco-friendly product and solution design and development technologies into your product and service innovation efforts
<b>Market Research and Competitive Analysis</b>	Stay informed about market trends, competitor innovations and emerging customer needs and use this information to identify opportunities for product and service development
<b>Continuous Improvement</b>	Establish a process for continuously reviewing and optimising your innovation practices
<b>Regulatory Compliance</b>	Ensure that innovative products and services adhere to local and international regulatory requirements
<b>Scenario Planning</b>	Develop scenarios and contingency plans to anticipate potential market changes and disruptions
<b>Technology Adoption</b>	Keep a close watch on emerging product and solution design and development technologies and evaluate the feasibility of adopting these technologies into your projects

# Practices Within Capability – *Lifecycle Management*

<b>Strategic Alignment</b>	Ensure that your product, solution and service design capability aligns with your function's strategic goals and supports the overall company strategy
<b>Cross-Functional Collaboration</b>	Foster collaboration and communication with other departments, such as engineering, operations, marketing and R&D, to ensure seamless product, solution and service development and delivery
<b>Customer-Centric Approach</b>	Prioritise understanding customer needs and preferences through market research and feedback and integrate customer feedback into the design process
<b>Clear Design Processes</b>	Develop standardised design processes that define key stages, responsibilities and deliverables for product, solution and service design
<b>Design Thinking and Innovation</b>	Implement design thinking principles and methodologies to understand end-users' needs, pain points and preferences and to encourage innovative, user-centred solutions and create a culture that values and promotes innovation
<b>User Experience (UX) Design</b>	Invest in UX design tools and skills to enhance the usability and user satisfaction of products and services
<b>Sustainability Integration</b>	Incorporate sustainable design practices, such as using eco-friendly materials and energy-efficient solutions
<b>Regulatory Compliance</b>	Ensure that designs comply with local, national and international regulations and standards
<b>Quality Assurance and Testing</b>	Implement robust quality control and testing procedures throughout the design process to maintain high standards
<b>Rapid and Iterative Prototyping and Simulation</b>	Use rapid prototyping and iterative design techniques and simulation tools to quickly test and refine design concepts to allow for continuous improvements based on feedback and real-world testing
<b>Data-Driven Design</b>	Utilise data analytics to make informed design decisions and track performance
<b>Change Management</b>	Develop a structured approach to manage changes in product, solution and service design and development
<b>Resource and Budget Management</b>	Efficiently allocate resources and manage budgets for design projects
<b>Risk Management</b>	Identify and mitigate design-related risks, such as cost overruns or design flaws
<b>Innovation Metrics and KPIs</b>	Define and track key performance indicators (KPIs) to measure the success and impact of design initiatives
<b>Talent Development</b>	Invest in training and development programs to enhance the skills and knowledge of your design team
<b>Supplier and Sub-Contractor Collaboration</b>	Build strong relationships with suppliers and sub-contractors to ensure the timely and cost-effective sourcing of resources, components, materials and services
<b>Market Research and Competitive Analysis</b>	Stay informed about market trends, competitor offerings and emerging technologies
<b>Continuous Improvement</b>	Establish processes for ongoing review and optimisation of design practices based on feedback and lessons learned
<b>Innovation Integration</b>	Continuously seek opportunities to integrate innovations and improvements into product, solution and service design
<b>Value Engineering</b>	Implement value engineering practices to optimise product and solution design and development for cost efficiency without compromising quality
<b>Modular Design</b>	Explore modular product and solution design and development methods to increase flexibility and scalability while reducing costs to speed up design and development processes and facilitate future expansions or adaptations
<b>Lifecycle Cost Analysis</b>	Consider the total cost of ownership over the lifecycle of your products and solutions that includes not only initial design and development costs but also operating and maintenance expenses
<b>Scalability</b>	Ensure that your Product, Solution and Service Design capability is scalable to accommodate growth, both in terms of projects and geographic expansion

# Practices Within Capability – *Product, Solution and Service Design*

<b>Strategic Alignment</b>	Ensure that your product, solution and service design capability aligns with your function's strategic goals and supports the overall company strategy
<b>Cross-Functional Collaboration</b>	Foster collaboration and communication with other departments, such as engineering, operations, marketing and R&D, to ensure seamless product, solution and service development and delivery
<b>Customer-Centric Approach</b>	Prioritise understanding customer needs and preferences through market research and feedback and integrate customer feedback into the design process
<b>Clear Design Processes</b>	Develop standardised design processes that define key stages, responsibilities and deliverables for product, solution and service design
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<b>User Experience (UX) Design</b>	Invest in UX design tools and skills to enhance the usability and user satisfaction of products and services
<b>Sustainability Integration</b>	Incorporate sustainable design practices, such as using eco-friendly materials and energy-efficient solutions
<b>Regulatory Compliance</b>	Ensure that designs comply with local, national and international regulations and standards
<b>Quality Assurance and Testing</b>	Implement robust quality control and testing procedures throughout the design process to maintain high standards
<b>Rapid and Iterative Prototyping and Simulation</b>	Use rapid prototyping and iterative design techniques and simulation tools to quickly test and refine design concepts to allow for continuous improvements based on feedback and real-world testing
<b>Data-Driven Design</b>	Utilise data analytics to make informed design decisions and track performance
<b>Change Management</b>	Develop a structured approach to manage changes in product, solution and service design and development
<b>Resource and Budget Management</b>	Efficiently allocate resources and manage budgets for design projects
<b>Risk Management</b>	Identify and mitigate design-related risks, such as cost overruns or design flaws
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<b>Scalability</b>	Ensure that your Product, Solution and Service Design capability is scalable to accommodate growth, both in terms of projects and geographic expansion

# Practices Within Capability – *Product, Solution and Service Delivery Management*

<b>Strategic Alignment</b>	Ensure that your Project Management capability aligns with your function's strategic goals and supports the company's overall strategy
<b>Leadership and Governance</b>	Appoint experienced project managers and establish a Project Management Office (PMO) to oversee project management functions, set standards and provide governance
<b>Digital Integration</b>	Incorporate digital tools and technologies such as project management software, digital interaction and sharing platforms for collaboration and data analytics to enhance project planning, execution and monitoring
<b>Cross-Functional Collaboration</b>	Foster collaboration and communication with other departments, such as engineering, design, operations and procurement, to facilitate seamless project execution
<b>Project Management Methodology</b>	Establish a clear and standardised project management methodology, which defines project phases, processes, roles and responsibilities
<b>Customer-Centric Approach</b>	Focus on understanding and meeting the evolving needs of your clients and regularly engage with clients to gather feedback and enhance customer satisfaction
<b>Project Planning and Scheduling</b>	Develop comprehensive project plans and schedules that include key milestones and deadlines
<b>Resource Allocation</b>	Efficiently allocate resources, including personnel and budget, to meet project requirements
<b>Risk Management</b>	Identify and assess project risks, develop mitigation strategies and establish a risk management plan
<b>Quality Assurance and Control</b>	Implement rigorous quality control processes to ensure that project deliverables meet the specified standards
<b>Change Management</b>	Develop a structured approach to manage changes in project scope, schedule, or budget
<b>Performance Metrics and KPIs</b>	Define key performance indicators (KPIs) to measure project performance and regularly assess and report on these metrics
<b>Stakeholder Communication</b>	Maintain open and transparent communication with all project stakeholders, including clients, subcontractors and internal teams
<b>Contract and Vendor Management</b>	Establish robust contract and vendor management practices for dealing with subcontractors and suppliers
<b>Project Management Software</b>	Utilise project management software and tools to streamline processes, monitor progress and track project performance
<b>Project Documentation and Knowledge Management</b>	Maintain comprehensive project and knowledge documentation, including project plans, reports and issue logs
<b>Lessons Learned and Continuous Improvement</b>	Encourage a culture of learning by capturing and applying lessons learned from previous projects
<b>Regulatory Compliance</b>	Ensure that projects comply with local, national and international regulations and safety standards
<b>Sustainability Integration</b>	Incorporate sustainability considerations into project management, such as environmentally friendly product and solution design and development practices
<b>Conflict Resolution</b>	Client Satisfaction and Feedback
<b>Budget and Cost Control</b>	Implement strategies for controlling project budgets and costs to prevent overruns
<b>Resource and Workforce Development</b>	Invest in training and development programs to enhance the skills and knowledge of your project management team
<b>Cybersecurity</b>	Prioritise cybersecurity to protect sensitive project data and ensure the security of digital project management systems

# Practices Within Capability – *Product, Solution and Service Quality Management*

<b>Strategic Alignment</b>	Align your Quality Management capability with the company's strategic goals and digital transformation initiatives and ensure that quality is a fundamental component of the company's mission
<b>Leadership and Governance</b>	Appoint experienced quality managers to oversee quality control and assurance processes and establish a Quality Management Office (QMO) or similar governance structure to centralise and coordinate quality efforts
<b>Digital Integration</b>	Leverage digital tools, such as quality management software and sensors, to monitor and manage quality in real-time and use data analytics to identify and address quality issues
<b>Quality Standards and Metrics</b>	Develop and maintain a comprehensive set of quality standards and metrics specific to your industry and ensure that these standards are consistently applied across all subsidiaries and projects
<b>Risk-Based Quality Assessment</b>	Implement a risk-based approach to quality assessment, where higher-risk areas receive more thorough quality inspections and monitoring
<b>Supplier and Subcontractor Quality</b>	Establish clear quality expectations for subcontractors and suppliers, monitor their compliance and performance closely and be selective in choosing suppliers and materials that meet your quality standards and align with your sustainability goals
<b>Documentation and Traceability</b>	Maintain detailed records of all quality-related activities and changes to ensure traceability and accountability throughout the project lifecycle
<b>Continuous Improvement</b>	Embrace a culture of continuous improvement in quality management and regularly review and refine quality processes based on data and feedback
<b>Change Management</b>	Recognise that digital transformation may involve significant changes in how quality is managed and implement change management strategies to help teams adapt to new technologies and methodologies
<b>Data Analytics and Reporting</b>	Utilise data analytics tools to track quality performance, identify trends and make data-driven decisions and develop clear and actionable quality reports to communicate status and areas for improvement
<b>Sustainability and Environmental Quality</b>	Integrate sustainability and environmental considerations into your quality management processes and ensure that product and solution design and development practices are aligned with eco-friendly standards
<b>Regulatory Compliance</b>	Stay up to date with relevant regulations and standards in the countries where you operate and ensure that your quality management practices meet or exceed these requirements
<b>Quality Culture</b>	Promote a culture of quality throughout the organisation and encourage all employees to take responsibility for the quality of their work
<b>Customer-Centric Quality</b>	Focus on understanding and meeting the evolving quality expectations of clients and engage with clients regularly to gain feedback and improve their satisfaction
<b>Innovation and Research</b>	Invest in research and development to explore and adopt emerging quality management technologies, such as IoT for quality monitoring, AI for predictive quality analysis and advanced testing equipment
<b>Benchmarking and Best Practices</b>	Benchmark your quality management practices against industry best practices and look to adopt and adapt successful strategies used by other leading companies
<b>Third-Party Certification</b>	Pursue third-party certifications and quality awards to demonstrate your commitment to quality
<b>Quality Audits and Inspections</b>	Conduct regular quality audits and inspections to monitor and verify the effectiveness of quality management practices
<b>Root Cause Analysis</b>	Develop a process for identifying and addressing the root causes of quality issues to prevent their recurrence
<b>Transparency and Reporting</b>	Communicate openly about quality initiatives, issues and progress with relevant stakeholders

# Practices Within Capability – *Sales and Marketing Expertise*

<b>Strategic Alignment</b>	Ensure that your Sales and Marketing Expertise capability aligns with your function's strategic goals and the overall company strategy
<b>Market Research and Analysis</b>	Invest in comprehensive market research to understand industry trends, customer needs and emerging technologies and continuously monitor the market and competition to identify opportunities and threats
<b>Cross-Functional Collaboration</b>	Foster collaboration and information sharing between the Sales and Marketing team and other departments, such as engineering, design and operations, to align strategies and support successful project implementation
<b>Customer-Centric Approach</b>	Develop a deep understanding of your customers' needs and preferences and tailor your products, services and solutions to meet their specific requirements
<b>Digital Marketing Strategy and Social Media Engagement</b>	Embrace digital marketing techniques, including online presence(s), content marketing, SEO, social media and email marketing, to reach a broader audience and engage with potential clients and industry peers through social media platforms to build brand awareness and credibility
<b>Data-Driven Decision-Making</b>	Utilise data analytics to gain insights into customer behaviour and preferences and use this data to make informed decisions about your marketing strategies
<b>Personalisation</b>	Implement personalisation in your marketing efforts to deliver targeted messages and offers to different customer segments
<b>Marketing Technology</b>	Invest in marketing automation tools and customer relationship management (CRM) systems to streamline marketing and sales processes and enhance customer management
<b>Collaboration with Technical Teams</b>	Foster strong collaboration between your sales and marketing teams and technical teams responsible for product and service development and ensure alignment between what's marketed and what's delivered
<b>Content Marketing and Thought Leadership</b>	Develop thought leadership content to establish your company as an industry authority and share valuable insights, case studies and research to build trust with potential clients
<b>Sales Enablement</b>	Equip your sales teams with the tools and knowledge they need to effectively communicate the value of your products and services and provide ongoing training and resources
<b>Lead Generation and Nurturing</b>	Implement lead generation strategies to attract potential clients and nurture them through the sales funnel and develop clear processes for handling leads and converting them into customers
<b>International Expansion Strategy</b>	Create a clear strategy for expanding into new European markets, taking into account local regulations, market dynamics and cultural considerations
<b>Partnerships and Alliances</b>	Explore strategic partnerships and alliances with complementary companies to expand your reach and offer bundled solutions
<b>Sustainability and Green Practices</b>	Emphasise your company's commitment to sustainability and green building practices in your marketing efforts, as these aspects are increasingly important to clients and regulatory bodies
<b>Customer Feedback and Satisfaction</b>	Collect and analyse customer feedback to continuously improve your products and services Use testimonials and case studies to showcase your successful projects
<b>Brand Management</b>	Develop a strong brand identity and ensure consistency in branding across all subsidiaries and monitor and protect your brand's reputation
<b>Regulatory Compliance</b>	Stay informed about the regulatory requirements in each European country where you operate and ensure that your marketing and sales practices comply with local laws
<b>Budget and ROI Analysis</b>	Implement a rigorous budgeting and ROI analysis process to measure the effectiveness of marketing and sales efforts and adjust strategies based on performance data
<b>Innovation and Technology Adoption</b>	Stay at the forefront of technology adoption in marketing, such as AI-powered marketing solutions and augmented reality for showcasing products and solutions
<b>Case Studies and Testimonials</b>	Showcase successful projects and client testimonials to build trust and credibility
<b>Local Market Adaptation</b>	Tailor your sales and marketing strategies to meet the specific requirements and cultural nuances of different European countries



# Capability And Practice Assessment

Practice Within Capability

Capability

Select Your View on the Priority

Select Your View on the Degree of Practice Automation by Technology

Select Your View on the Current State of Operation

Capability and Practice	Description	Notes	Priority of This Practice	Level of Automation Possible by Technology Solution	Satisfaction With Current Implementation and Operation	Importance	Current State of Implementation and Operation	Desired Target State Implementation and Operation
Ecosystem Partnerships	Collaborate with technology providers, startups and industry associations to gain insights and access cutting-edge solutions							
Innovation, Research and Development and Adaptability								
Strategic Alignment	Develop a clear strategic vision that emphasises innovation, research and adaptability as core elements of your organisation's culture and business model and ensure that the Innovation and Adaptability capability aligns with your function's strategic goals and the broader company's mission and overarching company objectives							
Cross-Functional Collaboration	Foster collaboration and information sharing between your function and other departments, such as R&D, Operations and Marketing							
Innovation Culture	Cultivate an innovation-focused culture that encourages engineers, architects, project managers and other teams to generate and explore new ideas, take calculated risks and learn from failures							
Research and Development Investment	Allocate a dedicated budget for research and development initiatives, including the exploration of new construction materials, methods and technologies and establish a dedicated Research and Development team with expertise in construction technology and emerging							
Idea Management	Implement an idea management system to capture, evaluate and prioritise innovative ideas from employees and stakeholders							
Technology Scouting	Regularly scan the market for emerging technologies, materials and construction methods that can enhance your products and services							
Customer-Centric Innovation	Engage with customers to understand their evolving needs and preferences and use this feedback to drive innovation in product and service design							
Innovation Teams	Form dedicated innovation teams or task forces responsible for researching, testing and implementing innovative solutions							
Prototyping and Rapid Testing	Develop a process for rapid prototyping and testing of new product and service concepts to validate their feasibility and desirability							

Select Your View on the Desired Optimum State of Operation

Select Your View on the Importance of the Practice

Select Your View on How Satisfied You Are With Current Operation

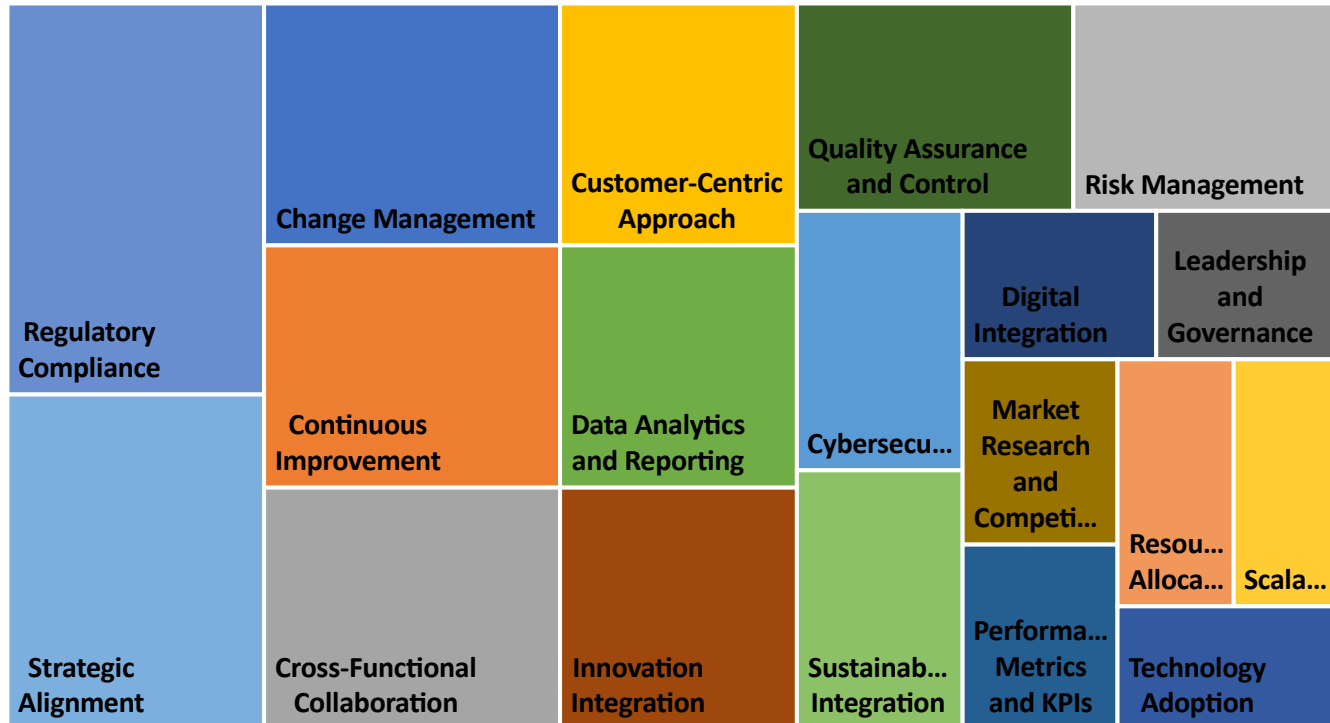


# Common Practices Across Capabilities

- There are practices that are common across the key capabilities:
  - Change Management
  - Continuous Improvement
  - Cross-Functional Collaboration
  - Customer-Centric Approach
  - Cybersecurity
  - Data Analytics and Reporting
  - Data-Driven Decision-Making
  - Digital Integration
  - Innovation Integration
  - Innovation Metrics and KPIs
  - Leadership and Governance
  - Market Research and Competitive Analysis
  - Performance Metrics and KPIs
  - Quality Assurance and Control
  - Quality Assurance and Testing
  - Regulatory Compliance
  - Resource Allocation
  - Risk Management
  - Scalability
  - Strategic Alignment
  - Sustainability Integration
  - Technology Adoption
- These are common skills that underpin many solution design capabilities
- This is one input into the ***Relevance/Importance/Not or Poorly Implemented or Operated*** triad

# ***Design, Develop and Manage Products, Services and Solutions***

## Capability Group – Common Cross-Capability Practices – Relative Importance



- You can prioritise the common practices:
  - Change Management
  - Continuous Improvement
  - Cross-Functional Collaboration
  - Customer-Centric Approach
  - Cybersecurity
  - Data Analytics and Reporting
  - Digital Integration
  - Innovation Integration
  - Leadership and Governance
  - Market Research and Competitive Analysis
  - Performance Metrics and KPIs
  - Quality Assurance and Control
  - Regulatory Compliance
  - Resource Allocation
  - Risk Management
  - Scalability
  - Strategic Alignment
  - Sustainability Integration
  - Technology Adoption

# Summary

- The application of product development approaches for external consumer-focussed products/solutions/services is long established and widely used
- There are many such product development approaches and methodologies
- While there is substantial potential to apply these product development approaches to internal solution design and implementation, this is done in a very limited way with none of the kill outcomes present in the gate component of a stage/gate process
- Solution architecture can use the product management approach in two ways:
  - To ensure that the process to design the solution takes account of the wider solution operational and deployment landscape
    - Treat the solution design and implementation as a more commercial exercise that regards internal solution consumers as customers
  - To manage the process for deciding which solutions should proceed to implementation using a rational stage-gate process
- The role of the solution architect is ideally placed to perform these functions effectively

# More Information

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<https://www.amazon.com/dp/1797567616>