HEALTHCARE ENVIRONMENTAL SERVICES
HESAS
AUTOMATION SOICETY

Draft
December 2020

ESM Activity Based Management

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HESAS EMS Standards Document

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Message from the chairman

It is vividly evident that the world witnessed the worst public health and economic crisis due to COVID-19 pandemic. This inevitably mobilized the international community to act seriously and swiftly. However, the mortalities and morbidities induced by healthcare-acquired infections (HAI) are equally fatal, but the international community did not act similarly. Consequently, we are continuously and chronically suffering from HAI.

The current intervention for HAI is merely based on passively-set standards and enforcing these standards via regulatory agencies such as the centre for disease control and prevention (CDC), joint commission international (JCI), ministries of health, and other regulatory agencies. To efficiently address HAI, we inevitably need to mobilize the international community because HAI traverses a multitude of epistemological dimensions, requiring multidisciplinary tacit knowledge, and mandates active international collaboration. Besides, we believe that we can efficiently traverse deeply into the root-causes and solution landscapes by automating the entire healthcare environmental services and infection control within healthcare institutions using the latest advancements in computational epistemology, computational infection control models, computational epidemiological models, artificial intelligence, machine learning, distributed ledger technology, collective intelligence, cognitive technologies, internet of things, ubiquitous technologies, intelligent micro-measurement frameworks, artificial life, evidence-based program implementation, patient-centric care, strategy anchored execution, and symbiotic healthcare ecosystem services. Consequently, we developed these open standards that were tailored from diverse international standards to promote the automation of healthcare environmental services and infection control processes and best practices.

The Healthcare Environmental Services Operational Map (HESOM) and other standards were developed to efficiently leverage multidisciplinary experts and practitioners to contribute towards the eradication of HAI-induced mortalities and morbidities. Using ReXcels research and innovation environment, we cultivate collective intelligence by bringing together these multidisciplinary experts to iteratively develop these standards and adaptively support the innovation of computational technology that automates the execution and enforcement of these standards. As such, we cordially invite you to use these documents and participate actively in the further development of these standards to significantly reduce HAI-induced mortalities, morbidities, and their enormous negative economic externalities.

Hamid Adem

Interim Chairman, and Chief R&D Officer

Change Control

Version:	Date:	Changes:

Table of Contents

Table of Contents

1. PURPOSE 6
2. STRUCTURE OF THE DOCUMENT 8
3. SCOPE 10
4. GENERAL ASSUMPTIONS 12
5. ACTIVITY BASED MANAGEMENT FRAMEWORK 14
   - 5.1 Activity Based Management Interactions 15
   - 5.2 Activity Based Management Process Sequence 16
     - 5.2.1 Establish goals 16
     - 5.2.2 Information gathering 16
     - 5.2.3 Activity Analysis 17
     - 5.2.4 Identify Opportunity for improvement 17
     - 5.2.5 Establish Performance Measures 18
6. ACTIVITY BASED MANAGEMENT PROCESS 19
   - 6.1 Process Model 20
   - 6.2 Process Specification 21
   - 6.3 Roles and Responsibilities 24
   - 6.4 Sub Process – Activity Analysis 25
   - 6.5 Sub Process – Activity Analysis Specification 26
   - 6.6 Sub Process – Activity Analysis Roles and Responsibilities 29
   - 6.7 Sub Process – Identify Opportunity for Improvement 30
   - 6.8 Sub Process – Identify Opportunity for improvement Specification 31
   - 6.9 Sub process – Identify Opportunity for improvement Roles and Responsibilities 34
   - 6.10 Sub Process – Establish Performance Measures 35
   - 6.11 Sub Process – Establish Performance Measures Specification 36

Table of Contents

6.12 Sub Process – Establish Performance Measures Roles and Responsibilities 39
7. REFERENCE 40
7.1 Business Rules 41
7.2 Risk 41
7.3 Quality Attribute 42
7.4 Data Quality Dimension 43
7.5 Operation Policy 43
7.6 KPI 44
7.7 CTQ 44
7.8 Abstract Time-Scale 45
7.9 SLA Terms 46
7.10 Voice of Customer 46
7.11 Customer Context Matrix 48
7.12 MSD Attributes 49
8. GLOSSARY / ACRONYMS 51
9. APPENDIX A: BUSINESS PROCESS MODELING NOTATION REFERENCE 54
10. APPENDIX B: CHAIN OF INFECTION 59

1

ESM Activity Based Management

Purpose

1 Purpose

1. PURPOSE

The purpose of this document is to establish a Activity Based Management process for Environmental Services department such that all aspects of Activity Based Management, are handled appropriately such that:

- The cost and value of activities are evaluated to identify opportunities for improvement
- Value or revenue adding activities are enhanced and non valued adding activities are removed.
- Well informed knowledge based decisions are made by the organization.

This process is based on international well acclaimed standards like:

- *NHS- National Health Services Standard*
- *OSHA- Occupational Safety and Health Administration standard*
- *CDC- Centers for Disease Control and Prevention standard*
- *Lean six sigma- Quality Standard*
- *JCI- Journal of Clinical Investigation standard*
- *JCAHO- Joint Commission on Accreditation of Healthcare Organizations (JCAHO)*
- *EPA- US Environmental Protection Agency*
- *HCAHPS - Hospital Consumer Assessment of Healthcare Providers and Systems*
- *HIPA- Health Information Privacy Act standard.*

P.S: *This process is a derivation from* ***ESM (Environmental Service Map)****, which is a holistic and a comprehensive model for Environmental Services Management.*

2

ESM Activity Based Management

Structure of the Document

2 Structure of the Document

2. STRUCTURE OF THE DOCUMENT

The Activity Based Management process document comprises the following chapters:

Chapter–3: *Scope:* This chapter describes the scope of the document and the Activity Based Management process.

Chapter–4: *General Assumptions:* This chapter describes the underlined assumptions made for both the document and Activity Based Management process.

Chapter–5: *Activity Based Management Framework:* This chapter exhibits the interaction of Activity Based Management process with other related processes and also describes the high level process sequence for Activity Based Management based on EMS framework.

Chapter–6: *Activity Based Management Process:* In this chapter Activity Based Management process and sub processes (if any) will be depicted and specified using rigorous BPMN and process specification templates.

Chapter–7: *References:* This chapter serves as a prime reference to Activity Based Management process and presents the details supporting it in tabular formats. The chapter describes relevant Business Rules, Risks, Quality Attributes, Data Quality Dimensions, Operation Policies, KPIs, CTQs, Abstract Time-scales and SLAs terms specific to Activity Based Management process.

The Activity Based Management process is supposed to be a living document and consists of various variable values which would frequently evolve or change as Activity Based Management process matures or changes.

3

ESM Activity Based Management

Scope

3 Scope

3. SCOPE

This process is applicable to all the projects activities undertaken by the environmental service department.

4

ESM Activity Based Management

General Assumptions

4 General Assumptions

4. GENERAL ASSUMPTIONS

The following are the general assumptions made:

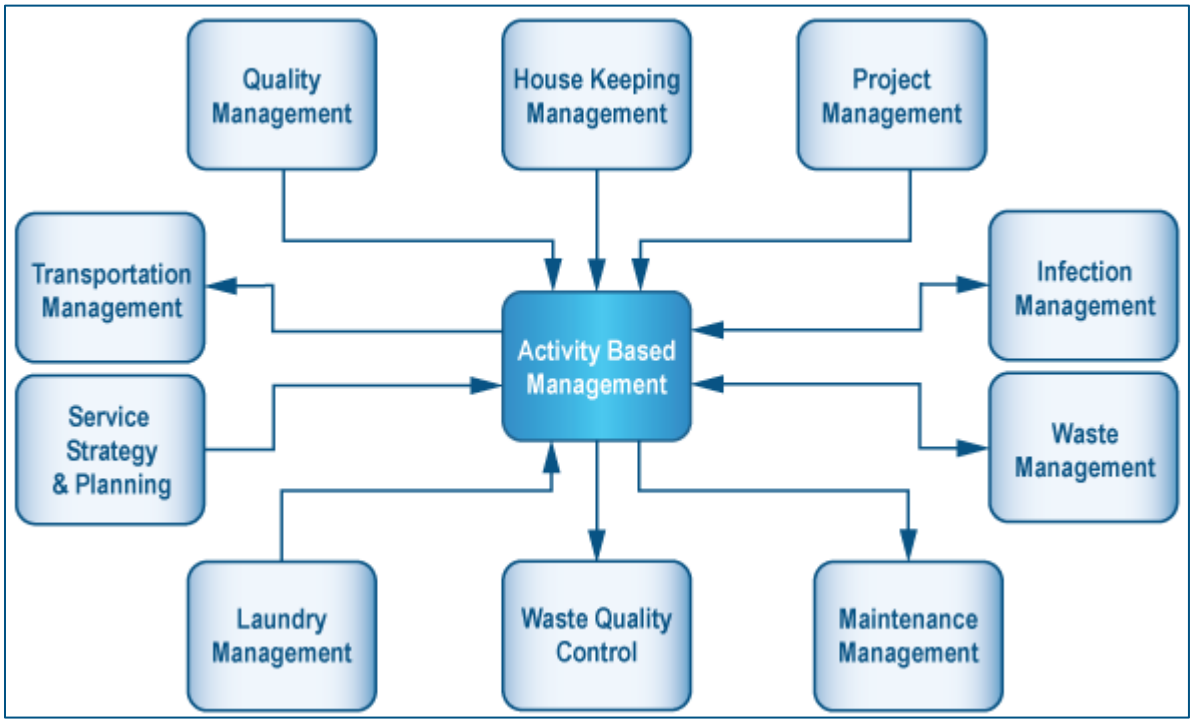
- Physical resources are readily available to this process.
- Activity Based Management process's activities are management and monitoring is automated.
- Senior management is committed to this process.
- The roles defined in this document can be attached to the existing position
- Any process or sub process related assumptions are explicitly identified in related Process Specification table in Chapter 6.

Activity Based Management Framework

5 Activity Based Management Framework

5.1 Activity Based Management Interactions

The following depiction shows the points of interaction of Activity Based Management process with other related EMS processes. The arrows moving into Activity Based Management process signify the inputs from the other process to Activity Based Management process, and the arrows moving out of the Activity Based Management process signify the inputs from Activity Based Management process to other related EMS processes. All these processes depicted below are defined in their own respective dedicated documents.



5 Activity Based Management Framework

5.2 Activity Based Management Process Sequence

The Activity Based Management process comprises of following high level sequence of activities:

1. **Establish Goals**
2. **Information gathering**
3. **Activity Analysis**
4. **Identify Opportunities for improvement**
5. **Establish performance Measures.**

Section 5.2.1 -5.2.5 describes the high level process sequence for Activity Based Management process based on EMS framework. **Section 6.1** Process Model sheds more light on the flow of Activity Based Management process.

5.2.1 Establish goals

This involves establishing the goals desired out of Activity based management. The prime objectives typically are as:

- **Reduce costs:** Reduction of various process related costs like overhead costs, operational costs.
- **Optimize processes management:** Enhance value added services and eliminate unimportant activities.
- **Effective decision making:** Identify which activities are more important for achievement organization goals and hence, spend more resources on them rather than the unimportant ones.

This process is responsible for collecting performance data for Activity Based Costing and evaluating against the relevant commitment:

5.2.2 Information gathering

This involves gathering information from various sources in the organizations via:

- **Interview:** This involves one to one intensive session to obtain detailed information
- **Group discussion:** This involves group discussion to get information at different level simultaneously.
- **Audit:** The operational and financial audits.
- **Process:** The prime input to this process is ESM Activity based Costing process.

5.2.3 Activity Analysis

This process comprises of identification of following:

- **Activities Definition**
  - **Value Added activities:** The activities which are necessary to remain in business
  - **Non Value added activities:** These are those activities which don't contribute to customer perceived value or organizational goals.
- **Activity Evaluation**
  - **Listing**: This involves listing all the activities performed.
  - **Measuring:** This involves identification of time, and resources required to perform the activities.
  - **Prioritizing:** This involves establishing priority of the activities.
  - **Activity Cost:** This involves establishing cost for the activities based on the resources and time required.
  - **Identifying Value Added.** This involves identifying whether the activity is value added or not by checking whether the activity
    - Contributes to organizational goal and
    - Has Customer perceived value

5.2.4 Identify Opportunity for improvement

This comprises of following:

- **Kaizen Costing:** This involves Constant incremental improvement, including cost reduction through activity management
  - **Activity Elimination:** This refers to removing the non value added activity all together.
  - **Activity Selection:** This involves choosing amongst sets of competing tasks.
  - **Activity Reduction:** This involves decre0asing time and resources required by an activity.
  - **Activity Sharing:** This involves using Economies of scale to increase efficiency.
- **Removing Low value-added activity:** This involves elimination of a low value-added activity which do not change or slightly diminishes customer satisfaction. Examples of low value-added activities include setting up machines, moving product parts, waiting, reworking, inspecting and storing. Various other methods to remove wastes can be used. For more information, please refer to:
  - EMS Service quality Management Process.
  - EMS Enterprise quality Management process.

5.2.5 Establish Performance Measures

This involves establishing performance measures

- **Financial Based:** This involves establishing:
    - Budget
    - Standard costing
- **Activity Based:** This involves process oriented standards dimensions:
    - Time
    - Quality
    - Efficiency

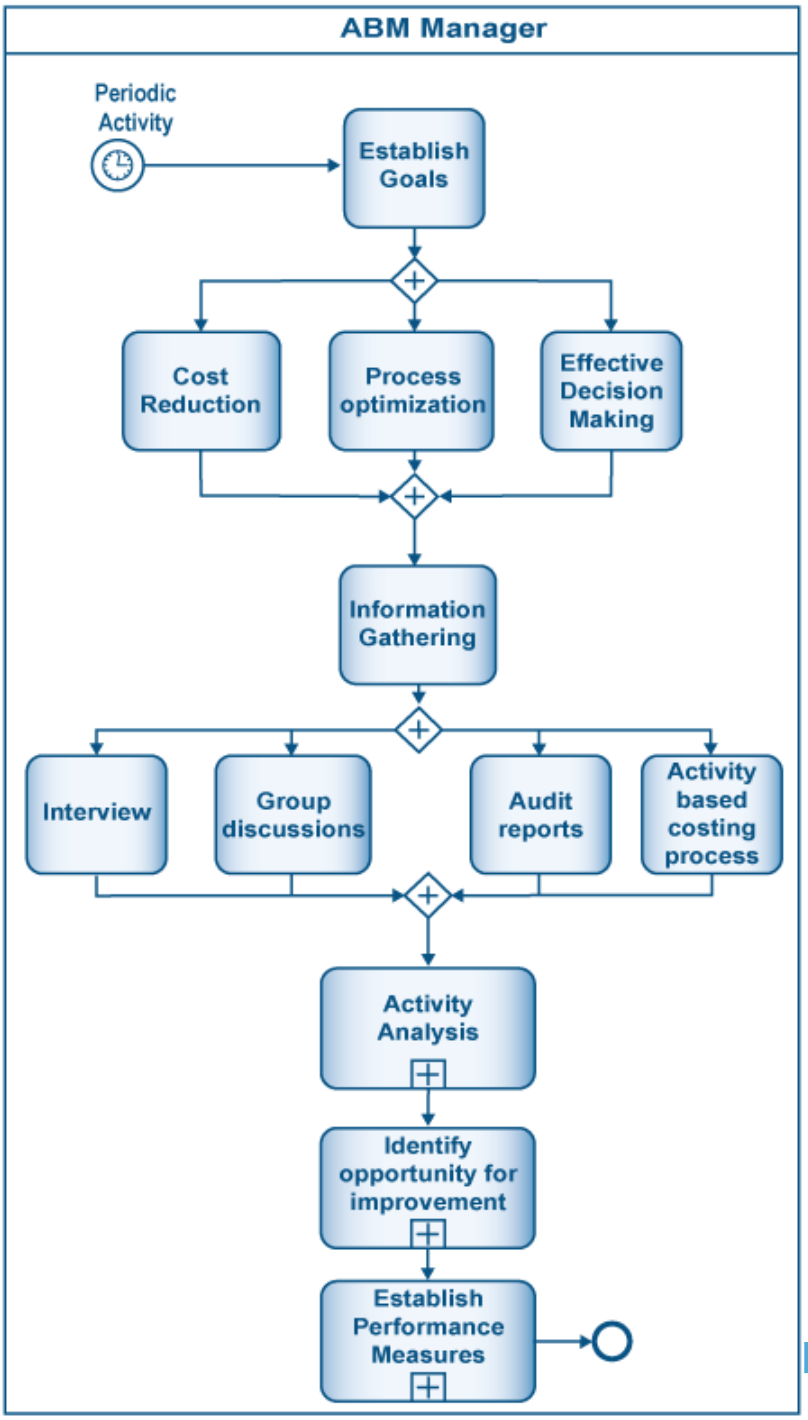
6

ESM Activity Based Management

Activity Based Management Process

6 Activity Based Management Process

6.1 Process Model



6 Activity Based Management Process

6.2 Process Specification

Specification	Description
Summary/Purpose	The purpose of this process is to create Activity Based Management process for environmental services department.
Scope	This is a Level 1 Process Specification.
Primary Reference	Lean Six Sigma, Activity Based Costing
Related ESM Practices	Transportation Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, waste Management, Infection Management, Project Management, House Keeping Management, activity based costing
Related Business Driver	Better Activity Based Management.
Related Operational Policies	OP-001, OP-002, OP-003(Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for Activity Based Management.

6 Activity Based Management Process

<table>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>• Periodic Activity</td></tr>
<tr><td>Basic Course of Event</td><td>Activity Based Management
1. ABM Manager identifies goals of Activity based management (cost reduction, optimized process management, effective decision making)
2. ABM performs information gathering via interviews, group discussions, audits and activity based costing management process.
3. ABM Manager performs activity Analysis
4. ABM Manager identifies opportunity for improvement
5. ABM Manager establishes performance measures.
6. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Transportation Management, Quality Management, Maintenance Management, Infection Management, Activity Management, House Keeping Management</td></tr>
<tr><td>Preconditions</td><td>Adequate resources are available to the process.</td></tr>
<tr><td>Post -conditions</td><td>Activity Based Management process is established.</td></tr>
</table>

6 Activity Based Management Process

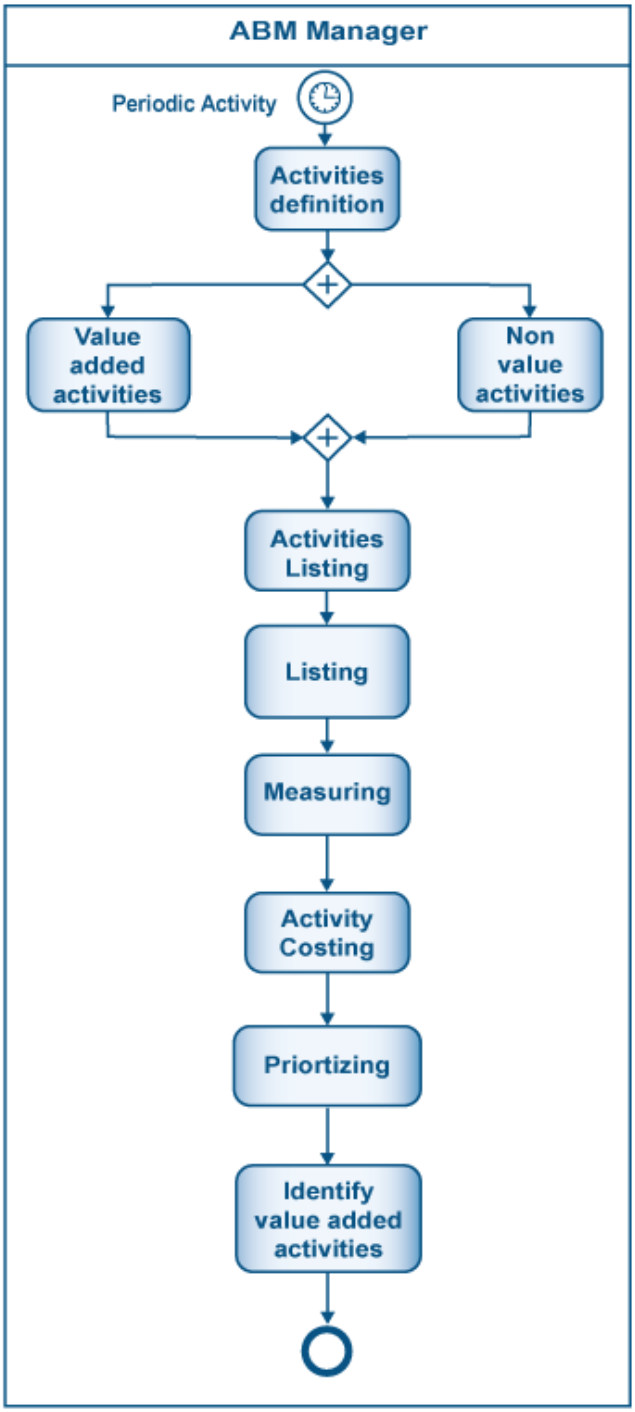
Related Business Rules	BR-001, BR-002, BR-003, BR-004 (Ref 7.1)
Related Risks	RR-001, RR-002, (Ref. 7.2)
Related Quality Attributes	Reliability, Service Reliability, Availability, Usability, Authenticity, Data Integrity, Non-repudiation, Accountability, Performance, Scalability, Extensibility, Adaptability, Testability, Auditability, Operability and Deployability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Believability, Reputation, Objectivity, Free-of-Error, Relevance, Completeness, Timeliness, Appropriate Amount, Understandability, Interpretability, Concise Representation (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	NVAAR, AER, BAR (Ref 7.6)
Related CTQs	NVAARV, AERV, BARV, MOM, PWOM, CTQ, IOM, TOM, WRM, DRM (Ref 7.7)
Actors/Agents	ABM Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Agent Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.1
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6 Activity Based Management Process

6.3 Roles and Responsibilities

Roles	Responsibilities
ABM Manager	• ABM Manager identifies goals of Activity based management (cost reduction, optimized process management, effective decision making) • ABM performs information gathering via interviews, group discussions, audits and activity based costing management process. • ABM Manager performs activity Analysis • ABM Manager identifies opportunity for improvement • ABM Manager establishes performance measures

6.4 Sub Process – Activity Analysis



6 Activity Based Management Process

6.5 Sub Process – Activity Analysis Specification

Specification	Description
Summary/Purpose	The purpose of this process is to perform activity analysis for Activity based management.
Scope	This is a Level 2 Process Specification.
Primary Reference	Lean Six Sigma, Activity based costing
Related ESM Practices	Transportation Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Waste Management, Infection Management, Project Management, House Keeping Management
Related Business Driver	Better understanding of activities.
Related Operational Policies	OP-001 (Ref 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for Activity Based Management.
MSD Management	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)

6 Activity Based Management Process

<table>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>• Project requirement</td></tr>
<tr><td>Basic Course of Event</td><td>Activity Analysis
1. ABM Manager establishes activities definition (value added activities, non-value added activities)
2. ABM Manager performs activities listing
3. ABM Manager measures activities
4. ABM Manager prioritizes activities
5. ABM Manager identifies cost of activities.
6. ABM Manager identifies value added activities.
7. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Identify opportunities for improvement.</td></tr>
<tr><td>Preconditions</td><td>Adequate resources are available to the process.</td></tr>
<tr><td>Post -conditions</td><td>Valued added activities are identified.</td></tr>
<tr><td>Related Business Rules</td><td>BR-001, BR-002 (Ref 7.1)</td></tr>
<tr><td>Related Risks</td><td>RR-001 (Ref. 7.2)</td></tr>
</table>

6 Activity Based Management Process

Related Quality Attributes	Reliability, Availability, Usability, Authenticity, Data Integrity, Non-repudiation, Accountability, Performance, Scalability, Extensibility, Adaptability, Auditability, Operability and Deployability (Ref 7.3) (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Believability, Reputation, Objectivity, Free-of-Error, Relevance, Completeness, Timeliness, Appropriate Amount, Understandability, Interpretability, Concise Representation (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	NVAAR Ref 7.6)
Related CTQs	NVAARV (Ref 7.7)
Actors/Agents	ABM Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Agent Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.4
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

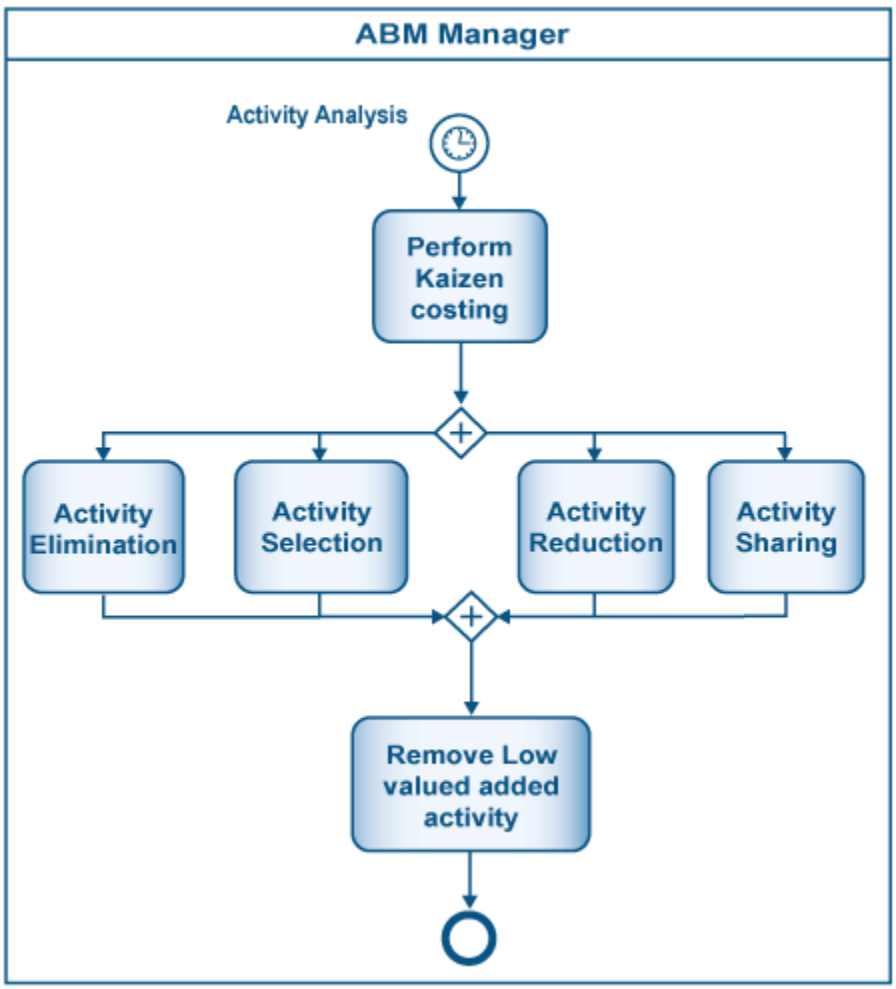
6 Activity Based Management Process

6.6 Sub Process – Activity Analysis Roles and Responsibilities

Roles	Responsibilities
Activity Based Management	• ABM Manager establishes activities definition (value added activities, non-value added activities) • ABM Manager performs activities listing • ABM Manager measures activities • ABM Manager prioritizes activities • ABM Manager identifies value added activities.

6 Activity Based Management Process

6.7 Sub Process – Identify Opportunity for Improvement



6 Activity Based Management Process

6.8 Sub Process – Identify Opportunity for improvement Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish process to identify opportunities for improvement with regards to Activity based management.
Scope	This is a Level 2 Process Specification.
Primary Reference	Lean six sigma, Activity based costing
Related ESM Practices	Transportation Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, waste Management, Infection Management, Project Management, House Keeping Management
Related Business Driver	Process improvisation
Related Operational Policies	OP-002(Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for Activity Based Management.
MSD Management	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)

6 Activity Based Management Process

<table>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td>
<table>
<tr><th>Type</th><th>Normal</th></tr>
<tr><td>Average</td><td>30 min</td></tr>
<tr><td>Std</td><td>12 min</td></tr>
</table>
</td></tr>
<tr><td>Trigger</td><td>Activity Analysis</td></tr>
<tr><td>Basic Course of Event</td><td>Opportunity for Improvement
• ABM performs kaizen costing (activity elimination, activity selection, activity reduction, activity sharing)
• ABM Manager removes low valued added activity.
• End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Establish performance measures.</td></tr>
<tr><td>Preconditions</td><td>Automated systems exist to support this process.</td></tr>
<tr><td>Post -conditions</td><td>Value added activities are optimized and enhanced.</td></tr>
<tr><td>Related Business Rules</td><td>BR-003(Ref 7.1)</td></tr>
<tr><td>Related Risks</td><td>RR-001(Ref. 7.2)</td></tr>
<tr><td>Related Quality Attributes</td><td>Reliability, Service Reliability, Availability, Usability, Authenticity, Data Integrity, Non-repudiation, Accountability, Performance, Extensibility, Adaptability, Auditability, (Ref 7.3)</td></tr>
<tr><td>Related Data Quality Dimensions</td><td>Accuracy, Believability, Objectivity, Free-of-Error, Relevance, Completeness, Timeliness, Appropriate Amount, Understandability, Interpretability (Ref 7.4) (Ref 7.4)</td></tr>
</table>

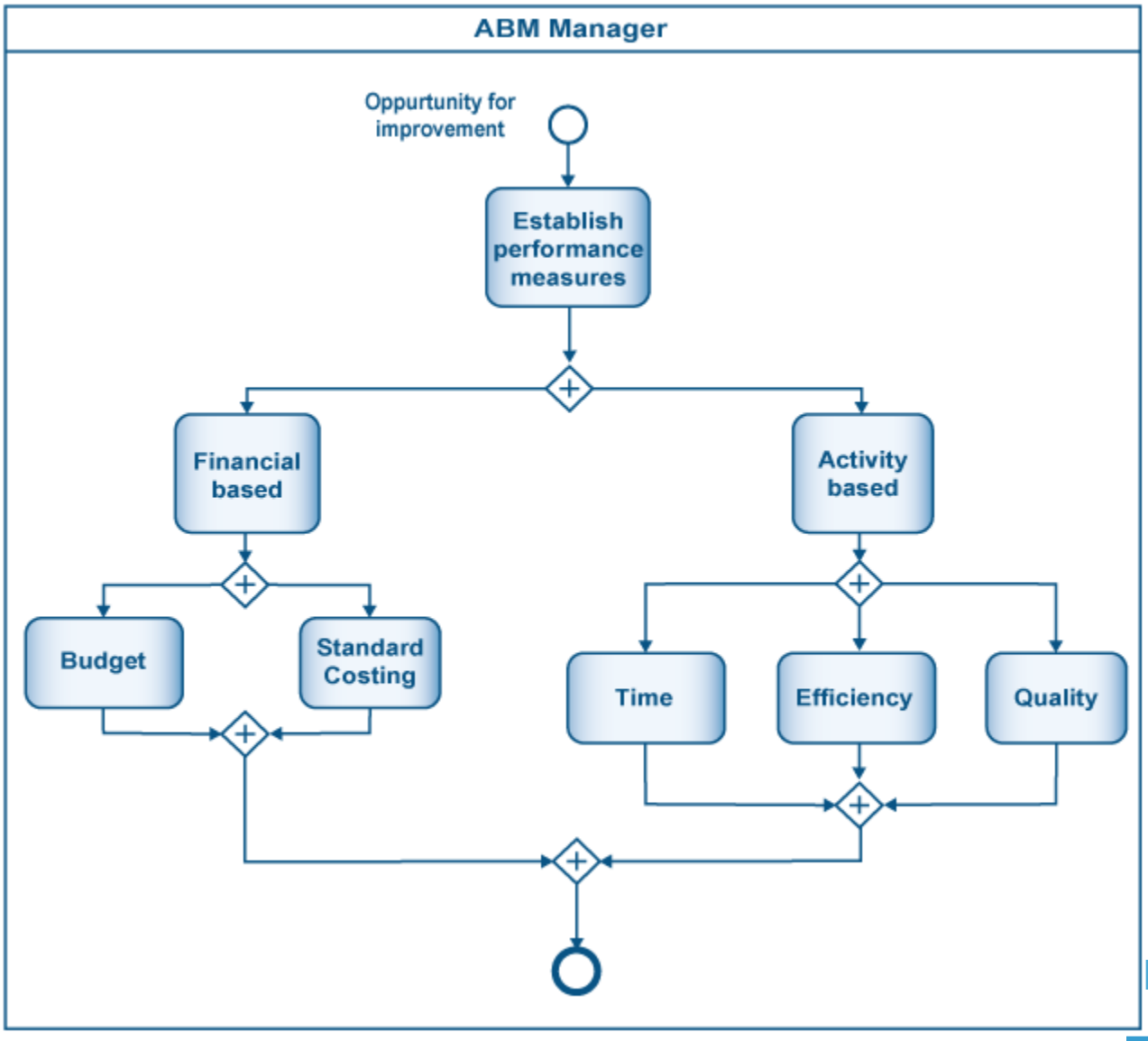
6 Activity Based Management Process

Related Primary SLA Terms	(Ref 7.9)
Related KPIs	AER (Ref 7.6)
Related CTQs	AERV(Ref 7.7)
Actors/Agents	ABM Manager.
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Agent Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.7
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.9 Sub process – Identify Opportunity for improvement Roles and Responsibilities

Roles	Responsibilities
ABM Manager	• ABM performs kaizen costing (activity elimination, activity selection, activity reduction, activity sharing) • ABM Manager removes low valued added activity.

6.10 Sub Process – Establish Performance Measures



6 Activity Based Management Process

6.11 Sub Process – Establish Performance Measures Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish performance measures.
Scope	This is a Level 2 Process Specification.
Primary Reference	Lean Six Sigma, Activity based Management
Related ESM Practices	Transportation Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, waste Management, Infection Management, Project Management, House Keeping Management
Related Business Driver	Establish performance measures.
Related Operational Policies	OP-003 (Ref 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for Activity Based Management.
MSD Management	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)
EBC Procedures	None

6 Activity Based Management Process

Timing Dimensions	<table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table>
Trigger	Opportunity for improvement
Basic Course of Event	**Establish performance measures.** 1. ABM Manager establishes performance measures financial based (budget and standard costing) and activity based (time, efficiency, quality) 2. End
Alternative Path	None
Exception Path	**System Down** 1. Keep paper track until system is up and running 2. Update the System and clear all logs. 3. End.
Extension points	Transportation Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, waste Management, Infection Management, Project Management, House Keeping Management
Preconditions	The process is supported by automated tools.
Post -conditions	Project control process is established
Related Business Rules	BR-004 (Ref 7.1)
Related Risks	RR-002(Ref. 7.2)
Related Quality Attributes	Reliability, Service Reliability, Availability, Usability, Data Integrity, Performance, Scalability, Extensibility, Testability, Auditability, Operability and Deployability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Believability, Reputation, Objectivity, Free-of-Error, Relevance, Completeness, Appropriate Amount, Interpretability(Ref 7.4)

6 Activity Based Management Process

Related Primary SLA Terms	(Ref 7.9)
Related KPIs	BAR (Ref 7.6)
Related CTQs	BARV (Ref 7.7)
Actors/Agents	ABM Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Agent Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.10
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.12 Sub Process – Establish Performance Measures Roles and Responsibilities

Roles	Responsibilities
ABM Manager	ABM Manager establishes performance measures financial based (budget and standard costing) and activity based (time, efficiency, quality)

Reference

7 References

7.1 Business Rules

BR ID	Description	Context	Rule	Source
BR-001	Activity Based management would be used for process improvisation	Business	NA	NA
BR-002	All non valued added activities would be eliminated.	Business	NA	NA
BR-003	Kaizen costing method would be applied to activities.	Business	NA	NA
BR-004	Performance as well as process measures would be used for the process.	Business	NA	NA

7.2 Risk

Risk ID	Description	Source	Severity Level	Status	Resolution
RR-001	Lack of analysis of activities.	NA	Medium	NA	The process should be properly reviewed by the senior committee to ensure that proper performs accurately.
RR-002	Poor monitoring of activities	NA	High	NA	Automated tools should be implemented to monitor the process.

7 References

7.3 Quality Attribute

QA ID	Description	Threshold
QA-001	Interoperability	TBD
QA-002	Reliability	TBD
QA-003	Service Reliability	TBD
QA-004	Availability	TBD
QA-005	Usability	TBD
QA-006	Normal Usability Operations	TBD
QA-007	Confidentiality	TBD
QA-008	Authenticity	TBD
QA-009	Data Integrity	TBD
QA-010	Availability	TBD
QA-011	Non-repudiation	TBD
QA-012	Accountability	TBD
QA-013	Security Integration	TBD
QA-014	Performance	TBD
QA-015	Scalability	TBD
QA-016	Extensibility	TBD
QA-017	Adaptability	TBD
QA-018	Testability	TBD
QA-019	Auditability	TBD
QA-020	Operability and Deployability	TBD

7 References

7.4 Data Quality Dimension

DQ ID	Description	Threshold
DQ-001	Accuracy	TBD
DQ-002	Believability	TBD
DQ-003	Reputation	TBD
DQ-004	Objectivity	TBD
DQ-005	Free-of-Error	TBD
DQ-006	Value Added	TBD
DQ-007	Relevance	TBD
DQ-008	Completeness	TBD
DQ-009	Timeliness	TBD
DQ-010	Appropriate Amount	TBD
DQ-011	Understandability	TBD
DQ-012	Interpretability	TBD
DQ-013	Concise Representation	TBD

7.5 Operation Policy

Policy ID	Description	Context	Importance (1-5)
OP-001	All value added activities would be identified.	TBD	TBD
OP-002	All low valued added activity would be removed.	TBD	TBD

OP-003	Time consumed and quality would be always considered as a measure for performance.	TBD	TBD

7.6 KPI

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard threshold
Non value added activities rate	**NVAAR**	Number of non value activities identified per process.	NA	TBD	TBD	TBD
Activity elimination rate	**AER**	Number of activities eliminated	NA	TBD	TBD	TBD
Budget accuracy rate	**BAR**	The planned minus the actual budget.	NA	TBD	TBD	TBD

7.7 CTQ

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard Threshold
Non value added activities rate	**NVAAR**	Number of non value activities identified per process.	NA	TBD	TBD	TBD
Activity elimination rate	**AER**	Number of activities eliminated	NA	TBD	TBD	TBD
Budget accuracy rate	**BAR**	The planned minus the actual budget.	NA	TBD	TBD	TBD

7 References

Motion Optimization Measure	**MOM**	Management of motion optimization measure	NA	TBD	TBD	TBD
Paper work Optimization Measure	**PWOM**	Management of Paper work Optimization Measure	NA	TBD	TBD	TBD
Correction reduction measure	**CRM**	Management of Correction reduction measure	NA	TBD	TBD	TBD
Inventory Optimization Measure	**IOM**	Management of Inventory Optimization Measure	NA	TBD	TBD	TBD
Transportation Optimization Measure	**TOM**	Management of Transportation Optimization Measure	NA	TBD	TBD	TBD
Waiting Reduction Measure	**WRM**	Management of Waiting reduction Measure	NA	TBD	TBD	TBD
Delays reduction measure	**DRM**	Management of delays reduction measure	NA	TBD	TBD	TBD

7.8 Abstract Time-Scale

Name	Acronym	Description	Quantification
TBD	**TBD**	TBD	TBD

7 References

7.9 SLA Terms

SLA ID	Description	Context	KPI	CTQ
TBD	TBD	TBD	TBD	TBD

7.10 Voice of Customer

VOC	Customer	Description	Perceived Value
Hygiene	Doctors, Patients, Nurses, Housekeeping Supervisors, Housekeepers, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker.	The environment should be attributing with great hygiene level.	• High quality healthcare services • Safe environment • Low infection rate • Low risk
High and Consistent Quality of standards	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	High and Consistent Quality of standards.	• Reputation of organization or hospital • Professionalism • Trust • Positive psychological bias
Free of Infections	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	Infections free and healthy environment.	• Safe environment • Reputation of hospital or organization • Trust • Quick healing • Positive psychological bias

7 References

			• Low risk
Timely Services	Doctors, Patients, Nurses, Housekeeping Supervisors, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	The response time for any request should be very short.	• Professionalism • Trust • Positive psychological bias • Reputation of hospital or organization • Safe environment
High Coordinating	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	There should be high level of coordination between hospital employees and departments.	• Professionalism • Trust • Low risk • Excellent Ergonomic
Remove Waste	Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	Wastes should be either removed or minimized.	• Safe environment • Low infection rate • Low risk • Reputation of hospital or organization • Low cost • Timely response • High quality
Excellent Ergonomic	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers.	The hospital environment and policy should comply with physical, organization and cognitive ergonomics.	• Professionalism • Trust • Job accuracy • Excellent communication • Low risk • Reputation of hospital or organization

Safety	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	Hospital environment should comply with occupational health and safety procedures.	• Safe environment • Professionalism • Low risk
Appearance	Housekeeping Supervisors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	The appearance of the workers, supervisors and manager should induce positive biases.	• Professionalism • Reputation of hospital or organization • Trust • Positive psychological bias
Excellent Worker Attitude	Housekeeping Supervisors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	The environment service employee should be free from negative attitudes.	• Professionalism • Reputation of hospital or organization • Trust • Positive psychological bias • Minimum disputes • Less employee turn over

7.11 Customer Context Matrix

Name of Customer	Acronym	Context of Customer	Coordination Process Area
Doctors	**DOC**	Direct	HIS Coordination
Patients	**PAT**	Direct	HIS Coordination
Nurses	**NUR**	Direct	HIS Coordination, Nurse Coordination

Housekeeping Supervisors	**HKS**	Direct	Quality Coordination, Nurse Coordination, infection control coordination
Clerks	**CLR**	Direct	HIS Coordination
Visitors	**VIS**	Indirect	HIS Coordination
Environmental Services Management	**ESM**	Direct	Nurse Coordination, infection control coordination
Other hospital workers	**OHW**	Indirect	Security coordination
Laundry worker	**LDW**	Direct	Nurse Coordination, HIS Coordination
Transportation worker	**TRW**	Direct	Quality Coordination, HIS Coordination
Maintenance worker	**MAW**	Direct	Quality Coordination, HIS Coordination
Waste management worker	**WMW**	Direct	Quality Coordination, HIS Coordination
Infection control professional	**ICP**	Indirect	Infection control coordination
Housekeepers	**HK**	Direct	HIS Coordination, Nurse Coordination

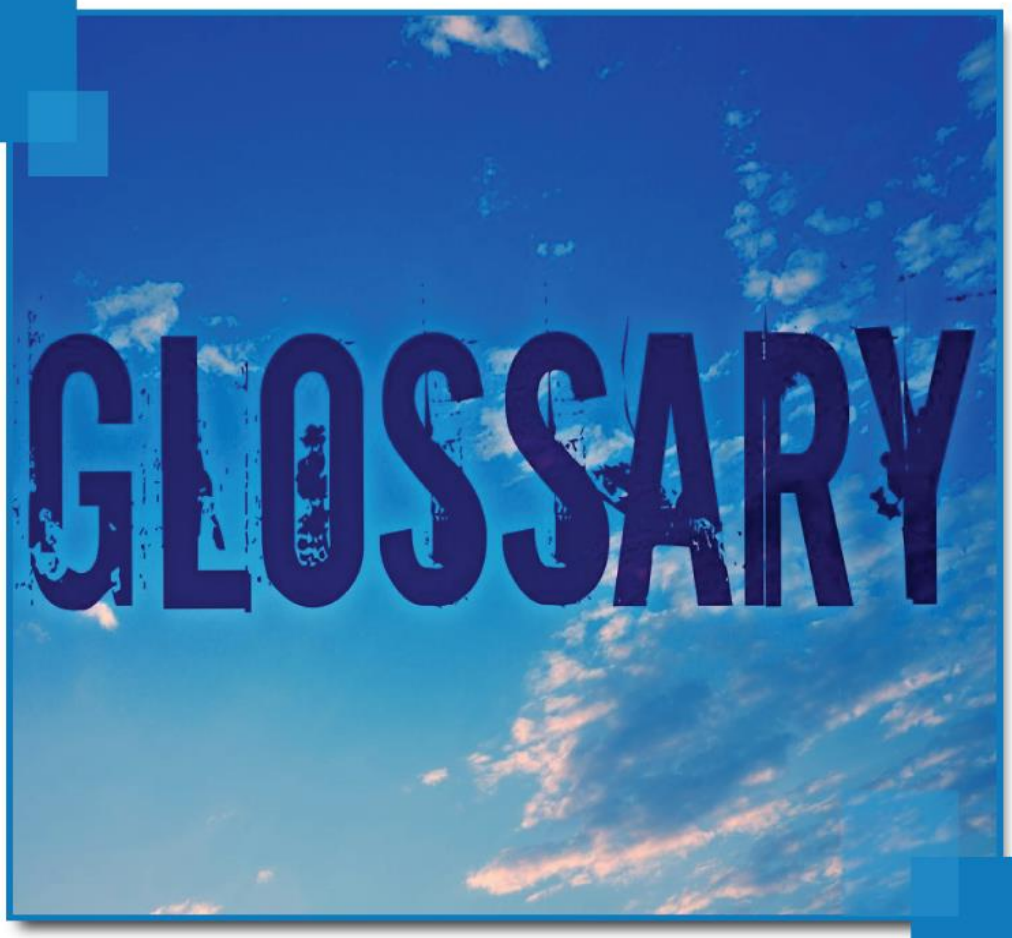
7.12 MSD Attributes

MSD Attribute	Description
Lifting/carrying	Large vertical movements, long carry distances.
Disability	Pose a risk to those with a health problem or a physical or learning disability.
Force	High initial forces to get the load moving.
Loaded motion	High forces to keep the load in motion.

7 References

Physical ergonomics	Constraints on body posture/positioning, confined spaces/narrow doorways.
Posture change	Strong force and awkward movement/posture. E.g. bent wrists.
Excessive force	Excessive force to grip raw materials, product or tools
Scarceness	Inadequate tools for repetitive use screwdrivers, pliers, hammers.
Noise	Noise which cause stress and muscle tension.
Concentration	Tasks require high levels of attention/concentration especially where the worker has little control over allocation of effect to the task.
Floor hazards	Remove slip and trip hazards through provision of appropriate floor surfaces and good keeping.
Clothing	Clothing/PPE may prevent sufficient movement for the task or reduce capability. E.g. to grip consider handling needs when selecting work wear/gloves.
Psychosocial factors	Adverse psychosocial factors can increase the potential for manual handling injuries. A workers psychosocial response to work and the workplace conditions can affect their health in general and MSDs in particular. The factors include the content, design, organization and management of the work

Glossary / Acronyms



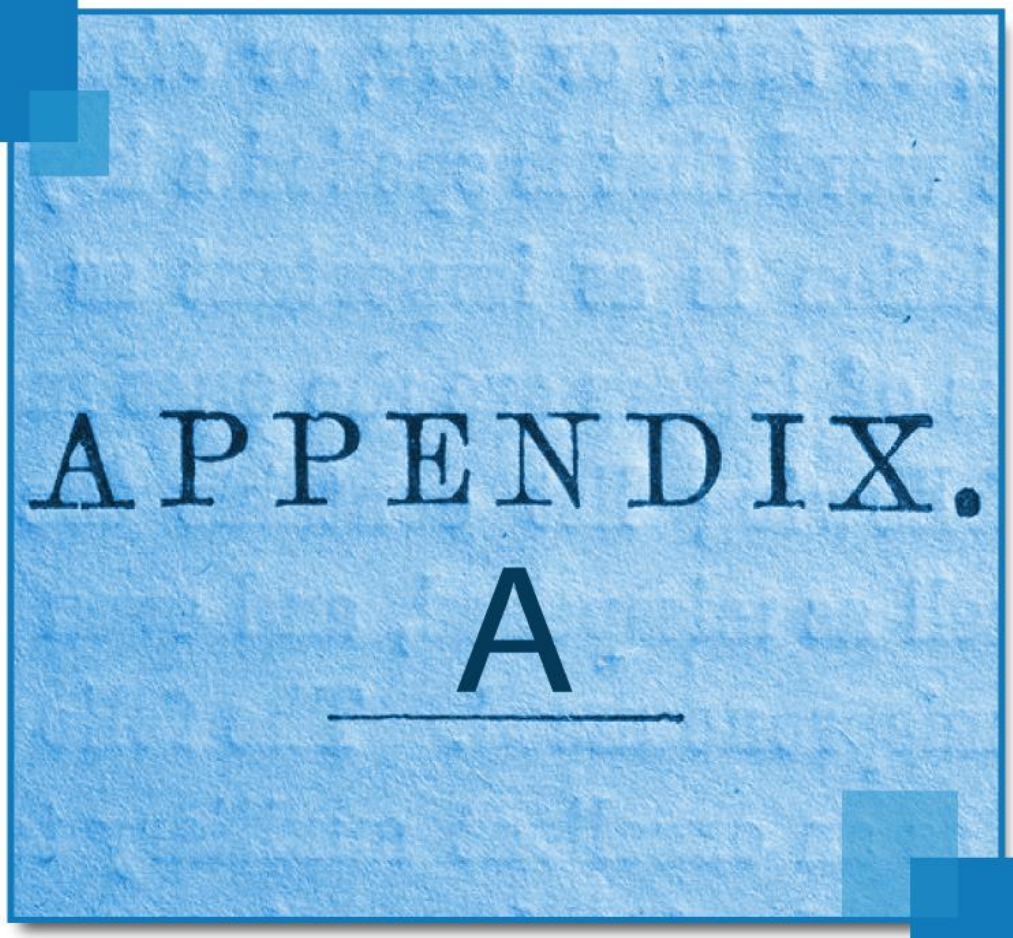
8 Glossary / Acronyms

Terminology	Description
Abstract Time Scale	Time Scale that will be quantified both during operations and continuous process improvement. These time identifiers are correlated with the soft thresholds that are dynamically specified during life span of the process.
BPMN	**Business Process Modelling Notation** Business Process Modelling Notation is the practice of documenting an organization's key business processes in a graphical format.
Business Rules	Business Rules are intended to assert business structure or to control or influence the behavior of the Business. Business rules describe the operations, definitions and constraints that apply to an organization
CRR	Contract Review Rate
CRRV	Contract Review rate Variation.
CTQ	**Critical to Quality** Critical To Quality (CTQ) is continuous measuring and monitoring tool agreed between the internal processes to achieve greater customer satisfaction.
Data Quality Dimensions	The totality of features and characteristics of data that bears on their ability to satisfy a given purpose
EBC	Evidence Based Cleaning
ESM	Environmental services Map
KPI	**Key Performance Indicator** A metric that is used to help manage a process, IT service or activity. Many metrics may be measured, but only the most important of these are defined as KPIs and used to actively manage and report on the process, IT service or activity. KPIs should be selected to ensure that efficiency, effectiveness, and cost effectiveness are all managed.
MSD	Macro Skeleton Disorder
OLA	**Organization level Agreement**

8 Glossary / Acronyms

	An Agreement between an IT Service Provider and another part of the same Organization
Operational Policy	Rules defined to operate the process.
PPE	Personal protection equipment.
Quality Attributes	Quality attributes are non-functional requirements used to evaluate the performance of a process.
Risk	A possible event that could cause harm or loss, or affect the ability to achieve Objectives. A risk is measured by the probability of a threat, the vulnerability of the asset to that threat, and the impact it would have if it occurred.
SLA	**Service Level Agreement** An Agreement between an IT Service Provider and a Customer. The SLA describes the IT Service, documents Service Level Targets, and specifies the responsibilities of the IT Service Provider and the Customer
VOC	Voice of Customer

Appendix A: Business Process Modeling Notation Reference



9 Appendix A: Business Process Modeling Notation Reference

INTRODUCTION

Business Process Modelling ("BPM") is the practice of documenting an organisation's key business processes in a manner which:

- is highly graphical
- focuses on business terminology rather than technical
- allows all business steps/tasks to be included, not just those which involve a computer system

Mentioned below are the various core concepts of BPMN with the relevant definition and graphic notation.

PROCESS START

All processes have to start somehow, general notation for a process models commence with the START event, is a circle.	
One can use simply the basic unmarked start event as above, or one of the different types of start event, to provide more detail as described below.	
If a process starts when some sort of message arrives, mail, email, text. Following notation can be used	**Message start** 
If a process starts by virtue of the passage of time – e.g. 1st Jan review or 4 days after the purchase order is sent, following notation can be used	**TIMER Start** 
If the process starts when a rule/condition is met – e.g. when Incident Impact is more than 100,000.	**RULE Start** 
If a process starts when another process finishes. Following notation can be used	**LINK Start** 
If there is more than one 'trigger' for a process to start. Following notation can be used	**MULTIPLE Start** 

9 Appendix A: Business Process Modeling Notation Reference

TASK AND SUB PROCESS

Task	Task is a lowest level activity in a process map. A task is used when the work is not broken down to a finer level of detail	
Sub Process	A Sub-process is a compound activity which can be broken down into finer details.	
Loops	Loops task or sub process continues to iterate until the loop condition is true.	

INTERMEDIATE EVENTS

Following notation can be used to display the intermediate event, similar to start and end events.	**BASIC**	**MESSAGE**	**TIMER**	**RULE**	**LINK**	**MULTIPLE**
						

PROCESS END

All processes have to end somehow, general notation for a process models end will be a circle with a solid line.	
One can use simply use the basic end event as above, or you can use one of the different types of end event, to provide more detail, as described below:	
If a process ends by something being sent via a message of some sort e.g., mail, email, document, following notation can be used.	**MESSAGE End**

9 Appendix A: Business Process Modeling Notation Reference

	
If the end of this process causes the start of another, following notation can be used.	**LINK End** 
If more than one consequence of the process ending, following notation can be used.	**MULTIPLE End** 

SWIM LANES

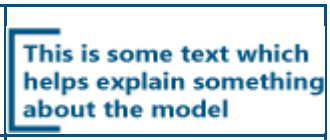
Pool	A Pool represents a participant in a Process. It is also acts as a "swimlane" and a graphical container for partitioning a set of activities from other Pools	
Lane	A Lane is a sub-partition within a Pool and will extend the entire length of the Pool, either vertically or horizontally. Lanes are used to organize and categorize activities.	

CONNECTORS

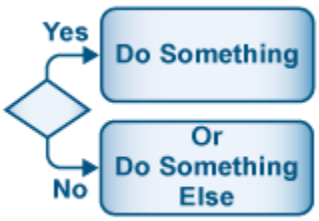
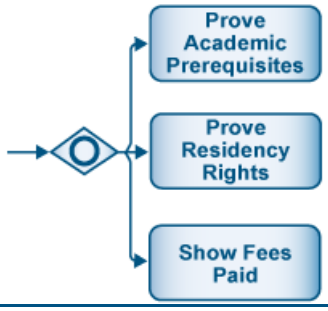
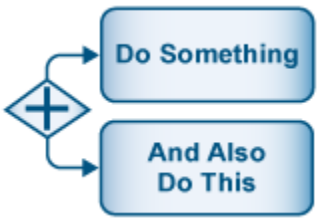
Sequence Flow	A Sequence Flow is represented by a solid line with a solid arrowhead (see the figure to the right) and is used to show the order (the sequence) that activities will be performed in a Process.	
Message Flow	A Message Flow is represented by a dashed line with an open arrowhead (see the figure to the right) and is used to show the flow of messages between two separate Process Participants. In BPMN, two separate Pools in the Diagram will represent the two Participants.	

9 Appendix A: Business Process Modeling Notation Reference

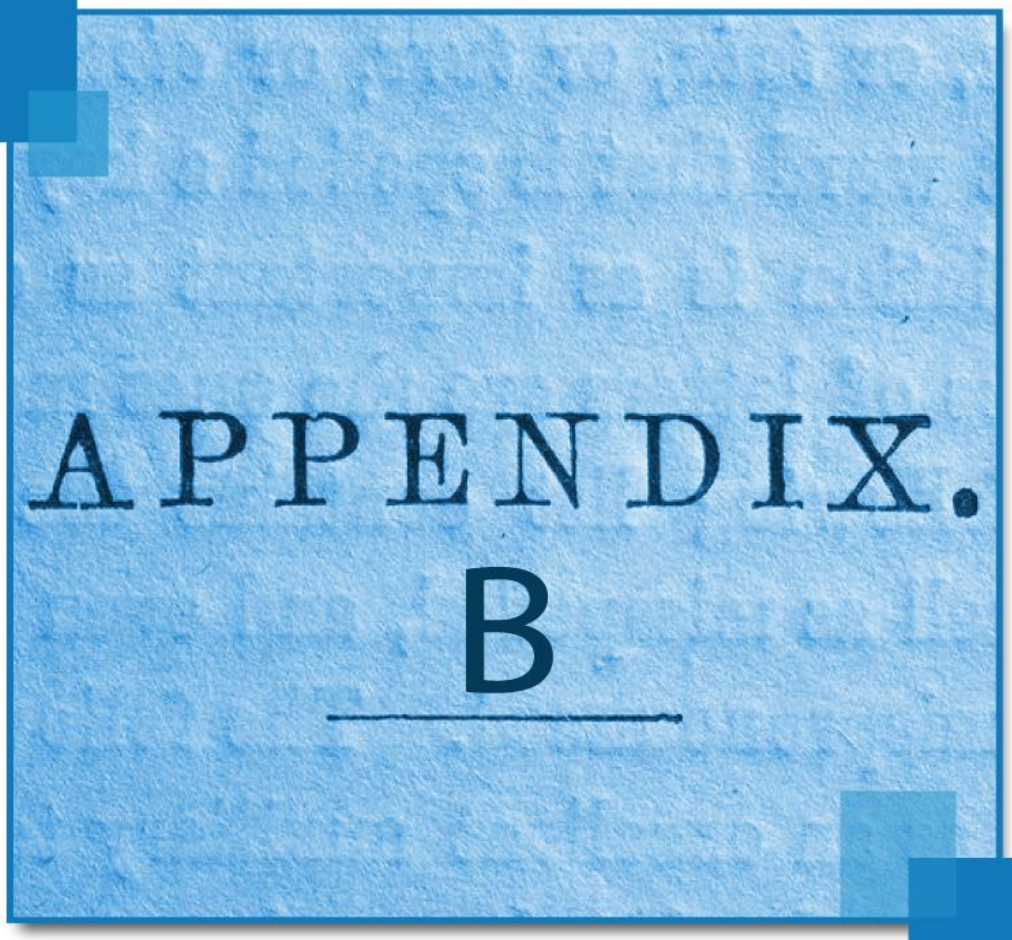
ARTIFACTS

Annotation	The ANNOTATION shape is used to add comments to a process model. It consists of text in a square left bracket	
Data Object	A data object represents a piece of data which is required or produced by the process eg. Customer details, output.	
Group	A grouping is purely for documentation or explanatory purposes. It has no impact on the model. It consists of a rectangle with dashed lines and rounded corners, usually enclosing other objects.	

GATEWAYS

Exclusive	The values of the process are examined to determine which path to take	
Inclusive	Each branch will be evaluated and will not stop when one branch condition becomes true.	
Parallel	Provides a mechanism to synchronize parallel flow and to create parallel flow.	

Appendix B: Chain of Infection



10 Appendix B: Chain of Infection

In order to control or prevent infection it is essential to understand that transmission stages of a pathogen resulting in infection requires the six vital links (Refer to the table below).

Each link mentioned below must be present for infection or colonization to proceed, and breaking any of the links can prevent the infection.

The section below details out the six stages:

Stage	Link	Description
1	Infectious Agent	Any disease-causing microorganism (pathogen)
2	The Reservoir Host	The organism in which the infectious microbes reside
3	The Portal of Exit	Route of escape of the pathogen from the reservoir.
4	The Route of Transmission	Method by which the pathogen gets from the reservoir to the new host
5	The Portal of Entry	Route through which the pathogen enters its new host
6	The Susceptible Host	The organism that accepts the pathogen

Link 1: Infectious Agent

The causative agent for infection is any microorganism capable of producing disease. Microorganisms responsible for infectious diseases include bacteria, viruses, rickettsiae, fungi, and protozoa. Sometimes, microorganisms are part of patient's own body flora and can cause infection in the immunocompromised host. These infections are called endogenous infections. Infections which are acquired from external sources are called exogenous infections.

Link 2: Reservoir Host

The second link in the chain of infection is the reservoir, i.e. the environment or object in or on which a microorganism can survive and, in some cases, multiply. Inanimate objects, human beings, and animals can all serve as reservoirs, providing the essential requirements for a microorganism to survive at specific stages in its life cycle.

Infectious reservoirs abound in health care settings, and may include everything from patients, visitors, and staff members to furniture, medical equipment, medications, food, water, and blood.

10 Appendix B: Chain of Infection

Link 3: Portal of Exit

The portal of exit is the path by which an infectious agent leaves its reservoir. Usually, this portal is the site where the microorganism grows. Common portals of exit associated with human reservoirs include the respiratory, genitourinary, and gastrointestinal tracts, the skin and mucous membranes and the placenta (transmission from mother to fetus)

Link 4: Route of Transmission

The microorganism can be acquired by inhalation (through respiratory tract), ingestion (through gastrointestinal tract), inoculation (through accidental sharp injury or bites), contact (during sexual intercourse) and transplacental transmission (microbes may cross placenta from the mother to fetus). It is important to remember that some microorganisms use more than one transmission route to get from the reservoir to a new host.

Of the six links in the chain of infection, the mode of transmission is the easiest link to break and is key to control of cross-infection in hospitals.

Link 5: The Portal of Entry

The portal of entry is the path by which an infectious agent invades a susceptible host. Usually, this path is the same as the portal of exit. For example, the portal of entry for tuberculosis and diphtheria is through the respiratory tract, hepatitis B and Human Immunodeficiency Virus enter through the bloodstream or body fluids and Salmonella enters through the gastrointestinal tract. In addition, each invasive device, e.g. intravenous line, creates an additional portal of entry into a patient's body thus increasing the chance of developing an infection.

Link 6: The Susceptible host

The final link in the chain of infection is the susceptible host. The human body has many defense mechanisms for resisting the entry and multiplication of pathogens. When these mechanisms function normally, infection does not occur. However, in immunocompromised patients, where the body defenses are weakened, infectious agents are more likely to invade the body and cause an infectious disease. In addition, the very young and the very old are at higher risk for infection because in the very young the immune system does not fully develop until about age 6 months, while old age is associated with declining immune system function as well as with chronic diseases that weaken host defenses.