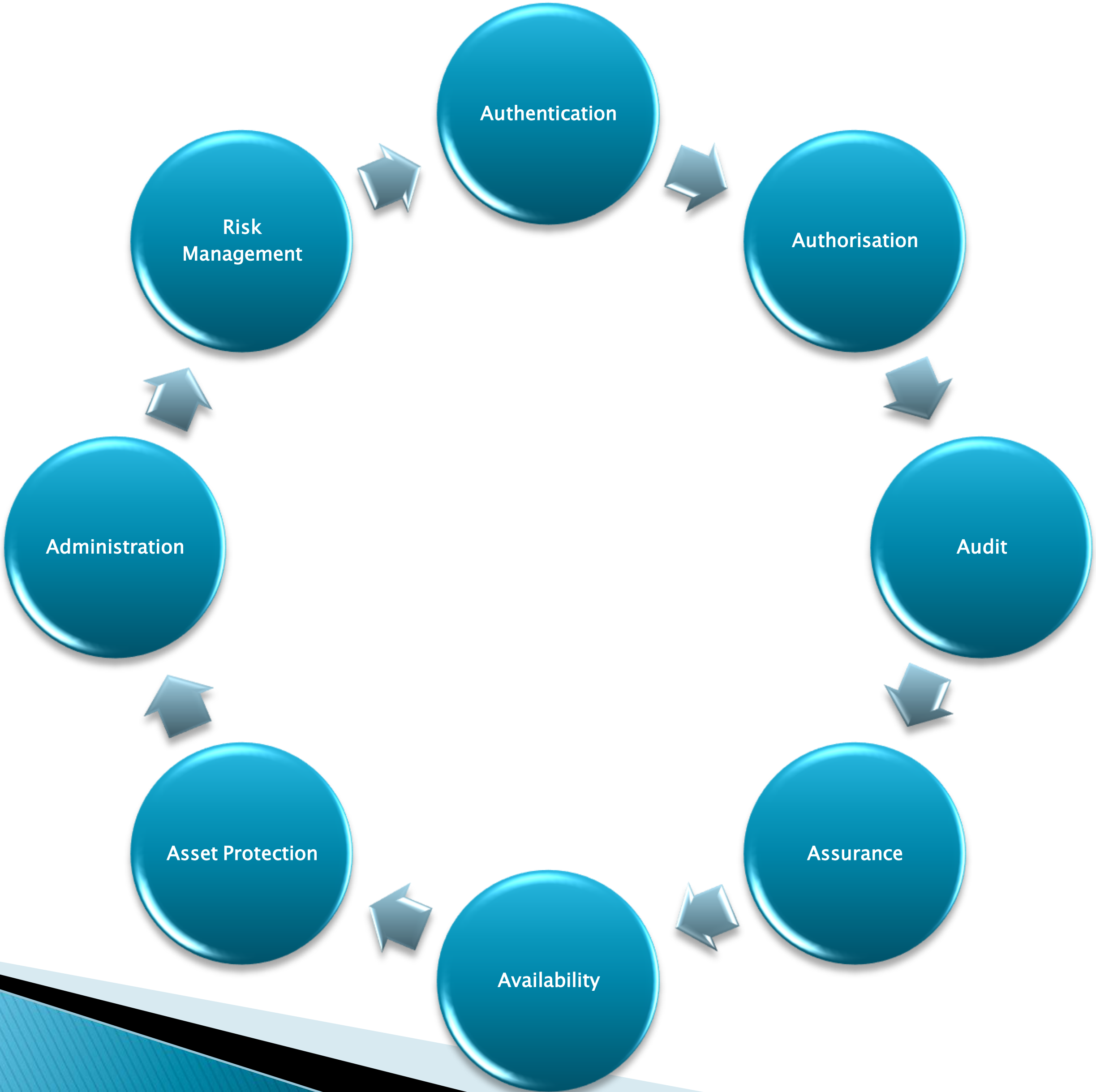
# TOGAF 9
# Security Architecture

Summarised - 2010

# Security Architecture Characteristics

- Security architecture has its own methods. These methods might be the basis for a discreet security methodology.
- Security architecture composes its own discrete view and viewpoints.
- Security architecture addresses non-normative flows through systems and among applications.
- Security architecture introduces its own normative flows through systems and among applications.
- Security architecture introduces unique, single-purpose components in the design.
- Security architecture calls for its own unique set of skill requirements in the IT architect.

# Areas of Concern for Security Architecture



Authentication

Authorisation

Audit

Assurance

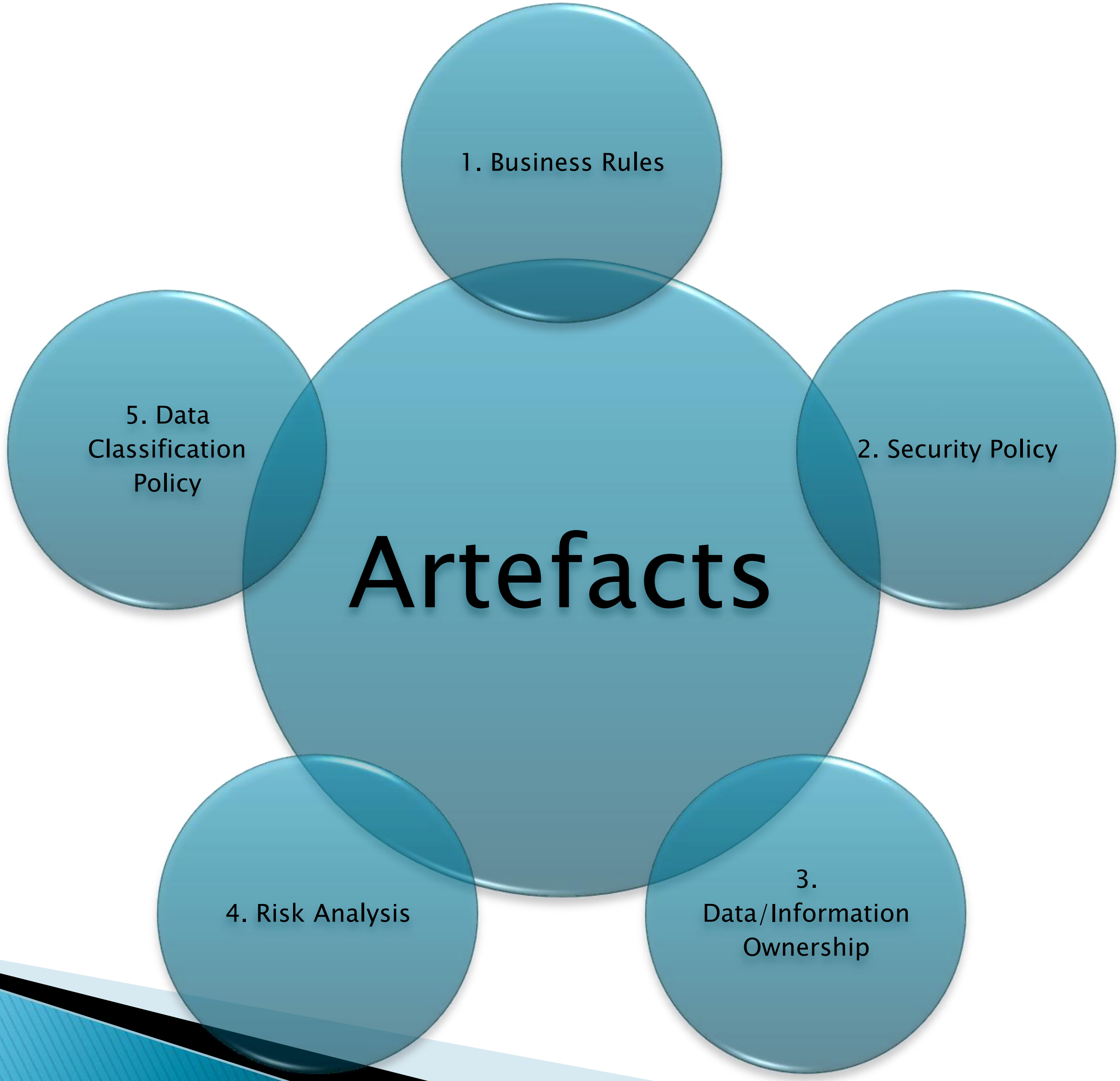
Availability

Asset Protection

Administration

Risk Management

# Security Architecture Artefacts



# ADM – Security Architecture Requirements Management

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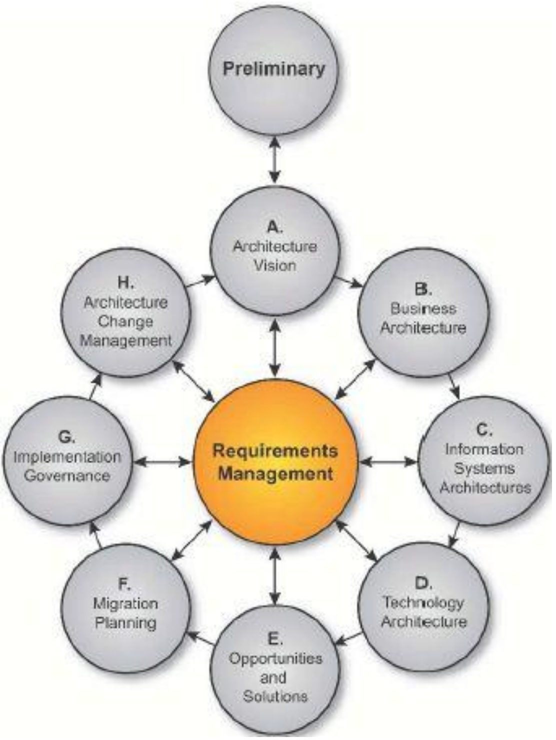
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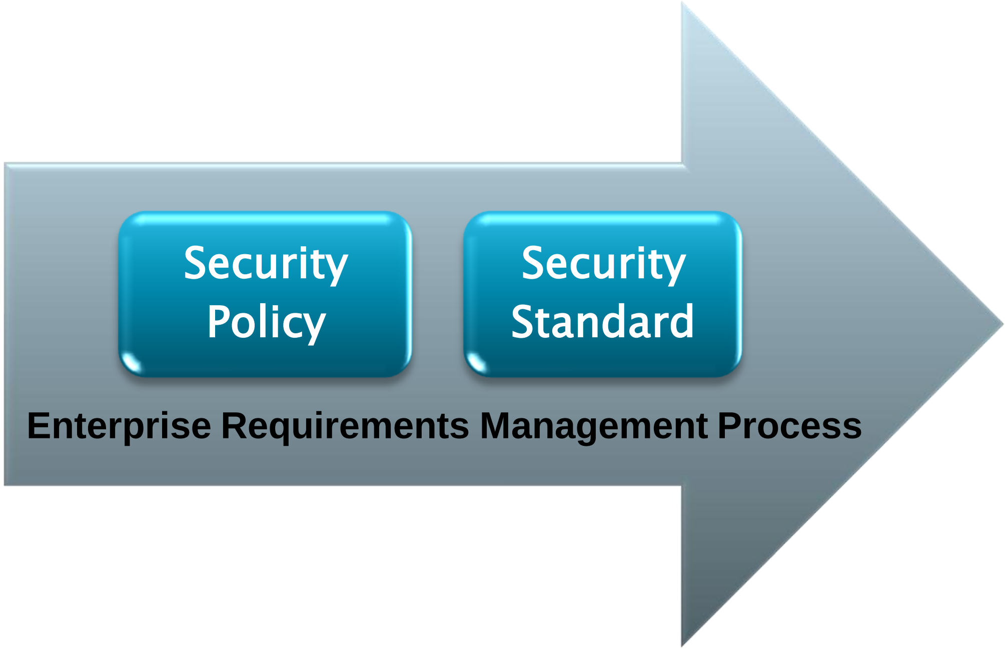

Security Policy

Security Standard

Enterprise Requirements Management Process

**New Security Requirements arise from many sources:**

1

A new statutory or regulatory mandate

2

A new threat realized or experienced

3

A new IT architecture initiative discovers new stakeholders and/or new requirements

# ADM – Security Architecture Preliminary

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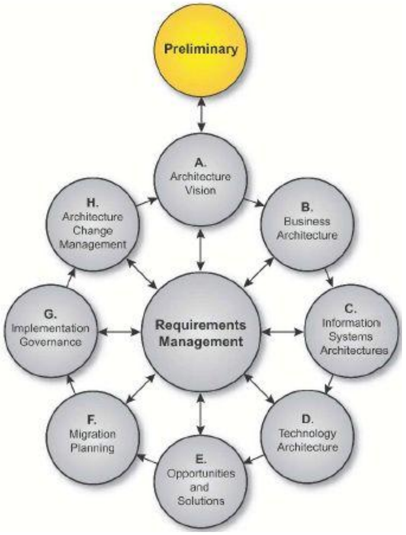
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**Objective**

- A written Security Policy for the organisation must be in place

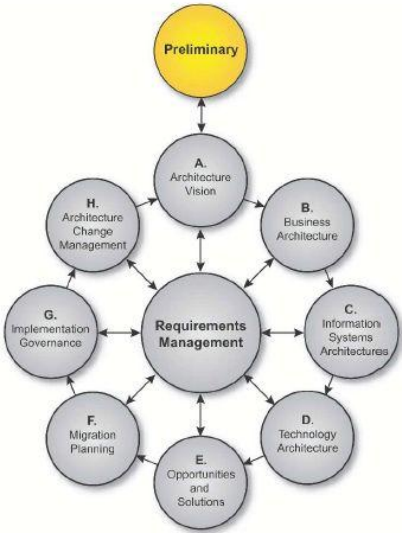
**Security Assessment**

- ISO/IEC 17799:2005 a basis for the security policy
- Architecture constraints established in the security policy must be communicated

**Regulatory Requirements**

- Dependent upon the functionality of the system and the data collected or maintained.
- The jurisdiction where the system or service is deployed

# ADM – Security Architecture Preliminary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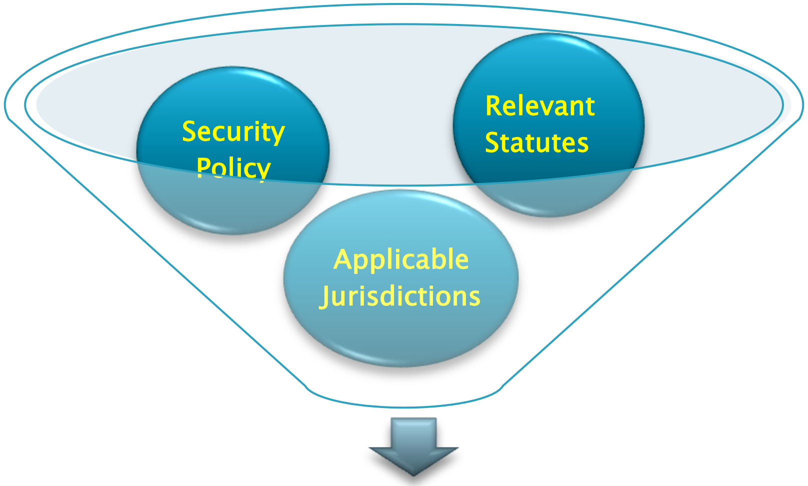
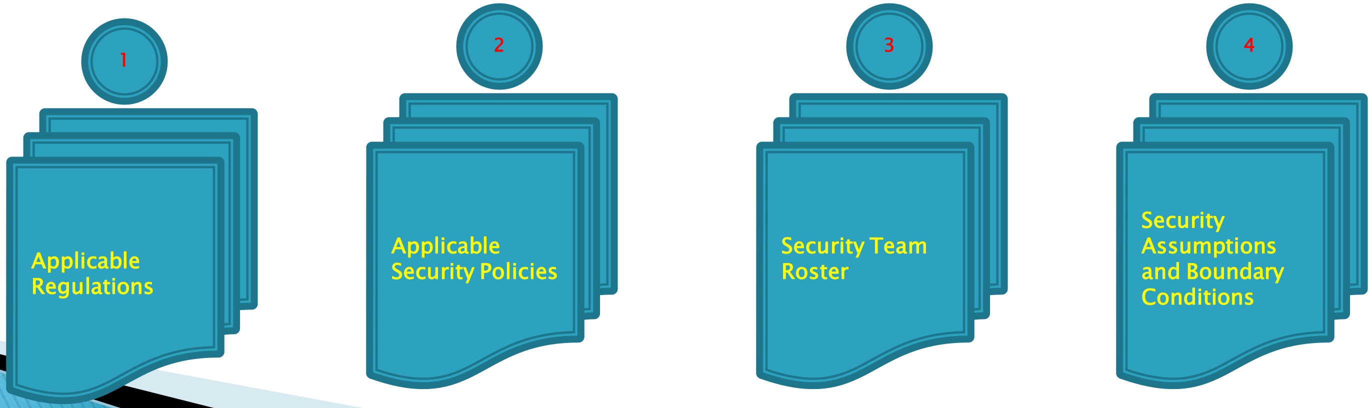


Security Policy

Relevant Statutes

Applicable Jurisdictions

Input



1 Applicable Regulations

2 Applicable Security Policies

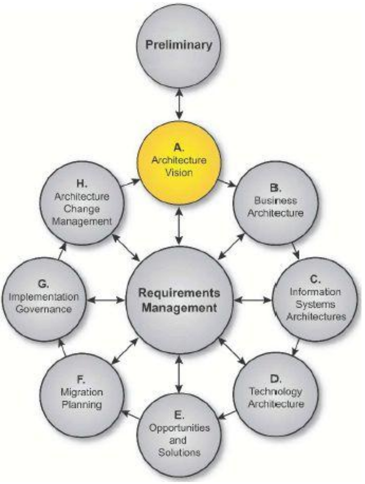
3 Security Team Roster

4 Security Assumptions and Boundary Conditions

Output

# Phase A – Security Architecture Vision

# Phase A – Security Architecture Vision



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Management Support

- Obtain management support for security measures

Milestones

- Define necessary security-related management sign-off milestones of this architecture development cycle

DR and BCM

- Determine and document applicable disaster recovery or business continuity plans/requirements

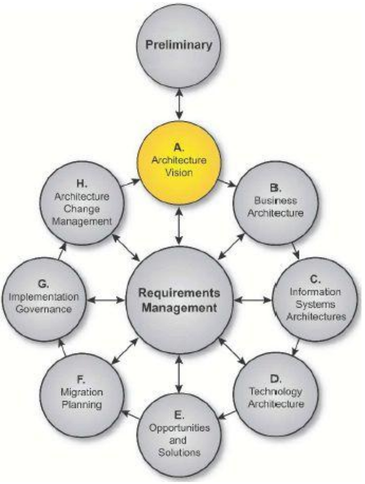
Environment

- Identify and document the anticipated physical/business/regulatory environment(s) in which the system(s) will be deployed

Criticality

- Determine and document the criticality of the system: safety-critical/mission-critical/noncritical

# Phase A – Security Architecture Vision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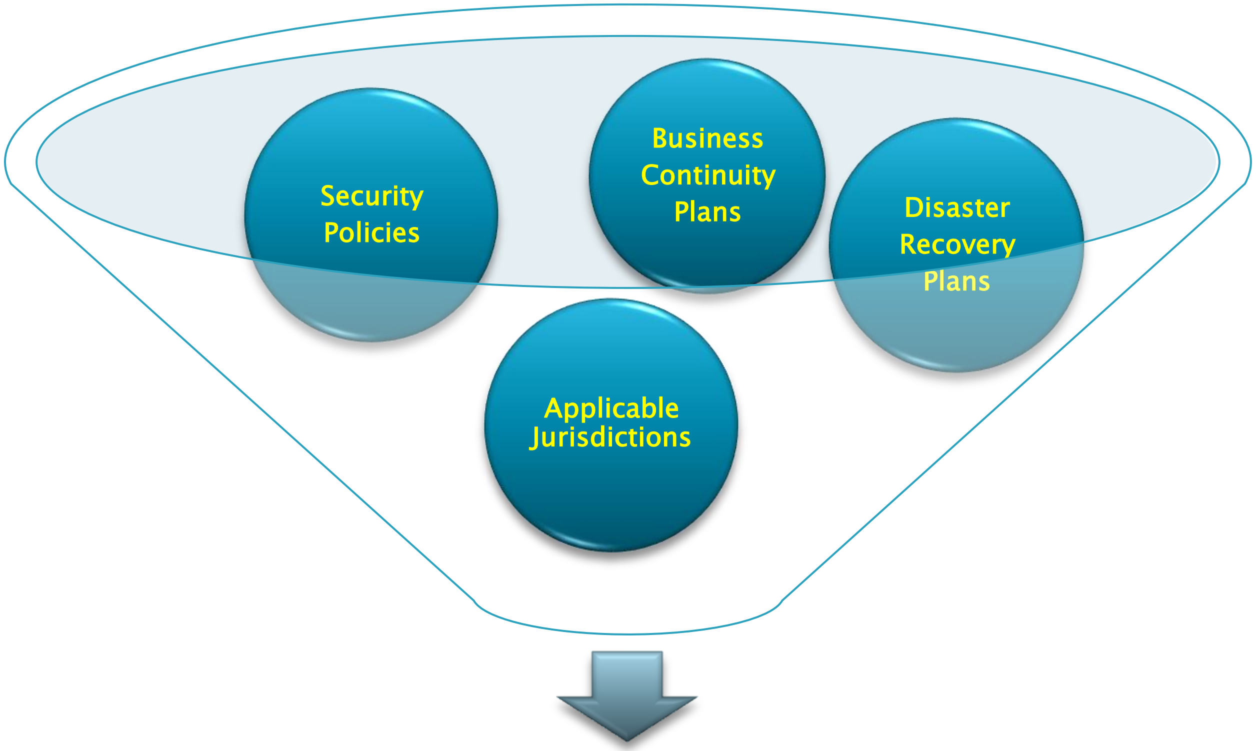


Security Policies

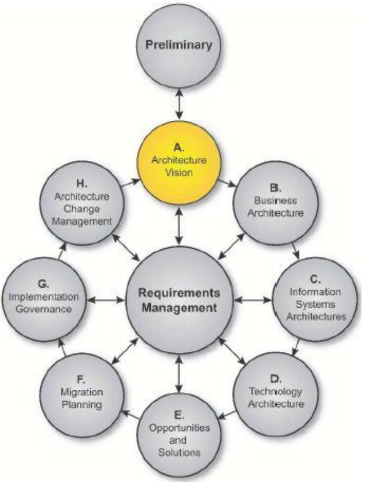
Business Continuity Plans

Disaster Recovery Plans

Applicable Jurisdictions

INPUT

# Phase A – Security Architecture Vision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Output

1 Physical Security Environment Statement

2 Business Security Environment Statement

3 Regulatory Environment Statement

4 Security Policy Cover Letter Signed

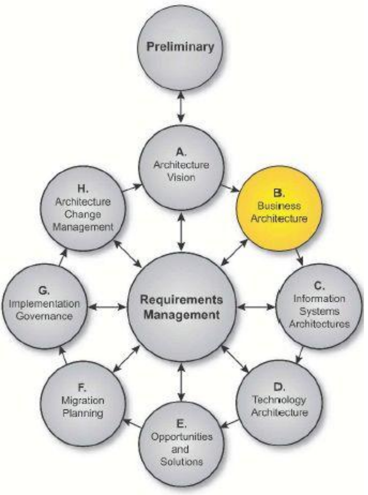
5 List of Architecture Development Checkpoints for Sign-off

6 Disaster Recovery and Business Continuity Plans

7 System Critical Statement

# Phase B – Business Architecture

# Phase B – Business Architecture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Legitimate Actors

- Determine who are the legitimate actors who will interact with the product/ser vice/process

Baseline

- Assess and baseline current security-specific business processes (enhancement of existing objective)

Security Measures

- Determine whom/how much it is acceptable to inconvenience in utilizing security measures

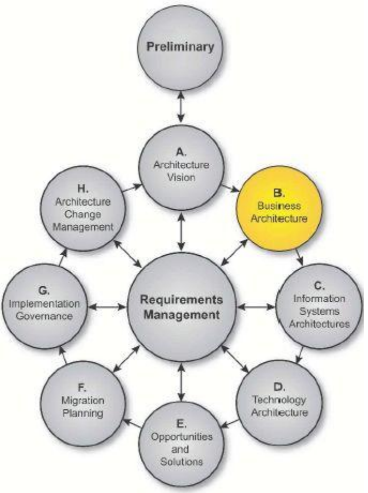
Interconnecting Systems

- Identify and document interconnecting systems beyond project control

Assets at Risk

- Determine the assets at risk if something goes wrong — ‘‘What are we trying to protect?’’

# Phase B – Business Architecture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E. Opportunities and Solutions

**Cost**

- Determine the cost (both qualitative and quantitative) of asset loss/impact in failure cases

**Asset Ownership**

- Identify and document the ownership of assets

**Forensic Process**

- Determine and document appropriate security forensic processes

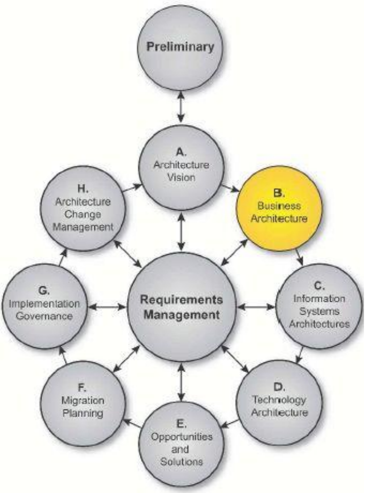
**Criticality**

- Identify the criticality of the availability and correct operation of the overall service

**Re-assess**

- Reassess and confirm Architecture Vision decisions

# Phase B – Business Architecture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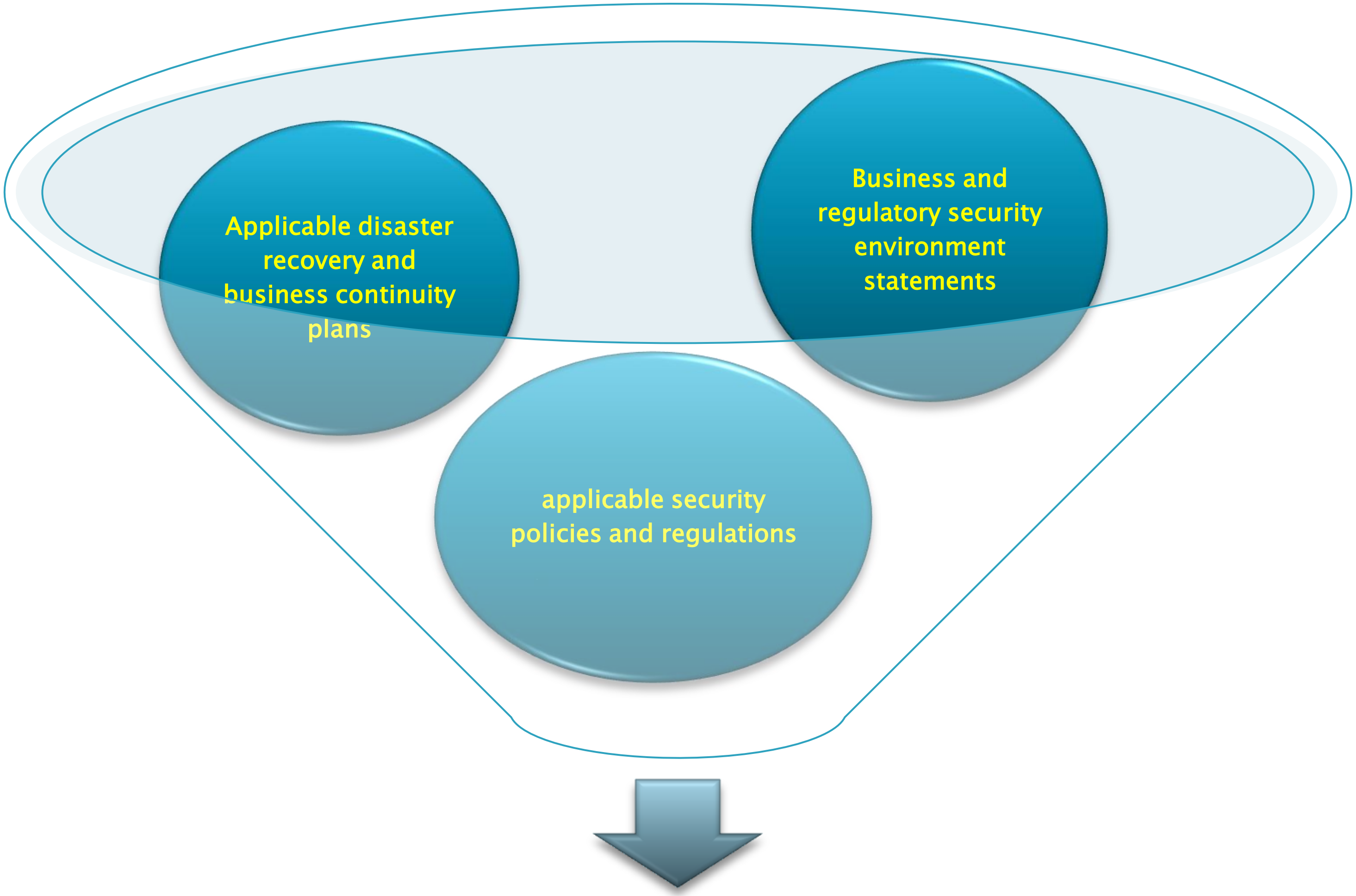


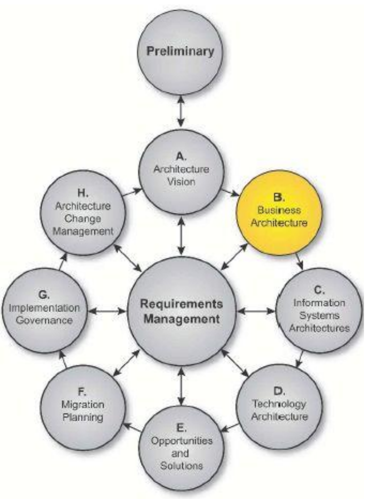
Applicable disaster recovery and business continuity plans

Business and regulatory security environment statements

applicable security policies and regulations

Input

# Phase B – Business Architecture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## Output

1 Forensic Processes

2 New disaster recovery and business continuity requirements

3 Validated business and regulatory environment statements

4 Validated security policies and regulations

5 Target security processes

6 Baseline security processes

7 security actors

8 Interconnecting Systems

9 security tolerance for each class of security actor

10 Asset list with values and owners

11 List of trust paths and Availability impact statement(s)

12 Threat analysis matrix

# Phase C – Information Systems Architecture

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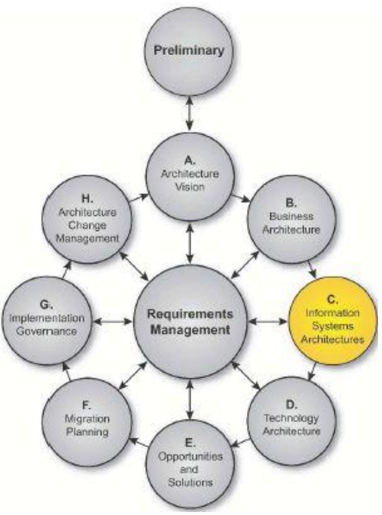

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**Baseline Architecture Elements**

- Assess and baseline current security-specific architecture elements (enhancement of existing objective)

**Default Actions and Failure States**

- Identify safe default actions and failure states
- Safe default actions and failure modes must be defined for the system informed by the current state, business environment, applicable policies, and regulatory obligations.

**Guidelines and Standards**

- Identify and evaluate applicable recognized guidelines and standards

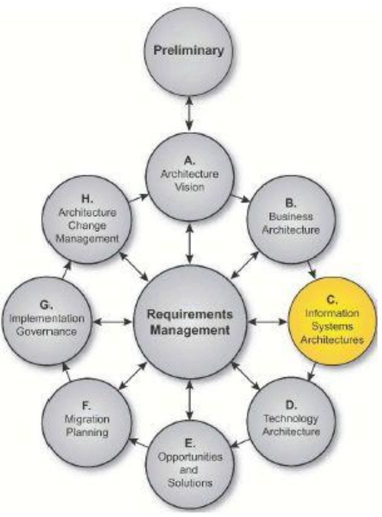
**Revisit Interconnecting Systems**

- Revisit assumptions regarding interconnecting systems beyond project control
- In light of the risk assessments performed, assumptions regarding interconnecting systems may
- require modification

**Classification Level**

- Determine and document the sensitivity or classification level of information stored/created/used
- Identify and document custody of assets
- Identify the criticality of the availability and correct operation of each function

# Phase C – Information Systems Architecture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**DR and BCM**

- Determine the relationship of the system under design with existing business disaster/continuity plans
- Identify what aspects of the system must be configurable to reflect changes in policy/business environment/access control

**Lifespan**

- Identify lifespan of information used as defined by business needs and regulatory requirements
- Determine approaches to address identified risks

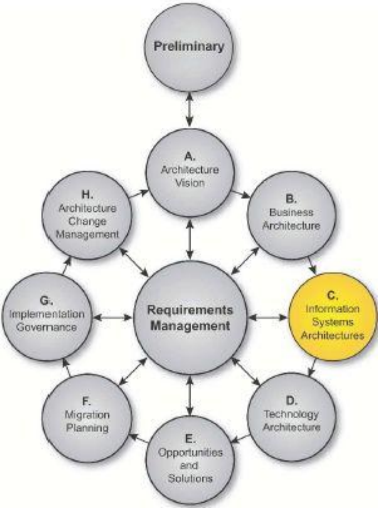
**Logs**

- Identify actions/events that warrant logging for later review or triggering forensic processes
- Identify and document requirements for rigor in proving accuracy of logged events (non-repudiation)

**Attacks**

- Identify potential/likely avenues of attack
- Thinking like an adversar y will prepare the architect for creation of a robust system that resists malicious tampering and, providentially, malfunction arising from random error

# Phase C – Information Systems Architecture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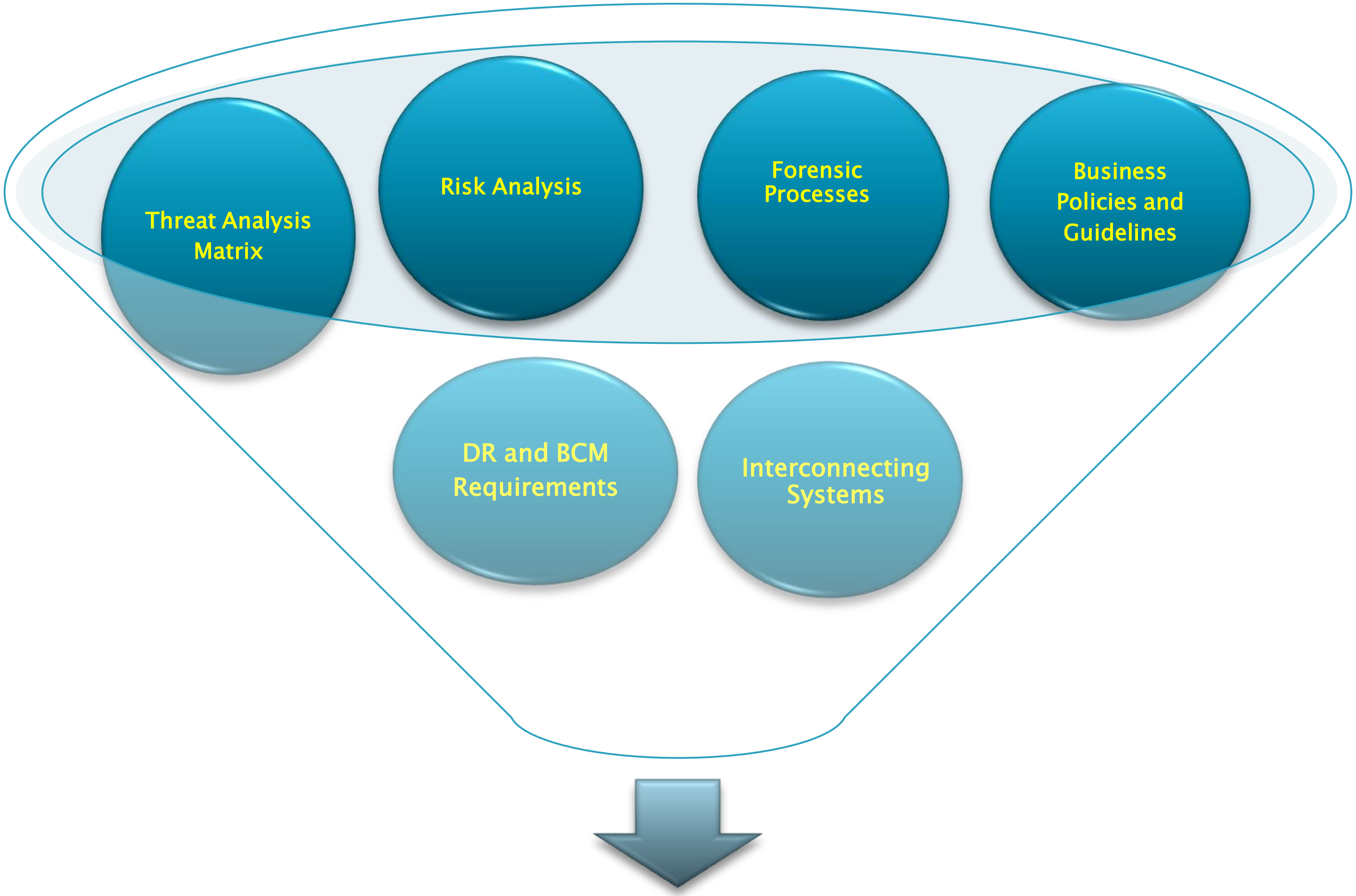


Threat Analysis Matrix

Risk Analysis

Forensic Processes

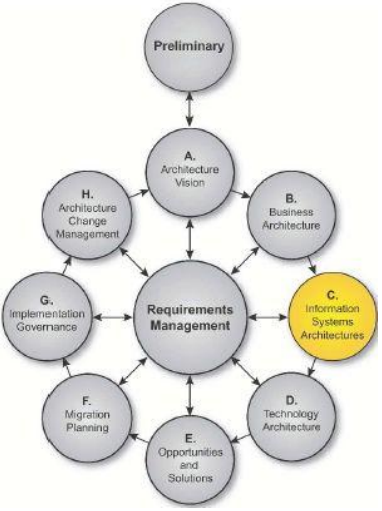
Business Policies and Guidelines

DR and BCM Requirements

Interconnecting Systems

Security Input

# Phase C – Information Systems Architecture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## Security Output

1 Event log-level matrix and requirements

2 Risk Management Strategy

3 Data Life Cycle Definitions

4 List of configurable system elements

5 Baseline list of security-related elements of the system

6 New or augmented security-related elements of the system

7 Security use-case models, List of applicable security standards

8 Validated interconnected system list

9 Information classification report, List of asset custodians

10 Function criticality statement

11 Revised disaster recovery and business continuity plans

12 Refined threat analysis matrix

# Phase D – Technology Architecture

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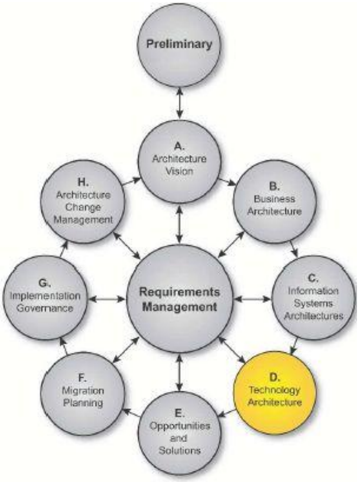

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**Baseline Technologies**

- Assess and baseline current security-specific technologies (enhancement of existing objective)
- Revisit assumptions regarding interconnecting systems beyond project control
- Identify and evaluate applicable recognized guidelines and standards

**Measures**

- Identify methods to regulate consumption of resources
- Engineer a method by which the efficacy of security measures will be measured and communicated on an ongoing basis
- Identify minimal privileges required for any entity to achieve a technical or business objective

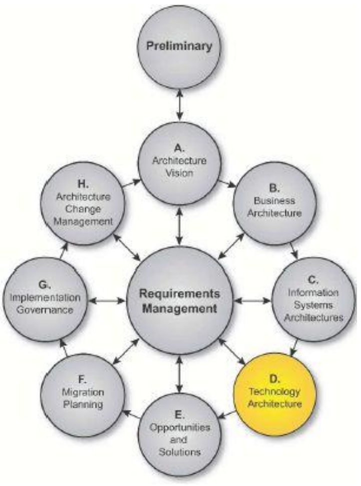
**Privileges**

- Identify minimal privileges required for any entity to achieve a technical or business objective

**Trust**

- Identify the trust (clearance) level of:
  - All users of the system
  - All administrators of the system
  - All interconnecting systems beyond project control

# Phase D – Technology Architecture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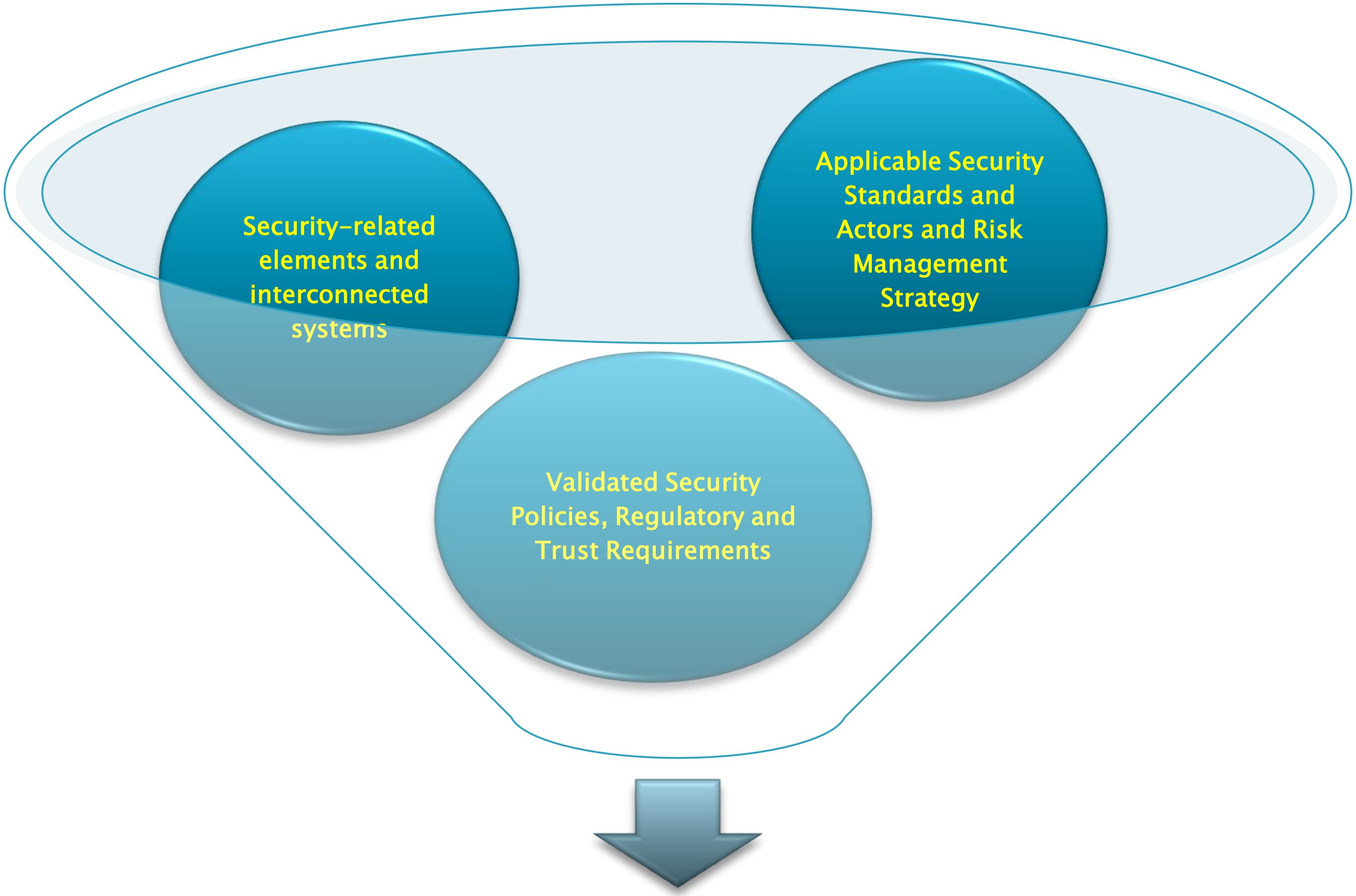


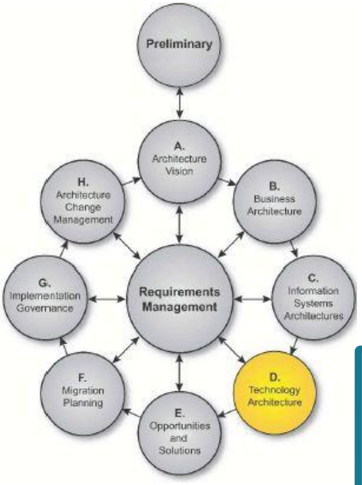
Security-related elements and interconnected systems

Applicable Security Standards and Actors and Risk Management Strategy

Validated Security Policies, Regulatory and Trust Requirements

Security Input

# Phase D – Technology Architecture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## Security Output

1 Baseline list of security technologies

2 Validated interconnected systems list

3 Selected security standards list

4 Resource conservation plan

5 Security metrics and monitoring plan

6 User authorization policies

7 Risk management plan

8 User trust (clearance) requirements

# Phase E – Opportunities and Solutions

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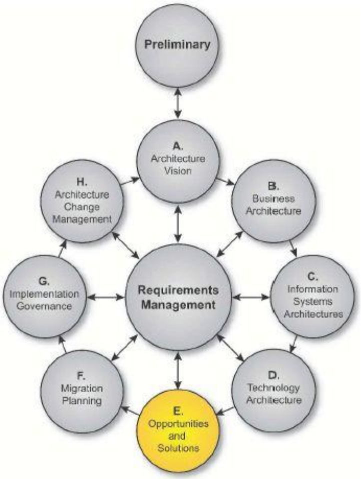
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**Security Services**

- Identify existing security services available for re-use
- Statutory or regulator y requirements may call for physical separation of domains which may eliminate the ability to re-use existing infrastructure

**Mitigation**

- Engineer mitigation measures addressing identified risks
- Mitigation measures must be designed, implemented, deployed, and/or operated.

**Evaluate**

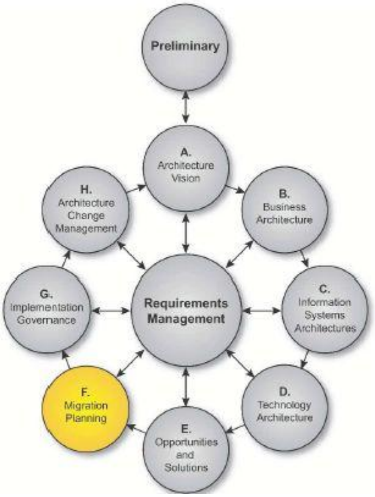
- Evaluate tested and re-usable security software and security system resources

**Re-Use**

- Identify new code/resources/assets that are appropriate for re-use
- It is appropriate to evaluate those new solutions for inclusion into any existing libraries, archives, or other repositories for future re-use.

# Phase F – Migration Planning

# Phase F– Migration Planning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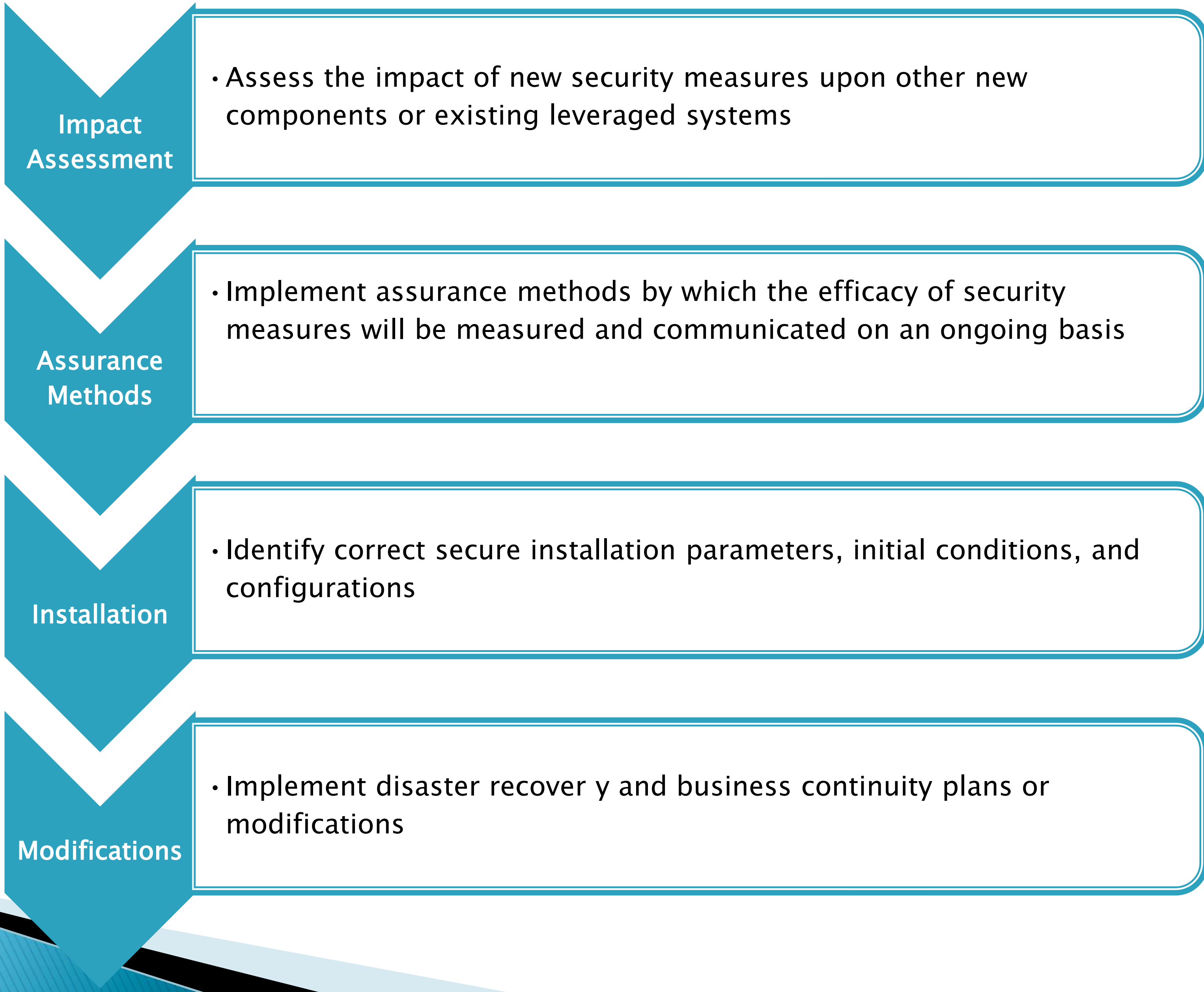


**Impact Assessment**

- Assess the impact of new security measures upon other new components or existing leveraged systems

**Assurance Methods**

- Implement assurance methods by which the efficacy of security measures will be measured and communicated on an ongoing basis

**Installation**

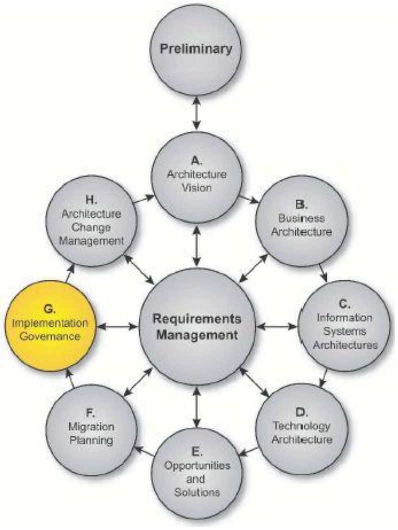
- Identify correct secure installation parameters, initial conditions, and configurations

**Modifications**

- Implement disaster recover y and business continuity plans or modifications

# Phase G – Implementation Governance

# Phase G – Implementation Governance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**Review**

- Establish architecture artifact, design, and code reviews and define acceptance criteria for the successful implementation of the findings

**Evidence**

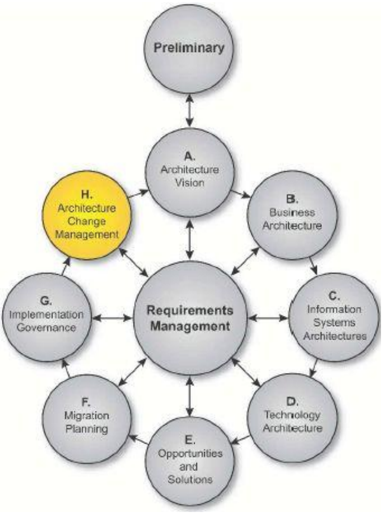
- Implement methods and procedures to review evidence produced by the system that reflects operational stability and adherence to security policies

**Training**

- Implement necessary training to ensure correct deployment, configuration, and operations of security-relevant subsystems and components; ensure awareness training of all users and non-privileged operators of the system and/or its components

# Phase H – Architecture Change

# Phase H– Architecture Change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**Requirements**

- Change is driven by new requirements. Changes in security requirements are often more disruptive than a simplification or incremental change.

**Statutes and Regulations**

- Changes in security policy can be driven by statute, regulation, or something that has gone wrong

**Standards**

- Changes in security standards are usually less disruptive since the trade-off for their adoption is based on the value of the change. However, standards changes can also be mandated

# Reference

- TOGAF Version 9, The Open Group Architecture Framework (TOGAF), 2009

If you have one last breath use it to say…