

The Maturity of Remote Product Service

April 2008



Executive Summary

Is a 99.9% level of asset availability the mark of a perfect service organization? With the increased focus of service and manufacturing firms on preventive and often predictive maintenance processes, it seems that the drive for zero downtime is the primary reason for the 41% increase in the percentage of assets being monitored remotely over the last year. However, leading service firms are looking to differentiate themselves by instilling a heightened level of maturity in their service processes; one in which the service organization takes a greater stake in both the availability and the overall performance of the serviceable asset.

Research Benchmark

Aberdeen's Research Benchmarks provide an in-depth and comprehensive look into process, procedure, methodologies, and technologies with best practice identification and actionable recommendations

Best-in-Class Performance

In a March 2008 research survey of 140 service professionals, Aberdeen benchmarked key service and asset performance criteria to distinguish Best-in-Class companies. These firms revealed the following performance results:

- 93% current performance in serviceable asset availability
- 89% current service efficiency performance in first-time fix
- 16% improvement in mean time between failure for their assets over the last two years

Competitive Maturity Assessment

Survey results show that the firms enjoying Best-in-Class performance are:

- Almost twice as likely as all others to trigger corrective or preventive actions on notice of performance drop captured directly from the asset
- Exhibiting a 30% advantage over all others in percentage of overall service dispatches conducted for preventive maintenance
- 25% more likely than all others to use remotely captured data to inform service technicians of possible repair and resolution scenarios prior to dispatch
- Nearly twice as likely as all others to currently have Remote Product Service applications in place

"By combining remote diagnostics and predictive maintenance, the number of traditional on-site dispatches will significantly decrease. We are just beginning our predictive maintenance journey, but the early integration of these components will ensure that ongoing maintenance and support can be performed on a cost-efficient and minimally disruptive basis."

~ Paul Mercina, Director,
Service Product Management /
Applications Planning, Diebold,
Incorporated

Required Actions

To achieve Best-in-Class performance, companies must:

- Be proactive in the maintenance of assets
- Educate their technicians / CSRs and customers on the use and benefits of remote monitoring technology
- Focus on knowledge assimilation and management - both for their service technicians and for other value chain counterparts
- Wrap value-added services around the performance of the asset

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Chapter One: Benchmarking the Best-in-Class

Business Context

The role of the service organization has shifted over the last few years. Traditionally, service was viewed as a necessity purely due to the fact that products fail and need to be repaired so as to enable customers to carry on with their business. However, as executives began to understand the value of customer loyalty, they also started to view service as a core competitive differentiator; one that would not only guaranteed a higher degree of asset availability for its customers, but one that would continue to drive value, customer loyalty and ultimately profitability.

As such, leading service firms not only look to delivering excellence in terms of service for assets that have already broken down and need repair, but also in terms of preventive and predictive maintenance processes that ensure that assets are less likely to be shut down in the first place. In recent times, inadequate maintenance practices in the airline industry have led to significant travel disruptions and significant cost headaches for an industry that is already struggling with rising resource costs. Whether it be for regulatory and safety purposes or for mandates to drive service and maintenance-based revenues, improved asset uptime and availability are key yardsticks for successful service organizations.

In the aid of processes to support faster service and better preventive and predictive support, service organizations are looking to directly tap into their assets remotely so as to trigger corrective or preventive actions as and when service-related issues occur. This class of service, coined Remote Product Service (RPS) or Remote Device Management (for the remote service capabilities supported by Machine to Machine (M2M) connectivity), can enable service organizations to better support their customer service needs by enabling these firms to remotely capture and analyze asset performance data so as to:

1. Trigger corrective actions, root cause failures and dispatch workflows for an asset that has already broken down
2. Trigger preventive service workflows for assets displaying suboptimal performance and require maintenance and repair before they break down

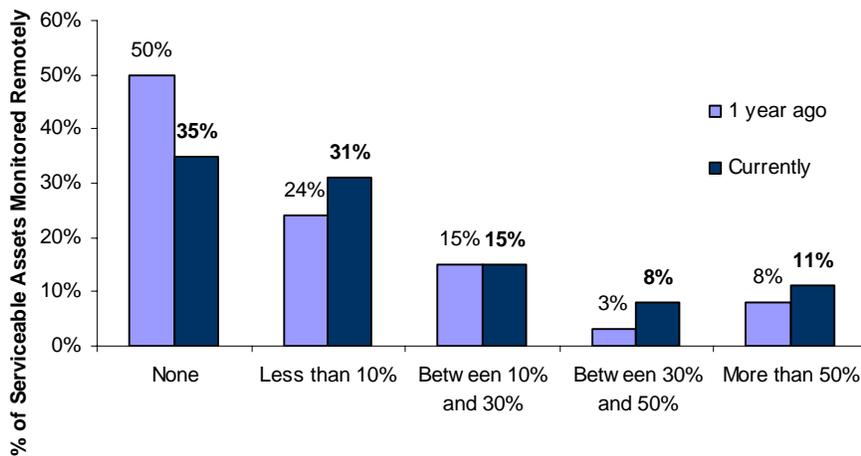
The emergence of this technology and its growth in popularity among service and manufacturing firms is timely, as of the 140 firms recently surveyed by Aberdeen, only 28% reported providing their customers with asset availability greater than 90%. In fact, 16% reported that assets at customer sites are down for nearly 50% of the time - not a successful recipe for customer satisfaction. As such, nearly 45% (64% for Best-in-Class versus 41% for all others) of firms have indicated that they currently leverage some form of remote monitoring with another 24% evaluating the use of remote monitoring solutions in the next 24 months.

Fast Facts

- √ **89%** of Best-in-Class firms indicate that they provide their customers with a level of asset availability greater than 90%, compared to 19% of all other firms
- √ **64%** of Best-in-Class firms indicate that they are currently leveraging some form of remote monitoring in their service organizations
- √ **41%** annualized growth rate in the percentage of overall assets that are monitored remotely by all responding firms
- √ **26%** average increase in cost per dispatch over the last two years for all service firms
- √ **19%** increase in number of calls resolved without customer dispatch for leading service firms, compared to a 2% increase for all other firms

Figure I reveals that from the perspective of percentage of assets in the field that are currently monitored remotely, there is a discernable shift in the number of firms remotely monitoring some proportion of their serviceable assets. In fact, the average proportion of assets currently being monitored has risen from 11.7% to 16.5% over the last year, an annual growth rate of 41%.

Figure I: Remote Monitoring Gaining Traction



Source: Aberdeen Group, April 2008

This report will look to highlight some of the key reasons for the maturity of RPS, not only from a perspective of growth in percentage of assets monitored remotely, but also in terms of the increased role that these tools play in ensuring improved asset uptime and improved asset performance, quality and overall customer satisfaction.

The Maturity Class Framework

Asset availability highlights the list of metrics that were used to determine Best-in-Class firms with respect to RPS. In essence, the combination of current performance in asset availability and first-time fix, coupled with improvement measurements in percentage of calls resolved without technicians dispatch and mean time between failure touch upon the core value proponents of RPS: improved asset performance, improved service efficiency and controlled service cost.

Table 1: Top Performers Earn Best-in-Class Status

Definition of Maturity Class	Mean Class Performance
Best-in-Class: Top 20% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 93% asset availability ▪ 89% first-time fix ▪ 19% increase in number of calls resolved without technician dispatch over the last two years ▪ 16% increase in mean time between failure over the last two years
Industry Average: Middle 50% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 80% asset availability ▪ 63% first-time fix ▪ 6% increase in number of calls resolved without technician dispatch over the last two years ▪ 5% increase in mean time between failure over the last two years
Laggard: Bottom 30% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 24% asset availability ▪ 22% first-time fix ▪ 5% decrease in number of calls resolved without technician dispatch over the last two years ▪ 4% increase in mean time between failure over the last two years

Source: Aberdeen Group, April 2008

With regards to asset availability for customers, the top Key Performance Indicator (KPI) measured by all firms in connection with the value of Remote Product Service, leading service firms are successful in ensuring that their customers' equipment is up and running 93% of time. While the 7% downtime represents room for improvement and the need for improved preventive maintenance and break / fix processes, these firms significantly outperform all other firms that report an average 65% of asset availability for their customers. Nearly 90% of leading firms indicate a greater than 90% level of asset availability for their customers, a range matched by only 19% of all other firms. In fact, 24% of non-Best-in-Class firms indicate a level of asset availability less than 50% for their customers, a precursor for malcontent and customer loss.

A significant contributor to improved asset availability and uptime is service efficiency, wherein customer issues are resolved on a first-time basis, therefore reducing or completely removing the need for secondary dispatch and delayed issue resolution. This ties directly back to the tools and knowledge with which the service technician is equipped before he is sent to the customer or asset site. For instance, visibility into available parts can lead to improved scheduling while upfront knowledge of the service issue and service or asset history can provide the technician with proper tools to accurately diagnose the issue and choose the appropriate remedy. As such, leading service firms boast a success rate near 90% in first-time fix when compared to a mere 51% for all other firms. To put that into perspective,

“Capturing the performance of the equipment before it becomes critical is a key to improving the asset performance by reducing down time. Customer expectation of good service is highly influenced by product performance, and lower failure rate is more important to customers than quick response time and fix time, etc.”

~ Director, Customer Service,
Global Office Equipment
Manufacturer

responding service firms indicate that the average cost of a technician dispatch is approximately \$263, a 26% increase from the \$209 estimate found by Aberdeen nearly two years ago. A 49% failure in first-time fix therefore means that there is a significant cost burden placed on the service organization from having to reschedule and redeploy service technicians who could have been used to complete other service tasks.

With a focus on cost management, leading service firms are also seeing significant improvements in completely removing service-related dispatches over the last two years, owing to improved management of minor service issues within the call center, improved capability to carry out repair or readjustment over a network, or increased use of customer self-service. Over the last two years, these firms have seen a 19% increase in number of service calls resolved without technician dispatch, which stands in contrast to the 2% increase for non-Best-in-Class firms. Tying this back to the increase of almost 26% in the costs associated with dispatching a service technician over the last two years, the removal of unnecessary dispatches can lead to significant cost savings.

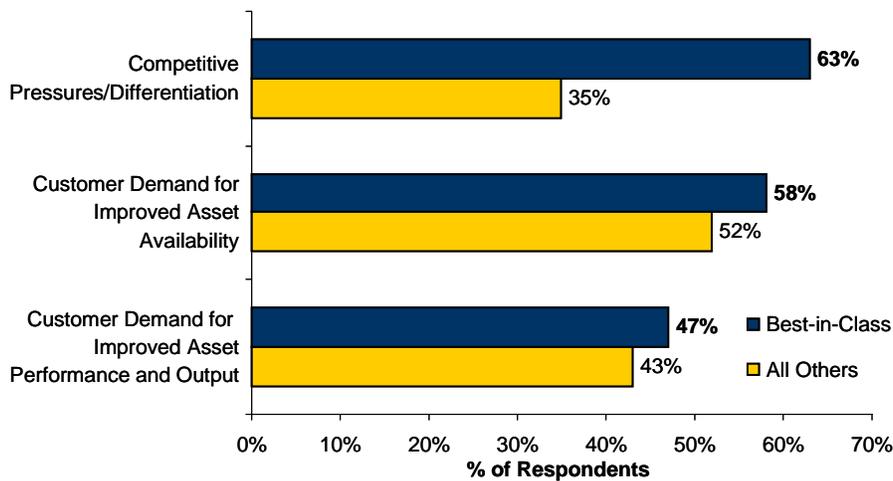
Over that same period of time, leading firms have also seen the greatest improvements in lengthening mean time between equipment failures. For instance, Best-in-Class firms report an average 15.6% increase in the period of time between subsequent failures on their serviceable equipment. This largely differs from the 4.5% improvement for non Best-in-Class firms over the last two years. A major contributor to this is the reliance of leading firms on preventive maintenance processes and tools that allow these firms to actually repair or service equipment before it fails, thus removing asset downtime.

The Best-in-Class PACE Model

Aberdeen's PACE framework is designed to highlight the key strategies and capabilities employed by Best-in-Class firms in support of their service operations and to alleviate market or internal pressures faced by their service organizations.

Aberdeen's survey found that the customer demand for improved asset availability was found to be a key pressure being faced by service organizations across the board to evaluate RPS-specific tools and processes. Fifty-four percent (54%) of all firms stated that this improved asset availability requirement was the top pressure. While 58% of Best-in-Class service firms also indicated that they were driven by their customer needs, nearly two-thirds view the need to differentiate themselves from the competition as a major driving force behind adopting improved remote monitoring tools. As such, these firms are looking to differentiate themselves with the level of service as well as complementary services that they can provide as a result of remote monitoring technology.

Figure 2: RPS as a Differentiator in a Competitive Landscape



Source: Aberdeen Group, April 2008

“We provide / report performance data back to the customer so they can use it for their own purposes in quality or reliability enhancement. Utilization is affected by many factors such as the lack of raw/input materials, operator inattention, and many other things besides the machine itself. We attempt to monitor those factors where possible so as to guide our customers on improved practices.”

~ Richard Lamb, President,
Midwest Technology Ventures,
Inc.

Nearly one-half of all organizations are beginning to see their customers demand that they take greater responsibility and oversight not only of asset availability but asset performance as well - a fact alluded to when referring to the maturity of RPS earlier in the chapter. While costs were deemed an important pressure for responding firms, only 22% stated that increased mobile worker or dispatch-related costs were driving them to consider remote monitoring solutions.

Table 2: Best-in-Class PACE Framework

Pressures	Actions	Capabilities	Enablers
<ul style="list-style-type: none"> Need to differentiate from competition 	<ul style="list-style-type: none"> Deploy monitoring technology on serviceable assets Develop preventive and predictive maintenance models Ensure improved collaboration between service and design / manufacturing teams 	<ul style="list-style-type: none"> Corrective action triggered on notice of performance drop captured remotely from asset Corrective or preventive action triggered on service and asset performance history Technicians / CSRs have on-demand access to asset / customer service performance history Technicians / CSRs have on-demand access to product schematics, service logs and resolution practices Assimilation of service logs and resolution practices into central knowledge base Upfront collaboration between service and design teams on virtual prototypes to identify potential causes of failure and resolution scenarios 	<ul style="list-style-type: none"> Service management solution with remote monitoring functionality Enterprise Asset Management solution Knowledge Management system Remote Monitoring or Remote Product Service application

Source: Aberdeen Group, April 2008

Best-in-Class Strategies

In response to these drivers, leading service organizations are taking steps to acquire greater insight into the performance of their assets and to use

the increased visibility and data flow to bolster their service performance. As such, these firms increasingly looking to:

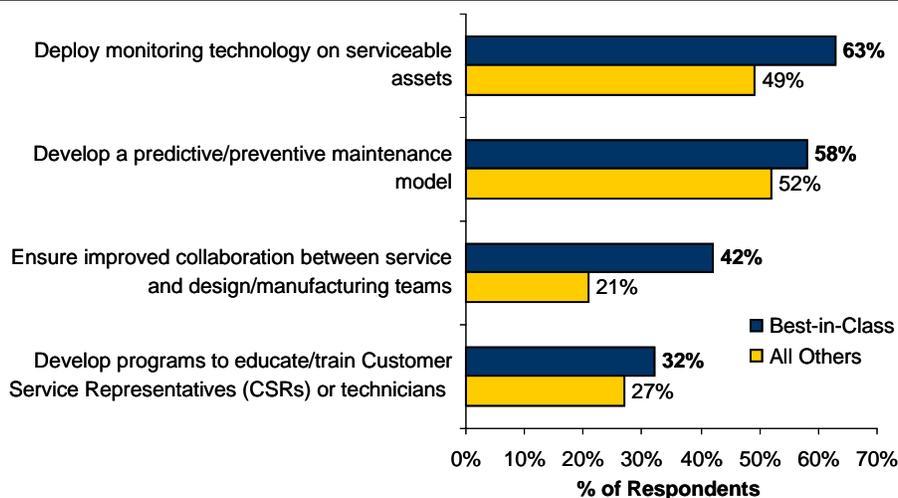
- Monitor their serviceable assets, not only from a location point of view, but also to tap into the performance of these assets to drive improved issue diagnosis and service
- Improve preventive and predictive maintenance processes within their organization to reduce the reliance on break / fix
- Employ a design for serviceability approach so as to improve product quality and reduce instances of asset failure
- Deploy programs to train their technicians on issue diagnosis techniques and resolution techniques so as to ensure improved performance in both asset availability and first-time fix, as they apply to both preventive and break / fix modes of service

The underlying theme of the key actions taken by leading firms is the focus on the quality of the underlying asset and how that ties back to improved customer satisfaction. These firms understand that it is no longer sufficient to just be excellent in product service, but for those firms that manufacture the equipment that they are required to service, there is an increasing need to focus on and improve the quality of their products so as to ensure minimal downtime intrusions.

"Remote monitoring will allow us to capture asset performance trending information which could allow our customer to make adjustments so as to improve output quality. At the same time, it can greatly enable us to reduce diagnosis time and time to issue resolution which is an incredible value to our customers."

~ Michael N. Olmstead, VP,
Outside Operations, Satisloh
North America

Figure 3: Strategic Actions in Aid of Improved Asset Performance



Source: Aberdeen Group, April 2008

Aberdeen Insights — Overall Equipment Effectiveness

A metric that is getting traction in the asset management space, particularly as firms look to take a greater stake in the quality of the assets that they manufacture, is Overall Equipment Effectiveness or OEE. Essentially OEE takes asset availability and uptime a step further by also considering the performance of the asset and the quality of output. OEE is measured as $OEE = \text{Asset Availability} \times \text{Asset Performance} \times \text{Asset Quality}$ where:

$\text{Asset Performance} = \text{Total Output} / \text{Potential Output at Full Capacity}$

$\text{Asset Quality} = \text{Good Output} / \text{Total Output}$

With regards to service, particularly for manufacturing firms that service their own assets, OEE provides a yardstick by which firms can measure the performance of their assets and trigger corrective actions upon a drop in the metric. The enhanced asset performance tracking capability provided by remote monitoring technology greatly facilitates the measurement of this metric. At this stage in the maturity of remote monitoring technology firms continue to monitor asset availability with 59% reporting that it is the key performance indicator that they use to measure the success of their asset management processes. Only 26% currently hold asset performance in the same regard with 15% providing the same level of importance to quality. As service firms continue to evolve in their approach to asset management, there could be significant customer service opportunities generated from proactively tracking OEE.

"Overall equipment utilization or effectiveness is one of the biggest drivers in the capital equipment business. Its all about creating value for your customers so that they can continue to operate effectively."

~ Manager, Customer Service,
Global Industrial Manufacturing
Organization

Chapter Two: Benchmarking Requirements for Success

The success of any initiatives and programs adopted to support remote product service ultimately depend on the supporting cast of organizational capabilities and processes in place. The identification of these vital capabilities, specifically around asset and service performance management, and the organizational gaps that need to be overcome to put these in place will help service firms ascend to the status of Best-in-Class.

Case Study — Diebold, Incorporated.

Diebold's service channel accounts for approximately half of the company's revenue. The company constantly strives to deliver higher-quality service, while financial institutions remain under constant scrutiny to reduce their operating costs, including those of outsourced services. This compelled Diebold to think beyond its standard service delivery by way of "rolling trucks" and explore more innovative ways to service machines.

With the technological trend to move to a more software-driven self-service ATM terminal, Diebold sought to remotely service its ATMs over the Internet. However, given the sensitive nature of cash-dispensing ATMs, the company required a proven, secure solution. Therefore in 2006, the company deployed a remote service enabler known as OpteView® for some of its Opteva ATMs, as well as its i and ix product lines. The solution sets up a direct communication flow between Diebold and end-user ATMs and securely leverages the devices to the people and systems responsible for service and support.

OpteView®, currently installed on more than 1200 ATMs with another 3000-5000 expected by the end of 2008, enhances every key aspect of servicing ATMs, including accuracy, timeliness and communication. In addition to break/fix, it enables Diebold to expand the level of its service and support offerings to include predictive maintenance, software version control and remote monitoring and notification. This tool helps Diebold maximize ATM availability and increase customer satisfaction, while aiding product and engineering development with data on hardware and software performance.

The solution has yielded impressive results. Diebold's traditional service model did not begin until a customer service engineer (CSE) arrived on site. Diebold can now remotely access the ATM while the CSE is en route to the ATM or before the CSE is dispatched. OpteView® remote support operators can conduct a remote diagnostic session to provide detailed information to the CSE when needed. As a result of deployment, a range of 10% to 17% of issues have been resolved remotely depending on the level of access allowed by customers, which corresponds to an average 8% to 15% decrease in equipment downtime for Diebold's customers. Turnaround time for problem resolution has been reduced from roughly three hours to fewer than 30 minutes, when remote corrective action is successful.

continued

Fast Facts

- √ 30% advantage revealed by leading service firms over all others in percentage of dispatches made for preventive maintenance visits
- √ Leading service firms are almost two times as likely as all others to trigger corrective or preventive actions on notice of performance drop captured directly from the asset
- √ Best-in-Class firms are 25% more likely than all others to use remotely captured data to inform service technicians of possible repair and resolution scenarios prior to dispatch
- √ Leading firms are nearly twice as likely as all others to currently have Remote Product Service applications in place

Case Study — Diebold, Incorporated.

In aid of preventive maintenance capabilities, OpteView® allows regularly scheduled data collection points. This data is compiled and reviewed periodically to enable Diebold to accurately track device performance metrics and to begin to establish predictive rules and processes to provide the customer and the manufacturer with advance notification of which components will fail and at what time.

About Diebold, Incorporated:

Diebold, Incorporated is a global leader in providing integrated self-service delivery and security systems and services. Diebold employs more than 17,000 associates with representation in nearly 90 countries worldwide and is headquartered in Canton, Ohio, USA.

Competitive Assessment

Best-in-Class service firms, as determined by their performance in key indicators, exhibit several of the aforementioned capabilities that fall into the five categories of Aberdeen's Competitive Framework: (1) **process** (workflows for dispatch and maintenance in place to assist with improved asset and service performance); (2) **organization** (corporate focus on the opportunity presented with improved customer service through oversight of service performance and the development of processes and programs to initiate improved service); (3) **knowledge management** (making asset and service data available to stakeholders that require it the most); (4) **technology** (the selection of appropriate tools and the intelligent deployment of those tools); and (5) **performance management** (the ability of the organization to track / measure performance and drive further improvements with necessary modifications to processes in place).

“We needed to provide service more efficiently and cost effectively, while delivering higher uptime and productivity to our customers, which improves their revenue opportunity. Remote service software would allow us to service machines, while continuing to respond to issues within minutes as opposed to always sending a technician on site. Finally, when we do need to dispatch a technician, we can eliminate unnecessary downtime by remotely diagnosing the problems while the technician is en route to the ATM.”

~ Shelly Ewing, Senior Product Manager, Service Product Management, Diebold, Inc.

Table 3: The Competitive Framework

	Best-in-Class	Average	Laggards
Process	Corrective or preventive action triggered based on service and asset performance history		
	58%	33%	20%
	Corrective or preventive action triggered upon notice of asset performance drop captured remotely from asset		
	32%	23%	12%
	Remotely captured data used to inform field technicians of failure and recommend resolution scenarios prior to dispatch (Note: The percentage here is based on the number of firms in each class that remotely capture data)		
	50%	40%	40%

	Best-in-Class	Average	Laggards
Organization	Organizational support for programs to train technicians / CSRs on resolution scenarios and best practices		
	37%	37%	16%
	Upfront collaboration between service technicians and design teams on virtual prototypes to identify potential causes of failure and resolution scenarios		
	32%	29%	20%
	Organization has senior service executive in place who has on-demand visibility into service and asset performance		
	37%	23%	28%
Knowledge	Technicians / CSRs have on-demand access to asset / customer service history		
	58%	37%	36%
	Assimilation of service logs and resolution practices into central knowledge base		
	47%	25%	16%
	Service data and history made available to design / manufacturing teams		
	47%	46%	24%
Technology	Applications in Place:		
	<ul style="list-style-type: none"> ▪ 42% Service Management with Remote Monitoring Functionality ▪ 37% Enterprise Asset Management Solution ▪ 47% Remote Product Service Solution ▪ 26% Knowledge Management Solution 	<ul style="list-style-type: none"> ▪ 31% Service Management with Remote Monitoring Functionality ▪ 25% Enterprise Asset Management Solution ▪ 25% Remote Product Service Solution ▪ 19% Knowledge Management Solution 	<ul style="list-style-type: none"> ▪ 28% Service Management with Remote Monitoring Functionality ▪ 16% Enterprise Asset Management Solution ▪ 24% Remote Product Service Solution ▪ 20% Knowledge Management Solution
	Real-time measurement of service and asset performance		
	47%	20%	20%
	Performance		

Source: Aberdeen Group, April 2008

Capabilities and Enablers

The Best-in-Class capabilities across the five recognized categories as identified in the competitive framework align specifically with the strategic actions taken by leading service firms towards highlighted in the previous chapter. In general, the focus on asset performance, service excellence and

quality is reflected in the capabilities with which leading firms equip themselves.

Process

Leading service firms are looking to reduce the incidence of break / fix service tasks for their service technicians. When compared to all other firms, leading firms exhibit a 30% advantage (31.8% for Best-in-Class versus 24.4% for all others) in terms of percentage of overall visits that are scheduled for preventive maintenance. Over the last year alone these leading firms have seen a 4% increase in the percentage of service visits being conducted for preventive reasons as opposed to break / fix visits.

In addition to taking actions to deploy remote monitoring sensors and tools on their serviceable assets, these firms are also looking to actively use the data gathered from these assets to schedule preventive visits. Fifty-eight percent (58%) of leading firms have processes in place to trigger corrective actions based on past history of service and asset performance while another 42% complement this with data and performance deterioration information directly captured from the serviceable asset itself. Only 29% of non-Best-in-Class firms rely on past service and asset performance history to schedule their service visits, with only 19% using the data captured directly from the serviceable asset.

While the shift is towards preventive maintenance tasks, break / fix events still occupy a portion of service dispatches. Forty-two percent (42%) of leading firms immediately trigger corrective actions on the notice of asset failure directly captured from the asset when compared to 22% of all other firms. A majority of non-service firms continue to rely on actual notification of asset failure from the asset operator, therefore delaying the actual time to repair.

“One of the biggest values to remote technology is in avoiding crisis management. In case something is beginning to falter during a preventive cycle, we can conduct a root cause analysis, diagnose the problem and dispatch the technician and required parts way before the problem escalates. With one customer, this capability enabled us resolve a potentially major problem with only 2.5 hours of downtime for the customer, when it could have been 38 to 70 hours.”

~ Manager, Customer Service,
Global Industrial Manufacturing
Organization

Aberdeen Insights — Use of Remote Connectivity

In addition to collecting data directly from serviceable assets to trigger corrective or preventive actions, either in the form of technician dispatch or customer contact, feeding the data captured from the equipment back to their service technicians so as to aid with issue resolution and dispatch. Fifty percent (50%) of leading firms that have remotely connected assets currently leverage this capability compared to only 40% of all other firms. As such, these firms are collecting all this performance data from their serviceable assets and using it or planning to use it for a lot more than just monitoring the condition of the asset.

continued

Aberdeen Insights — Use of Remote Connectivity

Table 4: Leading Uses of Remotely Captured Data for Best-in-Class firms

Current Use	Percent of BIC that Remotely Capture Data	Planned Use	Percent of BIC that Remotely Capture Data
To monitor asset condition	78%	To forecast future failures and plan service resource needs	58%
To monitor asset performance and quality to assist in preventive maintenance	61%	To improve design of product	44%
To inform field technicians of failure and recommend resolution scenarios prior to dispatch	50%	To determine value-added services	39%
To monitor asset usage information for repair/replacement decisions	50%	To execute repair over a network without technician dispatch	28%
To determine value-added services	44%	To ensure timely/accurate invoicing or billing	28%
To execute repair over a network without technician dispatch	39%	To determine root cause of failure for warranty claims	28%

Source: Aberdeen Group, April 2008

Organization

A shift in the service culture to one that significantly emphasizes the value of quality or relies on predictive or preventive service delivery requires the support of an organization that truly understands the value of its service operation. This is often reflected in the existence of a senior service executive, who not only controls the service P&L, but also has on-demand visibility into service and asset performance so as to make required modifications and / or investments. As such leading firms are 57% more likely (47% for Best-in-Class versus 30% for all other organizations) than all others to have such a senior executive in place, a consistent theme for Best-in-Class companies across the Aberdeen's Service Management research.

The value of a senior service executive is also felt in the form of well-established training programs that enable service technicians and CSRs to learn from others in the field and develop a familiarity with the tools and knowledge necessary to adequately diagnose and resolve issues at customer sites. While the development of training programs was highlighted as an ongoing strategic action for leading service firms, these firms are also more and more likely to have training programs in place to support the development of their field technicians.

Along with field-based knowledge, technician capabilities are also bolstered through collaboration with design or manufacturing teams to develop accurate diagnosis and resolution scenarios during the design or production

of serviceable equipment. A clearer understanding of asset components and make up can assist technicians in understanding potential causes of asset failure or performance deterioration that can improve their ability to repair assets on a first-time basis.

Knowledge Management

While ensuring that there is upfront collaboration between service and design teams, leading service firms are also taking steps to share service data with their design teams and incorporate service-related feedback into improved design and manufacturing process, so as to close the loop between design, manufacturing and service. In Table 4, 44% of leading service firms are looking to use remotely captured data to improve the design of their products and transfer the benefits of improved product quality to their customers. These firms are nearly 21% more likely than all others to share service and asset data with value chain counterparts and so will be better equipped to leverage the enhanced service data captured from remotely monitored assets. Service information such as the incidence of product failure due to a particular component or the environment in which a product is used can assist the design teams to go back to the drawing board and tweak the product so as to reduce incidence of asset failure or performance deterioration. To illustrate the value of this approach, firms that currently share data between their service and design teams report a 13% advantage in asset availability for their customers when compared to firms that don't.

“A lot of engineers don’t even consider service as important and feel that once the product goes off the line, it falls off the face of the earth. The whole design for serviceability approach requiring upfront collaboration at the design stage becomes an internal sale. But once they see the value of it, they become your biggest ally.”

~ Manager, Marketing and Customer Service, Telecommunication Equipment Provider

Table 5: Value of the Design for Serviceability Approach with regards to Asset Availability

Service and Asset Performance Data made available to Design/ Manufacturing Teams	Asset Availability
Currently done	77%
Not in place	68%

Source: Aberdeen Group, April 2008

While centrally available service data can greatly assist improve product quality, it can also be leveraged to arm service technicians with the right information and tools required to repair products when they do break down. As such 47% of leading firms have systems in place to assimilate service and asset information history into an accessible knowledge base. Once this is accomplished, these firms are providing their technicians with on-demand access to product schematics and resolution best practices. To take it a step further, 50% of leading firms that remotely capture asset information push this out to their service technicians and recommend potential causes for failure and scenarios for resolution.

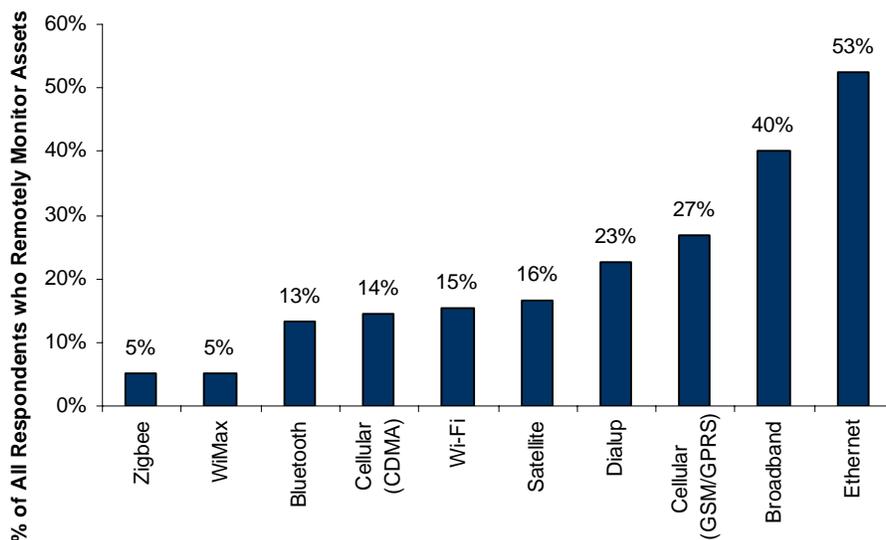
Technology

To support improved maintenance and service processes and to facilitate enhanced knowledge transfer, leading service firms are actively leveraging solutions that enable them to:

- Remotely capture data directly from the asset, as evidenced by the 47% of leading firms currently using stand-alone Remote Monitoring/Remote Product Service Solutions, which is almost two times the adoption rate of all other firms. Forty-two percent (42%) indicate that they are currently using service management systems that allow the remote capture of asset data.

Remote monitoring is made possible by the use of a device that captures asset data and transmits it back to the remote service application via an available network. Across all firms, the current preference is for tethered broadband or Ethernet-based connections (Figure 4). However, most of the interest going forward in the next 12-24 months is in the use of cellular, satellite or Wi-Fi based networks.

Figure 4: Network Usage for Remote Monitoring



Source: Aberdeen Group, April 2008

- Aggregate and store captured data, as made possible through the use of service management or enterprise asset management solutions.
- Assimilate and feed the data to related parties such as technicians, CSRs and other value chain counterparts in the case of Best-in-Class service firms. Hence, there's an increased attention being paid to Knowledge Management solutions.

Table 6: Applications in Support of Improved Service and Asset Management

Application Type	% of Respondents with Application Currently in Place	
	Best-in-Class	All Others
Remote Monitoring / Remote Product Service Application	47%	25%
Service Management Application with Remote Monitoring Functionality	42%	30%
Enterprise Asset Management System	37%	22%
Knowledge Management System	26%	19%

Source: Aberdeen Group, April 2008

Aberdeen Insights — Deployment

With regards to enabling the remote monitoring of serviceable assets and thereby facilitating processes around RPS, firms are faced with the choice of retrofitting assets out in the field with remote monitoring sensors or hardware or just attaching the required hardware to new products sold. Only 12% of polled respondents indicate that they are currently retrofitting all their assets in the field, while 49% indicate that their preferred strategy is to retrofit only those assets that are high value or critical nature. Along with retrofitting high value assets, 41% indicate that they are providing remote monitoring hardware and capabilities only on new equipment sold. Twenty-eight percent (28%) of firms also indicate that they are actually following a deployment strategy of replacing old equipment with upgraded versions that are fitted with remote monitoring hardware. As the cost associated with retrofitting assets, which varies with the number of assets deployed or complexity of the assets, is often prohibitive, manufacturing firms should consider the inclusion of remote capture capabilities and hardware in their product design or acquisition strategies.

"We are looking to remote service to drive efficiency and cost improvements. As such, we are looking for a near 25% increase in call avoidance, a 5% decrease in inventory and significant increase in response times in the minds of our customers- either before the product fails or within 30 minutes of issue log. With the combination of remote monitoring and our technical service team we can look to avoid dispatch on nearly 58% of our calls. This will help us develop stronger customer retention and loyalty and enable us to differentiate ourselves from our competition."

~ Director, North American Medical Device Manufacturer

Performance Management

To support the senior executives visibility into performance metrics, 47% of Best-in-Class firms measure service and asset performance in real-time. Real-time visibility into asset performance is another benefit of remotely monitoring service assets as information from the asset is continuously fed back to the service organization. As such, service organizations are capable of taking corrective or preventive actions the moment a triggering event occurs.

Real-time visibility into performance also enables the service organization to gauge the success and value of investments in modified processes or in

technology. Respondents to Aberdeen's survey indicated that cost was a major impediment to them making investments in remote technology. Visibility into enhancements afforded by remote technology on service performance will enable these organizations to get beyond the challenge of justifying the cost for such a solution. For instance, respondents to Aberdeen's survey have indicated that on average they have seen a 21% increase in asset availability since the adoption of remote monitoring solutions. From a cost savings perspective, reduced primary or secondary dispatches as a result of improved asset information along with improved resource usage practices have enabled service organizations to shave a significant amount off their operating costs. Taking a simple example of a firm with 320 technicians (average number as per Aberdeen's survey respondents) who are dispatched four times a day for approximately 200 days a year ($320 \times 4 \times 200 = 256,000$), a 28.1% reduction in the number of dispatches at \$263/dispatch (28.1% of 256,000 = 71,936) can lead to a savings of approximately \$19 million ($71,936 \times \263), without making considerations for technicians or other resource adjustments that the organization might make.

Table 7: Improvements Linked Back to Remote Product Service

Metric	Average Change Since Technology Deployment
Asset Availability	21.2%
First-Time Fix	20.3%
Mean Time Between Failure	22.4%
Mean Time to Repair	-21.0%
Percent of Calls Resolved without Technician Dispatch	28.1%

Source: Aberdeen Group, April 2008

Chapter Three: Required Actions

Whether a company is trying to move its performance in asset performance and customer satisfaction from Laggard to Industry Average, or Industry Average to Best-in-Class, the following actions will help spur the necessary performance improvements:

Laggard Steps to Success

- **Gain visibility into service and asset performance.** To develop a better understanding of where the service organization falls short and needs help, it is imperative that Laggards put systems in place to measure metrics such as asset availability, first-time fix and mean time between failure. Currently only 20% of Laggards measure service metrics in real-time compared to 47% of Best-in-Class firms. Even if you take out the real-time requirement, only 48% of Laggards actually measure asset availability. Without insight into the service organization's performance, it is extremely difficult for leadership to make fill in the gaps with improved processes or tools.
- **Leverage remote monitoring for more than just asset location tracking.** A majority of Laggards that currently remotely monitor their assets use it primarily to monitor the asset from a location point of view or for security purposes. While location tracking can be a large benefit to the service dispatch organization, remote monitoring enables a greater opportunity for these firms to track asset availability and asset performance. Currently 65% of Laggards who have remote tracking capabilities use remotely captured data to track the location of the serviceable asset, whereas only 40% and 35% use that information to monitor asset condition and asset performance respectively (compared to 78% and 61% for leading firms), so as to aid in determining corrective or preventive actions.
- **Share service data with design / manufacturing teams.** While Laggards need to take appropriate steps to enable improved break/fix and preventive maintenance, there also needs to be a focus from these firms on improving the quality of assets in the field. This can be accomplished by promoting a collaborative environment between service and design/manufacturing teams. Only 24% of Laggards currently make service data available to the other value chain counterparts in their organization compared to 46% of Industry Average firms and 47% of Best-in-Class.
- **Develop training programs for service technicians / CSRs.** Only 16% of Laggards currently have structured programs in place to train their service technicians on issue handling or issue resolution scenarios and only 20% consider it to be a strategic

To be Best-in-Class, firms must:

- √ Be proactive in the maintenance of assets
- √ Educate their technicians/CSRs and customers on the use and benefits of remote monitoring technology
- √ Focus on knowledge assimilation and management - both for their service technicians and for other value chain counterparts
- √ Wrap value-added services around the performance of the asset

"Remote service will give an insight to R & D on areas that can be improved on the next generation of product, what features the customers are using more / less often."

~ Director, Customer Service,
Global Office Equipment
Manufacturer

action to improve service performance. As exhibited in Chapter 2, leading service firms are placing a great deal of emphasis on formalized training programs so as to equip their technicians or CSRs with the knowledge and tools to interpret the enhanced service data available through remote monitoring so as to deliver efficient service to the end-user.

Industry Average Steps to Success

- **Develop processes and systems to assimilate and store service data and best practices.** Information on service calls and asset history can provide a great deal of value to other service technicians or related teams within the organization. While Industry Average firms are taking steps to ensure collaboration between their service and design teams, the collaboration is ad hoc in nature and there is not formalized approach to storing service and asset history in centralized knowledge base. While only 25% of Average firms currently assimilate service logs and resolution best practices, another 33% indicate that this is a top priority for them in the next 12-24 months. This becomes even more vital in organizations experiencing a high degree of technician turnover or those that are faced with a crop of technicians who are approaching retirement.
- **Provide technicians with issue resolution scenarios prior to dispatch.** While Industry Average firms are ahead of their Laggard counterparts in using RPS solutions to track asset condition, these firms are not taking advantage of the asset performance data to assist their technicians of possible causes of failure and probable resolution scenarios prior to dispatch. Average firms that currently monitor assets remotely are 25% less likely than their Best-in-Class counterparts to provide this level of assistance to their service technicians. This is a major reason why these firms struggle in their first-time fix performance when compared to leading service firms and therefore add avoidable dispatch-related costs to their service P&L.
- **Educate customers on the value of RPS.** While growth rates in RPS indicate a wider acceptance of the technology among service and manufacturing firms, the relatively low adoption rates still indicate a need for education in the marketplace on the benefits of remote monitoring. Nearly 32% of firms indicate that the major challenge to RPS adoption is the cost requirements associated with the technology that often gets passed on to end-users or asset operators. The cost factor is followed by objections to the perceived time taken to implement remote monitoring technology, the complexity of IT work required to initiate remote monitoring, and external access to process- or usage-related IP. These objections indicate the need for a consultative approach by service and manufacturing firms to help their customers understand the productivity and quality benefits afforded by remote monitoring

technology and how the improved visibility can ensure that the asset operators' top line isn't adversely impacted by inefficient service.

- **Leverage enhanced data capture capabilities to tailor covenants in service contracts and offer value-added services.** Enhanced visibility into the efficacy of the service organization can assist Industry Average firms to tailor their service contracts so as to match their capabilities in terms of speed and efficiency of service delivery. In addition, it can also enable these firms to introduce tiered or even pay-for performance contracts that can significantly help these firms drive service revenue opportunities. Nearly 30% of Average firms are currently considering the use of remote monitoring solutions to ensure improved SLA compliance or to develop pay-for-performance contracts. Information of asset usage trends and asset capacity can also enable these firms to up-sell and cross-sell complementary products and services to their customers.

In the case of Omnicell – a provider of patient safety systems and solutions for healthcare facilities – the company was looking to deploy an RPS solution in its service division to improve customer satisfaction, achieve competitive differentiation, reduce overall service costs, and increase system availability for its customers at healthcare facilities.

The company deployed a remote monitoring solution, called “V-Suite,” to facilitate automated event reporting, connectivity, and management of system uptime. As of 2006, Omnicell had deployed this solution at more than 350 hospitals (25% of its customer base) enabling technicians to monitor more than 5,000 devices and take corrective action prior to equipment failure.

Post deployment, the company reduced average mean-time-to-repair by 20% and decreased service costs by 5%. Additionally, Omnicell used its performance data to grow revenues as the company began offering three levels of service agreements, enabling its sales force to cross-sell and up-sell current customers based on visibility into trends of asset usage and service performance.

"Getting customers to buy 'Intelligent Support Services' based on remote product diagnostic capability was a challenge. So, we bundled the package with the initial product offering. Not only did we reduce service costs, but once the customers realized the value, they started calling us to retrofit the older presses with this technology!"

~ Richard Mack, Heidelberg
USA, Inc.

Best-in-Class Steps to Success

While Best-in-Class firms display excellence in reducing downtime for their service customers and in taking an active role in improving processes around preventive maintenance and asset performance, these firms can benefit by leveraging capabilities enabled by remote monitoring solutions such as:

- **Improved forecasting and planning service resource needs.** Polled Best-in-Class firms indicated that this was one of their top priorities in terms of planned uses of remotely captured asset performance and failure data (Table 4). Trends on asset failures and service needs can greatly assist these organizations in appropriately

positioning their service teams so as to ensure speedier and more efficient service.

- **The initiation of self-service scenarios.** Twenty-two percent (22%) of leading firms are also considering the use of remotely captured data to provide their customers with probable self-service scenarios so as to reduce the need for technician dispatch for non-essential service calls.
- **Expedited warranty claims processes.** Root causes for asset failure, as captured over remote networks, can expedite the approval of warranty claims. While 28% are currently leveraging data captured directly from the asset for their warranty claims processes, another 28% are looking to utilize this information in their warranty processes in the next 12 to 24 months. Trend data can also enable these firms to tailor warranty covenants so as to minimize overall warranty costs.

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Appendix A: Research Methodology

Between March and April 2008, Aberdeen examined the use, the experiences, and the intentions of 140 enterprises in the use of remote monitoring tools to boost asset and service performance.

Aberdeen supplemented this online survey effort with interviews with select survey respondents, gathering additional information on the strategies, experiences, and results associated with remote monitoring tools.

Responding enterprises included the following:

- *Job title / function:* The research sample included respondents with the following job titles: C-Level executive (16%); Vice-President or Director (28%); Manager (31%); and Engineer (12%).
- *Industry:* The following industries had the largest representation in the study. Industrial Equipment Manufacturing (17%); Utilities and Mining, Oil and Gas (13%); Computer Equipment and Peripherals (12%); Medical Devices and Services (12%); IT Services (11%); and Telecom (11%).
- *Geography:* The majority of respondents (55%) were from North America. Remaining respondents were primarily from the Asia-Pacific region (13%) and Europe, Middle East and Africa (29%).
- *Company size:* Twenty-six percent (26%) of respondents were from large enterprises (annual revenues above US \$1 billion); 37% were from midsize enterprises (annual revenues between \$50 million and \$1 billion); and 37% of respondents were from small businesses (annual revenues of \$50 million or less).
- *Field Service Headcount:* Twenty-eight percent (28%) of respondents were from large service enterprises (field technician headcount greater than 500); 33% were from midsize service enterprises (field technician headcount between 50 and 500); and 39% of respondents were from small field service businesses (technician headcount less than 50).

Solution providers recognized as sponsors were solicited after the fact and had no substantive influence on the direction of this report. Their sponsorship has made it possible for Aberdeen Group to make these findings available to readers at no charge.

Study Focus

Responding service and manufacturing executives completed an online survey that included questions designed to determine the following:

- √ The degree to which remote monitoring technology and RPS applications are deployed in their operations and the financial implications of the technology
- √ The structure and effectiveness of existing RPS implementations
- √ Current and planned use of remotely captured data to aid break / fix and preventive maintenance tasks.
- √ The benefits, if any, that have been derived from RPS initiatives

The study aimed to identify emerging best practices for the use of RPS in service, and to provide a framework by which readers could assess their own management capabilities.

Table 8: The PACE Framework Key

Overview
<p>Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows:</p> <p>Pressures — external forces that impact an organization’s market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)</p> <p>Actions — the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product / service strategy, target markets, financial strategy, go-to-market, and sales strategy)</p> <p>Capabilities — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products / services, ecosystem partners, financing)</p> <p>Enablers — the key functionality of technology solutions required to support the organization’s enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)</p>

Source: Aberdeen Group, April 2008

Table 9: The Competitive Framework Key

Overview	
<p>The Aberdeen Competitive Framework defines enterprises as falling into one of the following three levels of practices and performance:</p> <p>Best-in-Class (20%) — Practices that are the best currently being employed and are significantly superior to the Industry Average, and result in the top industry performance.</p> <p>Industry Average (50%) — Practices that represent the average or norm, and result in average industry performance.</p> <p>Laggards (30%) — Practices that are significantly behind the average of the industry, and result in below average performance.</p>	<p>In the following categories:</p> <p>Process — What is the scope of process standardization? What is the efficiency and effectiveness of this process?</p> <p>Organization — How is your company currently organized to manage and optimize this particular process?</p> <p>Knowledge — What visibility do you have into key data and intelligence required to manage this process?</p> <p>Technology — What level of automation have you used to support this process? How is this automation integrated and aligned?</p> <p>Performance — What do you measure? How frequently? What’s your actual performance?</p>

Source: Aberdeen Group, April 2008

Table 10: Relationship Between PACE and Competitive Framework

PACE and the Competitive Framework – How They Interact
<p>Aberdeen research indicates that companies that identify the most influential pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance that a company achieves is strongly determined by the PACE choices that they make and how well they execute those decisions.</p>

Source: Aberdeen Group, April 2008

Appendix B: Related Aberdeen Research

Related Aberdeen research that forms a companion or reference to this report includes:

- [*Ground Up Strategies in Asset Performance Management*](#); September 2007
- [*The Convergence of Field Service and Asset Management*](#); June 2007
- [*Benchmarking Enterprise Asset Management*](#); June 2007
- [*Collaborative Asset Maintenance Strategies*](#); December 2006
- [*Remote Product Service Update*](#); November 2006
- [*The Remote Product Service Solution Selection Report*](#); June 2006

Information on these and any other Aberdeen publications can be found at www.aberdeen.com.

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