CUSTOMER SERVICE MANAGEMENT (HELPDESK SERVICE MANAGEMENT)

QUALITY ASSURANCE PLAN: Project Background

Over the past decades, the problem of managing software changes has gained great attention from the Information Technology (IT) industry. The effort and attention of software change control management is being neglected or ignored, especially among fresh graduals. In the dynamic competitive IT environment in which a business competes and functions; IT organizations place great emphasis on operational process management ensuring software changes are systematically managed, controlled and tracked for better customer satisfaction, lesser reported bugs, increase in revenue growth and employee productivity gains.

However, the misconceptions of “operational process management” arise among project management teams and the technical teams. The technical teams (i.e. system analyst, senior analyst programmer, programmer, software engineers etc.) being overly focus and emphasize solely on the product or system output and neglect the “operational process management”. In many cases, technical teams are eager to push the system or software out of the door soonest possible and willing to sacrifice product quality.

The responsibilities of SCCM are seen to be shouldered by the project managers whereas the technical teams try extremely hard to escape. These irresponsible actions and wrong perceptions among IT specialists have created a burden for project managers over the past few years; not limiting to dollar and cents spend on rework but affecting team morale, motivation and company culture.

A Helpdesk or service desk is a one-stop point of contact that provides centralized information and support management service to handle a company’s internal or external queries. A helpdesk software solution enables the companies to resolve customer grievances faster and efficiently by simply automating the complaint resolution process with the ticket management system.

Why is Helpdesk Software Important?

Get the “help” you need to ensure no or minimal downtime. Whether it is the customer or the employees, no one appreciates when the system fails and the complaints are put on hold. Having a helpdesk system leaves a positive impact on multiple facets such as an improvement in customer satisfaction, increased agent productivity, and some of the operational/business benefits.

Customer Satisfaction

Customers want their query to resolve quickly and with minimal effort. Delight your customers by ensuring First contact resolution (FCR). Keep the customers informed by sending out timely updates about the status of their complaint. Moreover, make it easier for the customers to reach out for support via the channel of their preference. A helpdesk ticketing system creates a ticket for every customer interaction irrespective of the platform through which it originates.

Agent Productivity

Automating the repetitive task to help the agents to do more complex yet fulfilling work. Using the knowledge base, the agents can access a repository of information to help them solve the customer complaints effectively. Also, having a unified interface will enable the support executives to get a 360-degree view of the customer. Thus, enabling them to serve the customers better.

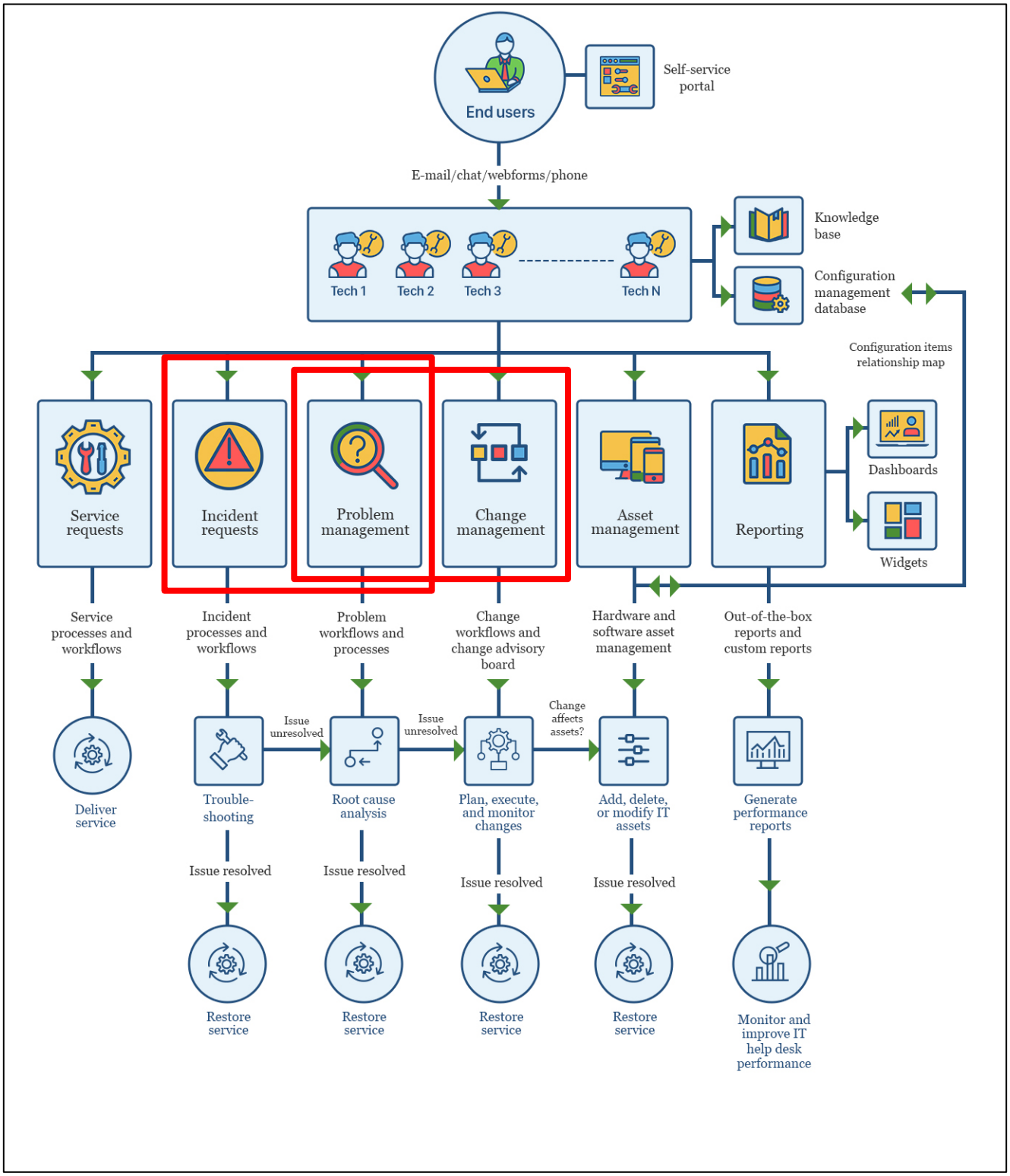
Business Operations

Streamline the operation to meet the SLAs and prioritize certain actions when required. Empowering the supervisor with intuitive graphs and data points to effectively monitor the functioning of the contact center. The supervisor gets to have a bird’s eye view of the operations and based on that data, can make informed decisions.

IT Helpdesk is a single (sometimes multiple) points of contact within the organization to cater to internal technical queries. This could also be a department in the organization which handles technical queries of the users. In the case of larger organizations, there are multiple levels to address the complaints. The L1 queries can be resolved using an FAQ repository.

Helpdesk for Ticket Management

Using a helpdesk ticketing system to create a ticket for every customer interactions and then, assigning, transferring and merging them for faster resolution. Prioritize the tickets with smart ticketing to expedite action based on the severity of the problem, duration since the ticket is pending or the availability of the customer. Whether it is an internal complaint or from an external customer, never lose out on an opportunity to resolve the query up to the satisfaction of the complainant.


End users
Self-service portal
E-mail/chat/webforms/phone
Tech 1
Tech 2
Tech 3
Tech N
Knowledge base
Configuration management database
Configuration items relationship map
Service requests
Incident requests
Problem management
Change management
Asset management
Reporting
Dashboards
Widgets
Service processes and workflows
Incident processes and workflows
Problem workflows and processes
Change workflows and change advisory board
Hardware and software asset management
Out-of-the-box reports and custom reports
Deliver service
Trouble-shooting
Issue unresolved
Root cause analysis
Issue unresolved
Plan, execute, and monitor changes
Change affects assets?
Add, delete, or modify IT assets
Generate performance reports
Issue resolved
Issue resolved
Issue resolved
Issue resolved
Restore service
Restore service
Restore service
Restore service
Monitor and improve IT help desk performance

SOFTWARE QUALITY ASSURANCE PLAN:

Project Quality Plan and Software Quality Assurance Plan

The goal of the quality assurance plan assignment is to provide students with a practical opportunity to plan a comprehensive quality assurance program for their software or project.

Students may work on this project in **groups** (students number to be determined later). Group projects will be given a single grade; **presentation grade vary for individual students**. You are free to choose your own groups. Expectations for the level of depth in the plan will be scaled to the quality of work; as a rule of thumb, your QA plan should be at least 20 – 30 pages (12-point single spaced) formatting (excluding process workflow and chartings).

NOTE: There are various sharing of URLs. These sharing are to aid of students' understanding in the areas of "Activities in PLC and SDLC", "Documents Inputs and Outputs within phases of PLC and SDLC", "IT project quality plan" and "IT software quality plan" area. Students are STRONGLY recommended to explore more videos, website, articles pertaining to relevant area of assignment purposes.

Project Activities and Project Documents: Within Phases of Project Life Cycle (PLC) and System Development Life Cycle (SDLC)

In reality, SCCM is the heart-of-quality and it should not be dealt separately for the technical teams. In short, both project managers and technical team are responsible for the change control process. Failure to deliver product on time results in cost overrun where rework is needed [1]. Since IT development process is expensive and labor intensive [3], it is always wise for the project team to follow a proven structured and systematic approach of SCCM to increase the success rate of product development.

In the broader view of project management, activities in the PLC and SDLC are dependent to each other. The compliance of tasks within phases of PLC or SDLC is interconnected to each other; where an input from a phase is transformed into an output; where these outputs later may also be input for subsequent phases or other phases in the PLC or SDLC.

Project Quality Plan

Quality can be defined as meeting the customer's expectations or exceeding the customer expectations achieved by way of deliverables and/or activities performed to produce those deliverables.

Project Quality Plan can be defined as a set of activities planned at the beginning of the project that helps achieve Quality in the Project being executed. The Purpose of the Project Quality Plan is to define these activities / tasks that intends to deliver products while focusing on achieving customer's quality expectations. These activities / tasks are defined on the basis of the quality standards set by the organization delivering the product.

Project Quality Plan identifies which Quality Standards are relevant to the project and determines how can they be satisfied. It includes the implementation of Quality Events (peer reviews, checklist execution) by using various Quality Materials (templates, standards, checklists) available within the organization. The holding of the Quality Event is termed as Quality Control. As an output of the various activities, Quality Metrics or Measurements are captured which assist in continuous improvement of Quality thus adding to the inventory of Lessons Learned. Quality Assurance deals in preparation of the Quality Plan and formation of organization wide standards.

Software Quality Assurance Plan

The purpose of this **Software Quality Assurance Plan** (SQAP) is to **define** the techniques, procedures, and methodologies that will be used at the organisation to assure timely delivery of the **software** that meets specified requirements within project resources.

Software Quality Assurance Plan (SQAP) consists of those procedures, techniques and tools used to ensure that a product (Hardware, Software, Services and Processes) meets the requirements specified in the **software** requirements specification.

Project Quality Plan versus Software Quality Assurance Plan

Project Quality Plan (PQP)

- It is a project level quality plan
- Project commitment to follow applicable set of standards, regulations, procedures and tools during SDLC
- Contains quality goals to be achieved
- SQP may contain new procedures for the project which are not defined in organisation SQA guide
- SQP may contain new tools being used in the project for SQA

Software Quality Assurance (SQA) Plan:

SQA Plan is an organisational quality guide:

- Process that ensures that developed software meets and complies with defined or standard quality specifications.
- Common Standards, regulations, and procedures to confirm work products during SDLC
- SQA is an ongoing process within the software development lifecycle (SDLC) that routinely checks the developed software to ensure it meets desired quality measures.
- SQA helps ensure the development of high-quality software.
- Organisational knowledge base of best practices
- Off-the-shelf software tools can be used
- Preventive activities

The Relationship of SQA, Quality Control and Testing

Software Quality Control (SQC):

- Set of activities for ensuring quality in software products
- Corrective activities
- Quality Control (QC) can be considered as a subset of Quality Assurance (QA)

Examples:

Reviews

1) Requirement Review
2) Design Review
3) Code Review
4) Deployment Plan Review
5) Test Plan Review
6) Test Cases Review

Testing

1) Unit Testing
2) Integration Testing
3) System Testing
4) Acceptance Testing

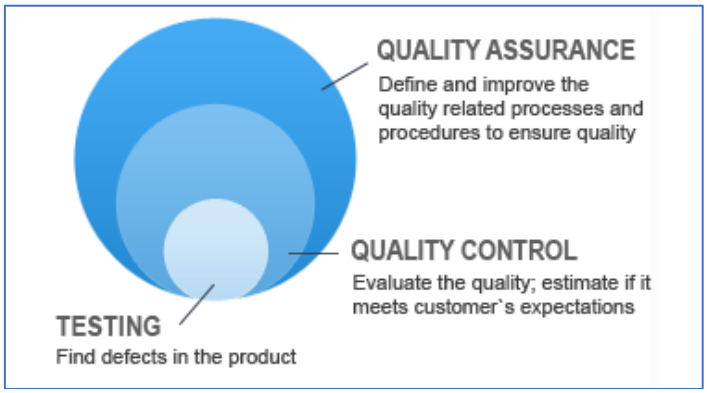


Fig. The relationship between SQA, QC and Testing

Software Quality Assurance Best Practice

Here are some best practices for an effective SQA implementation

- **Continuous improvement:** All the standard process in SQA must be improved **frequently** and made **official** so that the other can follow. This process should be **certified** by popular organization such as ISO, CMMI… etc.
- **Documentation:** All the QA policies and methods, which are defined by QA team, should be documented for training and reuse for future projects.
- **Experience:** Choosing the members who are seasoned SQA auditors is a good way to ensure the quality of management review
- **Tool Usage:** Utilizing tool such as the tracking tool, management tool for SQA process reduces SQA effort and project cost.
- **Metrics:** Developing and creating metrics to track the software quality in its current state, as well as to compare the improvement with previous versions, will help increase the value and maturity of the Testing process
- **Responsibility:** The SQA process is not the SQA member's task, but **everyone**'s task. Everybody in the team is responsible for quality of product, not just the test lead or manager.

NOTE: These are IMPORTANT practices when developing a SQAP.

Example: Software Change Control Management

Change Control is an important part of the project management process. With the pace of change today, it is almost certain that projects will face the demand for change during their life. While change may help ensure the project's alignment with business needs, it is important to consider and approve each change carefully.

The change control process in project management ensures that each change proposed during a project is **adequately defined, reviewed and approved before implementation**. The change control process helps avoid unnecessary changes that might disrupt services and also ensures the efficient use of resources.

Software Change Control normally contains five stages:
a) Proposing a Change
b) Summary of Impact
c) Decision
d) Implementing a Change
e) Closing a Change

(Haughey, D, 2011. What is Change Control, [online] Available at: https://www.projectsmart.co.uk/what-is-change-control.php, [Access: 13 Jan 2018].

A. Proposing a Change

This process gives the ability for anyone in the project team (including the customer) to suggest a change to the project. The proposal must include a **description of the change** and expected benefits or other reason for the change.

The change process can be viewed from TWO(2) perspective:
1. From client's Business Requirement List
2. From Helpdesk Support Management System

Upon receiving the change request from (1) and (2), the project team will plan and propose change(s) to system. The change control management involve internal processes and sub-processes within the company from proposing change(s), making the change(s), testing the change(s) and delivering the change(s) as system/patch release; all the way to system/patch implementation at client site.

The change is presented using various forms such as Change Form, which will be added to the Change Log for the project. Others forms like Test Form, Test Script, Software Release Note, Source Code Check-in/Out Log, Functional/Technical Specification etc.

B. Summary of Impact

The project manager, who will consider the overall effect on the project, covering the following items, carries out this process:
1) Quantifiable cost savings and benefits
2) Legal, regulatory or other unquantifiable reason for change
3) Estimated cost of the change
4) Impact on timescales

5) Extra resources needed
6) Impact on other projects and business activities
7) New risks and issues

After this assessment, the project manager recommends whether to carry out the change.

C. Decision

This process involves a review of the change request by an approved authority who will consider all the information provided by the project manager and person making the request. The decision will usually be:

- Accept
- Accept with comments and special conditions
- Reject
- Defer (change is not approved, but is left for consideration later)

D. Implementing a Change

If the change is approved it is planned, scheduled and executed at a time agreed with the stakeholders. As part of the planning, a regression test plan is needed in case the change needs to be backed out. After implementation, it is usual to carry out a post-implementation review.

E. Closing a Change

Once implemented, the requester checks and agrees on the change, and it is closed in the Change Log by the project manager.

According to Haughey, D, there are two documents used during the process:
1) **Change Log**: used to provide a record of all changes requested and decisions made
2) **Change Form**: used to document details of the change, including the business case (i.e. Software Change Request)

Following are some **sharing of process flow** (i.e. details and important fields for each process).

No	Description
1	**Project Document** • Whenever kick-start a new project, it is necessary to raise a “Project Document”. Project Document encompasses the followings: • Project Code • Project Description • Project Version • Project Team Members • Project Aims • Project Clients • Project Scope, etc.

2	**Functional/Technical Specification**
	• A brief functional specification is required when start-up a new project.
	• Functional/Technical Specification requires updates when there is:
	  • New files and/or Drop of existing files
	  • New classes and/or Drop/Replacement of classes
	  • New store-procedure and/or Drop of store-procedures
	  • New global/local variables and/or Drop of global/local variables, etc.

3	**Change Request Form** • All changes make to a project MUST have an approve “Change Request Form”. • All “Change Request Form” numbers are unique and must be recorded • Change Request Form is the link between “Business Requirement List” and to all project documentations for a project • Items to be included in the Change Request Forms are:

No	Description
	○ Change Request No ○ Client Call Tracking No (CCT No) or Incident Tracking No ○ Change Type (Fault, Enhancement, Request) ○ Change Request Level (Low, Medium and High) ○ Impact Level (Low, Medium and High) ○ Date ○ Change Description/Analysis ○ Files Affected ○ Duration of Change ○ New/Drop of Files, Variables (Global/Local) ○ Analysis By ○ Change Perform By ○ Testing Required (Outline) ○ Coding Effort ○ Testing Effort ○ Approve By, etc.
4	**Configuration Management** • Source-code check-in should be **programmer independent**. • List of source-code files to be checked-in must be mapped with "Change Form" • The check-in file must be the working file in server, which has been merged by programmers (if more than one change request for single source file) or being tested by all testers.
5	**Testing (Unit Testing)** • A formal "Test Script" is required for EACH "Change Form" • Failed test cases/scenarios must be re-tested with latest source-file until it pass • All test form must be mapped to change form • One CF with one Test Script. One Test Script contains multiple rows of record. Each record may represent a test case, test scenario or test condition or vice versa. • All testing by team members MUST be reviewed by a team project whom has higher seniority than tester • All test cases, test scenarios, test conditions etc. MUST have physical proof; i.e. screen capture and paste into MS-Word • However, for UI testing, evidence of screen shots are mandatory • All Change Form MUST have at least one pass test form (softcopy or hardcopy)

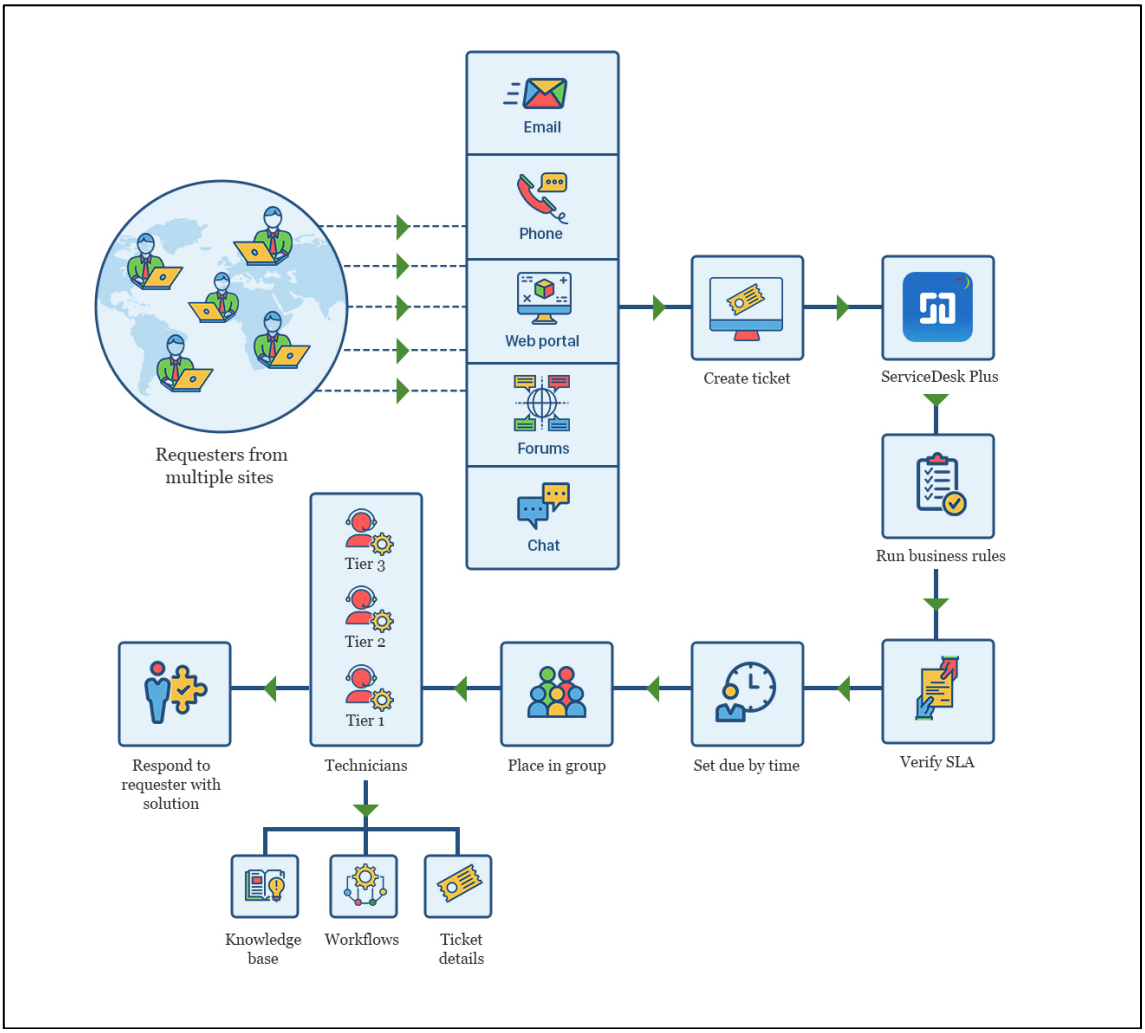
6	**Software Release Note (SRN)**
	• All Change Forms MUST be listed in the Software Release Note
	• Changes without Change Forms is not allowed to check-in as well as not allow to release
	• Need to prepare a "SRN Checklist" to ease of software release
	• To add-on following fields:
	  • Affected Clients
	  • Affected Client Call Tracking No (CCT No) or Incident Tracking No
	  • Functional Specification (Y / N)

7	**Post Release (System-release and Patch-release)**
	• A meeting of lesson-learn with all team members with official minutes is mandatory
	• Items for discussion are:
	  ○ What are the things/events/items/scenario that the team has done wrong?
	  ○ What are the things/events/items/scenario that the team has done right?
	  ○ What are the things/events/items/scenario that the team needs improvement?

Assignment: Project Background

Your company, an IT Software House; would like to strengthen its core values of providing world class customer support services to his customer. This helpdesk services will handle, manage, track and monitor all the incoming project-related activities via the helpdesk management system. You as the person incharge, Customer Support Manager will liaise with Software Development Project Manager after the release of each “system release” and/or “patch release”.

A team of customer support executives or helpdesk support executives will work as a team **handling all the incoming request, inquiry, reporting from end-users pertaining to ALL software of the company**.



The helpdesk management systems offers numerous benefits to the support teams, a few key benefits are listed below:

- Centralized control of all IT operations.
- A comprehensive knowledge base to help end users and technicians alike with known and approved solutions to common issues.
- Automated processes and workflows that reduce time, effort, and errors.
- Simplified communication through emails from within the application as well as notifications.
- Native problem, change, and asset management capabilities in addition to incident and service request management.
- Tracking KPIs and metrics and generating in-depth reports.

The company aims to file its Customer Support Services for ISO 9001:2018 certification in year 2022. The company has decided to prepare for ISO certification and you as the Customer Support Manager for the company were directed to work with the Department of Quality Assurance and Software Development Project Manager to develop a **complete and comprehensive customer service quality plan and customer service quality assurance plan** in preparation the company for Customer Service ISO certification by 2022.

Hints and Tips: IT Documentation Framework Definitions

Policy: A formal, brief, and high-level statement or plan that embraces an organization's general beliefs, goals, objectives, and acceptable procedures for a specified subject area. Policies always state required actions, and may include pointers to standards. Policy attributes include the following:

- Require compliance (mandatory)
- Failure to comply results in disciplinary action
- Focus on desired results, not on means of implementation
- Further defined by standards and guidelines

Standard: A mandatory action or rule designed to support and conform to a policy.

- A standard should make a policy more meaningful and effective.
- A standard must include one or more accepted specifications for hardware, software, or behavior.

Guideline: General statements, recommendations, or administrative instructions designed to achieve the policy's objectives by providing a framework within which to implement procedures.

- A guideline can change frequently based on the environment and should be reviewed more frequently than standards and policies.
- A guideline is not mandatory, rather a suggestion of a best practice. Hence "guidelines" and "best practice" are interchangeable

Procedures: Procedures describe the process: who does what, when they do it, and under what criteria. They can be text based or outlined in a process map. Represent implementation of Policy.

- A series of steps taken to accomplish an end goal.
- Procedures define "how" to protect resources and are the mechanisms to enforce policy.
- Procedures provide a quick reference in times of crisis.
- Procedures help eliminate the problem of a single point of failure.
- Also known as a SOP (Standard Operating Procedure)

Work Instructions: Describe how to accomplish a specific job. Visual aids, various forms of job aids, or specific assembly instructions are examples of work instructions. Work instructions are specific.

Forms and Other Documents: Forms are documentation that is used to create records, checklists, templates, surveys, or other documentation used in the creation of a product or service. Records are a critical output of any procedure or work instruction and form the basis of process communication, audit material, and process improvement initiatives.

Helpdesk Support Management Systems

Helpdesk Support Management Systems (HSMS) is a concept that enables an organization to maximize business value from the use of information technology. HSMS positions IT services as the key means of **delivering and obtaining value**, where an internal or external IT service provider works with business customers, at the same time taking responsibility for the associated costs and risks. ITSM works across the whole lifecycle of a service, from the original strategy, through design, transition and into live operation.

To IT Software House, HSMS provide ticketing assistance management to monitor, track and control massive communication electronically with end-users. To ensure sustainable quality of IT services, HSMS establishes a **set of practices**, or processes, constituting a **service management system**. There are **industrial**, **national** and **international standards** for IT service management, setting up requirements and good practices for the management system.

HSMS is based on a set of principles, such as **focusing on value** and **continual improvement**. It is not just a set of processes – it is a cultural mindset to ensure that the desired outcome for the business is achieved. The HSMS business models nowadays incorporates principles and practices from various management approaches, such as lean manufacturing, organizational change management, system analysis and risk management.

Let's focus on the following three processes of the HSMS:
1) Incident Management.
2) Problem Management
3) Change Management

Incident Management

Objective: Manage, track and monitor the Ticket Workflow Process, Improve IT Help Desk Efficiency.

- Cover every step of the ticket life cycle right from categorization to technician assignment by using business rules stated the Service Level Agreemenet (SLA)
- Make sure that no ticket is left unassigned by automatically assigning tickets to technicians based on pre-determined internal assignment mechanism
- Communicate better with end users with timely and/or automated notifications that use custom email templates.
- Reduce the rate of repeat incidents by defining closure rules to ensure effective resolution.
- Reduce service disruptions, meet your SLAs, improve technicians' productivity, and **manage the entire life cycle of a ticket**

Problem Management

Objective: Reduce Incident Volumes and Service Desk Burden

- Analyze the root cause of problems and reduce recurring incidents
- Make announcements on problems and avoid duplication of incident tickets.
- Maintain known error records and enable users to search for them in the database
- Enable technicians to close a problem and trigger an automatic closure of all linked incidents.
- Publish an effective knowledge base articles on resolved problems for future reference.
- Identify problem trends with insightful, easy-to-generate reports and come up with permanent solutions.

Change Management

Objective: Customize Software Change Control Workflow process

- Handle standard, emergency, and critical changes separately with unique and customizable workflows aligned to HSMS.
- Break down software changes into various custom stages, and assign these stages their own statuses.

- Build Change Flows with actions like approvals, notifications, field updates etc.
- Associate predefined software change control templates, forms, procedure, SOP, policies, guidelines etc. to preconfigured workflows to instantly trigger a change upon submission.

The change management will be implemented at the technical level where the Software Development Project Manager will take over the software changes responsibility from the helpdesk support. Software Change Control is implemented within PLC and SDLC. In the broader view of project management, activities in the PLC and SDLC are dependent to each other. The compliance of tasks within phases of PLC or SDLC is interconnected to each other; where an input from a phase is transformed into an output. These outputs may also be input for other phases in the PLC or SDLC.

There is an overall view of relationship between IT Processes, IT Products and IT Services within the PLC and SDLC. IT Processes as the heart-of-quality which involves a series of stages/phases transforming/converting input into output. These outputs may also be inputs for other phases further on. The same process repeats by traversing each phase of the SDLC within the PLC. This is applicable in the SQA context of IT Project management where output from a stage of PLC will be an input to next phase of PLC or SDLC. All projects are mandated to traverse across the stages/phases of IT Process consisting x-number of Project Life Cycle and SDLC depending on the business nature.

In short, both the Support Team and Technical Team should view all project activities (activities of SDLC within PLC) as ONE dependent entity within the product life cycle. This could lead to better controlling, managing and handling of product quality and customer satisfaction. To further stressed on the strong and linear relationship between PLC and SDLC; where the ability to properly manage one segment (or stage) will result in overall performance improvements ranging from output quality, delivery, satisfaction, sustain for improvement competitiveness. This implies to SSCM.

Part A: (100 marks)

Assuming you have been promoted to the new role of Helpdesk Support Manager for the Software House. There are various on-going projects in the organization; the clients community groups are spread over the South-East Asia countries (i.e. Thailand, Singapore, Vietnam, Indonesia, Philipines, Cambodia, Myanmar, Laos and Brunei).

The company is managing all the client calls and feedback via the centralized Helpdesk Support Management Systems (HSMS). In the Year 2020, the helpdesk support services achieved 69% of the Client Satisfaction Index (CSI); where the company target of helpdesk support services is 85% annually. As a newly promoted Helpdesk Support Manager, you are required to look into CSI rating seriously.

You are required to perform the following task and present to the management for feedback and recommendation:

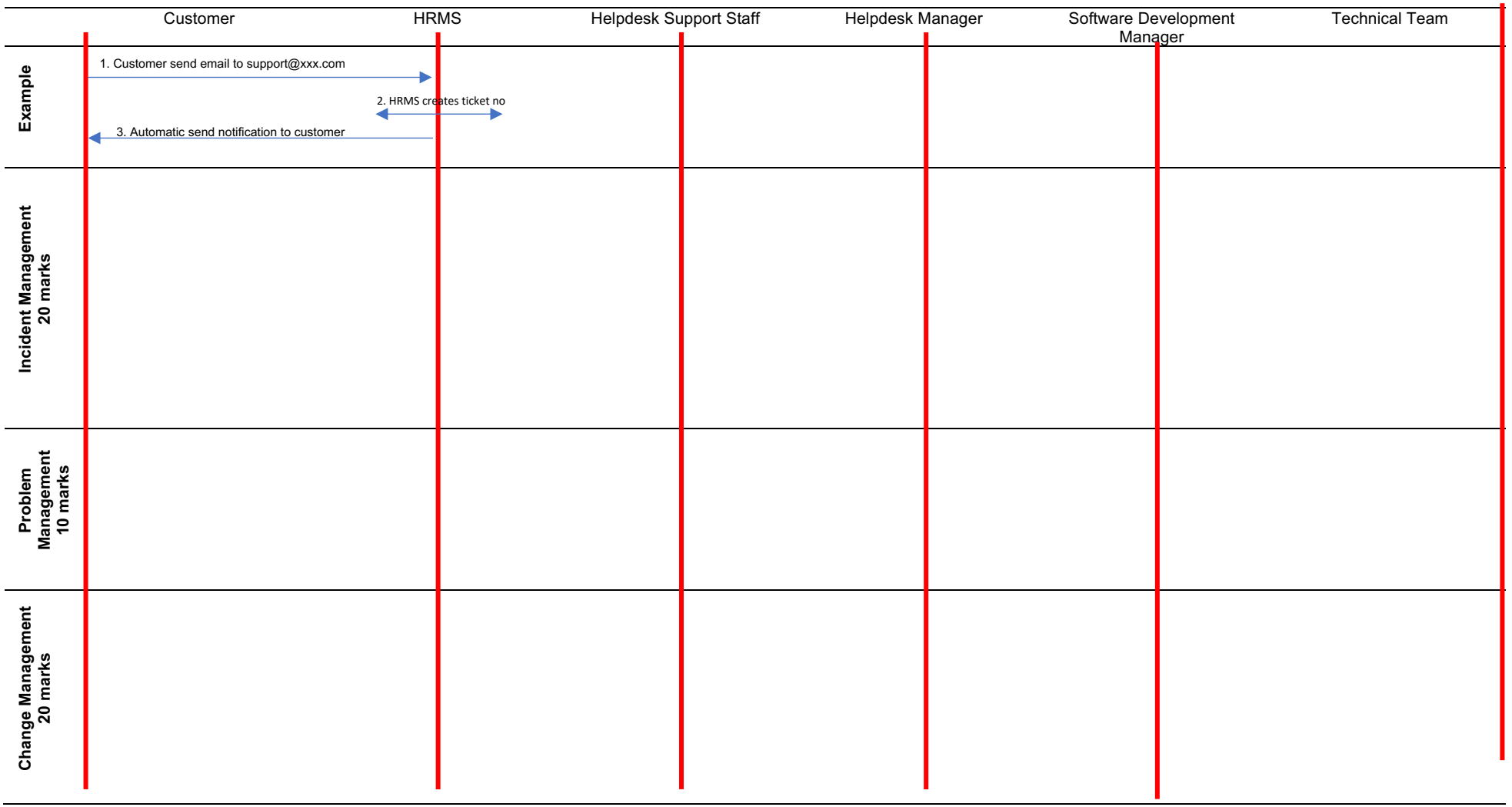
A1. Provide a broad overview of activities flow between the Helpdesk Support Management Systems and the Software Development Team; particularly **manage the entire life cycle of a ticket (until ticket closure)** (50 marks)

Note: You are required to place the numbering of EACH activities

A2. Provide a broad overview of project management activities flow to take over the management of "software change control" from the helpdesk management support team. (50 marks)

Followings are series of project activities (not in chronological sequence), you are required to place the correct activities in the relevant phase(s) of PLC versus SDLC as per provided tabular template in the example section.

Part A (Q1)


Customer
HRMS
Helpdesk Support Staff
Helpdesk Manager
Software Development Manager
Technical Team
Example
1. Customer send email to support@xxx.com
2. HRMS creates ticket no
3. Automatic send notification to customer
Incident Management 20 marks
Problem Management 10 marks
Change Management 20 marks

Part A Q2 (50 marks)(2 marks x 25)

Followings are series of project activities (not in chronological sequence), you are required to place the correct activities in the relevant phase(s) of PLC versus SDLC as per provided tabular template in example section.

1	Perform Design Analysis on CR Form	14	Business Case sign-off
2	UAT Sign-off	15	Charter Sign-off
3	Develop WBS	16	Transform items in BC to CR Form
4	Perform Analysis on CR Form	17	Bugs Fixing
5	Develop Unit Test Plan, System Test Plan, Integration Test Plan, UAT Plan	18	Review and Approve Unit Test, System Test, Integration Test
6	Design and Develop Prototype	19	Approve Software Release Note
7	Develop Project Schedule	20	Annual Audit
8	Fill Test Form	21	Retest failed Test Form
9	Prepare Software Release Note	22	Send email notification on Patch release
10	Code Walkthrough	23	Conduct Conformance Audit
11	Helpdesk Management System take over after Patch release	24	Check-in source code
12	Review and Approve Unit Test Plan, System Test Plan, Integration Test Plan, UAT Plan	25	IQA Audit
13	Review and Approve CR Form		

FOR ILLUSTRATION ONLY

PLC vs SDLC		Software Change Control Management: Project Life Cycle (PLC) Activities				
		Initiation	**Planning**	**Execution**	**Monitoring & Control**	**Project Closure**
Software Change Control Management: System Development Life Cycle (SDLC) Activities	**Planning**	(1) Develop WBS	(4) Transform items in BC to CR Form (5) Transform CR Form to Change Log (7) Conduct Conformance Audit			
	Analysis	(2) Produce Unit Test Plan				
	Design					
	Implementation	(3) Conduct System Test	(6) Check-in source code			
	Maintenance					

PLC vs SDLC		Software Change Control Management: Project Life Cycle (PLC) Activities				
		Initiation	Planning	Execution	Monitoring & Control	Project Closure
Software Change Control Management: System Development Life Cycle (SDLC) Activities	Planning					
	Analysis					
	Design					
	Implementation					
	Maintenance					

Part B (100 marks)

Part B1: Helpdesk Support Management Plan (50 marks)

Develop a customer support quality management plan for the IT Software House. Using the information from Part A, you are required to perform **tracking, monitoring and reviewing** the followings project activities:

a) **Helpdesk Support Quality Manual** with the combination of workflow, process flow, policy, standard, guideline, procedure and work instructions for the following project activities: **(40 marks)**
- Incident Management (4 x workflows and relevant documentations*)
- Problem Management (3 x workflows and relevant documentations*)
- Change Management (2 x workflows and relevant documentations*)

b) **Forms template** related to Part B1: **(10 marks)**
I. Incident Management (3 x Comprehensive Forms)
II. Problem Management (2 x Comprehensive Form)
III. Change Management (2 x Comprehensive Form)

Part B2: Software Change Control Quality Plan (50 marks)

Develop a software change control plan for the IT Software House. Using the information from Part A, you are required to perform **tracking, monitoring and reviewing** of tickets received from the helpdesk support management system:

a) **Software Change Control Quality Manual** with the combination of workflow, process flow, policy, standard, guideline, procedure and work instructions for the following project activities: **(40 marks)**
- Bug Fixes Handling (4 x workflows and relevant documentations*)
- Testing Handling (2 x workflows and relevant documentations*)
- Software Release Handling (1 x workflows and relevant documentations*)
- Lesson Learnt (1 x workflow and relevant documentations*)

b) **Forms template** related to Part B1: **(10 marks)**
I. Bug Fixes Handling (2 x Comprehensive Forms)
II. Testing Handling (2 x Comprehensive Form)
III. Software Release Handling (2 x Comprehensive Form)
IV. Lesson Learnt (1 x Comprehensive Form)

* Denotes any combination of process flow, policy, standard, guideline, procedure and work instructions

Assignment Submission Checklist

- ☐ **Cover Page (Provided by the lecturer, WBLE)**
- ☐ Part A (A1 & A2)
- ☐ Part B (B1 & B2)
- ☐ Title Page
- ☐ Table of Content
- ☐ Reference Document (**MUST have**)
- ☐ **Via WBLE (Part A and Part B)**