Service Quality Management

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HEALTHCARE ENVIRONMENTAL SERVICES
HESAS
AUTOMATION SOICETY

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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:

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1 Service Quality Management

Purpose

1 Purpose

1. PURPOSE

The purpose of this document is to ensure that Environmental Services' department's service quality is well managed, and any short comings if identified are rectified in an effective way.

The principle goals of this document are as:

- Minimization of HIA
- Optimization of timeliness
- Efficient customer service.
- Effective budget management.

This document would establish an efficient Service Quality Management process 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 Service Quality Management

Structure of the Document

2 Structure of the Document

2. STRUCTURE OF THE DOCUMENT

The Service Quality Management process document comprises the following chapters:

Chapter–3: *Scope*: This chapter describes the scope of the document and the Service Quality Management.

Chapter–4: *General Assumptions*: This chapter describes the underlined assumptions made for both the document and Service Quality Managementprocess.

Chapter–5: *Service Quality Management Framework*: This chapter exhibits the interaction of Service Quality Managementprocess with other related processes.

Chapter–6: *Service Quality Management Process*: In this chapter Service Quality Managementprocess 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 Service Quality Managementprocess 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 Service Quality Management process.

3 Service Quality Management

Scope

3 Scope

3. SCOPE

This process is applicable to all the service of Environmental Services Department.

4 Service Quality Management

General Assumptions

4 General Assumptions

4. GENERAL ASSUMPTIONS

Following are the general assumptions made for this process:

- Automated Service quality monitoring capacity exists.
- Senior Management is committed towards quality of services.
- The roles defined in all processes within this document can be attached to the existing position e.g. marketing Manager Role can be attached to Sales Manager.
- Any activity related assumptions are explicitly identified in related Process Specification table in Chapter 6.

5

Service Quality Management

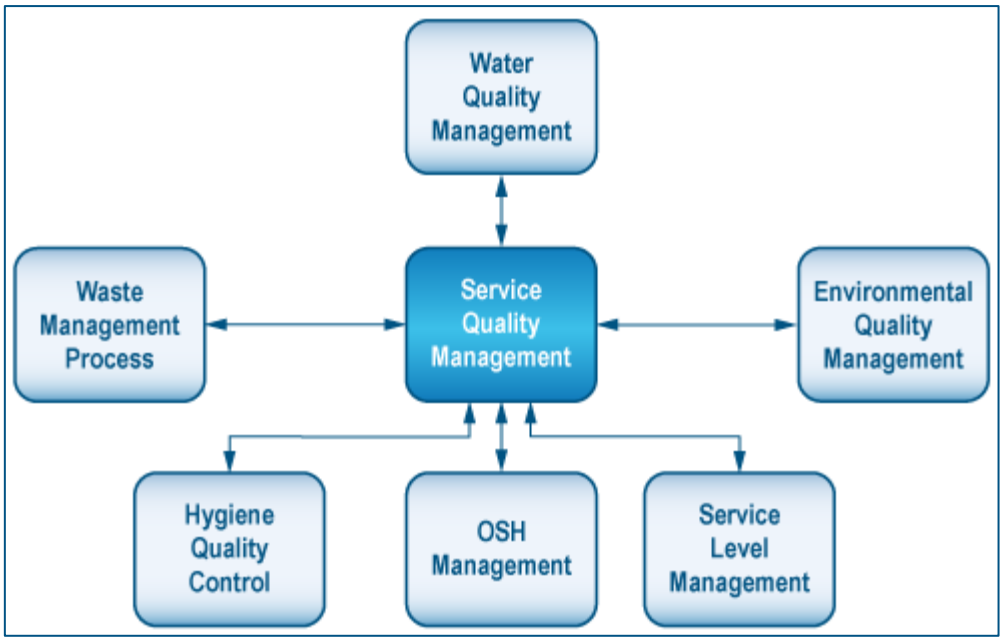
Service Quality Management Framework

5 Service Quality Management Framework

5.1 Service Quality Management Interactions

The following depiction shows the points of interaction of Service Quality Management process with other related processes/ entities. The arrows moving into Service Quality Management process signifies the inputs from the other processes/ entity to Service Quality Management Process, and the arrows moving out of the Service Quality Management process signify the inputs from Service Quality Management process to other related processes.

The following depiction shows the points of interaction of organization's Risk Management Integration process with other related enterprise processes. All the processes depicted below are defined in their own respective dedicated documents.



5 Service Quality Management Framework

5.2 Service Quality Management Process Sequence

The Service Quality Management process comprises of following high level sequence of processes:

1. **Establish seven plus three model**
2. **Perform environmental sampling.**
3. **Monitor Service Quality**
4. **Service Performance Degradation report**
5. **Track and Manage service quality performance resolution**

Service Quality Management process follows sequential steps mentioned below (**Section 5.2.1-5.2.3**). **Section 6.1** Process Model sheds more light on the flow of this process.

5.2.1 Establish seven plus three waste model

This step involves minimization of wastes. Wastes can lead to variation which can lead to quality degradation. Following are the various wastes that this quality process would effectively control.

- **Inventory**. Unneeded stocks and supplies lead to most costs in terms of space occupation and supplies expiration concerns. The best method to deal with this is to enforce JIT inventory (Just in time inventory).
- **Motion**. This refers to unorganized movement (spaghetti motion) of staff and information can lead to budget over runs.
- **Over production**. This refers to unnecessarily over working or over doing of things which results into over budgeting. For example over cleaning of rooms, beyond the required baseline would result into over budgeting.
- **Over processing**. This refers to the tendency of over complicating things that what is required e.g., filling out extra paperwork by patient.
- **Transportation**. Unnecessary movement of patient or equipment (round traffic) would be result into fatigue for the employees and also waste their precious time.
- **Rework/ Correction**. Paperwork, medical errors would result into reworking time which would affect the overall variation (sigma) and deter the quality.
- **Idle time.** This refers to the time spend in waiting for critical resource for the process, without which the process can't proceed. For example, time spend in waiting for arrival of cleaning supplies would result into idle time.
- **Knowledge.** This refers to knowledge being wasted when fully trained employees leave the organization. Studies show that a certified nurse can cause a monetary loss of 80K dollar to the hospital. Knowledge wastage can be avoided by establishing closed loop knowledge management process.

Please refer to EMS knowledge management process for more details.

- **Materials**. This refers management of materials in a prescribed manner so that there is no loss of material. For example, for preparation of disinfectant solution right proportion of 5H should be used, anything lesser or more would be wastage.
- **Equipment.** This refers management of equipment in best possible manner, such that the wastage that can result because of the equipment is controlled. This involves not using the equipment which does not provide quality results, ensuring that the equipment is fit for use.

5.2.2 Establishing Six Sigma Approach

Six sigma main objective is to reduce minimize variation. Following are the various activities for six sigma quality program.

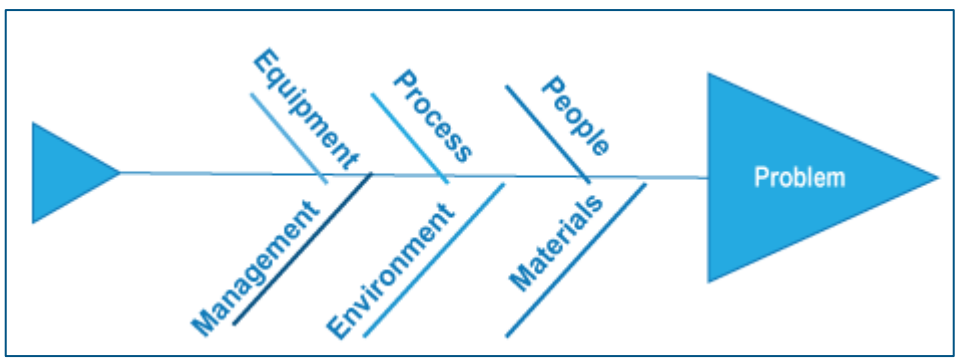
- **Define.**
  - **Goal establishment**. This comprises of establishing and defining target to achieve. For example, reduction in HIA by 25%. Reduction of cleaning process's standard deviation from 5 to 3.
  - **Establish tasks**. This involves setting up of task:
    - Implicit task. Implicit task which can be accomplished via automation.
    - Explicit task. Explicit tasks which require human intervention.
- **Measure**.

  This refers to the collection of data and measuring techniques. This involves following:
  - **Identification of parameters**. This involves identification of :
    - **Population.** The actual target audience of the data collection.
    - **Sampling.** The sample representation of the population.
    - **Hypothesis.** Test to ensure that the sample selected is actual representation of the population.
    - **Sample size.** The optimal sample size to establish purposeful results
  - **Data collection.** This comprises of following:
    - **Instantaneous data collection.** This refers to a conditions where by certain events can result into instantaneous data collection, for example a patient profile shows TB, would be an instantaneous data source rather than identification of microbes in the environmental conditions
    - **Implicit plan.** This refers to the computer generated automated plan.
    - **Explicit plan.** This refers to the whereby data collection is done for certain situations such as virus outbreaks and requires human intervention.

- **Sampling techniques.**
  This comprise of following:
  - **Simple random sampling**
    In a simple random sample ('SRS') of a given size, all such subsets of the frame are given an equal probability. Each element of the frame thus has an equal probability of selection: the frame is not subdivided or partitioned
  - **Systematic sampling**
    Systematic sampling relies on arranging the target population according to some ordering scheme and then selecting elements at regular intervals through that ordered list.
  - **Stratified sampling**
    Where the population embraces a number of distinct categories, the frame can be organized by these categories into separate "strata." Each stratum is then sampled as an independent sub-population, out of which individual elements can be randomly selected
  - **Line-intercept sampling**
    Line-intercept sampling is a method of sampling elements in a region whereby an element is sampled if a chosen line segment, called a "transect", intersects the element.

- **Analyze Phase**
  In the Analyze phase, information gathered in the Measure phase, is analyzed to pinpoints the root cause, and identify improvement opportunities where non-value-add tasks can be removed. Following are various methods to do so:
  - **Ishikawa Diagram.** This method can be useful in helping identify where something may be going wrong, or be improved. Such a diagram is typically the outcome of a brainstorming session where problem solvers can offer suggestions. The main goal is represented by the trunk of the diagram, and primary factors are represented as branches. Secondary factors are then added as stems, and so on. Creating the diagram stimulates discussion and often leads to increased understanding of a complex problem.
    Causes are usually grouped into major categories to identify the sources of problem. The categories typically include:
    - **People**: Anyone involved with the process
    - **Process**: How the process is performed and the specific requirements for doing it, such as policies, procedures, rules, regulations and laws
    - **Equipment**: Any equipment, computers, tools etc. required to accomplish the job

- **Materials**: Raw materials, parts, pens, paper, etc. used to produce the final product
- **Management**: Management related issues, decisions.
- **Environment**: The conditions, such as location, time, temperature, and culture in which the process operates.



- **Pareto Analysis.** This is a technique for separating important potential causes from more trivial issues. The following steps should be taken:
  - Form a table listing the causes and their frequency as a percentage.
  - Arrange the rows in the decreasing order of importance of the causes, i.e. the most important cause first.
  - Add a cumulative percentage column to the table

  Pareto Analysis signifies 80-20 rule, meaning that by doing 20% of work, 80% of the advantage of doing the entire job can be generated. Or in terms of Problem Management, a large majority of problems (80%) are produced by a few key causes (20%).This technique helps to identify the top 20% of causes that needs to be addressed to resolve the 80% of the problems. Once the top 20% of the causes are identified, then tools like the Ishikawa diagram or Fish-bone Analysis to be used to identify the root causes of the problems.
- **Root cause Analysis tree.**
  Root cause analysis tree is a structured evaluation method that identifies the root causes for an undesired outcome and the actions adequate to prevent recurrence. Root cause tree analysis continues until organizational factors have been identified, or until data are exhausted. Root cause tree analysis enables organization to make informed decisions and also serve as a mean to implement close loop knowledge

management in the organization. The root cause analysis can be utilized by any employee irrespective of his background and skill level to rectify a problem.

- **Improve Phase.**
  The Improve phase is when findings are implemented, workflows are streamlined
- **Control Phase.**
  This involves implementing monitoring and sustaining procedures to facilitate over all improvisation.

5.2.3 Perform environmental Sampling

Quality-assurance sampling can be used for sampling environment during major construction periods or newly constructed space in special care areas or assessing a change in housekeeping practice.

Environmental sampling comprises of following:

- **Air Sampling.**
  This comprises of following:
  - **Identification of factors effecting air quality**. This comprises of following factors:
    - Indoor traffic
    - Visitors entering
    - Temperature
    - Time of day or year
    - Relative humidity
    - Relative concentration of particles or organisms, and
    - The performance of the air-handling system component
  - **Determining the characteristics of aerosol.** This involves determining the conditions such as:
    - Size range of particles
    - Relative amount of inert material
    - Concentration of microorganisms
  - **Identifying survival factors for microorganism.** This comprises of identification of following factors:
    - The suspending medium,
    - Temperature
    - Relative humidity
    - Oxygen sensitivity, and
    - Exposure to UV or electromagnetic radiation

- **Establish Sampling strategy.** This involves establishing:
  - **Identify Sampling pre-requisites**. This involves identification of the sampling pre-requisites such as:
    - Selection of the laboratory what would provide proper microbiologic support.
    - Ensure refrigeration.
    - Ensure availability of supplies and equipment.
  - **Identify sampling method.** This involves selection of the most applicable Sampling method from the following:
    - Impingement in liquids
    - Impaction on solid surfaces
    - Sedimentation
    - Filtration
    - Centrifugation
    - Electrostatic precipitation
    - Thermal precipitation.
  - **Identify Type of sampling instruments.** This involves selection of the proper sampling instrument based on following criteria:
    - Type of the organism to be sampled
    - Compatibility with the selected method of analysis
    - Sensitivity of particles to sampling
    - Particle size
    - Volume of air to be sampled
    - Length of time sampler is to be continuously operated
    - Background contamination
    - Sampler collection efficiency
    - Effort and skill required to operate sampler
    - Availability
    - Cost of sampler
  - **Sampling time**
  - **Duration of the sampling program.**
  - **Determine the number of samples to be taken.**

5 Service Quality Management Framework

Section below provides more information of Air sampling methods and equipment examples.

Method	Principle	Suitable for measuring	Collection media or surface	Rate of collecti on	Auxilliary equipment needed+	Points to consider	Prototype samplers
Impingement in liquids	Air drawn through a small jet and directed against a liquid surface	Viable organisms, and concentration over time. Example use: sampling water aerosols to Legionella spp.	Buffered gelatin, tryptose saline, peptone, nutrient broth	12.5	**Yes**	Antifoaming agent may be needed. Ambient temperature and humidity will influence length of collection time	Chemical Corps. All Glass Impinger
Impaction on solid surfaces	Air drawn into the sampler; particles deposited on dry surfaces	Viable particles; viable organisms (on non-nutrient surfaces, limited to organisms that resist drying and spores); size measurement and concentration	Dry surface, coated surfaces, and agar	28 (sieve) 30–800 (slit)	**Yes**	Available as sieve impactors or slit impactors. Sieve impactors can be set up to measure particle size. Slit impactors have a rotating	Andersen Air Sampler (sieve impactor); TDL, Cassella MK-2 (slit impactors)

		over time. Example use: sampling air for Aspergillus spp., fungal spores				support stage for agar plates to allow for measurement of concentration over time.	
Sedimentation	Particles and microorganisms settle onto surfaces via gravity	Viable particles. Example uses: sampling air for bacteria in the vicinity of and during a medical procedure; general measurements of microbial air quality.	Nutrient media (agars) on plates or slides	_	**No**	Simple and inexpensive; best suited for qualitative sampling; significant airborne fungal spores are too buoyant to settle efficiently for collection using this method.	Settle plates
Filtration	Air drawn through a filter unit; particles	Viable particles; viable	Paper, cellulose, glass wool,	**1-50**	**Yes**	Filter must be agitated first in rinse fluid	**-**

	trapped; 0.2 µm pore size	organisms (on non-nutrient surfaces, limited to spores and organisms that resist drying); concentration over time. Example use: air sampling for Aspergillus spp., fungal spores, and dust	gelatin foam, and membrane filters			to remove and disperse trapped microorganisms; rinse fluid is assayed; used more for sampling dust and chemicals.	
Centrifugation	Aerosols subjected to centrifugal force; particles impacted onto a solid surface	Viable particles; viable organisms (on non-nutrient surfaces, limited to spores and organisms that resist drying); concentration over time.	Coated glass or plastic slides, and agar surfaces	**40-50**	**Yes**	Calibration is difficult and is done only by the factory; relative comparison of airborne contamination is its general use.	Biotest RCS Plus

		Example use: air sampling for Aspergillus spp., and fungal spores					
Electrostatic precipitation	Air drawn over an electrostatically charged surface; particles become charged	Viable particles; viable organisms (on non-nutrient surfaces, limited to spores and organisms that resist drying); concentration over time	Solid collecting surfaces (glass, and agar)	**85**	**Yes**	High volume sampling rate, but equipment is complex and must be handled carefully; not practical for use in healthcare settings.	_
Thermal precipitation	Air drawn over a thermal gradient; particles repelled from hot surfaces, settle on colder surfaces	Size measurements	Glass coverslip, and electron microscope grid	**.003-.4**	**Yes**	Determine particle size by direct observation; not frequently used because of complex adjustments and low sampling	_

						rates.	

- **Water Sampling.**
  This involves following:
  - **Ensuring pre-requisites.** This involves establishing following:
    - Temperature. Water samples should be collected at approximately 39.2°F [4°C])
    - Timing. Testing should be done within 24 hours
    - Availability of supplies. Sterile collection equipment should always be used.
    - Clean Source. This comprises of
      - Disinfecting. This involves Disinfection with 500–600 ppm sodium hypochlorite (1:100 v/v dilution of chlorine bleach) and flushing the tap should precede sample collection.
      - Use of reducing agents.
        I. Sodium thiosulfate [Na2S2O3]) needs to be added to neutralize residual chlorine or other halogen in the collected sample.
        II. Chelating agent. If the water contains elevated levels of heavy metals, then a chelating agent should be added to the specimen.
  - **Taking sample.** This involves following:
    - Volume of sample. Minimum volume of; 100 mL should be collected
    - Timing. Testing should be done within 24 hours
- **Environmental Sampling.**
  This involves following:
  - **Pre-considerations.** This involves following:
    - Location of surface to be sampled.
    - Appropriate equipment requirement
    - Number of samples needed
    - Availability of comparison samples
    - Sampling Methodology (qualitative, quantitative, or both)
    - Types on the surface(s) sampled
  - **Selection of the method.** This involves identification of the method for environmental surfacing sample. This comprises of:
    - Rinse
    - Direct immersion
    - Containment

- RODAC

The next section explains the method for environmental sampling in more detail

Method	Surface suitability	Important notes	Points of interpretation
Sample/rinse			
• Moistened swab/rinse	Non-absorbent surfaces, corners, crevices, devices, and instruments	Analyse multiple measures areas or devices with separate swabs	Report results per measured areas or if assaying an object, per the entire sample site
• Moistened sponge/rinse	Large areas and housekeeping surfaces (e.g., floors or walls)	Vigorously rub a sterile sponge over the surface	Report results per measured area
• Moistened wipe/rinse	Large areas and housekeeping surfaces (e.g., countertops)	Use a sterile wipe	Report results per measured area
Direct immersion	Small items capable of being immersed	Use membrane filtration if rinse volume is large and anticipated microbiological concentration is low	Report results per item
Containment	Interior surfaces of containers, tubes, or bottles	Use membrane filtration if rinse volume is large	Evaluate both the types and numbers of microorganisms
RODAC	Previously cleaned and sanitized flat, non-absorbent surfaces; not suitable for irregular surfaces	Overgrowth occurs if used on heavily Contaminated surfaces; use neutralizers in the agar if surface disinfectant residuals are present	Provides direct, quantitative results; use a minimum of 15 plates per an average hospital room

5.2.4 Monitor Sample Quality

This process aims at continuously monitoring the sample quality in real time, and compares with the established quality standards to identify whether the quality standards are breached. In case the quality is breached service performance degradation report gets created.

5.2.5 Service Performance Degradation Report

This process results in the creation of service performance degradation report. This comprises of following:

- Report ID
- Performance degradation details
- Effected service
- Environmental impact.
- Time and date of the report
- Current status
- Closure time and date.

5.2.6 Track and Manage Service Quality Performance Resolution

This comprises of following:

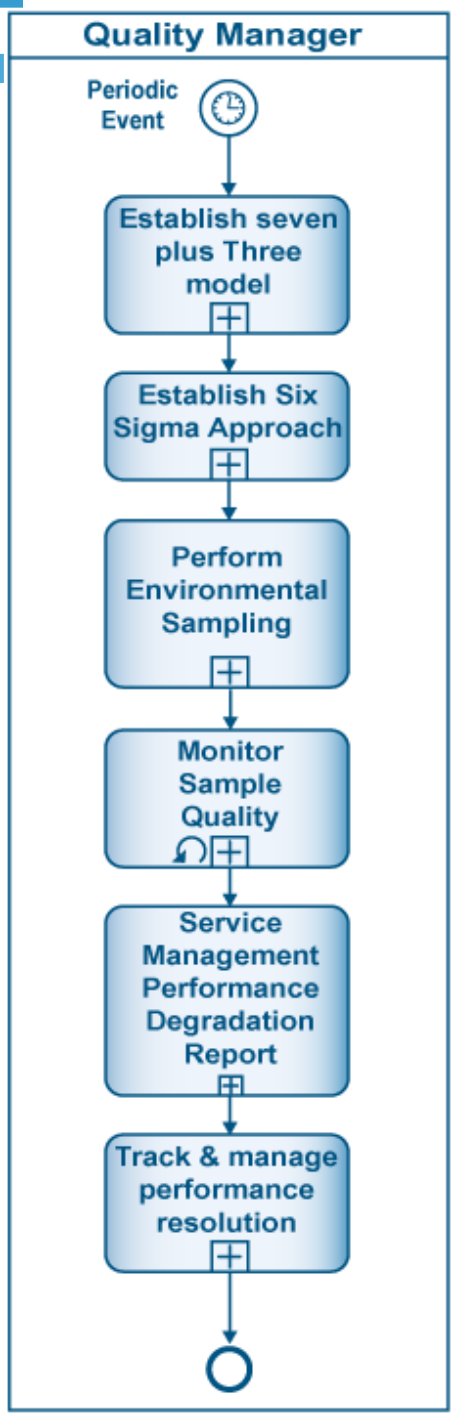
- **Investigation:** Once a service performance degradation report is created, the Service Quality Manager investigates, to verify whether the issue is genuine. Once it is verified that the performance degradation is genuine Service Quality Manager establishes schedule and assigns tasks, for supplier related issue the information is passed to S/P performance. Service Quality Manager analyzes and identifying the root cause of the problem.
- **Improvement of service quality:** This process aims at improving the overall quality of the identified service degradation. This process involves establishing of service improvement plan (internal created or supplier provided), obtaining authorization of Service improvement Plan and implementation of the plan.
- **Reporting:** Once the service performance degradation has been resolved, this process is responsible for confirming the resolution and thorough inspection of the documentation, seeking customer satisfaction, and eventually closing the report.

6 Service Quality Management

Service Quality Management Process

6 Service Quality Management Process

6.1 Service Quality Management – Process



6 Service Quality Management Process

6.2 Service Quality Management – Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish Service Quality Management process.
Scope	This is a level 1 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service performance improvisation
Related Operational Policies	OP-001, OP-002, OP-003, OP-004 (Ref 7.5)
Assumptions	Senior Management Support 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 service quality 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 Service Quality 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>• Period event</td></tr>
<tr><td>Basic Course of Event</td><td>Service Quality Management
1. Quality Manager performs environmental sampling.
2. Quality Manager monitors sample quality
3. Quality Manager initiates Service Management performance degradation report.
4. Quality Manager tracks and manages performance resolution.
5. 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>Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.</td></tr>
<tr><td>Preconditions</td><td>There exists a capability at environmental Services department to monitor the performance of Services.</td></tr>
<tr><td>Post -conditions</td><td>Service management process gets formulated.</td></tr>
<tr><td>Related Business Rules</td><td>BR-001, BR-002, BR-003, BR-004, BR-005, BR-006 (Ref 7.1)</td></tr>
<tr><td>Related Risks</td><td>RR-001, RR-002, RR-003, BR-004< RR-005 (Ref. 7.2)</td></tr>
<tr><td>Related Quality Attributes</td><td>Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability</td></tr>
</table>

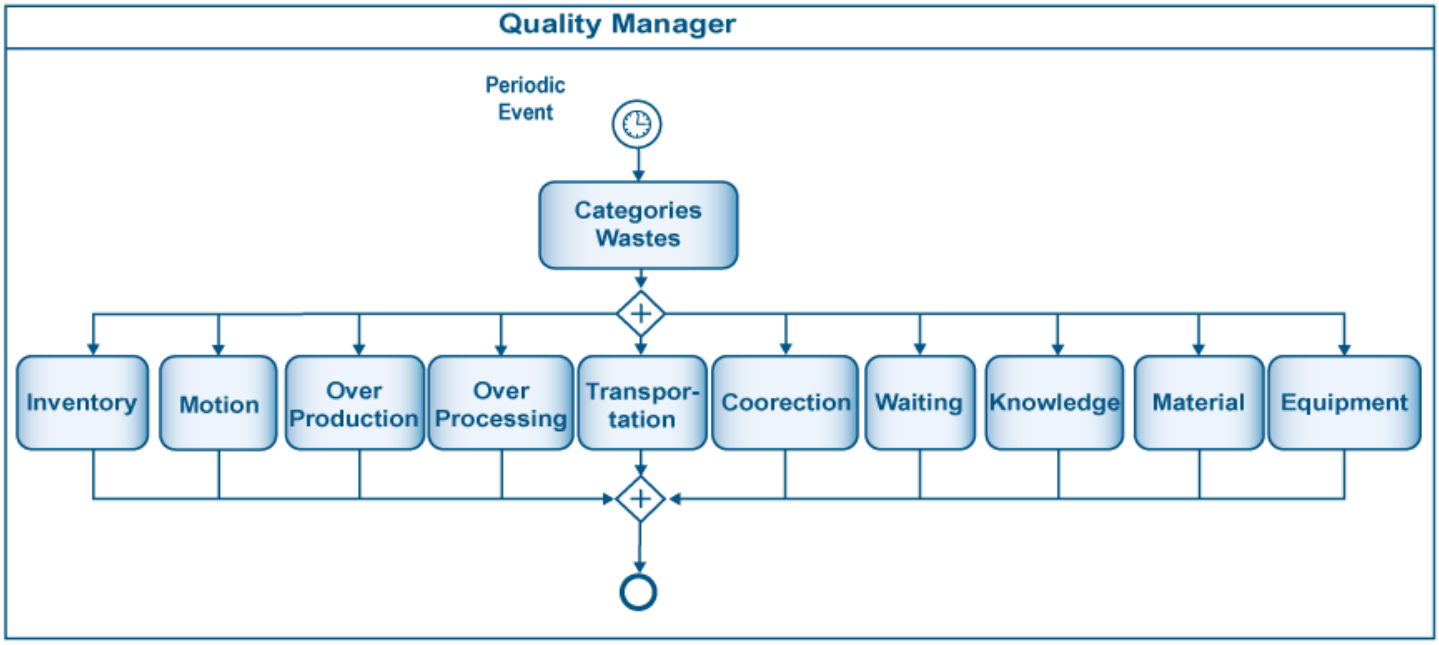
	(Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	CR, AR, DRR, DR, RR, SR, ASR, WSR, SSR, VR, WMR (Ref 7.6)
Related CTQs	CRV, ARV, DRRV, DRV, RRV, SRV, ASRV, WSRV, SSRV, VRV, WMRV, MOM, PWOM, CTQ, IOM, TOM, WRM, DRM (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.1
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6 Service Quality Management Process

6.3 Service Quality Management – Roles and Responsibilities

Roles	Responsibilities
Quality Manager	• Quality Manager performs environmental sampling. • Quality Manager monitors and analyzes management process • Quality Manager initiates service management performance degradation report. • Quality Manager tracks and manages performance resolution.

6.4 Sub Process – Establish Seven plus Three Model



6.5 Sub Process – Establish Seven plus Three Model Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish seven plus three model
Scope	This is a level 1 Process Specification.
Primary Reference	• Lean Six sigma
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service quality improvisation
Related Operational Policies	OP-004 (Ref 7.5)
Assumptions	Senior Management Support 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 service quality management, ATP devices.

6 Service Quality Management Process

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
Timing Dimension	<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	• Period event
Basic Course of Event	**Seven plus three model** 1. Quality manager categorizes wastes into inventory, motion, over production, transportation, correction, idle time, knowledge, material, equipment. 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	Establish Six sigma Approach.
Preconditions	There exists a capability at environmental Services department to monitor the performance of Services.
Post -conditions	Seven plus one model process gets formulated.
Related Business Rules	BR-003, BR-0045 (Ref 7.1)
Related Risks	RR-001, RR-004, BR-005 (Ref. 7.2)

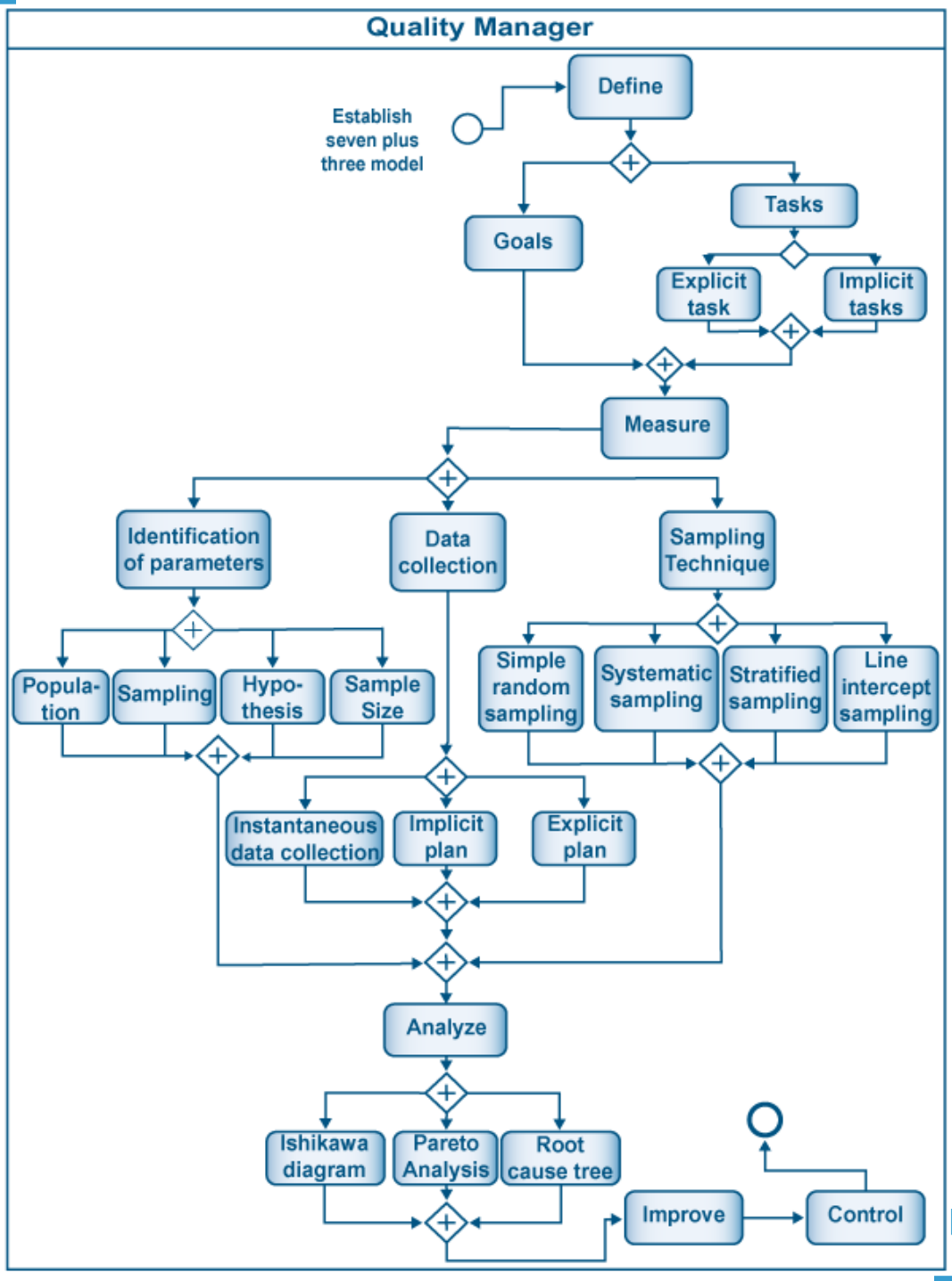
6 Service Quality Management Process

Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	WMR (Ref 7.6)
Related CTQs	WMRV, MOM, PWOM, CTQ, IOM, TOM, WRM, DRM (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.4
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.6 Sub Process – Establish Seven plus Three Model Roles and Responsibilities

Roles	Responsibilities
Quality Manager	Quality manager categorizes wastes into inventory, motion, over production, transportation, correction, idle time, knowledge, material, equipment.

6.7 Sub Process – Establish Six Sigma Approach



6.8 Sub Process – Establish Six Sigma Approach Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish seven plus three model
Scope	This is a level 1 Process Specification.
Primary Reference	• Lean Six sigma
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service quality improvisation
Related Operational Policies	OP-001, OP-002, (Ref 7.5)
Assumptions	Senior Management Support 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 service quality management, ATP devices.
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 Service Quality Management Process

<table>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimension</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>• Establish seven plus three model</td></tr>
<tr><td>Basic Course of Event</td><td>Seven plus three model
1. Quality manager defines quality goals and related task (explicit as well as implicit tasks)
2. Quality Manager establishes measure phases(identification of parameters (population, sampling, hypothesis, sample size) data collection categories (instantaneous data collection, implicit plan and explicit plan) and sampling techniques (simple random sampling, systematic sampling, stratified sampling, line intercept sampling)
3. Quality Manager establishes analyzes phase (via ishikawa diagram, pareto analysis and root cause tree)
4. Quality Manager improves the overall procedures and work flow
5. Quality manager controls the process.
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>Perform environmental sampling</td></tr>
<tr><td>Preconditions</td><td>There exists a capability at environmental Services department to monitor the performance of Services.</td></tr>
<tr><td>Post -conditions</td><td>Seven plus one model process gets formulated.</td></tr>
</table>

6 Service Quality Management Process

Related Business Rules	BR-006 (Ref 7.1)
Related Risks	RR-001, RR-002, RR-003, BR-004 (Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	VR (Ref 7.6)
Related CTQs	VRV (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1

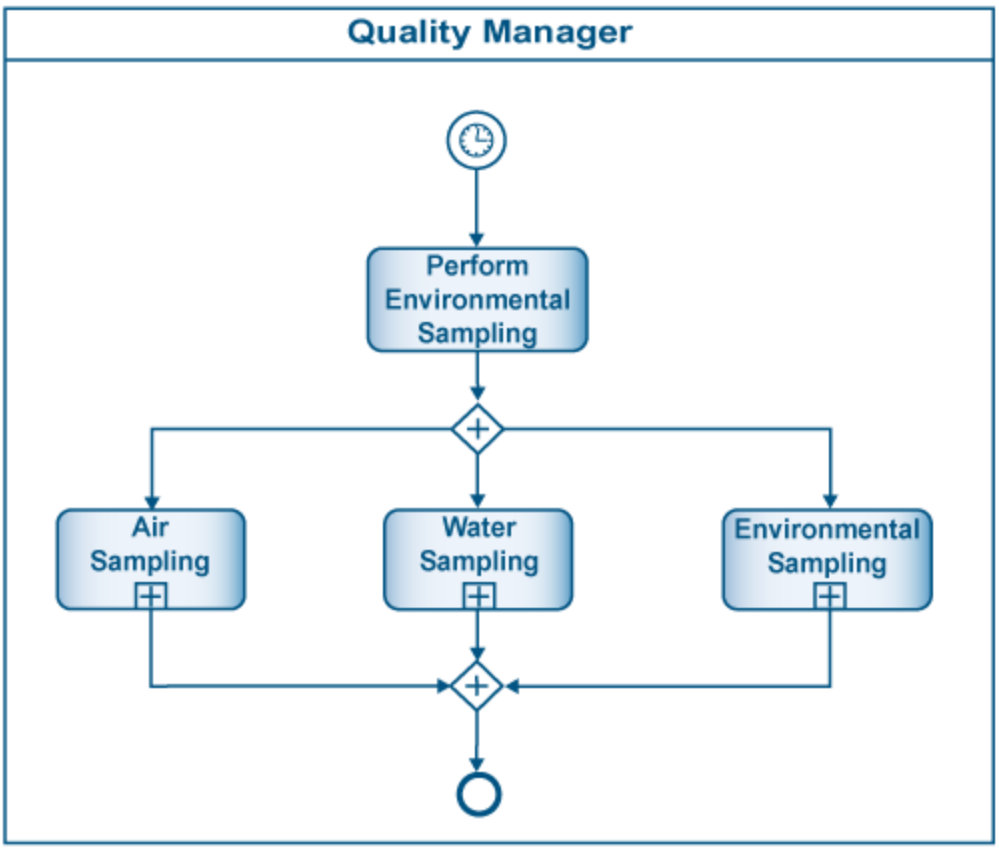
6 Service Quality Management Process

Process Model	Section 6.7
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.9 Sub Process – Establish Six Sigma Approach Roles and Responsibilities

Roles	Responsibilities
Quality Manager	• Quality manager defines quality goals and related task (explicit as well as implicit tasks) • Quality Manager establishes measure phases(identification of parameters (population, sampling, hypothesis, sample size) data collection categories (instantaneous data collection, implicit plan and explicit plan) and sampling techniques (simple random sampling, systematic sampling, stratified sampling, line intercept sampling) • Quality Manager establishes analyzes phase (via ishikawa diagram, pareto analysis and root cause tree) • Quality Manager improves the overall procedures and work flow • Quality manager controls the process.

6.10 Sub Process – Perform Environmental Sampling



6.11 Sub Process – Perform Environmental Sampling Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish environmental sampling process
Scope	This is a level 1 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service performance improvisation
Related Operational Policies	OP-003 (Ref 7.5)
Assumptions	Senior Management Support 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 service quality 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
Timing Dimension	**Type** / **Normal** **Average** / 30 min **Std** / 12 min
Trigger	• Period event
Basic Course of Event	**Perform environmental sampling** 1. Quality Manager performs environmental sampling (air sampling, water sampling, and environmental sampling). 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	Air sampling, water sampling, and environmental sampling.
Preconditions	There exists a capability at environmental Services department to monitor the performance of Services.
Post -conditions	Environmental sampling process is established.
Related Business Rules	BR-004 (Ref 7.1)
Related Risks	RR-004 (Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)

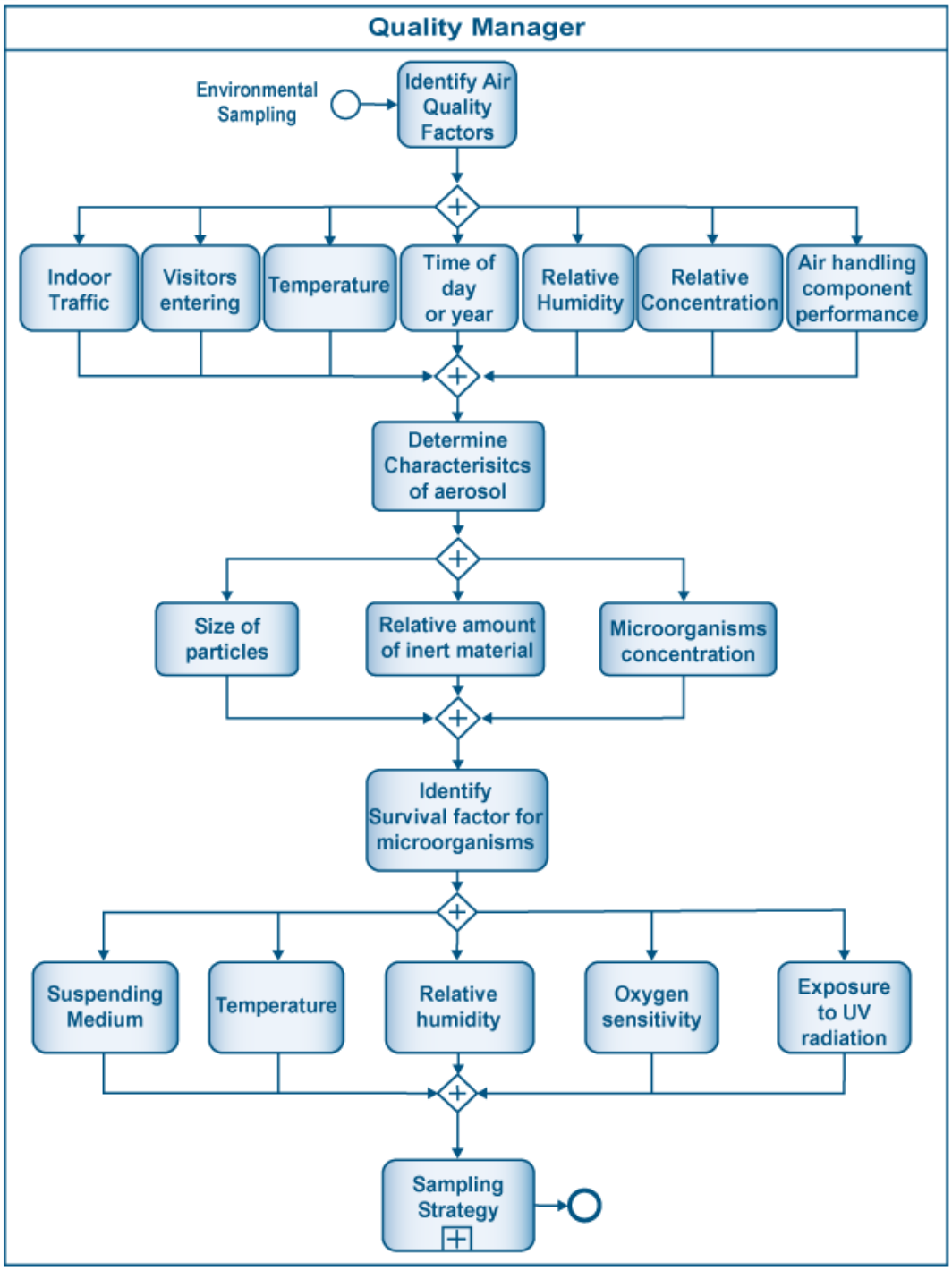
6 Service Quality Management Process

Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	SR, ASR, WSR, SSR (Ref 7.6)
Related CTQs	SRV, ASRV, WSRV, SSR V (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.10
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.12 Sub Process – Perform Environmental Sampling Roles and Responsibilities

Roles	Responsibilities
Quality Manager	Quality Manager performs environmental sampling (air sampling, water sampling, and environmental sampling).

6.13 Sub Process – Air Sampling



6.14 Sub Process – Air Sampling Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish air sampling process
Scope	This is a level 1 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service performance improvisation
Related Operational Policies	OP-003 (Ref 7.5)
Assumptions	Senior Management Support 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 service quality 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 Service Quality Management Process

<table>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimension</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>• Environmental sampling</td></tr>
<tr><td>Basic Course of Event</td><td>Air sampling
1. Quality Manager identifies air quality factors (indoor traffic, visitors entering, temperature, time of day or year, relative humidity, relative concentration, air handling component performance)
2. Quality Manager determines characteristics of aerosol (size of particles, relative amount of inert materials, microorganisms concentration)
3. Quality Manager identifies survival factors for microorganism (suspending medium, temperature, relative humidity, oxygen sensitivity and exposure to UV radiations)
4. Quality manager formulates sampling strategy.
5. 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>Sampling strategy</td></tr>
<tr><td>Preconditions</td><td>There exists a capability at environmental Services department to perform air sampling,</td></tr>
<tr><td>Post -conditions</td><td>Air sampling process is established.</td></tr>
<tr><td>Related Business Rules</td><td>BR-004 (Ref 7.1)</td></tr>
<tr><td>Related Risks</td><td>RR-004 (Ref. 7.2)</td></tr>
</table>

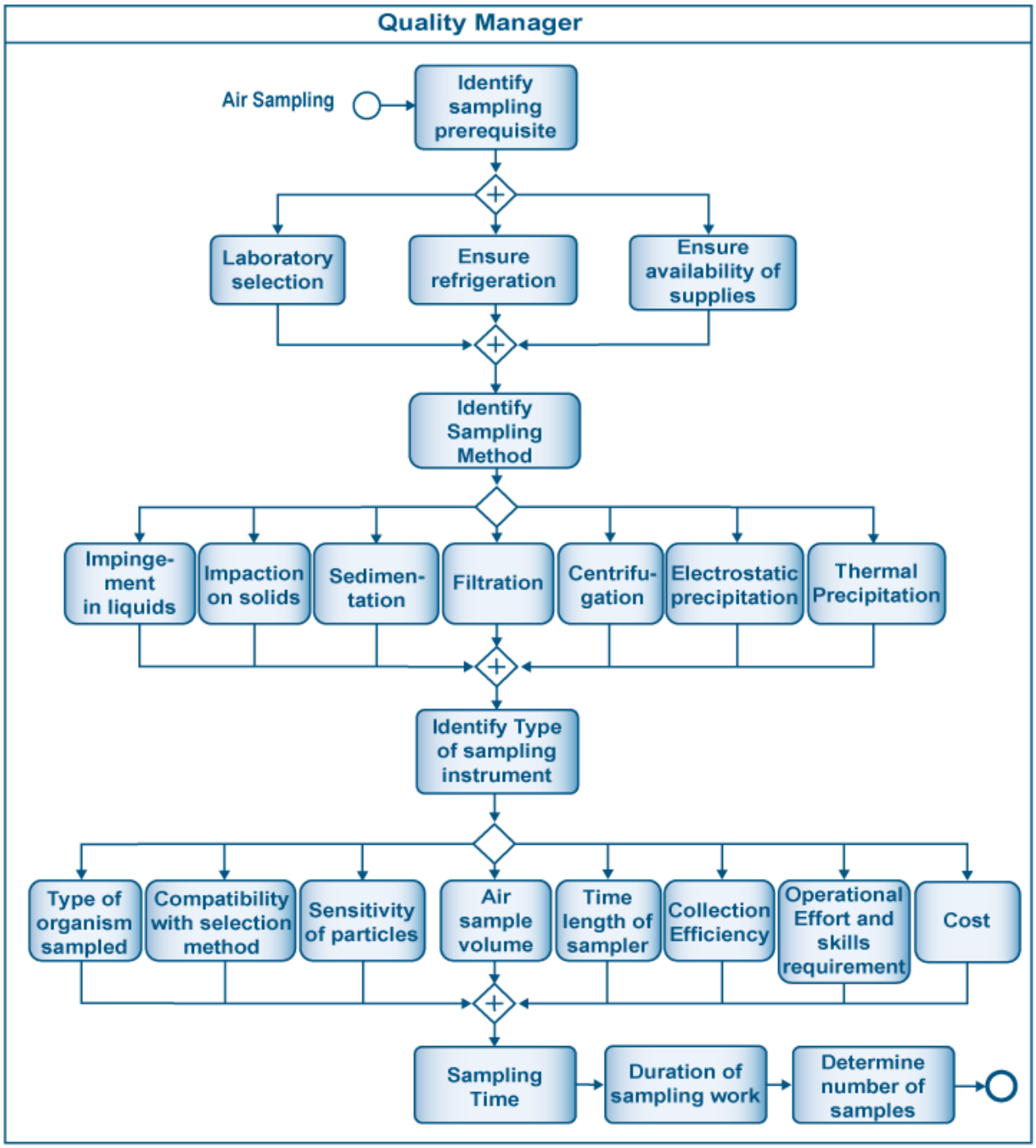
6 Service Quality Management Process

Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	ASR (Ref 7.6)
Related CTQs	ASRV (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.13
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.15 Sub Process – Air Sampling Roles and Responsibilities

Roles	Responsibilities
Quality Manager	Quality Manager performs air sampling.

6.16 Sub Process – Air Sampling Strategy



6.17 Sub Process – Air Sampling Strategy Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish air sampling strategy process
Scope	This is a level 1 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service performance improvisation
Related Operational Policies	OP-003 (Ref 7.5)
Assumptions	Senior Management Support 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 service quality 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 Service Quality Management Process

<table>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimension</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>• Air sampling</td></tr>
<tr><td>Basic Course of Event</td><td>Air sampling Strategy
1. Quality Manager identifies sampling pre-requistes laboratory selection, refrigeration and availability of supplies
2. Quality Manager identifies sampling method impingement in liquids, impaction on solids, sedimentation, filtration, centrifugation, electrostatic precipitation, thermal precipitation.
3. Quality Manager identifies type of sampling instrument based type of organism sampled, compatibility with selection method, sensitivity of particles, air sample volume, time length of sampler, collection efficiency, cost and operational effort and skills requirement
4. Quality Manager determines sampling time
5. Quality Manager identifies duration of sampling work
6. Quality manager determines number of samples.
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>Monitor sample quality</td></tr>
<tr><td>Preconditions</td><td>There exists a capability at environmental Services department to perform air sampling,</td></tr>
<tr><td>Post -conditions</td><td>Air sampling strategy is established.</td></tr>
</table>

6 Service Quality Management Process

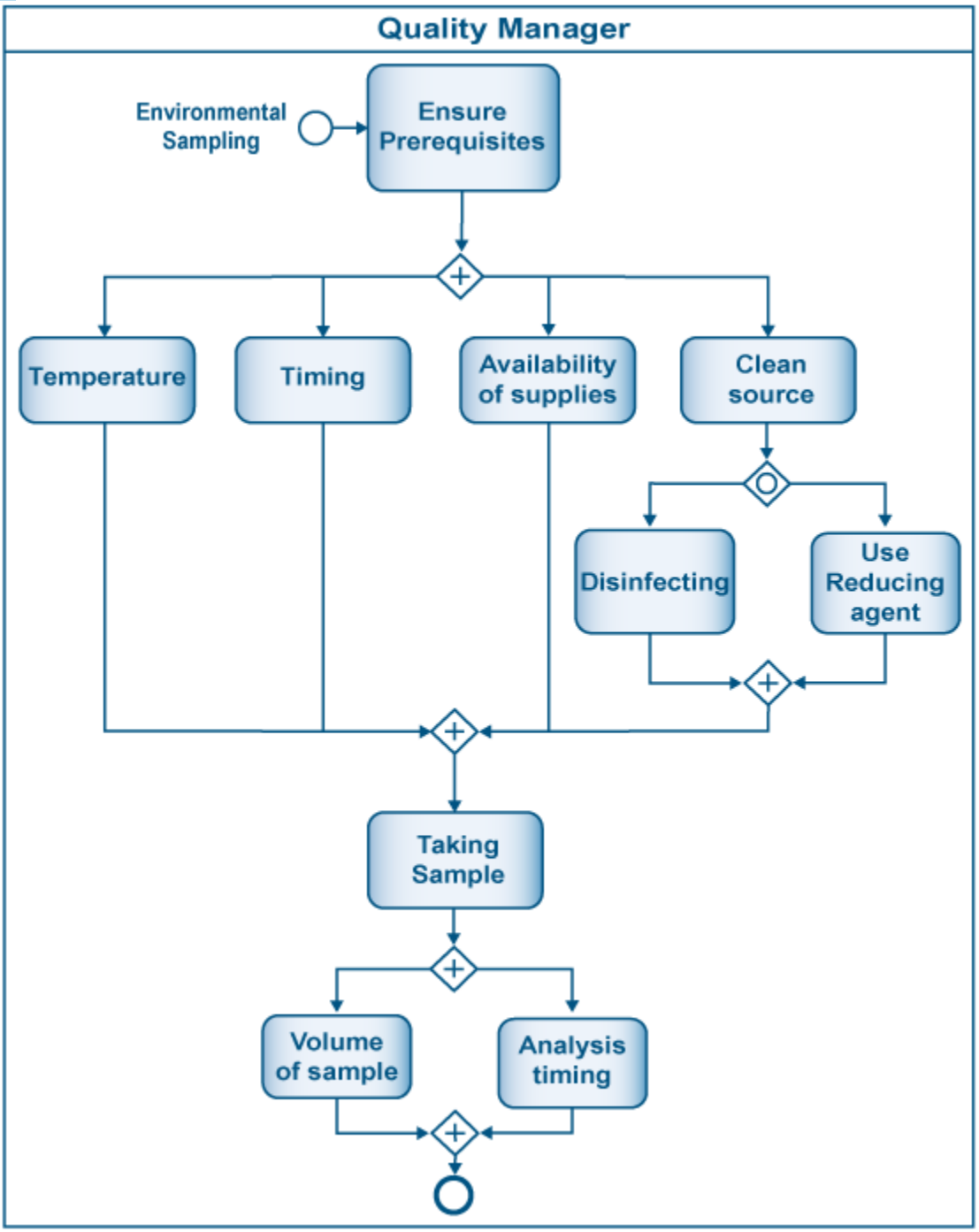
Related Business Rules	BR-004 (Ref 7.1)
Related Risks	RR-004 (Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	ASR (Ref 7.6)
Related CTQs	ASRV (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1

Process Model	Section 6.16
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.18 Sub Process – Air Sampling Strategy Roles and Responsibilities

Roles	Responsibilities
Quality Manager	Quality Manager formulates air sampling strategy

6.19 Sub Process – Water Sampling



6 Service Quality Management Process

6.20 Sub Process – Water Sampling Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish water sampling process
Scope	This is a level 1 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service performance improvisation
Related Operational Policies	OP-OO3 (Ref 7.5)
Assumptions	Senior Management Support 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 service quality 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 Service Quality Management Process

<table>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimension</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>• Environmental sampling</td></tr>
<tr><td>Basic Course of Event</td><td>Water Sampling
1. Quality Manager ensures pre-requisites (temperature, timing, availability of supplies, cleaning source of water (disinfection of source and or use of reducing agents)
2. Quality Manager takes sample (fixed volume of sample and time period for analysis)
3. 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>Monitor sample quality</td></tr>
<tr><td>Preconditions</td><td>There exists a capability at environmental Services department to perform water sampling,</td></tr>
<tr><td>Post -conditions</td><td>Water sampling process is established.</td></tr>
<tr><td>Related Business Rules</td><td>BR-004 (Ref 7.1)</td></tr>
<tr><td>Related Risks</td><td>RR-004 (Ref. 7.2)</td></tr>
</table>

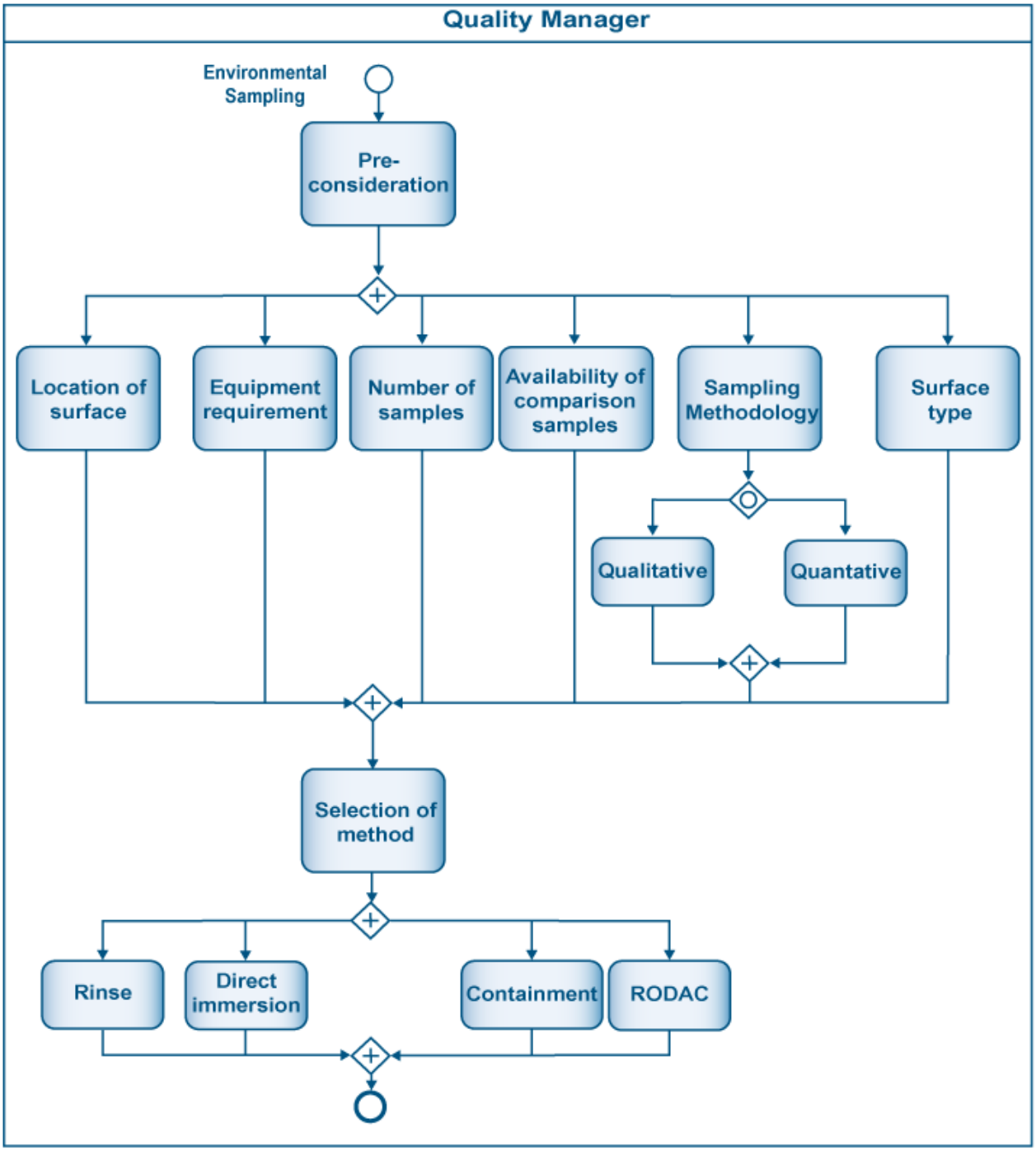
6 Service Quality Management Process

Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	WSR (Ref 7.6)
Related CTQs	WSRV(Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.19
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.21 Sub Process – Water Sampling Roles and Responsibilities

Roles	Responsibilities
Quality Manager	Quality Manager performs water sampling.

6.22 Sub Process – Environment Sampling



6 Service Quality Management Process

6.23 Sub Process – Environment Sampling Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish environmental sampling process
Scope	This is a level 1 Process Specification.
Primary Reference	Lean six sigma- Quality Standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	• CDC- Centers for Disease Control and Prevention standard
Related Operational Policies	OP-003(Ref 7.5)
Assumptions	Senior Management Support 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 service quality 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 Service Quality Management Process

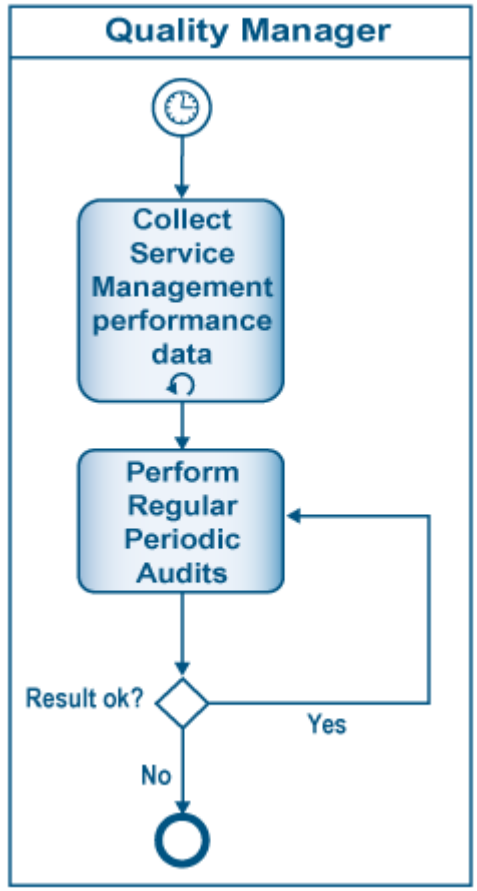
<table>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimension</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>• Environmental sampling</td></tr>
<tr><td>Basic Course of Event</td><td>Environmental sampling (surface)
1. Quality Manager consider the location of surface, equipment requirement number of samples, availability of comparison sample sampling methodology (qualitative and or qualitative), surface type
2. Quality Manager determines the method of sampling (rinse, direct immersion, containment, ROBAC)
3. 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>Monitor sample quality</td></tr>
<tr><td>Preconditions</td><td>There exists a capability at environmental Services department to perform environmental (surface0 sampling,</td></tr>
<tr><td>Post -conditions</td><td>Air sampling process is established.</td></tr>
<tr><td>Related Business Rules</td><td>BR-004 (Ref 7.1)</td></tr>
<tr><td>Related Risks</td><td>RR-004 (Ref. 7.2)</td></tr>
<tr><td>Related Quality Attributes</td><td>Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability</td></tr>
</table>

	(Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	SSR (Ref 7.6)
Related CTQs	SSRV (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.22
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.24 Sub Process – Environment Sampling Roles and Responsibilities

Roles	Responsibilities
Quality Manager	Quality Manager performs environmental (surface) sampling.

6.25 Sub Process – Monitor Sample Quality



6 Service Quality Management Process

6.26 Sub Process – Monitor Sample Quality Specification

Specification	Description
Summary/Purpose	The purpose of this process is to monitor and analyze sample quality e
Scope	This is a level 2 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Service performance improvisation
Related Operational Policies	OP-002 (Ref 7.5)
Assumptions	Senior management support is available to this process.
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 service quality 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 Service Quality Management Process

EBC Procedures	None
Timing Dimension	**Type** / **Normal** **Average** / 30 min **Std** / 12 min
Trigger	• Periodic activity.(monthly or quarterly)
Basic Course of Event	**Service Quality Management** 1. Quality Manager collects the Service quality Management performance data 2. Quality Manager perform regular audits. 3. Ends.
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	Service quality performance degradation report process
Preconditions	Service Quality Management performance metrics are established.
Post -conditions	Service Quality Management performance gets analyzed.
Related Business Rules	BR-002 (Ref 7.1)
Related Risks	RR-001 (Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability (Ref 7.4)

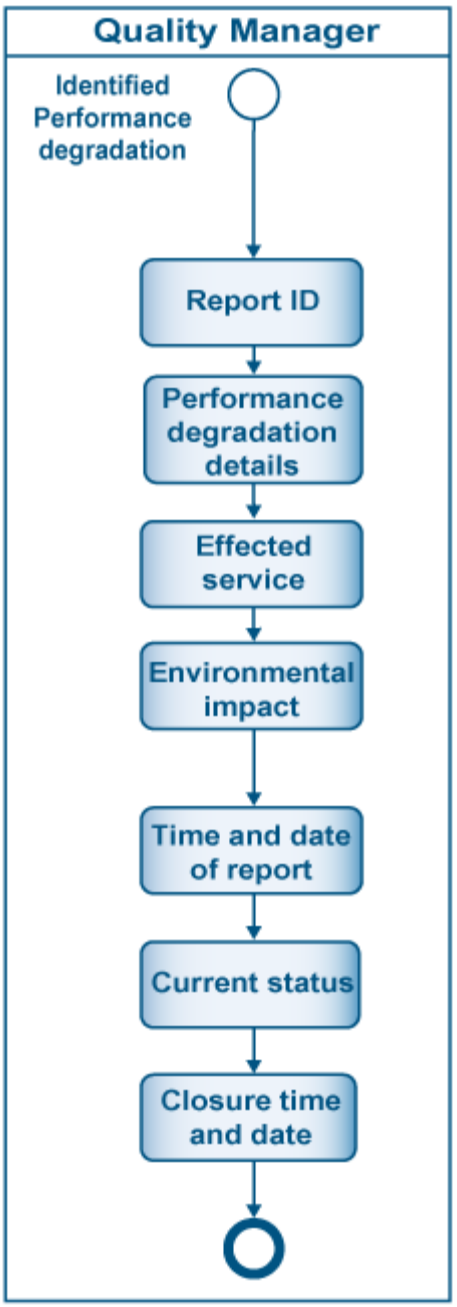
6 Service Quality Management Process

Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	AR,CR, DR (Ref 7.6)
Related CTQs	ARV, CRV , DRV (Ref 7.7)
Actors/Agents	Quality Manager
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.25
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.27 Sub Process – Monitor Sample Quality Roles and Responsibilities

Roles	Responsibilities
Quality Manager	• Quality Manager collects the Service quality Management performance data

6.28 Sub Process – Performance Degradation Report



6.29 Sub Process – Performance Degradation Report Specification

Specification	Description
Summary/Purpose	The purpose of this process is to create Service Quality Management performance degradation report.
Scope	This is a level 2 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Establishing the record of Service Quality Management performance failure.
Related Operational Policies	OP-001 (Ref 7.5)
Assumptions	Quality Performance failures have been accurately identified.
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 service quality management.

6 Service Quality 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 Dimension</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>Identified performance degradation</td></tr>
<tr><td>Basic Course of Event</td><td>Performance degradation Report
1. Quality Manager establishes a report ID
2. Quality Manager establishes performance degradation details
3. Quality Manager identifies the effected service
4. Quality Manager identifies environmental impact.
5. Quality Manager identifies time and date of the report
6. Quality Manager updates the current status from time to time based on the progress
7. Quality Manager enters the closure time and date upon completion of the service degradation report
8. Ends.</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>Track and Manage Service Management performance</td></tr>
<tr><td>Preconditions</td><td>Identification of quality performance failure.</td></tr>
<tr><td>Post -conditions</td><td>Degradation report gets formulated.</td></tr>
</table>

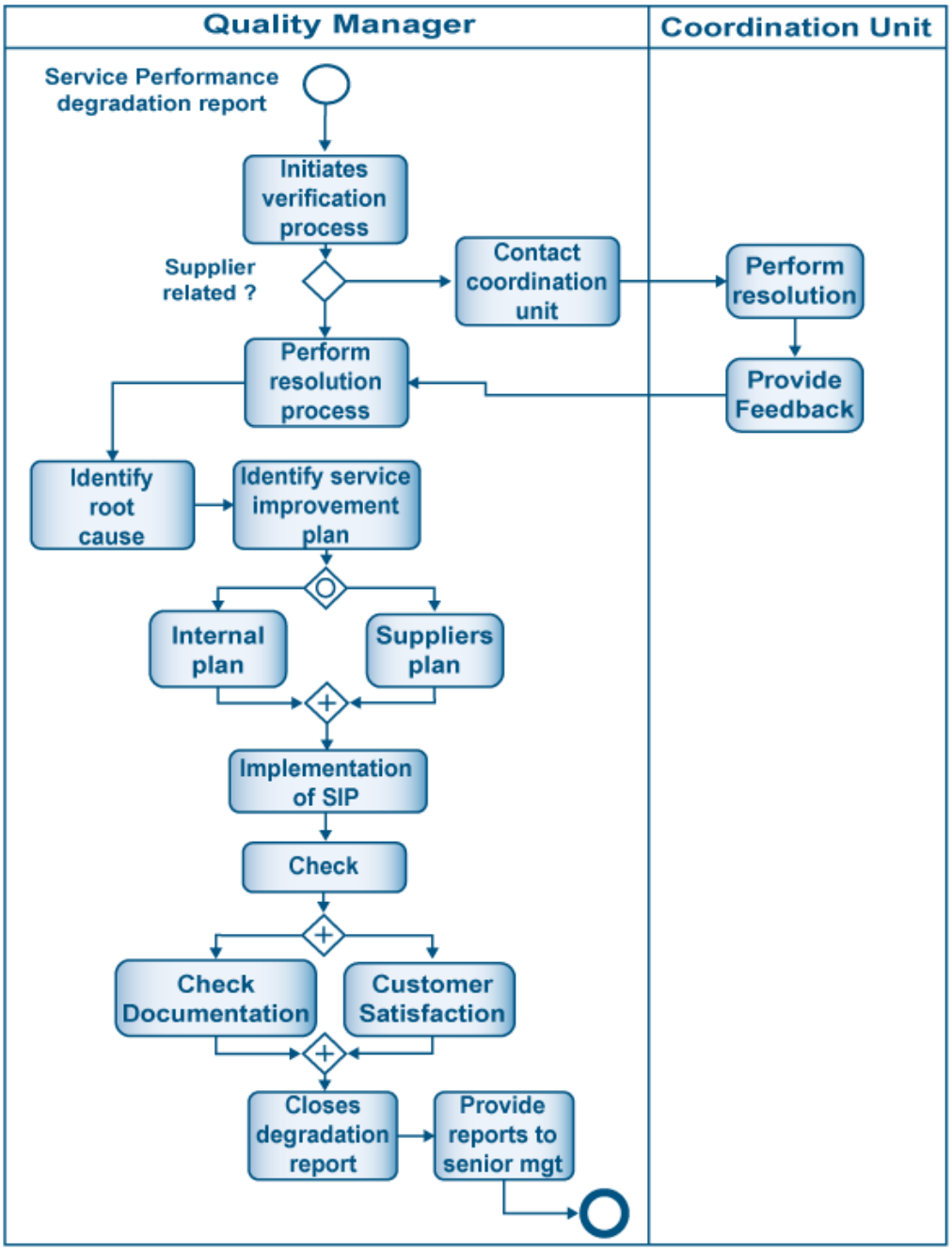
6 Service Quality Management Process

Related Business Rules	BR-003 (Ref 7.1)
Related Risks	RR-002 (Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, confidentiality, (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, free of error, concise representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	DRR (Ref 7.6)
Related CTQs	DRRV (Ref 7.7)
Actors/Agents	Quality Manager.
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.28
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.30 Sub Process – Performance Degradation Report Roles and Responsibilities

Roles	Responsibilities
Quality Manager	Quality Manager establishes Service Management performance degradation report.

6.31 Sub Process – Track & Manage Service Management Performance Resolution



6.32 Sub Process – Track & Manage Service Management Performance Resolution Specification

Specification	Description
Summary/Purpose	The purpose of this process is to track and manage Service Management performance resolution
Scope	This is a level 2 Process Specification.
Primary Reference	• CDC- Centers for Disease Control and Prevention standard
Related ESM Practices	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Related Business Driver	Faster correction of identified service quality performance degradation.
Related Operational Policies	OP-001 (Ref 7.5)
Assumptions	Supplier or vendors involved are committed in rectifying the performance degradation caused.
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 service quality management.

6 Service Quality 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 Dimension</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>• Performance degradation report</td></tr>
<tr><td>Basic Course of Event</td><td>Track and Manage Service Management
1. Quality Manager initiates verification process
2. Quality Manager performs resolution process
3. Quality Manager identifies root cause
4. Quality Manager identifies service improvement plan (internal as well as supplier plan)
5. Quality Manager implements Service improvement plan
6. Quality Manager checks documentation and customer satisfaction
7. Quality Manager closes degradation report
8. Quality Manager provides reports to senior management.
9. Ends.</td></tr>
<tr><td>Alternative Path</td><td>Track and Manage Service Management (supplier involved)
1. Quality Manager initiates verification process
2. Quality Manager contacts the supplier
3. Coordination unit performs the resolution
4. Coordination unit provides feedback
5. Quality Manager identifies root cause
6. Quality Manager identifies service improvement plan (internal as well as supplier plan)
7. Quality Manager implements Service improvement plan
8. Quality Manager checks documentation and customer satisfaction</td></tr>
</table>

	9. Quality Manager closes degradation report 10. End
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	Waste Quality Control management, Service level management, Environmental Quality Management, Hygiene quality control.
Preconditions	Service performance degradation exists.
Post -conditions	Service Quality Performance degradation gets corrected.
Related Business Rules	BR-001 (Ref 7.1)
Related Risks	RR-003 (Ref. 7.2)
Related Quality Attributes	Service Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, availability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, reputation, free of error (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	RR (Ref 7.6)
Related CTQs	RRV (Ref 7.7)
Actors/Agents	Quality Manager, Coordination unit
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation

	Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.31
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.33 Sub Process – Track & Manage Service Management Performance Resolution Roles and Responsibilities

Roles	Responsibilities
Supplier	• Quality Manager initiates verification process, performs resolution process, identifies root cause, identifies service improvement plan (internal as well as supplier plan) • Quality Manager Implements Service improvement plan, checks documentation and customer satisfaction and closes degradation report and provides reports to senior management.
Coordination unit	• Resolve the issue and provides feedback

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 Service Quality Management process matures or changes.

7.1 Business Rules

BR ID	Description	Context	Rule	Source
BR-001	All suppliers involved should cooperate in any type of resolution whereby their assistance is required.	Business	NA	NA
BR-002	All audit reports should be submitted to senior management	Business	TBD	TBD
BR-003	All violations should be recorded	Business	TBD	TBD
BR-004	Air, water and environment would be regularly sampled to ensure quality	Business	TBD	TBD
BR-005	All wastes should be minimized.	Business	TBD	TBD
BR-006	Lean Six sigma would be use as the prime quality standard	Business	TBD	TBD

7 Reference

7.2 Risk

Risk ID	Description	Source	Severity Level	Status	Resolution
RR-001	No mean of performance gathering exists	NA	High	TBD	An automated system should exist where by all the service performance are measured and monitored proactively.
RR-002	Performance degradation records are not stored	NA	High	TBD	All performance records should be stored and used to identify various trends and patterns so as to identify root cause.
RR-003	Suppliers don't entertain service quality requests.	NA	Medium	TBD	Involvement of Suppliers should be specifically be mentioned in all the biding documents, and penalties should be imposed in case they suppliers don't follow it.
RR-004	Sampling results are not accurate		High		Sampling should be done by trained personals and use automation wherever possible to ensure its accuracy.
RR-005	Inaccurate results		High		Automated tools should be utilized wherever possible to improve accuracy.

7.3 Quality Attribute

QA ID	Description	Threshold
QA-001	Interoperability	TBD
QA-002	Reliability	TBD

7 Reference

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 Reference

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 the degradation reports are resolved within 5 working days from the day of identification(maximum)	TBD	TBD

OP-002	Audits should be regularly conducted.	TBD	TBD
OP-003	All the air, water and environment sampling would be conducted after confirmation of stock of supplies and related equipments	TBD	TBD
OP-004	Seven plus three model would be implemented to minimize the wastes	TBD	TBD

7.6 KPI

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard Threshold
Variation rate	**VR**	percentage decrease in variation	NA	TBD	TBD	TBD
Waste minimization rate	**WMR**	Percentage increase in waste minimization	NA	TBD	TBD	TBD
Compliance rate	**CR**	Compliance achieved per month	NA	TBD	TBD	TBD
Audit rate	**AR**	Number of audits done per month	NA	TBD	TBD	TBD
Deviation rate	**DR**	Number of deviations found per month	NA	TBD	TBD	TBD

Degradation reporting rate	**DRR**	Degradation reports created per month	NA	TBD	TBD	TBD
Resolution Rate	**RR**	number of degradation reports resolved per month	NA	TBD	TBD	TBD
Sampling Rate	**SR**	Number of sampling activity done per year	NA	TBD	TBD	TBD
Air sampling rate	**ASR**	Number of air sampling activity done per year	NA	TBD	TBD	TBD
Water sampling rate	**WSR**	Number of water sampling activity done per year	NA	TBD	TBD	TBD
Surface sampling rate	**SSR**	Number of surface sampling activity done per year	NA	TBD	TBD	TBD

7.7 CTQ

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard Threshold
Variation rate variance	**VRV**	Standard deviation of VR	NA	TBD	TBD	TBD

7 Reference

Waste minimization rate variance	**WMRV**	Standard deviation of WMR	NA	TBD	TBD	TBD
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
Compliance rate variance	**CRV**	Standard deviation of CRV	NA	TBD	TBD	TBD
Audit rate variance	**ARV**	Standard deviation of ARV	NA	TBD	TBD	TBD
Deviation rate variance	**DRV**	Standard deviation of DRV	NA	TBD	TBD	TBD
Degradation reporting rate variance	**DRRV**	Standard deviation of DRRV	NA	TBD	TBD	TBD
Resolution Rate variance	**RRV**	Standard deviation of RRV	NA	TBD	TBD	TBD
Sampling Rate variation	**SRV**	Standard deviation of SR	NA	TBD	TBD	TBD
Air sampling rate variation	**ASRV**	Standard deviation of ASR	NA	TBD	TBD	TBD
Water sampling rate variation	**WSRV**	Standard deviation of WSR	NA	TBD	TBD	TBD

Surface sampling rate variation	**SSRV**	Standard deviation of SSR	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 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

7 Reference

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 • 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,	There should be high level of coordination between hospital	• Professionalism • Trust • Low risk • Excellent Ergonomic

	Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	employees and departments.	
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,	Hospital environment should comply with occupational health and safety procedures.	• Safe environment • Professionalism • Low risk

	Waste management worker, Housekeepers		
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

7 Reference

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.
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

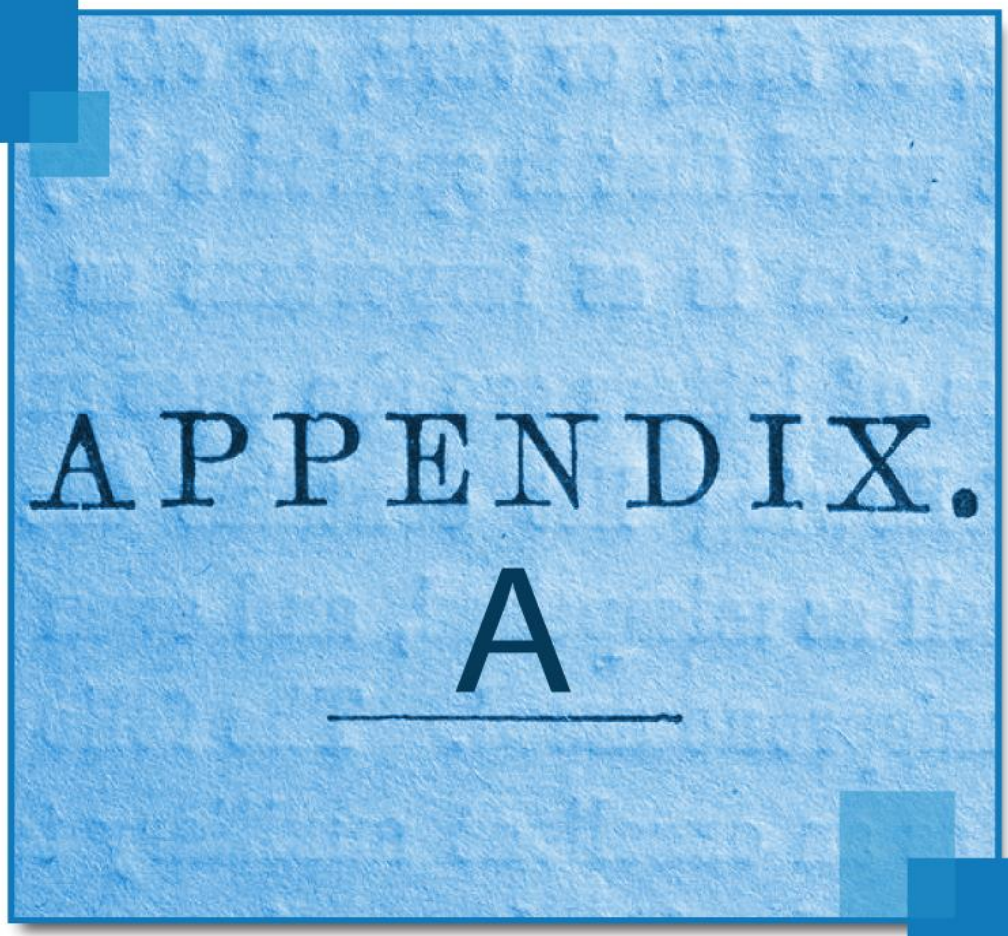
8 Glossary / Acronyms

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 organisation's key business processes in a graphical format.
Business Rules	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
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.
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 

SWIMLANES

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.	

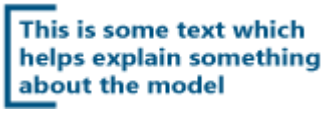
CONNECTORS

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.	

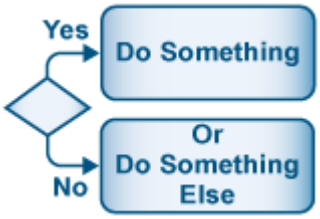
9 Appendix A: Business Process Modeling Notation Reference

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.	

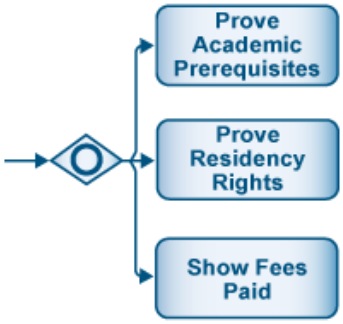
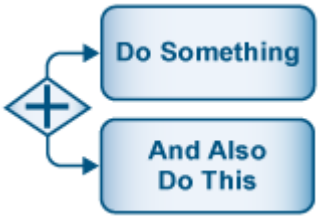
ARTIFACTS

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.	

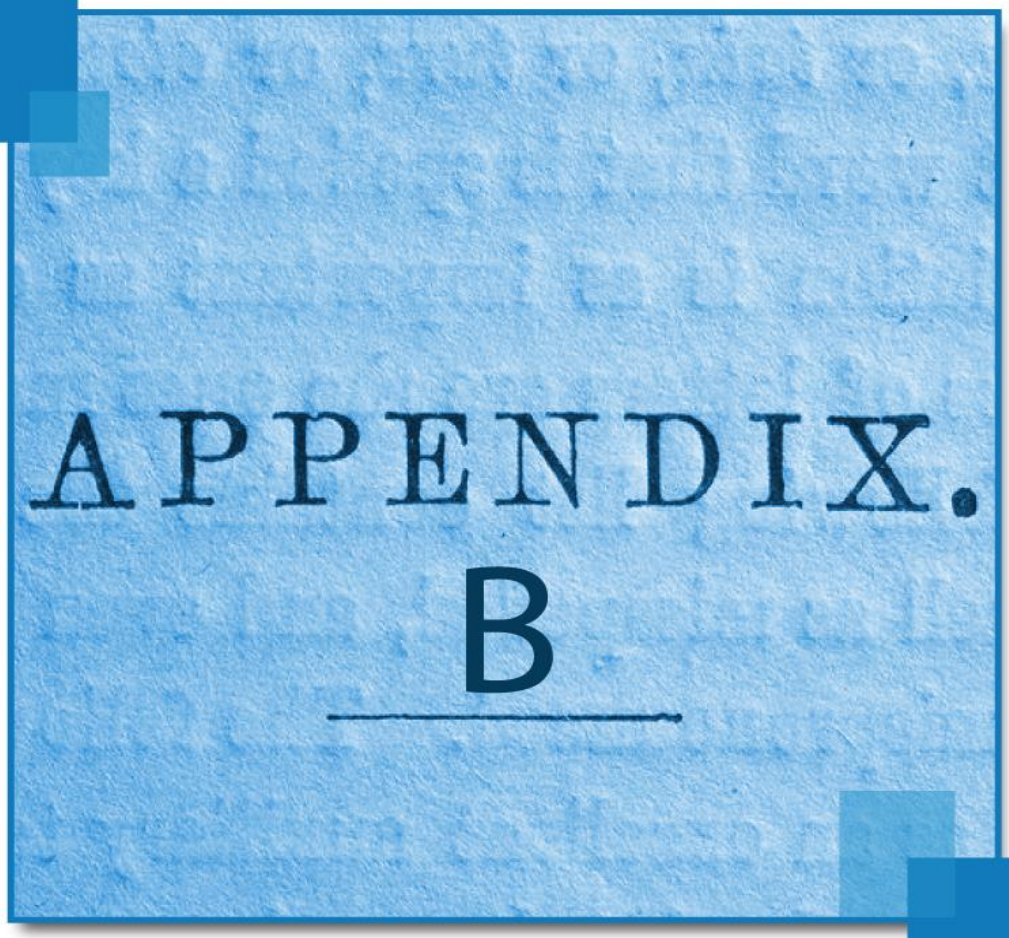
GATEWAYS

Exclusive	The values of the process are examined to determine which path to take	

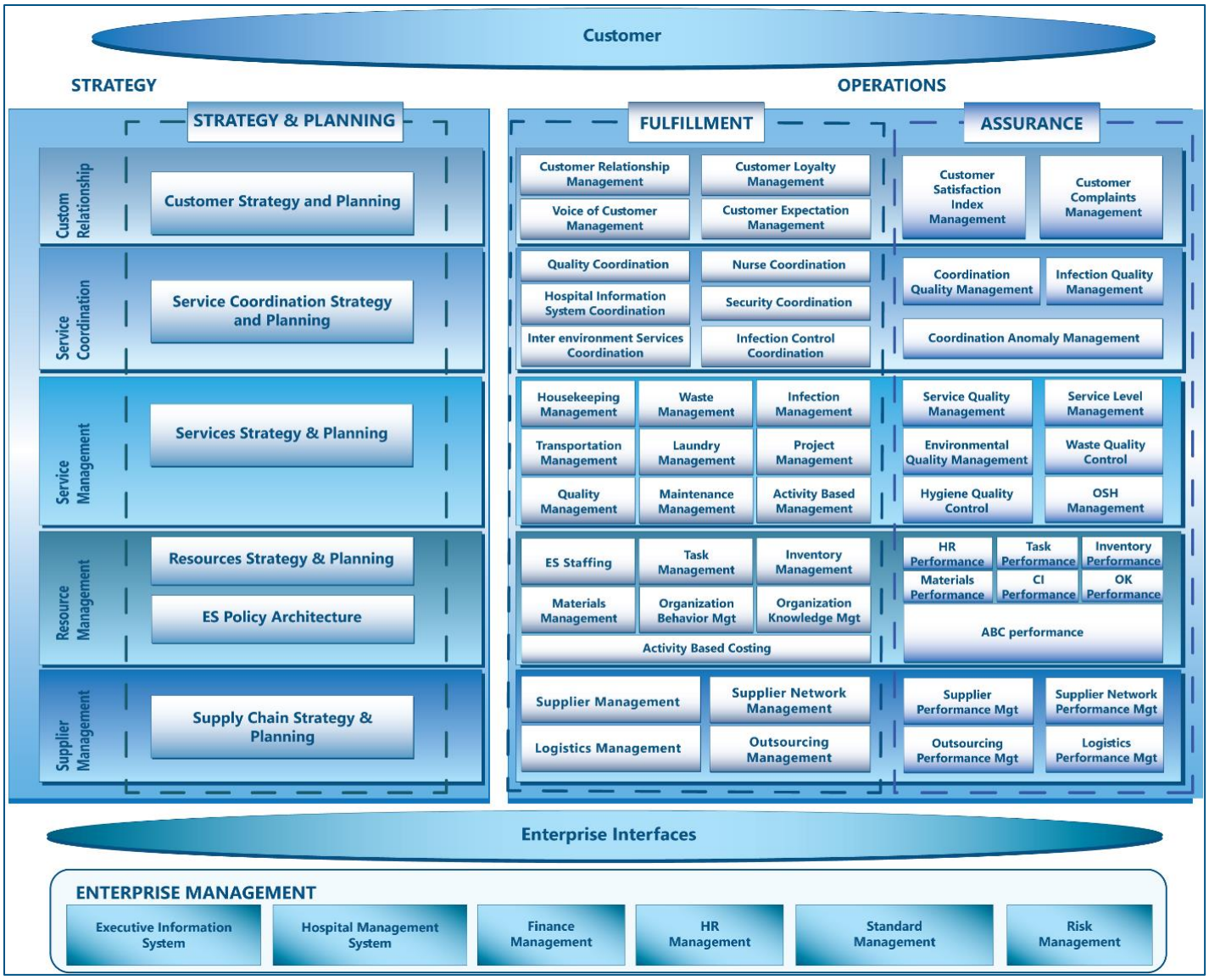
9 Appendix A: Business Process Modeling Notation Reference

Inclusive	Each branch will be evaluated and will not stop when one branch condition becomes true.	
Parallel	Provides a mechanism to synchronise parallel flow and to create parallel flow.	

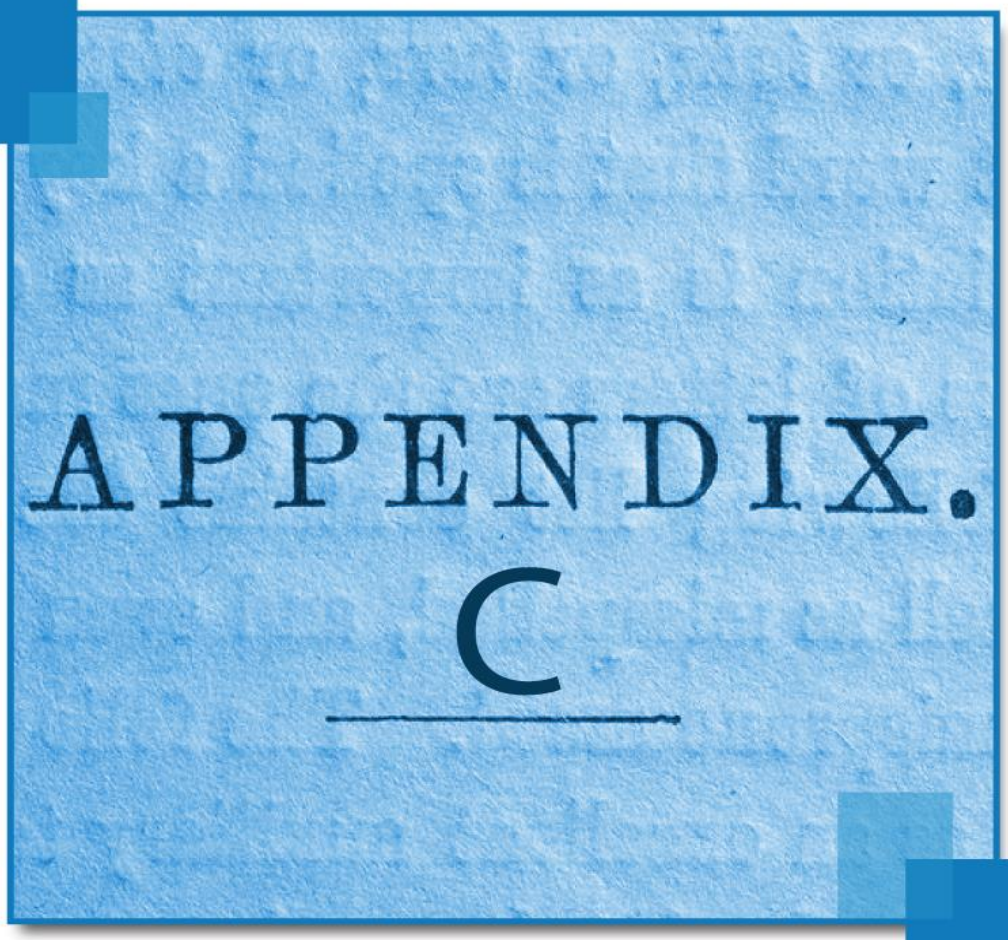
Appendix B: Environmental Service Map



10 Appendix B: Environmental Service Map



Appendix C: Chain of Infection



11 Appendix C: 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.

11 Appendix C: Chain of Infection

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.