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Panasonic Solutions Company

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The so-called “consumerization of enterprise IT” trend has challenged chief information officers (CIOs) and technology professionals in all industries to meet growing – and more insistent – demands of end-users to support and integrate a much broader array of end-point technologies (mobile phones, PDAs, laptops, tablets, etc.) into their enterprise systems. The healthcare industry has not been left unexposed to this phenomenon.

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In August and September of 2011, BizTechReports, an independent research and reporting agency based in Washington DC conducted a national survey of 100 executives and senior IT professionals in the healthcare sector. The project was commissioned by Panasonic and Intel.

Executives and IT Professionals Surveyed:

CEO		4.0 %
COO		4.0 %
CFO		6.0 %
CIO		24.0 %
Administrator		6.0 %
VP IT		6.0 %
Director IT		14.0 %
Manager IT		24.0 %
Programmer		2.0 %
Other		10.0 %
Total		100.0 %

Sectors of Healthcare Surveyed:

Clinic		24.0 %
Private Hospital		32.0 %
Public Hospital		40.0 %
Community Hospital		16.0 %
Urgent Care Facility		10.0 %
Other		16.0 %
Total		100.0 %

The results of the survey reveal that consumerization in general – and the launch of the Apple’s iPad in particular – has created a conundrum for

There is a sense of concern among healthcare IT executives that pressure to meet the demands of end-users to support consumer-grade computing and communications devices like the iPad, is coming at the expense of other important priorities.

healthcare CIOs and their IT departments. Pressure to adopt and integrate these technologies is driven by the fact that customer service and end-user satisfaction is an increasingly important metric against which the success or failure of technology organizations are measured. However, this metric must be balanced against other imperatives, such as:

- **Governance structures** that comply with a wide array of industry specific and cross-sector requirements around privacy and personally-identifiable information.

Consumer-grade tablets (such as the iPad) create governance challenges for our organization.

Agree		66.0 %
Disagree		26.0 %
Don't Know		8.0 %
Total		100.0 %

- **Risk management** policies that ensure patients, practitioners and institutions are able to share information and collaborate, while limiting the chances of losing control of critical data.
- **Control and remediation** mechanisms that allow institutions to rapidly react and recover from unexpected situations that may expose the community of interest to risk.
- **Productive end-to-end technology frameworks** that optimize business processes from the end-point to back-office operations.

Ultimately, the IT organization in healthcare organizations are charged with putting in place technology infrastructures that contribute directly to the improvement of patient outcomes while reducing risks and costs.

There is a sense of concern among healthcare IT executives that pressure to meet the demands of end-users to support consumer-grade computing and communications devices like the iPad, is coming at the expense of other important priorities.

In this report we provide an assessment of the strategic, operational and financial issues raised by the introduction of consumer-grade technologies – specifically the iPad – and provide a framework for how IT executives can engage with doctors, nurses, other healthcare practitioners as well as management to address these issues in a productive manner.

It is often not possible for consumer-grade technologies to comprehensively interact or comply with key systems, policies and processes.

Strategic Imperatives

IT organizations in the healthcare industry are strategically tasked with making risk-adjusted decisions about how technology investments can be best deployed to streamline the delivery of effective healthcare services in a cost-effective manner. Notwithstanding the undeniably attractive design of the iPad, and its ability to deliver a rich consumer multi-media experience, this technology can create significant impediments for healthcare IT executives' efforts to achieve their strategic mission. To understand how this mission may be impeded, it is important for the entire healthcare community of interest to have a working understanding of overall "anatomy" of a healthcare IT infrastructure. The technology that doctors, nurses and other healthcare practitioners want to use must be viewed in the context of the significant investments required for secure and robust deployment of:

- Wired and wireless network infrastructures.
- Industry-specific applications that automate critical healthcare operations.
- Data center hardware.
- Security-measures (including role-based access control and identity management that ensure that the right people access the right applications in an appropriate and auditable manner).

Products like the iPad are consumer technologies have derived many of their most attractive features by adopting non-industry-standard components. Because of this, it is often not possible for these technologies to comprehensively interact or comply with key systems, policies and processes. For instance:

- **Healthcare information systems** (HIS) and electronic medical records (EMR) applications do not interoperate effectively with consumer technologies. Often, these challenges are rooted in the differences that exist between the underlying operating systems (OS) of devices like the iPad and those that are presumed to be in place at the end-point (the PC, terminal, hand-held device or tablet) by developers of enterprise applications.

Enterprise applications -- such as electronic patient record management -- are NOT designed to be presented to consumer-grade tablets (such as the iPad).

Agree		58.0 %
Disagree		34.0 %
Don't Know		8.0 %
Total		100.0 %

Blind spots that are introduced by injecting technologies, like the iPad – which are incompatible with the overall architecture of enterprise systems and processes – work against efforts to manage and mitigate risk.

- **Technology governance policies** established by healthcare organizations do not support consumer-grade technologies. These policies represent the high-level principles – often developed with the active cooperation of an institution’s board of directors – that define how processes are supported to meet the objectives of the overall organization. The introduction of technologies, like the iPad, that do not readily address these governance rules require “work-arounds” or exception management procedures that are frowned upon by both regulators and boards of directors.
- **Risk and security management operations** developed by the IT organization, legal counsel, security professionals and other senior members of the executive team do not typically do well with consumer-grade technologies. These operations are designed to identify as many circumstances that can expose practitioners, patients and/or the overall healthcare organization to harm. Often the key to successful threat mitigation (and recovery, should worst come to worst) is full end-to-end transparency, automation and active monitoring. Blind spots that are introduced by injecting technologies, like the iPad – which are incompatible with the overall architecture of enterprise systems and processes – work against efforts to manage and mitigate risk.

"Consumerization of IT" is complicating the ability to securely manage key information resources in our organization.

Agree		66.0 %
Disagree		24.0 %
Don't Know		10.0 %
Total		100.0 %

A principal deterrent to unauthorized activity – as well as the key to rapid recovery in the wake of such actions – is the ability to engage in real-time identity management and role-based access control.

Security is greatly enhanced by the ability to automatically enforce policies that determine what specific resources individuals can access based on the enterprise system’s active understanding of what responsibilities and rights are associated with an individual. Effective identity management is derived from strong multi-factor authentication. The iPad’s inability to collect biometric factors – such as with a fingerprint scanner – significantly reduces the capacity to confirm the identity of authorized healthcare professionals.

- **Automated control capabilities** of the IT organization can be side tracked by consumer-grade technologies. Like virtually every other industry in today’s economy, the healthcare sector is charged with doing much more with far fewer technical and financial resources. The ability to remotely access, manage – and even disable – any and all elements attached to the enterprise system makes maintenance of the entire operation more efficient. It also reduces

Unlike end-point devices that have been designed to operate in a healthcare environment, the iPad is not remotely visible to IT support and security staffs via industry standard tools and solutions.

risk. Unlike end-point devices that have been designed to operate in a healthcare environment, the iPad is not remotely visible to IT support and security staffs via industry standard tools and solutions.

- This introduces cost, because technicians must physically take possession of the device.
- It also introduces risk to the institution, because security professionals may not be able to remotely wipe data from a lost or stolen device (especially if it has been altered from its original OS).

Healthcare is a data entry- and collection-intensive environment. Doctors, nurses and other healthcare practitioners must gather and input all kinds of information – from medical histories, prescription data, therapy notes and much more.

Operational Implications

Beyond the strategic short-comings of consumer-grade technologies, like the iPad, these devices also present significant operational limitations in the often complex and hazardous healthcare environment. Operational areas in which the devices like these can fall short include:

- **Data Collection and Input.** The benefits of the admittedly attractive design and ability of the iPad to consume multi-media information are offset by its inability to address the multi-modal input requirements of the healthcare provider community.

Consumer-grade tablets (such as the iPad) present challenges for entering data into enterprise applications.

Agree		74.0 %
Disagree		22.0 %
Don't Know		4.0 %
Total		100.0 %

Healthcare is a data entry- and collection-intensive environment. Doctors, nurses and other healthcare practitioners must gather and input all kinds of information – from medical histories, prescription data, therapy notes and much more. This data is collected in a great variety of formats. As a result, there is no single data gathering technique that is likely to address the needs of healthcare professionals.

Ideally, devices in a healthcare setting should support:

- Concise handwriting recognition (using a stylus that is effective even when a body part is touching the screen – as is often the case when left-handed professionals are entering data with a stylus).
- Extensive key-board-based entry of narratives and thoughts on patient care.
- Note dictation or recording of patient interviews.
- Speech-to-text conversion at industrial-strength performance levels.
- Scanning of prescription labels and patient wristbands (a major safety and security requirement that should not be ignored).

The absence on the iPad of a mechanical keyboard and USB ports to which devices like barcode scanners or other external data collection tools can be attached, severely limit the number of applications that can be supported by the device.

Consumer-grade technology specifications, like those of the iPad were not designed to operate – or survive long – in this type of an environment.

- Durability and Ruggedness.** The healthcare setting is not a typical office environment. Workers who require mobile devices are not typically using their devices at their desks or in conference rooms. Devices must follow healthcare providers on patient rounds and/or rapid rushes into emergency rooms. The devices are often left on counters, bedsides, benches and other unstable surfaces as professionals work with patients.

Device durability and "ruggedness" ARE important requirements in hospital and clinical settings.

Agree		94.0 %
Disagree		2.0 %
Don't Know		4.0 %
Total		100.0 %

Consumer-grade tablets (such as the iPad) are NOT durable and rugged enough for operations in hospital and clinical settings.

Agree		50.0 %
Disagree		44.0 %
Don't Know		6.0 %
Total		100.0 %

The likelihood of equipment falling – by being inadvertently brushed off a high counter to the floor, for instance – is high. Consumer-grade technology specifications, like those of the iPad were not designed to operate – or survive long – in this type of an environment.

- Sanitization.** As healthcare workers move from room to room and patient to patient it is important to thoroughly clean and disinfect devices to meet the most basic hygiene protocols of an institution. The iPad's surfaces were not specifically designed to be frequently cleaned with the chemical agents that other equipment and instruments designed for the healthcare environment are manufactured to withstand.

Diagnosis Danger: iPad Generates IT Concerns in Healthcare Setting

On a scale of one to five (with one being “not very important at all” and five being “critically important” please rank the following features you would like to see on portable computing devices used by healthcare providers in your healthcare environment:

	Not Very Important At All 1	2	3	4	Critically Important 5	Total
Hardware-based security						
	2.0 %	0.0 %	10.0 %	20.0 %	68.0 %	100.0 %
Stylus for signature capture						
	4.0 %	4.0 %	16.0 %	30.0 %	46.0 %	100.0 %
Keyboard						
	4.0 %	6.0 %	18.0 %	48.0 %	24.0 %	100.0 %
Daylight viewable screen						
	2.0 %	2.0 %	6.0 %	34.0 %	56.0 %	100.0 %
Removable battery						
	4.0 %	4.0 %	14.0 %	42.0 %	36.0 %	100.0 %
Ruggedness/Durability						
	2.0 %	0.0 %	6.0 %	30.0 %	62.0 %	100.0 %
Ease of sanitization						
	2.0 %	2.0 %	10.0 %	26.0 %	60.0 %	100.0 %

Establishing enterprise-wide standards is a higher imperative in the healthcare sector than in most other industries. Ensuring properly working equipment that is integrated into systems that provide accurate and timely information carries far more than financial risk.

Financial Considerations

The total cost of ownership (TCO) analysis of computer technology in an enterprise is much different than performing the same calculation for consumer applications.

Providing technical supporting consumer-grade tablets (such as the iPad) raises IT costs.

Agree		66.0 %
Disagree		26.0 %
Don't Know		8.0 %
Total		100.0 %

Indeed, when non-technology executives challenge IT professionals with the high-cost of desktop and laptop technology and their related accessories, it is often a source amusement – and sometimes friction. It is not unusual for CIOs to hear executives wonder why a laptop computer available at a big box store costs less than \$1000.00, while a similar device can show up as an IT line-item at twice the amount or more.

The answer, of course, is that the true TCO goes way beyond the price of the device itself. Ensuring that the device is properly configured to meet the security, compliance and governance requirements of the enterprise require significant investments of time as well as technical and financial resources. This is one reason why IT organizations go through the trouble of creating enterprise-wide standards for as many of their technical variables as possible. Standards reduce costs and improve reliability and performance.

Establishing enterprise-wide standards is an even higher imperative in the healthcare sector than in most other industries. Ensuring properly working equipment that is integrated into systems that provide accurate and timely information carries far more than financial risk. The health, and sometimes the very lives, of patients and practitioners can be at stake.

When introducing new technologies into the healthcare enterprise, the IT organization must take into account a number of critical factors to calculate and manage TCO to calculate an accurate return on investment (ROI).

These include:

- The cost of risk.
- The cost of technology maintenance and refresh.
- The cost of productivity.
- The cost of effective technical performance.

Enterprise standards that are based on a comprehensive assessment of operational, security and risk requirements help to establish an optimal balance of cost, performance, and personal productivity.

Devices like the iPad, which are not designed to meet general enterprise requirements, or the specific needs of the healthcare sector, can cause users to fall out of compliance with the internal standards of hospitals.

In so doing, it introduces a need to manage exceptions. Exception management can create a force-multiplier effect on the cost of supporting and integrating technologies in the healthcare enterprise.

Conclusion and Prescription

The trend toward the consumerization of enterprise IT – which has been epitomized most recently by the introduction of the iPad in corporate settings – is a double-edged sword.

Consumerization is undoubtedly challenging technologists in many industries – including those in healthcare – to be more responsive and innovative in their use of technology. This represents a positive application of pressure that promises to make healthcare organizations more effective. Consumerization can even contribute to improved personal productivity that can help elevate healthcare outcomes while reducing costs.

However, there is a potential downside to the consumerization trend. If it is not properly understood and managed by the entire community of interest of providers, administrators and IT professionals in the healthcare sector, organizations risk:

- Increasing the cost of managing the critical healthcare infrastructures; and
- Elevate institutions' exposure to a number of different risks.

Over the past two decades, there has been a separate trend that pre-dates the consumerization phenomenon. Healthcare IT departments have worked very hard to carefully align investments in technology initiatives with the mission-critical objectives of their organizations.

As a result, an IT culture has emerged is loath to “just say no,” to requests from business users. This is especially true if the user requests come from revenue producing doctors, nursing staffs and other healthcare professionals who attract patients in search of their specific care.

That is why the security, governance, risk and control issues that guide technology decisions must be embraced by all who are affected. Effective technology management should be seen as a shared responsibility.

That said, it is clear that IT departments have an opportunity to take a leadership role in leveraging their expertise on these issues. CIOs and other senior technology leaders in the healthcare sector can start a meaningful dialog on the concerns that consumer technologies, like the iPad, raise for effective technology management. After all, proper technology stewardship is a critically important variable in the institutional health of the overall organization.

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