

Solution Architecture – Approach to Rapidly Scoping The Initial Solution Options

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Objective

- Describe an approach to creating a high-level architecture for a complete end-to-end solution design

A Solution Is ...

- ... An answer to a business problem
- The solution will generally consist of some or all of:
 - New system(s)
 - Changes to existing systems
 - Changes to existing data model and data storage
 - Data migration/conversion
 - System and data interfaces
 - New business processes
 - Documentation
 - User training
 - Changes to existing business processes
 - Operational infrastructure
 - Operational and support processes
- A solution very, very rarely consists of a single stand-alone, newly-developed system

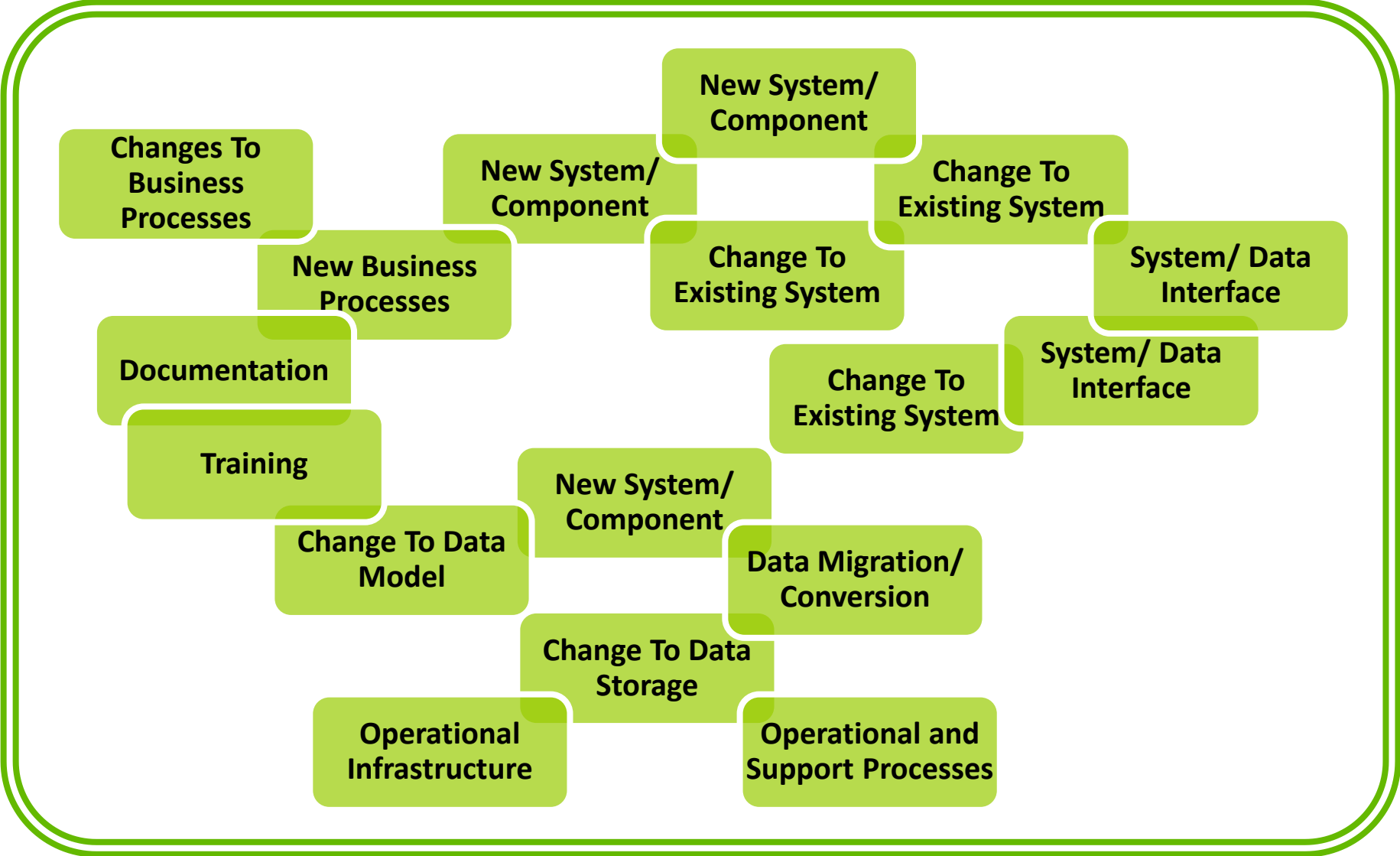
Solution Architecture Is ...

- Description of the structure, characteristics and behaviour of a solution
- The means by which the solution is defined, delivered, managed and operated
- A solution is an answer to a business problem that may or may not include a technology component
- Solution architecture is concerned with identifying that solution or set of solution options and their components
- Generally there are many potential solutions to a problem with varying suitability
- All solutions are subject to constraints

Solution Architecture

- Solution architecture involves identifying the scope of the entire solution including all its components and the required technology and operational changes
- Multi-stage process to define the solution
- Solution architecture needs to take account of all solution components in order to quantify the true scope of the effort needed to implement the solution
- Without the complete, end-to-end view, the project to implement the solution and transfer it to operations will experience problems

Complete Scope Of Solution



Complete Scope Of Solution

- You need this end-to-end view to comprehend fully what solution delivery effort you are likely to incur, what resources are required, what are the likely costs and how long the implementation will take
- You can make informed decisions to include/exclude components and understand the consequences of these decisions
- You can engage at an early stage with the potential complexity of the solution
- You can assess the potential organisational impact

Solution Architecture In The Context Of The Overall Solution Delivery

- Previously covered this subject in <http://www.slideshare.net/alanmcsweeney/integrated-project-and-solution-delivery-and-business-engagement-model>
- Solution architecture needs to be involved at the early stage of the project to allow effective decision-making and to ensure that the complete effort and resources required are identified early
- Solution architecture is involved throughout the delivery of the solution, from initial concept to detailed functional design

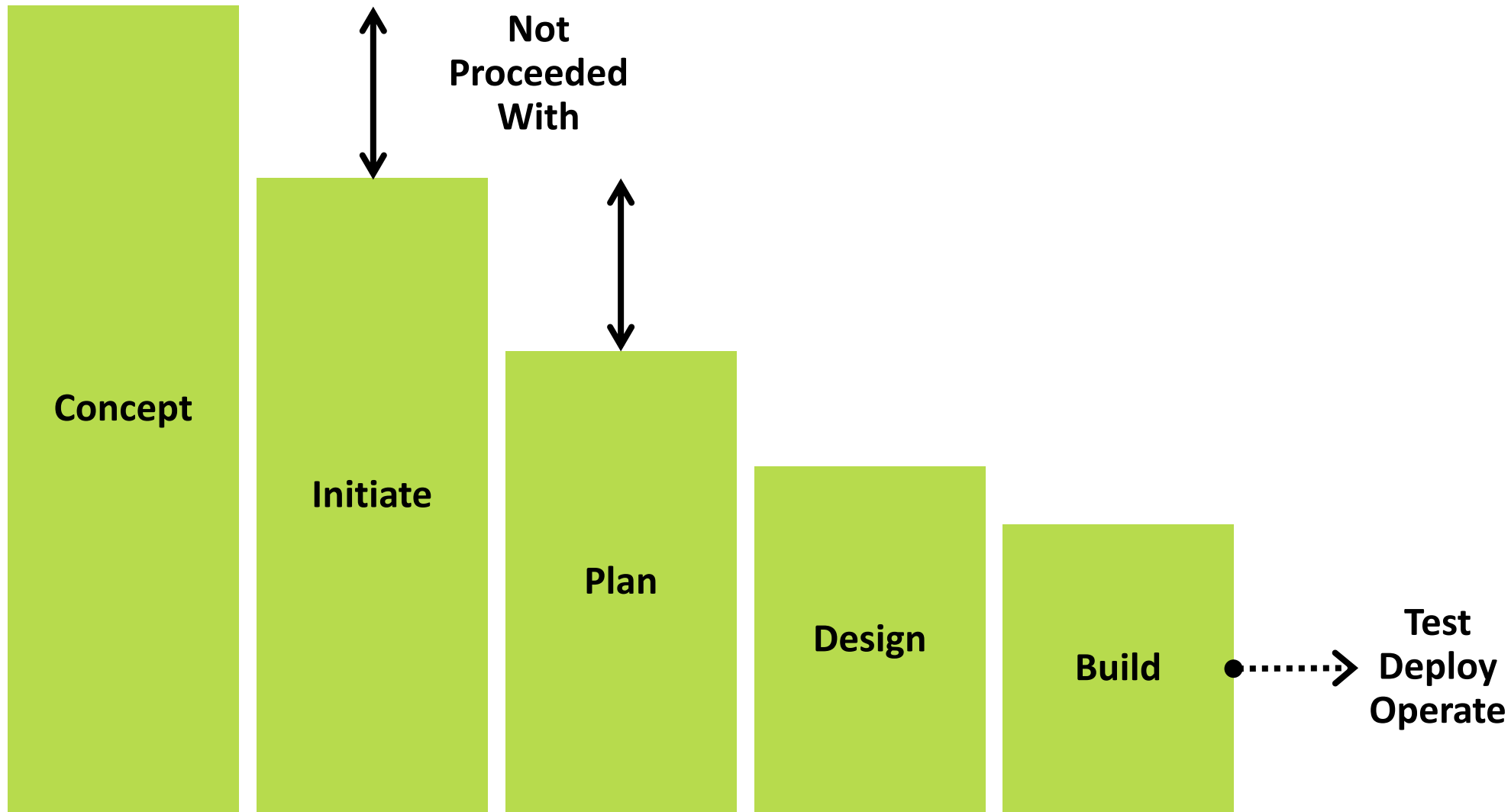
Solution Architecture in Integrated Solution Delivery Process

	Concept	Initiate	Plan	Design	Build	Test	Deploy	Operate
Project Management		Project Charter Project Initiation Document	Project Plan Project Resource Plan	Project Management – Planning, Resource, Scheduling Risk, Actions, Issues and Dependencies Management Reporting and Communications Management Change Management				
Business Function	Solution Concept/ Requirements Document	Business Case		Benefits Schedule and Benefits Realisation Plan		User Acceptance Test Results		Benefits Realisation Review Lessons Learned
Business Analysis			Functional Requirements As Is Process Definition	To Be Process Definition	User Acceptance Test Design and Plan Standard Operating Procedures			Documentation Library
Solution Architecture	Rough Order of Magnitude Estimate		Solution Architecture High Level Design	Non Functional Requirements Detailed Solution Design/ Functional Specification				
Delivery			Data Audit Configuration Management Approach and Plan Detailed Estimates	Confirmed Estimates Data Design and Data Migration Plan Technical/Build Specification	Data Migration Results Build Documentation Unit Test Results Integration Test Results	Data Migration Test Results System Test Plan Results UAT Changes and Rework	Data Migration to Live Results Deploy to Production Results Support and Operations Documentation	Go Live Support
Test and Quality			Test Strategy	Functional Test Design and Plan Non-Functional Test Design and Plan Integration Test Design and Plan System Test Design and Plan	Functional Test Results Non-Functional Test Results Integration Test Results System Test Results	Operational Readiness Review		
Organisation Readiness			Management Team Briefing Communications Strategy and Plan	Change Impact Assessment Detailed Communications Plan Training Needs Analysis	Change Action Plan Organisation Design Develop Training Material	Role Definition Training Schedule	Organisation and Staffing Implementation Training Delivery	
Service Management			Service Impact Assessment	Service Level Requirements Access and Security Definition	Operations Acceptance Testing Design and Plan	Operations Acceptance Testing Results Service Definition	Service and Operational Level Agreement(s) Transfer to Production Plan	
Infrastructure			Infrastructure Plan	Infrastructure Design Infrastructure Technical Specification Build Development Environment	Build Test Environment Build UAT Environment Build OAT Environment	Build Training Environment	Build Production Environment	Decommission Unused Environments

Integrated Solution Delivery Process

- Solution architecture involved at four key solution delivery stages
 - **Concept** – produce initial rough-order-of-magnitude estimate to allow decision to be made to proceed to more detailed analysis
 - **Plan** – produce high-level solution design identifying all the solution components to allow decisions be made on whether to proceed and what to automate or operate manually
 - **Design** – produce detailed functional specification of what the solution must do, incorporating business requirements
 - **Build/Test** – act as source of subject matter expertise clarifying requirements and assisting with change control and scope management

Not All Concepts Become Projects And Not All Projects Proceed To Completion



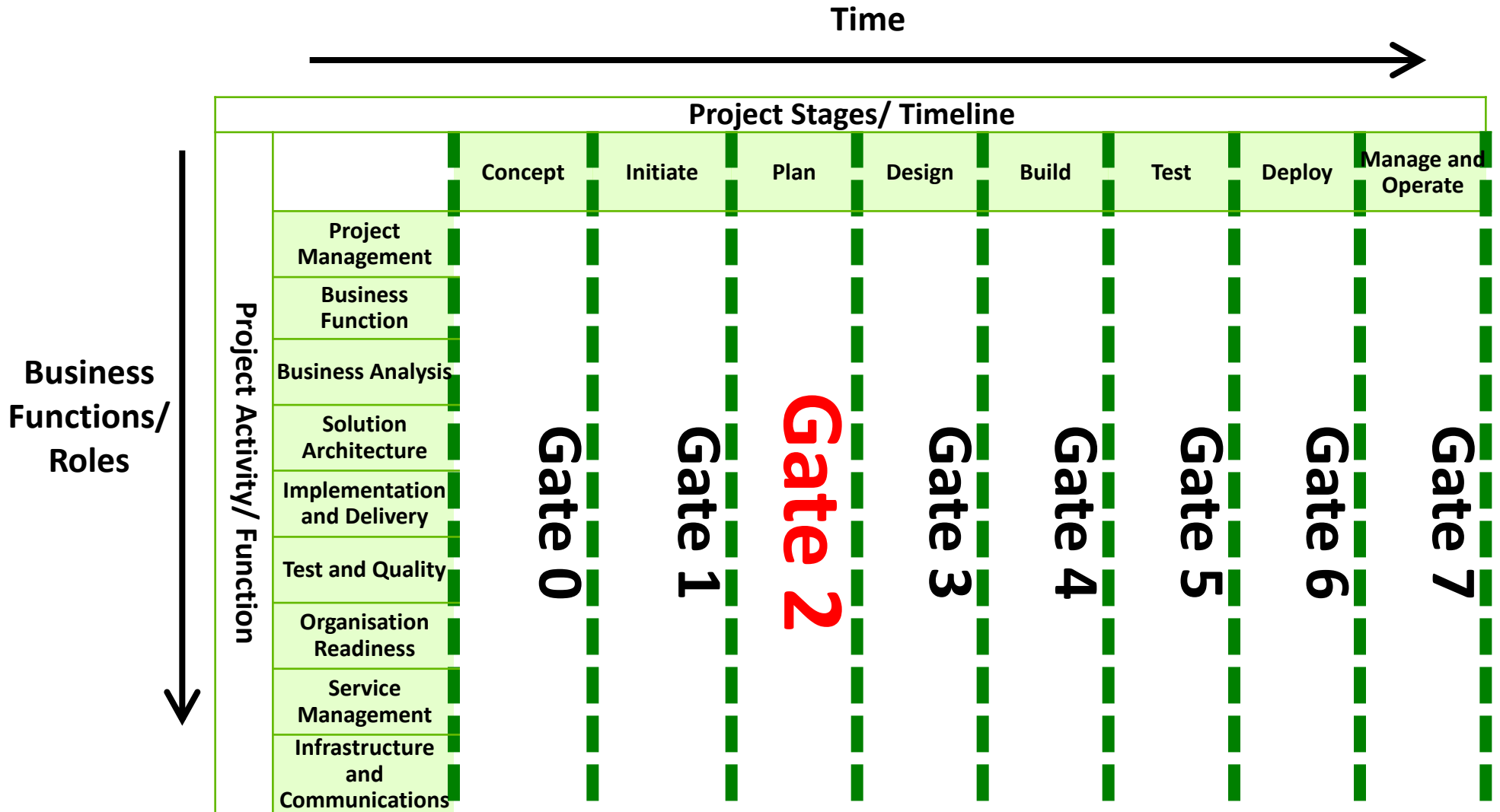
Not All Concepts Become Projects And Not All Projects Proceed To Completion

- There is an inevitable cancellation/postponement/decision not to proceed with projects during the solution selection and elaboration process

Not All Concepts Become Solutions And Not All Solutions Proceed To Completion

- Need to identify feasible, worthwhile, justified concepts to develop into projects and to eliminate those that are not cost-effective
- Solution architecture plays an important role in identifying solutions worth implementing and in quantifying the effort
- Need to involve solution architecture at an early stage to understand the full scope of the solution and its implementation
- Enable decisions to be made on whether to proceed and what will be included in the scope
- Create initial high-level solution architecture that can be expanded on if the solution is being proceeded with
- Minimise the work done while maximising the information gathered and processed and results obtained

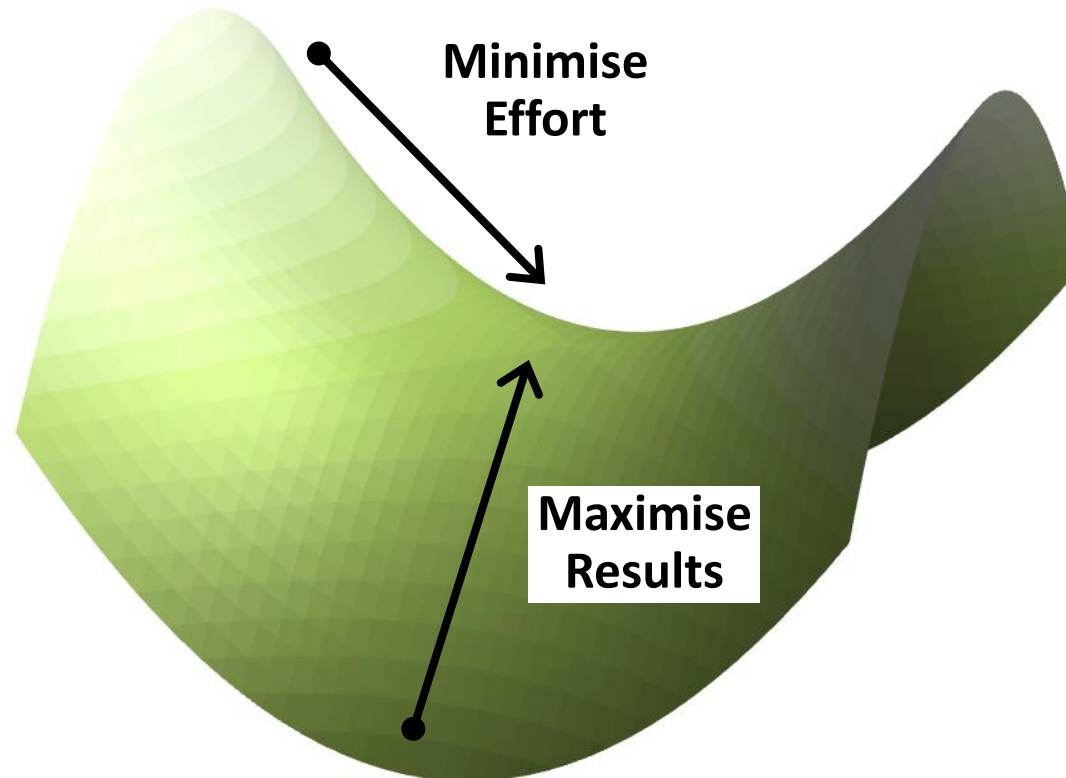
Project Gates – Review And Decision Points



Project Gates – Review And Decision Points for High Level Solution Architecture

- **Gate 2** is the point where the high-level solution architecture is reviewed, assessed and decisions are made on whether to proceed and what is being proceeded with

Find The Information Saddle Point



- Do as little as possible to achieve as much as possible to make an informed decision on whether and how to proceed at gate stage in solution journey
- Key principle at this stage is ***satisficing*** – optimise effort and resources during planning- satisfy requirements sufficiently

Structured Approach To Solution Architecture

- Previously covered this subject in <http://www.slideshare.net/alanmcsweeney/structured-approach-to-solution-architecture>
- Objective of structured approach is to ensure consistency in solution architecture design options
- Ensure solution addresses all business requirements
- Provide checklist to validate solution design options
- Design realistic and achievable solutions that meet the business needs

Approach To Initial Solution Architecture Definition

- Want an approach that quickly identifies the likely scope of the solution, the options and the decisions that need to be made
- Key elements of initial solution scope and design:
 - **Systems/Applications** – new and existing systems that must be developed/changed to deliver functions
 - **System Interfaces** – links between systems
 - **Actors** – business functions and roles that will interact with the overall solution and its components
 - **Actor-System Interactions** – interactions between Actors and Systems/Applications
 - **Actor-Actor Interactions** – interactions between Actors
 - **Functions** – functions that must be delivered by the overall solution
 - **Processes** – business processes required to operate the solution
 - **Journey** – standard journey through processes/functions and exceptions/deviations from “happy path”
 - **Logical Data View** – data elements required
 - **Data Exchanges** – movement of data between Systems/Applications
- These combine to provide a comprehensive view of the potential solution at this early stage

Approach To Initial Solution Architecture Definition

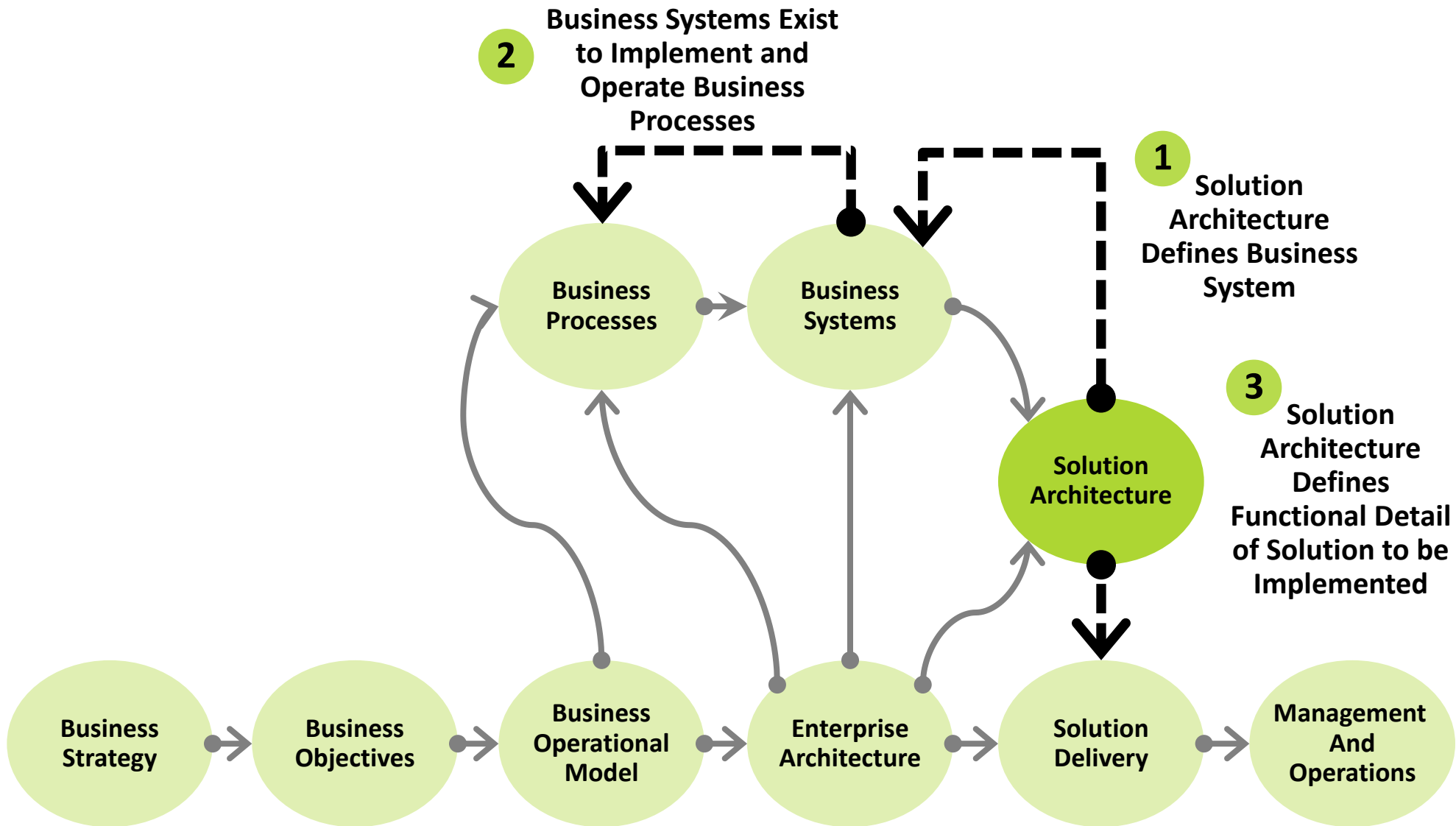
Core Definition Elements	Extended Definition Elements
Processes Functions Actors Systems/Applications	System Interfaces Actor-System Interactions Actor-Actor Interactions Solution Usage Journeys Logical Data View Data Exchange

- Start with identifying core solution definition elements – those elements directly involved in the solution
- Expand initial solution definition with extended elements – element interactions and data storage and exchange

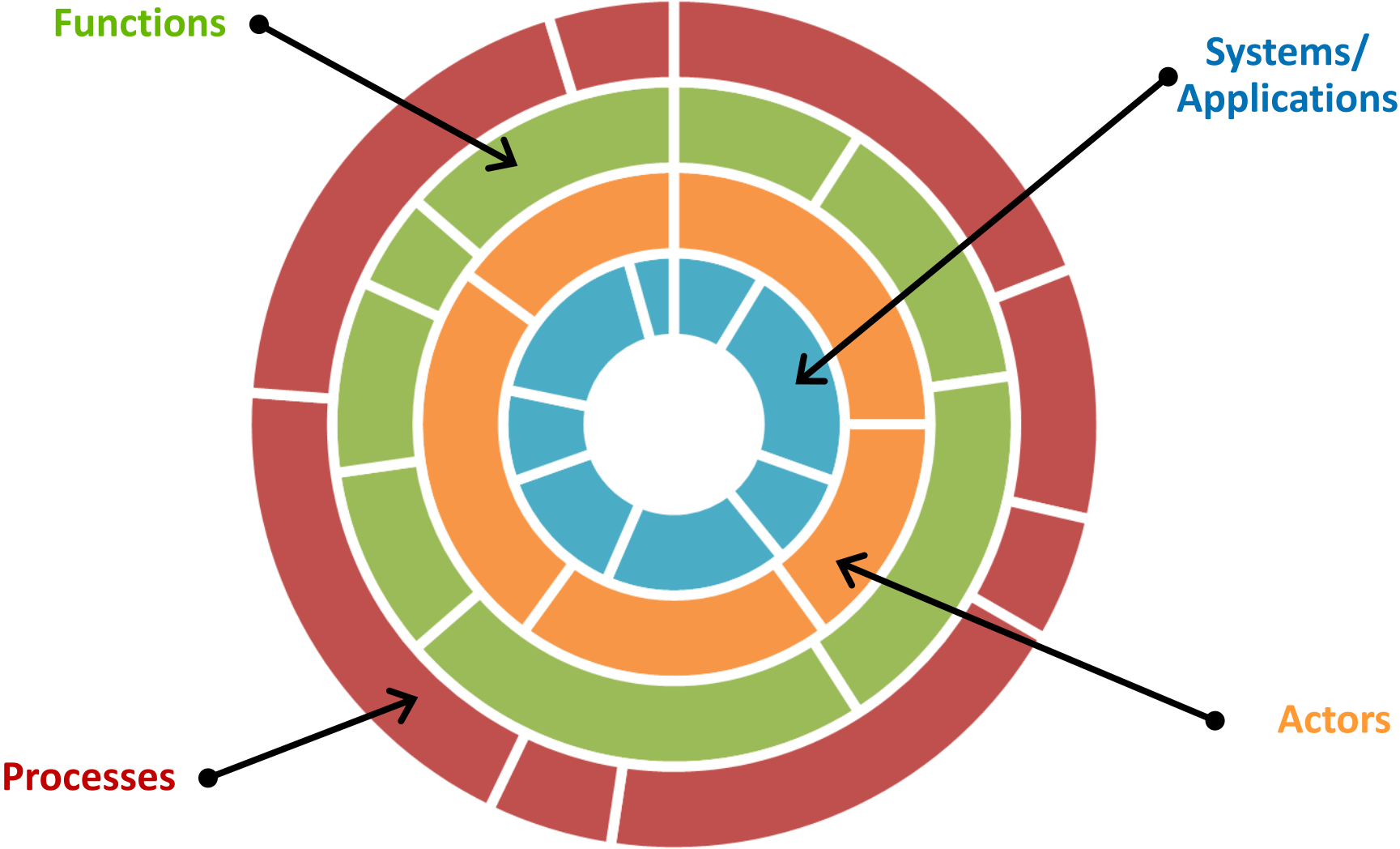
Initial Solution Architecture Definition

- This allows:
 - System changes and developments required to be defined
 - Potential options for reuse of existing systems to be determined
 - Options for manual or automated operation to be pinpointed
 - Effort to be estimated
 - Organisational impact to be quantified including staffing, training, support, cutover, parallel run and documentation
 - Dependencies to be identified
 - Informed decision to proceed to be made
- Provides a worklist/table of contents of further work if decision to continue is made

Solution Architecture In Business Context



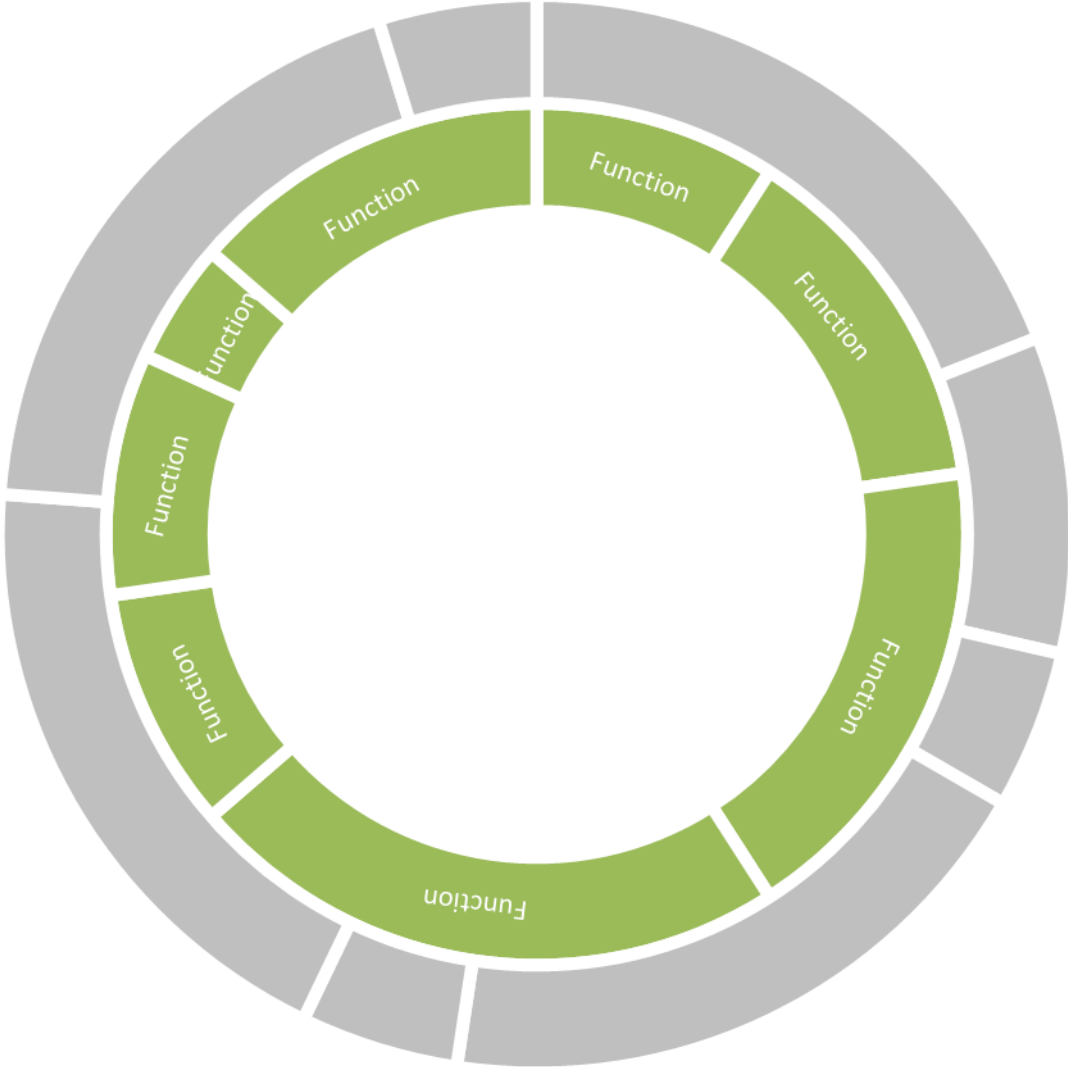
Core Elements Of Initial Solution Architecture Definition



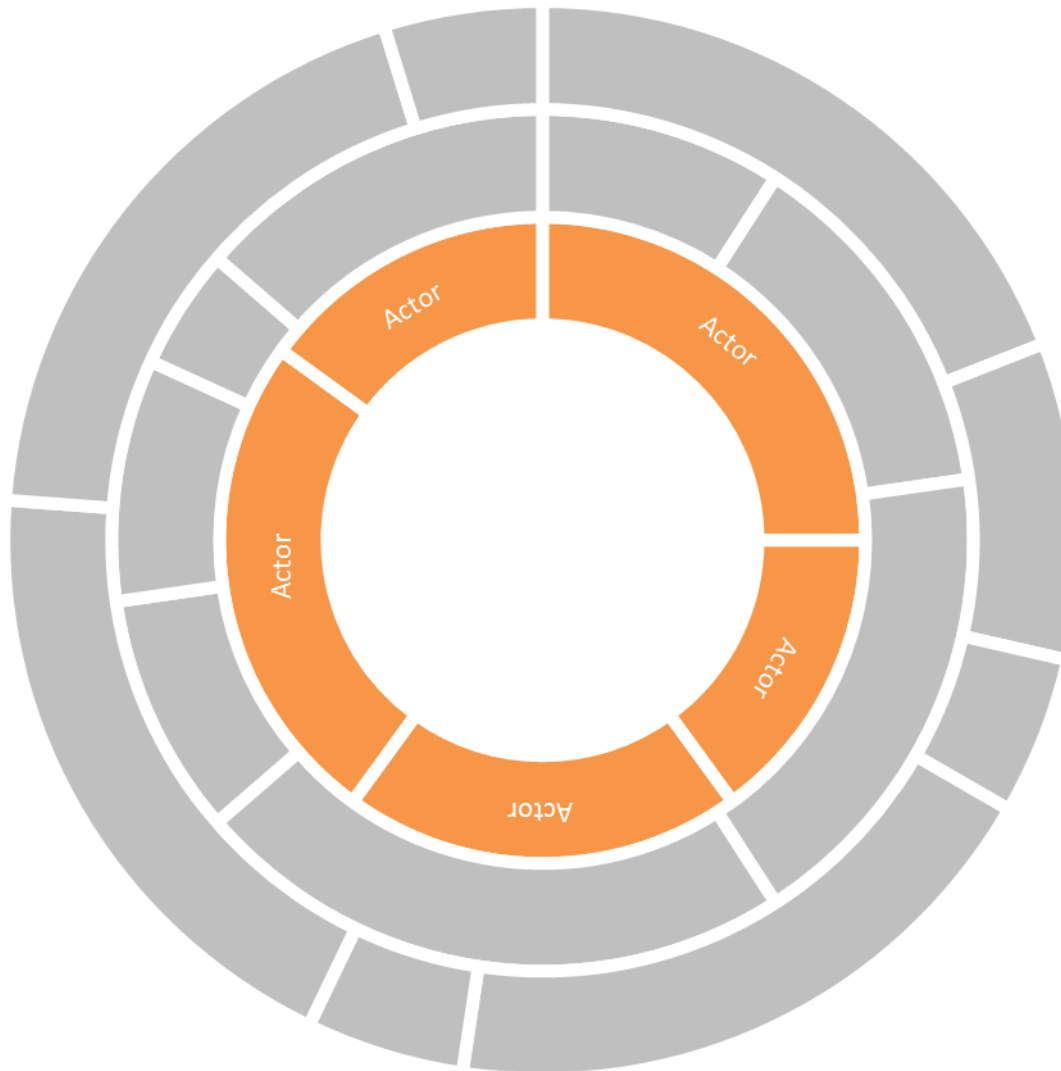
Initial Solution Architecture Definition – Identify Key Existing Business Processes Affected Or New Ones Required



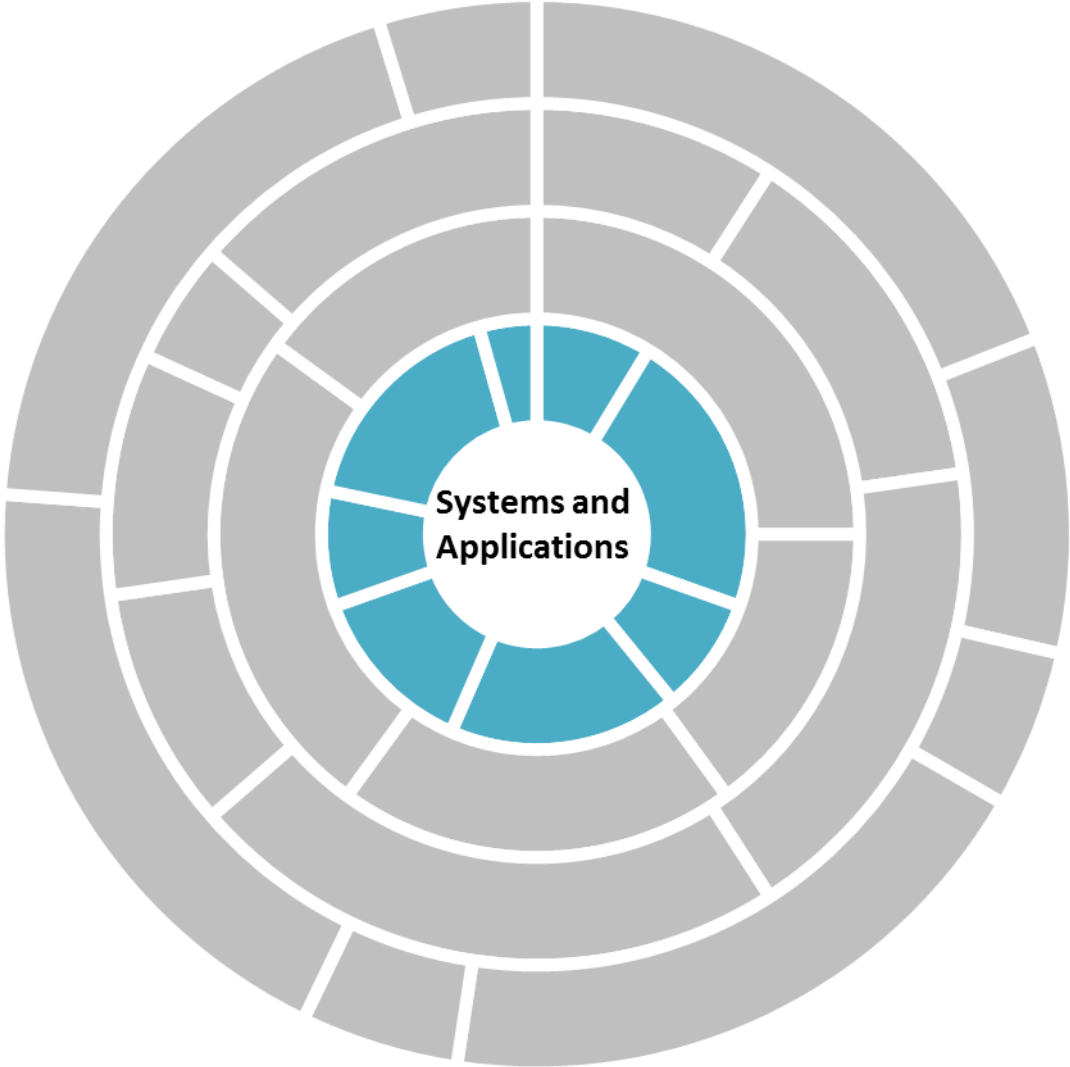
Identify Functions Required To Enable Processes



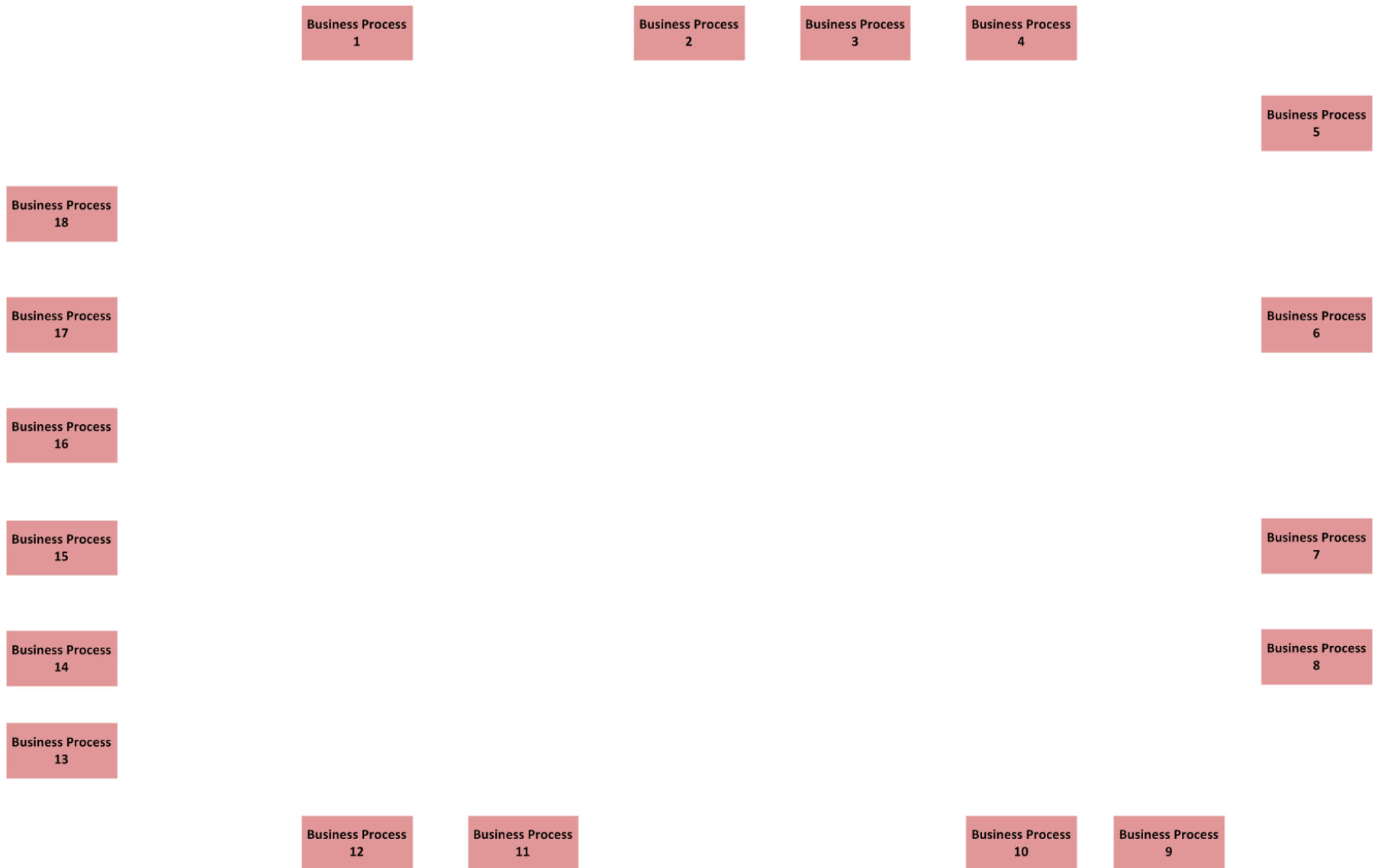
Identify Actors Who Will Use Functions And Participate In Processes



Identify New Systems/Applications And Changes To Existing Systems/Applications To Deliver Functions



Sample Representation Of Core Solution Elements



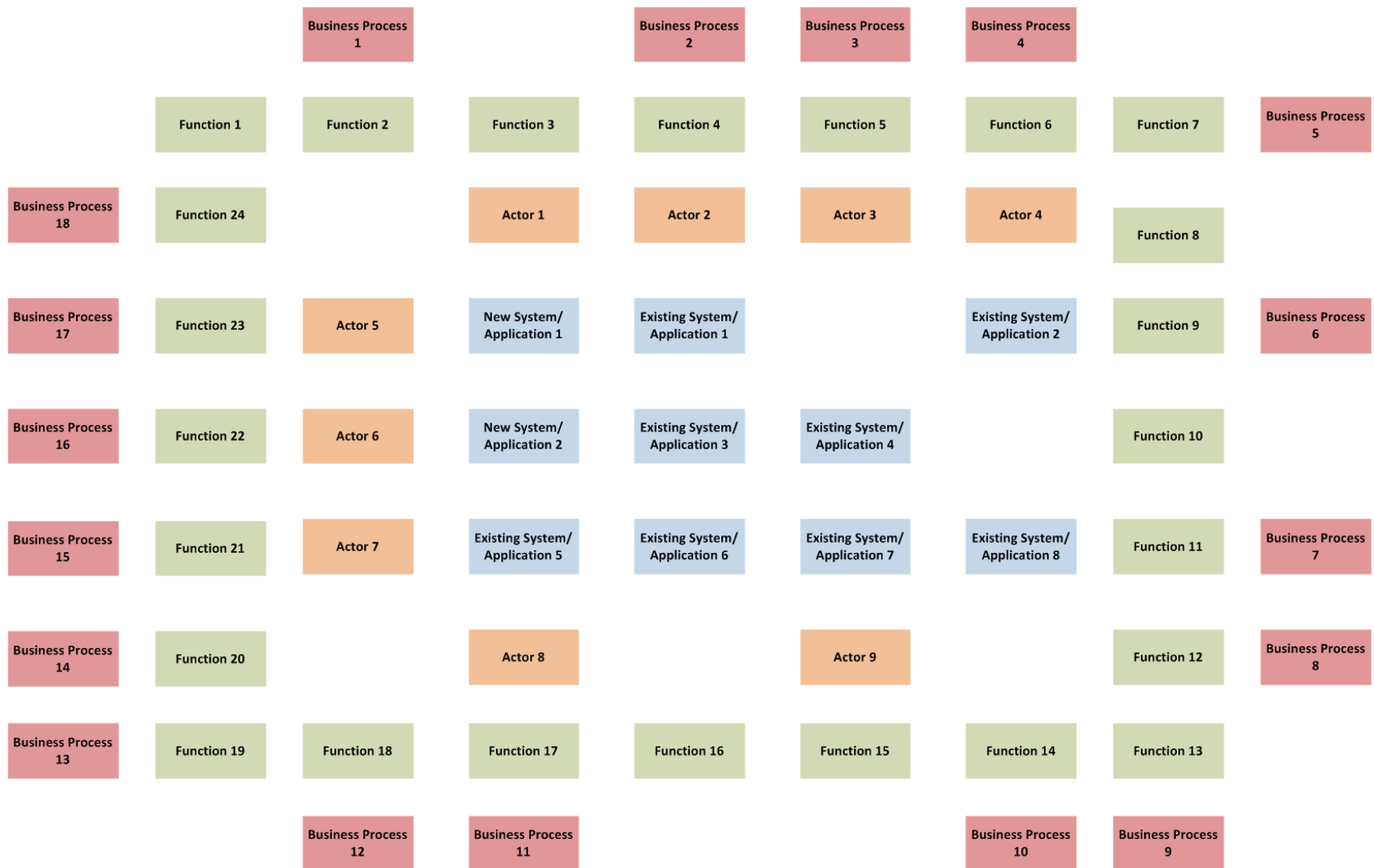
Sample Representation Of Core Solution Elements



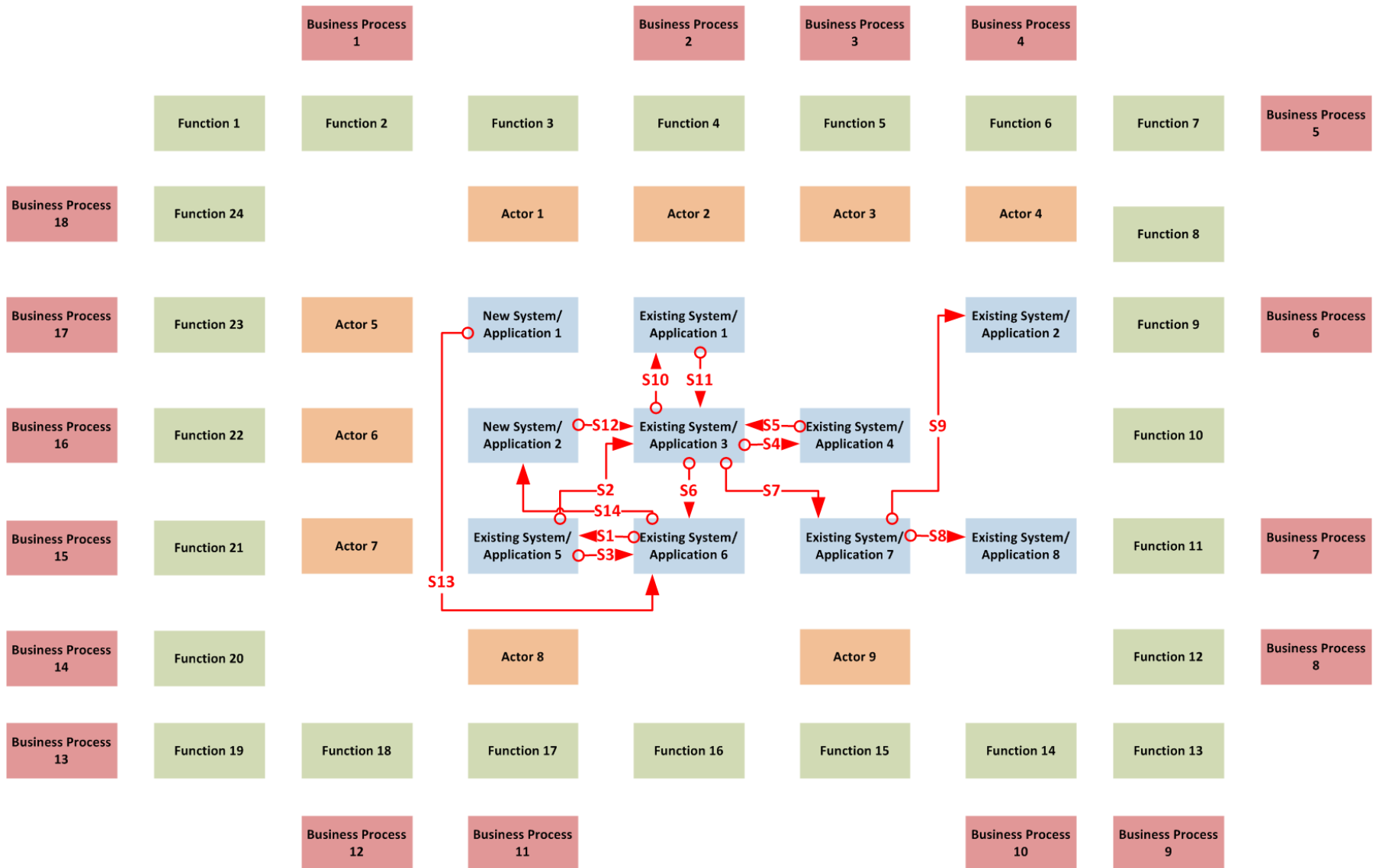
Sample Representation Of Core Solution Elements



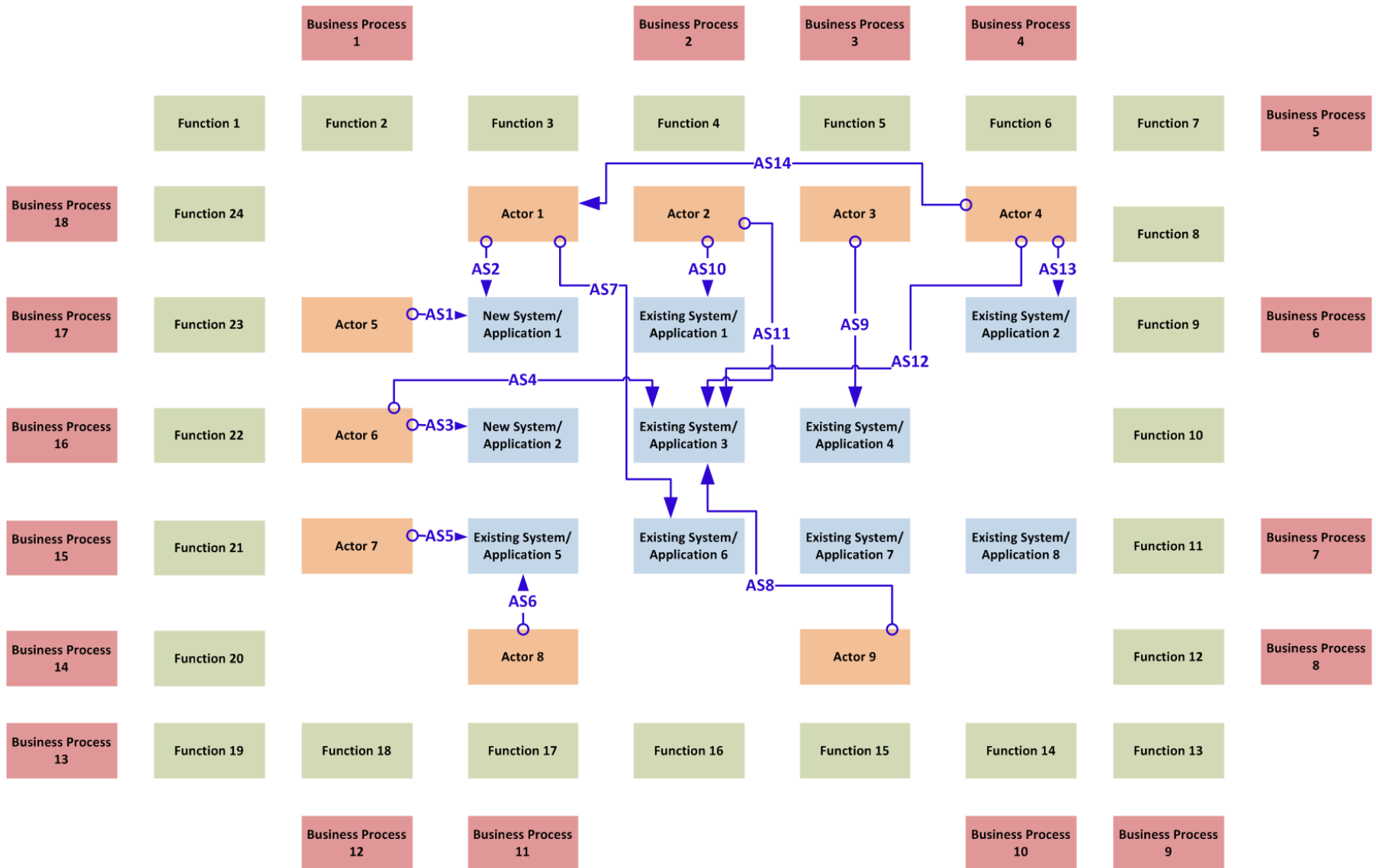
Sample Representation Of Core Solution Elements



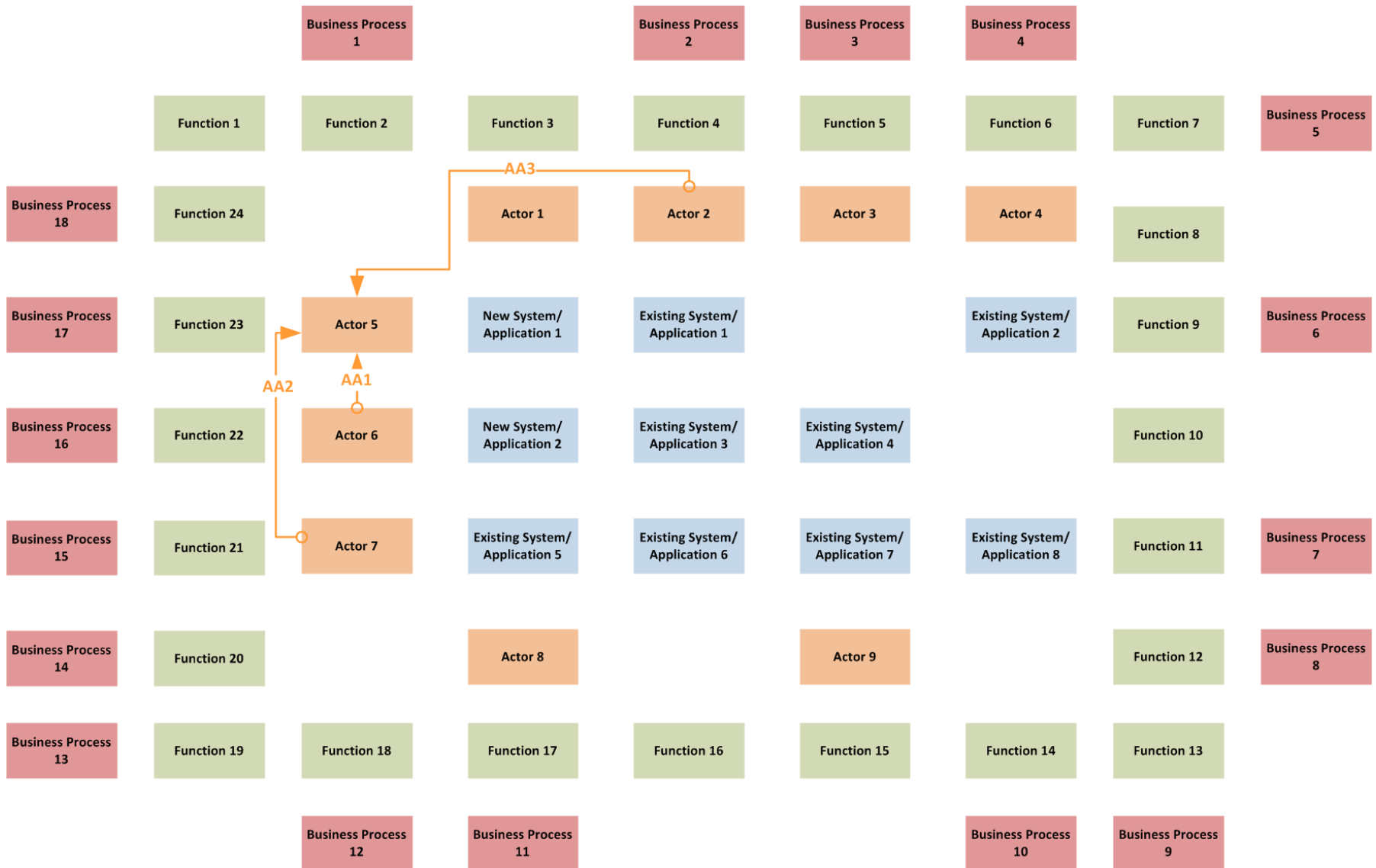
Required System Interfaces And Interactions



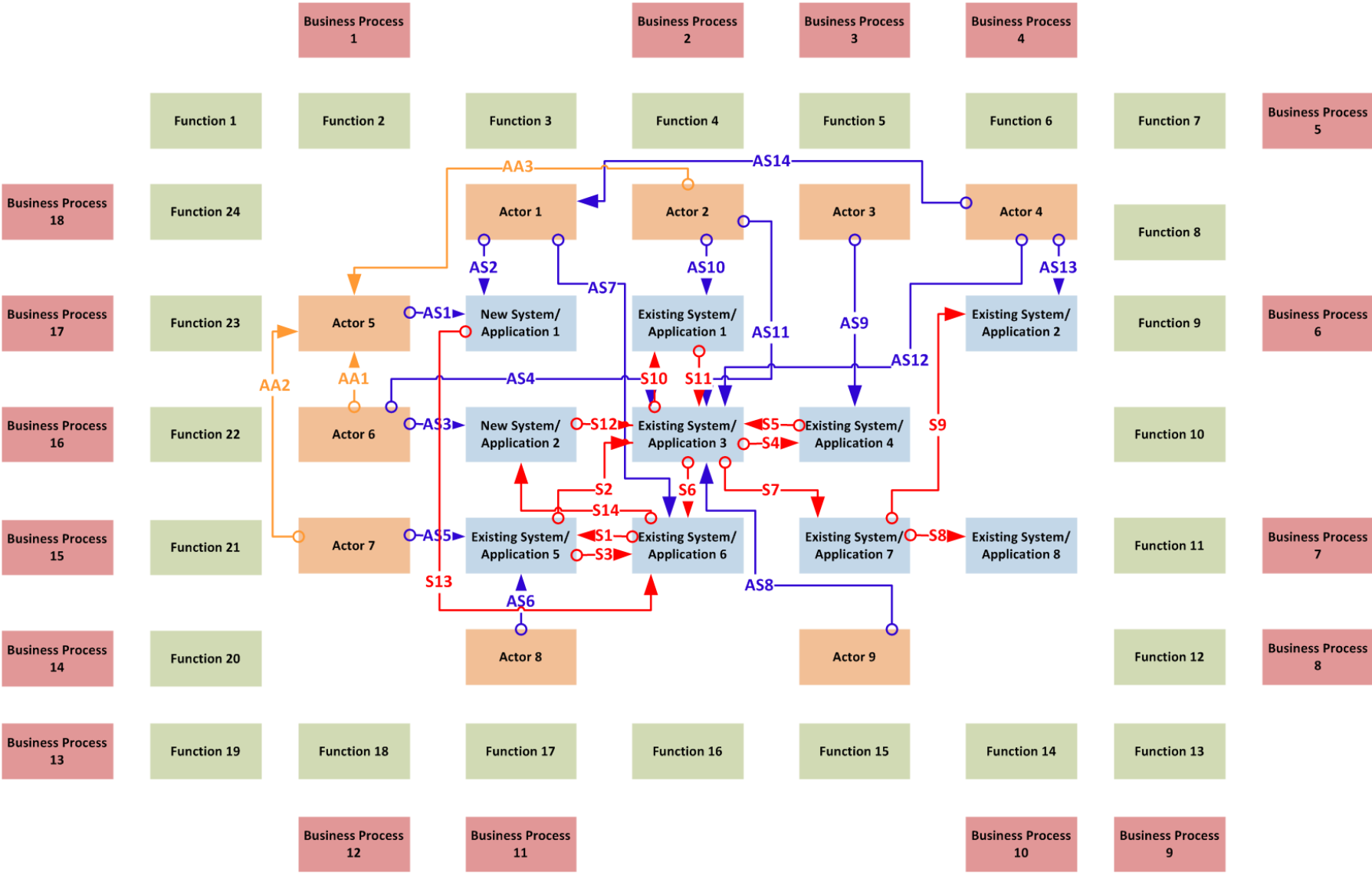
Required Actor System Interfaces And Interactions



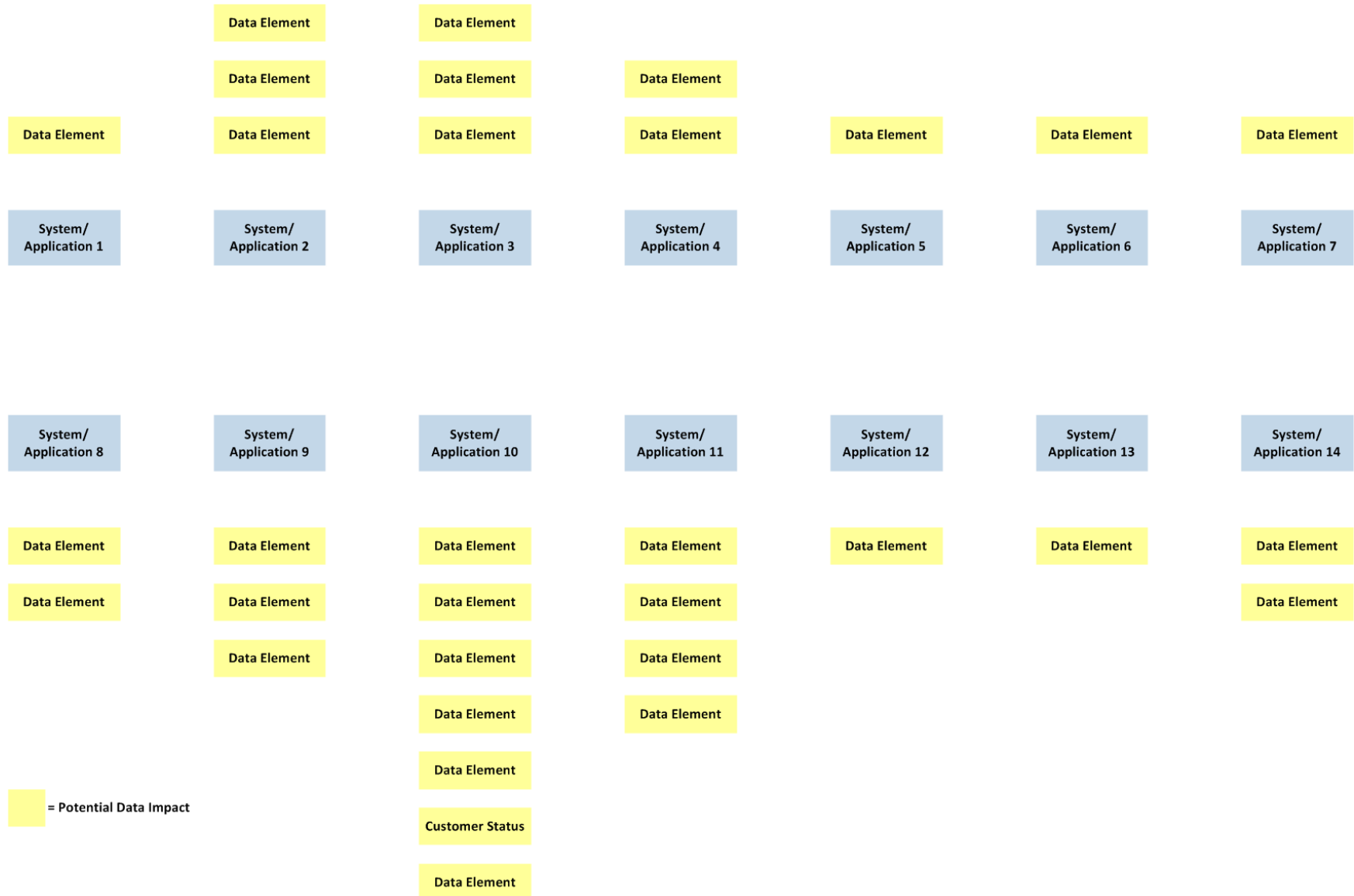
Required Actor-Actor Interactions



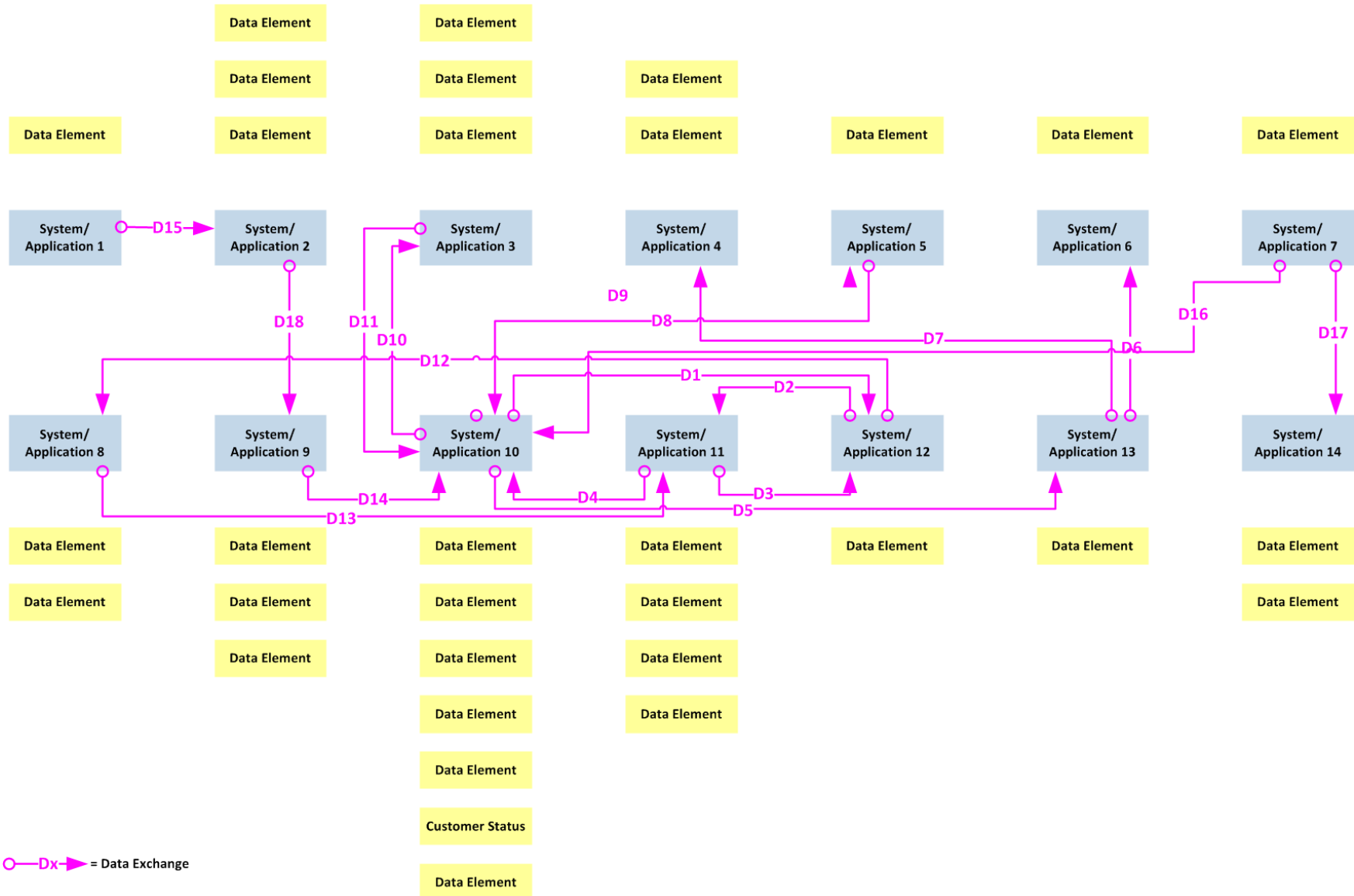
Core and Extended Solution Elements



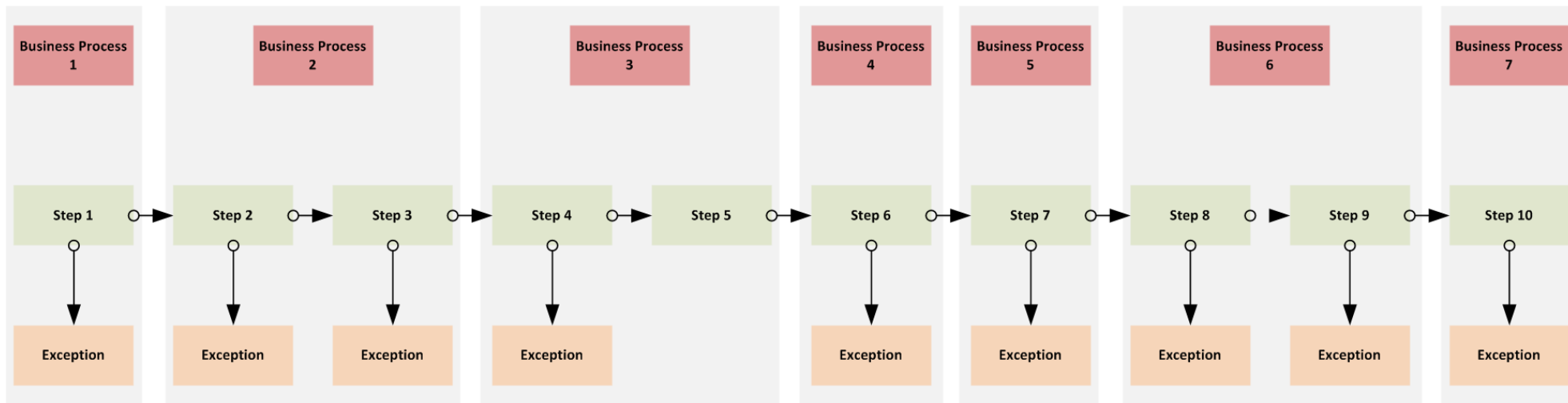
Data Elements Required Within Systems/ Applications



Data Exchanges Required Between Systems/ Applications



Solution Usage Journeys



- For every solution there will be one or more “happy paths” – standard paths through the solution without exception/problem/deviation handling
- Exceptions may occur at each step in these happy paths
- High-level solution should identify solution usage journeys and their possible exceptions

Solution Definition Summary

Core Definition Elements	Extended Definition Elements
Processes <i>Process 1</i> ...	System Interfaces <i>Interface 1</i> ...
Functions <i>Function 1</i> ...	Actor-System Interactions
Actors <i>Actor 1</i> ...	Actor-Actor Interactions
Systems/Applications <i>Systems/Applications 1</i> ...	Solution Usage Journeys
	Logical Data View <i>Data Impact 1</i> ...
	Data Exchange <i>Data Exchange 1</i>

- Forms the basis of an inventory of work needed to implement solution
 - Subsequent detailed solution design will specify each component
- Enables decisions to be made on how to proceed

Solution Options



- Explore options for manual and automated operation
- What functions can be omitted
- What existing and available functionality can be reused

Maximise The Known Knowns Of The Potential Solution

- Solution unknowns are the source of potential problems during solution delivery
- The goal of solution design is no surprises

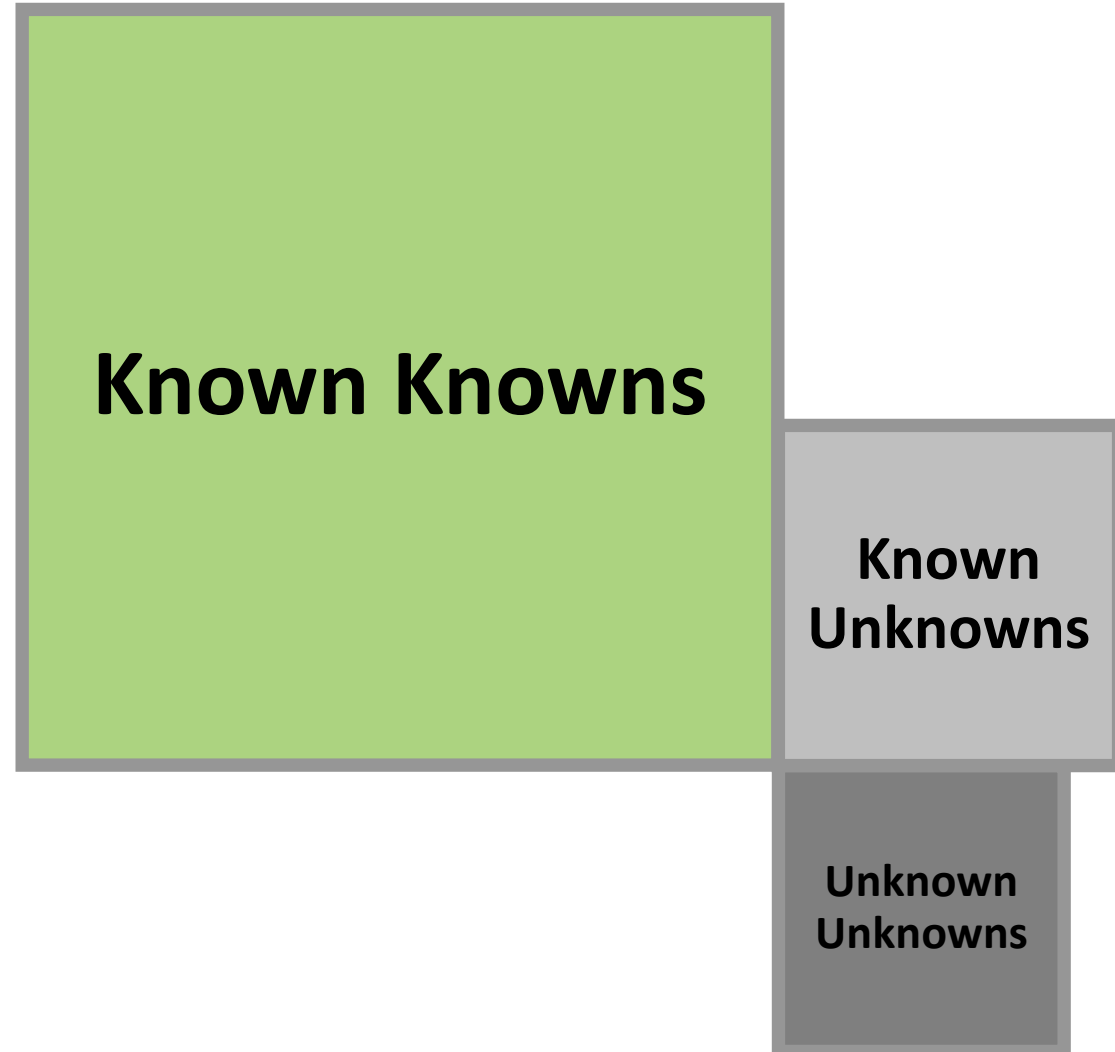
What We Know

What Can Be Known

	Known	Unknown
Known		 <i>Here Be Dragons</i>
Unknown		

Maximise The Known Knowns Of The Potential Solution

- The more that is known about the solution design the fewer the problems relating to scope and changes will occur later



Benefits Of High-Level Solution Architecture Definition Approach

- Provides an initial, high-level view of complete end-to-end solution with all elements required to implement
- Not concerned with constraints or technical implementation concerns at this stage
- Creates a a standardised repeatable approach to solution architecture
- Covers all elements that comprise the solution
- Detailed design follows later

Summary

- End-to-end solution architecture approach provides sufficient information at the planning stage to make informed decisions
- Provides realistic view of what is needed
- Balances effort required with results achieved
- Maximises available information and accuracy of decisions
- Contributes to the success of any solution delivery

More Information

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