A White Paper from the Experts in Business-Critical Continuity™

Hospital IT and Facilities Special Report

Top concerns in the hospital include budget, power requirements

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Executive Summary

Budget and power requirements were listed as the top IT-related concerns inside the hospital, according to a mid-year 2010 survey of IT managers, facility managers, data center managers and engineers. Given the mission-critical nature of healthcare IT, the audience pointed to system availability as the next highest priority inside the hospital. Other notable results from the survey included:

- More than one-half of hospitals needed to upgrade their power and cooling infrastructure when implementing new technologies like Voice over Internet Protocol (VoIP)/network communications (58 percent) and picture archiving and communication systems (PACS) (54 percent), indicating a correlation between the importance of power and cooling infrastructure and the reliance on IT systems.

- Although 75 percent of hospital data centers supply power through a centralized uninterruptible power supply (UPS) system, more than one-half of network closets are supported by small, individual UPS systems rather than a large, facility-wide unit. This discrepancy highlights the lack of understanding regarding the benefits of a centralized UPS system to maintain multiple network closets in the hospital setting.

- Inside the hospital, where IT usage comes to the point of care, more than one-half of patient rooms are not supported by any uninterruptible power source. Additionally, just 28 percent of operating rooms have all emergency power receptacles serviced through a UPS. This lack of protection makes point-of-care technologies vulnerable to downtime.

- Despite the recession, 60 percent of respondents are planning to add more server and storage capacity in their hospital data centers in the next 24 months. More than one-half are planning to update or expand IT infrastructure within an existing hospital. Twenty-seven percent plan to expand the existing hospital, while 15 percent plan to build a new facility.

- Thirty-two percent of those surveyed had experienced unplanned downtime of their IT systems, while 29 percent responded that their data centers did not deploy redundant power systems or didn't know what type of distribution strategy was being used. This suggests that, despite an increased reliance on IT, there is a lagging awareness of infrastructure technologies and strategies.

Those responsible for IT-related issues inside the hospital continue to face the challenge of balancing fluctuating budgets and growing power requirements with a constant need for availability. Although most hospitals have already implemented technologies like electronic medical records (EMRs) and VoIP, the survey indicated that a number of facilities have not taken full advantage of infrastructure upgrades to ensure the applications continue to operate uninterrupted. As the dependency on availability, particularly inside the hospital, continues to rise, IT and data center managers will seek additional options to balance their needs.

Survey Methodology

Respondents to the survey fill a variety of IT-related roles inside the hospital. Nearly one-half (47 percent) were in IT management/ IT operations, 15 percent were in data center management and 11 percent were in facilities management. Twenty percent of the respondents were facility engineers.

Nearly one-half of the respondents come from a self-identified Tier III (multiple independent distribution paths serving dual powered IT equipment) or above organization, and 65 percent had primary data centers comprising less than 5,000 square feet. Figures 1 and 2 show specific breakdowns.

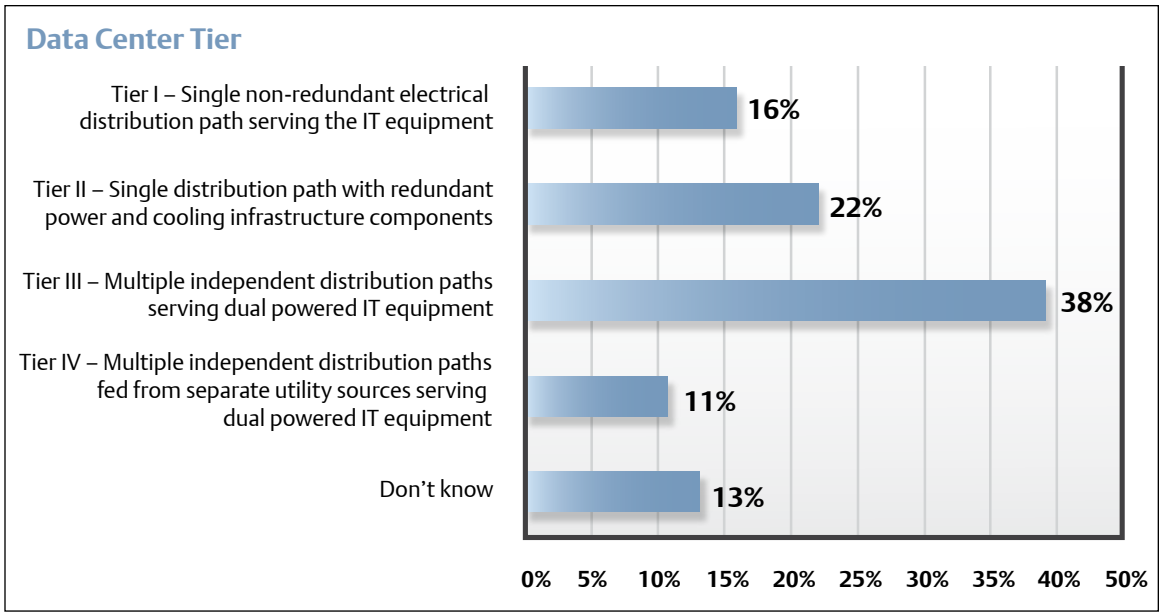

Figure 1: Respondents represented data centers ranging from Tier I to Tier IV.

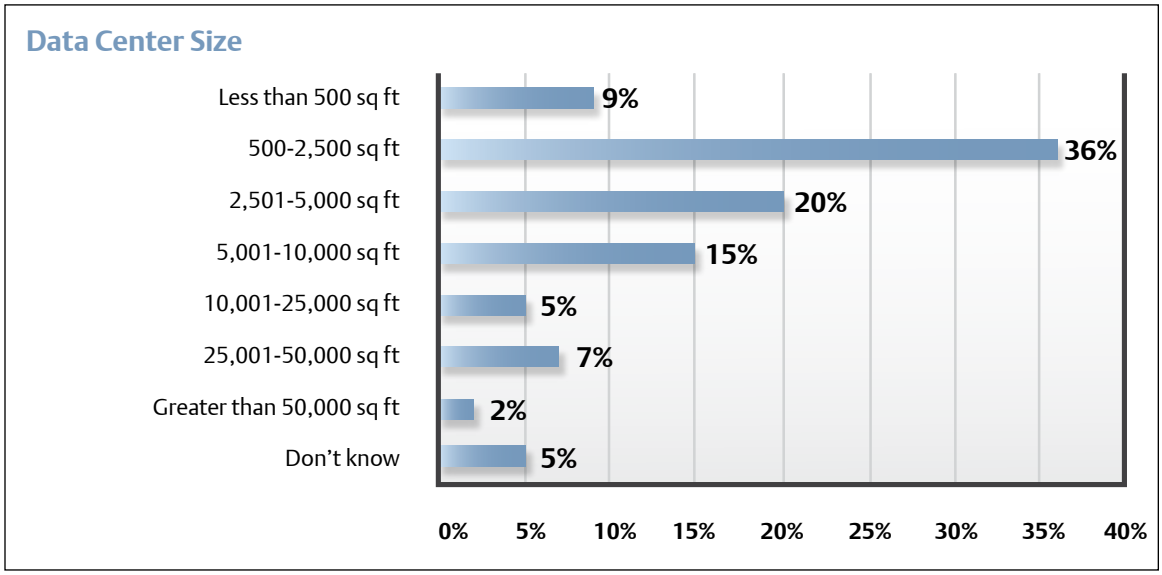

Figure 2: Respondents represented data centers ranging in size from less than 500 square feet to more than 50,000 square feet.

This hospital-specific survey corresponded both with the highly publicized healthcare reform legislation at the federal level and ongoing discussions regarding digitizing healthcare records and satisfying meaningful use for stimulus funding. At the time of the survey, the economy was starting to show signs of recovery, giving the healthcare industry some stability and room to grow.

Technology Inside the Hospital

The desire to improve patient care, as well as factors such as federal government initiatives and physician attraction and retention strategies, continue to drive the deployment of new technologies throughout the hospital. The technologies implemented throughout today's hospitals include wireless IT, PACS, VoIP and EMRs.

Although healthcare often is behind other industries in adopting new technologies, hospitals have moved quickly to deploy IP telephony and wireless LANs to save money and more effectively provide connectivity in older buildings. EMR implementation has helped to make workflows more efficient, improve the quality of patient care and reduce costs. The use of VoIP aligns with the trend to unify and streamline communications, and use of PACS offers faster access to diagnostic information, reduces the need for film and film storage, virtually eliminates the problem of lost films, and increases radiologist and physician satisfaction and productivity.

As these new technologies are deployed within the hospital, it is vital to consider the power and cooling infrastructure needed to support those applications. The required increase in computing capacity, file storage and performance creates a corresponding need to have greater control over the IT infrastructure in order to assure the continuous operation of technology systems. Without disturbance-free power support provided through a UPS, any outage or voltage sag could limit access to vital patient data or other equipment. Proper environmental control – temperature, humidity and air quality – also is needed to keep sensitive electronic equipment at safe operating temperatures, maintaining overall system reliability.

According to the survey, more than one-half of hospitals needed to upgrade power and cooling infrastructure when implementing VoIP/network communications and PACS (See Figure 3). Forty-nine percent of those deploying EMRs also saw a need to upgrade. The results indicate that the majority of survey respondents realize the need to be proactive in upgrading power and cooling infrastructure at the time of technology deployment, rather than waiting for problems to occur. Delaying infrastructure upgrades can result in problems including damage to expensive equipment; loss of patient data and/or corrupted diagnostic images; and revenue loss due to patient/staff dissatisfaction.

Balancing Budget, Power and Availability

Despite the economic recession, survey respondents reported 2010 budget increases of 6 percent on average. More specifically, one-half of the respondents saw an increase in their budgets, while one-third faced budget cuts. See Figure 4 for specific breakdowns.

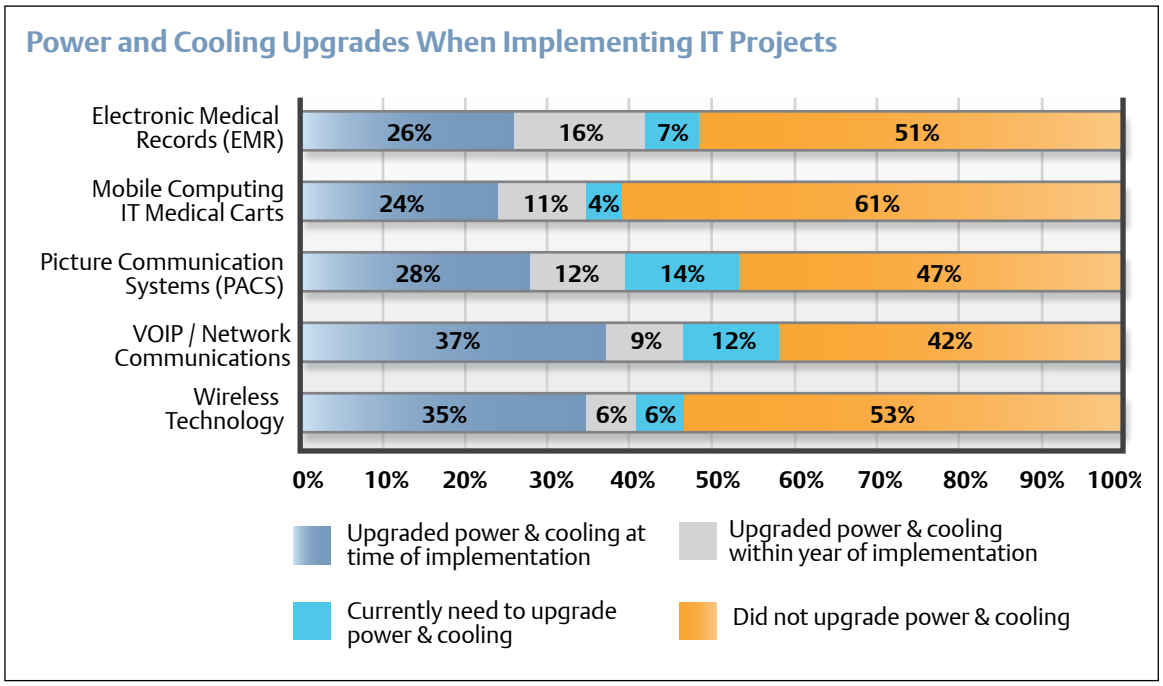

Figure 3: Respondents indicated when they upgraded power and cooling infrastructure in conjunction with technology deployments inside the hospital.

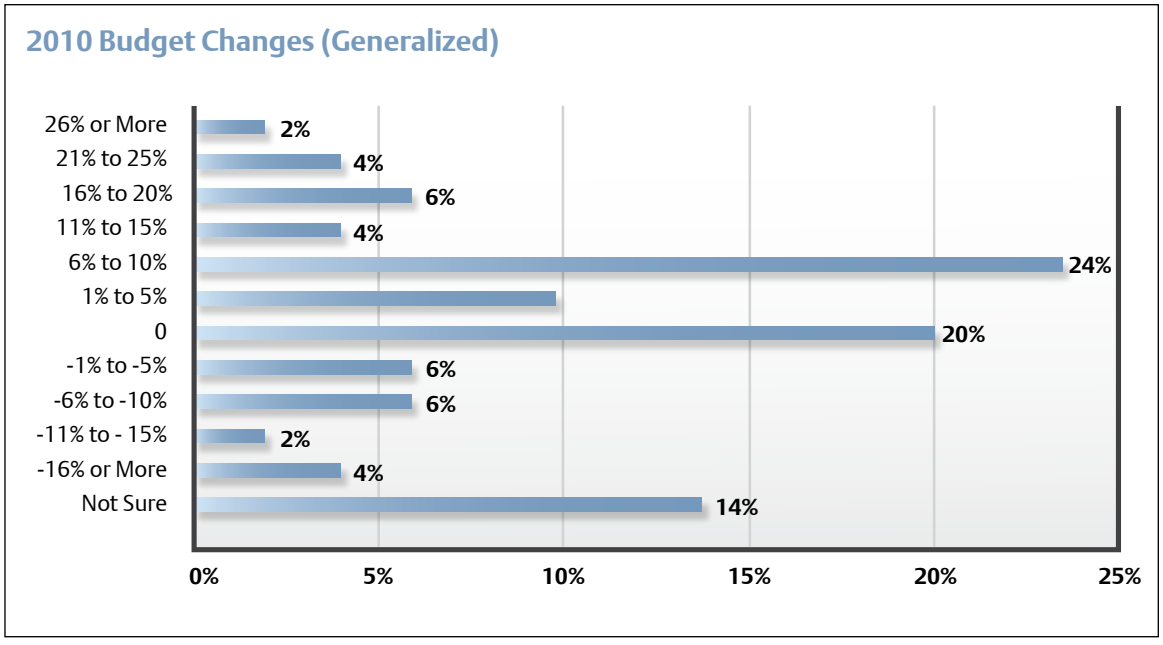

Figure 4: Respondents described the fluctuations to their 2010 IT budgets.

While budget certainly is top-of-mind, the evolution of the hospital into an always-on technology center has driven the emerging criticality of both power and availability inside the facility and in the corresponding data center. Technologies, such as EMRs and digital imaging, have revolutionized the healthcare industry by streamlining processes, eliminating waste, improving accuracy and, most importantly, improving patient outcomes. As these systems become seamlessly woven into the fabric of how healthcare is delivered, however, their continuous operation becomes increasingly critical.

There are various approaches to power supply and protection, although the centralized UPS approach has been touted for its cost-effectiveness and efficiency when supporting large, mission-critical systems such as those in the hospital. Rather than implementing separate small UPS systems at the device level—which can reduce power system reliability and scalability, and also increase costs and maintenance over time—the centralized approach places a larger UPS upstream of the power distribution, providing protection for multiple devices and receptacles. As compared to placing UPS systems at the device level, the centralized approach results in advantages including improved efficiency (94 percent compared to 90 percent), greater reliability and scalability, and a lower total cost of ownership. The five-year TCO for a single 400 kVA unit is 26 percent less than for four, 100 kVA units. The same cost benefits hold true for a single 80 kVA UPS compared to 10, 8 kVA units.

Following the trend, 75 percent of the survey respondents indicated their hospital data centers supply power through a centralized UPS system. Despite the decreased cost, increased efficiency and availability benefits of the centralized approach, more than one-half (65 percent) of network closets and imaging/radiology rooms inside the hospital still use a decentralized/dedicated UPS system.

Moving into the hospital, where IT availability also is critical, 62 percent of respondents reported their patient rooms do not have a UPS at all (See Figure 5). Additionally, 42 percent of nurses' stations and 20 percent of operating rooms reportedly also lack UPS protection. Having key areas within the hospital without UPS protection makes point-of-care technologies – such as access to patient data – vulnerable to downtime. For more information on best practices for UPS deployment for life critical applications in hospitals, see Emerson Network Power's white paper, *Best Practices in Protecting the Technology Systems Revolutionizing Healthcare*, available at www.liebert.com.

Although most survey respondents indicated they had not experienced unplanned downtime in the past year, the concept of availability inside the hospital remains a concern. Of those who had experienced unplanned downtime, 18 percent said patient needs were mildly impacted. Seven percent noted significant patient and staff impact as a result of unplanned downtime (See Figure 6). Even brief power outages and/or voltage sags can lead to a number of issues inside the hospital, impacting the patient both directly and indirectly. These events can include corrupted diagnostic images, lost time and revenue as patients and staff wait for IT equipment to reboot (or as equipment, such as an MRI machine, is unavailable), and damage to expensive medical equipment.

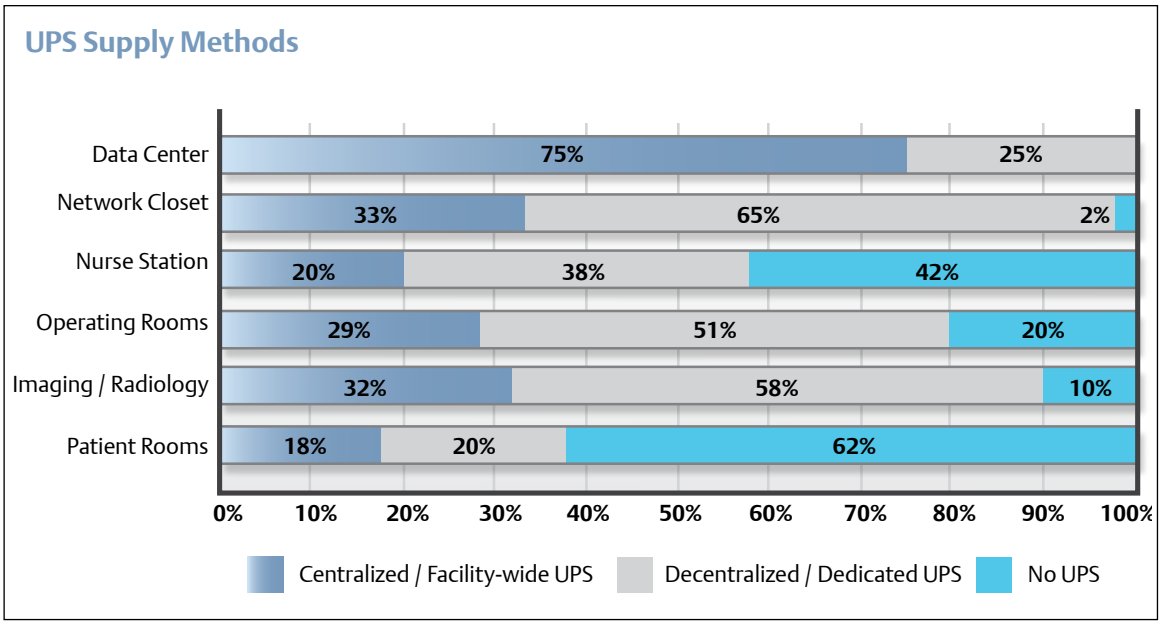

Figure 5: Respondents identified their UPS power supply methods in different areas of the hospital.

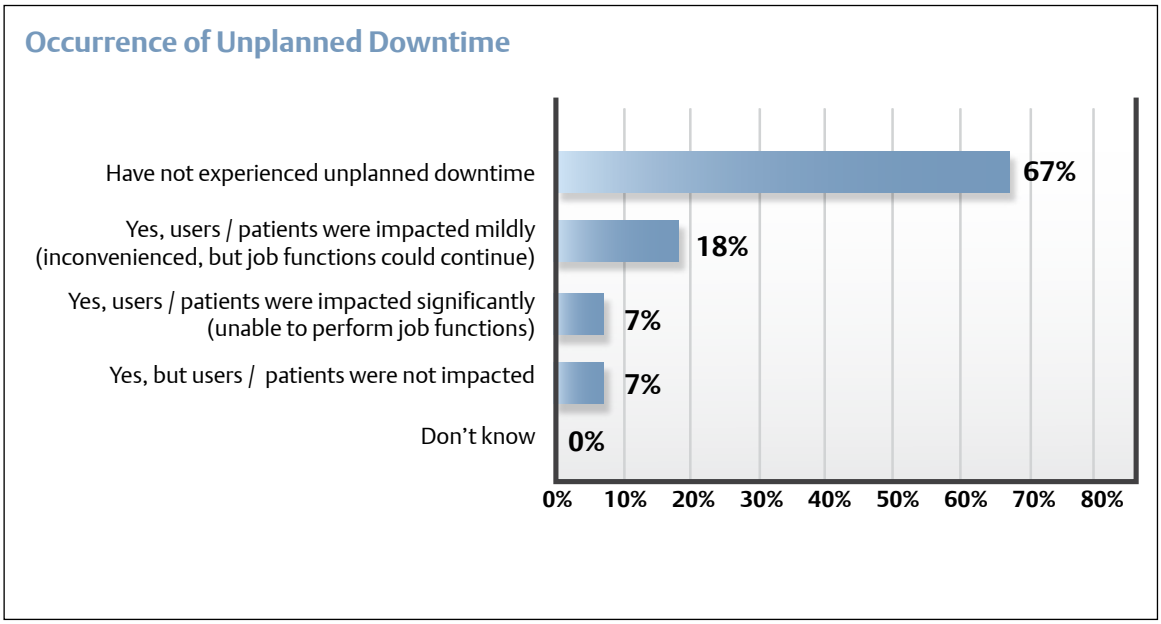

Figure 6: Respondents indicated the occurrence of unplanned downtime in their hospitals over the past year, and how they were impacted as a result.

Major Changes and Expansion Coming

Despite the recession, major changes and expansion are on the horizon for hospitals (See Figure 7). In the next 24 months, 60 percent of survey respondents indicated they plan to add more server and storage capacity in their hospital data centers. More than one-half are planning to update or expand IT infrastructure within an existing hospital. Twenty-seven percent plan to expand the existing hospital, while 15 percent plan to build a new facility.

When hospitals are building new facilities or retrofitting existing facilities to accommodate additional server and storage capacity, managers may choose between several different approaches to updating the power infrastructure of the hospital.

For new facilities, it is ideal to implement a centralized UPS configuration to supply uninterruptible power to all critical areas of the hospital. This approach enables all downstream equipment to continue operating without interruption in the event of a total UPS failure. Although a large, centralized UPS represents a higher first-cost investment than multiple, small UPS systems, the total cost of ownership is lower when taking into consideration the cost to scale and maintain multiple units. Additionally, when building a new facility, managers are well advised to plan for the space required to house a large UPS.

Inside the data center, where expansion is needed due to increasing server densities, cooling system scalability can be accomplished via supplemental refrigerant-based systems. Precision cooling systems, such as the Liebert XD, can bring cooling closer to the source of heat, both in new-build and retrofit situations. This allows cooling to be focused where it is needed most and can be added to, rather than displace, the existing cooling system. For both new-build IT facilities and expansions, designing high-density architecture from the start results in higher efficiency and lower operating costs.

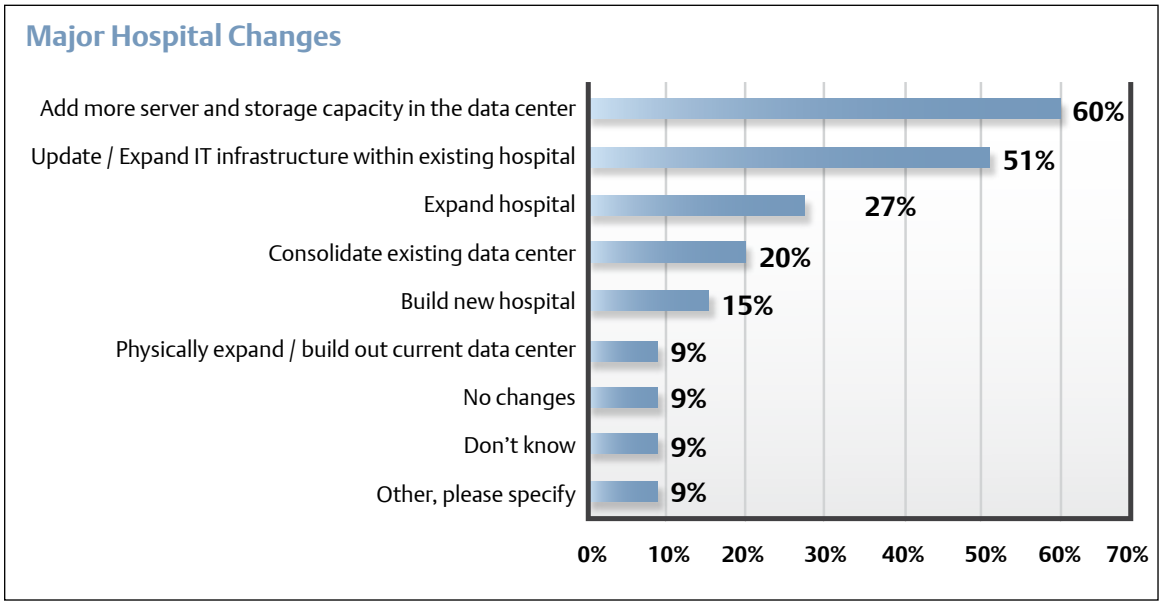

Figure 7: Respondents described the major changes they are planning to their hospitals in the next 24 months.

Cloud computing

Another area of change coming to healthcare IT is cloud computing. The survey identified several application services which are currently being evaluated for moving into cloud environments, whether internal or external clouds. Web servers and Web-based applications have the second highest cloud adoption rate at 49 percent (13 percent is specified as internal cloud). Fifty percent plan to implement disaster recovery/backup-as-a-service on an internal or external cloud (See Figure 8).

The biggest concern cited by respondents with regard to cloud computing was security (See Figure 9). Forty-nine percent of respondents mentioned this concern, likely due to the sensitive nature of a hospital's business. Health Insurance Portability and Accountability Act (HIPAA) regulations make the protection of electronic patient information absolutely vital. With the increase in implementation of EMRs inside the hospital, there is a coinciding dependency on high availability. There are risks involved with moving any application into the cloud environment, and healthcare enterprises are less willing than many other organizations to take that risk.

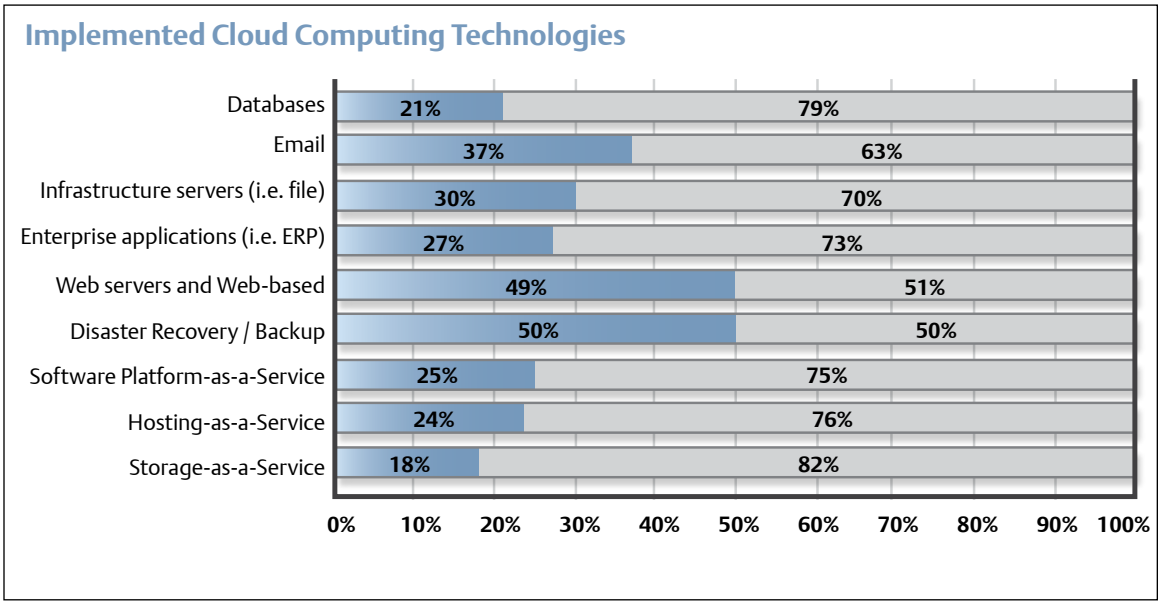

Figure 8: Respondents identified services currently being evaluated for moving into cloud environments, either internal or external clouds.

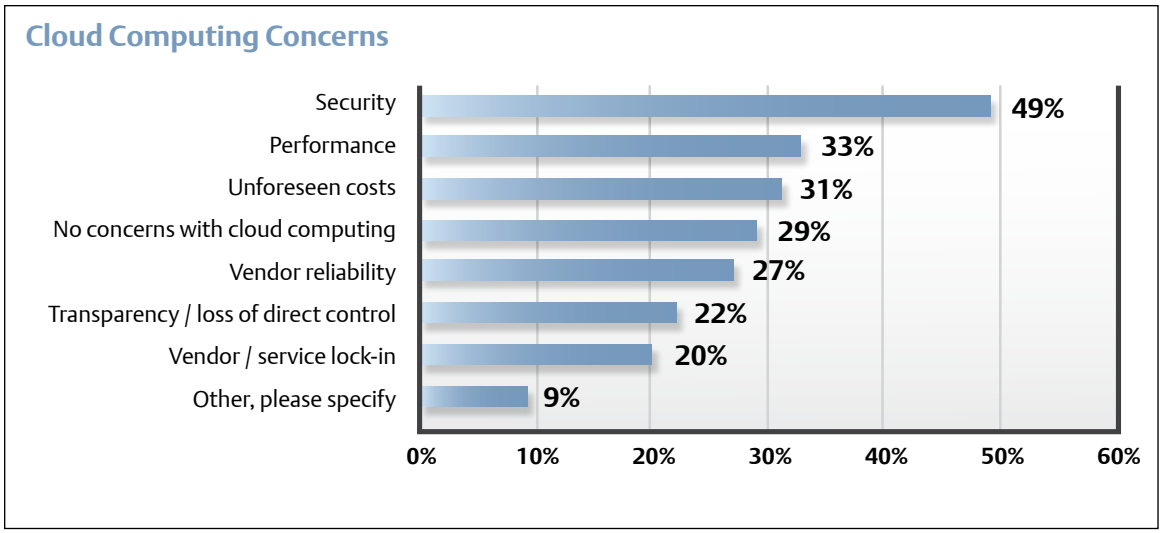

Figure 9: Respondents identified their concerns with regard to cloud computing inside the hospital.

Conclusion

This mid-year 2010 survey found that budget, power requirements and availability were three top-of-mind issues for IT managers, facility managers, data center managers and engineers working inside the hospital. In addition, these notable results emerged:

- More than one-half of hospitals needed to upgrade their power and cooling infrastructure when implementing new technologies like VoIP and PACS, indicating a correlation between the importance of power and cooling infrastructure and the reliance on IT systems.

- Although 75 percent of hospital data centers supply power through a centralized UPS system, more than one-half of network closets are supported by small, individual UPS systems rather than a large, facility-wide unit. This discrepancy highlights the lack of understanding regarding the benefits of a centralized UPS system to maintain multiple network closets in the hospital setting.

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- Thirty-two percent of those surveyed had experienced unplanned downtime of their IT systems while 29 percent responded that their data centers did not deploy redundant power systems or didn't know what type of distribution strategy was being used. This suggests that, despite an increased reliance on IT, there is a need for increasing awareness of infrastructure technologies and strategies.

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SL-24650 (R09-10) Printed in USA