

THE VALUE OF ISIS

RAISING THE COMPETITIVE ADVANTAGE

ABSTRACT

The reliable interoperability provided by industry-standard interfaces helps software and hardware vendors drive sales, enhance the total customer experience and reduce development costs. This paper provides a brief overview of ISIS® (Image and Scanner Interface Specification) and how document capture and imaging vendors can leverage the industry standard to bring more competitive applications and products quickly to market. The basis for a public domain standard ANSI/AIIM MS61-1996 Application Programming Interface (API) for Scanners in Document Imaging Systems and issued as ISO 14984, the ISIS interface is a modular and extensible interface for the acquisition, viewing, data format conversion, printing and storage of document files and images.

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EXECUTIVE SUMMARY

In virtually every industry vertical, document imaging is becoming ubiquitous. Document imaging presents an opportunity for growth as well as a challenge for vendors to distinguish themselves as high-value solution providers rather than merely commodity peddlers. To enter the more lucrative segments of the document imaging market, increase existing market share, and create entirely new high-margin opportunities, hardware and software vendors must adopt industry standards that reduce development costs and time to market while meeting the increasingly high expectations of customers.

Large and Small Opportunities Exist

Document imaging opportunities exist at both ends of the market. Larger organizations are adopting increasingly complex and sophisticated high-end solutions. Some are calling for centralized scanning with advanced features and others for a network of scanners to facilitate distributed capture. As more of these features are being pushed to the low and mid-market areas, demand is growing in this segment for cost-effective solutions with increasing sophistication and functionality. Another consequence of the maturing document imaging market is that end-users are increasingly becoming technology savvy, risk-averse and may have existing IT investments that have to be accommodated and accounted for.

ISIS® (Image and Scanner Interface Specification), a modular and extensible standard for the acquisition, viewing, data format conversion, printing and storage of document files and images, can help hardware and software vendors meet the varying demands of these potential customers. With the proven consistency and high-reliability of ISIS ensuring communication between hardware devices and software applications, vendors can quickly bring products to market that are industry standard and easy to implement, use, and administer.

Because it combines extensibility and consistency, the architecture of ISIS, described at a high-level later in this paper, helps to speed the time to market and significantly reduces associated development costs related to the end business application product. ISIS development and support is a core business of EMC Corporation. This ensures its viability and ongoing consistency through a standardized and accepted quality assurance certification process. The predictable operation that stems from this interface, complemented by its support of the latest scanner models and features, increases customer satisfaction and enhances the total customer experience. This generates new sales and retains existing customers.

INTRODUCTION

This white paper provides an understanding of the ISIS technology and its value to developers, integrators, end-users, and ultimately hardware or software vendor's bottom line. The first major section of this paper provides a brief high-level overview of ISIS, including its architecture, capability, and features. Information about the development, support, and standardization of the ISIS specification is also included in this section.

The second major section of this paper focuses on how ISIS technology, acceptance and support can help hardware and software vendors remain competitive in three main areas: increasing sales and revenues, maintaining customer satisfaction by enhancing the total customer experience, and reducing associated development costs associated to the end product. By adhering to an industry-standard, the full-featured ISIS interface specification is backed by a dedicated business unit and a reputable company like EMC Corporation. By utilizing ISIS, vendors can bring more sophisticated document imaging solutions to market faster and maintain positive partnerships with customers, systems integrators, and complementary vendors.

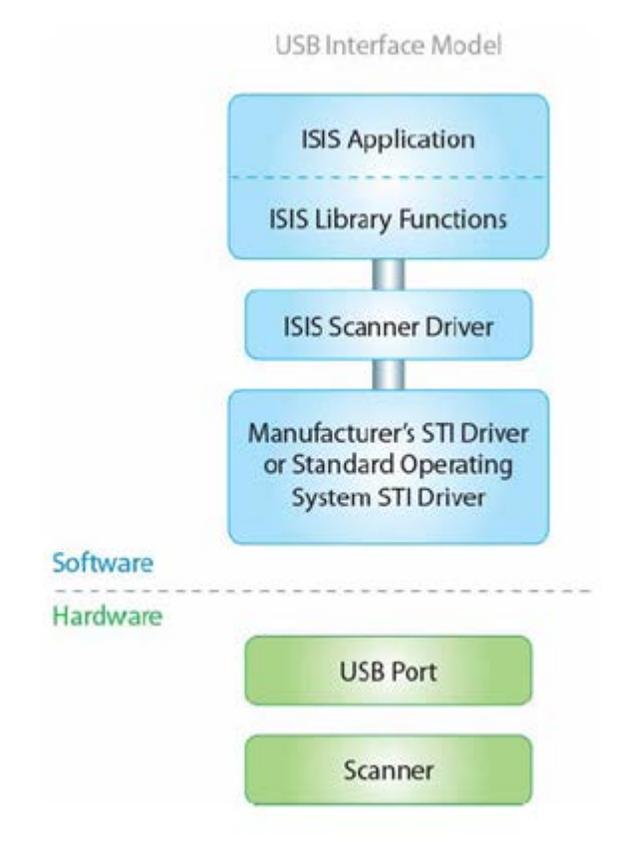
At the end of this paper, there is a list of resources for more information about opportunities in the document imaging and management market and a link to a list of the hundreds of hardware and software solutions that currently support ISIS, a list that is constantly growing. Their adherence to the ISIS standard assures that these systems will be interoperable and that they can take advantage of the full feature sets of each component as technology moves forward.

OVERVIEW OF ISIS

Created by Pixel Translations (formerly Input Software and/or Actionpoint and now part of EMC Corporation) in 1990, ISIS is a modular and extensible standard for the acquisition, viewing, data format conversion, printing and storage of document images, which ensures consistent and reliable communication between hardware and software. ISIS was designed as a framework for the construction of high-volume document image capture and processing systems. EMC Corporation continues to be committed

to marketing, selling and enhancing commercial-quality tools and services for ISIS developers and providing ongoing professional services support in a number of foreign languages.

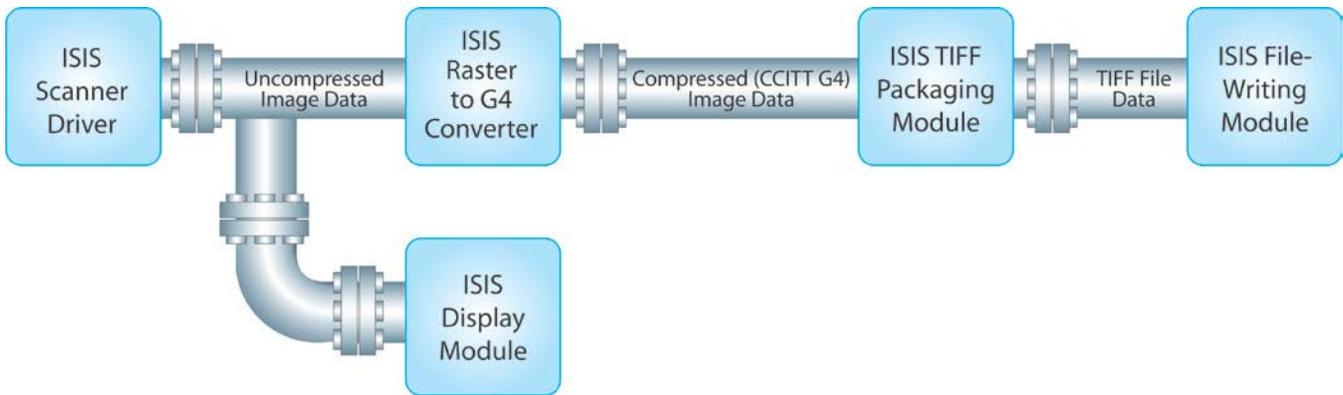
In 2002, the Association for Imaging and Information Management (AIIM) acknowledged ISIS “as a de facto standard and key enabling technology for document imaging,” awarding its developer with the first-ever award for Standards Implementation Excellence. ISIS is the basis for a public domain standard, ANSI/AIIM MS61-1996 Application Programming Interface (API) for Scanners in Document Imaging Systems. It is also issued as ISO 14984. ISIS is bus-independent and it supports Firewire in addition to USB 2.0 implementations. In essence, ISIS supports ANY kind of hardware, insulating the application from caring about the hardware connection. Figure 1 illustrates the basic interface model for a USB ISIS application.



EMC Figure 1 ISIS Hardware Model

It's all about the Architecture

ISIS is a modular software system in which each image acquisition, format conversion, data extraction and file read/write function exists as a separate software component. Examples of ISIS modules available from EMC Corporation include scanner drivers for more than 400 models, ISIS data format converters and ISIS file-writing modules. Imaging solutions are created by linking modules to create an ISIS pipe (See Figure 2). Any modules written to the ISIS specification can become part of the pipe, regardless of whoever developed the non-driver modules.



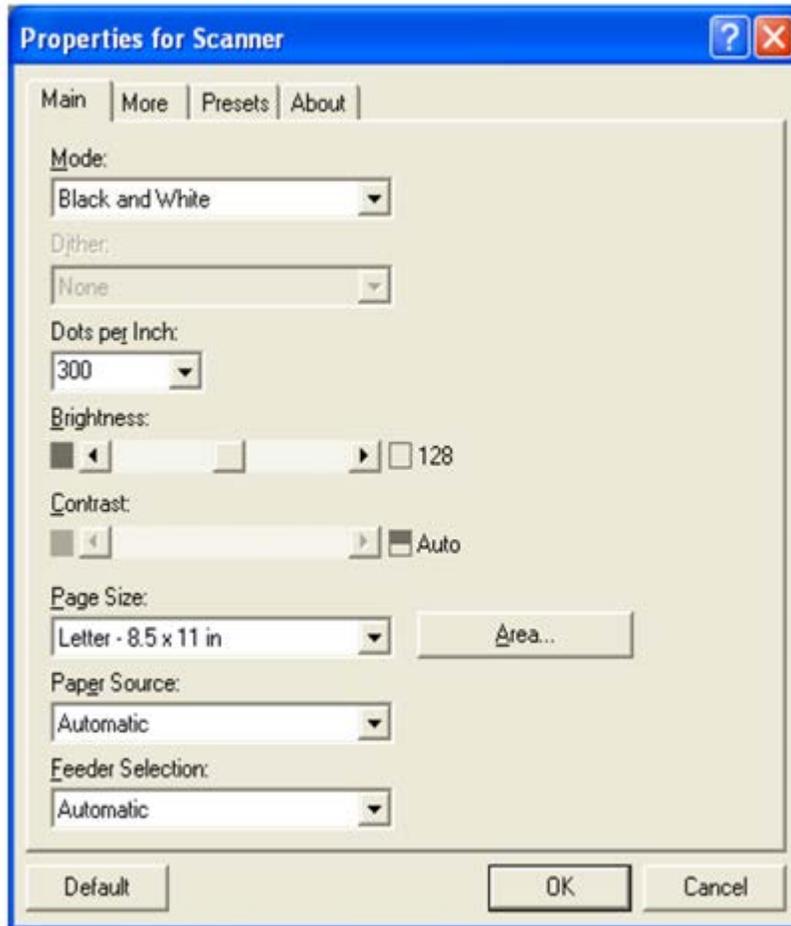
EMC Figure 2 An example of a split ISIS pipe

Each ISIS module communicates with other ISIS modules through a system of tags, data storage areas within each module from which status information can be read and to which parameters can be written. Tag information includes a module's current value, a default value and a set of legal values called choices, which may be expressed as a list or a range of values. For example, an ISIS scanner driver may have tags related to scanner capabilities for color depth, palette information, scan resolution, scan area, and output data format. Any ISIS application can read these tags to determine the current state of the scanner or write them to change scan parameters, or even just test them to discover the scanner's capabilities.

Often there are dependencies between tags. A scanner might support different compression modes for different color depths and ISIS allows the developer to test what is supported and make the best choice for the application. When such dependencies exist, dependency orders are expressed by the driver so that developers can make the appropriate programmatic and user-interface decisions when designing their applications.

This architecture provides a number of benefits to both the developer and end-user communities. An ISIS application can be easily modified and enhanced as the requirements of the solution change or new technologies are introduced to the market. Because new functionality can be added to the pipe by adding a new module written to the ISIS standard, application developers do not need to modify their code to support new hardware or software capabilities. If file format support or a new compression are added, any developer using our graphical user interface (GUI) or generic interfaces to get available nodes, the application will just inherit the new functionality.

Using ISIS pipes, developers can build scanner control into any application. When end-users are given access to interact with the scanning interface, developers can choose to apply the standard ISIS interface to every scanner or create a custom user interface. Also, ISIS provides complete programmatic control so that the developer can use their own interface and never has to display ours. From the easy-to-use tabbed set-up interface (See Figure 3) users can select scanner-specific features.



EMC Figure 3 Scanner Interface

Speed and Throughput Optimized

ISIS is also designed to maximize the performance of an imaging solution and keep it operating at expected throughput levels. ISIS scanner drivers are designed to ensure that hardware operates at its rated speed and specialized modules provide enhanced capabilities. Streaming, for instance, passes image data from module to module in small manageable packets rather than as a single unit of data. This optimizes and conserves system resources by eliminating the need to cache an entire image in memory.

Examples of ISIS-specific functionality that improve scanning throughput include Scan & Rotate and ScanAhead™. Scan & Rotate allows users to take advantage of the increased speed associated with scanning in landscape mode by automatically rotating images after scanning, boosting productivity by 20%. ScanAhead scans and buffers images that have not been requested by the application yet and stores them in memory. This prevents any delays when the application is ready for the next image.

EMC Corporation supports the PixTools ISIS toolkit suite, which includes Visual C++® and .NET APIs. To promote successful development, sample code is also provided. EMC Corporation also provides dedicated developer support and formal scanner driver development/certification programs. These ensure that developers can quickly deliver reliable scanner-enabled applications and products by adopting the ISIS standard. Hardware manufacturers can also take advantage of turnkey ISIS scanner driver development and certification services provided by EMC Corporation.

THE VALUE OF ISIS TO HARDWARE AND SOFTWARE VENDORS

Hardware and software vendors have to combine agility and quality to deliver high-value solutions. As the business cases continue to grow for new applications, ranging from ad-hoc check scanning to digital mailrooms, ISIS delivers the functionality end-users require in a way that is easy to integrate, use, and enhance. Because of its technical features and business model, ISIS reduces the costs and complexities related to application development needed to support these features.

ISIS compatibility can help hardware and software vendors realize the following benefits:

- A product that is more appealing and attractive to new customers
- Reliability that engenders customer satisfaction and loyalty, ultimately enhancing the total customer experience
 - Peripherals just simply work with the ISIS drivers
 - Set-up problems are greatly reduced
 - Support calls are minimized
- Reduced administration, development, testing and support costs

Lower the Barrier to Entry for New Customers

ISIS interoperability is a key criterion in the purchasing decision of many end-users who must often create requirements for a solution that includes a complex variety of products. Overwhelmed by the potential scope of due diligence, many customers will look to third-party standards or recommendations for best practices. ISIS removes much of the risk, particularly for those customers who have experienced or heard about imaging solutions that failed and do not wish to risk their careers by making the same mistakes.

ISIS customers can also take comfort in knowing that they have placed their trust in a market-leading company like EMC Corporation. Many of them will already be familiar with EMC Corporation, a multibillion dollar enterprise committed to ECM technology and end-to-end information life cycle and infrastructure management. Because it is backed by a solid, proven, and secure company heavily invested in this technology, ISIS will continue to be developed as part of a viable, well-funded business unit.

By standardizing on a consistently interoperable standard, hardware and software manufacturers benefit from the ability to fit easily into environments where imaging hasn't been implemented, as well as increase opportunities to displace incumbent capture or imaging applications and products. The ISIS standard is accepted by hundreds of leading document capture and imaging independent software vendors (ISVs) and more than 400 scanner models, so customers don't have to be concerned about replacing products with which they are satisfied.

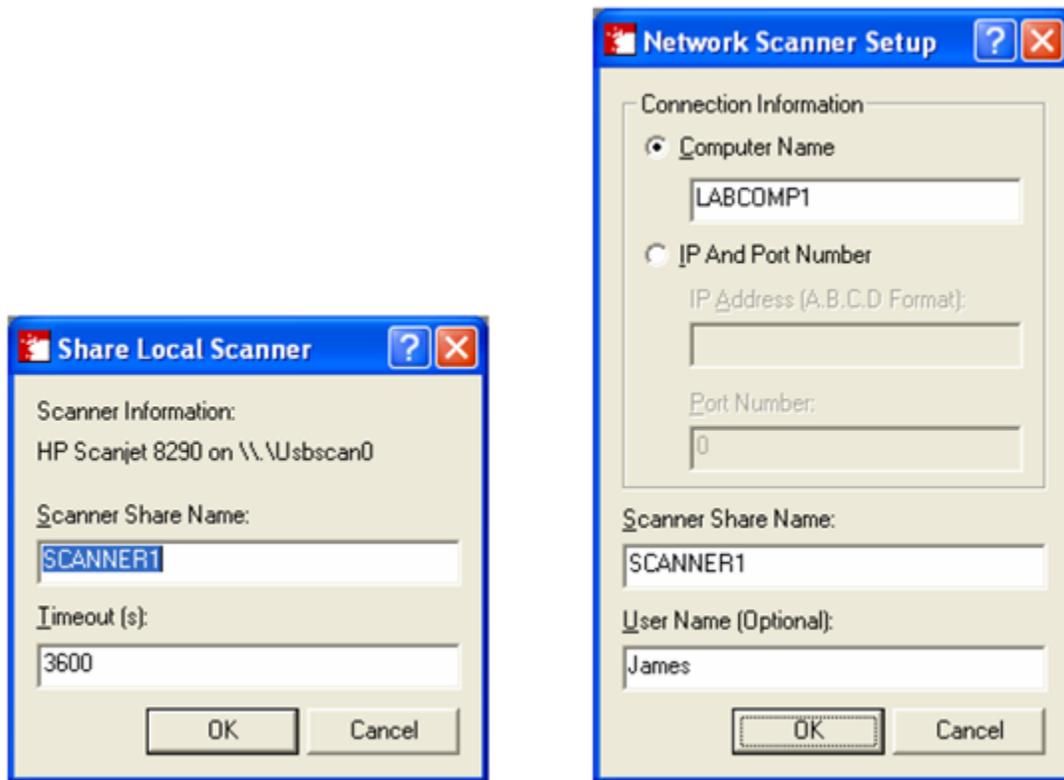
Because it is hardware independent, ISIS supports all standard hardware interfaces, including narrow and wide SCSI, USB 1.1 and 2.0, FireWire and specialized interfaces. In fact, 32-bit ISIS applications developed prior to USB and FireWire's deployment were conceived will work with those interfaces. As a result, vendors can be confident their applications will support not only a customer's current hardware configuration, but future ones as well. The consistency of the ISIS interface appeals to potential customers who are concerned about the underlying project costs of training end-users and administrators and change management initiatives.

Because driver development is consistent from one scanner model to another and not written to a specification that is open to interpretation by many different groups, ISIS drivers provide reliable, predictable performance, seamless in any hardware and software combination. The standard menu options are consistent, regardless of the hardware or software used, eliminating the need for users to adapt to new methods for completing routine tasks. System administration is also simplified because ISIS will always look, feel and act the same regardless of version, unless a developer has opted to create a customized interface.

The architecture of ISIS allows hardware and software manufacturers to be first to market with new technologies, supporting the perception that they are thought leaders and leading to early adopter sales. As new functionality emerges, it can be implemented into new or existing solutions simply by creating a new module, eliminating the delays created by the need to modify code to support these features. Support of new scanner features is implemented in a generalized fashion, so that when an application supports a feature, that feature is supported for all similar scanners. The savings realized by decreased development time can be passed on to customers, allowing a vendor to be price-competitive as well as technologically competitive.

ISIS was first used primarily in high volume production scanning environments. At that time, features such as high-speed color, multiple data streams, ultrasonic double-feed detection and image processing were found only on high-end scanners. As these features have migrated down market to the desktop and workgroup environment, ISIS has similarly continued and followed its migration. ISIS enables state-of-the-art scanning technology in nearly every segment of the document imaging market.

Beyond basic high-speed image capture, ISIS provides architecture for imaging management including compression/decompression, image display, file writing and support for features that simply may not be available on other drivers. For instance, Network ISIS (See Figure 4) allows multiple users to share a networked scanner without disrupting the user at the workstation to which it is attached. (This feature has been available on all ISIS drivers since December 2005).



EMC Figure 4 Sample Network ISIS Scanning Interfaces

Whether a customer environment requires support for languages other than English or a vendor has strategically targeted foreign markets, ISIS modules and toolkit libraries are designed for easy localization. Using external .LOC text files, ISIS can be quickly adapted to the needs of a global customer.

The consistency and interoperability of ISIS not only appeals to end-users, but it can also be a factor in value-added reseller (VAR) recruitment for vendors that are building an indirect channel. VARs and systems integrators prefer solutions that can be easily implemented without a great deal of support and/or troubleshooting, as this can drain their technical resources and erode margins. As a result, they are more likely to promote new products (or remain loyal to existing products) that adhere to reliable and predictable standards and that readily communicate with other solution components.

An Investment in Customer Retention

In the document management industry, securing an initial sale is just the tip of the iceberg. Most hardware and software vendors rely on recurring revenue of maintenance, consumables, service agreements and new add-on purchases. Unfortunately, perception is often as important as reality, and an unsuccessful attempt to connect various solution components has a negative impact and impression on the user's opinion of all products involved.

Here is an all-too-frequent scenario: a new solution is implemented and the components don't work or interface correctly. For instance, a specialized feature like an imprinter may not be as fully functional with the scanning software as desired. It is easy

for the situation to deteriorate to unproductive finger-pointing where the hardware vendor blames the software developer and vice versa, with the end user caught in the middle. The longer the problem is unresolved and the further the situation deteriorates, the more negative feelings result for everyone involved as productivity is lost, anticipated ROI is not met or attained and business relationships are ruined and damaged.

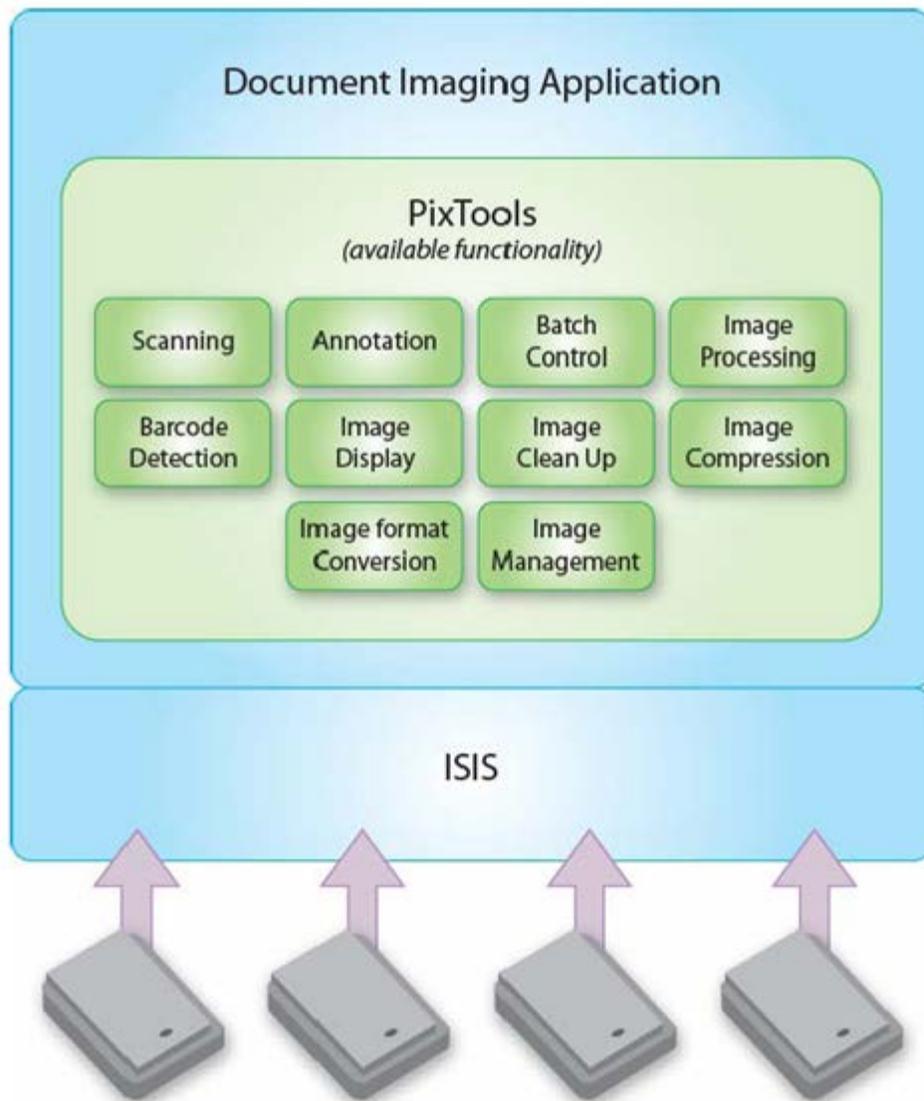
Worse yet, if a solution with compatibility issues was implemented through a reseller or systems integrator, a vendor may lose future business through that same reseller. As the “one throat to choke” when a solution goes wrong, resellers are concerned about reputation risk and do not want to tie up resources tracing interoperability and incompatibility issues. In this situation, the vendor has not only created an unhappy customer, but potentially loses out on additional deals that the reseller/integrator tends to land in the future. However, if a solution is composed of ISIS-compliant hardware and software, there is no question that the components will be seamlessly compatible. When problems do occur, the ISIS support staff acts as an auxiliary support group to move issues quickly relating to problem determination and resolution. That is why even some vendors that support other interfaces will guarantee operation only with interfaces that adhere to the ISIS standard.

The ability to rapidly modify an ISIS application to respond to evolving technology advancements give ISIS vendors a competitive advantage in staying engaged with customers and demonstrating their reliability as a long-term technology partner. This agility also ensures that a vendor’s solution won’t be switched out for another product that supports a new feature/function sooner.

As noted earlier, end-users are risk averse. Consequently, a customer is more likely to be loyal to a solution they know will work when they have to replace existing units or add new ones. An enhanced total customer experience to include customer satisfaction and loyalty, whether from end-users or systems integrators, helps vendors build a strong referral base as they seek to increase their market share.

Lowering the Cost of Development, Testing, and Technical Support

Vendors who rely on the trusted and tested ISIS interface can supplement the revenue generated through new sales and customer retention with lower operating costs. By building an interface with proven ISIS building blocks, vendors reduce costs for development, testing and technical support. EMC Corporation also provides the option of outsourcing the development and testing of a solution entirely, allowing vendors to focus internal development resources on enhancing their core products. Figure 5 illustrates a capture solution built on the ISIS architecture.



EMC Figure 5 ISIS Architecture Solution

Because the basic functions of imaging are already defined, implemented and tested in the ISIS interface, developers can concentrate on the structure and functionality of their applications and not the details of the hardware device interfaces. All ISIS scanner drivers and all modules provided with EMC Corporation's PixTools toolkits have been tested rigorously and extensively and certified for ISIS compatibility. This means that all ISIS modules with functions that can be meaningfully linked together will be compatible with one another when added to an ISIS pipe. The resulting reduction in development cycles lets vendors get to market faster their application products with fewer man-hours.

EMC Corporation offers unparalleled professional support for developers. Robust toolkits from EMC Corporation conform to an unambiguous API, delivering simple yet powerful imaging functionality from well-tested building blocks. EMC Corporation is also committed to maintaining a competent developer support staff for quick and efficient resolution of issues surrounding ISIS implementations. Using reliable and certified components reduces quality assurance (QA) issues from the outset. Again, time and resources saved in QA translate into quicker time to market at a lower total development cost.

Of course, a completed document capture/imaging product interface must be tested for compatibility with that of leading complementary technology vendors. EMC Corporation can eliminate the need for extensive testing processes with individual hardware and software vendors because an ISIS driver ensures that the products will be interoperable and compatible. EMC Corporation has developed a substantial suite of testing software to thoroughly test ISIS modules and PixTools ISIS toolkits before they are released to the marketplace. Painstaking and rigorous testing of all scanning device features is always rigorously performed before a driver is certified ready for introduction.

When there is a problem with an ISIS application, EMC Corporation is committed to solving partners' scanning issues. The EMC Corporation technical support team can generally recreate a problem in-house because it has production units of more than 400 certified scanners onsite. This allows an ISV to address a potential issue much more quickly than it could on its own. ISIS-certified solutions will automatically be tested for interoperability and compatibility with all other ISIS-certified products. Because the EMC Corporation lab has access to virtually every major hardware product in the document imaging market, the time and expense associated with pursuing and maintaining complicated technical partnerships with every one of those vendors is greatly eliminated.

Because EMC Corporation is a commercial enterprise that depends on ISIS development as a significant source of revenue, its business model requires that the company be a continuing source of support for ISIS developers and maintain the high quality of ISIS modules and toolkits. Even though module development services and toolkits are available from third parties, the availability of toolkits, testing and certification services from EMC Corporation and its participation in the market will help ensure that competition will only enhance the quality of ISIS implementations.

Ultimately, the more stable, better supported ISIS standard results in fewer interoperability and compatibility issues. The consistent user interface can reduce the amount of usability support calls. Consequently, staffing and infrastructure requirements for post-sales support are also reduced, further lowering the total implementation cost of bringing a viable application product to market.

CONCLUSION

Hardware and software vendors adhering to the ISIS standard have the option of creating entire imaging interface applications or specialized functionalities into their products. Alternately, they also have access to commercial-quality solutions and services, including turnkey applications, directly from EMC Corporation. Certification and testing programs help assure vendors, end-users and systems integrators that ISIS applications will contribute to scalable and interoperable solutions that address current and future business needs in every market segment.

The architecture of ISIS and its solid, proven, consistent, and reliable interoperability provide a means for vendors to increase revenue while reducing development costs. Being first to market with the latest solution product sets written to a highly respected standard overcomes many barriers to entry, including potential integration with legacy applications. The customer satisfaction and loyalty engendered by a seamlessly implemented, trouble-free solution aids in customer retention and the creation of a reference-able customer base, ultimately enhancing the total customer experience. Reducing development cycles, including QA and testing, and post-sales support lowers operational costs and free-up resources for development of a vendor's core application product line.

Document capture and imaging vendors that do not differentiate themselves in a fragmented market and fail to react quickly to the fast-paced evolution of the technology will soon become commodities. If they are able to compete at all, they will be relegated to low-margin, entry level solutions and displaced as end-users adopt the latest features and functionalities. Interface applications that adhere to the ISIS specification deliver cost-effective agility to ensure that vendors can play with – and compete against – the established industry leaders.

By adhering to the ISIS industry-standard and backed by a dedicated business unit and a reputable company like EMC Corporation, vendors can bring rich and sophisticated document imaging solution products to the marketplace faster, maintain positive relationships and partnerships with customers, systems integrators and complementary vendors and ultimately reap the benefits of generating more sales and revenues.

References

For more information about ISIS and EMC Captiva's PixTools® ISIS toolkits, including a list of supported hardware and software vendors, go to www.emc.com/captiva.

EMC supports and recommends the ISIS scanner driver standard to seamlessly interface our scanning software with document scanners. Every ISIS driver must pass thousands of rigorous tests to fully validate its performance, compatibility and reliability in order to achieve ISIS device certification. This certification process results in fewer hardware support problems and delivers the most solid document scanning interface available on the market. When you are ready to purchase, choose ISIS certified devices for all document scanners or MFPs and easily achieve plug-n-play deployment capability. To find more information on ISIS certified devices, please go visit www.scannerdrivers.com.

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