COBIT® Assessment Process (CAP):

COBIT® 4.1 Process Assessment Model

Exposure Draft

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1.0 Introduction

1.1 Purpose

This paper outlines an International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 15504-compliant process assessment model based on COBIT 4.1.

This model will be the basis for the assessment of an organisation's IT processes against COBIT 4.1 and a training programme and certification programme for assessors. The assessment process will be evidenced-based to enable a reliable, consistent and repeatable assessment process in the area of governance and management of IT.

The assessment model will enable internal assessments by organisations to support process improvement. Guidance will be given in a separate assessor's guide on a risk-based approach to selecting the processes to be assessed, including the use of ISACA's published COBIT 4.1 mappings to determine the processes to be assessed. These include:
- Linking business goals to IT goals
- Linking IT goals to IT processes
- Mapping IT processes to IT governance focus areas
- Governance focus areas
- US Sarbanes-Oxley Act
- Cloud computing
- Diagnostic tool for selecting scoping areas

1.2 Scope

This document defines the COBIT 4.1 process assessment model that supports the performance of an assessment by providing indicators for guidance on the interpretation of the process purposes and outcomes as defined in COBIT 4.1 and the process attributes as defined in ISO/IEC 15504-2.

The COBIT 4.1 process assessment model is composed of a set of indicators of process performance and process capability. The indicators are used as a basis for collecting the objective evidence that enables an assessor to assign ratings.

1.3 Assessment Domain

The COBIT 4.1 process assessment covers the assessment of those processes required for governance and management of information technology and related services as described in COBIT 4.1.

1.4 Normative References

The following documents are referenced in this document:
- COBIT 4.1, ITGI, 2007
- ISO/IEC 15504-1:2004, *Information technology—Process assessment—Part 1: Concepts and vocabulary*

- ISO/IEC 15504-2:2003, *Information technology—Process assessment—Part 2: Performing an Assessment*

1.5 Comparisons to COBIT 4.1 Maturity Model

The COBIT 4.1 process assessment model uses a measurement framework that is similar in terminology to the maturity models developed for each of the 34 COBIT 4.1 IT processes (referred to here as the COBIT 4.1 maturity model [MM]); however, there are differences.

The first difference is that, as shown in **figure 1**, the process capability (or process maturity) levels are expressed in different terms:
- The COBIT 4.1 MM uses a scale from the Software Engineering Institute (SEI) Capability Model (a precursor to SEI Capability Maturity Model Integration [CMMI]).
- The COBIT 4.1 process assessment model uses the scale used from ISO/IEC 15504.

Figure 1—Terms Used for Process Capability[1]		
COBIT 4.1 Process Maturity Levels	**ISO/IEC 15504 Process**	
	Capability Levels	**Attribute**
5 Optimised	5 Optimizing	PA.5.1 Process Innovation PA 5.2 Process Optimization
4 Managed and measurable	4 Predictable	PA.4.1 Process Measurement PA 4.2 Process Control
3. Defined	3 Established	PA.3.1 Process Definition PA 3.2 Process Deployment
2 Repeatable but intuitive	2 Managed	PA.2.1 Performance Management PA 2.2 Work Product Management
1 Initial/*ad hoc*	1 Performed	PA.1.1 Process Performance
0 Non-existent	0 Incomplete	

The assessment for COBIT 4.1 MM is based on a set of requirements that are specified for each process. These are broadly based on the generic maturity model contained within COBIT 4.1. However, they are not precisely defined requirements or structured for a rigorous assessment. The approach enables a judgement to be made, with the results very dependent on the individual making the judgement.

As discussed in this document, the COBIT 4.1 process assessment model uses a capability assessment approach defined in ISO/IEC 15504. The aim is to provide a rigorous, objective and repeatable assessment.

The key outcome from these differences is that the assessment results (in terms of levels) may be different because the COBIT 4.1 process assessment model has more precise criteria than the COBIT 4.1 MM. While it is possible that processes will be rated at the same level under the two approaches, the probability is that processes will gain a lower rating under an assessment undertaken against the COBIT 4.1 process assessment model.

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1.6   Terms and Definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 15504-1 apply. Key definitions include:

- **Attribute indicator**—An assessment indicator that supports the judgement of the extent of achievement of a specific process attribute (ISO/IEC 15504:1, 3.16)
- **Base practice**—An activity that, when consistently performed, contributes to achieving a specific process purpose (ISO/IEC 15504:1, 3.17)
- **Capability dimension**—The set of elements in a process assessment model explicitly related to the Measurement Framework for Process Capability (ISO/IEC 15504:1, 3.18)
- **Capability indicator**—An assessment indicator that supports the judgement of the process capability of a specific process (ISO/IEC 15504:1, 3.19)
- **Generic practice**—An activity that, when consistently performed, contributes to the achievement of a specific process attribute (ISO/IEC 15504:1, 3.22)
- **Performance indicator**—An assessment indicator that supports the judgement of the process performance of a specific process (ISO/IEC 15504:1, 3 26)

  NOTE: A performance indicator is an attribute indicator for Process Attribute 1.1 for a specific process. (See ISO/IEC 15504:2.)
- **Process assessment model**—A model suitable for the purpose of assessing process capability, based on one or more process reference models (ISO/IEC 15504:1, 3.33)
- **Process attribute**—A measurable characteristic of process capability applicable to any process (ISO/IEC 15504:1, 3.31)
- **Process attribute rating**—A judgement of the degree of achievement of the process attribute for the assessed process (ISO/IEC 15504:1, 3.32)
- **Process capability**—A characterisation of the ability of a process to meet current or projected business goals (ISO/IEC 15504:1, 3.33)
- **Process capability level**—A point on the six-point ordinal scale (of process capability) that represents the capability of the process, each level building on the capability of the level below (ISO/IEC 15504:1, 3.36)
- **Process capability level rating—**A representation of the achieved process capability level derived from the process attribute ratings for an assessed process (ISO/IEC 15504:1 3.37)
- **Process outcome**—An observable result of a process (Note: An outcome is an artefact, a significant change of state or the meeting of specified constraints.) (ISO/IEC 15504:1, 3.44)
- **Process purpose—**The high-level measurable objectives of performing the process and the likely outcomes of effective implementation of the process (ISO/IEC 15504:1, 3.47)
- **Process reference model**—A model composed of definitions of processes in a life cycle described in terms of process purpose and outcomes, together with an architecture describing the relationships amongst the processes (ISO/IEC 15504:1, 3.48)
- **Work product**—An artefact associated with the execution of a process (ISO/IEC 15504:1, 3.55)

2.0 Overview of the COBIT 4.1 Process Assessment Model

2.1 Introduction

The process assessment model is a two-dimensional model of process capability, as shown in **figure 2**. In one dimension, the process dimension, the processes are defined and classified into process categories. In the other dimension, the capability dimension, a set of process attributes grouped into capability levels is defined. The process attributes provide the measurable characteristics of process capability.

Figure 2—Overview of the Process Assessment Model (PAM)[2]
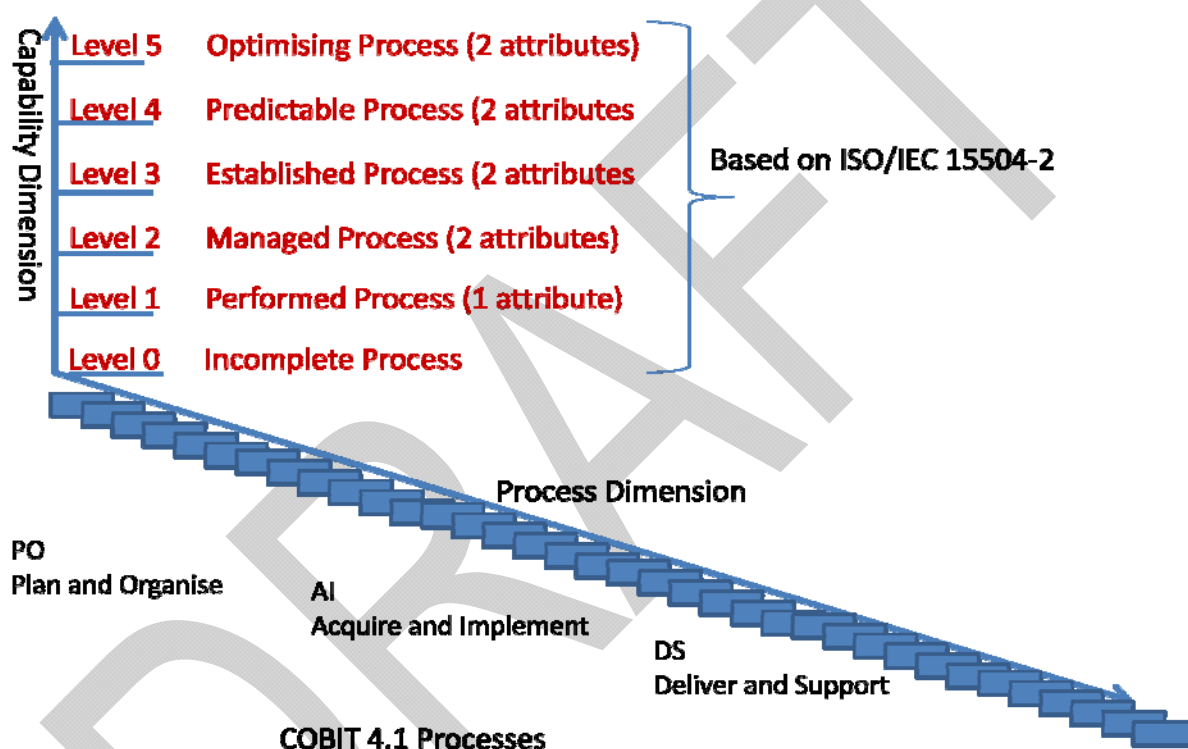
The process assessment model defined in this document conforms to ISO/IEC 15504-2 requirements for a process assessment model, and can be used as the basis for conducting an assessment of the capability of each COBIT 4.1 process.

2.2 The Process Dimension—COBIT 4.1 Processes

The process dimension uses COBIT 4.1 as the process reference model. COBIT 4.1 provides definitions of processes in a life cycle (the process reference model), together with an architecture describing the relationships amongst the processes.

The COBIT 4.1 framework is composed of 34 processes describing a life cycle for governance of IT, as shown in **figure 3**.

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Figure 3—COBIT 4.1 Overview
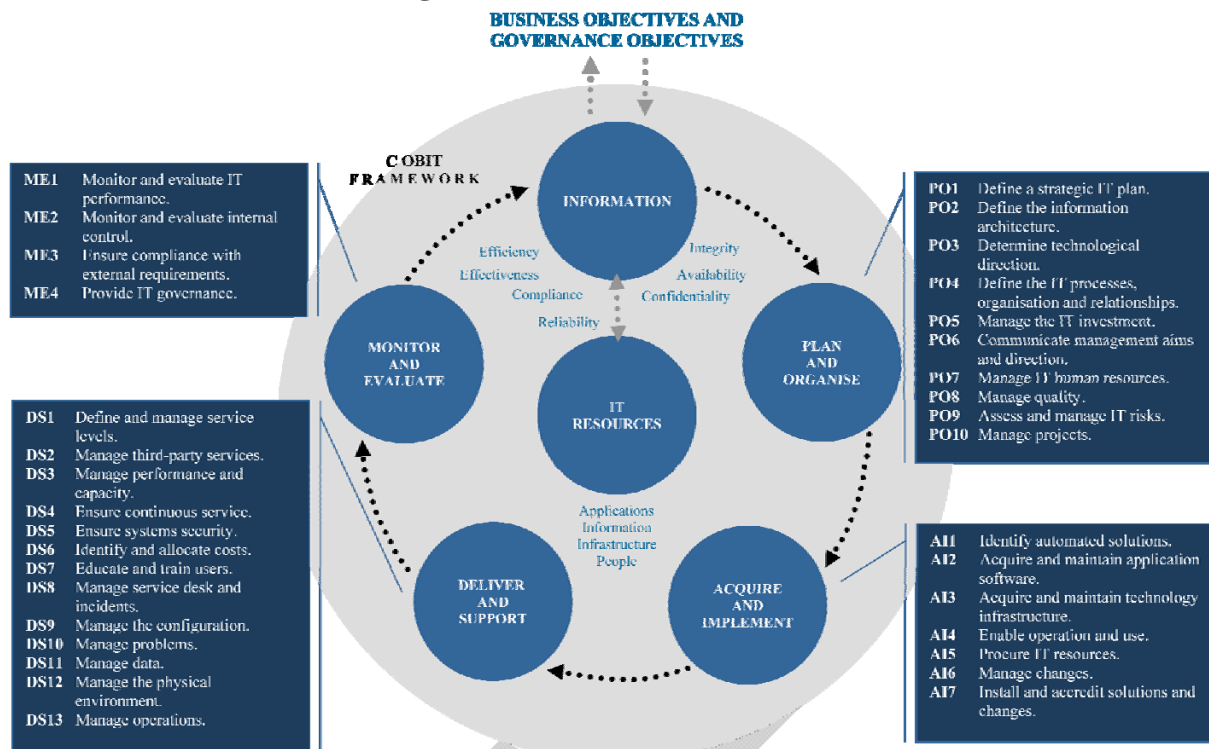
COBIT 4.1 identifies the IT processes' requirement for governance and management of IT within four domains. The domains map to IT's traditional responsibility areas of plan, build, run and monitor. These domains are:

- **Plan and Organise (PO)**—Provides direction to solution delivery (AI) and service delivery (DS). This domain covers strategy and tactics, and concerns the identification of the way IT can best contribute to the achievement of the business objectives. The realisation of the strategic vision needs to be planned, communicated and managed for different perspectives. A proper organisation, as well as technological infrastructure, should be put in place.
- **Acquire and Implement (AI)**—Provides the solutions and passes them on to be turned into services. To realise the IT strategy, IT solutions need to be identified, developed or acquired, as well as implemented and integrated into the business process. Changes in and maintenance of existing systems are also covered by this domain, to ensure that the solutions continue to meet business objectives.
- **Deliver and Support (DS)**—Receives the solutions and makes them usable for end users. This domain is concerned with the actual delivery of required services, which includes service delivery, management of security and continuity, service support for users, and management of data and operational facilities.
- **Monitor and Evaluate (ME)**—Monitors all processes to ensure that the direction provided is followed. All IT processes need to be regularly assessed over time for their quality and compliance with control requirements. This domain addresses performance management, monitoring of internal control, regulatory compliance and governance.

Across the four domains there are 34 defined IT processes. The COBIT 4.1 processes are as follows:

- PO1 Define a strategic IT plan.
- PO2 Define the information architecture.

- PO3 Determine technological direction.
- PO4 Define the IT processes, organisation and relationships.
- PO5 Manage the IT investment.
- PO6 Communicate management aims and direction.
- PO7 Manage IT human resources.
- PO8 Manage quality.
- PO9 Assess and manage IT risks.
- PO10 Manage projects.
- AI1 Identify automated solutions.
- AI2 Acquire and maintain application software.
- AI3 Acquire and maintain technology infrastructure.
- AI4 Enable operation and use.
- AI5 Procure IT resources.
- AI6 Manage changes.
- AI7 Install and accredit solutions and changes.
- DS1 Define and manage service levels.
- DS2 Manage third-party services.
- DS3 Manage performance and capacity.
- DS4 Ensure continuous service.
- DS5 Ensure systems security.
- DS6 Identify and allocate costs.
- DS7 Educate and train users.
- DS8 Manage service desk and incidents.
- DS9 Manage the configuration.
- DS10 Manage problems.
- DS11 Manage data.
- DS12 Manage the physical environment.
- DS13 Manage operations.
- ME1 Monitor and evaluate IT performance.
- ME2 Monitor and evaluate internal control.
- ME3 Ensure compliance with external requirements.
- ME4 Provide IT governance.

2.3   The Capability Dimension

The capability dimension provides a measure of a process's capability to meet an organisation's current or projected business goals for the process.

The process capability is expressed in terms of process attributes grouped into capability levels, as shown in **figure 4**. The capability level of a process is determined on the basis of the achievement of specific process attributes as per ISO/IEC 15504-2:2003.

Figure 4—Capability Levels and Process Attributes[3]	
Process Attribute ID	**Capability Levels and Process Attributes**
	Level 0: Incomplete process
	Level 1: Performed process
PA 1.1	Process performance
	Level 2: Managed process
PA 2.1	Performance management
PA 2.2	Work product management
	Level 3: Established process
PA 3.1	Process definition
PA 3.2	Process deployment
	Level 4: Predictable process
PA 4.1	Process measurement
PA 4.2	Process control
	Level 5: Optimising process
PA 5.1	Process innovation
PA 5.2	Continuous optimization

The rating scale involves six capability levels as follows.
- **Level 0 Incomplete process**—The process is not implemented or fails to achieve its process purpose. At this level, there is little or no evidence of any systematic achievement of the process purpose.
- **Level 1 Performed process** (one attribute)—The implemented process achieves its process purpose.
- **Level 2 Managed process** (two attributes)—The previously described performed process is now implemented in a managed fashion (planned, monitored and adjusted) and its work products are appropriately established, controlled and maintained.
- **Level 3 Established process** (two attributes)—The previously described managed process is now implemented using a defined process that is capable of achieving its process outcomes.
- **Level 4 Predictable process** (two attributes)—The previously described established process now operates within defined limits to achieve its process outcomes.
- **Level 5 Optimising process** (two attributes)—The previously described predictable process is continuously improved to meet relevant current and projected business goals.

2.4 Assessment Indicators

Assessment indicators are used to assess whether process attributes have been achieved.

There are two types of assessment indicators:
- Process capability indicators, which apply to capability levels 1 to 5
- Process performance indicators, which apply exclusively to capability level 1

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Figure 5-Assessment Indicators[4]
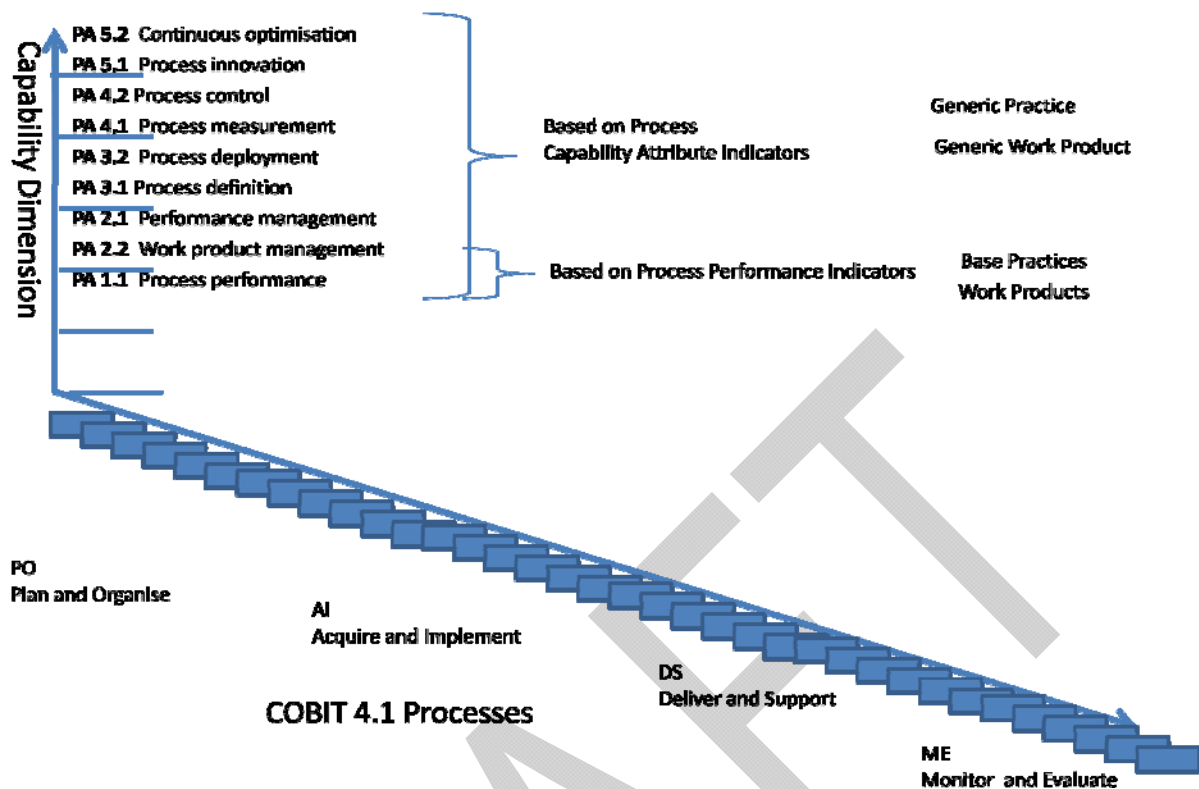
Process performance indicators (base practices and work products) are specific for each process and are used to determine whether a process is at capability level 1. The base practices and work products for each COBIT 4.1 process are shown in section 3.0. These are based on material in COBIT 4.1.

The process capability indicators are generic for each process attribute for capability levels 1 to 5.

The process capability indicators used in the COBIT 4.1 process capability assessment are:
- Generic practice (GP)
- Generic work product (GWP)

These are shown in section 4.0.

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3.0 Process Dimension and Process Performance Indicators

This section defines the processes and the process performance indicators, also known as the process dimension, of the process assessment model. The processes in the process dimension can be directly mapped to the processes defined in the process reference model.

The individual processes are described in terms of process name, purpose and outcomes (Os), based on COBIT 4.1.

In addition, the process dimension of the process assessment model provides information in the form of:

- A set of base practices (BPs) for the process, providing a definition of the tasks and activities needed to accomplish the process purpose and fulfil the process outcomes. Each BP is explicitly associated to a process outcome.
- A number of input and output work products (WPs) associated with each process and related to one or more of its outcomes
- Characteristics associated with each WP

The process purposes, Os, BPs and WPs associated with the processes are included in this section. The WPs are defined in appendix B, section B.2.

The BPs and WPs constitute the set of indicators of process performance. The associated WPs listed in this clause may be used when reviewing potential inputs and outputs of an organisation's process implementation.

The associated WPs provide objective guidance for potential inputs and outputs to look for, and objective evidence supporting the assessment of a particular process. A documented assessment process and assessor judgement is needed to ensure that process context (application domain, business purpose, development methodology, size of the organisation, etc.) is explicitly considered when using this information.

This list of WPs should not be considered a checklist of what each organisation must have but rather as an example and starting point for considering whether, given the context, the WPs are necessary and contribute to the intended purpose of the process.

It should be noted that WPs for some processes provide higher capability requirements for other processes. This will result in a progressive implementation of processes. The initial focus on any process assessment would be the core (sometimes called primary processes) which are primarily part of the AI and DS domains. Processes in the PO and ME domains will be required to support improvement in the capability of these core processes past level 1. An example is PO4 *Define the IT processes, organisation and relationships*, which is required as part of establishing the IT process framework, documented roles and responsibilities required by processes at capability level 2.

The following WPs are input to all processes but are not listed in the input sections: PO6-WP1, PO6-WP2, PO7-WP5, PO8-WP3.

3.1 Plan and Organise (PO)

Process ID	PO1		
Process Name	**Define a Strategic IT Plan**		
Purpose	Satisfy the business requirement of sustaining or extending the business strategy and governance requirements while being transparent about benefits, costs and risks.		
Outcomes (Os)	**Number**	**Description**	
	PO1-O1	Value management processes, including business cases and benefits realisation, are established.	
	PO1-O2	Business and IT are involved in strategic planning.	
	PO1-O3	Current IT capabilities are defined.	
	PO1-O4	An IT strategic plan is prepared that defines IT goals and priorities based on the business objectives.	
	PO1-O5	IT tactical plans are prepared.	
	PO1-O6	Project and service portfolios are prepared and managed.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO1-BP1	Link business goals to IT goals.	PO1-O1, O2
	PO1-BP2a	Identify critical dependencies.	PO1-O2, O6
	PO1-BP2b	Identify current performance.	PO1-O3
	PO1-BP3	Build an IT strategic plan.	PO1-O2, O4
	PO1-BP4	Build IT tactical plans, taking into account dependencies and performance identified.	PO1-O5
	PO1-BP5a	Analyse program portfolios.	PO1-O6
	PO1-BP5b	Manage project and service portfolios.	PO1-O6
Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO5-WP1	Cost-benefit reports		PO1-O1, O4
PO9-WP1	Risk assessment		PO1-O1, O3, O4, O5
PO10-WP5	Updated IT project portfolio		PO1-O6
DS1-WP3	New/updated service requirements		PO1-O6
DS1-WP6	Updated IT service portfolio		PO1-O6
Outside COBIT	Business strategy and priorities		PO1-O2, O4
Outside COBIT	Programme portfolio		PO1-O1, O6
ME1-WP1	Performance input to IT planning		PO1-O5
ME4-WP2	Report on IT governance status		PO1-O1, O2
ME4-WP4	Enterprise strategic direction for IT		PO1-O1, O2

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Process ID	PO1		
Process Name	Define a Strategic IT Plan		
Outputs			
Number	**Description**	**Input To**	**Supports**
PO1-WP1	Strategic IT plan	PO2 to PO6, PO8, PO9, AI1, DS1	PO1-O2, O4
PO1-WP2	Tactical IT plan	PO2 to PO6, PO9, AI1	PO1-O5
PO1-WP3	IT project portfolio	PO5, PO6, PO9, PO10, AI6	PO1-O1, O6
PO1-WP4	IT service portfolio	PO5, PO6, PO9, DS1	PO1-O1, O6
PO1-WP5	IT sourcing strategy	DS2	PO1-O2, O3
PO1-WP6	IT acquisition strategy	AI5	PO1-O2, O4

Process ID	PO2		
Process Name	**Define the Information Architecture**		
Purpose	Satisfy the business requirement of being agile in responding to requirements; provide reliable, consistent information, and seamlessly integrate applications into business processes.		

Outcomes (Os)	**Number**	**Description**	
	PO2-O1	There is an effective information architecture and data model.	
	PO2-O2	A data dictionary is maintained to enable the sharing of data elements amongst applications and systems, and to promote a common use of data throughout all IT applications.	
	PO2-O3	A data classification scheme is maintained.	
	PO2-O4	Processes are in place to ensure the integrity and consistency of all data stored in electronic form.	

Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO2-BP1	Create and maintain a corporate/enterprise information model.	PO2-O1
	PO2-BP2	Create and maintain a corporate data dictionary(ies).	PO2-O2
	PO2-BP3	Establish and maintain a data classification scheme.	PO2-O3
	PO2-BP4	Provide data owners with procedures and tools for classifying information systems.	PO2-O2
	PO2-BP5	Utilise the information model, data dictionary and classification scheme to plan optimised business systems.	PO2-O3, O4

Work Products (WPs)			

Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		PO2-O1
PO1-WP2	Tactical IT plan		PO2-O1
AI1-WP1	Business requirements feasibility study		PO2-O1, O2, O3
AI7-WP5	Post-implementation review		PO2-O4
DS3-WP1	Performance and capacity information		PO2-O1
ME1-WP1	Performance input to IT planning		PO2-O1

Outputs			
Number	**Description**	**Input To**	**Supports**
PO2-WP1	Data classification scheme	AI2	PO2-O1, O3
PO2-WP2	Optimised business systems plan	PO3, AI2	PO2-O1
PO2-WP3	Data dictionary	AI2, DS11	PO2-O2
PO2-WP4	Information architecture	PO3, DS5	PO2-O1
PO2-WP5	Assigned data classifications	DS1, DS4, DS5, DS11, DS12	PO2-O3
PO2-WP6	Classification procedures and tools	Outside COBIT	PO2-O4

Process ID	PO3		
Process Name	**Determine Technological Direction**		
Purpose	Satisfy the business requirement of having stable, cost-effective, integrated and standard application systems, resources and capabilities that meet current and future business requirements.		

Outcomes (Os)	**Number**	**Description**	
	PO3-O1	A technology infrastructure plan is developed and maintained based on an analysis of existing and emerging technologies and in accordance with the IT strategic and tactical plans.	
	PO3-O2	An IT architecture board (or equivalent) exists to provide architecture guidelines and advice on their application, and to verify compliance.	

Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO3-BP1	Create and maintain a technology infrastructure plan.	PO3-O1
	PO3-BP2	Create and maintain technology standards.	PO3-O2
	PO3-BP3	Monitor technology evolution.	PO3-O1
	PO3-BP4	Define future strategic use of new technology.	PO3-O1

Work Products (WPs)			

Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		PO3-O1
PO1-WP2	Tactical IT plan		PO3-O1
PO2-WP2	Optimised business systems plan		PO3-O1, O2
PO2-WP4	Information architecture		PO3-O1
AI3-WP4	Updates for technology standards		PO3-O1
DS3-WP1	Performance and capacity information		PO3-O1, O2

Outputs			
Number	**Description**	**Input To**	**Supports**
PO3-WP1	Technology opportunities	AI3	PO3-O1
PO3-WP2	Technology standards	AI1, AI3, AI7, DS5	PO3-O1, O2
PO3-WP3	Regular 'state of technology' updates	AI1, AI2, AI3	PO3-O2
PO3-WP4	Technology infrastructure plan	AI3	PO3-O1
PO3-WP5	Infrastructure requirements	PO5	PO3-O1, O2

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Process ID	PO4		
Process Name	**Define the IT Processes, Organisation and Relationships**		
Purpose	Satisfy the business requirement of being agile in responding to the business strategy whilst complying with governance requirements and providing defined and competent points of contact.		
Outcomes (Os)	**Number**	**Description**	
	PO4-O1	An IT process framework is defined to include an IT process structure and relationships, ownership, maturity, performance measurement, and improvement.	
	PO4-O2	The appropriate organisational bodies and structure are established to advise on strategic direction and review major investments on behalf of the board.	
	PO4-O3	Roles, responsibilities and reporting lines are defined and integrated into business and decision processes. This includes responsibilities for quality assurance, risk management and data ownership.	
	PO4-O4	Implementation of adequate supervisory practices includes separation of duties in the IT function to ensure that roles and responsibilities are properly exercised and to assess whether all personnel have sufficient authority and resources.	
	PO4-O5	Staffing requirements are evaluated on a regular basis or upon major changes to the business, operational or IT environments to ensure that the IT function has sufficient resources to adequately and appropriately support the business goals and objectives.	
	PO4-O6	Appropriate policies and procedures exist for contracted staff.	
	PO4-O7	An established and maintained optimal co-ordination, communication and liaison structure exists between the IT function and various other internal or external interests.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO4-BP1	Establish IT organisational structure, including committees and linkages to the stakeholders and vendors.	PO4-O2, O3
	PO4-BP2	Design an IT process framework.	PO4-O1
	PO4-BP3	Identify system owners.	PO4-O3
	PO4-BP4	Identify data owners.	PO4-O3
	PO4-BP5	Establish and implement IT roles and responsibilities, including supervision and segregation of duties.	PO4-O3, O4, O5, O6, O7
Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		PO4-O1
PO1-WP2	Tactical IT plan		PO4-O1
PO7-WP1	IT human resources policy and procedures		PO4-O4, O5, O6
PO7-WP2	IT skill matrix		PO4-O4, O5, O6
PO7-WP3	Job descriptions		PO4-O4, O5, O6
PO8-WP4	Quality improvement actions		PO4-O1
PO9-WP4	IT-related risk remedial action plans		PO4-O7

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Process ID	PO4		
Process Name	**Define the IT Processes, Organisation and Relationships**		
ME1-WP2	Remedial action plans		PO4-O7
ME2-WP1	Report on effectiveness of IT controls		PO4-O3, O4
ME3-WP1	Catalogue of legal and regulatory requirements related to IT service delivery		PO4-O1
ME4-WP1	Process framework improvements		PO4-O1
Outputs			
Number	**Description**	**Input To**	**Supports**
PO4-WP1	IT process framework	ME4	PO4-O1
PO4-WP2	Documented system owners	AI7, DS6	PO4-O3
PO4-WP3	IT organisation and relationships	PO7	PO4-O2, O3, O4, O6, O7
PO4-WP4	Documented roles and responsibilities	PO7	PO4-O1, O3

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Process ID	PO5		
Process Name	**Manage the IT Investment**		
Purpose	Satisfy the business requirement of continuously and demonstrably improving IT's cost-efficiency and its contribution to business profitability with integrated and standardised services that satisfy end-user expectations.		
Outcomes (Os)	**Number**	**Description**	
	PO5-O1	Budgets for IT-enabled investments are forecasted, allocated and managed.	
	PO5-O2	Formal investment criteria (return on investment [ROI], payback period, net present value [NPV]) are defined.	
	PO5-O3	Business value is measured and assessed against forecast.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO5-BP1	Establish and maintain a financial management framework.	PO5-O1
	PO5-BP2	Maintain a programme portfolio.	PO5-O1
	PO5-BP3	Maintain project and service portfolios.	PO5-O2
	PO5-BP4	Establish and maintain the IT budgeting process.	PO5-O1, O2
	PO5-BP5a	Identify, communicate IT investment, cost and value to the business.	PO5-O3
	PO5-BP5b	Monitor IT investment, cost and value to the business.	PO5-O3

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		PO5-O1, O2
PO1-WP2	Tactical IT plan		PO5-O1, O2
PO1-WP3	IT project portfolio		PO5-O1, O2
PO1-WP4	IT service portfolio		PO5-O1, O2
PO3-WP5	Infrastructure requirements		PO5-O1, O2
PO10-WP5	Updated IT project portfolio		PO5-O3
AI1-WP1	Business requirements feasibility study		PO5-O1, O2
AI7-WP5	Post-implementation reviews		PO5-O3
DS3-WP2	Performance and capacity plan (requirements)		PO5-O1, O2, O3
DS6-WP1	IT financials		PO5-O1
ME4-WP3	Expected business (supports outcome of IT-enabled business investments)		PO5-O2
Outputs			
Number	**Description**	**Input To**	**Supports**
PO5-WP1	Cost-benefit reports	PO1, AI2, DS6, ME1, ME4	PO5-O2, O3
PO5-WP2	IT budgets	DS6	PO5-O1
PO5-WP3	Updated IT service portfolio	DS1	PO5-O1, O3
PO5-WP4	Updated IT project portfolio	PO10	PO5-O1, O3

Process ID	PO6		
Process Name	**Communicate Management Aims and Direction**		
Purpose	Satisfy the business requirement of supplying accurate and timely control over current and future IT services, associated risks and responsibilities.		
Outcomes (Os)	**Number**	**Description**	
	PO6-O1	An IT control framework is established.	
	PO6-O2	IT policies are defined.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO6-BP1	Establish and maintain an IT control environment and framework.	PO6-O1
	PO6-BP2	Develop and maintain IT policies.	PO6-O2
	PO6-BP3	Communicate the IT control framework and IT objectives and direction.	PO6-O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		PO6-O1, O2
PO1-WP2	Tactical IT plan		PO6-O1, O2
PO1-WP3	IT project portfolio		PO6-O1, O2
PO1-WP4	IT service portfolio		PO6-O1, O2
PO9-WP3	IT-related risk management guidelines		PO6-O1, O2
ME2-WP1	Report on effectiveness of IT controls		PO6-O2
Outputs			
Number	**Description**	**Input To**	**Supports**
PO6-WP1	Enterprise IT control framework	All	PO6-O1
PO6-WP2	IT policies, standards and procedures	All	PO6-O2

Process ID	PO7		
Process Name	Manage IT Human Resources		
Purpose	Satisfy the business requirement of acquiring competent and motivated people to create and deliver IT services.		

Outcomes (Os)	Number	Description	
	PO7-O1	Recruitment and retention policies and processes ensure that skills are available to achieve organisational goals.	
	PO7-O2	Training exists to ensure that IT employees maintain their knowledge, skills and abilities at the level required to achieve organisational goals.	
	PO7-O3	Risks of overdependence on key resources are mitigated.	
	PO7-O4	Appropriate personnel clearance procedures are in place.	
	PO7-O5	Staff performance is regularly evaluated and reviewed.	
	PO7-O6	Risks associated with job changes and terminations are mitigated.	

Base Practices (BPs)	Number	Description	Supports
	PO7-BP1	Identify IT skills, define position descriptions, define adequate salary ranges and evaluate personal performance through benchmarks.	PO7-O1, O3, O4
	PO7-BP2a	Recruit, hire, vet IT employees.	PO7-O1, O3, O4, O6
	PO7-BP2b	Perform employee performance appraisals consistent with HR policies and procedures.	PO7-O5
	PO7-BP2c	Provide/enable employee training and professional development consistent with HR policies and procedures.	PO7-O2, O6
	PO7-BP2d	Promote/terminate employees consistent with HR policies and procedures.	PO7-O5

Work Products (WPs)			
Inputs			

Number	Description		Supports
PO4-WP3	IT organisation and relationships		PO7-O1, O4
PO4-WP4	Documented roles and responsibilities		PO7-O1, O4
AI1-WP1	Business requirements feasibility study		PO7-O1, O2, O3, O4, O5, O6

Outputs			
Number	Description	Input To	Supports
PO7-WP1	IT human resources policy and procedures	PO4	PO7-O1, O4, O5
PO7-WP2	IT skills matrix	PO4, PO10	PO7-O2, O3
PO7-WP3	Job descriptions	PO4	PO7-O1
PO7-WP4	Users' skills and competencies, including individual training	DS7	PO7-O1, O2, O5, O6
PO7-WP5	Roles and responsibilities	All	PO7-O1, O3, O4

Process ID	PO8		
Process Name	**Manage Quality**		
Purpose	Satisfy the business requirement of ensuring continuous and measurable improvement in the quality of IT services delivered.		
Outcomes (Os)	**Number**	**Description**	
	PO8-O1	A quality management system (QMS) is developed and maintained, with the purpose of supporting continuous improvement.	
	PO8-O2	Standards are maintained for all quality, development and acquisition activities.	
	PO8-O3	Internal and external performance is monitored and reviewed against the defined quality standards and practices.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO8-BP1	Define a quality management system (QMS).	PO8-O1
	PO8-BP2	Establish and maintain the QMS.	PO8-O1
	PO8-BP3	Build and communicate quality standards through the organisation.	PO8-O2
	PO8-BP4	Build and manage the quality plan for continuous improvement.	PO8-O1
	PO8-BP5	Measure, monitor and review compliance with the quality goals.	PO8-O3

Work Products (WPs)			

Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		PO8-O1, O2
PO10-WP4	Detailed project plans		PO8-O3
ME1-WP2	Remedial action plans		PO8- O3

Outputs			
Number	**Description**	**Input To**	**Supports**
PO8-WP1	Acquisition standards	AI1, AI2, AI3, AI5, DS2	PO8-O1, O2
PO8-WP2	Development standards	PO10, AI1, AI2, AI3, AI7	PO8-O1, O2
PO8-WP3	Quality standards and metrics requirements	All	PO8-O1, O2
PO8-WP4	Quality improvement actions	PO4, AI6	PO8-O3

Process ID	PO9		
Process Name	**Assess and Manage IT Risks**		
Purpose	Satisfy the business requirement of analysing, communicating and managing IT risks and their potential impact on business processes and goals.		
Outcomes (Os)	**Number**	**Description**	
	PO9-O1	An IT risk management framework is established that is aligned to the organisation's (enterprise's) risk management framework.	
	PO9-O2	Risk remediation action plans are defined and communicated.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	PO9-BP1	Determine risk management alignment (e.g., assess risk).	PO9-O1
	PO9-BP2	Understand relevant strategic business objectives.	PO9-O1
	PO9-BP3	Understand relevant business process objectives.	PO9-O1
	PO9-BP4	Identify internal IT objectives related to risk management, and establish the risk context.	PO9-O1
	PO9-BP5	Identify events associated with these objectives.	PO9-O1
	PO9-BP6	Assess risk associated with the events.	PO9-O1
	PO9-BP7	Evaluate risk responses.	PO9-O1
	PO9-BP8	Prioritise and plan control activities.	PO9-O2
	PO9-BP9	Approve and ensure funding for risk action plans.	PO9-O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		PO9-O1, O2
PO1-WP2	Tactical IT plan		PO9-O1, O2
PO1-WP3	IT project portfolio		PO9-O1, O2
PO1-WP4	IT service portfolio		PO9-O1, O2
PO10-WP2	Project risk management plan		PO9-O1, O2
DS2-WP3	Supplier risks		PO9-O1, O2
DS4-WP1	Contingency test results		PO9-O1, O2
DS4-WP5	Security threats and vulnerabilities		PO9-O1, O2
ME1-WP3	Historic risk trends and events		PO9-O1, O2
ME4-WP5	Enterprise appetite for IT risks		PO9-O1, O2
Outputs			
Number	**Description**	**Input To**	**Supports**
PO9-WP1	Risk assessment	PO1, DS4, DS5, DS12, ME4	PO9-O1, O2
PO9-WP2	Risk reporting	ME4	PO9-O1, O2
PO9-WP3	IT-related risk management guidelines	PO6	PO9-O1
PO9-WP4	IT-related risk remedial action plans	PO4, AI6	PO9-O2

Process ID	PO10		
Process Name	Manage Projects		
Purpose	Satisfy the business requirement of ensuring the delivery of project results within agreed-upon time frames, budget and quality.		
Outcomes (Os)	Number	Description	
	PO10-O1a	A programme management framework is defined.	
	PO10-O1b	A programme management framework is followed.	
	PO10-O1c	Contributions of projects within the programme are managed to expected outcomes.	
	PO10-O1d	Activities, interdependencies, resource requirements and conflicts of multiple projects are managed and resolved.	
	PO10-O2a	A project management framework is defined.	
	PO10-O2b	Projects follow a defined project management framework/process that requires appropriate approvals, planning, risk management, quality management and monitoring.	
	PO10-O3	Project planning is performed for each project and is detailed in the project portfolio.	
	PO10-O4	There is commitment to, and involvement of, business and end users in projects.	
Base Practices (BPs)	Number	Description	Supports
	PO10-BP1	Define a programme/portfolio management framework for IT investments.	PO10-O1
	PO10-BP2	Establish and maintain an IT project management framework.	PO10-O2
	PO10-BP3	Establish and maintain an IT project monitoring, measurement and management system.	PO10-O2
	PO10-BP4	Build project charters, schedules, quality plans, budgets, and communication and risk management plans.	PO10-O2
	PO10-BP5	Assure the participation and commitment of project stakeholders.	PO10-O1c, O4
	PO10-BP6	Assure the effective control of projects and project changes.	PO10-O1b, O1c, O1d, O2b, O3
	PO10-BP7	Define and implement project assurance and review methods.	PO10-O2
Work Products (WPs)			
Inputs			
Number	Description		Supports
PO1-WP3	IT project portfolio		PO10-O1, O2
PO5-WP4	Updated IT project portfolio		PO10-O3
PO7-WP2	IT skill matrix		PO10-O1a, O1b, O2a
PO8-WP2	Development standards		PO10-O1, O2
AI7-WP5	Post-implementation review		PO10-O3, O4
Outputs			
Number	Description	Input To	Supports
PO10-WP1	Project performance reports	ME1	PO10-O1b, O1d, O4
PO10-WP2	Project risk management plan	PO9, AI3	PO10-O1c, O1d, O3
PO10-WP3	Project management guidelines	AI1 to AI7	PO10-O2, O3
PO10-WP4	Detailed project plans	PO8, AI1 to AI7, DS6	PO10-O1c, O3

Process ID	PO10		
Process Name	Manage Projects		
PO10-WP5	Updated IT project portfolio	PO1, PO5	PO10-O1, O3

3.2 Acquire and Implement (AI)

Process ID	AI1		
Process Name	**Identify Automated Solutions**		
Purpose	Satisfy the business requirement of identifying automated solutions that translate business functional and control requirements into effective and efficient solutions.		
Outcomes (Os)	**Number**	**Description**	
	AI1-O1	Business and technical requirements are defined and maintained.	
	AI1-O2	Risk are identified and analysed as part of requirements development.	
	AI1-O3	Business requirements feasibility studies are prepared.	
	AI1-O4	Approved (or rejected) requirements and feasibility study results are prepared.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	AI1-BP1	Define business functional and technical requirements.	AI1-O1
	AI1-BP2	Establish processes for integrity/currency of requirements.	AI1-O1
	AI1-BP3	Identify, document and analyse business process risk.	AI1-O2
	AI1-BP4	Conduct a feasibility study/impact assessment in respect of implementing proposed business requirements.	AI1-O3
	AI1-BP5	Assess IT operational benefits of proposed solutions.	AI1-O3
	AI1-BP6	Assess business benefits of proposed solutions.	AI1-O3
	AI1-BP7	Develop a requirements approval process.	AI1-O4
	AI1-BP8	Approve and sign off on solutions proposed.	AI1-O4
Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		All
PO1-WP2	Tactical IT Plan		All
PO3-WP2	Technology standards		All
PO3-WP3	Regular 'state of technology' updates		All
PO8-WP1	Acquisition standards		All
PO8-WP2	Development standards		All
PO10-WP3	Project management guidelines		All
PO10-WP4	Detailed project plans		All
AI6-WP1	Change process description		All
AI6-WP2	Change process procedures		All
DS1-WP4	SLAs		All
DS3-WP2	Performance and capacity plan (requirements)		All
Outputs			

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Process ID	AI1		
Process Name	Identify Automated Solutions		
Number	**Description**	**Input To**	**Supports**
AI1-WP1	Business requirements feasibility study	PO2, PO5, PO7, AI2, AI3, AI4, AI5	All

Process ID	AI2		
Process Name	**Acquire and Maintain Application Software**		
Purpose	Satisfy the business requirement of aligning available applications with business and security requirements, and doing so in a timely manner and at a reasonable cost.		
Outcomes (Os)	**Number**	**Description**	
	AI2-O1	Design specifications are prepared based on business requirements and managed for new systems or major changes.	
	AI2-O2	Application control, security, availability and auditability controls are included in the design, development and implementation.	
	AI2-O3	The application software is developed and/or configured and maintained according to design specifications and development and documentation standards.	
	AI2-O4	Development and maintenance are subject to the requirements of a quality assurance (QA) plan.	
	AI2-O5	Software requirements are subject to requirements management.	
	AI2-O6	A strategy for application software is in place.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	AI2-BP1	Translate business requirements into high-level design specifications.	AI2-O1
	AI2-BP2	Prepare detailed design and technical software application requirements.	AI2-O1
	AI2-BP3	Specify application controls within the design.	AI2-O2
	AI2-BP4	Customise and implement acquired automated functionality.	AI2-O3
	AI2-BP5	Develop formalised methodologies and processes to manage the application development process.	AI2-O3
	AI2-BP6	Create a software QA plan for the project.	AI2-O4
	AI2-BP7	Track and manage application requirements.	AI2-O5
	AI2-BP8	Develop a plan for the maintenance of software applications.	AI2-O6
Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO2-WP1	Data classification scheme		AI2-O1, O2, O3, O6
PO2-WP2	Optimised business system plan		AI2-O1, O2, O3, O6
PO2-WP3	Data dictionary		AI2-O1, O2, O3, O6
PO3-WP3	Regular 'state of technology' updates		AI2-O4, O5
PO5-WP1	Cost-benefit reports		AI2-O1, O2
PO8-WP1	Acquisition standards		AI2-O1
PO8-WP2	Development standards		AI2-O1
PO10-WP3	Project management guidelines		AI2-O1, O2
PO10-WP4	Detailed project plans		AI2-O1, O2
AI1-WP1	Business requirements feasibility study		AI2-O1, O5
AI6-WP1	Change process description		AI2-O4, O5, O6
AI6-WP2	Change process procedures		AI2-O4, O5, O6

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Process ID	AI2
Process Name	Acquire and Maintain Application Software

Outputs			
Number	**Description**	**Input To**	**Supports**
AI2-WP1	Application security controls specification	DS5	AI2-O1, O2
AI2-WP2	Application and package software knowledge	AI4	AI2-O3, O6
AI2-WP3	Procurement decisions	AI5	AI2-O5
AI2-WP4	Initial planned SLAs	DS1	AI2-O6
AI2-WP5	Availability, continuity and recovery specification	DS3, DS4	AI2-O1, O3, O4, O6

Process ID	AI3		
Process Name	**Acquire and Maintain Technology Infrastructure**		
Purpose	Satisfy the business requirement of acquiring and maintaining an integrated and standardised IT infrastructure.		
Outcomes (Os)	**Number**	**Description**	
	AI3-O1	A technology acquisition plan is produced that aligns to the technology infrastructure plan.	
	AI3-O2	Internal control, security and auditability measures are implemented for infrastructure components.	
	AI3-O3	Infrastructure maintenance is planned.	
	AI3-O4	Technology infrastructure changes are tested.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	AI3-BP1	Define acquisition procedure/process.	AI3-O1
	AI3-BP2	Discuss infrastructure requirements with approved vendors.	AI3-O1
	AI3-BP3	Define strategy and plan maintenance for infrastructure.	AI3-O1, O2, O3, O4
	AI3-BP4	Configure infrastructure components.	AI3-O2, O4

Work Products (WPs)			

Inputs			
Number	**Description**		**Supports**
PO3-WP1	Technology opportunities		AI3-O1, O2
PO3-WP2	Technology standards		AI3-O1, O2
PO3-WP3	Regular 'state of technology' updates		AI3-O1, O2
PO3-WP4	Technology infrastructure plan		AI3-O1, O2
PO8-WP1	Acquisition standards		AI3-O1, O2
PO8-WP2	Development standards		AI3-O1, O2
PO10-WP2	Project risk management risk plan		AI3-O3
PO10-WP3	Project guidelines		AI3-O3
PO10-WP4	Detailed project plans		AI3-O3
AI1-WP1	Business requirements feasibility study		AI3-O1, O2
AI6-WP2	Change process procedures		AI3-O1, O2
AI6-WP1	Change process description		AI3-O2
DS3-WP2	Performance and capacity plan (requirements)		AI3-O1, O4

Outputs			
Number	**Description**	**Input To**	**Supports**
AI3-WP1	Procurement decisions	AI5	AI3-O1
AI3-WP2	Configured system that is tested/installed	AI7	AI3-O4
AI3-WP3	Physical environment requirements	DS12	AI3-O1, O2, O3
AI3-WP4	Updates for technology standards	PO3	AI3-O3
AI3-WP5	System monitoring requirements	DS3	AI3-O2

Process ID	AI3		
Process Name	Acquire and Maintain Technology Infrastructure		
AI3-WP6	Infrastructure knowledge	AI4	All
AI3-WP7	Initial planned OLAs	DS1	AI3-O1

Process ID	AI4		
Process Name	**Enable Operation and Use**		
Purpose	Satisfy the business requirement of ensuring stakeholder satisfaction with service offerings and service levels and seamlessly integrating the use of applications and technology solutions throughout the business.		

Outcomes (Os)	**Number**	**Description**	
	AI4-O1	Plans are produced for knowledge transfer during the implementation of application system or infrastructure change.	
	AI4-O2	Knowledge is communicated and users, business management, support staff and operational staff are trained.	

Base Practices (BPs)	**Number**	**Description**	**Supports**
	AI4-BP1	Develop a strategy to operationalise the solution.	AI4-O1
	AI4-BP2	Develop a knowledge transfer methodology.	AI4-O1, O2
	AI4-BP3	Develop end-user procedure manuals.	AI4-O2
	AI4-BP4	Develop technical support documentation for operations and support staff.	AI4-O2
	AI4-BP5	Develop and deliver training.	AI4-O2
	AI4-BP6	Evaluate training results and enhance documentation as required.	AI4-O2

Work Products (WPs)
Inputs

Number	**Description**	**Supports**
PO10-WP3	Project management guidelines	All
PO10-WP4	Detailed project plans	All
AI1-WP1	Business requirement feasibility study	All
AI2-WP2	Application and package software knowledge	All
AI3-WP6	Infrastructure knowledge	All
AI7-WP2	Known and accepted errors	All
DS7-WP2	Required documentation updates	All

Outputs			
Number	**Description**	**Input To**	**Supports**
AI4-WP1	User, operational, support, technical and administration manuals	AI7, DS4, DS8, DS9, DS11, DS13	All
AI4-WP2	Knowledge transfer requirements for a solution's implementation	DS7	All
AI4-WP3	Training materials	DS7	All

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Process ID	AI5
Process Name	**Procure IT Resources**

Purpose	Satisfy the business requirement of improving IT's adherence to acquisition processes to enhance effectiveness, cost-efficiency and contribution to business profitability.

Outcomes (Os)	Number	Description
	AI5-O1	Procurement procedures and standards are defined and followed.
	AI5-O2	Procedures exist that ensure that legal and contractual arrangements are addressed when establishing, modifying and terminating contracts for all suppliers.
	AI5-O3	Requested hardware, software and services are procured in line with defined procedures.

Base Practices (BPs)	Number	Description	Supports
	AI5-BP1	Develop IT procurement policies and procedures aligned with procurement policies at the corporate level.	AI5-O1, O2
	AI5-BP2	Establish/maintain a list of accredited suppliers.	AI5-O1, O2
	AI5-BP3	Evaluate and select suppliers through a request for proposal (RFP) process.	AI5-O3
	AI5-BP4	Develop contracts that protect the organisation's interests.	AI5-O1, O2
	AI5-BP5	Procure in compliance with established procedures.	AI5-O1, O3

Work Products (WPs)		

Inputs		
Number	**Description**	**Supports**
PO1-WP6	IT acquisition strategy	AI5-O1, O2
PO8-WP1	Acquisition standards	AI5-O1, O2
PO10-WP3	Project management guidelines	AI5-O1, O2
PO10-WP4	Detailed project plans	AI5-O1, O2
AI1-WP1	Business requirement feasibility study	AI5-O1, O2
AI2-WP3, AI3-WP1	Procurement decisions	AI5-O3
DS2-WP2	Supplier catalogue	AI5-O3

Outputs			
Number	**Description**	**Input To**	**Supports**
AI5-WP1	Third-party relationship management requirements	DS2	AI5-O1, O2
AI5-WP2	Procured items	AI7	AI5-O3
AI5-WP3	Contractual arrangements	DS2	AI5-O1, O2

Process ID	AI6		
Process Name	Manage Changes		
Purpose	Satisfy the business requirement of managing IT changes in alignment with the business strategy to reduce solution and service delivery defects and rework.		

Outcomes (Os)	Number	Description	
	AI6-O1	Change standards and associated procedures, including those for emergency changes, are defined and communicated.	
	AI6-O2	Changes are assessed, prioritised and authorised.	
	AI6-O3	Change status is tracked and reported.	

Base Practices (BPs)	Number	Description	Supports
	AI6-BP1	Develop and implement a process to consistently record, assess and prioritise change requests.	AI1-O1
	AI6-BP2	Assess impact and prioritise changes based on business needs.	AI1-O2
	AI6-BP3	Assure that any emergency and critical change follows the approved process.	AI1-O1
	AI6-BP4	Authorise changes.	AI1-O2
	AI6-BP5	Manage and disseminate relevant information regarding changes.	AI1-O3

Work Products (WPs)

Inputs

Number	Description	Supports
PO1-WP3	IT project portfolio	AI6-O1
PO8-WP4	Quality improvement actions	AI6-O2
PO9-WP4	IT-related risk remedial action plans	AI6-O2, O3
PO10-WP3	Project management guidelines	AI6-O1
PO10-WP4	Detailed project plans	AI6-O1
DS3-WP3	Required changes	AI6-O2, O3
DS5-WP4	Required security changes	AI6-O2, O3
DS8-WP1	Service requests/requests for change (RFC)	AI6-O2, O3
DS10-WP1	RFC (where and how to apply the fix) (also DS9-WP2)	AI6-O2, O3
DS10-WP2	Problem records	

Outputs

Number	Description	Input To	Supports
AI6-WP1	Change process description	AI1, AI2, AI3	AI6-O1
AI6-WP2	Change process procedures	AI1, AI2, AI3	AI6-O1
AI6-WP3	Change status reports	ME1	AI6-O3
AI6-WP4	Change authorisation	AI7, DS8, DS10	AI6-O2

Process ID	AI7		
Process Name	Install and Accredit Solutions and Changes		
Purpose	Satisfy the business requirement of implementing new or changed systems that function without major problems after installation.		
Outcomes (Os)	**Number**	**Description**	
	AI7-O1	A test strategy/plan based on organisational standards for testing of the system and data conversion is prepared and followed.	
	AI7-O2	Release planning, including planned approval and fallback mechanisms is undertaken.	
	AI7-O3	An appropriate environment for testing, including training, is established.	
	AI7-O4	Test results are evaluated and approved by business management prior to approval of release to production.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	AI7-BP1	Build and review implementation plans.	AI7-O1
	AI7-BP2	Define and review a test strategy (entry and exit criteria) and an operational test plan methodology.	AI7-O1
	AI7-BP3	Build and maintain a business and technical requirements repository and test cases for accredited systems.	AI7-O1
	AI7-BP4	Perform system conversion and integration tests on the test environment.	AI7-O4
	AI7-BP5	Deploy the test environment and conduct final acceptance tests.	AI7-O1
	AI7-BP6	Recommend promotion to production based on agreed-upon accreditation criteria.	AI7-O3, O4

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO3-WP2	Technology standards		AI7-O1, O2
PO4-WP2	Documented system owners		AI7-O1, O3
PO8-WP2	Development standards		AI7-O1, O2, O3
PO10-WP3	Project management guidelines		AI7-O1, O2
PO10-WP4	Detailed project plans		AI7-O1, O2
AI3-WP2	Configured system to be tested/installed		AI7-O3
AI4-WP1	User, operational, support, technical and administration manuals		AI7-O2
AI5-WP2	Procured items		AI7-O1, O3
AI6-WP4	Change authorisation		AI7-O1
Outputs			
Number	**Description**	**Input To**	**Supports**
AI7-WP1	Released configuration items	DS8, DS9	AI7-O4
AI7-WP2	Known and accepted errors	AI4	AI7-O4
AI7-WP3	Promotion to production	DS13	AI7-O4
AI7-WP4	Software release and distribution plan	DS13	AI7-O1, O2, O3
AI7-WP5	Post-implementation review	PO2, PO5, PO10	AI7-O1
AI7-WP6	Internal control monitoring	ME2	AI7-O3, O4

3.3 Deliver and Support (DS)

Process ID	DS1		
Process Name	**Define and Manage Service Levels**		
Purpose	Satisfy the business requirement of ensuring the alignment of key IT services with the business needs.		
Outcomes (Os)	**Number**	**Description**	
	DS1-O1	A service management framework is in place to define the organisational structure for service level management, covering the base definitions of services, roles, tasks and responsibilities of internal and external service providers and customers.	
	DS1-O2	Internal and external SLAs are formalised in line with customer requirements and delivery capabilities.	
	DS1-O3	Operating level agreements (OLAs) are developed to specify the technical processes required to support SLAs.	
	DS1-O4	Processes are in place to monitor (and periodically review) SLAs and achievements.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS1-BP1	Create a framework for defining IT services.	DS1-O1
	DS1-BP2	Build an IT service catalogue.	DS1-O1, O2
	DS1-BP3	Define SLAs for critical IT services.	DS1-O2
	DS1-BP4	Define OLAs for meeting SLAs.	DS1-O3
	DS1-BP5	Monitor and report end-to-end service level performance.	DS1-O4
	DS1-BP6	Review SLAs and underpinning contracts.	DS1-O4
	DS1-BP7	Review and update the IT service catalogue.	DS1-O1
	DS1-BP8	Create a service improvement plan.	DS1-O1

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO1-WP1	Strategic IT plan		DS1-O1, O2, O3, O4
PO1-WP4	IT service portfolio		DS1-O1, O2, O3, O4
PO2-WP5	Assigned data classifications		DS1-O1
PO5-WP3	Updated IT service portfolio		DS1-O4
AI2-WP4	Initial planned SLAs		DS1-O3
AI3-WP7	Initial planned OLAs		DS1-O3
DS4-WP5	Disaster service requirements, including roles and responsibilities		DS1-O1
ME1-WP1	Performance input to IT planning		DS1-O1, O2
Outputs			
Number	**Description**	**Input To**	**Supports**
DS1-WP1	Contract review report	DS2	DS1-O1, O4
DS1-WP2	Process performance reports	ME1	DS1-O4
DS1-WP3	New/updated service requirements	PO1	DS1-O2, O3

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	DS1		
Process Name	Define and Manage Service Levels		
DS1-WP4	SLAs	AI1, DS2, DS3, DS4, DS6, DS8, DS13	DS1-O2
DS1-WP5	OLAs	DS4 to DS8, DS11, DS13	DS1-O3
DS1-WP6	Updated IT service portfolio	PO1	DS1-O1, O4

Process ID	DS2		
Process Name	Manage Third-party Services		
Purpose	Satisfy the business requirement of providing satisfactory third-party services whilst being transparent about benefits, costs and risks.		
Outcomes (Os)	**Number**	**Description**	
	DS2-O1	Supplier services are identified and relationships managed.	
	DS2-O2	Supplier risk is identified and mitigated.	
	DS2-O3	Supplier performance is monitored and measured.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS2-BP1	Identify and categorise third-party service relationships.	DS2-O1
	DS2-BP2	Define and document supplier management processes.	DS2-O1
	DS2-BP3	Establish supplier evaluation and selection policies and procedures.	DS2-O1
	DS2-BP4	Identify, assess and mitigate supplier risks.	DS2-O2
	DS2-BP5	Monitor supplier service delivery.	DS2-O3
	DS2-BP6	Evaluate long-term goals of the service relationship for all stakeholders.	DS2-O3

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO1-WP5	IT sourcing strategy		DS2-O1
PO8-WP1	Acquisition standards		DS2-O1
AI5-WP1	Third-party relationship management requirements		DS2-O2
AI5-WP3	Contractual arrangements		DS2-O2
DS1-WP1	Contract review report		DS2-O3
DS1-WP4	SLAs		DS2-O3
DS4-WP5	Disaster service requirements, including roles and responsibilities		DS2-O1
Outputs			
Number	**Description**	**Input To**	**Supports**
DS2-WP1	Process performance reports	ME1	DS2-O1, O3
DS2-WP2	Supplier catalogue	AI5	DS2-O1, O3
DS2-WP3	Supplier risks	PO9	DS2-O2

Process ID	DS3		
Process Name	**Manage Performance and Capacity**		
Purpose	Satisfy the business requirement of optimising the performance of IT infrastructure, resources and capabilities in response to business needs.		
Outcomes (Os)	**Number**	**Description**	
	DS3-O1	Current and future system capacity and availability are planned and provided.	
	DS3-O2	System performance is monitored and reported.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS3-BP1	Establish a planning process for the review of performance and capacity of IT resources.	DS3-O1
	DS3-BP2	Review current IT resource performance and capacity.	DS3-O1
	DS3-BP3	Conduct IT resource performance and capacity forecasting.	DS3-O1
	DS3-BP4	Conduct gap analysis to identify IT resource mismatch.	DS3-O1
	DS3-BP5	Conduct contingency planning for potential IT resource unavailability.	DS3-O2
	DS3-BP6	Continuously monitor and report the availability, performance and capacity of IT resources.	DS3-O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
AI2-WP5	Availability, continuity and recovery specification		DS3-O1
AI3-WP5	System monitoring requirements		DS3-O1
DS1-WP4	SLAs		All
Outputs			
Number	**Description**	**Input To**	**Supports**
DS3-WP1	Performance and capacity information	PO2, PO3	All
DS3-WP2	Performance and capacity plan (requirements)	PO5, AI1, AI3, ME1	All
DS3-WP3	Required changes	AI6	All
DS3-WP4	Process performance reports	ME1	All

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	DS4			
Process Name	**Ensure Continuous Service**			
Purpose	Satisfy the business requirement of ensuring minimal business impact in the event of an IT service interruption.			
Outcomes (Os)	**Number**	**Description**		
	DS4-O1	An IT continuity framework and plan are developed and maintained (improved).		
	DS4-O2	Training on and testing of IT contingency plans occur.		
	DS4-O3	Contingency plans and data are stored at offsite locations.		
Base Practices (BPs)	**Number**	**Description**		**Supports**
	DS4-BP1	Develop an IT continuity framework.		DS4-O1
	DS4-BP2	Conduct business impact analysis and risk assessment.		DS4-O1
	DS4-BP3	Develop and maintain IT continuity plans.		DS4-O1
	DS4-BP4	Identify and categorise IT resources based on recovery objectives.		DS4-O1
	DS4-BP5	Define and execute change control procedures to ensure that the IT continuity plan is current.		DS4-O1
	DS4-BP6	Regularly test IT continuity plans.		DS4-O2
	DS4-BP7	Develop a follow-up action plan from test results.		DS4-O2
	DS4-BP8	Plan and conduct IT continuity training.		DS4-O2
	DS4-BP9	Plan IT services recovery and resumption.		DS4-O2
	DS4-BP10	Plan and implement backup storage and protection.		DS4-O3
	DS4-BP11	Establish procedures for conducting post-resumption reviews.		DS4-O1, O2

Work Products (WPs)			

Inputs			
Number	**Description**		**Supports**
PO2-WP5	Assigned data classifications		DS4-O1
PO9-WP1	Risk assessment		DS4-O2
AI2-WP5	Availability, continuity and recovery specification		DS4-O1
AI4-WP1	User, operational, support, technical and administration manuals		DS4-O1
DS1-WP4	SLAs		DS4-O1
DS1-WP5	OLAs		DS4-O1

Outputs			
Number	**Description**	**Input To**	**Supports**
DS4-WP1	Contingency test results	PO9	DS4-O3
DS4-WP2	Criticality of IT configuration items	DS9	DS4-O1
DS4-WP3	Backup storage and protection plan	DS11, DS13	DS4-O1, O2, O3
DS4-WP4	Incident/disaster thresholds	DS8	DS4-O1
DS4-WP5	Disaster service requirements, including roles and responsibilities	DS1, DS2	DS4-O1
DS4-WP6	Process performance reports	ME1	DS4-O2

Process ID	DS5		
Process Name	**Ensure Systems Security**		
Purpose	Satisfy the business requirement of maintaining the confidentiality, integrity and availability of information and the processing infrastructure aligned to business needs and minimising the impact of security vulnerabilities.		
Outcomes (Os)	**Number**	**Description**	
	DS5-O1	A security plan is developed and approved.	
	DS5-O2	User identities and authorisations are managed in a standardised manner.	
	DS5-O3	Security is monitored and tested.	
	DS5-O4	Techniques are in place to ensure that networks and information are secure.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS5-BP1	Define and maintain an IT security plan.	DS5-O1
	DS5-BP2	Define, establish and operate an identity (account) management process.	DS5-O2
	DS5-BP3	Clearly define characteristics of potential and actual security incidents.	DS5-O1, O2, O3
	DS5-BP4	Periodically review and validate user access rights and privileges.	DS5-O2, O3
	DS5-BP5	Establish and maintain procedures for maintaining and safeguarding cryptographic keys.	DS5-O1, O2, O4
	DS5-BP6	Implement and maintain technical and procedural controls to protect information flows across networks.	DS5-O4
	DS5-BP7	Conduct regular vulnerability assessments.	DS5-O3

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO2-WP4	Information architecture		
PO2-WP5	Assigned data classifications		DS5-O1
PO3-WP2	Technology standards		DS5-O4
PO9-WP1	Risk assessment		DS5-O3. O4
AI2-WP1	Application security controls specification		DS5-O2
DS1-WP5	OLAs		DS5-O4
Outputs			
Number	**Description**	**Input To**	**Supports**
DS5-WP1	Security incident definition	DS8	DS5-O1
DS5-WP2	Specific training requirements on security awareness	DS7	DS5-O1
DS5-WP3	Process performance reports	ME1	DS5-O3
DS5-WP4	Required security changes	AI6	DS5-O4
DS5-WP5	Security threats and vulnerabilities	PO9	DS5-O2, O3, O4
DS5-WP6	IT security plan and policies	DS11	DS5-O1

Process ID	DS6		
Process Name	**Identify and Allocate Costs**		
Purpose	Satisfy the business requirement of ensuring transparency and understanding of IT costs and improving cost-efficiency through well-informed use of IT services.		
Outcomes (Os)	**Number**	**Description**	
	DS6-O1	A cost model is developed and maintained based on the service provided and the business processes supported.	
	DS6-O2	Charges are implemented as per the agreed-upon policy.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS6-BP1	Map IT infrastructure to services provided/business processes supported.	DS6-O1
	DS6-BP2	Identify all IT costs (e.g., people, technology) and map them to IT services on a unit cost basis.	DS6-O1
	DS6-BP3	Establish and maintain an IT accounting and cost control process.	DS6-O2
	DS6-BP4	Establish and maintain charging policies and procedures.	DS6-O1,-O2
Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO4-WP2	Documented system owners		DS6-O1
PO5-WP1	Cost-benefit reports		DS6-O2
PO5-WP2	IT budgets		DS6-O2
PO10-WP4	Detailed project plans		DS6-O1, O2
DS1-WP4	SLAs		DS6-O1, O2
DS1-WP5	OLAs		DS6-O1, O2
Outputs			
Number	**Description**	**Input To**	**Supports**
DS6-WP1	IT financials	PO5	DS6-O1, O2
DS6-WP2	Process performance reports	ME1	DS6-O1, O2

Process ID	DS7		
Process Name	**Educate and Train Users**		
Purpose	Satisfy the business requirement of effectively and efficiently using applications and technology solutions and ensuring user compliance with policies and procedures.		
Outcomes (Os)	**Number**	**Description**	
	DS7-O1	A training curriculum is established based on identified needs.	
	DS7-O2	Training is delivered and evaluated to meet identified needs.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS7-BP1	Identify and characterise users' training needs.	DS7-O1
	DS7-BP2	Build a training programme.	DS7-O1, O2
	DS7-BP3	Conduct awareness, education and training activities.	DS7-O2
	DS7-BP4	Perform training evaluation.	DS7-O2
	DS7-BP5	Identify and evaluate best training delivery methods and tools.	DS7-O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO7-WP4	Users' skills and competencies, including individual training		DS7-O1
AI4-WP2	Knowledge transfer requirements for solutions implementation		DS7-O1
AI4-WP3	Training materials		DS7-O1
DS1-WP5	OLAs		DS7-O2
DS5-WP2	Specific training requirements on security awareness		DS7-O1, O2
DS8-WP4	User satisfaction reports		DS7-O2
Outputs			
Number	**Description**	**Input To**	**Supports**
DS7-WP1	Process performance reports	ME1	DS7-O1
DS7-WP2	Required documentation updates	AI4	DS7-O1

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	DS8		
Process Name	**Manage Service Desk and Incidents**		
Purpose	Satisfy the business requirement of enabling effective use of IT systems by ensuring resolution and analysis of end-user queries, questions and incidents.		
Outcomes (Os)	**Number**	**Description**	
	DS8-O1	A service desk is installed and operating, with logging and tracking of calls, incidents, service requests and information needs.	
	DS8-O2	Trends are monitored and reported.	
	DS8-O3	Clear escalation criteria and procedures are defined.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS8-BP1	Create classification (severity and impact) and escalation procedures (functional and hierarchical).	DS8-O1, O2, O3
	DS8-BP2	Detect and record incidents and service/information requests.	DS8-O1
	DS8-BP3	Classify, investigate and diagnose queries.	DS8-O1
	DS8-BP4	Resolve, recover and close incidents.	DS8-O1
	DS8-BP5	Inform users (e.g., status updates).	DS8-O1
	DS8-BP6	Produce management reporting.	DS8-O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
AI4-WP1	User, operational, support, technical and administration manuals		DS8-O1, O3
AI6-WP4	Change authorisation		DS8-O1, O3
AI7-WP1	Released configuration items		DS8-O1, O3
DS1-WP4	SLAs		DS8-O1, O3
DS1-WP5	OLAs		DS8-O1, O3
DS4-WP4	Incident/disaster thresholds		DS8-O1, O3
DS5-WP1	Security incident definition		DS8-O1, O3
DS9-WP1	IT configuration/asset details		DS8-O1, O3
DS10-WP4	Known problems, known errors and workarounds		DS8-O2
DS13-WP1	Incident tickets		DS8-O2
Outputs			
Number	**Description**	**Input To**	**Supports**
DS8-WP1	Service requests/requests for change (RFC)	AI6	DS8-O1, O2, O3
DS8-WP2	Incident reports	DS10	DS8-O1, O2, O3
DS8-WP3	Process performance reports	ME1	DS8-O1, O2, O3
DS8-WP4	User satisfaction reports	DS7, ME1	DS8-O1, O2, O3

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	DS9		
Process Name	Manage the Configuration		
Purpose	Satisfy the business requirement of optimising the IT infrastructure, resources and capabilities; and accounting for IT assets.		
Outcomes (Os)	Number	Description	
	DS9-O1	A central repository of all configuration items is established, with procedures to support management and logging of changes.	
	DS9-O2	Integrity of configuration data is periodically reviewed.	
Base Practices (BPs)	Number	Description	Supports
	DS9-BP1	Develop configuration management planning procedures.	DS9-O1
	DS9-BP2	Collect initial configuration information and establish baselines.	DS9-O1
	DS9-BP3	Verify and audit configuration information (includes detection of unauthorised software).	DS9-O2
	DS9-BP4	Update configuration repository.	DS9-O1, O2

Work Products (WPs)			

Inputs			
Number	Description		Supports
AI4-WP1	User, operational, support, technical and administration manuals		DS9-O1
AI7-WP1	Released configuration items		DS9-O1
DS4-WP2	Criticality of IT configuration items		DS9-O2

Outputs			
Number	Description	Input To	Supports
DS9-WP1	IT configuration/asset details	DS8, DS10, DS13	DS9-O1
DS9-WP2	RFC (where and how to apply the fix)	AI6	DS9-O2
DS9-WP3	Process performance reports	ME1	DS9-O2

Process ID	DS10		
Process Name	**Manage Problems**		
Purpose	Satisfy the business requirement of ensuring end users' satisfaction with service offerings and service levels by reducing solution and service delivery defects and rework.		
Outcomes (Os)	**Number**	**Description**	
	DS10-O1	A service desk is installed and operating ,with logging and tracking of calls, incidents, service requests and information needs.	
	DS10-O2	Trends are monitored and reported.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS10-BP1	Identify and classify problems.	DS10-O1
	DS10-BP2	Perform root cause analysis.	DS10-O2
	DS10-BP3	Resolve problems.	DS10-O1, O2
	DS10-BP4	Review status of problems.	DS10-O1, O2
	DS10-BP5	Issue recommendations for improvement and create a related RFC.	DS10-O1, O2
	DS10-BP6	Maintain problem records.	DS10-O1, O2
Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
AI6-WP4	Change authorisation		DS10-O1
DS8-WP2	Incident reports		DS10-O2
DS9-WP1	IT configuration/asset details		DS10-O1
DS13-WP2	Error logs		DS10-O1, O2
Outputs			
Number	**Description**	**Input To**	**Supports**
DS10-WP1	RFC (where and how to apply the fix)	AI6	DS10-O1, O2
DS10-WP2	Problem records	AI6	DS10-O1, O2
DS10-WP3	Process performance reports	ME1	DS10-O2
DS10-WP4	Known problems, known errors and workarounds	DS8	DS10-O2

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	DS11		
Process Name	**Manage Data**		
Purpose	Satisfy the business requirement of optimising the use of information and ensuring that information is available as required.		
Outcomes (Os)	**Number**	**Description**	
	DS11-O1	Policies and procedures exist for data management that are based on business requirements.	
	DS11-O2	Onsite and offsite data storage is managed.	
	DS11-O3	Data and equipment are disposed of securely.	
	DS11-O4	Data are backed up and restoration is tested.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	DS11-BP1	Translate data storage and retention requirements into procedures.	DS11-O1
	DS11-BP2	Define, maintain and implement procedures to manage media library.	DS11-O1, O2
	DS11-BP3	Define, maintain and implement procedures for secure disposal of media and equipment.	DS11-O1, O3
	DS11-BP4	Back up data according to scheme.	DS11-O4
	DS11-BP5	Define, maintain and implement procedures for data restoration.	DS11-O1, O4

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO2-WP3	Data dictionary		DS11-O1, O2
PO2-WP5	Assigned data classifications		DS11-O1, O2
AI4-WP1	User, operational, support, technical and administration manuals		DS11-O1, O2
DS1-WP5	OLAs		DS11-O1
DS4-WP3	Backup storage and protection plan		DS11-O4
DS5-WP6	IT security plan and policies		DS11-O3
Outputs			
Number	**Description**	**Input To**	**Supports**
DS11-WP1	Process performance reports	ME1	DS11-O2
DS11-WP2	Operator instructions for data management outcomes	DS13	DS11-O1

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	DS12		
Process Name	Manage the Physical Environment		
Purpose	Satisfy the business requirement of managing the physical environment to protect computer accesses and business data to minimise the risk of business disruption.		
Outcomes (Os)	Number	Description	
	DS12-O1	Facilities are selected and managed.	
	DS12-O2	Physical security measures are implemented.	
	DS12-O3	Facilities are protected against environmental factors.	
Base Practices (BPs)	Number	Description	Supports
	DS12-BP1	Define the required level of physical protection.	DS12-O2, O3
	DS12-BP2	Select and commission the site (data centre, office, etc.).	DS12-O1
	DS12-BP3	Implement physical environmental protection measures.	DS12-O1, O2, O3
	DS12-BP4	Manage the physical environment (including maintaining, monitoring and reporting).	DS12-O1, O2, O3
	DS12-BP5	Define and implement procedures for physical access authorisation and maintenance.	DS12-O2

Work Products (WPs)			
Inputs			
Number	Description		Supports
PO2-WP5	Assigned data classifications		DS12-O1
PO9-WP1	Risk assessment		DS12-O2, O3
AI3-WP3	Physical environment requirements		DS12-O3
Outputs			
Number	Description	Input To	Supports
DS12-WP1	Process performance reports	ME1	DS12-O1, O2

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	DS13		
Process Name	Manage Operations		
Purpose	Satisfy the business requirement of maintaining the management of operations to ensure that operational service levels can be achieved and IT infrastructure can resist and recover from errors and failures.		
Outcomes (Os)	Number	Description	
	DS13-O1	The IT environment is operated in line with agreed-upon service levels and defined instructions.	
	DS13-O2	The IT infrastructure is subject to appropriate preventive maintenance.	
Base Practices (BPs)	Number	Description	Supports
	DS13-BP1	Create/modify operations procedures (including manuals, checklists, shift planning, handover documentation and escalation procedures).	DS13-O1
	DS13-BP2	Schedule workload and batch jobs.	DS13-O1
	DS13-BP3	Monitor infrastructure and processing, and resolve problems.	DS13-O1
	DS13-BP4	Manage and secure physical output (e.g., paper, media).	DS13-O1
	DS13-BP5	Apply fixes or changes to the schedule and infrastructure.	DS13-O1, O2
	DS13-BP6	Schedule and perform preventive maintenance.	DS13-O2
Work Products (WPs)			
Inputs			
Number	Description		Supports
AI4-WP1	User, operational, support, technical and administration manuals		DS13-O1
AI7-WP3	Promotion to production		DS13-O1
AI7-WP4	Software release and distribution plan		DS13-O1
DS1-WP4	SLAs		DS13-O1
DS1-WP5	OLAs		DS13-O1
DS4-WP3	Backup storage and protection plan		DS13-O1
DS9-WP1	IT configuration/assets details		DS13-O1
DS11-WP2	Operator instructions for data management outcomes		DS13-O1
Outputs			
Number	Description	Input To	Supports
DS13-WP1	Incident tickets	DS8	DS13-O1
DS13-WP2	Error logs	DS10	DS13-O1
DS13-WP3	Process performance reports	ME1	DS13-O1

3.4 Monitor and Evaluate (ME)

Process ID	ME1		
Process Name	**Monitor and Evaluate IT Performance**		
Purpose	Satisfy the business requirement of transparency and understanding of IT cost, benefits, strategy, policies and service levels in accordance with governance requirements.		
Outcomes (Os)	**Number**	**Description**	
	ME1-O1	Processes exist to collect, collate and translate process performance reports into management reports for operational, executive and board reporting.	
	ME1-O2	Performance is verified against agreed-upon targets and any necessary remedial action is performed.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	ME1-BP1	Establish the monitoring approach.	ME1-O1
	ME1-BP2	Identify and collect measureable objectives that support the business objectives.	ME1-O1
	ME1-BP3	Create scorecards.	ME1-O1, O2
	ME1-BP4	Assess performance.	ME1-O2
	ME1-BP5	Report performance.	ME1-O1, O2
	ME1-BP6	Identify and monitor performance improvement actions.	ME1-O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
PO5-WP1	Cost-benefit reports		ME1-O1, O2
PO10-WP1	Project performance reports		ME1-O1, O2
AI6-WP3	Change status reports		ME1-O1, O2
DS1-WP2	Process performance reports (and all other WPs for process performance reports)		ME1-O1, O2
DS3-WP2	Performance and capacity plan (requirements)		ME1-O1
DS8-WP4	User satisfaction reports		ME1-O1, O2
ME2-WP1	Report on effectiveness of IT controls		ME1-O1, O2
ME3-WP2	Report on compliance of IT activities with external legal and regulatory requirements		ME1-O1, O2
ME4-WP2	Report on IT governance status		ME1-O2
Outputs			
Number	**Description**	**Input To**	**Supports**
ME1-WP1	Performance input to IT planning	PO1, PO2, DS1	ME1-O1
ME1-WP2	Remedial action plans	PO4, PO8	ME1-O1, O2
ME1-WP3	Historic risk trends and events	PO9	ME1-O2
ME1-WP4	Process performance report	ME2	ME1-O2

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	ME2		
Process Name	**Monitor and Evaluate Internal Control**		
Purpose	Satisfy the business requirement of protecting the achievement of IT objectives while complying with internal controls.		
Outcomes (Os)	**Number**	**Description**	
	ME2-O1	A system of internal controls is embedded in the IT process framework.	
	ME2-O2	Monitoring and reporting on the effectiveness of the internal controls over IT occur.	
	ME2-O3	Control exceptions are reported to management for action.	
	ME2-O4	Monitoring and reporting on the effectiveness of IT internal controls at third-party suppliers occur.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	ME2-BP1	Monitor and control IT internal control activities.	ME2-O2
	ME2-BP2	Monitor the self-assessment process.	ME2-O3
	ME2-BP3	Monitor the performance of independent reviews, audits and examinations.	ME2-O2, O4
	ME2-BP4	Monitor the process to obtain assurance over controls operated by third parties.	ME2-O1, O3, O4
	ME2-BP5	Monitor the process to identify and assess control exceptions.	ME2-O1
	ME2-BP6	Monitor the process to identify and remediate control exceptions.	ME2-O1, O4
	ME2-BP7	Report to key stakeholders.	ME2-O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
AI7-WP6	Internal control monitoring		ME2- O2
ME1-WP4	Process performance report		ME2-O1
Outputs			
Number	**Description**	**Input To**	**Supports**
ME2-WP1	Report on effectiveness of IT controls	PO4, PO6, ME1, ME4	All

COBIT® Assessment Process (CAP): COBIT® 4.1 Process Assessment Model

Process ID	ME3		
Process Name	**Ensure Compliance With External Requirements**		
Purpose	Satisfy the business requirement of ensuring compliance with laws, regulations and contractual requirements.		
Outcomes (Os)	**Number**	**Description**	
	ME3-O1	Legal, regulatory and contractual requirements related to IT have been identified and appropriate policies are communicated.	
	ME3-O2	Compliance with legal, regulatory and contractual requirements is monitored and reported.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	ME3-BP1	Define and execute a process to identify legal, contractual, policy and regulatory requirements.	ME3-O1
	ME3-BP2	Evaluate compliance of IT activities with IT policies, plans and procedures.	ME3-O1, O2
	ME3-BP3	Report positive assurance of compliance of IT activities with IT policies, plans and procedures.	ME3-O2
	ME3-BP4	Provide input to ensure alignment of IT policies, plans and procedures to compliance requirements.	ME3-O1
	ME3-BP5	Integrate IT reporting on regulatory requirements with similar output from other business functions.	ME3-O1, O2

Work Products (WPs)			
Inputs			
Number	**Description**		**Supports**
Legal and regulatory compliance requirements	Outside COBIT		ME3- O1
Outputs			
Number	**Description**	**Input To**	**Supports**
ME3-WP1	Catalogue of legal and regulatory requirements related to IT service delivery	PO4, ME4	ME3-O1
ME3-WP2	Report on compliance of IT activities with external legal and regulatory requirements	ME1	ME3-O2

Process ID	ME4	
Process Name	**Provide IT Governance**	
Purpose	Satisfy the business requirement of integrating IT governance with enterprise governance and complying with laws, regulations and contracts.	
Outcomes (Os)	**Number**	**Description**
	ME4-O1	There is an IT governance framework integrated into enterprise governance that enables the board and executive to have appropriate oversight and direction over the achievement of strategic alignment, value delivery, resource management and risk management.
	ME4-O2	Business and IT are involved together as part of governance bodies such as an IT strategy committee in strategic decision making and IT benefit

Process ID	ME4		
Process Name	**Provide IT Governance**		
		optimisation.	
	ME4-O3	There is a disciplined approach to portfolio, programme and project management, with business taking ownership of all IT-enabled investments and IT ensuring optimisation of the costs of delivering IT capabilities and services.	
	ME4-O4	There is oversight of investment in and use and allocation of IT resources to ensure appropriate resourcing and alignment with current and future strategic objectives and business imperatives.	
	ME4-O5	There is reasonable assurance that IT risk management practices are appropriate and do not exceed the board's risk appetite.	
Base Practices (BPs)	**Number**	**Description**	**Supports**
	ME4-BP1	Establish executive and board oversight and facilitation over IT activities.	ME4-O1, O2
	ME4-BP2a	Review, endorse and align IT performance, IT strategy, and resource and risk management with business strategy.	ME4-O1, O2, O3, O4
	ME4-BP2b	Communicate IT performance, IT strategy, and resource and risk management with business strategy.	ME4-O1, O2, O3, O4
	ME4-BP3	Obtain periodic independent assessment of performance and compliance with policies, plans and procedures.	ME4-O5
	ME4-BP4a	Resolve findings of independent assessments to make agreed-upon recommendations.	ME4-O5
	ME4-BP4b	Ensure management's implementation of agreed-upon recommendations.	ME4-O5
	ME4-BP5	Generate an IT governance report.	ME4-O5

Work Products (WPs)			

Inputs			
Number	**Description**		**Supports**
PO4-WP4	IT process framework		ME4- O1
PO5-WP1	Cost-benefit reports		ME4-O5
PO9-WP1	Risk assessment		ME4-O4, O5
PO9-WP2	Risk reporting		ME-O4, O5
ME2-WP1	Report on effectiveness of IT controls		ME4-O4, O5
ME3-WP1	Catalogue of legal and regulatory requirements related to IT service delivery		ME4-O1, O2

Outputs			
Number	**Description**	**Input To**	**Supports**
ME4-WP1	Process framework improvements	PO4	ME4-O1, O2
ME4-WP2	Report on IT governance status	PO1, ME1	ME4-O4, O5
ME4-WP3	Expected business outcomes of IT-enabled business investments	PO5	ME4-O3
ME4-WP4	Enterprise strategic direction for IT	PO1	ME4-O2
ME4-WP5	Enterprise appetite for IT risks	PO9	ME4-O2

4.0 Process Capability Indicators

This section presents the process capability indicators related to the process attributes (PAs) associated with capability levels 1 to 5 defined in the capability dimension of the process assessment model.

Process capability indicators are the means of achieving the capabilities addressed by the process attributes. Evidence of process capability indicators supports the judgement of the degree of achievement of the PA.

The capability dimension of the process assessment model consists of six capability levels matching the capability levels defined in section 2 of this process assessment model. This section describes the process capability indicators for the nine PAs included in the capability dimension for levels 1 to 5.

Level 0 does not include any type of indicators. Level 0 reflects a non-implemented process or a process that fails, even partially, to achieve its outcomes.

4.1 Level 1—Performed Process

PA 1.1 Process Performance—A measure of the extent to which the process purpose is achieved. Full achievement of this attribute results in the process achieving its defined outcomes, as shown in **figure 6**.

Figure 6—PA1.1 Process Performance		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
The process achieves its defined outcomes.	**GP 1.1.1 Achieve the process outcomes.** There is evidence that the intent of base practice is being performed.	Work products are produced that provide evidence of process outcomes, ss outlined in section 3.

4.2 Level 2—Managed Process

Performed Process is now implemented in a managed fashion (planned, monitored and adjusted) and its work products are appropriately established, controlled and maintained.

PA 2.1 Performance Management—A measure of the extent to which the performance of the process is managed. As a result of full achievement of this attribute:
a. Objectives for the performance of the process are identified.
b. Performance of the process is planned and monitored.
c. Performance of the process is adjusted to meet plans.
d. Responsibilities and authorities for performing the process are defined, assigned and communicated.
e. Resources and information necessary for performing the process are identified, made available, allocated and used.
f. Interfaces between the involved parties are managed to ensure effective communication and clear assignment of responsibility.

The GPs and generic GWPs that provide evidence of achievement of the attribute are shown in **figure 7**.

Figure 7—PA 2.1 Performance Management		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
a. Objectives for the performance of the process are identified.	**GP 2.1.1 Identify the objectives** for the performance of the process. The performance objectives, scoped together with assumptions and constraints, are defined and communicated.	**GWP 1.0 Process documentation** should outline the process scope. **GWP 2.0 Process plan** should provide details of the process performance objectives.
b. Performance of the process is planned and monitored.	**GP 2.1.2 Plan and monitor the performance** of the process to fulfil the identified objectives. Basic measures of process performance linked to business objectives are established and monitored. They include key milestones, required activities, estimates and schedules.	**GWP 2.0 Process plan** should provide details of the process performance objectives. **GWP 9.0 Process performance records** should provide details of the outcomes. **Note**: At this level, the record of process performance may be in the form of reports, issues registers and informal records.
c. Performance of the process is adjusted to meet plans.	**GP 2.1.3 Adjust the performance** of the process. Action is taken when planned performance is not achieved. Actions include identification of process performance issues and adjustment of plans and schedules as appropriate.	**GWP 4.0 Quality record** should provide details of action taken when performance is not achieved.
d. Responsibilities and authorities for performing the process are defined, assigned and communicated.	**GP 2.1.4 Define responsibilities and authorities** for performing the process. The key responsibilities and authorities for performing the key activities of the process are defined, assigned and communicated. The need for process performance experience, knowledge and skills is defined.	**GWP 1.0 Process documentation** should provide details of the process owner and who is responsible, accountable, consulted and/or informed (RACI). **GWP 2.0 Process plan** should include details of the process communication plan as well as process performance experience, skills requirement.
e. Resources and information necessary for performing the process are identified, made available, allocated and used.	**GP 2.1.5 Identify and make available** resources to perform the process according to plan. Resources and information necessary for performing the key activities of the process are identified, made available, allocated and used.	**GWP 2.0 Process plan** should provide details of the process training plan and process resourcing plan.
f. Interfaces between the involved parties are managed to ensure effective communication and clear assignment of responsibility.	**GP 2.1.6 Manage the interfaces** between involved parties. The individuals and groups involved with the process are identified, responsibilities are defined and effective communication mechanisms are in place.	**GWP 1.0 Process documentation** should provide details of the individuals and groups involved (suppliers, customers and RACI). **GWP 2.0 Process plan** should provide details of the process communication plan.

PA 2.2 Work Product Management—A measure of the extent to which the work products produced by the process are appropriately managed. The work products referred to in this clause are those that result from the achievement of the process outcomes. As a result of full achievement of this attribute:
a. Requirements for the work products of the process are defined.
b. Requirements for documentation and control of the work products are defined.
c. Work products are appropriately identified, documented and controlled.
d. Work products are reviewed in accordance with planned arrangements and adjusted as necessary to meet requirements.

Note: Requirements for documentation and control of work products may include requirements for the identification of changes and revision status, approval and re-approval of work products, and the creation of relevant versions of applicable work products available at points of use.

The GPs and generic GWPs that provide evidence of achievement of the attribute are shown in **figure 8.**

Figure 8—PA 2.2 Work Product Management		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
a. Requirements for the work products of the process are defined.	**GP 2.2.1 Define the requirements for the work products**, including content structure and quality criteria.	**GWP3.0 Quality plan** should provide details of quality criteria and work product content and structure.
b. Requirements for documentation and control of the work products are defined.	**GP 2.2.2 Define the requirements for documentation and control** of the work products. This should include identification of dependencies, approvals and traceability of requirements.	**GWP 1.0 Process documentation** should provide details of controls (control matrix). **GWP 3.0 Quality plan** should provide details of work product, quality criteria, documentation requirements and change control.
c. Work products are appropriately identified, documented and controlled.	**GP 2.2.3 Identify, document and control** the work products. Work products are subject to change control, versioning and configuration management as appropriate.	**GWP 3.0 Quality plan** should provide details of work product, quality criteria, documentation requirements and change control.
d. Work products are reviewed in accordance with planned arrangements and adjusted as necessary to meet requirements.	**GP 2.2.4 Review and adjust work products** to meet the defined requirements. Work products are subject to review against requirements in accordance with planned arrangements and any issues arising are resolved.	**GWP4.0 Quality records** should provide an audit trail of reviews undertaken.

4.3 Level 3—Established Process

Managed Process is now implemented using a defined process that is capable of achieving its process outcomes.

PA 3.1 Process Definition—A measure of the extent to which a standard process is maintained to support the deployment of the defined process. As a result of full achievement of this attribute:
a. A standard process, including appropriate tailoring guidelines, is defined that describes the fundamental elements that must be incorporated into a defined process.
b. The sequence and interaction of the standard process with other processes are determined.
c. Required competencies and roles for performing a process are identified as part of the standard process.
d. Required infrastructure and work environment for performing a process are identified as part of the standard process.
e. Suitable methods for monitoring the effectiveness and suitability of the process are determined.

Note: A standard process may be used as is when deploying a defined process, in which case tailoring guidelines would not be necessary.

The GPs and generic GWPs that provide evidence of achievement of the attribute are shown in **figure 9.**

Figure 9—PA 3.1 Process Definition		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
a. A standard process, including appropriate tailoring guidelines, is defined that describes the fundamental elements that must be incorporated into a defined process.	**GP 3.1.1 Define the standard** process that will support the deployment of the defined process. A standard process is defined that identifies the fundamental process elements and provides guidance and procedures to support implementation and guidance on how it can be tailored when needed.	**GWP 5.0 Policies and standards** should provide details of the organisational objectives for the process, minimum standards of performance, standard procedures, and reporting and monitoring requirements. The evidential requirement at this level is not just that policies and standards exist but that they are applied across the organisation.
b. The sequence and interaction of the standard process with other processes are determined.	**GP 3.1.2 Determine the sequence and interaction between processes** so that they work as an integrated system of processes. The standard process's sequence and interaction with other processes are determined and maintained when a process is implemented in different parts of the organisation.	**GWP 5.0 Policies and standards** should provide a process mapping with details of standard processes and expected sequences and interaction. The evidential requirement at this level is not just that policies and standards exist but that they are applied across the organisation.
c. Required competencies and roles for performing a process are identified as part of the standard process.	**GP 3.1.3 Identify the roles and competencies** for performing the standard process.	**GWP 5.0 Policies and standards** should provide details of roles and competencies for performing. The evidential requirement at this level is not just that policies and standards exist but that they are applied across the organisation.
d. Required infrastructure and work environment for performing a process are identified as part of the standard process.	**GP 3.1.4 Identify the required infrastructure and work environment** for performing the standard process. The infrastructure (facilities, tools, methods, etc.) and work environment for performing the standard process are identified.	**GWP 5.0 Policies and standards** should identify minimum required infrastructure and work environment for performing the process. The evidential requirement at this level is not just that policies and standards exist but that they are applied across the organisation.
e. Suitable methods for monitoring the effectiveness and suitability of the process are determined.	**GP 3.1.5 Determine suitable methods** to monitor the effectiveness and suitability of the standard process, including ensuring that appropriate criteria and data needed to monitor the effectiveness and suitability of the process are defined, and establishing the need to conduct internal audit and management review.	**GWP 5.0 Policies and standards** should provide details of the organisational objectives for process, minimum standards of performance, standard procedures, and reporting and monitoring requirements. The evidential requirement at this level is not just that policies and standards exist but that they are applied across the organisation. **GWP 4.0 Quality records** and G**WP 9.0 Process performance records** should provide evidence of reviews undertaken.

PA 3.2 Process Deployment—A measure of the extent to which the standard process is effectively deployed as a defined process to achieve its process outcomes. As a result of full achievement of this attribute:

a. A defined process is deployed based upon an appropriately selected and/or tailored standard process.

b. Required roles, responsibilities and authorities for performing the defined process are assigned and communicated.

c. Personnel performing the defined process are competent on the basis of appropriate education, training and experience.

d. Required resources and information necessary for performing the defined process are made available, allocated and used.

e. Required infrastructure and work environment for performing the defined process are made available, managed and maintained.

f. Appropriate data are collected and analysed as a basis for understanding the behaviour of the process, to demonstrate its suitability and effectiveness, and to evaluate where continuous improvement of the process can be made.

Note: Competency results from a combination of knowledge, skills and personal attributes that are gained through education, training and experience.

The GPs and generic GWPs that provide evidence of achievement of the attribute are shown in **figure 10**.

<table>
<tr><td colspan="3" align="center">Figure 10—PA 3.2 Process Deployment</td></tr>
<tr><td>Result of Full Achievement of the Attribute</td><td>Generic Practices (GPs)</td><td>Generic Work Products (GWPs)</td></tr>
<tr><td>a. A defined process is deployed based upon an appropriately selected and/or tailored standard process.</td><td>GP 3.2.1 Deploy a defined process that satisfies the context. When the same process is used within different areas of the organisation, it is based on a standard process, tailored as appropriate, with conformance to the requirements of the defined process verified.</td><td>GWP 5.0 Policies and standards should define the standards to be followed across all implementations of the process. The evidential requirement at this level is not just that policies and standards exist but that they are applied across the organisation.</td></tr>
<tr><td>b. Required roles, responsibilities and authorities for performing the defined process are assigned and communicated.</td><td>GP 3.2.2 Assign and communicate roles, responsibilities and authorities for performing the defined process. When the same process is used within different areas of the organisation, the authorities and roles for performing the activities of process are assigned and communicated.</td><td>GWP 5.0 Policies and standards should provide details, responsibilities and authorities for performing the activities of process. The evidential requirement at this level is not just that policies and standards exist but that they are applied across the organisation.</td></tr>
<tr><td>c. Personnel performing the defined process are competent on the basis of appropriate education, training and experience.</td><td>GP 3.2.3 Ensure necessary competencies for performing the defined process. When the same process is used within different areas of the organisation, the appropriate competencies for assigned personnel are identified and suitable training is available for those deploying the defined process.</td><td>GWP 1.0 Process documentation should provide details of competencies and training requirements. GWP 2.0 Process plan should include details of the process communication plan, training plan and resourcing plan for each instance of the process.</td></tr>
<tr><td>d. Required resources and information necessary for performing the defined process are made available, allocated and used.</td><td>GP 3.2.4 Provide resources and information to support the performance of the defined process. When the same process is used within different areas of the organisation, the required human resources and information to perform the process are made available, allocated and used.</td><td>GWP 2. Process plan should include details of the resourcing plan for each instance of the process.</td></tr>
<tr><td>e. Required infrastructure and work environment for performing the defined process are made available, managed and maintained.</td><td>GP 3.2.5 Provide adequate process infrastructure to support the performance of the defined process. When the same process is used within different areas of the organisation, the required organisational support, infrastructure and work environment are made available, allocated and used.</td><td>GWP 2. Process plan should include details of the process infrastructure and work environment for each instance of the process.</td></tr>
<tr><td>f. Appropriate data are collected and analysed as a basis for understanding the behaviour of the process to demonstrate its suitability and effectiveness, and to evaluate where continuous improvement of the process can be made.</td><td>GP 3.2.6 Collect and analyse data about performance of the process to demonstrate its suitability and effectiveness. Data required to monitor the effectiveness and suitability of the process across the organisation are defined, collected and analysed as a basis for continual improvement.</td><td>GWP 4.0 Quality records and GWP 9.0 Process performance records should provide evidence of reviews undertaken tools for each instance of the process.</td></tr>
</table>

4.4 Level 4—Predictable Process

Established Process now operates within defined limits to achieve its process outcomes.

PA 4.1 Process Measurement—A measure of the extent to which measurement results are used to ensure that performance of the process supports the achievement of relevant process performance objectives in support of defined business goals. Measures may be either process measures or product measures or both. As a result of full achievement of this attribute:

a. Process information needs in support of relevant defined business goals are established.

b. Process measurement objectives are derived from process information needs.
c. Quantitative objectives for process performance in support of relevant business goals are established.
d. Measures and frequency of measurement are identified and defined in line with process measurement objectives and quantitative objectives for process performance.
e. Results of measurement are collected, analysed and reported in order to monitor the extent to which the quantitative objectives for process performance are met.
f. Measurement results are used to characterise process performance.

Note: Information needs may typically reflect management, technical, project, process or product needs.

The GPs and generic GWPs that provide evidence of achievement of the attribute are shown in **figure 11**.

Figure 11—PA 4.1 Process Measurement		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
a. Process information needs in support of relevant defined business goals are established.	**GP 4.1.1 Identify process information needs,** in relation with business goals. The business goals and process stakeholder information needs have been established as a basis for determining the process performance measurement objectives.	**GWP 6.0 Process improvement plan** should provide process improvement objectives and proposed Improvement actions.
b. Process measurement objectives are derived from process information needs.	**GP 4.1.2 Derive process measurement objectives** from process information needs. Measurement objectives are based on the defined process measurement objectives.	**GWP 7.0 Process measurement plan** should provide details of proposed measurement objectives.
c. Quantitative objectives for process performance in support of relevant business goals are established.	**GP 4.1.3 Establish quantitative objectives** for the performance of the defined process, according to the alignment of the process with the business goals Quantitative measurement objectives are established that explicitly reflect business goals and have been verified as realistic and useful with organisational management and process owner(s).	**GWP 7.0 Process measurement plan** should provide details of proposed measurement measures and indicators.
d. Measures and frequency of measurement are identified and defined in line with process measurement objectives and quantitative objectives for process performance.	**GP 4.1.4 Identify product and process measures** that support the achievement of the quantitative objectives for process performance. Detailed measures for products and process are identified, together with the frequency of data collection and measurement as well as verification mechanisms.	**GWP 7.0 Process measurement plan** should provide details of proposed measures/indicators together with data collection procedures and analytical procedures.
e. Results of measurement are collected, analysed and reported in order to monitor the extent to which the quantitative objectives for process performance are met.	**GP 4.1.5 Collect product and process measurement results** through performing the defined process**.** Product and process measurement results are collected, analysed and reported according to a defined plan.	**GWP 7.0 Process measurement plan** should provide details of proposed analytical procedures. **GWP 9.0 Process performance records** should provide details of measurements collected and analysed.
f. Measurement results are used to characterise process performance.	**GP 4.1.6 Use the results of the defined measurement** to monitor and verify the achievement of the process performance objectives**.** The results of the defined measurement are analysed to verify achievement against the process performance objectives. Appropriate techniques are used to understand process performance and capability within defined control limits.	**GWP 9.0 Process performance records** should provide details of measurements collected and analysed.

PA 4.2 Process Control—A measure of the extent to which the process is quantitatively managed to produce a process that is stable, capable and predictable within defined limits. As a result of full achievement of this attribute:

a. Analysis and control techniques are determined and applied where applicable.
b. Control limits of variation are established for normal process performance.
c. Measurement data are analysed for special causes of variation.
d. Corrective actions are taken to address special causes of variation.
e. Control limits are re-established (as necessary) following corrective action.

The GPs and generic GWPs that provide evidence of achievement of the attribute are shown in **figure 12**.

Figure 12—PA 4.2 Process Control		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
a. Analysis and control techniques are determined and applied where applicable.	**GP 4.2.1 Determine analysis and control techniques** appropriate to control the process performance. Methods of measuring the effectiveness of process control are defined and validated.	**GWP 1.Process documentation** should provide details of controls (control matrix). **GWP 8.0 Process control plan** should exist that specifies for each process the measurement approach.
b. Control limits of variation are established for normal process performance.	**GP 4.2.2 Define parameters** suitable to control the process performance. The standard process definition is modified to include methods for process control and control limits are established.	**GWP 8.0 Process control plan** should exist that specifies for each control limits for normal performance.
c. Measurement data are analysed for special causes of variation.	**GP 4.2.3 Analyse process and product measurement results** to identify variations in process performance. The results of process control measurements are analysed to determine issues of concern and forwarded for action.	**GWP 9.0 Process performance record** should provide details of measurements collected and analysed.
d. Corrective actions are taken to address special causes of variation.	**GP 4.2.4 Identify and implement corrective actions** to address assignable causes. Corrective action is taken to address process control concerns and results are monitored and evaluated.	**GWP 9.0 Process performance record** should provide details of measurements collected and analysed and corrective action taken.
e. Control limits are re-established (as necessary) following corrective action.	**GP 4.2.5 Re-establish control limits** following corrective action. Process control limits are appropriately modified after corrective action is taken.	**GWP 8.0 Process control plan** should exist that specifies control limits for normal performance.

4.5 Level 5—Optimising Process

Predictable Process is continuously improved to meet relevant current and projected business goals.

PA 5.1 Process Innovation—A measure of the extent to which changes to the process are identified from analysis of common causes of variation in performance, and from investigations of innovative approaches to the definition and deployment of the process. As a result of full achievement of this attribute:

a. Process improvement objectives for the process are defined that support the relevant business goals.
b. Appropriate data are analysed to identify common causes of variations in process performance.
c. Appropriate data are analysed to identify opportunities for best practice and innovation.
d. Improvement opportunities derived from new technologies and process concepts are identified.
e. An implementation strategy is established to achieve the process improvement objectives.

The GPs and GWPs that provide evidence of achievement of the attribute are shown in **figure 13**.

Figure 13—PA 5.1 Process Innovation		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
a. Process improvement objectives for the process are defined that support the relevant business goals.	**GP 5.1.1 Define the process improvement objectives for the process** that supports the relevant business goals. Directions to process innovations are set. Quantitative and qualitative process improvement objectives—based on the potential for process innovation as well as business vision and goals— have been defined and documented.	**GWP 7.0 Process improvement plan** should provide process improvement objectives and proposed Improvement actions.
b. Appropriate data are analysed to identify common causes of variations in process performance.	**GP 5.1.2 Analyse measurement data of the process** to identify real and potential variations in process performance. Process performance data are analysed to identify variations in process performance together with the root cause of common process performance issues.	**GWP 9.0 Process performance records** should provide details of measurements collected and analysed.
c. Appropriate data are analysed to identify opportunities for best practice and innovation.	**GP 5.1.3 Identify improvement opportunities of the process** based on innovation and best practices. Process improvement opportunities are identified based on comparison with industry best practices.	**GWP 6.0 Process improvement plan** should provide details of analysis against best practice.
d. Improvement opportunities derived from new technologies and process concepts are identified.	**GP 5.1.4 Derive improvement opportunities of the process from new technologies and process concepts.** Process improvement opportunities are identified based on review and analysis of emerging technological and process concept innovations, taking into account business environment changes including emerging business risks.	**GWP 6.0 Process improvement plan** should provide details of analysis of technology improvement opportunities.
e. An implementation strategy is established to achieve the process improvement objectives.	**GP 5.1.5 Define an implementation strategy** based on long-term improvement vision and objectives. A process improvement strategy is defined and validated based on long-term improvement goals and objectives. Commitment to improvement is demonstrated by organisational management and process owner(s).	**GWP 6.0 Process improvement plan** should provide details of the implementation strategy for process improvement.

PA 5.2 Process Optimisation—A measure of the extent to which changes to the definition, management and performance of the process result in effective impact that achieves the relevant process improvement objectives. As a result of full achievement of this attribute:
a. Impact of all proposed changes is assessed against the objectives of the defined process and standard process.
b. Implementation of all agreed changes is managed to ensure that any disruption to the process performance is understood and acted upon.
c. Based on actual performance, effectiveness of process change is evaluated against the defined product requirements and process objectives to determine whether results are due to common or special causes.

The GPs and GWPs that provide evidence of achievement of the attribute are shown in **figure 14.**

Figure 14—PA 5.2 Process Optimisation		
Result of Full Achievement of the Attribute	**Generic Practices (GPs)**	**Generic Work Products (GWPs)**
a. Impact of all proposed changes is assessed against the objectives of the defined process and standard process.	**GP 5.2.1 Assess the impact of each proposed change** against the objectives of the defined and standard process. The impact of proposed changes is assessed against the objectives of the process and to determine the impact on product quality and process performance as well as other related processes.	**GWP 6.0 Process improvement plan** should provide details of the required process improvement project quality approach
b. Implementation of all agreed changes is managed to ensure that any disruption to the process performance is understood and acted upon.	**GP 5.2.2. Manage the implementation of agreed changes** to selected areas of the defined and standard process according to the implementation strategy. The implementation of agreed changes is managed in accordance with defined change management and change enablement processes.	**GWP 6.0 Process improvement plan** should provide details of the implementation strategy for process improvement and evidence of changes in: • **GWP 1.0 Process documentation** • **GWP 3.0 Quality plan** • **GWP 5.0 Policies and standards**
c. Based on actual performance, effectiveness of process change is evaluated against the defined product requirements and process objectives to determine whether results are due to common or special causes.	**GP 5.2.3 Based on actual performance, evaluate the effectiveness of process change** against process performance, capability objectives and business goals. The effectiveness of the changes made to the process is measured, evaluated and reported after implementation.	**GWP 6.0 Process improvement plan** should provide details of the required process improvement project quality approach

Appendix A. Conformity of the COBIT 4.1 Process Assessment Model

A.1   Introduction

This part of the COBIT 4.1 process assessment is the statement of conformance to the requirements defined in ISO/IEC 15504-2. For ease of reference, the requirements from Clause 6.3 of ISO/IEC 15504-2 are embedded verbatim in the text of this action.

A.2 Requirements for Process Assessment Models (from ISO/IEC 15504-2)

A.2.1 Introduction

In order to assure that assessment results are translatable into an ISO/IEC 15504 process profile in a repeatable and reliable manner, Process Assessment Models shall adhere to certain requirements. A Process Assessment Model shall contain a definition of its purpose, scope and elements; its mapping to the Measurement Framework and specified Process Reference Model(s); and a mechanism for consistent expression of results.

A Process Assessment Model is considered suitable for the purpose of assessing process capability by conforming to 6.3.2, 6.3.3, and 6.3.4.

ISO/IEC 15504:2, 6.3.1

The purpose of the COBIT 4.1 process assessment model is to support assessment of process capability in accordance with the requirements of ISO/IEC 15504:2 (refer to Clause 1).

A.2.2 Process Assessment Model Scope

6.3.2.1 A Process Assessment Model shall relate to at least one process from the specified Process Reference Model(s).

6.3.2.2 A Process Assessment Model shall address, for a given process, all, or a continuous subset, of the levels (starting at level 1) of the Measurement Framework for process capability for each of the processes within its scope.

NOTE: It would be permissible for a model, for example, to address solely level 1, or to address levels 1, 2 and 3, but it would not be permissible to address levels 2 and 3 without level 1.

6.3.2.3 A Process Assessment Model shall declare its scope of coverage in the terms of:
a) the selected Process Reference Model(s);
b) the selected processes taken from the Process Reference Model(s);
c) the capability levels selected from the Measurement Framework.

ISO/IEC 15504:2, 6.3.2

This process assessment model is based upon COBIT 4.1, which serves as its 'process reference model'.

In the process dimension of this process assessment model, the model provides coverage of all processes in the process reference model.

In the capability dimension of this process assessment model, the model addresses all of the capability levels defined in the Measurement Framework in ISO/IEC 15504-2, Clause 5.

A.2.3 Process Assessment Model Elements and Indicators

A Process Assessment Model shall be based on a set of indicators that explicitly addresses the purposes and outcomes, as defined in the selected Process Reference Model, of all the processes within the scope of the Process Assessment Model; and that demonstrates the achievement of the process attributes within the capability level scope of the Process Assessment Model. The indicators focus attention on the implementation of the processes in the scope of the model.

ISO/IEC 15504:2, 6.3.3

The COBIT 4.1 process assessment model provides a two-dimensional view of process capability for the processes in the process reference model, through the inclusion of assessment indicators as shown in **figure 5.** The assessment indicators used are:
- Base practices and work products
- GPs and GWPs

They support the judgement of the performance and capability of an implemented process.

Note: The assessment indicators for COBIT 4.1 process assessment model do not include resources.

A.2.4 Mapping Process Assessment Models to Process Reference Models

A Process Assessment Model shall provide an explicit mapping from the relevant elements of the model to the processes of the selected Process Reference Model and to the relevant process attributes of the Measurement Framework.

The mapping shall be complete, clear and unambiguous. The mapping of the indicators within the Process Assessment Model shall be to:
a*) the purposes and outcomes of the processes in the specified Process Reference Model*
b*) the process attributes (including all of the results of achievements listed for each process attribute) in the Measurement Framework.*

This enables Process Assessment Models that are structurally different to be related to the same Process Reference Model.

ISO/IEC 15504:2, 6.3.4

Each of the processes in this COBIT 4.1 process assessment model is identical in scope to the process defined in the process reference model. Each base practice and work product is cross-referenced to the process outcomes it addresses. All work products relate as inputs or outputs to the process as a whole—see the mappings in Clause 5.

Each of the process attributes in this process assessment model is identical to the process attribute defined in the measurement framework. The generic practices address the characteristics from each process attribute. The generic resources and GWPs relate to the process attribute as a whole.

The mappings of the GPs to the achievements associated with each process attribute are shown in section 5.

A.2.5 Expression of Assessment Results

A Process Assessment Model shall provide a formal and verifiable mechanism for representing the results of an assessment as a set of process attribute ratings for each process selected from the specified Process Reference Model(s).

Note: The expression of results may involve a direct translation of Process Assessment Model ratings into a process profile as defined in this international standard, or the conversion of the data collected during the assessment (with the possible inclusion of additional information) through further judgment on the part of the assessor.

ISO/IEC 15504:2, 6.3.5

The processes in this process assessment model are identical to those defined in the process reference model. The process attributes and the process attributes rating in this process assessment model are identical to those defined in the ISO/IEC 15504-2 Measurement Framework. As a consequence, results of assessments based upon this process assessment model are expressed directly as a set of process attribute ratings for each process within the scope of the assessment. No form of translation or conversion is required.
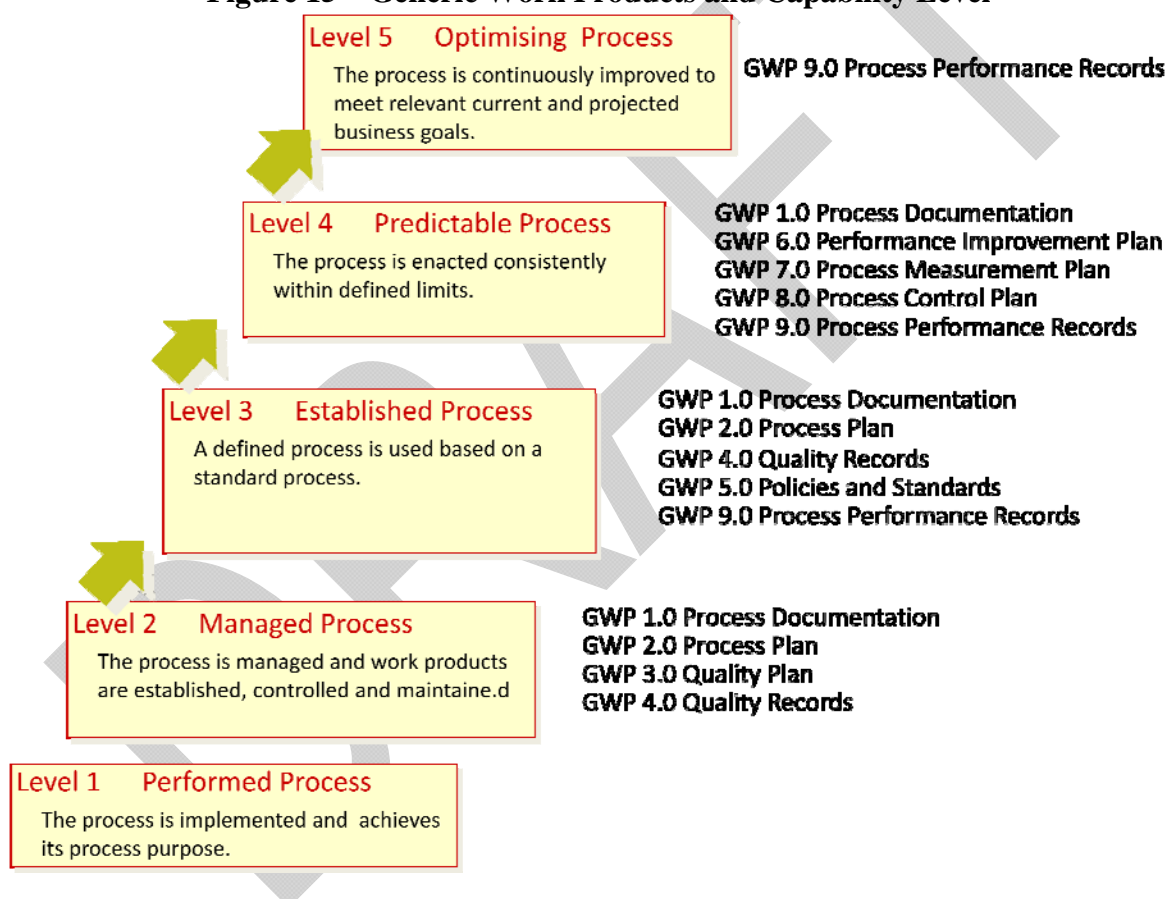
Appendix B. Generic and Level 1 Output Work Products

B.1   Generic Work Products (GWPS)

The GWPs are those work products required to support the management of a process. As outlined in section 4, their existence, together with generic work practices, provides evidence for the achievement of specific process capability attributes. The evidence includes such things as process objectives, responsibilities, performance requirements, improvement plans and outcomes required at various levels of process capability.

They are called 'generic' because similar work products would be expected for each process. They are indicative of the types of work products and content that will be introduced to support increased process capability. **Figure 15** lists GWPs be capability level.

Figure 15—Generic Work Products and Capability Level

Level 5   Optimising Process
The process is continuously improved to meet relevant current and projected business goals.

GWP 9.0 Process Performance Records

Level 4   Predictable Process
The process is enacted consistently within defined limits.

GWP 1.0 Process Documentation
GWP 6.0 Performance Improvement Plan
GWP 7.0 Process Measurement Plan
GWP 8.0 Process Control Plan
GWP 9.0 Process Performance Records

Level 3   Established Process
A defined process is used based on a standard process.

GWP 1.0 Process Documentation
GWP 2.0 Process Plan
GWP 4.0 Quality Records
GWP 5.0 Policies and Standards
GWP 9.0 Process Performance Records

Level 2   Managed Process
The process is managed and work products are established, controlled and maintaine.d

GWP 1.0 Process Documentation
GWP 2.0 Process Plan
GWP 3.0 Quality Plan
GWP 4.0 Quality Records

Level 1   Performed Process
The process is implemented and achieves its process purpose.

It is not expected that every organisation will use GWPs with the exact description and content as shown in **figure 16**.

GWP ID	GWP	Typical Contents	Related GP	Additional Explanation
		Figure 16—Generic Work Products (GWPs)		
1.0	**Process Documentation**	Process name		
		Process owner	GP 2.1.4	The person responsible for the design of the process. This includes being responsible for the creation, update and approval of documents (procedures, work instructions/protocols) to support the process.
		Process scope	GP 2.1.1	A clear statement of where the process begins and ends
		Process roles	GP 2.1.6	Details of key roles in the process: • Supplier(s) and inputs • Output and customers
		Process map	GP 3.1.2	Generally, in the form of a schematic picture of a process to show the sequential flow of work. In most cases, there will be a map showing flows across a number of processes
		RACI chart	GP 2.1.4 GP 2.1.6	Identifies who is responsible, accountable, consulted and informed with respect to each of the key activities in the process
		Internal control matrix	GP 2.2.2	Matrix showing identified risks within the business process together with identified controls
		Process procedures	GP 3.1.1	A document outlining the activities required to achieve the required process outcomes
2.0	**Process Plan**	Process performance objectives	GP 2.1.1 GP 2.1.2	Will vary, depending on the process. However, there should be evidence of targets such as milestones, required activities, estimated output volumes or schedules.
		Process resourcing	GP 2.1.5 GP 3.2.4	A plan indicating resources and information required to meet the performance required for the process, and information on what resources are to be supplied
		Process communication	GP 2.1.4, GP 2.1.6 GP 3.2.3	A plan for the communication required for the process. It should include such things as the: • Responsibility for communication • Target audience • Content that should be communicated • Timing for communications • Communication approach
		Process infrastructure and work environment	GP 3.1.4 GP 3.2.5	The facilities, tools, methods and work environment for performing the processes
		Process performance experience, skills requirement	GP 2.1.4	Job descriptions and skills required to undertake the process
		Process training requirement	GP 2.1.5	Users' skills and competencies, including individual training requirements
3.0	**Quality Plan**	Statement of quality policy and objectives	GP 2.1.2	A statement of the customer's quality expectations for the process, e.g., deliverables or timeliness
		Work products content	GP 2.2.1	Identification of all work products, their structure and expected content
		Quality criteria for the work products produced during the processes as basis for reviews and approvals	GP 2.2.1	The criteria against which each work product will be reviewed and approved
		Work products documentation	GP 2.2.2	The requirements for documentation and control requirement, including identification, traceability and approvals
		Work products change control, versioning and configuration management requirements	GP 2.2.3	Outline of procedures for versioning and change control to be applied to work products,
4.0	**Quality Records**	Records of reviews against requirements and action taken providing evidence during the required controls and quality checks	GP 2.2.4	Record of reviews undertaken of work products together with any issues arising and resolution

GWP ID	GWP	Typical Contents	Related GP	Additional Explanation
				Figure 16—Generic Work Products (GWPs)
5.0	**Policies and Standards**	Organisational objectives and responsibility for the process	GP 3.1.1	A statement of the organisation's objectives for the process as it is applied across organisational units. It should identify overall responsibilities of the process. **Note**: The implementation of policies and standards across the organisation will have to be confirmed.
		Minimum standard of performance required for a process	GP 3.1.1	The expected level of performance expected for the process across the organisation. This could include milestones, required activities, estimated output volumes or schedules. **Note**: It is possible that this will be established for individual implementations of the process rather than as a generic performance.
		Standard process mapping, including expected sequence and interaction between processes	GP 3.1.2 GP 3.2.1	A schematic picture of the sequential flow of work expected for the process. This should also identify expected interactions between different implementations of the process.
		Standardised procedures	GP3.2.1	A document outlining the procedures that should be followed in all implementations of the processes
		Roles and competency for performing the process to minimum standards of performance	GP 3.1.3 GP 3.2.2 GP 3.2.3	Standardised job descriptions and skill requirements for the process
		The minimum infrastructure (facilities, tools, methods, etc.) and work environment for performing the standard process	GP 3.1.4	The facilities, tools, methods and work environment for performing the processes
		Reporting and monitoring requirements, including audit and review	GP 3.1.5	Expected reports and monitoring required for the process, including standardised reporting requirements
6.0	**Performance Improvement Plan**	Process improvement objectives	GP 5.1.1	The expected level of performance expected from the process, based on business objectives
		Analysis against best practice	GP 5.1.3	Identified opportunities for process improvements based on analysis of comparison with industry best practices
		Technology improvement opportunities	GP 5.1.4	Identified opportunities for process improvements based analysis of technology and process innovations
		Improvement actions	GP 5.1.5	Identified actions for improving the process across the organisation
		Improvement implementation plan	GP 5.1.6	The proposed improvements, planned actions to implement those improvements, responsibilities and time table
		Project quality approach	GP 5.1.5	Proposed process for confirming the achievement of the improvements—measures, reviews, etc.
7.0	**Process Measurement Plan**	Measurement objectives	GP 4.1.1	Quantitative objectives for the process relative to quality and process performance, based on customer needs and business objectives
		Proposed measure/ indicators	GP 4.1.2	Identification of what is to be measured and the measurement indicators
		Data collection procedures	GP 4.1.3	Identification of how data are to be collected to support measurement
		Analytical procedures	GP 4.1.3 GP 4.1.4	Identification of analytical procedures to be used, from simple charts and graphs, to more sophisticated quantitative analyses such as statistical process control (SPC), structural modelling, or other multivariate statistical methods
8.0	**Process Control Plan**	Control techniques	GP 4.2.1	A description of the methods used to minimise process and product variation. It will differ for each process and might include such things as standards, testing, reviews, walkthrough and testing.
		Measurement approach.	GP 4.2.1	How the variation in each process will be measured

Figure 16—Generic Work Products (GWPs)				
GWP ID	**GWP**	**Typical Contents**	**Related GP**	**Additional Explanation**
		Control limits for normal performance.	GP 4.2.2	The acceptable level of process variations
9.0	**Process Performance Records**	Records of reviews against requirements and action taken	GP 4.1.5	Record of actual process performance, with any variations from expected results and action taken to rectify variations

B.2 Level 1 Output Work Products

Figure 17 provides level 1 output WPs.[5]

<table>
<tr><td colspan="3" align="center">Figure 17—Level 1 Output Work Products (WPs)</td></tr>
<tr><th>WP ID</th><th>WP</th><th>Description</th></tr>
<tr><td>PO1- WP1</td><td>Strategic IT plan</td><td>A long-term plan, i.e., three- to five-year horizon, in which business and IT management co-operatively describe how IT resources will contribute to the enterprise's strategic objectives (goals)</td></tr>
<tr><td>PO1- WP2</td><td>Tactical IT plan</td><td>A medium-term plan, i.e., six- to 18-month horizon, that translates the IT strategic plan direction into required initiatives, resource requirements and ways in which resources and benefits will be monitored and managed</td></tr>
<tr><td>PO1- WP3</td><td>IT project portfolio</td><td>A grouping of IT projects managed and monitored to optimise business value</td></tr>
<tr><td>PO1- WP4</td><td>IT service portfolio</td><td>A grouping of IT services managed and monitored to optimise business value</td></tr>
<tr><td>PO1-WP5</td><td>IT sourcing strategy</td><td>Where to buy and what to buy, considering demand and supply situation while minimising risk and costs</td></tr>
<tr><td>PO1-WP6</td><td>IT acquisition strategy</td><td>An overall strategy for acquisition of IT services based on business objectives. The strategy should be based on an understanding of future purchasing, market analysis and strategic impact of purchasing decisions.</td></tr>
<tr><td>PO2-WP1</td><td>Data classification scheme</td><td>The assignment of a level of sensitivity to data (or information) that results in the specification of controls for each level of classification. Levels of sensitivity of data are assigned according to pre-defined categories as data are created, amended, enhanced, stored or transmitted. The classification level is an indication of the value or importance of the data to the organisation.</td></tr>
<tr><td>PO2-WP2</td><td>Optimised business systems plan</td><td>An actionable road map that aligns technology investments to business strategy. It is optimised for the management of the data</td></tr>
<tr><td>PO2-WP3</td><td>Data dictionary</td><td>A database that contains the name, type, range of values, source and authorisation for access for each data element in a database. It also indicates which application programs use that data so that when a data structure is contemplated, a list of the affected programs can be generated.
Scope note: The data dictionary may be a stand-alone information system used for management or documentation purposes, or it may control the operation of a database.</td></tr>
<tr><td>PO2-WP4</td><td>Information architecture</td><td>A component of IT architecture (together with applications and technology)</td></tr>
<tr><td>PO2-WP5</td><td>Assigned data classification s</td><td>An enterprise scheme for classifying data by factors such as criticality, sensitivity and ownership</td></tr>
<tr><td>PO2-WP6</td><td>Classification procedures and tools</td><td>Procedures and tools to enable data to be classified, created in line with organisation policies</td></tr>
<tr><td>PO3-WP1</td><td>Technology opportunities</td><td>Identification of technology opportunities for the business</td></tr>
<tr><td>PO3-WP2</td><td>Technology standards</td><td>Organisational standard for infrastructure products and practices together with guidance on the selection of technology</td></tr>
<tr><td>PO3-WP3</td><td>Regular 'state of technology' updates</td><td>An assessment of current and future technology trends and the potential opportunities and risks to the organisation</td></tr>
<tr><td>PO3-WP4</td><td>Technology infrastructure plan</td><td>A plan for the technology, human resources and facilities that enable the current and future processing and use of applications</td></tr>
<tr><td>PO3-WP5</td><td>Infrastructure requirements</td><td>The required set of hardware, software and facilities that integrates an organisation's IT assets
Scope note: Specifically, this includes the equipment (including servers, routers, switches and cabling), software, services and products used in storing, processing, transmitting and displaying all forms of information for the organisation's users.</td></tr>
<tr><td>PO4-WP1</td><td>IT process framework</td><td>A process framework that includes IT process structure and relationships (e.g., to manage process gaps and overlaps), ownership, maturity, performance measurement, improvement, compliance, quality targets, and plans to achieve them. It should provide integration amongst the processes that are specific to IT, enterprise portfolio management, business processes and business change processes. The IT process framework should be integrated into a quality management system (QMS) and the internal control framework.</td></tr>
<tr><td>PO4-WP2</td><td>Documented system owners</td><td>An application system owner is the individual who has been assigned ultimate responsibility for a system.</td></tr>
<tr><td>PO4-WP3</td><td>IT organisation and relationships</td><td>A specification of internal and external IT organisational structure and responsibilities</td></tr>
<tr><td>PO4-WP4</td><td>Documented roles and responsibilities</td><td>Roles and responsibilities for IT personnel and end users that delineate between IT personnel and end-user authority, responsibilities and accountability for meeting the organisation's needs</td></tr>
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[5] Compiled from ISO/IEC 15504:1, 15504:7, COBIT 4.1 and Process Assessment (*ibid*). For a general introduction to the concepts of process assessment, refer to section 4 of ISO/IEC 15504:1.

Figure 17—Level 1 Output Work Products (WPs)		
WP ID	**WP**	**Description**
PO5-WP2	IT budgets	A budget reflecting the priorities established by the enterprise's portfolio of IT-enabled investment programmes, and including the ongoing costs of operating and maintaining the current infrastructure.
PO5-WP1	Cost-benefit reports	A report weighing the total expected costs against the total expected benefits of one or more actions to choose the best or most profitable option
PO5-WP3	Updated IT service portfolio	A grouping of IT services managed and monitored to optimise business value
PO5-WP4	Updated IT project portfolio	A grouping of IT projects managed and monitored to optimise business value
PO6-WP1	Enterprise IT control framework	A set of fundamental controls that facilitates the discharge of business process owner responsibilities to prevent financial or information loss in an organisation
PO6-WP2	IT policies, standardised procedures	High-level statements of management intent and direction
PO7-WP1	IT human resources policy and procedures	Policies and procedure for IT HR, including recruitment and selection, conditions of employment, performance learning and development, behaviour and code of conduct, administration, and support
PO7-WP2	IT skills matrix	Details of skills required by the IT organisation to meet business objectives
PO7-WP3	Job descriptions	Outline of responsibilities of a position. It may often include to whom the position reports and specifications such as the qualifications or skills needed by the person in the job
PO7-WP4	Users' skills and competencies, including individual training	Identification of IT knowledge or skill required to produce outputs in an organisation using IT. It should identify the individual competencies that need to be attained by a specific staff and the training required to achieve those competencies.
PO7-WP5	Roles and responsibilities	Roles and responsibilities for IT personnel and end users that delineate between IT personnel and end-user authority, responsibilities and accountability for meeting the organisation's needs
PO8-WP1	Acquisition standards	Standards that define the process and activities required to acquire application software or an upgrade, including evaluation of the supplier's financial stability, track record, resources and references from existing customers
PO8-WP2	Development standards	Standards that define the process and activities necessary to produce quality software. It should include detailed procedures and practices for key IT development practices.
PO8-WP3	Quality standards and metrics requirements	A system that outlines the policies and procedures necessary to improve and control the various processes that will ultimately lead to improved organisation performance
PO8-WP4	Quality improvement actions	The quality improvement actions that are planned, who will be responsible and when they will be implemented
PO9-WP1	Risk assessment	A process used to identify and evaluate risks and their potential effects **Scope note:** Risk assessment includes assessing the critical functions necessary for an organisation to continue business operations, defining the controls in place to reduce organisation exposure and evaluating the cost for such controls. Risk analysis often involves an evaluation of the probabilities of a particular event.
PO9-WP2	Risk reporting	A report to senior management of high-risk actions, responsibilities and proposed actions
PO9-WP43	IT-related risk management guidelines	The co-ordinated activities to direct and control an organisation with regard to risk [ISO/IEC Guide 73:2002]
PO9-WP54	IT-related risk remedial action plans	The actions planned to address identified risks, who will be responsible and when they will be implemented
PO10-WP1	Project performance reports	Report on the status of projects against planned milestones and resource usage, highlighting any issues potentially impacting the achievement of planned outcomes
PO10-WP2	Project risk management plan	Describes how risk management will be structured and performed on the project. It becomes a subset of the project management plan.
PO10-WP3	Project management guidelines	Guidance on the approach to be adopted for defining the scope and boundaries of managing projects, as well as the method to be adopted and applied to each project undertaken
PO10-WP4	Detailed project plans	A formal, approved document used to guide both project execution and project control. The primary uses of the project plan are to document planning assumptions and decisions, facilitate communication among stakeholders, and document approved scope, cost and schedule baselines. A project plan may be summarised or detailed.
PO10-WP5	Updated IT project portfolio	A grouping of IT projects managed and monitored to optimise business value (see PO1)
AI1-WP1	Business requirements feasibility study	A phase of an SDLC methodology that researches the feasibility and adequacy of resources for the development or acquisition of a system solution to a user need
AI2-WP1	Application security controls specification	Controls that achieve the business objectives of timely, accurate and reliable information. They consist of the manual and automated activities that ensure that information conforms to certain criteria—what COBIT refers to as business requirements for information. Those criteria are effectiveness, efficiency, confidentiality, integrity, availability, compliance and reliability.

Figure 17—Level 1 Output Work Products (WPs)		
WP ID	**WP**	**Description**
AI2-WP2	Application and package software knowledge	Also known as an application or application system, it is computer software designed to help the user to perform singular or multiple related specific tasks. An application differs from an operating system (which runs a computer), a utility (which performs maintenance or general-purpose chores) and a programming language (with which computer programs are created).
AI2-WP3	Procurement decisions	Documented specification (at a high level) of the software and services to be acquired. It is used as a basis for procurement action.
AI2-WP4	Initial planned SLAs	An agreement, preferably documented, between a service provider and the customer(s)/user(s) that defines minimum performance targets for a service and how they will be measured
AI2-WP5	Availability, continuity and recovery specification	Availability and service continuity requirements should be identified on the basis of business plans, SLAs and risk assessments. Requirements should include access rights and response times as well as end-to-end availability of system components.Requirements should include but not be limited to access rights, service response times and end-to-end availability of services.
AI3-WP1	Procurement decisions	Acquired (or developed) system configured to meet business-defined requirements
AI3-WP2	Configured system that is tested/installed	System configured to meet business-defined requirements after testing and installation in the production environment
AI3-WP3	Physical environment requirements	The physical environment required for IT assets. It includes: • The physical sites for IT equipment • Physical security measures—Definition and implementation of procedures to grant, limit and revoke access to premises, buildings and areas • Protection against environmental factors • Physical facilities management, including power and communications equipment
AI3-WP4	Updates for technology standards	Changes to organisational standards for infrastructure products and practices based on decisions made during acquiring and maintaining technology infrastructure
AI3-WP5	System monitoring requirements	The specification of the information required to be provided to enable effective monitoring of the application, system or infrastructure
AI3-WP6	Infrastructure knowledge	Knowledge about available IT infrastructure, where IT infrastructure is the set of hardware, software and facilities that integrates an organisation's IT assets (see PO3)
AI3-WP7	Initial planned OLAs	An internal agreement covering the delivery of services that support the IT organisation in its delivery of services
AI4-WP1	User, operational, support, technical and administration manuals	Technical communication documents intended to give assistance to people using, supporting or administering a particular system
AI4-WP2	Knowledge transfer requirements for a solution's implementation	The specification of the knowledge that needs to be transferred to business management, end users, and operations and support staff to enable effective management, use, operation and support of the part(s) of the application system or IT infrastructure
AI4-WP3	Training materials	Material used to train business management, end users, and operations and support staff to enable effective management, use, operation and support of the part(s) of the application system or IT infrastructure
AI5-WP1	Third-party relationship management requirements	The specification of the requirements for managing customer-supplier relationships. It includes clearly defined roles, responsibilities and expectations in third-party agreements as well as monitoring processes.
AI5-WP2	Procured items	Hardware or software procured as part of the acquisition process
AI5-WP3	Contractual arrangements	A formal agreement regarding expectations and responsibilities between the parties
AI6-WP1	Change process description	A documented procedure to record, classify, assess and approve requests for change
AI6-WP2	Change process procedures	A documented procedure to apply changes to the production environment
AI6-WP3	Change status reports	A log of all change requests and the status in terms of assessment, approval (or rejection) and implementation
AI6-WP4	Change authorisation	A record of the approval (or authorisation) for a change
AI7-WP1	Released configuration items	Components of an infrastructure—or an item, such as a request for change, associated with an infrastructure—that is (or is to be) under the control of configuration management **Scope note:** CIs may vary widely in complexity, size and type, from an entire system (including all hardware, software and documentation) to a single module or a minor hardware component.
AI7-WP2	Known and accepted errors	The documentation of known and accepted errors identified in testing (for identification in documented procedures together with any additional procedures required)
AI7-WP3	Promotion to production	Handover of a system from development to testing to operations in line with an implementation plan
AI7-WP4	Software release and distribution plan	Documented plan on how to roll out the release. It should include identifying requirements for ensuring sign-off, packaging, regression testing, distribution, handover, status tracking, backout procedures and user notification.
AI7-WP5	Post-implementation review	An assessment and review of the completed working solution performed after a period of live running

WP ID	WP	Description
Figure 17—Level 1 Output Work Products (WPs)	
WP ID	**WP**	**Description**
AI7-WP6	Internal control monitoring	Identified key controls that should be subject to monitoring, including frequency, possible procedures and thresholds for monitoring
DS1-WP1	Contract review report	A report reviewing contracted IT services
DS1-WP2	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose
DS1-WP3	New/updated service requirements	New or updated specifications of services required and defined by business needs, to be addressed by IT
DS1-WP4	SLAs	An agreement, preferably documented, between a service provider and the customer(s)/user(s) that defines minimum performance targets for a service and how they will be measured
DS1-WP5	OLAs	An internal agreement covering the delivery of services that support the IT organisation in its delivery of services (see AI3)
DS1-WP6	Updated IT service portfolio	The updated set of services that are managed by a service provider, is used to manage the entire life cycle of all IT services
DS2-WP1	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS2-WP2	Supplier catalogue	A catalogue of third-party suppliers of IT products and services
DS2-WP3	Supplier risks	Risks associated with the engagement or provisioning of third-party IT products and services
DS3-WP1	Performance and capacity information	Information on IT resources available or needed to process IT workloads
DS3-WP2	Performance and capacity plan (requirements)	A plan for the review of performance and capacity of IT resources to ensure that cost-justifiable capacity and performance are available to process the agreed-upon workloads as determined by the SLAs
DS3-WP3	Required changes	Changes required to be made to infrastructure and applications
DS3-WP4	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS4-WP1	Contingency test results	Test results for contingency arrangements that ensure that IT systems can effectively recover from systems failure or disruption in the case of an adverse event
DS4-WP2	Criticality of IT configuration items	The criticality of particular IT infrastructure components that are under the control of configuration management
DS4-WP3	Backup storage and protection plan	A plan for copying and storing data and other IT resources to protect against loss of integrity or availability of the original that includes procedures for backup and restoration of systems, applications, data and documentation according to business need, continuity plan and security requirements
DS4-WP4	Incident/disaster thresholds	The trigger points marking a major disruption on key functions and processes
DS4-WP5	Disaster service requirements, including roles and responsibilities	Definition of requirements designed to return the organisation to an acceptable condition, including restoration of critical business functions, from an interruption in services
DS4-WP6	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS5-WP1	Security incident definition	Specification of the characteristics of security incidents that are used by the incident and problem management process
DS5-WP2	Specific training requirements on security awareness	Requirements definition for the awareness training of individuals who potentially have access to the organisation's information
DS5-WP3	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS5-WP4	Required security changes	Change requirements in the context of IT security
DS5-WP5	Security threats and vulnerabilities	Potential for threat sources to successfully exploit lapses in security either accidentally or intentionally
DS5-WP6	IT security plan and policies	A high-level document defining an organisation's information security philosophy, commitment preparedness and response in the context of business, risk and compliance requirements
DS6-WP1	IT financials	Financial information pertaining to IT-related activities and operations
DS6-WP2	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS7-WP1	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS7-WP2	Required documentation updates	Requirements for documentation updates pertaining to IT operations and use
DS8-WP1	Service requests/requests for change (RFC)	A user request for advice or information; for a standard change; for access to an IT service, e.g., to reset a password; to provide standard IT services for a new user. Service requests are usually handled by a service desk, and do not require a formal RFC to be submitted.
DS8-WP2	Incident reports	Reports of unexpected events or unplanned interruption or quality reduction to an IT service, which may involve an attack or series of attacks (compromise and/or breach of security)

Figure 17—Level 1 Output Work Products (WPs)		
WP ID	WP	Description
DS8-WP3	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS8-WP4	User satisfaction reports	Reports on satisfaction levels of IT users on one or more of the following: IT services, application performance, incident/problem resolution, education and training
DS9-WP1	IT configuration/asset details	Details regarding a component of an infrastructure—or an item, such as a request for change, associated with an infrastructure—that is (or is to be) under the control of configuration management
DS9-WP2	RFC(where and how to apply the fix)	A formal proposal for a change to be made, which includes details of the proposed change
DS9-WP3	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS10-WP1	RFC (where and how to apply the fix)	A formal proposal for a change to be made, which includes details of the proposed change (Repeated from DS9-WP2)
DS10-WP2	Problem records	Records of the unknown underlying cause of one or more incidents. The cause is not usually known at the time a problem record is created, and the problem management process is responsible for further investigation.
DS10-WP3	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS10-WP4	Known problems, known errors and workarounds	Known error: A problem that has a documented root cause and a workaround. Known errors are created and managed throughout their life cycle by problem management.
DS11-WP1	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS11-WP2	Operator instructions for data management outcomes	Procedural instructions for data storage/retention/archival arrangements, disposal, backup/restoration, and compliance with security requirements
DS12-WP1	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
DS13-WP1	Incident tickets	An acknowledgement generated upon the initial lodgement of an incident
DS13-WP2	Error logs	A serial or chronological record of design flaws or malfunctions that cause failures of one or more configuration items or IT services. Errors include mistakes made by persons or a faulty process that affects a configuration item or IT service.
DS13-WP3	Process performance reports	Reports for the extent to which the execution of processes achieve their purpose (Repeated from DS1-WP2)
ME1-WP1	Performance input to IT planning	Performance in terms of IT's contribution to business objectives, functionality, stability, complexity, costs, strengths and weaknesses
ME1-WP2	Remedial action plans	Plan (including time frame) showing remedial action in place to address non-compliance issues
ME1-WP3	Historic risk trends and events	A monitoring report that is part of the enterprise's ERM system that continuously identifies risk trends and events
ME1-WP4	Process performance reports	Reporting on the performance of selected processes against agreed performance indicators
ME2-WP1	Report on effectiveness of IT controls	Report outlining effectiveness of IT controls based on management assessment and independent assurance reviews
ME3-WP1	Catalogue of legal and regulatory requirements related to IT service delivery	Reporting outlining legal and regulatory requirements and their impact on IT service delivery
ME3-WP2	Report on compliance of IT activities with external legal and regulatory requirements	Report outlining compliance of IT activities with external legal and regulatory requirements based on management assessment and independent assurance reviews
ME4-WP1	Process framework improvements	Action taken to change an enterprise's framework (its strategies, goals, policies responsibilities and activities) so that they meet the enterprise's business goals
ME4-WP2	Report on IT governance status	An assessment of the effectiveness of IT governance based on independent assurance
ME4-WP3	Expected business outcomes of IT-enabled business investments	Documentation of an observable result or change in business performance, possibly supported by transaction-based metrics, resulting from new initiatives based on new or changed IT
ME4-WP4	Enterprise strategic direction for IT	A monitoring report of the enterprise governance of IT that identifies strategic issues such as technology capabilities, which creates a shared understanding between business and IT
ME4-WP5	Enterprise appetite for IT risks	A statement of approved risk appetite for IT based on and consistent with the enterprise risk appetite statement