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## **A Best Practice Approach to Priority Messaging**

### Implementing Response Scenarios

How to bring efficiency, clarity and effectiveness to an organisation's response to critical situations.

January, 2011

**Paper 3 in a series of 3**

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This paper is the third in a series of 3 white papers:

<b>Paper 1</b>	A framework for understanding priority messaging.
<b>Paper 2</b>	A model for building response scenarios.
<b>Paper 3</b>	<b>A practical approach to implementing priority messaging solutions.</b>

The purpose of this series of White Papers is to:

- Assist organisations in clarifying the critical nature of priority messaging in their business
- Show how business needs can be matched with appropriate priority messaging solutions
- Provide guidance on implementation strategies.

The first 2 white papers set the context and importance of priority messaging. This white paper seeks to discuss implementation strategies and practical steps an organisation can take to improve their responses to critical situations.

It is assumed the reader is familiar with the concepts outlined in Papers 1 & 2 of this 3 part series.

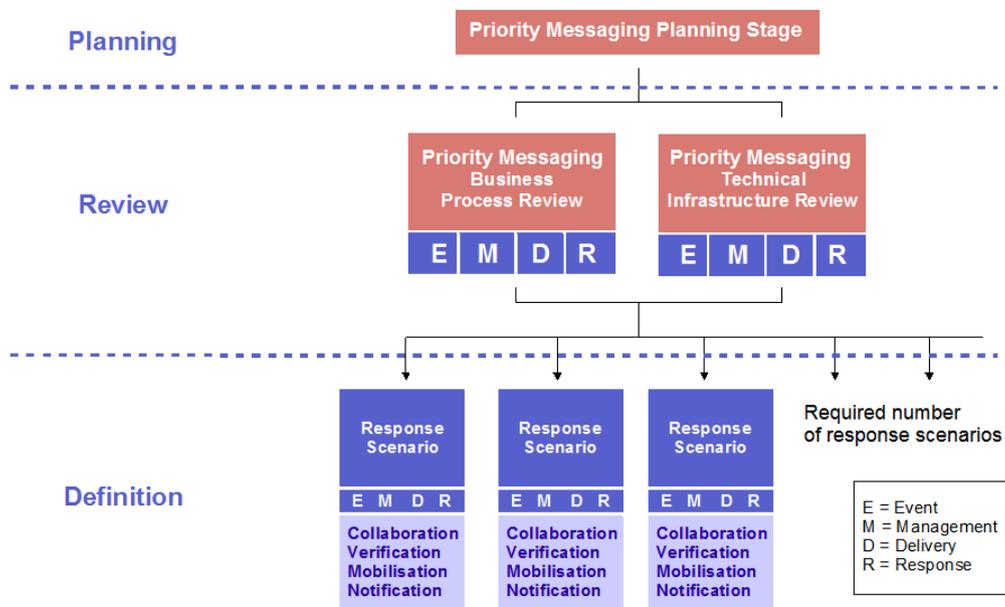
## Introduction

The aim of these 3 white papers is to provide a consistent way for an organisation to view, organise and implement a priority messaging strategy and to this end, the previous 2 white papers delivered:

- A priority messaging framework to understand and define any critical event in an organisation
- A priority messaging model to create effective response scenarios for any situation

This paper seeks to apply these principles in the creation of response scenarios.

### Priority Messaging Implementation Overview



This document will outline each step in the implementation process:

- **Planning Stage** – Identify purpose and scope for project
- **Review Stage** – Review both priority messaging business processes and technical infrastructure
- **Definition Stage** – Define the required individual response scenarios

## Priority Messaging Planning Stage

The planning stage defines the scope of the priority messaging project being undertaken.

The aim of a typical priority messaging project is to:

- identify the most efficient and effective means of managing responses to critical events
- clarify both business processes and technical architecture supporting response scenarios
- define specific response scenarios to be implemented

The planning stage begins by defining a clear purpose for the priority messaging review.

The following 3 options provide a starting point for an organisation. These options do not necessarily have to stand alone, it is possible for a gap analysis report to generate the need for a 'green field' review of a specific area of priority messaging.

Purpose	Description
<b>State of play</b>	Document the current situation.
<b>Gap analysis</b>	Identify gaps that need addressing in both business process and infrastructure.
<b>Green field</b>	Implement a new priority messaging architecture.

Having established the purpose of the overall review, the scope is typically defined in two main ways:

Scope	Description
<b>Organisational</b>	<p>In broad terms, we see 2 main levels of organisational review:</p> <ul style="list-style-type: none"> <li>• <b>Entire organisation</b> – a summary of how an organisation manages the process of priority messaging and how the technical architecture supports these processes across the entire organisation. An overview of each business unit would be one of the outputs of the review.</li> <li>• <b>Department / Business Unit</b> – a summary of how a specific business unit manages both the process and technical architecture of priority messaging. A list of response scenarios would be an output of this review.</li> </ul>
<b>Functional</b>	<p>An organisation can review the alarms and responses on the basis of functionality and not be constrained by departmental limits. Some examples include:</p> <ul style="list-style-type: none"> <li>• <b>Security</b> – how are all the security alarms handled at a site / campus or across an organisation as a whole?</li> <li>• <b>Fire</b> – how are fire alarms managed? Site by site or organisation wide basis?</li> <li>• <b>(Healthcare example) Patient bedside alarms</b> – how are patient bedside alarms managed across all departments within a hospital?</li> </ul>

The advantages for this top down approach include:

- Identifying common processes that can be replicated across an organisation. This saves time and effort by developing a response process once and re-using when required.
- Defining the most effective use of technology across an organisation or department. For instance, Nexon has clients sending SMS messages to DECT handsets and completely replacing the need for short range pagers – this type of solution is only possible when a review of all technology in use
- Showing where automation of response management can be applied, not just for one response scenario or department but on an organisation wide basis. In this area, Nexon has implemented a solution for one organisation which reduced the number of management systems by 75%.

## Review Stage - Priority Messaging Business Process

This review is focused on defining an organisation's response to specific events or classes of event.

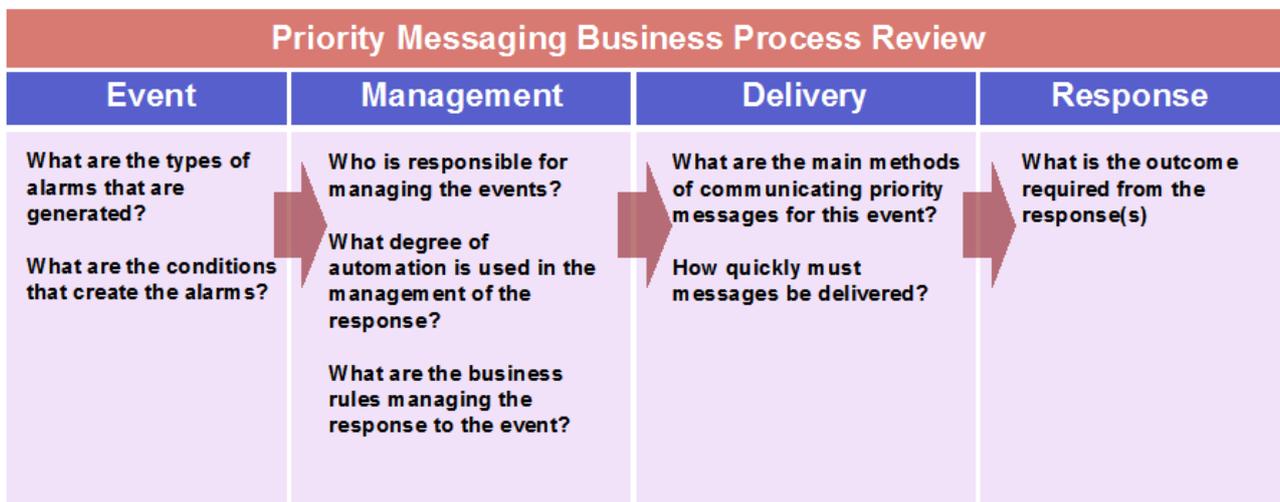
As outlined in the previous section, there are 2 main types of review.

Review	Description
<b>Organisational</b>	Identify the events or categories of events that occur within an organisation and / or department. Review current responses to these events and document accordingly.
<b>Functional</b>	Identify categories of events e.g.; security that occur right across an organisation irrespective of department or business unit. Review responses to these events and document accordingly.

The aim is to build a clear picture for either the entire organisation or a department:

- A list of events or categories of events that have to be managed.
- The reasoning behind the need for these specific events to be managed.
- The expected outcomes from the response and how they meet organisational goals.
- Documentation of responsibilities and ownership for events and responses.
- The business rules that govern the responses.
- Feedback from staff on how to improve event and response processes.
- How the business measures effectiveness and efficiency of a response. What reporting is in place?
- What are the backup plans for responses should identified personnel not be available?
- Identify where manual processes can be automated to improve response effectiveness.

The review is carried out using the Priority Messaging Framework described in the first white paper in this series. Using this framework enables an organisation to ask questions and organise answers in a manner that can be mapped to the priority messaging technical architecture (see next section).



This review should be carried out by personnel responsible for the response outcomes and include the input of all major stakeholders in the response scenario.

The outcome from the review is to:

- Clarify events and responses within a specific department or organisation
- Define priority messaging in a structured and consistent manner
- Identify efficiencies across multiple response scenarios where resources can be re-used or replaced and eliminated

## Priority Messaging Technology Infrastructure Review

The technical infrastructure review should be run in parallel with the priority messaging business process review (see previous section). Organisations often find that mapping business processes on to the technical infrastructure is an iterative process:

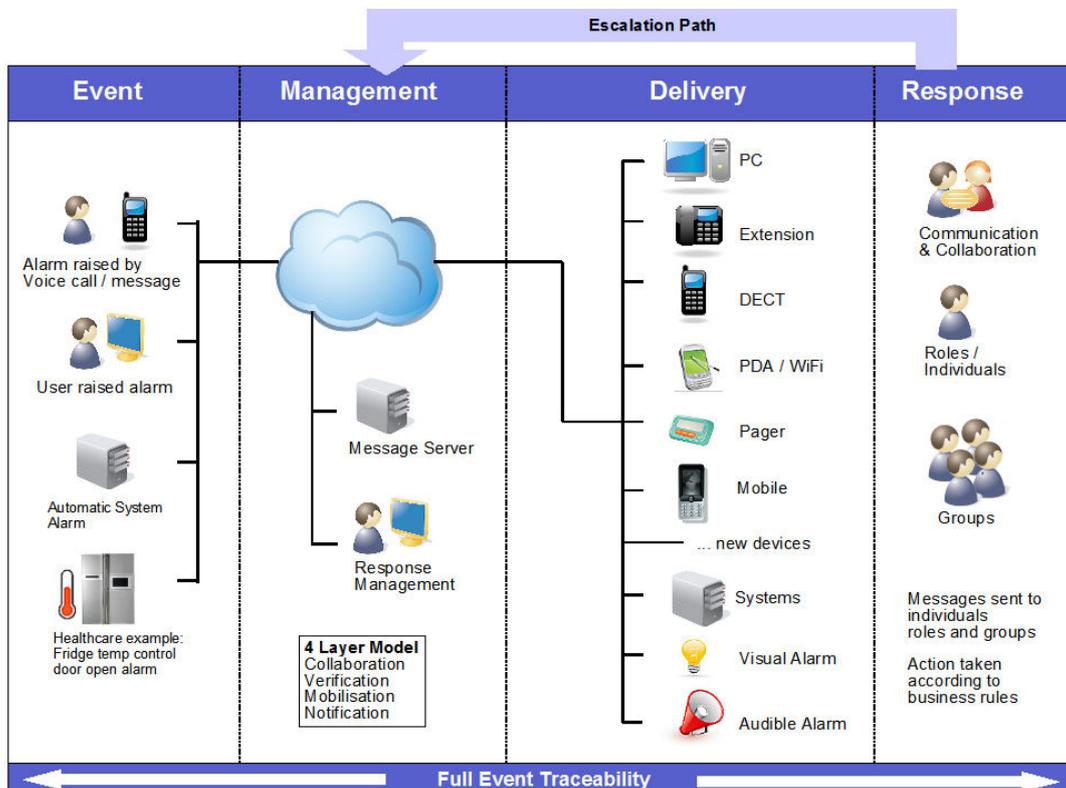
- New response scenarios are defined and the technology architecture must be checked to see if it can support the functionality required by the business or...
- The introduction of new technology provides a wider range of functionality that the business needs to evaluate and the value for response scenarios.

Typically there are 3 types of infrastructure review (in line with planning stage on page 3 of this document):

Infrastructure	Description
<b>Existing Infrastructure only</b>	Straight forward description of current installed infrastructure supporting priority messaging. Functionality of this infrastructure is all that is available to the business.
<b>Existing + planned infrastructure</b>	Current infrastructure and planned priority messaging infrastructure investment. Requires planning for the additional systems / devices and clarity on potential extra functionality.
<b>Green field infrastructure</b>	Business requirements have identified a new infrastructure is required for a specific priority messaging need. Functionality of infrastructure is defined by business needs.

This infrastructure overview sets the context for priority messaging within the organisation. All response scenarios will be developed within the capabilities of this infrastructure.

All infrastructure diagrams are created within the Priority Messaging Framework which enables them to be closely aligned with the business processes documented in the business process review. An infrastructure diagram based on the priority messaging framework can represent any part of an organisation, any functional area of events (e.g.; security) and to any level of detail required by an organisation.



## Technical Infrastructure Capability

The most important aspect the technical infrastructure is its capability to meet business needs. The table below identifies the critical factors that affect the capability of the infrastructure.

The checklist is particularly relevant for organisations undertaking a comprehensive review of their priority messaging needs. Once complete, this review provides a complete reference for new response scenarios.

Category	Description
<b>Management</b>	Who is managing the infrastructure over which a response scenario takes place? Is the management internal / outsourced? Are all parties aware of their roles in management of the priority messaging infrastructure?
<b>Capacity Planning</b>	Does the infrastructure have the ability to meet the maximum throughput of alarm and delivery messages: <ul style="list-style-type: none"> <li>• For one scenario sending the maximum number of messages for that scenario at any given time</li> <li>• For all scenarios sending maximum numbers of messages simultaneously</li> <li>• For foreseeable future priority messaging requirements</li> </ul>
<b>Functionality</b>	What are the management, delivery and response capabilities of the infrastructure and how do these match to the business requirements?
<b>Reliability</b>	How reliable is the technology in relation to the needs of the business? Given the nature of priority messaging, reliability will be a high priority for most if not all parts of the infrastructure. Consider redundancy options, hot swap equipment and spares.
<b>Maintenance and Support</b>	What is the maintenance and support for each part of the infrastructure? Is the support sufficient to meet the business needs? Are there opportunities to streamline support from end to end?
<b>Reporting</b>	How will alarms, messages and responses be tracked? Full and comprehensive reporting ensures KPIs are being met and the business can review performance. Where is the reporting information held, in what data format?
<b>Expansion</b>	Does each piece of equipment have the requisite number of slots etc to be expanded if required? If additional units are purchased how and where will they be installed? Is there sufficient room for expansion?
<b>Integration</b>	How will the components of the infrastructure be integrated? Example: if a message server is to be integrated with an organisation's PABX, how will this be accomplished? What extra functionality is delivered by integration?
<b>Physical Network</b>	How are the components physically connected – cabling, connections (possible converters required e.g.; IP to serial), wireless transmitters, frequencies
<b>Messaging</b>	What are the message formats in use by each system and how will the architecture manage the communication between devices?
<b>Security</b>	What are the business requirements for secure message transmission? How will the infrastructure meet these security requirements?

## Technology Reference Matrix

A technology reference matrix was developed to assist organisations match the capability of end user devices with the 4 layer model defined in the second white paper..

In white paper 1 we identified the 4 main message data types:

Delivery Format	Description
<b>Text</b>	<ul style="list-style-type: none"> <li>Alpha numeric text message, variable length</li> </ul>
<b>Voice</b>	<ul style="list-style-type: none"> <li>A person can call one or many people directly</li> <li>A recorded voice message can be played to the call recipient</li> <li>A person can be conferenced in to a phone call automatically</li> </ul>
<b>Image</b>	<ul style="list-style-type: none"> <li>An image file e.g.; a jpeg picture file can be sent to a device</li> </ul>
<b>Video</b>	<ul style="list-style-type: none"> <li>A video file can be sent to a device for playback</li> <li>A video streaming session between devices can be initiated</li> </ul>

Below is a summary table identifying which devices are most suitable for receiving which type of data.

The table is organised according to the 4 layer priority messaging model outlined in the second white paper.

4 Layer Model	Notification				Mobilisation				Verification				Collaboration			
	T	Vo	I	Vi	T	Vo	I	Vi	T	Vo	I	Vi	T	Vo	I	Vi
Mobile Phone			*	*				*			*	*				
DECT extension																
Fixed PABX extension																
Land line																
Short Range pager					*											
Long Range pager					*											
PC				*				*				*				*
VoIP device				*				*				*				*
System e.g.; Help Desk system – any system capable of receiving a message from message server		*	*	*		*		*	*	*	*	*		*		
Audio Alarm	**															
Visual Alarm	**															
.... and others yet to be defined																

\* Dependent on device specifications

\*\* Text message sent to systems controlling audio and visual alarms

The matrix is meant as a guide for organisations and is not meant to be exhaustive. Each organisation will need to carefully evaluate the functions and capability of the end user devices deployed in their organisation.

## Response Scenario Definition

Before an organisation defines a response scenario it is advisable to have completed both the business process and technical architecture reviews.

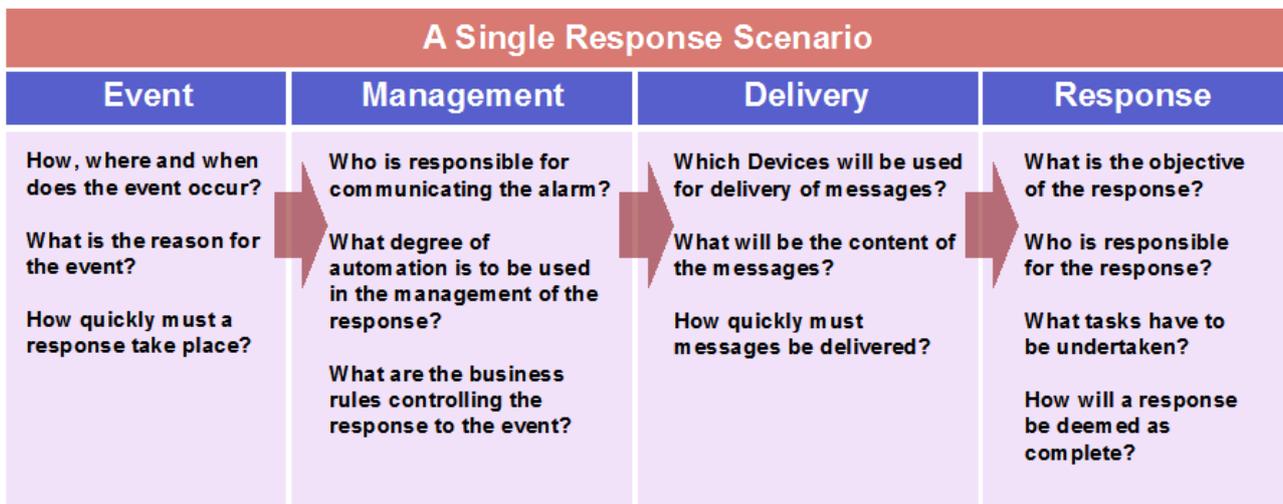
With both reviews complete, any new response scenario will ensure that processes developed elsewhere in the organisation are not re-invented and the capabilities of the technical architecture are clearly understood.

In the definition of a response scenario, there are 3 main documents.

- A priority messaging business process
- A technical architecture diagram and report
- A 4 layer model diagram used to define the response workflow for the scenario

## Response Scenario Business Process

Using the same framework as used for the organisation / department / functional review, the specific response scenario is divided into Event, Management, Delivery and Response processes.



A response scenario should take the same basic questions used in the higher level reviews and apply them to the lowest level of detail, for example:

- Specific tasks and actions that are required to deliver the required outcome
- Name, role, telephone, pager number of staff involved in response scenario
- Exact details of event that raises alarm
- How will the end to end process be documented and who will 'own' the process?
- How will the process be automated to save time and improve efficiency?
- How many messages need to be sent, what is the message content?
- How quickly do the messages have to be delivered?
- What is the backup plan should the planned response process not be possible?

## Response Scenario Technical Architecture

It is feasible for an architecture diagram for an entire business unit (or for an area of functionality e.g.; security) to be sufficient for all or some of the response scenarios within that area. It may not be necessary to create a new diagram for each response scenario.

However, while an overall diagram will serve as a useful reference, it is important that the details of the technology involved in a response scenario is clearly understood. These details include:

- Message format and communication protocols
- Device network addresses

## Priority Messaging 4 Layer Model

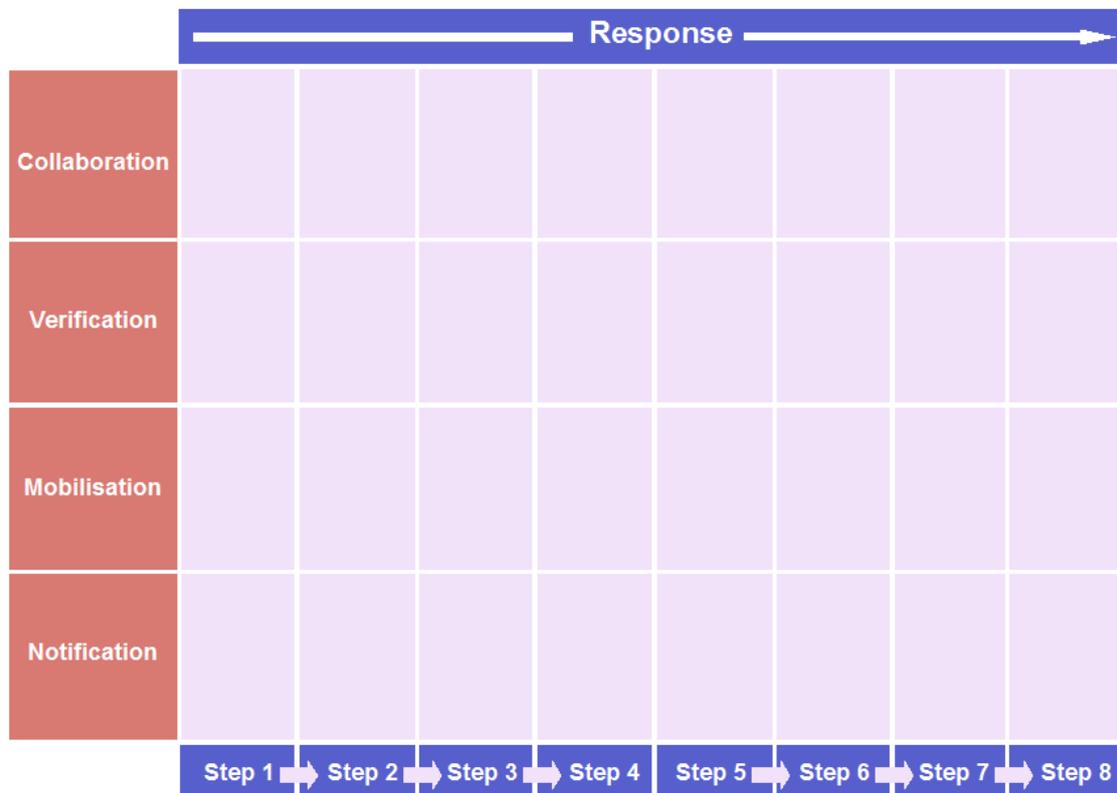
This is a concise description of the response scenario that maps out each step of the response workflow. It is important to have first completed both the business process and technical infrastructure reviews so that the business outcomes and the infrastructure capabilities are clearly understood.

The model then assists the organisation in clarifying how, why and when specific technologies are used in the response to an event.

The template below has 8 steps marked out but a response scenario can theoretically be much longer, and this will certainly be the case for multi stage emergency responses. The vertical axis has a row for each of the 4 layers of priority messaging.

### Response Scenario Template

4 Layer Priority Messaging Model



For each distinct step in the response workflow, the appropriate layer of the priority messaging model is applied. As mentioned in the second white paper, each layer can be used at any step in the process and in any order. Step 1 could just as easily start with collaboration as notification.

Each step is documented to include the following details:

- actions to take place
- contact numbers of staff involved in the response scenario
- how quickly must the message(s) be sent
- how quickly must response(s) be received
- what devices will be receiving messages

## Example Response Scenario

The example used in the previous 2 white papers, comes together with the following reference diagrams.

The Priority Messaging Framework is used to summarise the response scenario.

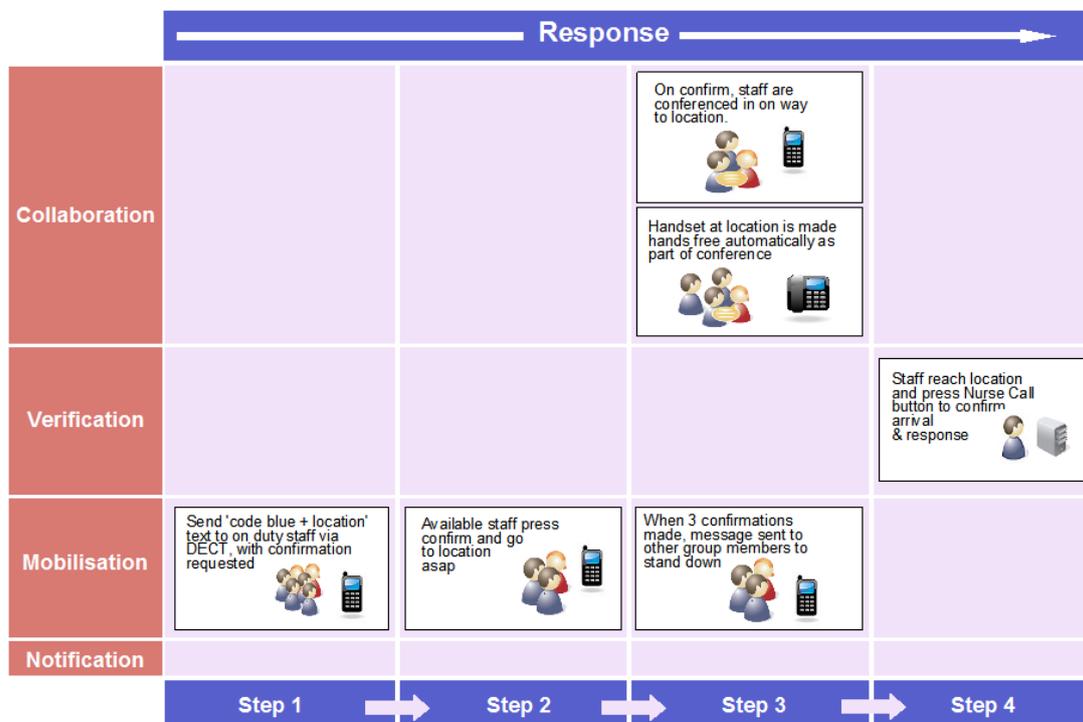
Event	Management	Delivery	Response
<p>Staff press Nurse Call button by patient bedside.</p> <p>Nurse Call system sends message to messaging system.</p>	<p>Messaging server receives message.</p> <p>Based on bed location, message sent to local nursing staff</p> <p>3 staff from the on-duty pool are required to respond</p>	<p>Message sent to DECT handsets</p> <p>Using DECT</p> <ul style="list-style-type: none"> <li>- Confirmation possible</li> <li>- Conference call</li> </ul> <p>Enable hands free function on phone by bedside to communicate with patient / attending nurse</p>	<p>Once 3 respondents confirmed, message server will advise further respondents to stand down</p> <p>Message server will automatically escalate to new group if no confirmation received within a specific time frame</p>

The above summary will be supported by documentation of the exact business rules to be followed and the technology to be used as well as the person / role who owns the process.

The Response Scenario diagram shown below breaks the scenario down into a step by step process.

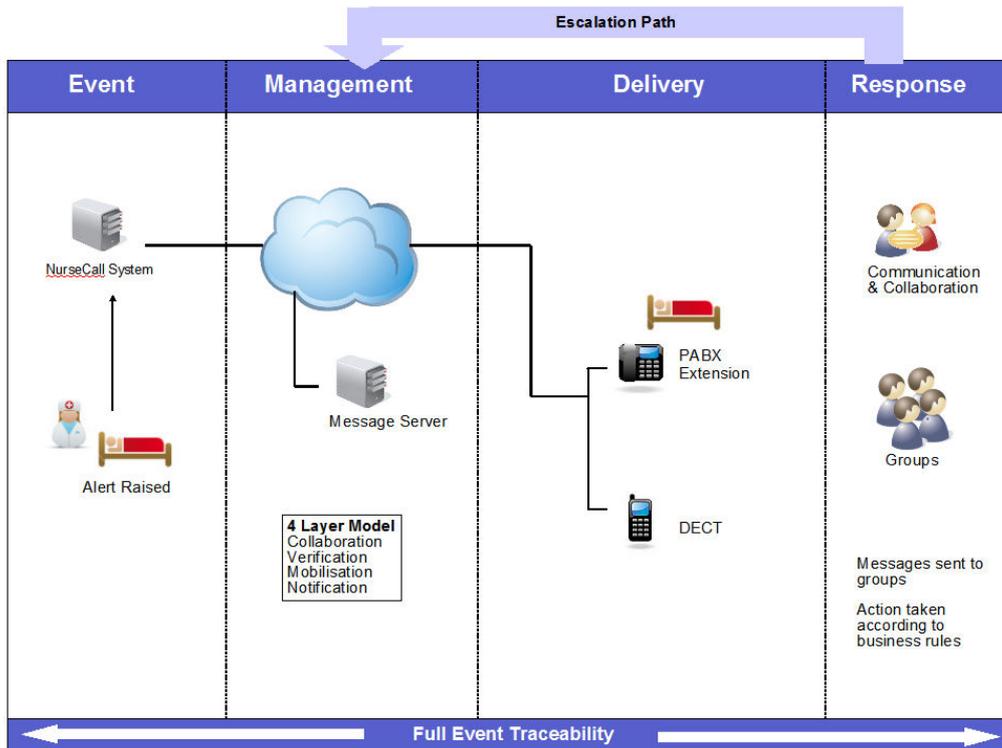
### Example Response Scenario

4 Layer Priority Messaging Model



The above diagram will be supported by further documentation including details of the exact phone numbers to call, the staff involved in the process, the timing of the calls, when calls are confirmed and when the response is verified.

The technical architecture diagram below summarises the architecture used in the support of the response scenario.



The above example is greatly simplified. It is most likely that an overall architecture diagram only needs to be created for different categories of event or for all events within one department. This saves effort and time by not having to create a separate architecture diagram for each scenario.

Detailed network and infrastructure diagrams, redundancy planning, details of maintenance and support agreements, capacity planning information amongst other documents will be required to support the technical architecture diagram.

In summary, we have 3 main areas of documentation:

- The Priority Messaging Framework – high level summary of the response scenario
- The 4 layer model diagram – step by step breakdown of the response scenario
- The technical architecture diagram – the technology to be used for the response scenario.

Each area of documentation is based around the same priority messaging concepts giving an organisation a consistent body of reference for all response scenarios.

## Implementation

Each organisation will have its own project management, testing procedures and business process design processes and consequently these activities are outside the scope of this document.

The advantage of using the same frame of reference for both business and technology personnel is clear communication using the same terminology across all aspects of the priority messaging implementation.

The scope of the implementation plan will determine the level of detail required:

Scope	Description
<b>Organisational / Departmental</b>	<p>This is often a first step of implementation to clarify the 'big picture', identify where opportunities exist to bring efficiencies and list the response scenarios to be reviewed or implemented. This is largely based on the audit / review work outlined on pages 4-7 of this paper.</p> <p>The output is typically a project plan with recommendations to:</p> <ul style="list-style-type: none"> <li>• Define organisational goals</li> <li>• Categorise events and responses</li> <li>• Identify working / non-working processes</li> <li>• Review how automation can bring efficiencies to the business</li> <li>• List the response scenarios within the organisation</li> </ul>
<b>Functional – e.g.; Security</b>	<p>Similar to the organisational review, the functional review will clarify the 'big picture' for a particular category of response scenario. This is largely based on the audit / review work outlined on pages 4-7 of this paper. The output is typically a project plan which:</p> <ul style="list-style-type: none"> <li>• Defines goals for functional area e.g.; safety, maintenance</li> <li>• Identifies and review technologies in use, look for opportunities to implement common technology platforms to reduce costs and improved efficiency</li> <li>• Lists the response scenarios occurring within a function</li> </ul>
<b>Individual response scenario</b>	<p>Having created the 'big picture', each response scenario can be reviewed with a clear perspective of the processes and technology to be employed. The definition of each response scenario is based upon the work detailed in pages 8-9 of this paper.</p> <ul style="list-style-type: none"> <li>• Identify existing / new technologies to be used</li> <li>• Clarify roles and responsibilities</li> <li>• Create a test plan, implementation plan and training plan</li> <li>• Document the response scenario and allocate ownership</li> </ul>

A top down approach ensures that response scenarios are devised and implemented with respect to the overall organisation goals and outcomes, not just as individual solutions that do not take advantage of shared technology or common business processes.

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## Summary

It is in critical moments when organisations are tested the most.

The UK Health and Safety Executive (HSE) has stated the following:

“Better alarm handling can have a significant effect on the safety of your business (the cost of not improving alarm handling can literally be your business in some cases). An improved alarm system can bring tighter quality control, improved fault diagnosis and more effective plant management by operators.”

(Quote in relation to priority messaging at an oil refinery)

The importance of priority messaging cannot be underestimated as organisations are required to manage, control and respond to a constantly expanding range of events.

From safety to security, from maintenance to health care, from emergency response to evacuation... it is imperative an organisation develops and maintains a comprehensive priority messaging strategy.

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Nexon Asia Pacific is a leading telecommunications integration consultancy with offices in Sydney, Brisbane and Melbourne.

Nexon have developed both the Priority Messaging Framework and the Priority Messaging 4 Layer Model as a means of assisting organisations to more effectively review their priority messaging strategy. Nexon offer priority messaging integration consultancy and services to medium sized enterprises, the corporate community and government agencies.

If you require assistance with your priority messaging strategy and implementation, call Mike Sultan, Priority Messaging Programme Manager at Nexon Asia Pacific.

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## Glossary

<b>Priority Messaging</b>	Priority messages are concise electronic messages delivered in the shortest possible time to generate an appropriate response to an alert.
<b>Priority Messaging Framework</b>	A framework of processes describing how an organisation responds to an alert.
<b>Core Process</b>	There are 4 core processes within the priority messaging framework. The processes are: alert, management, delivery and response.
<b>Alert</b>	A concise message from a validated source that requires an organisation to respond.
<b>Management</b>	A set of pre-defined business rules are applied to an incoming alert. The rules define the process of how an alert will be resolved through the sending of specific priority messages to people / systems via the most appropriate technology.
<b>Delivery</b>	Delivery of message(s) via the most appropriate device(s) / system(s).
<b>Response</b>	Action to be taken by an organisation to resolve an alert. The business rules in the management process underpin the actions in the response process.
<b>Full Event Traceability (FET)</b>	The ability of an organisation to track and report on actions starting with the generation of an alert to the resolution of a response.
<b>Priority Messaging 4 Layer Model</b>	A model for interpreting business rules to create priority messages and define how the messages are transmitted and who they are received by in order to respond and resolve an alert. The 4 layer model sits within the management process of the priority messaging framework.
<b>Response Scenario</b>	A specific alert and response situation within an organisation.
<b>Notification</b>	Send message(s) to generate a response. No confirmation of receipt of message or guarantee response has taken place.
<b>Mobilisation</b>	Send message(s) and confirm receipt. Automated escalation if no confirmation. Improved probability of resolution.
<b>Verification</b>	Verification required that business response is complete. Guaranteed resolution of situation.
<b>Collaboration</b>	Voice / video conference decision makers to agree and action a response. Guaranteed resolution of situation.
<b>Message Server</b>	A message server will decode the signal from an alert, apply business rules and send a message(s) via the chosen delivery mechanism(s). A message server sits within the management process in the priority messaging framework and provides the means to automate many priority messaging tasks.