

*Battling Complexity with Automated Diagnostics
Leveraging Innovative Technology to Help Technology
Companies Stay Ahead of the Complexity Curve*

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*A Joint Research Paper from
ISOdx and TSIA*

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EXECUTIVE SUMMARY

Today's technology users are faced with an incredibly sharp complexity curve as products ranging from personal mobile devices to enterprise hardware and software evolve faster than users are able to understand and consume new product versions and features. Nowhere within technology companies is the pain of this avalanche of complexity felt more than in customer support. TSIA benchmark data shows that as product complexity has risen, overall service performance has fallen dramatically, and response and resolutions times are taking longer. Fewer incidents are resolved on the first interaction—meaning customer downtime is increasing and threatening to impact customer success and satisfaction.

In an attempt to reverse this trend, support organizations have invested heavily in technical training for support representatives, and in knowledge management tools to help support techs find a needed answer quickly. Unfortunately, both approaches have proven inadequate. New support technicians are now spending almost six weeks in training their first year—very expensive “off phone” time—and TSIA members report high dissatisfaction with existing knowledge management systems.

Innovation is the answer, and this report will describe innovative technology from ISODx Solutions which can quickly analyze an enterprise's entire technology infrastructure to find the cause of a system failure or outage in minutes, doing what would take days or even weeks to accomplish manually. Support executives must look beyond their own walls for expertise in battling complexity, leveraging technology from suppliers with a track record of high performance and innovation to not only cut operating expenses for support, but to vastly improve the service experience for customers.

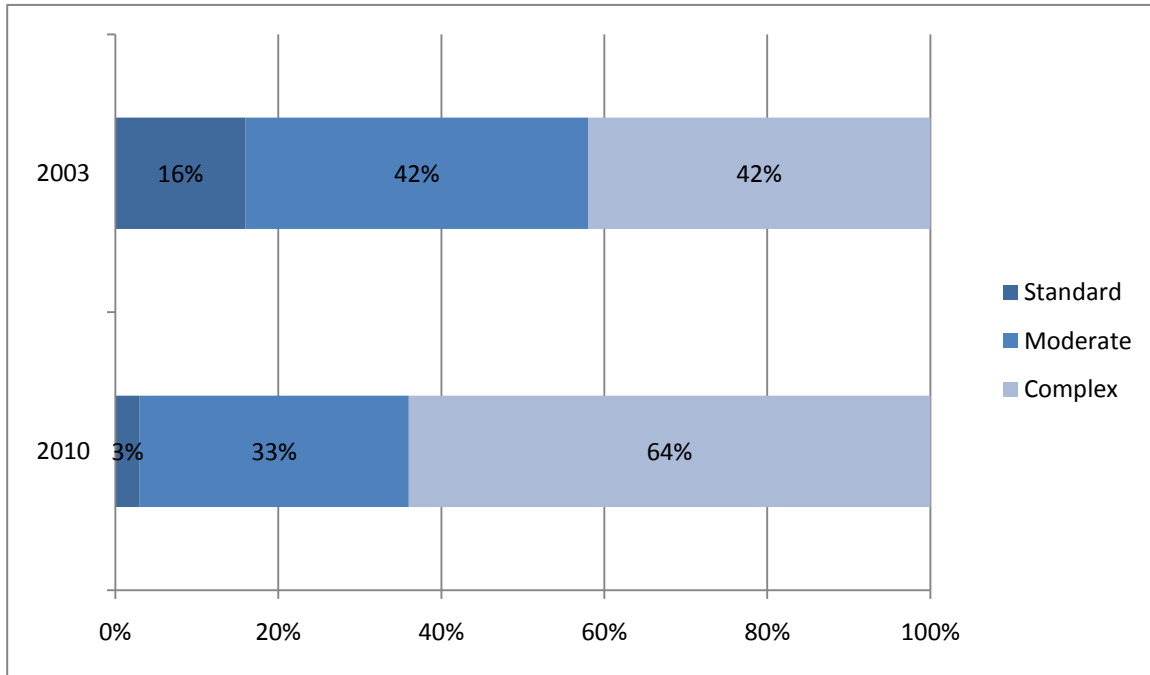
COMPLEXITY IMPACTS SERVICE PERFORMANCE

An excellent illustration of how complexity is impacting the technology industry is the way TSIA members classify the products they support. One question on the benchmark survey asks: How would you describe the complexity of the products that you support?

- **Standard.** General business products or applications. Requires product proficiency to effectively support.
- **Moderate.** Increasingly complex products running in a variety of environments. Requires advanced technical and/or business skills to provide effective support.
- **High.** Complex application and/or operating environment; requires high degree of technical and/or business expertise.

The percentage of clients who identify their products as highly complex has grown from 42% in 2003 to 64% today. As seen in *Figure 1*, only 3% of members now identify their product complexity as “standard.”

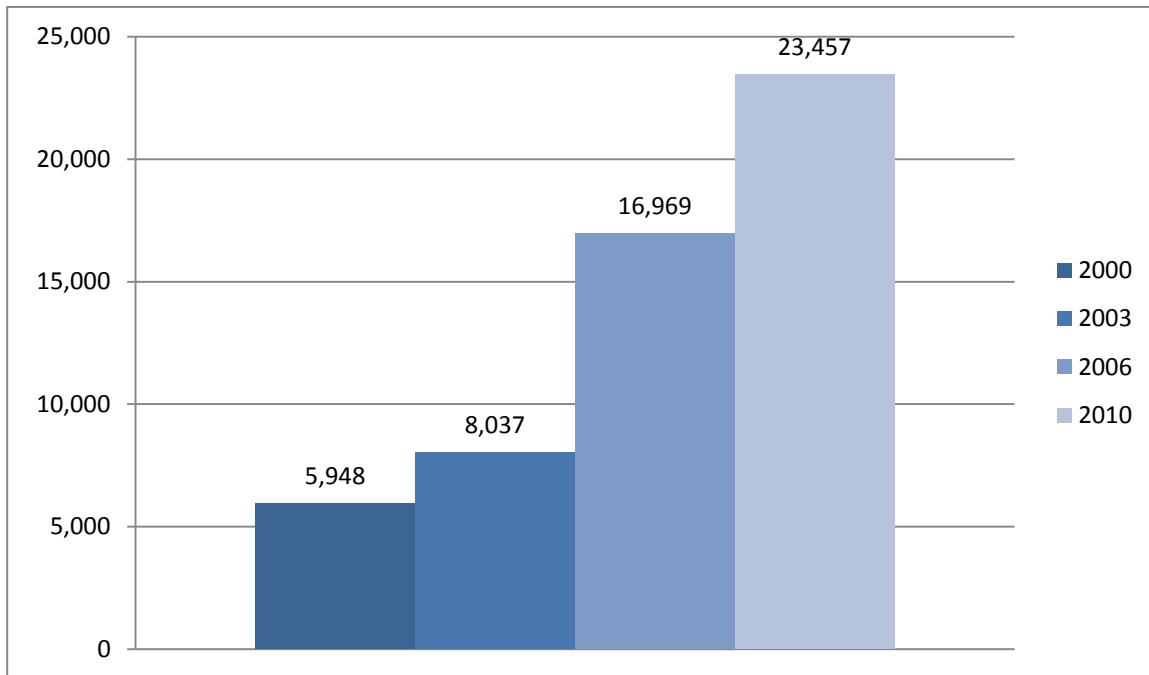
Figure 1: Complexity of Product Supported by TSIA Members



Source: TSIA Support Services Benchmark

Complexity has a major impact on customers, who struggle to keep up with new devices, new features, new user interfaces, and an ever-increasing array of operating systems and platforms. As a result, the volume of support incidents is dramatically climbing year over year. In *Figure 2*, the average monthly incident volume for TSIA members is shown, with data from 2000, 2003, 2006 and 2010.

Figure 2: Average Monthly Incident Volume 2000–2010



Source: TSIA Support Services Benchmark

Increased Incident Complexity: Multivendor Support

Another aspect of complexity that is increasing the difficulty of solving each support incident is the phenomenon of multivendor support. Hardware and software do not exist in a vacuum; they are part of a complex environment of hardware devices, operating systems, and software versions, each with its own list of compatibility and conflicts. With components so tightly integrated, isolating a single failing component for an outage may seem impossible. To solve most technical problems, support representatives must be able to troubleshoot multiple layers of technology, including technology they do not create or manufacture. According to the TSIA support services benchmark, the rise of multivendor support means that:

- **48% of support staff are now trained on third-party technology.** As we will see in a later section, today's support technicians spend as much as six weeks in product and service skills training their first year, and this expensive "off phone" time is increasing as support representatives must also be trained on a variety of hardware platforms, operating systems, and key integration points—all technology from other vendors.
- **30% of support incidents involve another vendor's products.** Today's technology environments have become so intertwined that nearly a third of product support incidents involve another vendor's technology, requiring additional knowledge and time to troubleshoot

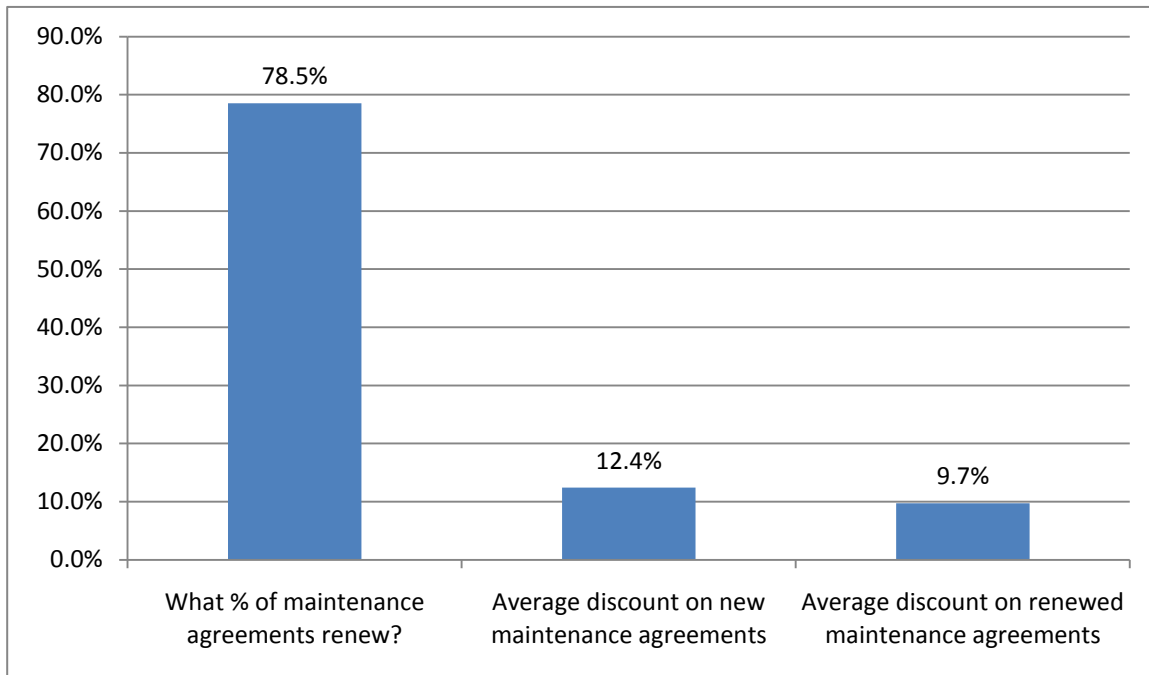
and resolve. This also means that support technicians must be scheduled “off phone” for additional training classes to stay current on third-party products—creating another drain on resources and seriously impacting employee costs, productivity, and customer service levels.

- **15% of those incidents require collaboration with another vendor.** When another vendor’s products are involved in a support issue, 15% of the time the support technician has to contact the partner company for assistance in resolution. The most common approach for this collaboration is for the technician to call the main customer support number and navigate the IVR and support entitlement process to speak to a representative—further lengthening resolution time.
- **Multivendor support issues take four times longer to resolve.** Because of the complexities of compatibility, versions, and integration approaches, these multivendor support (MVS) issues take, on average, four times longer to solve than issues involving the company’s own technology. As the percent of MVS issues continues to climb, this dramatically extends average resolution time as well as causing more downtime for customers. Support organizations are eager to invest in new technologies that will not only help pinpoint problems, but will also clarify where a problem is not, significantly cutting time and energy on investigation, as well as eliminating finger-pointing with technology partners.

Support Faces Increased Demand for Services at Lower Cost

The facts speak for themselves: as products grow more complex, the burden for support teams increases as incident volumes rise dramatically, and each issue is harder to solve. Does that mean customers are willing to pay more for today’s more sophisticated support? As seen in *Figure 3*, the opposite is actually true. According to TSIA benchmark data, 78.5% of support contracts renew each year, but not without negotiations and demands for discounts. The average discount given on new contracts is 12.4%, with renewing customers demanding an average 9.7% discount.

Figure 3: Maintenance Renewals and Average Discounts



Source: TSIA 2010 Support Services Benchmark

This intense price pressure from customers, coupled with rising support costs due to complexity, means product support organizations are under close financial scrutiny with ongoing executive demands to cut expenses and increase profits. These pressures are forcing companies to attempt multiple initiatives:

- **Automate to reduce costs.** Technical support teams are always investigating new tools that can shortcut problem identification and resolution. Introducing new automation techniques to streamline support operations improves service levels while also cutting operating expenses.
- **Identify new for-profit value-added services.** Customers are often willing to pay more for better service, particularly for mission-critical hardware and software deployments, and support must identify new service offerings—often aided by innovative service technologies—that guarantee shorter response and resolution times, often with dedicated technical account managers.
- **Improve the customer experience.** Customers do not have time in their packed schedules to spend hours working with support to solve a problem, especially as resolution times stretch due to increased complexity. Additionally, longer talk times and rising incident volumes are also driving up hold times and abandon rates. Support organizations want to find ways to not only improve the customer support experience, but

ideally eliminate problems or solve them before customers are impacted, masking more complexity from end users.

Existing Approaches Not Effective: Skills Training and Knowledge Management

To battle this deluge of complex inbound interactions, TSIA members have made major investments in service and support over the last decade, with larger employee teams, increased technology training, and new productivity tools, including heavy investments in knowledgebase and knowledge management solutions. Time spent on technology training for support techs continues to rise, with the current average, as seen in *Table 1*, at four weeks of training for new hires, and over two weeks for support techs with more than one year of experience.

Table 1: Training Days

	New Hires	Support Techs with >1 Year of Experience
Technology Training (days)	20.1	11.6
Customer Service Skills Training (days)	7.8	4.8

Source: TSIA Support Services Benchmark

Not only are there expenses related to creating and administering training, but having support techs off the phone for up to six weeks a year for technical and customer service skills training has obvious impacts to staffing, productivity, and service levels.

Knowledge management is the other area companies turn to in hopes of providing information to employees to help solve problems faster. According to the annual TSIA Member Technology Survey, 69% of TSIA members have created a knowledgebase for support techs, and member spending on knowledge management remains high: a full 23% of members reported budget for additional knowledge management tools in 2010–2011. But are these knowledge investments delivering value? Knowledgebase applications are only good for known issues, offering no assistance for new or emerging problems, which consume the most support resources. When it comes to complex technical support, it is clear that knowledge tools alone are not enough. The real need is to identify how system parameters change between known good and compromised operating states. Providing additional training does not make the task of isolating difficult-to-locate changes any faster.

Not only is member satisfaction with existing knowledge tools very low (knowledge tools were ranked 3.28 on a five-point scale, one of the lowest ratings in the 2010 survey), but during the last decade of unprecedented spending on knowledge management tools and processes, service levels have declined across the board. As seen in *Table 2*, first-contact resolution rates and percent of issues

resolved within 24 hours have all declined from 2006 to today, and average resolution times for both phone and email incidents have increased during the same period.

Table 2: Service Level Metric Trends

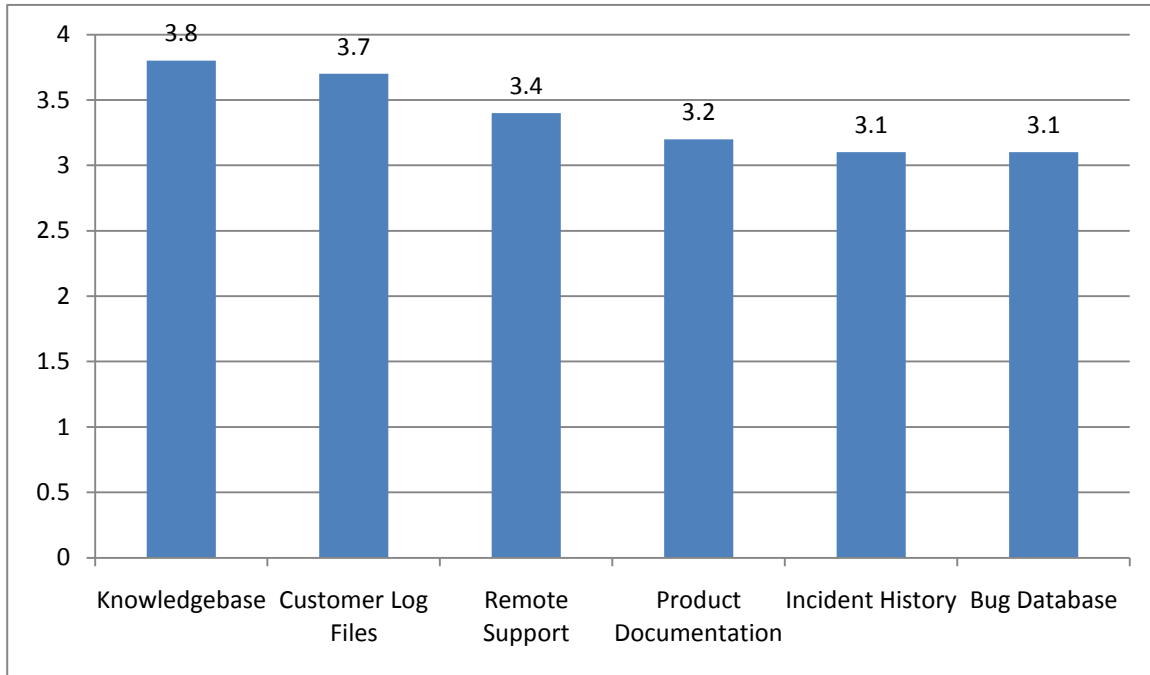
Metric	2006	2010
Resolved on First Interaction – Phone	46%	44%
Resolved on First Interaction – Email	40%	34%
Percent of Issues Resolved within 24 Hours – Phone	58%	56%
Percent of Issues Resolved within 24 Hours – Email	50%	46%
Average Resolution Time – Phone (minutes)	155	192
Average Resolution Time – Email (minutes)	318	348

Source: TSIA Benchmark

Clearly, over-reliance on knowledge tools is not enough, especially with a goal of moving beyond reactive support to identify problems earlier, and even detecting issues before customers are impacted. A proof point of this shift is a survey question in the TSIA Benchmark which asks member companies which tools are the most useful for issue resolution. Though in years past the knowledgebase was king, today there are other data and content resources gaining popularity which lend themselves to automatic diagnostics and proactive support.

As seen in *Figure 4*, customer log files, which are leveraged by automatic diagnostics and analytics to identify failing components, are now almost equal in importance to knowledgebase applications. Remote support tools, which allow support technicians to directly access, monitor, and analyze customer systems, have become another most useful tool for problem resolution.

Figure 4: TSIA Members Rate Most Useful Tools for Issue Resolution



Source: TSIA 2010 Support Services Benchmark. Scale: 5 = Most Valuable

Without changes to existing support processes and technology, the declines in service levels we have experienced over the last decade will continue, and even worsen, in the future as:

- **Complexity continues to rise.** Product release cycles continue to shrink as development is pressured to create new products to meet the ever-evolving needs of customers, as well as speed the delivery of new point releases to address existing bugs and functional holes.
- **New channels emerge.** Online communities and social media are introducing additional channels for support even as companies struggle to effectively service customers via traditional channels. Also, communities provide more visibility for customers into the development process, providing them with an amplified voice to lobby for prioritization of enhancements.
- **Cost pressure increases.** With services revenue representing a larger share of corporate revenue, support is under ever-increasing pressure to lower operating costs and margins while finding new sources for incremental service revenue.

Overcoming Complexity: Automating Diagnostics with ISOdx

As previously addressed, increased complexity is having a negative impact on customer satisfaction. Though today's technical support engineers are well-trained and armed with knowledge tools, diagnosing hardware and software problems remains challenging—and time-consuming.

The solution, it would seem, is to harness innovation to help support technicians troubleshoot large enterprise technology infrastructures to easily identify failing components. This is exactly what ISOdx, an inventive customer support empowerment solution, does: help support techs immediately find problems and thereby achieve shorter problem resolution times, reduced call escalation, faster response times, and enhanced systems visibility. With ISOdx, technical support engineers can analyze hundreds of thousands of elements pertaining to applications, operating systems, servers, and devices to identify a failing component in a matter of seconds.

The notion that changes in an IT environment are a trigger for support calls in approximately 90% of cases is generally-accepted among both support industry analysts and support managers. Upgrades, patches, field edits, or any other change impact the system or application that was changed and have the potential to impact other elements within the broader ecosystem. Considering the complexity of customer IT environments, an intended change to a target system can have unintended and difficult-to-identify impact on the broader ecosystem. This interaction among supported applications and the ecosystems in which they operate is the factor that creates the sense of “trying to find a needle in a haystack” among support staff.

ISOdx pioneered the approach of leveraging the powerful impact of change to solve problems. It stands to reason that a system that is functioning as expected and suddenly begins to perform differently has been changed in some way. IT systems operate logically, so the notion that a system operating in a known-good state could somehow perform differently without having experienced some sort of change would violate that logic. ISOdx enables extremely detailed moment-in-time views of supported environments, and dramatically faster problem resolution times by comparing elements of supported systems at various moments in time to quickly identify where changes have occurred. Using their talents and experience in diagnosing problems, support staff is no longer burdened with finding changes. They are asked instead to determine which of the changes identified by ISOdx is causing the problem they are attempting to address. Current ISOdx customers have validated the dramatic business impact of this approach with documented reductions in mean time to problem resolution as high as 92%.

The solution provides a better, faster way to troubleshoot and keep pace with growing and increasingly complex infrastructures by tackling support's biggest business complaints:

- Case resolution time is too long.
- Too few cases are solved with Level 1 resources.
- Case resolution costs are too high.
- Customers are not satisfied with the case closure process.
- Too much customer involvement, especially on complex and MVS cases.

ISOdx dramatically reduces time spent looking for the root cause of problems by providing new visibility and analysis capabilities, including discovering new issues that can be added to a knowledgebase for future occurrences.

ISOdx can even be used proactively to prevent problems *before* they impact customers. The system uses automation to securely collect, and store historical support forensics on a regularly scheduled basis prior to the occurrence of a problem. ISOdx fully documents the supported environment and provides comprehensive reports and drill-down capability to quickly identify the problem source.

In reference to *Figure 4*, log files actually are only a very small piece of the puzzle. Configuration objects, file versions, registry entries, security settings, and conditional settings (stateful elements) are the remaining components that will provide required information to quickly locate root cause—this approach is useful in solving even the most complex MVS issues.

The issue surrounding review of simple log files *only* is that log files are only as good as the logic and the log level configured at the time of the issue. How many times has the log level been set too low to get the right clue depth to really solve a case? How many times has the log error message left us wondering, what does “there was an error” actually mean? Log files aren’t nearly enough for complex cases.

Rapid ROI

Because organizations are constantly driven to do “more with less” and to grow their businesses, there are enormous strains on support budgets and staff efficiency. Because ISOdx is proven to reduce time in solving customer support issues by up to 92 percent, support capacity is increased—and costs are decreased.

Consider the business impact of being able to ensure your customers reduced downtime, greater productivity, a more efficient operating environment, and better service to *their* customers. ISOdx has a rapid, noninvasive implementation that is immediately productive. Since the source of your customer problems are instantly visible and no longer take hours or days to uncover, you gain:

- New freedom to reallocate budget dollars by dramatically reducing support costs.
- A reduction in the burden of unplanned work.

- Time to focus on more strategic initiatives by transforming the way customer support is approached and provided.
- Flexibility in resource location, as remote analysis can be done from any location without back-and-forth dialogs with the customer, eliminating common complaints of customers who do not want to be burdened with helping support solve problems, particularly when dealing with heavy accents.

Customer Satisfaction

Because it's obvious that the customer is king in the current economic environment, customer support needs to be increasingly competitive, improve customer satisfaction, and enhance customer loyalty to provide genuine business value to their companies.

When support is able to reduce the amount of time needed to address reactive issues by gathering information prior to the occurrence of a customer problem, everything moves at a more rapid pace and your support organization gains time to focus on strategic customer initiatives. Ensuring less downtime and rapid problem resolution, in addition to having the ability to proactively manage problems before they impact your customers, provides an immediate and impressive demonstration of the value of your support offering and represents an instant competitive advantage.

ISOdx customers have reported reduced time to problem resolution by up to 92 percent, and upticks in customer satisfaction surrounding problem resolution by as much as 300 percent.

Netezza Finds ISOdx “Invaluable” for Shortcutting Issue Resolution

Netezza, an IBM company, recently became an ISOdx client. A global leader in data warehouse, analytic, and monitoring appliances, Netezza products dramatically simplify high-performance analytics across an extended enterprise. The company's notoriety comes from producing technology that enables organizations to process enormous amounts of captured data at exceptional speed—a singular claim in today's marketplace.

A company that has garnered many awards for its exceptional customer support, including multiple TSIA STAR Awards, Netezza always seeks to bring their support to the next level. Enter ISOdx.

The ISOdx team connected with Netezza last fall at TSIA's Technology Services World (TSW) conference in Las Vegas and quickly recognized the value ISOdx could bring. Netezza immediately realized ISOdx was a very unique product that could help them resolve a critical subset of customer problems; problems that previously took an extreme amount of time to resolve, could now be resolved in minutes.

Today, ISOdx helps Netezza quickly understand changes in their customers' computing environments that may be contributing to problems, a benefit they have termed "invaluable," along with the ability to provide an entirely "new level of service."

With ISOdx, Netezza completed a strategic 90-day project in just 45 days, including completion of implementation, integration, and training time on the use of ISOdx. Today, Netezza uses ISOdx to support and troubleshoot its more than 300 product installations.

Currently, the company has a project in the works to leverage the proactive capabilities of ISOdx. They are incorporating the snapshot feature of ISOdx into its product set for a "call home" feature that monitors systems for problematic change and sends an email alert to Netezza support before a problem can impact its customers.

ISOdx Helps RouteSmart Technologies Take Client Support to the Next Level

RouteSmart Technologies is recognized as a world leader in the field of route optimization software solutions for the newspaper, postal, public works, and utility industries. Based in Columbia, MD, RouteSmart Technologies has nearly 25 years of experience serving clients within these industry segments. Some of its current clients include the United States Postal Service, FedEx Home Delivery, Republic Services Group, and numerous municipalities and newspapers around the world that use the RouteSmart product to solve diverse, high-density residential routing problems.

RouteSmart Technologies' goal was to become quicker and more proactive in serving their clients, both for client satisfaction and retention. The company researched technologies to bolster proactivity and selected ISOdx Rapid Resolve OEM as the foundation for its RouteSmart Enhanced Virtual Support (REVS) solution. Their research was based on the fact that 80 percent of issue resolution time is spent trying to identify the cause, and 87 percent of all issues result from planned or unplanned change.

Powered by ISOdx, REVS isolates changes in client routing systems by taking a snapshot of each RouteSmart machine. The snapshots are transmitted via HTTPS to RouteSmart's secure collector server and compared with previous snapshots via the REVS Portal, empowering the RouteSmart support team to quickly identify change and deliver more efficient troubleshooting.

Using the ISOdx solution, RouteSmart Technologies was able to reduce its mean time to problem resolution by an astounding 92 percent for mission-critical automated routing support incidents. They experienced transformational CSAT results immediately. Customer satisfaction rankings directly related to the REVS program jumped from a rating of 86 in Q408 to 95 in Q109.

TSIA RECOMMENDS

As the complexity of technology rises, companies must find innovative ways to effectively meet customer needs. However, according to TSIA operational benchmarks, with key performance metrics such as first-contact resolution and the percentage of issues resolved within 24 hours declining, clearly companies are not innovating fast enough to battle the complexity avalanche. Industry leaders are always innovating, looking for new technology and processes that can positively impact operational goals and the customer experience. Support executives should evaluate emerging technology for proactive monitoring and remote diagnostics to:

- **Empower support technicians.** Employees who are provided with innovative tools to perform their jobs more effectively are not only more productive, but TSIA research shows they are also more satisfied with their roles and less likely to leave, lowering employee attrition.
- **Minimize customer downtime.** Clearly, the customer impacts of automated, remote diagnostics are large and visible: customers encounter fewer problems, and each issue is easier and faster to resolve, minimizing downtime and eliminating customer disruptions.
- **Increase customer value and consumption.** The end result of improving problem diagnostics is that customer consumption of products is accelerated, encouraging companies to use more product features at a faster rate, with the additional value received boosting customer satisfaction and loyalty and speeding the repurchase cycle.