



**Draft**

December 2020



# **Customer Expectation Management**



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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

## Change Control

Version:	Date:	Changes:

# Table of Contents

## Table of Contents

<b>1. PURPOSE</b>	<b>6</b>
<b>2. STRUCTURE OF THE DOCUMENT</b>	<b>8</b>
<b>3. SCOPE</b>	<b>10</b>
<b>4. GENERAL ASSUMPTIONS</b>	<b>12</b>
<b>5. CUSTOMER EXPECTATION MANAGEMENT FRAMEWORK</b>	<b>14</b>
5.1 Customer Expectation Management Interactions	15
5.2 Customer Expectation Management Process Sequence	15
5.2.1 Establish Successful customer outcomes	16
5.2.2 Establish Process Activity List	16
5.2.3 Process Diagnosis	16
5.2.4 Perform risk assessment	17
5.2.5 Develop Action Plan	17
<b>6. CUSTOMER EXPECTATION MANAGEMENT PROCESS</b>	<b>18</b>
6.1 Process Model	19
6.2 Process Specification	20
6.3 Roles and Responsibilities	23
6.4 Sub Process – Process Diagnosis	24
6.5 Sub Process – Process Diagnosis Specification	25
6.6 Sub Process – Process Diagnosis Roles and Responsibilities	28
<b>7. REFERENCE</b>	<b>29</b>
7.1 Business Rules	30
7.2 Risk	30
7.3 Quality Attribute	31
7.4 Data Quality Dimensions	32

# Table of Contents

7.5 Operation Policy .....	33
7.6 KPI .....	33
7.7 CTQ.....	34
7.8 Abstract Time-Scale .....	35
7.9 SLA Terms .....	35
7.10 Voice of Customer .....	35
7.11 Customer Context Matrix.....	39
7.12 MSD Attributes .....	40
<b>8. GLOSSARY / ACRONYMS.....</b>	<b>41</b>
<b>9. APPENDIX A: BUSINESS PROCESS MODELING NOTATION REFERENCE.....</b>	<b>44</b>
<b>10. APPENDIX B: CHAIN OF INFECTION .....</b>	<b>50</b>

# Customer Expectation Management

## Purpose



# 1 Purpose

## 1. PURPOSE

The purpose of this document is to establish a Customer Expectation Management process for Environmental Services such that customer interactions are managed to build brand equity and improve long-term profitability for environmental service department.

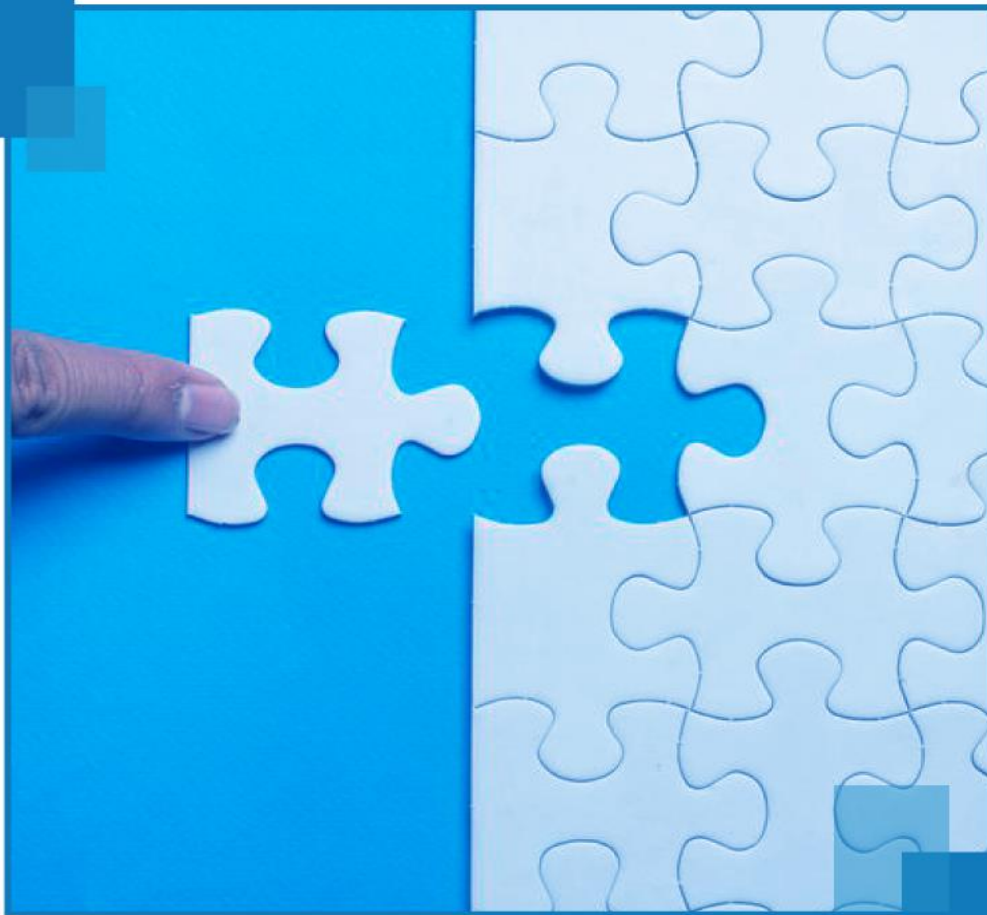
This process is based on international well acclaimed standards like:

- *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.



## Structure of the Document



## 2. STRUCTURE OF THE DOCUMENT

The Customer Expectation Management process document comprises the following chapters:

**Chapter-3:** Scope: This chapter describes the scope of the document and the Customer Expectation Management process.

**Chapter-4:** General Assumptions: This chapter describes the underlined assumptions made for both the document and Customer Expectation Management process.

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

**Chapter-6:** Customer Expectation Management Process: In this chapter Customer Expectation 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 Customer Expectation 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 Customer Expectation Management process.

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

## Scope



# 3 Scope

## 3. Scope

This process is applicable to all the environmental services customers.

## General Assumptions



## 4. GENERAL ASSUMPTIONS

The following are the general assumptions made:

- Inputs to the process are accurate.
- This process assumes that the customers are best judge on what they want and need.
- This process is supported by automated tools.
- 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.

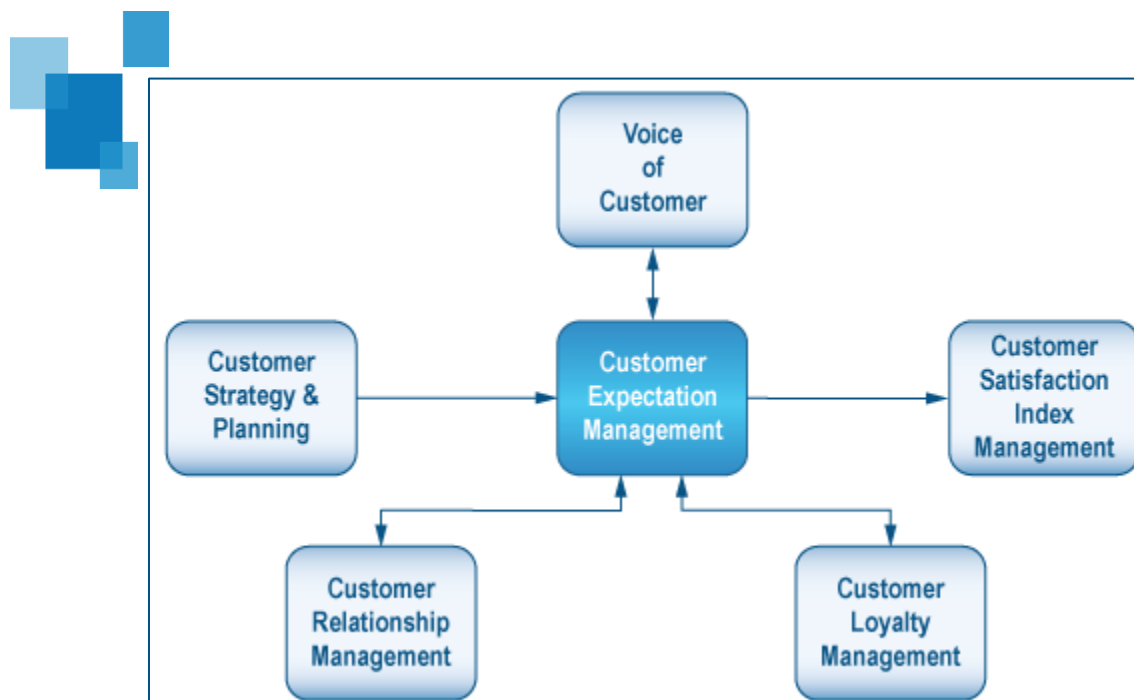
# Customer Expectation Management

## Customer Expectation Management Framework



## 5.1 Customer Expectation Management Interactions

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



## 5.2 Customer Expectation Management Process Sequence

The Customer Expectation Management process comprises of following high level sequence of activities:

1. Establishing Successful customer outcomes
2. Establish Process Activity List
3. Process Diagnosis
4. Perform risk assessment



## 5. Develop Action Plan

**Section 5.2.1 -5.2.4** describes the high level process sequence for Environmental services department Customer Expectation Management based on EMS framework. **Section 6.1** Process Model sheds more light on the flow of Customer Expectation Management process.

### 5.2.1 Establish Successful customer outcomes

This involves identifying the customer's current expectation. This process comprises of following:

- **Identification of customer base.** This involves identification of category of people who the organization plans to have as customers.
- **Identification of customer's current expectation.** This involves identification of current needs form the organization. This involves establishing expected value of current customers.
- **Identification Impact factors.** This involves establishing of success factors that would have an impact on customers' expectation. This involves establishing goals that are:
  - Specific
  - Measurable
  - Attainable
  - Relevant
  - Time bound.

### 5.2.2 Establish Process Activity List

The purpose of this process is to establish current the process flow from customer's perspective as is seen by the customer. This involves breaking the process into:

- Procedural Steps
- Activities
- Tasks.

### 5.2.3 Process Diagnosis

This involves following:

- **Identify Moments of truth**

The purpose of this process is to capture every client interaction in the current process. This involves capturing following:

- People to People

- System to People
- People to system
- System to System
- **Identify Breakpoint**  
The purpose of this process is to capture every internal interaction where work is handed off.
- **Identify Business Rules**  
This involves identification of points within a process where decisions are made. These can be of:
  - Operational
  - Strategic
  - Regulatory.Business rules control behaviour of the process
- **Identify Points of failure.**  
This involves identification of points of failure.

## 5.2.4 Perform risk assessment

This involves identification of factors which can have high risk on customers' expectation.

Risk Management can use the methodology expressed in ESM Risk Management Process. For more details please refer to the risk Management process.

## 5.2.5 Develop Action Plan

This involves identification of action plan to:

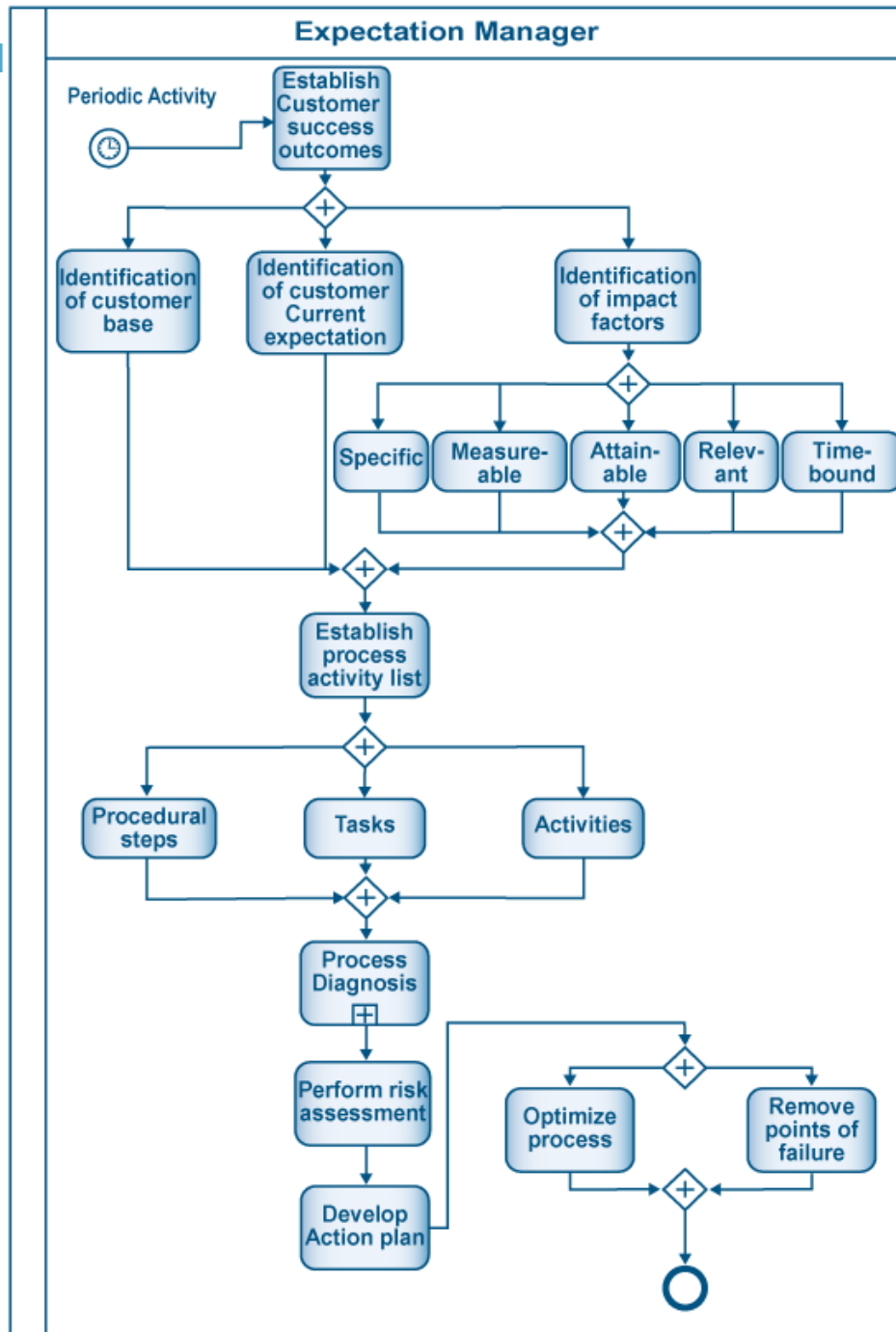
- **Remove points of failures.** To make process free from the points of failures as much as possible.
- **Optimize current process.** To improve process to be streamlined towards customer's expectation.

# Customer Expectation Management

## Customer Expectation Management Process



## 6.1 Process Model



## 6.2 Process Specification

Specification	Description
<b>Summary/Purpose</b>	The purpose of this process is to create Customer Expectation Management process for environmental services.
<b>Scope</b>	This is a Level 1 Process Specification.
<b>Primary Reference</b>	Lean Six Sigma Standard
<b>Related ESM Practices</b>	VOC management, customer satisfaction index management, customer loyalty management, customer relationship management, customer strategy & planning.
<b>Related Business Driver</b>	Customer retention
<b>Related Operational Policies</b>	OP-001, OP-002 (Ref. 7.5)
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Inputs to the process are accurate.</li> <li>Top level management commitment exists.</li> </ul>
<b>Voice of Customer</b>	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)
<b>Customer Satisfaction Measure</b>	Customer satisfaction index
<b>COI Correlation</b>	None
<b>Raw Materials</b>	None
<b>Equipment &amp; Accessories</b>	Automated System for Customer Expectation Management.

## 6

# Customer Expectation Management Process

<b>MSD Management</b>	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)						
<b>EBC Procedures</b>	None						
<b>Timing Dimensions</b>	<table border="1"> <thead> <tr> <th>Type</th> <th>Normal</th> </tr> </thead> <tbody> <tr> <td>Average</td> <td>30 min</td> </tr> <tr> <td>Std</td> <td>12 min</td> </tr> </tbody> </table>	Type	Normal	Average	30 min	Std	12 min
Type	Normal						
Average	30 min						
Std	12 min						
<b>Trigger</b>	<ul style="list-style-type: none"> <li>Periodic activity (regular)</li> </ul>						
<b>Basic Course of Event</b>	<p><b>Customer Expectation Management</b></p> <ol style="list-style-type: none"> <li>Expectation Manager establishes customer success outcomes (identification of customer base, identification of customer current expectation, identification of impact factors ( specific, measureable, attainable, relevant, time bound)</li> <li>Expectation Manager establishes process activity list (procedural steps, tasks, activities)</li> <li>Expectation Manager performs process diagnosis</li> <li>Expectation Manager performs risk assessment</li> <li>Expectation Manager develops action plan (optimizes process, and removes points of failure)</li> <li>End</li> </ol>						
<b>Alternative Path</b>	None						
<b>Exception Path</b>	<p><b>System Down</b></p> <ol style="list-style-type: none"> <li>Keep paper track until system is up and running</li> <li>Update the System and clear all logs.</li> <li>End.</li> </ol>						
<b>Extension points</b>	Customer satisfaction index management,						
<b>Preconditions</b>	Adequate resources are available to the process.						
<b>Post -conditions</b>	Customer Expectation Management process is established.						

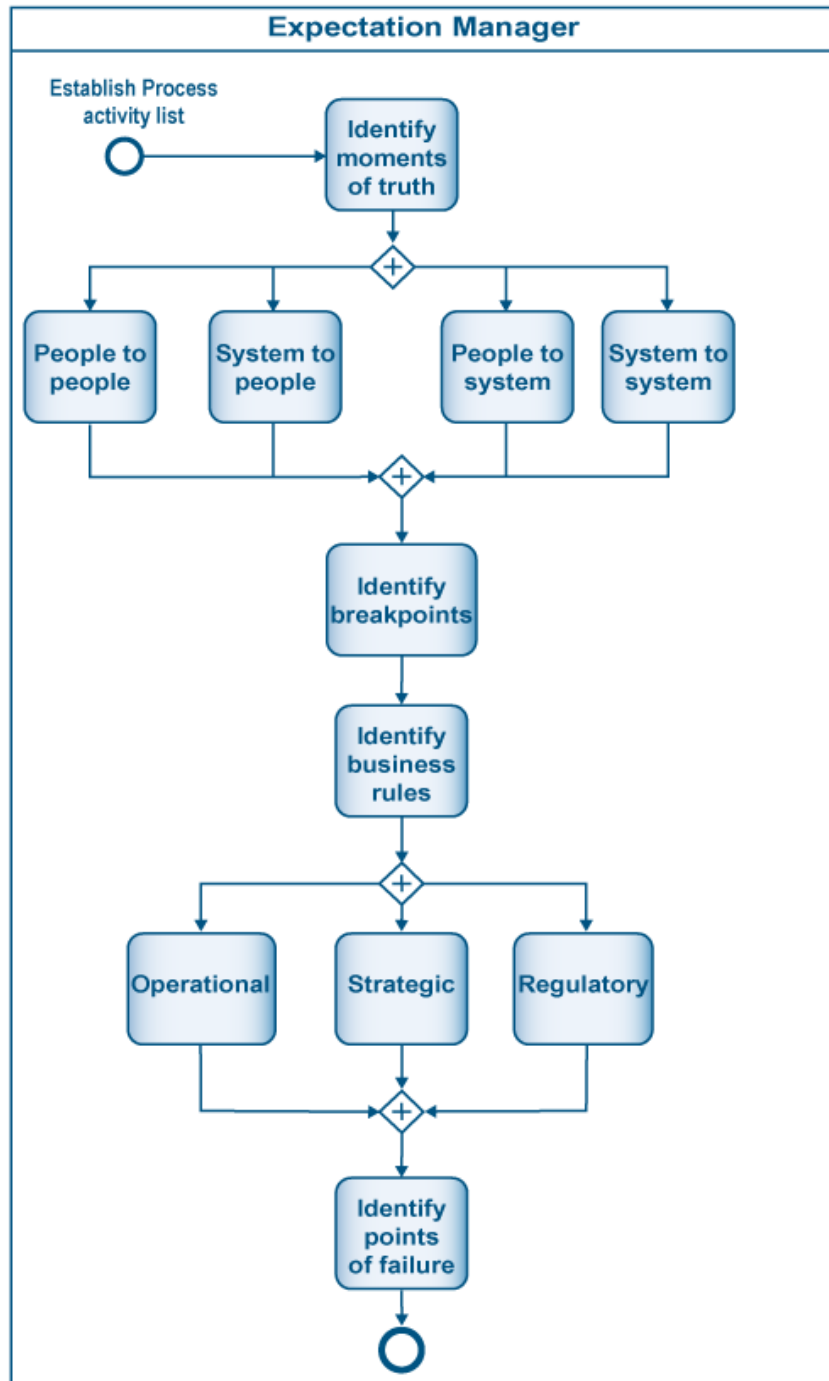
<b>Related Business Rules</b>	BR-001, BR-002 (Ref 7.1)
<b>Related Risks</b>	RR-001, RR-002, (Ref. 7.2)
<b>Related Quality Attributes</b>	Reliability, Availability, Accountability, Performance, Auditability (Ref 7.3)
<b>Related Data Quality Dimensions</b>	Accuracy, Reputation, Objectivity, free of error, Relevance, completeness, timeliness (Ref 7.4)
<b>Related Primary SLA Terms</b>	(Ref 7.9)
<b>Related KPIs</b>	BUR, MTR(Ref 7.6)
<b>Related CTQs</b>	BURV, MTRV, MOM, PWOM, CTQ, IOM, TOM, WRM, DRM (Ref 7.7)
<b>Actors/Agents</b>	Customer expectation Manager
<b>Delegation</b>	<p><u>Delegation Rule -1: Loyalty Manager Not Available</u></p> <ol style="list-style-type: none"> <li>1. Delegate the task to the agent with same role</li> <li>2. Update the task</li> <li>3. Log the delegation</li> </ol> <p><u>Delegation Rule -2: Loyalty Manager Overloaded</u></p> <ol style="list-style-type: none"> <li>1. Delegate the task to the agent with same Role</li> <li>2. Update the task</li> <li>3. Log the delegation</li> </ol>
<b>Escalation</b>	<p><u>Rule 1: Performance, operational legal Issues</u></p> <ol style="list-style-type: none"> <li>1. Escalate to environmental services department head.</li> <li>2. Log Escalation</li> </ol>
<b>Process Map</b>	5.1
<b>Process Model</b>	6.1
<b>Other References</b>	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

## 6.3 Roles and Responsibilities

Roles	Responsibilities
<b>Customer Expectation Manager</b>	<ul style="list-style-type: none"><li>• Expectation Manager establishes customer success outcomes (identification of customer base, identification of customer current expectation, identification of impact factors)</li><li>• Expectation Manager establishes process activity list (procedural steps, tasks, activities)</li><li>• Expectation Manager performs process diagnosis</li><li>• Expectation Manager performs risk assessment</li><li>• Expectation Manager develops action plan (optimizes process, and removes points of failure)</li></ul>



## 6.4 Sub Process – Process Diagnosis



## 6.5 Sub Process – Process Diagnosis Specification

Specification	Description
<b>Summary/Purpose</b>	The purpose of this process is to perform diagnosis of the customer expectation process.
<b>Scope</b>	This is a Level 2 Process Specification.
<b>Primary Reference</b>	Lean Six Sigma standard
<b>Related ESM Practices</b>	VOC management, customer satisfaction index management, Loyalty management, customer relationship management, customer strategy & planning.
<b>Related Business Driver</b>	Customer retention.
<b>Related Operational Policies</b>	OP-002 (Ref. 7.5)
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Inputs to the process are accurate.</li> <li>Top level management commitment exists.</li> </ul>
<b>Voice of Customer</b>	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)
<b>Customer Satisfaction Measure</b>	Customer satisfaction index
<b>COI Correlation</b>	None
<b>Raw Materials</b>	None
<b>Equipment &amp; Accessories</b>	Automated System for Customer Expectation Management.

<b>MSD Management</b>	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)						
<b>EBC Procedures</b>	None						
<b>Timing Dimensions</b>	<table border="1"> <thead> <tr> <th>Type</th> <th>Normal</th> </tr> </thead> <tbody> <tr> <td>Average</td> <td>30 min</td> </tr> <tr> <td>Std</td> <td>12 min</td> </tr> </tbody> </table>	Type	Normal	Average	30 min	Std	12 min
Type	Normal						
Average	30 min						
Std	12 min						
<b>Trigger</b>	<ul style="list-style-type: none"> <li>Establish process activity list</li> </ul>						
<b>Basic Course of Event</b>	<p><b>Customer Risk Analysis</b></p> <ol style="list-style-type: none"> <li>Expectation Manager identifies moments of truth (people to people, system to people, people to system, system to system)</li> <li>Expectation manager identifies breakpoints</li> <li>Expectation manager identifies business rules (operational, strategic, regulatory)</li> <li>Expectation Manager identifies points of failure.</li> <li>End</li> </ol>						
<b>Alternative Path</b>	None						
<b>Exception Path</b>	<p><b>System Down</b></p> <ol style="list-style-type: none"> <li>Keep paper track until system is up and running</li> <li>Update the System and clear all logs.</li> <li>End.</li> </ol>						
<b>Extension points</b>	Perform risk assessment.						
<b>Preconditions</b>	Customer information gathering is accurate.						
<b>Post -conditions</b>	Moments of truth and breakpoints and business rules are identified.						
<b>Related Business Rules</b>	BR-002 (Ref 7.1)						
<b>Related Risks</b>	RR-002(Ref. 7.2)						

<b>Related Quality Attributes</b>	Reliability, Accountability, Performance, Auditability, Extensibility (Ref 7.3)
<b>Related Data Quality Dimensions</b>	Accuracy, Reputation, Objectivity, free of error, Relevance, completeness, , Value added, Believability (Ref 7.4)
<b>Related Primary SLA Terms</b>	(Ref 7.9)
<b>Related KPIs</b>	BUR, MTR (Ref 7.6)
<b>Related CTQs</b>	BURV, MTRV (Ref 7.7)
<b>Actors/Agents</b>	Expectation Manager
<b>Delegation</b>	<p><u>Delegation Rule -1: Loyalty Manager Not Available</u></p> <ol style="list-style-type: none"> <li>1. Delegate the task to the agent with same role</li> <li>2. Update the task</li> <li>3. Log the delegation</li> </ol> <p><u>Delegation Rule -2: Loyalty Manager Overloaded</u></p> <ol style="list-style-type: none"> <li>1. Delegate the task to the agent with same Role</li> <li>2. Update the task</li> <li>3. Log the delegation</li> </ol>
<b>Escalation</b>	<p><u>Rule 1: Performance, operational legal Issues</u></p> <ol style="list-style-type: none"> <li>1. Escalate to environmental services department head.</li> <li>2. Log Escalation</li> </ol>
<b>Process Map</b>	5.1
<b>Process Model</b>	6.4
<b>Other References</b>	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

## 6.6 Sub Process – Process Diagnosis Roles and Responsibilities

Roles	Responsibilities
<b>Customer Expectation Manager</b>	<ul style="list-style-type: none"><li>• Expectation Manager identifies moments of truth (people to people, system to people, people to system, system to system)</li><li>• Expectation manager identifies breakpoints</li><li>• Expectation manager identifies business rules (operational, strategic, regulatory)</li><li>• Expectation Manager identifies points of failure.</li></ul>

## Reference



# 7 Reference

This chapter serves as a prime reference to Chapter 6 and presents the details supporting Chapter 6 in tabular formats. This chapter consists of various variable values which would frequently evolve or change as organization's Environmental Services' Customer Expectation Management process matures or changes.

At minimal this document can be updated biannually. However, if need arises this document may be updated earlier than its prescribed revision period.

## 7.1 Business Rules

BR ID	Description	Context	Rule	Source
BR-001	Customer expectation process would take into consideration voice of customer	Business	NA	NA
BR-002	All the points of failures would be addressed.	Business	NA	NA

## 7.2 Risk

Risk ID	Description	Source	Severity Level	Status	Resolution
RR-001	The risk analysis results are not accurate.	NA	High	NA	Strict tools and techniques should be employed to ensure that the quality of analysis remain excellent.
RR-002	Inappropriate monitoring of customer expectation.	NA	Medium	NA	Automated performance Monitoring should be enforced so get desired results.

### 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



# 7 Reference

QA-017	Adaptability	TBD
QA-018	Testability	TBD
QA-019	Auditability	TBD
QA-020	Operability and Deployability	TBD

## 7.4 Data Quality Dimensions

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

# 7 Reference

DQ-012	Interpretability	TBD
DQ-013	Concise Representation	TBD

## 7.5 Operation Policy

Policy ID	Description	Context	Importance (1-5)
OP-001	Risk assessment results should be highlighted to senior management	TBD	TBD
OP-002	Automated tools would be used wherever possible to ensure quality of data.	TBD	TBD

## 7.6 KPI

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard threshold
Break up rate	BUR	Number of breakup per process	NA	TBD	TBD	TBD
Moments of truth rate	MTR	Number of moments of truth per processt	NA	TBD	TBD	TBD

## 7.7 CTQ

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard Threshold
Break up rate variation	<b>BURV</b>	Standard deviation of BUR	NA	TBD	TBD	TBD
Moments of truth rate variation	<b>MTRV</b>	Standard deviation of MTR	NA	TBD	TBD	TBD
Motion Optimization Measure	<b>MOM</b>	Management of motion optimization measure	NA	TBD	TBD	TBD
Paper work Optimization Measure	<b>PWOM</b>	Management of Paper work Optimization Measure	NA	TBD	TBD	TBD
Correction reduction measure	<b>CRM</b>	Management of Correction reduction measure	NA	TBD	TBD	TBD
Inventory Optimization Measure	<b>IOM</b>	Management of Inventory Optimization Measure	NA	TBD	TBD	TBD
Transportation Optimization Measure	<b>TOM</b>	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

## 7.9 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	The environment should be attributing with great hygiene level.	<ul style="list-style-type: none"> <li>• High quality healthcare services</li> <li>• Safe environment</li> <li>• Low infection rate</li> <li>• Low risk</li> </ul>

	Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker.		
<b>High and Consistent Quality of standards</b>	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.	<ul style="list-style-type: none"> <li>• Reputation of organization or hospital</li> <li>• Professionalism</li> <li>• Trust</li> <li>• Positive psychological bias</li> </ul>
<b>Free of Infections</b>	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.	<ul style="list-style-type: none"> <li>• Safe environment</li> <li>• Reputation of hospital or organization</li> <li>• Trust</li> <li>• Quick healing</li> <li>• Positive psychological bias</li> <li>• Low risk</li> </ul>
<b>Timely Services</b>	Doctors, Patients, Nurses, Housekeeping Supervisors, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance	The response time for any request should be very short.	<ul style="list-style-type: none"> <li>• Professionalism</li> <li>• Trust</li> <li>• Positive psychological bias</li> <li>• Reputation of hospital or organization</li> <li>• Safe environment</li> </ul>

	worker, Waste management worker, Housekeepers		
<b>High Coordinating</b>	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.	<ul style="list-style-type: none"> <li>• Professionalism</li> <li>• Trust</li> <li>• Low risk</li> <li>• Excellent Ergonomic</li> </ul>
<b>Remove Waste</b>	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.	<ul style="list-style-type: none"> <li>• Safe environment</li> <li>• Low infection rate</li> <li>• Low risk</li> <li>• Reputation of hospital or organization</li> <li>• Low cost</li> <li>• Timely response</li> <li>• High quality</li> </ul>
<b>Excellent Ergonomic</b>	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.	<ul style="list-style-type: none"> <li>• Professionalism</li> <li>• Trust</li> <li>• Job accuracy</li> <li>• Excellent communication</li> <li>• Low risk</li> <li>• Reputation of hospital or organization</li> </ul>

<b>Safety</b>	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.	<ul style="list-style-type: none"> <li>• Safe environment</li> <li>• Professionalism</li> <li>• Low risk</li> </ul>
<b>Appearance</b>	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.	<ul style="list-style-type: none"> <li>• Professionalism</li> <li>• Reputation of hospital or organization</li> <li>• Trust</li> <li>• Positive psychological bias</li> </ul>
<b>Excellent Worker Attitude</b>	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.	<ul style="list-style-type: none"> <li>• Professionalism</li> <li>• Reputation of hospital or organization</li> <li>• Trust</li> <li>• Positive psychological bias</li> <li>• Minimum disputes</li> <li>• Less employee turn over</li> </ul>

## 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
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## 7.12 MSD Attributes

MSD Attribute	Description
<b>Lifting/carrying</b>	Large vertical movements, long carry distances.
<b>Disability</b>	Pose a risk to those with a health problem or a physical or learning disability.
<b>Force</b>	High initial forces to get the load moving.
<b>Loaded motion</b>	High forces to keep the load in motion.
<b>Physical ergonomics</b>	Constraints on body posture/positioning, confined spaces/narrow doorways.
<b>Posture change</b>	Strong force and awkward movement/posture. E.g. bent wrists.
<b>Excessive force</b>	Excessive force to grip raw materials, product or tools
<b>Scarceness</b>	Inadequate tools for repetitive use screwdrivers, pliers, hammers.
<b>Noise</b>	Noise which cause stress and muscle tension.
<b>Concentration</b>	Tasks require high levels of attention/concentration especially where the worker has little control over allocation of effort to the task.
<b>Floor hazards</b>	Remove slip and trip hazards through provision of appropriate floor surfaces and good keeping.
<b>Clothing</b>	Clothing/PPE may prevent sufficient movement for the task or reduce capability. E.g. to grip consider handling needs when selecting work wear/gloves.
<b>Psychosocial factors</b>	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



**GLOSSARY**

Terminology	Description
<b>Abstract Time Scale</b>	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.
<b>BPMN</b>	<b>Business Process Modelling Notation</b> Business Process Modelling Notation is the practice of documenting an organisation's key business processes in a graphical format.
<b>Business Rules</b>	Business Rules are intended to assert business structure or to control or influence the behaviour of the Business. Business rules describe the operations, definitions and constraints that apply to an organization
<b>CRR</b>	Contract Review Rate
<b>CRRV</b>	Contract Review rate Variation.
<b>CTQ</b>	<b>Critical to Quality</b> Critical To Quality (CTQ) is continuous measuring and monitoring tool agreed between the internal processes to achieve greater customer satisfaction.
<b>COI</b>	Chain of infection
<b>Data Quality Dimensions</b>	The totality of features and characteristics of data that bears on their ability to satisfy a given purpose
<b>EBC</b>	Evidence Based Cleaning
<b>ESM</b>	Environmental services Map
<b>KPI</b>	<b>Key Performance Indicator</b> 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.
<b>MSD</b>	Macro Skeleton Disorder

<b>OLA</b>	<b>Organization level Agreement</b> An Agreement between an IT Service Provider and another part of the same Organization
<b>Operational Policy</b>	Rules defined to operate the process.
<b>Quality Attributes</b>	Quality attributes are non-functional requirements used to evaluate the performance of a process.
<b>Risk</b>	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.
<b>SLA</b>	<b>Service Level Agreement</b> 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
<b>VOC</b>	<b>Voice of Customer</b>



## Appendix A: Business Process Modeling Notation Reference



APPENDIX.  
A









## 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 <i>basic unmarked</i> 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	<b>Message start</b> 
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	<b>TIMER Start</b> 
If the process starts when a rule/condition is met – e.g. when Incident Impact is more than 100,000.	<b>RULE Start</b> 
If a process starts when another process finishes. Following notation can be used	<b>LINK Start</b> 
If there is more than one ‘trigger’ for a process to start. Following notation can be used	<b>MULTIPLE Start</b> 



## TASK AND SUB PROCESS



<b>Task</b>	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	
<b>Sub Process</b>	A Sub-process is a compound activity which can be broken down into finer details.	
<b>Loops</b>	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.						
	<b>BASIC</b>	<b>MESSAGE</b>	<b>TIMER</b>	<b>RULE</b>	<b>LINK</b>	<b>MULTIPLE</b>
						

## 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 <i>basic</i> 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 

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 

## SWIMLANES

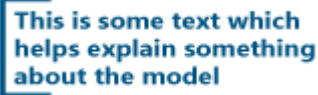


<b>Pool</b>	A <i>Pool</i> represents a participant in a Process. It is also acts as a “swimlane” and a graphical container for partitioning a set of activities from other Pools	
<b>Lane</b>	A <i>Lane</i> is a sub-partition within a Pool and will extend the entire length of the Pool, either vertically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

## CONNECTORS

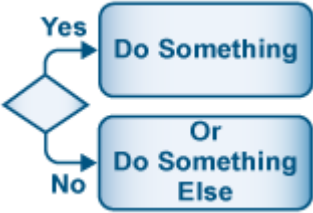
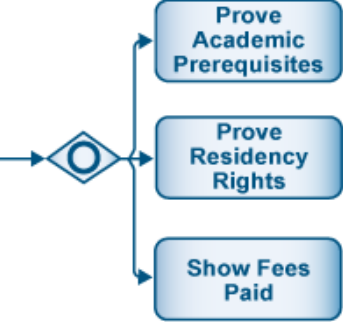
<b>Sequence Flow</b>	A <i>Sequence Flow</i> is represented by a solid line with a solid arrowhead (see the figure to the right) and is used to show the order (the sequence) that activities will be performed in a Process.	
<b>Message Flow</b>	A <i>Message Flow</i> is represented by a dashed line with 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.	




## ARTIFACTS

<b>Annotation</b>	The ANNOTATION shape is used to add comments to a process model. It consists of text in a square left bracket	
<b>Data Object</b>	A data object represents a piece of data which is required or produced by the process eg. Customer details, output.	
<b>Group</b>	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

<b>Exclusive</b>	The values of the process are examined to determine which path to take	
<b>Inclusive</b>	Each branch will be evaluated and will not stop when one branch condition becomes true.	

<b>Parallel</b>	Provides a mechanism to synchronise parallel flow and to create parallel flow.	 A diamond-shaped gateway symbol containing a plus sign (+). Two arrows originate from the right side of the diamond, pointing to two rounded rectangular task boxes. The top box is labeled "Do Something" and the bottom box is labeled "And Also Do This".
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## Appendix B: Chain of Infection



APPENDIX.  
B

# 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.

## **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.