



How to Get Critical Systems Back Online in Minutes

Simplifying Problem Resolution with IT Process Automation



White Paper by Ayehu | Gabby Nizri, CEO | June 2015

Who Should Read This White Paper

This paper is for IT executives and managers in any size of organization, who are concerned with Systems & Application availability and their impact on productivity, service levels and downtime. In particular, IT Operations Managers should read this paper to get practical guidelines on improving Mean Time to Recovery (MTTR) and reducing time spent on problem resolution.

In This White Paper

The Challenge of IT Problem Resolution (pg. 3)

IT operations staff spend a huge portion of their time resolving urgent problems like system downtime, performance, and network availability, or performing critical maintenance tasks. As IT environment get more virtualized and more complex, problems take longer and longer to resolve. The burden of these urgent tasks, combined with today's tight budgets, make it difficult for IT operations to work on key initiatives that add business value.

Why Do Problems Take So Long to Resolve? (pg. 4)

In this section we show five glaring inefficiencies in the way problem resolution is handled today, and show why monitoring systems, scripting and ITIL structured workflows are not enough to solve these inefficiencies.

4 Ways to Cut Problem Resolution Time (pg. 6)

In this section we present best practices which address all the inefficiencies in the problem resolution process—diagnose problems using rules, not experts; define problem ownership in advance; document the full resolution process; and automate problem resolution steps. Using these best practices, you can improve your Mean Time to Recovery (MTTR) and save valuable time for operations staff.

Ayehu eyeShare—End-to-End Interactive Problem Resolution (pg. 9)

Ayehu eyeShare is a lightweight, off-the-shelf product that manages and automates IT problem resolution. eyeShare provides a rule engine for problem diagnosis, a bi-directional automated notification system, a workflow studio for problem resolution processes, and a task automation library. These capabilities allow you to easily implement all the best practices above, dramatically reducing problem resolution time.

Brief Case Study: Insurance Group Cuts Resolution Time by 90% (pg. 16)

Ayehu eyeShare was selected by Clal Insurance, a global financial group managing over \$40 billion in assets. Clal was facing unacceptable recovery time for its main business portal, causing customer dissatisfaction and financial damage. Clal was able to quickly implement eyeShare, and reduced portal recovery time by 90%, while freeing up operations staff's time for more valuable work.

The Challenge of IT Problem Resolution

IT operations departments are expected to innovate and deliver business value, but IT operations staff spend a large portion of their time resolving problems with critical systems and performing critical maintenance tasks. With so many resources invested in these urgent activities, there is little time left for initiatives that add business value.

Are You Fighting Fires or Adding Value?

In today's IT organizations, IT operations departments are at the forefront of innovation. Key initiatives such as virtualization, cloud computing, IT modernization, ITIL implementation, and IT compliances (e.g. operations).

But do operations staff really have the time to make these big steps forward?

It is a common experience among operations staff that urgent problems push aside other important tasks. A large portion of the time is spent resolving problems—such as system downtime, performance of critical systems, and network availability—and performing critical maintenance of the same systems, leaving relatively few resources for key initiatives, strategy and planning, and even regular ongoing maintenance.

This makes it very difficult for IT operations to keep CIOs and CEOs happy—to do more than just “keep the wheels turning,” by delivering real business value.

Two Trends That Will Make the Problem Worse

Forrester Research¹ identifies two trends that will adversely affect IT operations' ability to resolve problems while leaving time for other activities:

- Increased complexity of the IT environment—virtualization and cloud computing introduce “a new layer of infrastructure complexity”; a complex infrastructure means problems are getting more complex to identify and troubleshoot, and require more time to resolve. Critical maintenance tasks are also more difficult than ever.
- Economic pressures and accelerated trend to productivity—IT organizations are required to do more with less, and “business satisfaction with IT seems to be at an all-time low.” With less manpower and increased pressure to deliver value, IT operations departments are starving for resources.

Clearly, a solution is needed that will make problem resolution processes more efficient. This is the only way to reduce the burden on operations teams, and free up time for more valuable work. The rest of this paper discusses ways to achieve this in your organization.

¹ Forrester Research, July 24, 2009, “The Shifting Sands Of IT Compel A New Landscape For IT Automation Tools,” pg. 2.

Why Do Problems Take So Long to Resolve?

There are five inherent inefficiencies in the way most IT organizations resolve problems and perform critical maintenance tasks. Each one of these inefficiencies causes IT staff to spend more time on problem resolution, and increases Mean Time to Recovery (MTTR). Thus, each of them also represents an opportunity for increased productivity and faster recovery.



- Non-expert diagnosis—there is usually *someone* in the organization who knows to diagnose and solve a given problem. But chances are that when the problem occurs, that expert is not around, and there is usually no comprehensive process documentation which explains how to solve the problem. Often a non-expert needs to decide which problem occurred and how to solve it—they might contact the wrong people or perform the wrong resolution steps, causing needless delay.
- Can't find an owner for the problem—when a problem occurs, someone needs to take responsibility and make the tough decisions. It takes precious minutes to get someone on the line, and then it often turns out they're unable or unwilling to take ownership of the problem. The search for an owner can sometimes take hours.
- No structured process—when somebody starts working on resolving the problem, they usually don't have a step-by-step process to guide them. Even the best troubleshooter on your team might miss an important step or go off in a wrong direction—particularly when under pressure and at unusual hours—further stretching time to recovery.
- Slow manual resolution—even the right expert, performing the right steps to resolve the problem, might take a very long time to do it manually. If the problem requires checking memory and restarting a service on 9 remote servers, this will take plenty of time for any human operator.
- Prone to human error—it only takes a typo in a command-line operation to bring critical systems to their knees. Human errors are always possible, but much more likely when staff are responding to immediate problems under pressure. What's more, staff might take actions that solve the problem immediately, without realizing broader implications, such as risk to peripheral or dependent systems.

Existing Solutions are Not Enough

Many IT organizations use monitoring systems, script automation and ITIL-style documented workflows to improve the problem resolution process. But these solutions cannot solve the inefficiencies we list above—as explained in the table below.

Solution	How It Helps	Why It's Not Enough
Monitoring (such as CA Unicenter, HP, IBM Tivoli, BMC Patrol, Nagios)	<ul style="list-style-type: none">• Reports symptoms• Reports root causes• Performs simple tasks automatically (e.g. restarting a service)	Cannot solve severe problems , which require troubleshooting and tricky, multi-step resolution. So human intervention and manual problem resolution are still needed.
Scripts and batches	<ul style="list-style-type: none">• Automating tasks on a single machine• Automating tasks in simple P2P scenarios• On-demand or scheduled execution	Cannot deal with complex environments with multiple nodes, virtualization, remote servers, etc. It's very difficult to write a script that will run on numerous machines with interdependencies. So many tasks are too complex to automate with scripts.
ITIL and documented workflows	<ul style="list-style-type: none">• Creates a central, standard knowledge base for problem resolution• Clarifies risks and important considerations• Reduces human error	Not there at 3:00am —when a critical problem occurs, the procedure is not on hand and there's no time to read complex flowcharts to find the solution. IT staff will simply do something immediately to solve the problem.

4 Ways to Cut Problem Resolution Time

In this section we present best practices which address all the inefficiencies in the problem resolution/critical maintenance process, allowing you to substantially reduce Mean Time to Recovery (MTTR) in your IT organization. Some of these guidelines are easy to implement; some are more complex and require planning and supporting technology.

In the next section (pg. 9), we discuss Ayehu eyeShare, an IT solution that allows you to fully implement all four of these best practices in one simple, off-the-shelf product.

#1: Turn Expert Knowledge into Diagnosis Rules

Instead of relying on experts to diagnose problems in real time, which turns these experts into a bottleneck, you can make the expert knowledge available in real time. Specify rules that clearly answer these questions:

- Which combination of symptoms indicates that the problem occurred?
- How to validate that the problem really occurred?
- Which solution is appropriate for this type of problem?

These rules must be readily available, so that as soon as a problem occurs, it is immediately clear what the problem is and what type of solution is appropriate.



For example: The problem—high risk of server downtime due to disk raid malfunction. The diagnosis rule—if event logs for the past 6 hours show symptoms of disk failure in 2 out of 3 disks in the array, the problem is about to occur. The solution—repair or replace the malfunctioning disks.

#2: Define Problem Ownership and Escalation in Advance

When a problem occurs, operations staff spend time seeking an owner for the problem. To save this time and speed problem resolution, you should define the following in advance:

- A shift schedule, specifying which staff members are on call at any given time of day, and what types of problems each of them can handle.
- Escalation paths, for cases in which staff are unavailable or unable to take responsibility for a problem.

#3: Document the Full Resolution Process

The next step is to find a way to immediately notify staff according to the schedule when a problem occurs—this allows you to find an owner for the problem immediately.



For example: The website is down at 7pm—the person who receives the alert checks the shift schedule, and sees that the engineers on call are John and Andrew. The schedule specifies that only John handles website downtime problems. An SMS is sent to John, requesting that he takes ownership of the problem. If John does not respond, the problem is escalated—an SMS is sent to Sarah, John’s boss, requesting that she take ownership.

#3: Document the Full Resolution Process

To streamline the problem solving work itself, and make sure IT staff are able to capitalize on previous knowledge and experience, document and integrate the full resolution process for each problem:

- Clearly spell out all the operations needed to resolve the problem, from start to finish.
- Document decision junctions during the process, what the decision should be based on, and resolution steps for each possible decision.
- Test the documented process, by watching an inexperienced operator using it to solve the problem.
- Make sure the documentation is available at the time and place the problem occurs.



#4: Automate Problem Resolution Steps

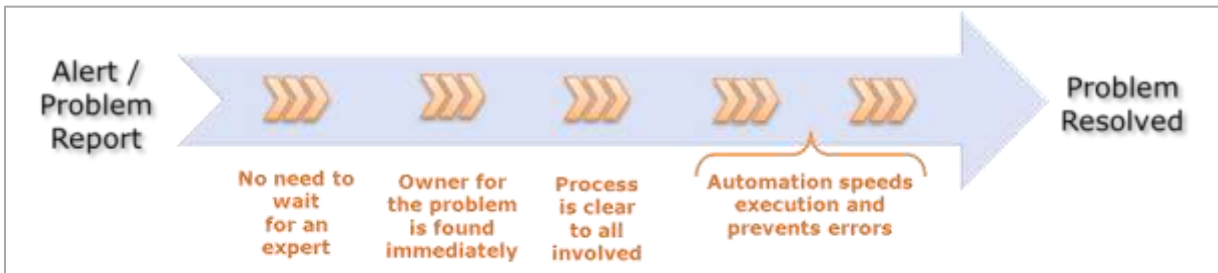
Automation addresses two problems in the problem resolution process—slow manual execution of problem resolution tasks, and human errors. Any process you automate will run faster and will be less error-prone. You should strive to:

#4: Automate Problem Resolution Steps

- Automate any step in the resolution process that is predetermined and does not require manual intervention or human judgment. In Ayehu's experience, over 80% of problem resolution steps can be automated.

Simple forks in the process such as "if the server is up, do X, if not, do Y" can and should be automated, unless there is a complex decision that a human being really needs to make.

- Use scripts to automate simple tasks, which do not require complex interactions between machines.
- Investigate automation solutions to automate complex tasks—today's IT Process Automation technology can integrate with numerous systems and perform broad, cross-cutting operations.
- Give human operators full control—automatic processes should stop and wait for human input when they reach an important decision junction. Human operators should be able to easily oversee and abort any automatic process.



For example: Automate Microsoft IIS service recovery process—an automatic process can be designed, which starts by pinging the web server to confirm that it is up. If server is up, and system Telnet port 80 is working, the process checks status of IIS services, and returns the status to relevant IT staff. If server is down or Telnet port 80 not working, the process reports this. The automatic process could ask whether to restart the server, and do this automatically upon receiving a response.

Ayehu eyeShare—End-to-End Interactive Incident Resolution

Ayehu eyeShare is the first off-the-shelf product that manages and automates IT problem resolution and critical maintenance tasks. It incorporates all of the four best practices we mentioned above, allowing you to speed up problem diagnosis, immediately locate an owner for a problem, guide problem resolution using a structured workflow, and automate routine tasks.

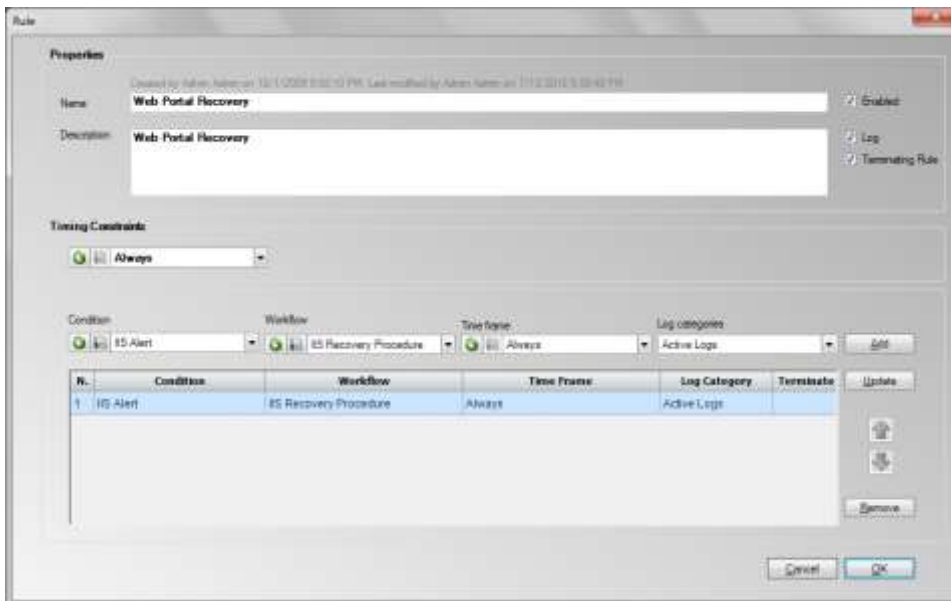
Unlike other IT Process Automation tools on the market, eyeShare is a lightweight solution focused exclusively on IT problem resolution. It provides the above tools and capabilities right out of the box, and does not require any development, nor a significant planning effort.

See the following section (pg. 16), for a brief case study showing how easy it is to get results with eyeShare.

Turning Expert Knowledge Into Diagnosis Rules—eyeShare Rules Engine

Ayehu eyeShare integrates with your existing monitoring system (either home-grown systems or products like CA Unicenter, IBM Tivoli, HP, BMC Patrol, Nagios, or What'sUp Gold), and captures alerts, device status and system variables as they occur.

You can define a *rule* that specifies a combination of symptoms and a specific timeframe, which correlate to a specific type of problem, and activates a *problem resolution workflow*.



Once a rule is defined, eyeShare listens for the symptoms defined in the rule, using any of the following methods:

- Searching for text strings (e.g. the word "critical") in alerts or logs
- Alerts
- Traps
- File events (files or folders created, modified or deleted)

When the symptoms occur, eyeShare understands that a specific problem has occurred, and automatically triggers the appropriate problem resolution workflow.

BOTTOM LINE: Eliminates the effort of non-expert diagnosis, cutting problem resolution time.

Defining Responsibilities and Escalation—eyeShare Global Shift Management

Ayehu eyeShare's web-based Global Shift Management module allows you to define a full shift schedule and escalation paths, specifying exactly who is responsible for which problem at which hour of the day.



This allows you to define in advance who is responsible for different types of problems at any given time, eliminating the effort of seeking an owner for the problem.

Immediate Contact with Problem Owners—eyeShare Bi-Directional Notification Engine

eyeShare not only defines responsibilities and escalation. When a problem occurs, it automatically notifies the person responsible by any of these methods:

- SMS
- Email
- Instant messaging
- Telephone—eyeShare comes with built-in IVR (Interactive Voice Response) and text-to-speech capabilities, enabling it to call IT staff and deliver problem information over the phone.

Ensuring Someone Takes Ownership of the Problem

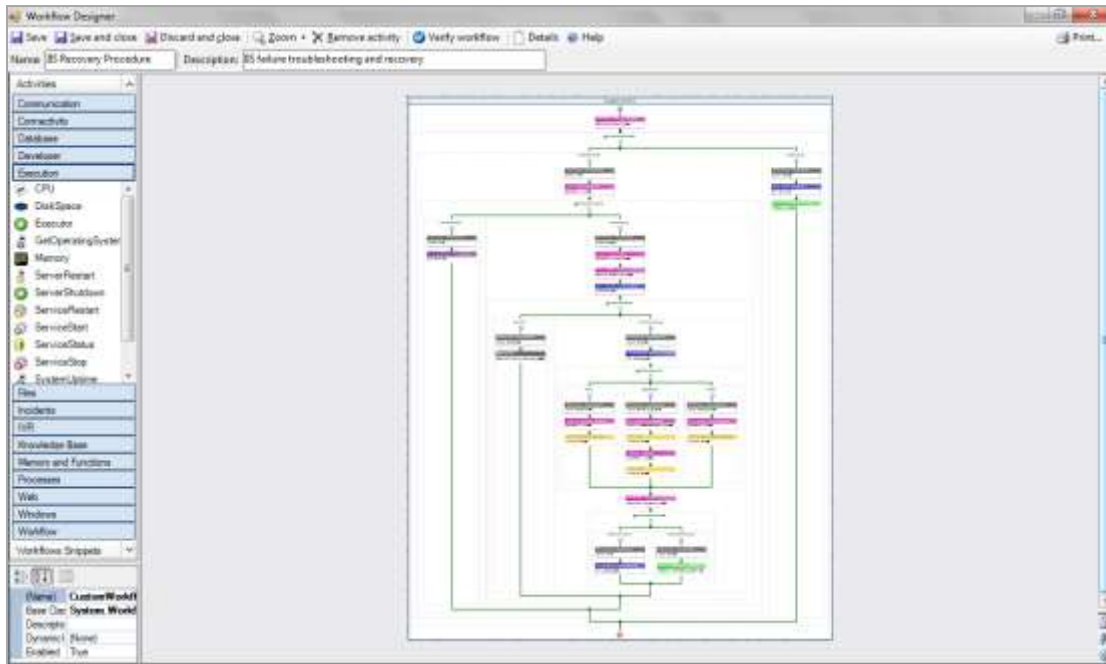
eyeShare doesn't just send out notifications—it asks if the person notified can take responsibility for the problem, waits for a reply, and performs escalation if necessary.

User type	Name	Comm. method	Reply wait	Show	Escalate	Time frame	One by one	Level	RN
Group	System	SMS	00:05:00	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
User	John	SMS		<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

- If the person notifies replies and takes responsibility (simply by replying with the word “yes”, by SMS, email, IM or voice) eyeShare defines that person as the owner for the problem. It then starts an automatic problem resolution workflow, and notifies the problem owner when a decision needs to be made.
- If the person replies negatively or does not respond, eyeShare escalates the problem to a superior, as defined in the escalation path.
- If a group of people are notified, as soon as one takes responsibility, eyeShare can contact the rest to let them know they can stand down.

Documenting and Guiding Problem Resolution— eyeShare Workflow Studio

The heart of Ayehu eyeShare is a user interface that allows you to design *problem resolution workflows*. These are used both to document how problems should be resolved, and to automate problem resolution.



What You Can Do with eyeShare Workflows

- Document the entire resolution process for a specific problem, as an easy-to-read flowchart.
- Define routine tasks for automation—as part of the process, you can define tasks that eyeShare should execute automatically. eyeShare comes with built-in automation for all common IT activities related to problem resolution (*for more details see the next subsection, “Automating Routine Tasks—eyeShare Task Automation Library”*).
- Automate simple decisions—eyeShare integrates with all monitoring and C&C systems, so it can request the status of a device or a system parameter, examine the response and make a simple decision with no human intervention. You can build these types of automated decisions into your automatic workflow.
- Request a human decision—when the process reaches a significant decision junction requiring human judgment, you can instruct eyeShare to contact the problem owner (by SMS, email, IM or phone), present the available data and wait for a response before continuing the process.

How eyeShare Executes Workflows

1. eyeShare automatically captures symptoms, matches them to a problem, and automatically executes the appropriate resolution workflows (see *“Diagnosing Using Rules, Not Experts—eyeShare Rules Engine”* above).
2. Each workflow starts with finding an owner (see *Immediate Contact with Problem Owners—eyeShare Bi-Directional Notifications Engine* above).
3. Once an owner is found, eyeShare proceeds automatically, executing the automatic decisions and automated tasks defined in the workflow.
4. When a decision junction is reached, the automatic process stops, eyeShare notifies the problem owner and waits for input.

BOTTOM LINE: Executes problem resolution much faster and reduces human error, cutting problem resolution time.

Automating Problem Resolution Steps—eyeShare Task Automation Library

Ayehu eyeShare comes with a large library of automated tasks, which you easily drag and drop into your problem resolution workflows. This allows you to automate most common problem resolution steps, even in complex, multi-node environments.

If you prefer running your own IT Process Automation scripts for certain resolution steps, eyeShare allows you to use your existing scripts or batches, or even insert your own code in C# or VB.NET, executing any of these as part of the workflow.

The table on the following page lists activities eyeShare can automate out-of-the-box.

Notifications	System Automation	Service/ IT Process Automation
<ul style="list-style-type: none"> • Assign owner • Contact last responder • Wait for input (by CMD, email, SMS, voice) • Send email • Send IM • Send SMS • Make phone call • Play audio • Recognize speech • Record audio • Dial phone (DTMF) 	<ul style="list-style-type: none"> • Get CPU activity • Get available disk space • Current OS • Execute command or script • Get memory size • Restart a server • Shutdown server • User authentication 	<ul style="list-style-type: none"> • Restart service • Shutdown service • Get service status • Get service uptime • Stop service • Get process counter • Get process CPU usage • Get process memory usage • Kill process • Start process • Open/close ticket

Network/DB Automation	File System Automation	Web Applications Automation
<ul style="list-style-type: none"> • Ping a machine • Telnet session • Run SQL/TSQL statement • Run SQL/TSQL query 	<ul style="list-style-type: none"> • Delete file • Delete folder • Copy file • Get file create date • Check if file exists • Get file modified date • Rename file • Get file size • Create folder • Check if folder exists • Rename folder • Continuously read a file • Read text file • Read Excel file • Create text file • Create Excel file 	<ul style="list-style-type: none"> • Restart application pool • Start application pool • Stop application pool • Create virtual directory • Check if web page is available • Invoke web service • Reset IIS • Start IIS • Stop IIS
<p>Windows OS Automation</p> <hr/> <ul style="list-style-type: none"> • Get Windows event log • Delete registry • Query registry • Log off from server • Pause Windows service • Resume Windows service • Explore WMI 		

BOTTOM LINE: Executes problem resolution much faster and reduces human error, cutting problem resolution time.

Seeing the Bigger Picture—eyeShare Executive Dashboard and Continuous Improvement Tools

The dashboard shows:

- Real-time status of all active incidents across the organization
- Incident ownership
- Distribution of problems by severity and priority
- Predicted MTTR for each problem—based on how long it took to resolve the same type of problem in the past.



This provides unprecedented transparency for operations staff, IT managers and CIOs—everyone can see, at a glance, what is currently wrong, who is taking care of it and how long until the problems are resolved.

In-Depth Reporting on Problem Resolution Performance

In addition, eyeShare produces detailed reports on problem resolution, including:

- Actual historic MTTR for different types of events
- Incident resolution rates, bottlenecks, SLA breaches
- Complete event logs including notifications and operator responses
- Recurring events
- Critical maintenance tasks



Together, these reporting tools enable continuous improvement of your problem resolution process. You can look back at similar problems and see how they were resolved, which problems operators faced and how to improve the process in the future.

Brief Case Study: How a Leading Insurance Group Cut Portal Failure Resolution Time by 90%

Ayehu eyeShare was selected to improve IT problem resolution at Clal Insurance, a financial group which holds 23% of the Israeli insurance market and manages over \$40 billion in assets. Haim Inger, Clal's CTO, was in charge of implementing the solution.

The Challenge—Unacceptable Time to Recovery for Business Portal, Causing Financial Damage

Clal Insurance operates a web-based financial portal serving thousands of insurance agents. A major concern was the vulnerability of the portal to delays, disruptions and system downtime, which resulted in inconvenience, dissatisfaction, and subsequent loss of business. The relevant operational procedures, including system recovery, took too long and had to be done manually.

Inger realized that the root cause of the problem was that operational recovery procedures were stored in people's heads, rather than in any accessible repository. He tried to solve this by documenting operational procedures using Microsoft Visio, and handing these over to operations staff to follow. But recovery times remained high.

Implementing Ayehu eyeShare for the Portal Recovery Process

Clal selected Ayehu eyeShare to improve the portal's recovery process. Once eyeShare was installed and integrated, Clal could quickly implement the Visio procedures directly into eyeShare workflows:

- Workflows were triggered automatically when the portal failed
- An SMS messages was sent immediately to the operator responsible for the portal
- The operator was able to reply from a mobile phone, without needing to log in remotely or perform any other manual activities
- The SMS reply triggered an automatic recovery of the portal

The Result—90% Faster Recovery and More Time to Work on Other Valuable Tasks

Implementing eyeShare immediately resulted in a major reduction in portal downtime. Inger says that “once we started using eyeShare for portal system recovery, response time ... fell by over 90% and we feel that we have reduced lost business and created happier end-users.”

Inger adds that “the people previously involved in manual recovery of the portal are now free to work on other, more valuable tasks, and all system recovery knowledge is encapsulated in the eyeShare workflows.”

“We are no longer dependent on the availability of certain people to perform these critical recovery tasks, which sometimes happen when these people are sleeping or otherwise unavailable.”

Clal’s second project was problem resolution in a file data collection system (CyberArk). The result was improved quality of service and reduced work for developers, saving one man-year for this process only.

Inger says that “as a result of this success ... all new systems will be implemented on eyeShare prior to going into production, and I will no longer accept manual laminated Run Books”. Clal is now in the process of implementing eyeShare across the IT organization.

Want to read the whole story? [Download the full Clal Insurance case study.](#)



“We have reduced lost business and created happier end-users”

Haim Inger, CTO

Want to cut problem resolution time in your organization?

Automate one problem resolution process for free

Download trial version of Ayehu eyeShare

TRY IT TODAY >>

