IT Service Management

Incident/Problem Management Methods and Service Desk Implementation Best Practices

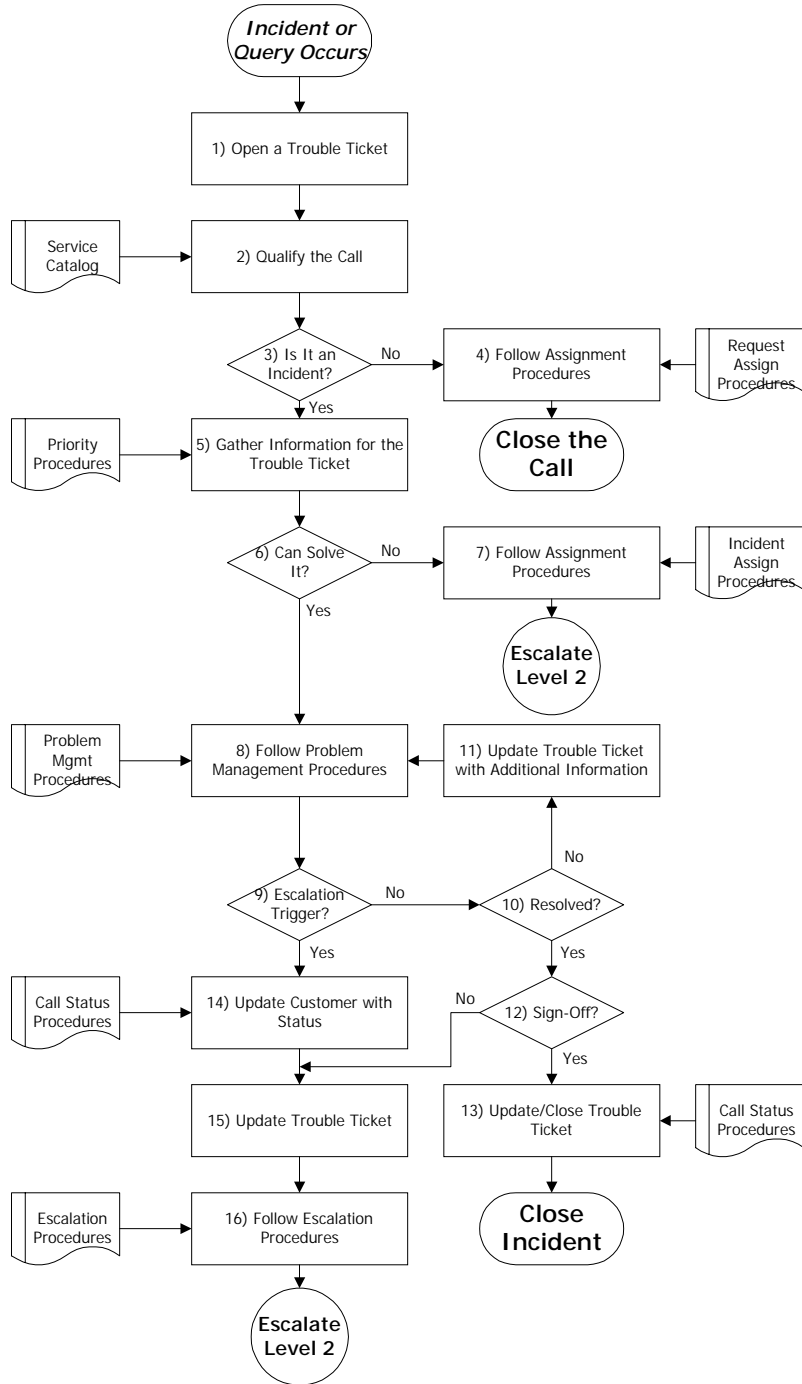## White Paper

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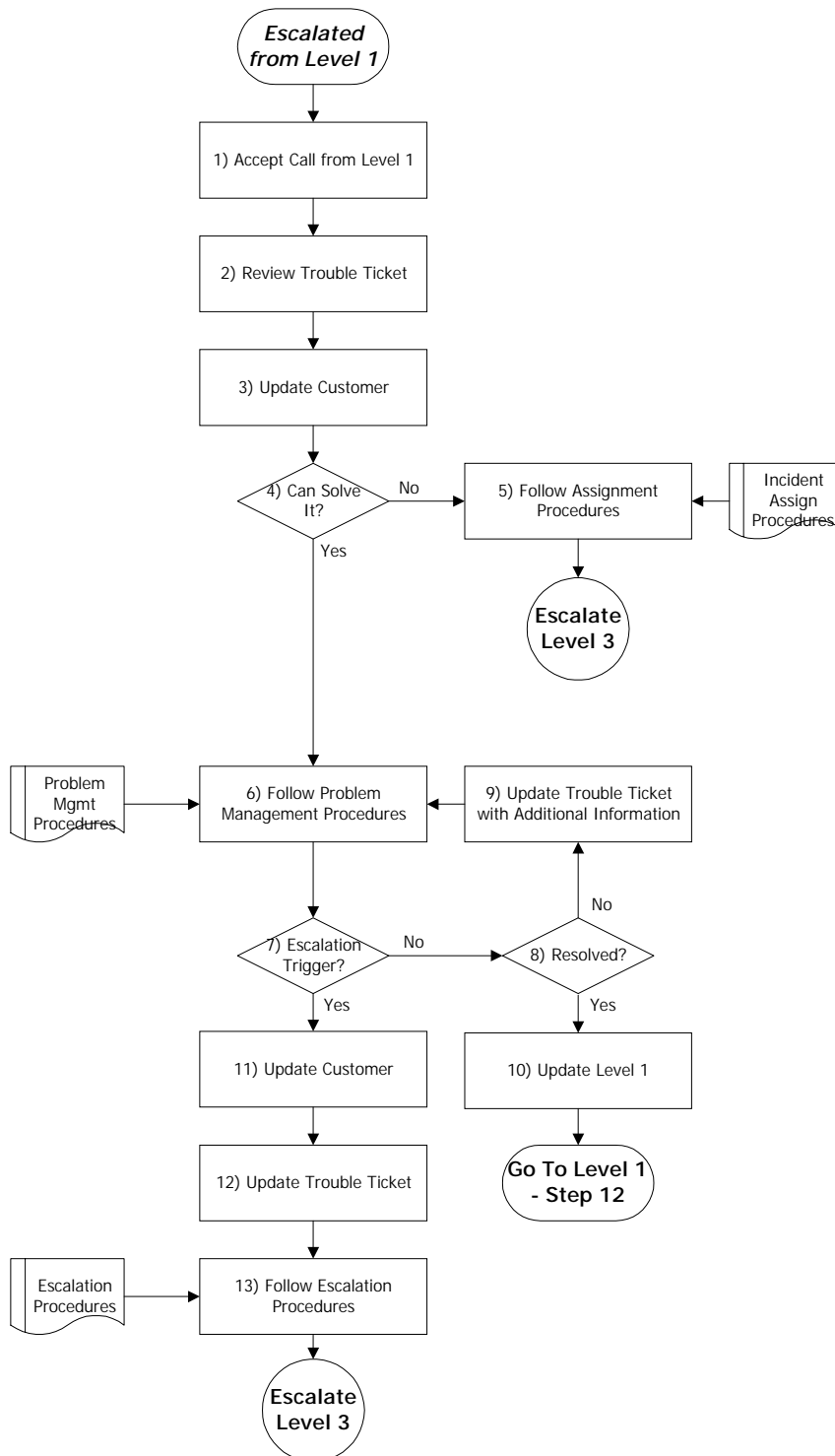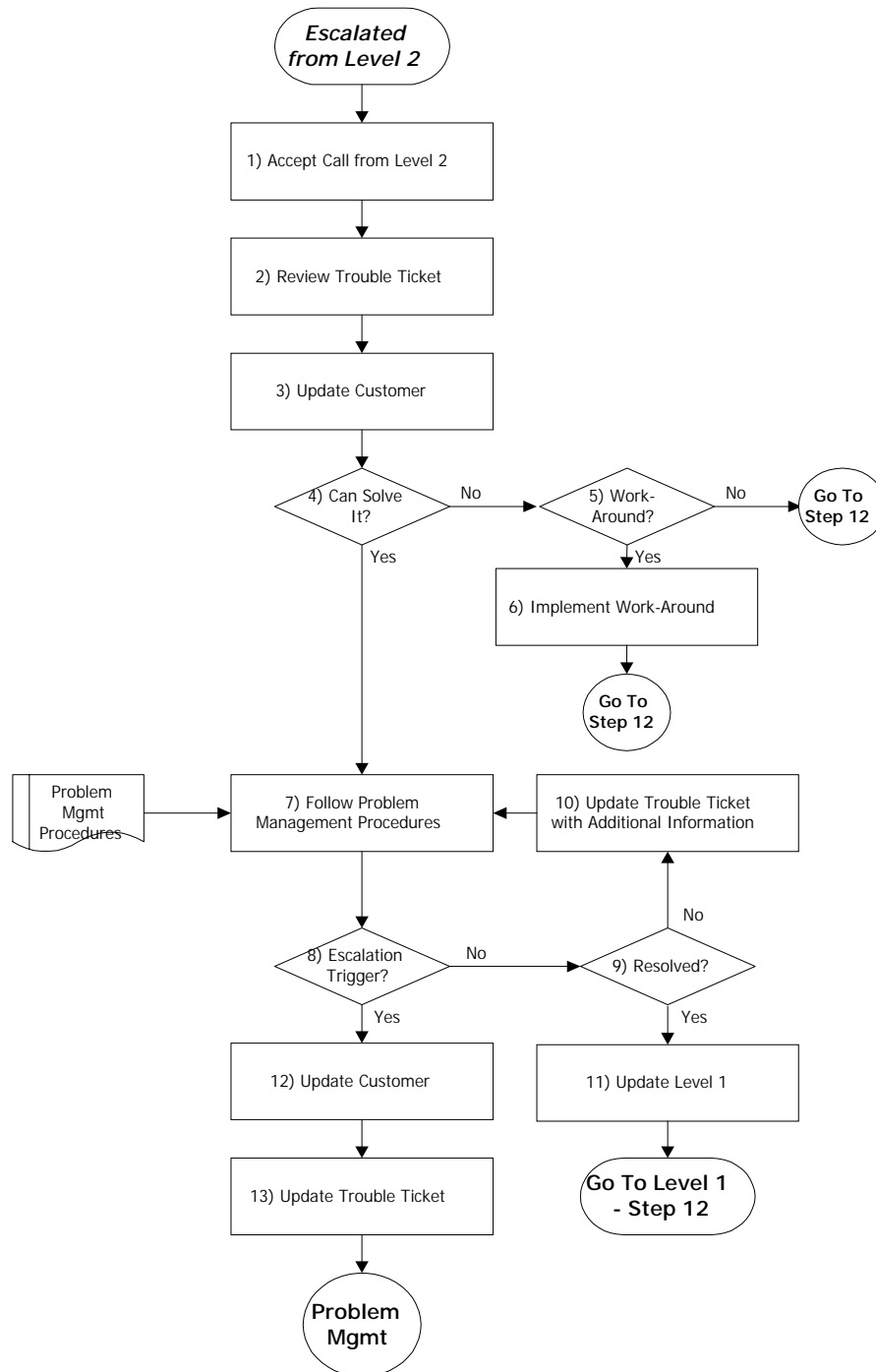November 8, 2003

Service Desk and Incident Management

High Level Service Desk Incident Control Process - Level 1

Incident or Query Occurs

1) Open a Trouble Ticket

Service Catalog → 2) Qualify the Call

3) Is It an Incident? — No → 4) Follow Assignment Procedures ← Request Assign Procedures

Close the Call

Yes

Priority Procedures → 5) Gather Information for the Trouble Ticket

6) Can Solve It? — No → 7) Follow Assignment Procedures ← Incident Assign Procedures

Escalate Level 2

Yes

Problem Mgmt Procedures → 8) Follow Problem Management Procedures ← 11) Update Trouble Ticket with Additional Information

No

9) Escalation Trigger? — No → 10) Resolved?

Yes

Call Status Procedures → 14) Update Customer with Status

Yes

12) Sign-Off? — No

15) Update Trouble Ticket

13) Update/Close Trouble Ticket ← Call Status Procedures

Yes

Escalation Procedures → 16) Follow Escalation Procedures

Close Incident

Escalate Level 2

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High Level Service Desk Incident Control Process - Level 2

```
                    ┌──────────────┐
                    │  Escalated   │
                    │ from Level 1 │
                    └──────────────┘
                            │
                            ▼
                 ┌──────────────────────┐
                 │ 1) Accept Call from Level 1 │
                 └──────────────────────┘
                            │
                            ▼
                 ┌──────────────────────┐
                 │ 2) Review Trouble Ticket │
                 └──────────────────────┘
                            │
                            ▼
                 ┌──────────────────────┐
                 │ 3) Update Customer │
                 └──────────────────────┘
                            │
                            ▼
                       4) Can Solve        No      ┌──────────────────────┐      ┌──────────────┐
                          It?         ─────────►   │ 5) Follow Assignment │ ◄─── │  Incident    │
                            │                      │    Procedures         │      │  Assign      │
                           Yes                     └──────────────────────┘      │  Procedures  │
                            │                                 │                  └──────────────┘
                            │                                 ▼
                            │                          ┌──────────────┐
                            │                          │   Escalate   │
                            │                          │   Level 3    │
                            │                          └──────────────┘
                            ▼
  ┌──────────┐    ┌──────────────────────┐      ┌──────────────────────────┐
  │ Problem  │───►│ 6) Follow Problem     │ ◄─── │ 9) Update Trouble Ticket │
  │ Mgmt     │    │ Management Procedures │      │ with Additional Information│
  │Procedures│    └──────────────────────┘      └──────────────────────────┘
  └──────────┘               │                              ▲
                             │                             No
                             ▼                              │
                       7) Escalation    No            8) Resolved?
                          Trigger?     ─────────►
                             │                              │
                            Yes                            Yes
                             │                              │
                             ▼                              ▼
                 ┌──────────────────────┐      ┌──────────────────────┐
                 │ 11) Update Customer  │      │ 10) Update Level 1   │
                 └──────────────────────┘      └──────────────────────┘
                             │                              │
                             ▼                              ▼
                 ┌──────────────────────┐          ┌──────────────┐
                 │ 12) Update Trouble Ticket │      │ Go To Level 1 │
                 └──────────────────────┘          │  - Step 12    │
                             │                      └──────────────┘
                             ▼
  ┌──────────┐    ┌──────────────────────┐
  │Escalation│───►│ 13) Follow Escalation │
  │Procedures│    │     Procedures        │
  └──────────┘    └──────────────────────┘
                             │
                             ▼
                       ┌──────────────┐
                       │   Escalate   │
                       │   Level 3    │
                       └──────────────┘
```

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High Level Service Desk Incident Control Process - Level 3

```
                        ┌─────────────────┐
                        │   Escalated     │
                        │  from Level 2   │
                        └─────────────────┘
                                 │
                        ┌─────────────────────┐
                        │ 1) Accept Call from │
                        │      Level 2        │
                        └─────────────────────┘
                                 │
                        ┌─────────────────────┐
                        │ 2) Review Trouble   │
                        │       Ticket        │
                        └─────────────────────┘
                                 │
                        ┌─────────────────────┐
                        │ 3) Update Customer  │
                        └─────────────────────┘
                                 │
                    4) Can Solve   No    5) Work-    No    Go To
                        It?      ──────►  Around?  ──────► Step 12
                         │                   │
                        Yes                 Yes
                                             │
                                  ┌──────────────────────┐
                                  │ 6) Implement          │
                                  │    Work-Around        │
                                  └──────────────────────┘
                                             │
                                          Go To
                                          Step 12

  Problem          7) Follow Problem        10) Update Trouble Ticket
   Mgmt      ───►  Management Procedures ◄── with Additional Information
 Procedures
                         │                            ▲
                                                     No
                   8) Escalation   No    9) Resolved?
                      Trigger?   ──────►
                         │                   │
                        Yes                 Yes
                                             │
            ┌─────────────────────┐   ┌─────────────────────┐
            │ 12) Update Customer │   │ 11) Update Level 1  │
            └─────────────────────┘   └─────────────────────┘
                         │                       │
            ┌─────────────────────┐        Go To Level 1
            │ 13) Update Trouble  │          - Step 12
            │       Ticket        │
            └─────────────────────┘
                         │
                     Problem
                      Mgmt
```

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Process Description

Refer to the High Level Service Desk Incident Control Process maps for a graphical representation of the process.

Service Desk Incident Control Process – Level 1
Customer has an incident or request. Customer provides correct information when placing call to Level 1 Support. (i.e., The customer is educated on what is expected of them before calling Level 1 Support. For example, Login ID, computer system, application, etc.)

1) **Open Trouble Ticket.** Upon receiving an incident call (or request) from a customer, the Level 1 Support Specialist enters the customer information into a trouble ticketing system.

2) **Qualify the Call.** The Level 1 Support Specialist refers to a predefined list of qualifying criteria and the Service Catalog to assist the specialist in qualifying the type of call being logged (i.e. incident, informational request, enhancement request, Request For Change (RFC), etc.). Note that regardless of whether the call is "qualified" to receive; it is logged anyway, thus ensuring that Incident Control metrics and service reports will be current and accurate.

3) **Is It an Incident?** The Level 1 Support Specialist determines whether this call is an incident or a request for some type of information or procedure. If it is not an incident, proceed to 4. If it is an incident proceed to 5.

4) **Follow Assignment Procedures for Requests.** The Level 1 Support Specialist reviews the Request Assignment Procedures documentation and refers the request to the appropriate location. Proceed to:
    > **Close Call.** With the call complete, the Level 1 Support Specialist can close it in the system following the documented procedures for the service provided on this type of request.

5) **Gather Incident Information Required in Trouble Ticket.** The Level 1 Support Specialist fills in the appropriate fields in the trouble ticket with information from the customer. Refer to the Prioritization Procedures for information on setting the priority of the call. Setting the priority begins the "clock" for any conditions associated with that priority, such as the requirement to resolve the incident within a certain length of time. Proceed to L1.7.

6) **Can Service Desk Solve It?** The Level 1 Support Specialist solves the incident if this is a supported service type. If they know the answer, proceed to 8. If they cannot provide resolution on this incident based on the type and/or skill required, the incident is assigned to Level 2. Proceed to 7.

7) **Follow Assignment Procedures for Incidents.** The Level 1 Support Specialist refers to the Incident Assignment Procedures document and routes the call to the appropriate Level 2 contact. Proceed to:

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Escalate to Level 2. At this stage the responsibility for resolving the incident passes to the Level 2 Support Specialist, however the responsibility for final customer contact to close out the call remains with the Level 1 Specialist.

8) **Follow Problem Management Procedures.** The Level 1 Support Specialist consults with the Problem Management Procedures for problem resolution and proceeds to 9.

9) **Is an Escalation Condition Triggered?** If any condition established in the escalation procedures is met, proceed to 14, if not proceed to 10.

10) **Is the Problem Resolved?** If yes, proceed to 12, if not continue with resolution procedures by proceeding to 11.

11) **Update Trouble Ticket with Additional Information.** Continuous update of resolution actions taken must be documented in the trouble ticket.

12) **Customer Sign-off?** If yes, proceed to 13. If no, proceed to 15.

13) **Update/Close Trouble Ticket.** The Level 1 Support Specialist must update the trouble ticket with the appropriate information before it can be closed. Proceed to:

Close Incident. With the incident complete, the Level 1 Support Specialist can close the trouble ticket.

14) **Update the Customer with Status.** Level 1 refers to the Call Status Procedures and the customer is provided status information on the call, (i.e. it is being escalated and is now with Level 2, Level 1 retains ownership of the call).

15) **Update Trouble Ticket.** The Level 1 Support Specialist must update the trouble ticket with appropriate information before the incident can be escalated to the next level. Proceed to 16.

16) **Follow Escalation Procedures.** The Level 1 Support Specialist refers to the Escalation Procedures document and escalates the call to the appropriate Level 2 contact. Proceed to:

Escalate to Level 2. At this stage the responsibility for resolving the incident passes to the Level 2 Specialist, however the responsibility for final customer contact and closure of the call remains with the Level 1 Specialist.

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Service Desk Incident Control Process – Level 2

1) **Accept Call from Level 1.** The Level 2 Support Specialist receives assigned and escalated incidents from Level 1 when the Level 1 Specialists cannot resolve an incident according to the conditions set in the escalation procedures, or they require additional, more specialized skills to fix the problem. At this point the responsibility for resolving the incident, and for communicating the resolution to Level 1, passes to the Level 2 Support Specialist. The responsibility for final contact with the customer to confirm closing of call stays with Level 1 Specialist.

2) **Review Trouble Ticket.** The Level 2 Support Specialist reviews the escalated incident in order to understand the user's problem. Proceed to 3.

3) **Update Customer**. The Level 2 Support Specialist may contact the customer as needed to gather more data. Proceed to 4.

4) **Can the Specialist Solve the Problem?** The Level 2 Support Specialist solves the incident if they can. If they can solve it, proceed to 6. If not proceed to 5.

5) **Follow Assignment Procedures.** The Level 2 Support Specialist refers to the Incident Assignment Procedures document and routes the call to the appropriate Level 3 contact. Proceed to:

   Escalate to Level 3. At this stage the responsibility for resolving the incident passes to the Level 3 Support Specialist, however the responsibility for final customer contact still remains with the Level 1.

6) **Follow Problem Resolution Procedures.** The Level 2 Support Specialist consults the documented Problem Management procedures for incident resolution and proceeds to 7.

7) **Is an Escalation Condition Triggered?** If any condition established in the Prioritization (Escalation) Procedures is met, proceed to 11, if not proceed to 8.

8) **Is the Problem Resolved?** If yes, proceed to 10, if not continue with resolution procedures and proceed to 9.

9) **Update Trouble Ticket with Additional Information.** Continuous update of resolution actions taken must be documented in the trouble ticket. Proceed to 6.

10) **Update Level 1.** The Level 2 Support Specialist must update Level 1 with the resolution of the incident. Proceed to Incident Control Process – Level 1, step 12.

11) **Update the Customer.** Notify the customer of the status and that the incident will be escalated. Proceed to 12. (Level 1 may provide this service.)

12) **Update Trouble Ticket.** The Level 2 Support Specialist updates trouble ticket with appropriate information before the incident is escalated to the next level. Proceed to 13.

13) **Follow Escalation Procedures.** The Level 2 Support Specialist refers to the Escalation Procedures document and routes the call to the appropriate Level 3 contact. Proceed to:

   Escalate to Level 3. The responsibility for resolving the incident goes to the Level 3 Support Specialist, however the responsibility for final customer contact remains with the Level 1 Specialist.

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Service Desk Incident Control Process – Level 3

1) **Accept Call from Level 2.** The Level 3 Support Specialist receives escalated incidents from Level 2 when the Level 2 Support Specialists cannot resolve an incident according to the conditions set in the escalation procedures, or when incidents require additional, more specialized skills to resolve the incident. At this point the responsibility for resolving the incident, and for communicating the resolution to Level 1, passes to the Level 3 Support Specialist. The responsibility for the final contact with the customer to confirm the closing of the call stays with the Level 1 Specialist.

2) **Review Trouble Ticket.** The Level 3 Support Specialist reviews the escalated incident in order to understand the user's problem. Proceed to 3.

3) **Update Customer**. The Level 3 Support Specialist may contact the customer as needed to gather more data. Proceed to 4.

4) **Can the Specialist Solve the Problem?** The Level 3 Support Specialist solves the incident if they can. If they solve it, proceed to 7. If not proceed to 5.

5) **Is There a Workaround?** Is there a workaround or can one be created within the escalation criteria? If so, proceed to 6, if not proceed to 12.

6) **Implement the Workaround.** Create or install the workaround and proceed to 12.

7) **Follow Problem Resolution Procedures.** The Level 3 Support Specialist consults the documented procedures for incident resolution and proceeds to 8.

8) **Is an Escalation Condition Triggered?** If any condition established in the Escalation (Prioritization) Procedures is met, proceed to 12, if not proceed to 9.

9) **Is the Problem Resolved?** If yes, proceed to 11, if not continue with resolution procedures proceed to 11.

10) **Update Trouble Ticket with Additional Information.** Continuous update of resolution actions taken must be documented in the trouble ticket, proceed to 7.

11) **Update Level 1.** The Level 3 Support Specialist must update Level 1 with the resolution of the incident. Proceed to Incident Control Process – Level 1, step 12.

12) **Update the Customer.** Notify the customer of the status and that the incident will be escalated. Proceed to 13.

13) **Update Trouble Ticket.** The Level 3 Support Specialist must update the trouble ticket with appropriate information before the incident can be escalated to the next level. Proceed to:

> **Escalate Problem Management.** Problem Management must take responsibility for resolution of this incident.

Benchmarking and Metrics

Benchmarking
Benchmarking produces substantial insight into the underlying processes that drive performance. The numbers can quantify effectiveness and can be used as a diagnostic tool. They reflect the strengths and weaknesses of Level 1 Support's processes.

Metrics
Metrics are designed to ensure that service quality is measurable and balanced and should be chosen to be conceptually simple, measurable, valuable, aligned with underlying economics, and agreed on by everyone.

Typical Metrics

Categories to Track	Current Value
Avg. # of Incoming Calls per Day	
Avg. # of Abandoned Calls per Day	
Avg. Incoming Calls Time (hrs) per Day	
Avg. Duration per Call (sec.)	
Avg. # Trouble Tickets Created per Day	
Avg. # Trouble Tickets Pending per Day	

Service Desk Metrics

Categories to Track	Current Value
Customer Satisfaction.	
Volume of incidents processed per period per service type.	
Number of incidents not resolved with the concurrence of customers.	
Delivery of new services according to plan.	
Completion of training for Service Desk staff.	
Customer education on Service Desk process, services, contacts, and metrics.	
Average resolution time of incidents.	

Level One Support Metrics

Categories to Track	Current Value
Customer satisfaction with the work and attitude of Level 1 Support.	
Customer satisfaction regarding the handling of incidents.	
Correct and relevant input of data and classification of incidents.	
Average resolution time of incidents.	

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Complete problem resolution documentation.	
Percentage of escalations.	
Percentage of incidents routed correctly to next level. (100% Compliance)	
Percentage of calls resolved.	
Number of requests handled.	

Level Two Support Metrics

Categories to Track	Current Value
Customer satisfaction with the work and attitude of Level 2 Support.	
Customer satisfaction regarding the handling of incidents.	
Routing of incidents to the correct Level 3 support specialist.	
Correct and relevant input of data and classification of incidents.	
Compliance with escalation procedures.	
Resolution time of incidents.	
Complete problem resolution documentation.	
Percentage of escalations.	
Percentage of incidents routed correctly to next level. (100% Compliance)	
Percentage of calls resolved.	
Number of requests handled.	

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Roles and Responsibilities

Level 1 Support (Service Desk)
Function:
- The Level 1 Support ensures effective coordination of activities to restore service to customers via Level 1 and Level 2 support. It manages and coordinates all activities necessary to detect, resolve, and avoid incidents that (potentially) affect the service level.
- Level 1 Support is the single contact point for customers looking for information and reporting disruption in services of the system.
- Level 1 Support is also the primary contact point for the IT organization to disseminate operational information to the customer.
- The Level 1 Support is a prime source of management information on IT service quality and the relationship with the customer.
- A Level 1 Support manager should lead the Level 1 Support organization and be responsible for the adequate skill levels and performance of assigned staff members and the effective cooperation with appropriate support specialists.

Level Two Support (Specialists)
Function:
- Level 2 Support accepts calls from Level 1.
- Level 2 Support provides updates to Level 1 regarding the status of incident calls.
- Level 2 Support resolves incidents.
- Level 2 Support routes incidents and requests to the appropriate area.
- Level 2 Support interfaces and provides support to Level 1 Support and the Level 1 Support Specialists with additional subject matter expertise and knowledge in specific areas (technical, business or application) that ensure rapid resolution of incidents.
- Level 2 support provides analysis and reporting on the incident control process.

Level Three Support (Specialists)
Function:
- Level 3 Support accepts calls from Level 1 and Level 2.
    - **NOTE**: *Level 3 Support could be the appropriate hardware and/or software vendor*
- Level 3 Support provides updates to Level 1 regarding the status of incident calls.
- Level 3 Support resolves incidents and provides the resolution documentation to Level 1.

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- Level 2 Support interfaces and provides support to Level 2 Support and the Level 1 and Level 2 Support Specialists with additional subject matter expertise and knowledge in specific areas (technical, business or application) that ensure rapid resolution of incidents.
- Level 3 Support provides information on actions that will affect the uptime of services provided and supported by Level 1 Support.
- Level 3 Support provides information/training/documentation on updates to current services that are supported by Level 1 Support.
- Level 3 Support provides information/training/training on new services that will be supported by Level 1 and Level 2 Support.

Recommendations for Implementing Incident Control and the Service Desk Function

The following recommendations should be implemented in a multi-phased project with participation from individuals across organizations.

Phase I – Establish a Steering Committee
Goal: Establish membership, objectives, project plan and planning framework for a core planning team. This group should be comprised of Managers for the applications.
- Management Support
  - ➢ Obtain support of key stakeholders on the incident control process and objectives
- Communication
  - ➢ Communicate the progress of the project to the management team.
  - ➢ Establish communication requirements for the core team.
- Training
  - ➢ Train steering committee and larger management team on Service Management concepts

Phase II – Core Planning Team
Goal: Determine the services and procedures required to implement the framework. Validate and refine the planning framework. Create the project plan to implement the framework.
- Communication
  - ➢ Establish communications on the progress of the project to the steering committee and to the groups the core team represent.
  - ➢ Establish cross-area communication teams that address the following items:
    - ▪ Customer and incident resolution information
    - ▪ Areas of responsibility across different levels and organizations
  - ➢ Reporting of key success metrics
  - ➢ Development of a marketing plan
  - ➢ Call ownership policy
  - ➢ Service management, including service levels and offerings
  - ➢ Liaison role between organizations
  - ➢ Customer satisfaction
- Training
  - ➢ Develop learning solutions to address the following issues:
    - ▪ Objectives and policies
    - ▪ Ownership of calls
  - ➢ Customer, Service Desk, and incident resolution information.

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- ➤ Areas of responsibility across different levels and organizations
- Designing key success metrics
  - ➤ Call ownership policy
  - ➤ Service management, including service levels and offerings
  - ➤ Liaison role between the applications and the organization business end users
  - ➤ Customer satisfaction

Phase III –Working Sessions
Goal: The core planning team should develop workshops to define:
- Objectives and policies for Incident Control and the Service Desk
- Definition of Ownership
- Role of Stakeholder and Owner
- Areas of responsibility across different levels and organizations
- Define key success metrics
  - ➤ Service management, including service levels and offerings
  - ➤ Customer satisfaction
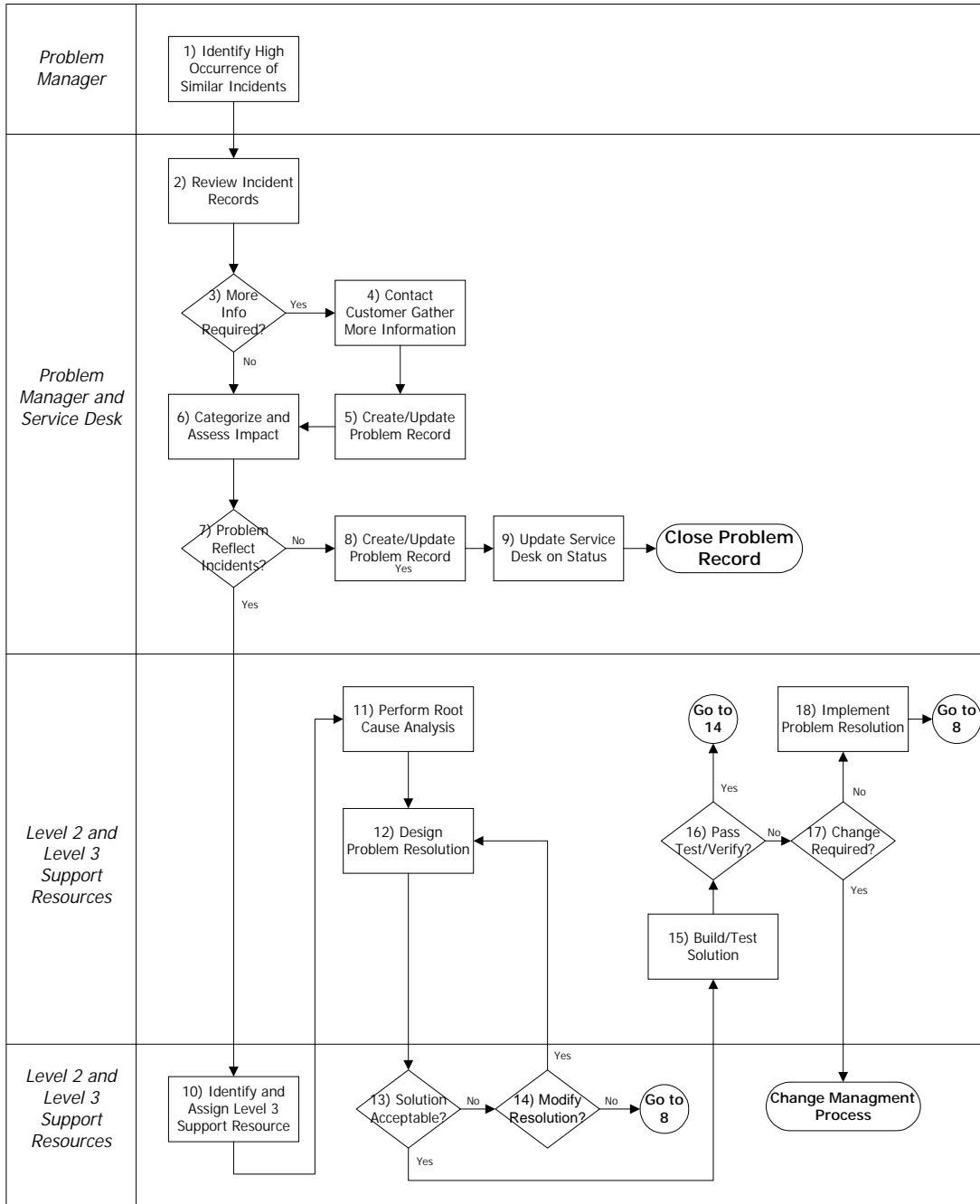
Phase IV – Implementation
Goals: Implement incremental changes throughout the project that the core team and steering committee finds appropriate. Establish linkages to other service management processes as they are created. Establish procedures to ensure continuous process improvement.

Problem Management

Process Methodology and Graphs

High Level Problem Management Process

Problem Manager	1) Identify High Occurrence of Similar Incidents
Problem Manager and Service Desk	2) Review Incident Records 3) More Info Required? — Yes → 4) Contact Customer Gather More Information No 6) Categorize and Assess Impact ← 5) Create/Update Problem Record 7) Problem Reflect Incidents? — No → 8) Create/Update Problem Record → 9) Update Service Desk on Status → **Close Problem Record** Yes
Level 2 and Level 3 Support Resources	11) Perform Root Cause Analysis 12) Design Problem Resolution Go to 14 18) Implement Problem Resolution → Go to 8 Yes / No 16) Pass Test/Verify? — No → 17) Change Required? 15) Build/Test Solution
Level 2 and Level 3 Support Resources	10) Identify and Assign Level 3 Support Resource 13) Solution Acceptable? — No → 14) Modify Resolution? — No → Go to 8 Yes / Yes Change Managment Process

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Problem Management Process Description

Refer to the High Level Problem Management Process map for a graphical representation of the process.

Problem Management Process

1) **Identify High Occurrence of Similar Incidents.** Level 1 Support Analyst (Problem Manager) provides incident trend analysis and identifies high occurrence incidents from the Service Desk (Incident Control). Proceed to 2.

2) **Review Incident Records.** Problem Manager and Service Desk reviews all relevant incidents indicated by the trend analysis. Capturing, using, and analyzing of incident history is done at this point and documented. Proceed to 3.

3) **Is more information required?** If yes proceed to 4.

4) **Contact Customer and Gather more information.** Get additional information from customer that have reported the incidents, review with technical support in the resolution of the incidents, etc. Proceed to 5.

5) **Create/Update the problem record.** Proceed to 6.

6) **Categorize and assess the impact of the incidents.** Determine who is impacted, what is impacted, the effect in time, resources, and cost. Proceed to 7.

7) **Does the problem reflect incidents?** Does this problem warrant the problem management process? If yes, proceed to 10. If no, proceed to 8.

8) **Create/Update Problem record.**

9) **Update the Service Desk on the status of the problem.** Close the problem record.

10) **Identify and Assign Level 3 Support Resource.** A Level 3 support specialist(s) to perform root cause analysis, design solution. Proceed to 11.

11) **Perform root cause analysis.** Determine the root cause of the incidents. (Need to define known error at this point). Proceed to 12.

12) **Design Problem Resolution.** This includes solutions, develop requirements, and identify required resources. Proceed to 13.

13) **Solution Acceptable?** Would this cost too much? Does it impact more than it fixes? If no, proceed to 14. If yes, proceed to 15.

14) **Modify the Resolution?** If yes, proceed to 12. If no, proceed to 8.

15) **Build/Test the solution.** (This should be another process output. i.e., to deployment, or planning, or what) Proceed to 16.

16) **Passed Test/Verification?** The production environment test for the solution passed? If yes, proceed to 17. If no, proceed to 14.

17) **Change required to implement the solution?** If no, proceed to 18. If yes, proceed to the **Change management Process.**

18) **Implement the solution.** (This should be another process output. i.e., to deployment, or planning, or what) Proceed to 8.

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Problem Management Roles and Responsibilities

Problem Manager
Function:
- The Problem Manager manages and coordinates all activities necessary to detect, resolve, and avoid failures that (potentially) affect the services provided.
- The Problem Manager leads the problem management process.

Problem Management Team
The problem management team is comprised of personnel from technical and application functional areas. These include the Problem Manager, Level 2 Support Specialist(s), a Network Operations Center (including Network Services), Level 3 Support Specialists, Database Unit, System Software Unit, Security, and application support. This team would have a core set of members, but would also utilize Level 3 Support Specialists as needed. The following will outline the functions of this team.
Function:
- The problem management core team detects, resolves, and avoids failures that (potentially) affect the services provided.
- Establishes the cause of problems.
- Proactively prevents any re-occurrence of incidents.

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