

**PATH TO ACHIEVING  
NEXT-GENERATION TECHNOLOGY  
FOR THE HOTEL INDUSTRY**

**White Paper**

*Prepared by*

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**Chicago**

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## **Summary**

The hotel industry is fundamentally dissatisfied with the effectiveness of its current technology options and their ability to satisfy future business needs. The primary causes of this dissatisfaction are:

- lack of effective inter-vendor cooperation and systems integration
- drawbacks in the current technology financing process, and
- poor adoption of modern technologies.

Further, many segments of the hotel community do not recognize the importance of technology in hotel

management. Equally, the industry has been unable to communicate a common and consistent vision of its requirements to the vendor community.

A new approach is needed in order to facilitate the development of next-generation, customer-centric systems that will better meet the needs of the global hotel community. This White Paper describes the Hotel Technology—Next Generation (HTNG) initiative, which aims to define a new approach to providing systems and technology services at the property, brand, management company, and ownership levels, worldwide. Comment and discussion are invited.

## **Introduction**

### ***Background***

Few other industries face a technology environment as large and complex as the one found in the hotel industry. There are more than 100 different categories of systems commonly used within hotels, and many of them do (or need to) interact.

Hotels struggle daily to manage this complexity. They are handicapped by a complex decision-making process for capital spending, and also by a relative lack of third-party providers who can deliver comprehensive solutions on a pay-as-you go basis.

Hotel technology vendors are mostly small and undercapitalized. While there is much in the way of quality product to meet each area of functional need, each product addresses only a very limited set of the total application requirements. Interoperability of systems, with a few notable exceptions, has been an elusive goal.

Annual global hotel technology spending has been estimated by various studies to be as high as US\$25 billion, although the truth is that, as technology expenses are buried in so many parts of hotel budgets, such estimates are at best educated guesses. By any measure, however, hospitality represents one of the largest industries in terms of technology spend,

perhaps surpassed only by the retail industry and the technology industry itself.

How can it be that no technology company has succeeded in capitalizing on this huge opportunity to any significant degree?

The largest software providers and technology service delivery companies in the hotel industry each command less than 1% of the market. The vast majority of vendors have market shares of less than 0.1%. Many major software and service providers that dominate other industries have left this huge market largely untouched. Others recognized the opportunity and tried to stake out positions, but have been largely unsuccessful. Several have abandoned the industry completely, often after years of frustration and losses.

Among the existing set of hotel technology vendors, only a few have achieved any significant success with consolidation or partnership strategies, whether by acquisition, through alliances, or through internal development. Even these more successful companies, however, have barely achieved 1% market shares.

The resulting fragmentation of systems and vendors has imposed significant costs and inefficiencies on hotels. At the property level, it requires high levels of management effort to manage the multi-system,

multi-vendor environment. For multi-hotel organizations (whether management, ownership, franchise, or membership), it complicates the consolidation of accurate, comprehensive data on guests' profiles, preferences and activities—the lifeblood of any hospitality organization.

Similarly, the industry structure has imposed costs on technology vendors. The frequent need for capital budget approval of multiple parties just to sell to a single hotel (much less a multi-hotel organization) have led to high selling costs, long sales cycles, and lagging financial performance among vendors. Access to seed capital has been limited, and exit strategies have proven difficult to execute.

### ***Experience of Other Industries***

While many of the technology challenges to the industry may appear intractable, it is important to recognize that other industries have been through very similar problems in recent decades, and that better solutions *can* be achieved.

Twenty-five years ago, for example, the U.S. banking industry was highly fragmented and dominated by small, independent branch banks. Technology had become critical to competitive success, yet the software and service suppliers to the industry were nearly as fragmented as in the hotel industry today. Branch managers and holding company executives in the banking industry in the 1970s and 1980s voiced many of the same concerns raised today by hotel general managers and executives.

Yet today, the vast majority of U.S. branch banks receive *all* of their technology, delivered to them as a service by one of three independent commercial vendors. It is only because of this structure that the technology suppliers to the banking industry have been able to deliver a reasonably customer-centric, consistent technology ... one that facilitates the financial side of world trade, enables customers to use their ATM cards around the world, allows banks to cross-sell a range of financial products, and frees bank managers to focus on customer retention and profitability rather than technology.

Like the hotel industry, the retail industry is dominated by small outlets with mixed ownership, management, and franchise relationships. Yet retail has achieved quite a high degree of supply chain integration, point-of-sale consistency across a wide variety of merchants, and merchandise management strategies. Those accomplishments would have been impossible without the emergence of technology standards, vendors who supported them, and products

that were interoperable even, when required, with competitive systems.

Without these developments, credit cards would only work if the cardholder's issuing bank was the same as the merchant's, and ATM cards would only work with the issuing bank's own cash machines.

In each case, the emergence of single-source, full-solution vendors, who can offer turnkey technology on a pay-as-you-go basis, frees the business unit to focus on meeting the needs of its customers, without having to worry about managing complex technology.

- These single-source vendors can focus on ease of use and simplicity of management for the end user.
- In many cases the underlying applications may consist of a patchwork of legacy solutions and newer technologies, but the end user sees a single, consistent, evolving application.
- Software upgrades occur seamlessly, the equipment and networks are reliable, and the applications are nearly bug-free.
- Application suites meet nearly every need of the business unit, and can be configured to meet the competitive requirements of widely varying strategies.
- The cost to the business unit is known in advance and can be budgeted as an operating expense, often directly tied to revenue-generating transactions.
- Over time, the vendors can reduce operating and maintenance costs by rewriting legacy applications into a consistent, modern technology platform.

Simply put, today's branch bank or retail store manager worries no more about technology than he or she worries about the electricity, water supply, or telephone. They pay the "utility" bill each month, and the technology arrives. In the rare instances where it fails, they call the "utility" company and have it repaired.

### ***Overview of This White Paper***

This White Paper addresses the current state of technology within the hotel industry, and proposes a set of technical and business standards designed to facilitate the development of stronger, more credible technology vendors who can deliver the technology that hotels need, in a way that fits with the way hotels are managed, and that can do so cost-effectively.

There is no intent to favor any particular technology solution or vendor, but rather to establish a common

basis by which both hotels and the technology vendors that serve them (both existing and future) can move forward. Hotels that adopt the standards and use them to help select future technology providers will benefit from increased interoperability, lower total cost of ownership, and greater reliability. Technology vendors that embrace the standards will find significantly reduced barriers to selling their products, because *adhering to the standards will dramatically improve the customer's return on investment.*

We also identify some specific actions that the hotel industry needs to take, independent of vendor and product selection, in order to achieve a rational process for technology procurement, adoption, and renewal.

### ***Genesis and Future of HTNG***

Hotel Technology—Next Generation (HTNG) was founded on June 23, 2002 by a group of nine leading hotel industry technology experts, with global representation of hotel technology management, consulting, and academia. The group members' experiences, developed over many decades of work with hundreds of hotel companies and vendors, represented the broadest possible spectrum of the industry.

During two days of intensive discussion, the group articulated a cohesive view about the state of technology within the global hotel industry, concluding that the current system is severely dysfunctional. The group also identified the steps that need to be taken in order to raise the hotel industry to a level of technology performance comparable to that achieved in other industries. The group's conclusions were less the result of negotiating different perspectives than they were a process of putting common words around shared experiences and observations.

HTNG was founded as a noncommercial organization by individuals who see change as essential to releasing the constraints of the current situation and to producing a quantum increase in efficiency to the benefit of owners, operators and vendors alike. HTNG is intended as a vehicle to foster the adoption of standards and practices that can help the hotel industry achieve generational change in technology that will provide both a technical architecture and integrated software environment to address the needs of the hotel industry in the years to come. The keys to this vision are application integration, interoperability, stability, flexibility, scalability, and adaptability.

**HTNG is actively seeking endorsement from industry participants for the general concepts outlined in this White Paper.** We seek input from the community that endorses and supports the concepts

to determine how best to evolve HTNG into an industry-controlled organization. We make no assumptions from the outset as to the appropriate ongoing role, structure, membership, or management ... but action is essential.

### ***Potential Benefits***

The potential benefits to the industry are substantial, although they will differ from hotel company to hotel company and from vendor to vendor. Table 1 shows how some key industry stakeholder groups would benefit if the industry could achieve a substantial level of system interoperability, eliminate inefficiencies in its technology funding practices, and attract large, credible service providers to deliver it on a pay-as-you go basis.

Vendors can achieve many of the benefits shown in Table 1 through reduced obstacles to selling. The conversion and system integration costs, capital budgeting processes, and "partial solution" nature of existing product and service offerings make it far more difficult for hotels to recognize the full financial return of technology projects. As a result, vendor sales cycles are long, and "large" sales, across an entire management company or brand, are often difficult or impossible.

### ***Call to Action***

Senior executives from hotel companies and hotel technology suppliers are invited to contact HTNG if they support the concepts enunciated in this White Paper and have comments, questions, or want to endorse or assist in the launch of the effort. Inquiries can be sent via e-mail to [info@htng.org](mailto:info@htng.org), or by contacting any of the HTNG founders, who are listed at the end of this document.

**If you received this White Paper via e-mail directly from HTNG and agree with it in principle, please read the Statement of Support in that e-mail and reply to the e-mail as instructed. An ongoing list of public supporters will be maintained on the Web site [www.htng.org](http://www.htng.org) for your reference.**

If you received this White Paper from a friend, colleague or media/agency contact, please e-mail us at [info@htng.org](mailto:info@htng.org) and we will send you the covering e-mail that contains the Statement of Support and instructions for joining the cause.

Your assistance in lobbying your industry colleagues will also help move this effort forward.

**Table 1: Benefits by Stakeholder Group**

	Operators	Owners	Franchisors	Current Vendors	Future Service Providers*
Less technology knowledge needed to operate successfully; ability to concentrate on product and service delivery and guest satisfaction	X	X	X		
Less redundancy of data entry and resulting inconsistent data, unnecessary costs, and guest disservice	X	X	X		
Reduction or elimination of capital spending in favor of pay-as-you-go funding	X	X	X		
Better ability to accurately measure ROI of technology projects	X	X	X	X	X
Budgeting of infrastructure independently of applications, ensuring continual infrastructure refresh, and avoiding burdening new applications with the entire cost of new infrastructure	X	X	X	X	
Fewer vendors to manage within hotels; less finger-pointing for support and integration	X		X		
Managed, ongoing technology refresh without disruptive, discontinuous system replacement	X	X	X	X	X
More intra-vendor cooperation to create full-suite offerings	X		X	X	X
Improved ability to sell into compatible vendors'/partners' customer base				X	
Better interoperability of systems and data sharing across multiple flags or operators; easier consolidation of data	X	X	X		
More complete view of customer, accessible at more touch points within the hotel	X	X	X		
Consistency of guest experience and hotel operation across multi-unit groups	X	X	X		
Lower technology costs, through economies of scale from large service providers	X	X	X		
Easier to evaluate technology provided by operators and franchisors		X			
Reduced conversion, integration, and training costs	X	X	X	X	
Less technology risk from incorrect or inflexible infrastructure choices	X	X	X	X	
Easier assessment of new products for interoperability with legacy systems	X		X		
Ability to achieve large, recurring revenue bases from a single sale with a clear decision maker				X	X
Greater attraction of large players to industry, as exit strategy for existing vendors				X	
Improved profitability	X	X	X	X	X

\*Refers specifically to large, well-capitalized, multi-industry, turnkey, pay-as-you-go technology service providers, such as are commonly found in many other industries. This could include, as examples, such companies as IBM Global Services, EDS, Perot Systems, Accenture, or SAP.

***The Path Forward***

The founders of HTNG envision the following process for launching this initiative over the coming months. Timing is approximate.

1. June 27, 2002 - Initial announcement
2. June 29, 2002 – Release of White Paper
3. July-September 2002 – Seek feedback and statements of support from industry leaders within the hotel (primarily CIO level) and vendor community (CEO-level). Maintain a public list of supporters to assist the effort by hotel CIOs to gain additional support from their CEOs, COOs, CMOs, and CFOs.

4. July-September 2002 – Founders to seek industry input as to ongoing structure of HTNG, addressing such question as (a) membership categories; (b) role, e.g. certification of vendors; (c) funding strategies; and (d) governing structure.
5. September-October 2002 – Founders to appoint an initial Executive Board, based on industry input, and to cede control of the organization to that board. The Executive Board will likely consist primarily of hotel technology executives, but depending on industry input, other groups (vendors, consultants, academics, press) may also be involved.
6. October-December 2002 – Initial executive board establishes ongoing membership requirements, dues, and election processes and timing, and solicits membership.
7. January 2003 – Completion of launch.

## **Current Status of Technology in the Hotel Industry**

### ***Dissatisfaction with Technology Options***

Unquestionably, there is a growing gap between the business needs of the hotel industry and the solutions available to meet those needs. The hotel industry is broadly dissatisfied with the technology available to it, including both the installed base of products and those available as replacements. This dissatisfaction is amplified by the need of many companies to replace aging systems within the next few years due to hardware and software obsolescence. In many cases, support services have been withdrawn by vendors for their oldest legacy products—for entirely understandable reasons, given that some are more than a decade old and run on platforms that are themselves unsupported.

Most hotel companies face huge capital spending requirements over the next few years to replace legacy systems such as property management systems, telephone switches and software, and central reservations systems. Even for smaller hotel companies, the costs for these replacements can easily total tens of millions of dollars.

Yet in most cases, the available replacement systems fail to offer significant business benefit versus the legacy systems they would replace. Features and functionality may be greater, and the technical platform may be newer. But the level of integration with other hotel systems is often worse, and the “newer” technical platform is frequently five or more years behind the current state of the art. Too often, the answer to the question, “why should we spend this money” is not “because it will improve profit” but “because our old system is about to fall apart.”

This dissatisfaction is widespread despite the view that there are many technology products on the market that offer more than adequate features and functionality, at least within their defined scopes. Yet

with few exceptions, these same products fail to meet the true business needs. Equally, the hotel industry has failed to state those needs to the vendor community clearly, or has stated them in ways that applied only to a subset of the problem.

There are four key reasons for dissatisfaction.

*1. Complexity of deployment.* Most technology products are physically installed at individual hotels but utilize core technologies that are too complex to be supported cost-effectively by hotel staff. Remote management and support of software, either by a corporate technology group or a third party, is often infeasible due to the choice of technologies used to build the software, the lack of understanding of the need by vendors, and the absence of credible third party service providers.

The evolution of products from standalone, turnkey systems into products that operate on the hotel’s local area network has created configuration and interoperability issues that neither the vendor nor the hotel staff can easily diagnose or correct. To effectively manage the current generation of technologies in an average full-service hotel, without support from a central technology organization, can easily require IT skill levels commanding a salary that can rival or exceed that of the general manager.

Obviously, it is neither realistic nor cost-effective for hotels to contemplate this approach. Even among the major management companies and brands that provide centralized support and maintenance of core systems, the requirements of the non-core systems that are purchased and managed locally often overwhelm the capabilities of the on-site IT staff, if indeed there are any. The technical evolution that has created these challenges continues unabated. Absent fundamental change in the systems architecture and

delivery model, this situation will continue to get worse.

*2. Inability to integrate.* Hotels have become intense information producers and users, yet still cannot view required information when and where they need it. No common integration method allows the installed systems to work together to effectively create, store, retrieve, and present information that may exist across them.

Proprietary interfaces are seen as expensive and in constant need of upgrade as the respective applications evolve to meet new industry requirements. Furthermore, the growing need for integrated information has resulted in the need for more interfaces and for greater functionality from existing interfaces. The situation has been exacerbated by the need to integrate information not only within the hotel, but at multiple levels of organizations (management company, brand, ownership company, regional cluster). These entities frequently have differing needs and priorities, and competing and incompatible standards.

Standards bodies such as the HITIS and the Open Travel Alliance have focused on a narrow (if critical) range of systems, principally within the distribution chain. While these efforts are important and worthy of strong hotel industry support, the fact remains that very few hotel technology vendors have embraced them and even fewer have implemented them (and in fairness, few of their customers have demanded them). Furthermore, HITIS/OTA standards address only application- and data-level issues, and not the broader architectural and business issues that often prevent effective system integration.

*3. Role of hotel management.* Hotel managers cannot, do not want to, and should not be expected to manage complex technology systems. Yet, in the current environment, many are forced to take on this role. Arguably, both the experience of most incumbent general managers, and the success drivers of the business, suggest that general managers should be responsible for filling beds, satisfying guests, and controlling costs. It is naïve to believe that they are capable of making valid purchasing decisions for complex systems, or of managing their technology operation effectively.

This problem is particularly acute for smaller hotel companies, independent hotels, and globally diverse hotel companies, who often lack the financial resources to provide even limited levels of centralized technology management or support.

*4. Unrealized benefits.* Hotel technology investments often fail to deliver the expected benefits. Even when a product meets its functional expectations completely within its intended range, it may prove difficult, costly, or even impossible to integrate it with other components of the hotel's technology. These limitations often become evident only during the implementation of a new system.

The vendor frequently takes the blame when this occurs, but in many cases the limitations may be caused more by the legacy systems than by the replacement.

In many cases too, hotel management fails to re-engineer the underlying business processes, and fails to implement the procedures that may be needed to achieve the desired results. Managing this re-engineering process effectively often requires technical project management skills that most hotels cannot find internally – and should not be expected to.

### ***Lack of Leadership and Vision***

There is little strategic leadership or vision from either the hotel industry or the vendor community to define the key attributes required of the technology to meet current and future needs, or the key business issues that fund technology investment. While there have been pockets of leadership and vision within the hotel industry and among its technology vendors, too often that leadership and vision has been functionally limited, geographically narrow, market-segment specific, or financially constrained. At other times it delivers functionality but fails to address integration, supportability, or scalability.

Many other industries have the same broad geographic distribution of front-line operations that creates much of the complexity in hospitality. Some of these, such as airlines, banks, and retail, are the very industries hotels deal with every day. Yet unlike these industries, the hotel industry lacks any significant presence of major, broad-based product or service vendors with multi-industry expertise to provide technology leadership and vision.

Similarly, many hospitality technology executives have worked only within the hotel industry and are unaware of how other industries have addressed some of the same issues they face. Many hotel companies have been unwilling to fund technology organizations to the level needed to obtain the breadth of experience, creativity, and knowledge of new technologies that is needed to drive change.

Finally, technology-related research and development is virtually non-existent within the hotel industry. The result has been incremental rather than genera-

tional change, lack of innovation, and persistent reliance on legacy technologies.

### ***Evolving Requirements, Business Needs, and Models***

The historical approach to product development by most hotel technology vendors is no longer relevant. The hotel business is customer-centric, yet much of the available software remains transaction-centric.

The transaction-centric model originated in the days when systems were used primarily to deliver a guest folio and to account for the revenue. The industry need has evolved well beyond those requirements. Even some of today's more customer-centric technology offerings often lack the ability to store multiple profiles for the same customer depending on his/her nature of travel. They also fail to recognize the many levels and types of customers (guests, sales accounts, distributors, etc.).

Furthermore, no product or combination of products is capable of delivering a consistent view of the customer across every point of interaction that the customer may have within a single hotel, let alone across multiple hotels within a brand.

There are more than 100 categories of technology-based systems in use within the hotel industry, and the average full-service hotel employs at least 20 to 30 different systems. The vast majority of those systems interact with customers in some way or enable service staff to do so. Yet typically only a few (sometimes as few as one) are connected to any system that can accurately describe the customer in even a limited fashion, or record the results of the interaction.

Even where interfaces exist, they may be too expensive to implement, too difficult to maintain, too limited in scope, or simply incapable of delivering the type of customer experience that the hotel wants to provide.

Nowhere is this issue more evident than within the distribution process. Hotels want to control how their product is presented to the customer throughout the distribution network, to retain control of the customer relationship, and to customize the experience of the customer based on their knowledge of who the customer is, what they want, and how they behave.

Yet few of the systems within the distribution chain support a notion of "customer" that goes beyond the most basic identifying information. Even where they do, that notion may be lost before delivery of a reser-

vation to the hotel, for lack of an effective interface to the property management system, or even with an interface, for lack of a consistent data model.

The evolution of user requirements from transaction-centric to customer-centric is largely unrecognized. Most hotel systems were not designed to be interconnected as fully as today's business needs require and will fall even further short in meeting hotel requirements in the future, creating inefficiencies and opportunities for service-delivery failures. Interfaces that do exist are expensive, difficult to maintain, and often offer only limited functionality. Worse yet, their number is growing, and the complexity of managing them grows exponentially as the number of interfaces grows linearly.

### ***Infrastructure***

Modern technology systems require a consistent and reliable infrastructure, much of which is usually shared among several applications. The key elements of infrastructure are the wide and local area data networks (WANs and LANs), the network operating system, the server and workstation operating systems, and the data management platform. Secondary elements include such items as office automation software, firewalls, virus scanners, and custom reporting packages. These requirements are no different than for businesses in other industries.

Within the hotel industry, however, the required infrastructure is often non-existent. Where it does exist, it is frequently incompatible with modern system requirements. Too often, it is physically crumbling, unsupported, improperly managed, or vulnerable to security attacks—and quite possibly all at the same time.

Different technology products deployed within the same hotel or hotel group not infrequently require infrastructures that are incompatible in critical ways, leading to redundancy, performance degradation, and inability to achieve integration—and all of these can adversely affect guest service and the overall guest experience.

Critical functions such as user authentication, data management, word processing, e-mail, and printer management are often implemented in inconsistent ways, by multiple applications that need to be deployed within the same environment. These functions can and usually are provided by the base operating environment that has been established by the hotel (for example, the combination of Microsoft Windows, Microsoft Office, and Microsoft SQL Server). Their inclusion in end-user applications, with different functionality and unique user

interfaces, leads to redundancy, user confusion, and integration challenges.

Some systems even require their own unique, single-use workstations and networks, despite the fact that the intended users may have (or have the need for) standard PCs, connected to the hotel's local area network, to perform other job functions.

Some of these problems are legacy-system related, but many result from absence of industry-wide infrastructure standards and ignorance of the impact at the hotel company level. As an industry, our information assets must be sharable as required across multiple organizations, such as management companies, franchisors, owning companies, suppliers, and distribution partners.

Investment in infrastructure that is needed for today's systems may turn out to be totally wasted if the hotel is reflagged or sold tomorrow. It only makes sense to define a common platform that guarantees a minimum level of operability. Yet hotels have not done so to date, and vendor interest in common platforms and interoperability, while growing, is far from sufficient.

### ***Acquisition and Return-on-Investment (ROI) Measurement***

More and more aspects of hotel operations and guest room features require integrated technologies, and therefore coordinated acquisition. The existing funding model, typically based on capital acquisition and spread across multiple budgets, creates many obstacles to effective selection and deployment. The diverse and sometimes incompatible needs of owners, managers and franchisors need to be reconciled, and multiple constituencies need to be represented in, and often to sign off on, acquisition decisions. Even individual properties often have multiple owners with conflicting views and priorities.

Vendors cannot easily conclude organization-wide deals because each organization has so many competing interests and because each hotel (e.g. within a management company or brand) may need to be "sold" individually. This structure has led many of the largest technology players, who have huge presences across many other industries, to abandon their attempts to establish a significant presence in the hotel industry over frustration with the long sales cycles and the inability to close major, organization-wide deals.

Compared with most other industries, the presence of such technology leaders as IBM, EDS, Perot Systems, Cap Gemini, and Accenture (among others) is extremely limited.

The capital acquisition model also makes little allowance for technology refresh. Basic items such as workstations, which other industries routinely replace on a regular cycle (such as every three years), are often purchased and left in place until a newly selected system forces their replacement. The cost of those workstations is then factored in as part of the system that requires their replacement, even if other systems use the same workstations (and even if the next upgrade to those other systems will dictate the same workstation upgrade). The extra cost burden may well make the project appear to be financially unviable. Alternatively, the hotel may try to deploy the new system without the recommended upgrade, and then fail to achieve the performance they require. The operational cost of unreliable and inadequate systems is almost invariably ignored.

Hotel budgeting processes recognize the need for physical infrastructure maintenance by creating reserves for furniture, fixtures and equipment (FF&E). This process recognizes that the physical infrastructure of the hotel—the lobby, carpeting, and furnishings, for example—requires periodic renovation or replacement, either because it wears out, because customer needs change, or because the asset becomes dated.

The very same factors are equally applicable to technology infrastructure, but most hotels treat the replacement or refresh of technology assets as discretionary. Infrastructure projects that are necessary to support future systems are often held to ROI standards, when the benefits are impossible to quantify. Failure to invest over any extended period of time would clearly damage or destroy the hotel's revenue base and limit its ability to adapt to changing business needs, yet the budgeting process treats these investments as discretionary.

One can only imagine what the guest experience might be like if the hotel industry were to hold non-technology infrastructure decisions, such as elevator repair, lobby recarpeting, air conditioning, or roof replacement, to the same ROI standard.

Overall, the technology systems and infrastructure are almost never supported in a way commensurate with the fact that they contain the most valuable asset that hotels own – their customer data.

## **The HTNG Vision Statement**

*HTNG aims to achieve a flexible technical environment that will allow multiple vendors' systems to interoperate and that will facilitate vendor alliances and the consolidation of applications, in order to provide hotels with easily managed, continually evolving, cost-effective solutions to meet their complete technology needs on a global basis. These solutions should be deliverable to hotels and hotel companies either as a product or as a service, and should be responsive to progressive and clearly enunciated hotel industry standards.*

HTNG intends to achieve its vision by obtaining broad-based support for the technical standards, business standards, and hotel industry management practices enumerated in this White Paper.

Adoption of the standards by both hotel companies and technology vendors is, of course, voluntary. However, it is expected that hotels that adopt the standards and use them to guide technology decisions

will recognize substantial short- and long-term benefits in technology effectiveness and productivity.

Technology suppliers who embrace these guidelines will prosper by becoming part of a solution that delivers the technology that hotels need, in the way they need it. At present, no vendor within the industry even remotely approaches this level of success.

## **Technical Standards**

Many applications in use today are built using aging toolsets and/or are targeted at legacy operating environments. These system environments were at one time relevant, and provided a low-cost base from which to deliver increased functionality. In today's modern, networked and Internet-connected world, however, these systems do not provide the needed connectivity to, or integration with, the many other applications that hotels are required to operate.

For a variety of valid business reasons, hotels need to interconnect complementary products produced by vendors who may be direct competitors, either in the same or in other application areas. Yet these interconnections are often frustrated by architectural incompatibilities. Many application vendors, for example, are still in the process of migrating MS-DOS based applications to Windows, at a time when technology has moved through several generations of Windows and is now shifting to the Web.

Given the multi-vendor landscape of the industry, a new approach is needed, one based on the effective use of available, modern technologies, and that allows rapid feature function development and facilitates easier application integration, deployment, management and upgrade.

Table 2 describes in technical terms, and at a high level, the desired characteristics of applications built to support the new model. All applications should be built or migrated to operate in (or to interoperate with) the environment described in Table 2.

In addition to the specific requirements outlined here, applications should make proper use of all relevant network services that are provided by the environment, such as user security, data security, and printer management.

It is important to note that there is *no requirement to use (or avoid) the products of any particular technology vendor*. Rather, Table 2 represents mainstream requirements that can for the most part be delivered using different choices of core technologies. While it is still preferable that compatible vendors work together to standardize their choice of platforms, this approach allows systems to interoperate (albeit less effectively) even when vendors choose different platforms.

Progress toward any technical standard will be evolutionary, and vendors cannot be expected to convert their legacy systems to meet new standards overnight. These standards are not intended to be flexible,

**Table 2:** *Technical Standards*

- 1. Network Architecture**
  - a. TCP/IP protocol
  - b. Encryptable data transmission
- 2. Security**
  - a. Network/Directory application authentication and authorization
  - b. Role-based authorization model
  - c. Encryptable file systems and/or database volumes
- 3. Database Management System (DBMS)**
  - a. SQL-based DBMS (to latest standard)
  - b. Encryption at field/record level
  - c. Database query capability independent of application
  - d. Reporting capability independent of application
  - e. Data dictionary query/display
- 4. Application Integration**
  - a. Integration via XML-based message broker
  - b. All relevant business processes to be published and made available for use at no additional cost
  - c. Applications and application interfaces to be OTA compliant, wherever OTA standards have been defined
  - d. Transaction-based (data integrity), loosely-coupled (time-independent) message-based (distance-independent) architecture
  - e. Data inheritance (each application can inherit data from/feed data to other applications, avoiding need to re-establish or re-key data common to both)
- 5. Application Presentation**
  - a. Delivery via Web browser
- 6. Application Services**
  - a. 3-tier (complete independence of presentation, data management and application services)
  - b. Modular upgradability
  - c. Transactional integrity
  - d. Transactional logging (100%)
  - e. Continuous operation
  - f. Time zone / locale sensitive
  - g. Multi-language/character set support
  - h. Network provided services (i.e. printers, date, time zone, user identity) inherited/used by application
  - i. Network/directory-aware security
  - j. Integration with standard applications typically provisioned with workstations (e.g. office automation)
- 7. Performance and Scalability**
  - a. Server (application and DBMS) rather than client-based performance optimization.
  - b. Multi-threaded application architecture capable of exploiting multi-CPU server computer systems.
- 8. Support**
  - a. Remote management support and upgrade
  - b. System instrumentation, at least to basic SNMP level, for remote management by third-party system management applications.

but rather the application of the standards in hotel purchasing decisions will of necessity be flexible, at least in the short term. The desired result can be achieved if technology buyers make their commitment to long-term achievement of the standards a critical element of the evaluation, negotiation, and contracting process.

## **Business Standards**

Many of the limitations of the current situation have evolved from contractual restrictions in software licensing and usage, and in the limited willingness or ability of many technology vendors to support the integration requirements of their hotel customers.

While the technical standards create the platform for open systems, business standards are needed to ensure that hotel companies have the contractual right to license and integrate systems as needed, even where competing vendors are involved, and using whatever means of integration are available and appropriate.

At the same times, vendors have the right to protect their intellectual property, and to compete in the provision of software and services that assist in or accomplish such integration.

We urge vendors and hotels to adopt these forward-thinking business standards that are responsive to hotel industry needs.

1. Vendors who do (or who wish to) offer complementary products to common customer base are encouraged to work together in open and effective partnerships, to make common choices with regard to infrastructure and architecture, and to provide a cohesive set of interoperable software and related delivery and support services. This approach will reduce the total cost of ownership to hotels significantly, improve the vendors' ability to deliver the solution the hotels need, reduce support costs for the vendors, and therefore be expected to increase the sales and profitability of the participating vendors.
2. Vendors should agree to provide open-systems access to their technologies. Vendors are encouraged to provide comprehensive, real-time, transaction-based interfaces, and hotels are encouraged to utilize vendor-provided interfaces. However, if a hotel concludes that a vendor cannot provide the appropriate interface in a cost-ef-

Questions will emerge as any new set of standards is adopted into the real world. It is not our intention to claim that this list is definitive or complete. We acknowledge the need to create clear definitions and we believe that this should be accomplished with considered input from hotel companies and technology vendors over a period of time.

3. In an effective manner, the software license or use contract should not restrict the hotel from acquiring a third-party interface or from building its own. Software should include comprehensive documentation of data structures, procedure calls, security, and other functionality that another party may reasonably require in order to effect interoperability for a hotel. In the absence of comprehensive documentation, or in the event of unclear documentation, vendors should be contractually required to assist third parties to the degree needed for the third party to complete its tasks. Vendors should not be expected to provide their competitors with details regarding the means by which their code accomplishes specific tasks internally, nor should they be expected to provide documentation to parties that do not have a bona fide need based on an actual customer.
4. Vendors should not impose contractual restrictions that would prevent a hotel from contracting any third party of the hotel's choosing to develop integration capabilities to the vendors' software, such as restrictions on who may have access to documentation or to live systems. Vendors should be entitled to notice from the hotel company when a third-party integration requires such documentation or access, and should be able to impose reasonable restrictions on the scope, extent, and duration of access and on the rights of the third party to retain copies of documentation, provided that those restrictions do not prevent the third party from effectively achieving their objectives.
5. Hotels should agree to honor the intellectual property rights of vendors' products and to enforce the vendors' rights with respect to any subcontractors who have access to the vendors' system.

6. Vendor consortia that claim interoperability of their respective applications (including by traditional interfaces) should individually and collectively commit to technical support and performance service levels on an end-to-end basis. Such cooperating vendors should implement a single point of contact support for integration issues, with defined escalation processes within each vendor's support and development organizations. This approach should not only improve end-user support but, properly implemented, will reduce vendors' support costs.
7. Contracts should clearly state that data entered into, created by or inherited by any technology system is owned by the hotel as customer. The hotel should have the right, and be provided with

the means, to extract its data in a usable format. Vendors have no rights to use the hotel's data except for (a) rights specifically granted by the hotel; and (b) the right to use aggregate customer production metrics (across all of its customers combined) as indications of vendor's industry volume. Exception (b) should not apply to any customer or group of related customers that constitutes more than one-third of the vendor's total volume on a particular metric.

8. Hotels should strongly consider the benefits of working with vendors who adhere to the standards and should seek to recognize, patronize, and endorse them for their commitment to improving the industry's technical capabilities.

## **Actions the Hotel Industry Needs to Take**

Many of the challenges in the hotel technology arena have been created by policies and practices of hotel companies themselves. In order to achieve success, a substantial number of hotel companies may need to change key elements of how they measure, fund, and purchase technology. In some cases these changes can be effected through the auspices of trade organizations such as HFTP; while in other instances they must be undertaken by each hotel company independently.

*Many of these actions are outside the CIO's scope of responsibility, and will require the endorsement and adoption by hotel company CEOs, COOs, CFOs, and Boards of Directors.*

### ***Improve Technology Cost Measurement***

The consultants among the founding members of HTNG are continually asked by major industry players to assist in developing solid estimates of industry technology spending. Despite the level of interest among CEOs and CIOs within the industry, technology cost measurement has proven extremely elusive.

There is a widespread view among many companies that, while service delivery models for technology (ASP services being one example) are attractive, the current offerings on the marketplace seem too expensive in comparison to acquisition costs.

While this may be true in some cases, there are fundamental issues with attempts to compare service models with capital spending models. First, current hotel accounting standards make it virtually impossi-

ble to measure technology costs. Most technology costs within the hotel are buried within departmental budgets. Costs for a single technology initiative typically span across departmental borders. Technology that is provisioned by management companies or franchisors is often priced to the hotels at an amount that bears at best a loose relationship to underlying costs (and sometimes no relationship at all).

Second, many of the costs borne within the service model are typically excluded when estimating the total cost of ownership of an alternative capital-acquisition based solution. Internal cost calculations rarely include the time of all of the IT and non-IT management and staff needed to manage the operation on an ongoing basis. Furthermore, hotel companies rarely hold internal service departments to the same service-level agreements that they insist upon with external service providers. Perhaps even more important, the service model typically includes regular technology refresh that would lead to additional downline costs in the capital acquisition model, most (or all) of which are often not considered. One of the consultants in our group has estimated that these issues can cause the typical capital acquisition funding approach to understate true costs by 30% or more.

The industry as a whole needs to find a better way to capture technology costs within its accounting systems. This role should logically fall within the scope of HFTP's charter. In order to manage technology spending appropriately, the hotel industry's

accounting, budgeting and ROI analysis approaches need to:

- Clearly identify technology costs by category (e.g. infrastructure, operational systems, sales/marketing/distribution, guest room, etc.), regardless of which department funds them.
- Clearly measure or, at a minimum, estimate, indirect costs of technology projects, including management staff time, burdens on support departments such as accounting and human resources, and similar resources.
- Measure technology costs actually incurred by the hotel, management company, and franchisor levels, *and paid to third-party (unrelated) vendors*. Too often, technology projects are mis-analyzed and underfunded because a manager or franchisor imposes a cost on a hotel that covers the provision of both technology-based and non-technology services. The hotel experiences a single price for the service and may not be able to assess the technology components independently.
- Make explicit assumptions about technology refresh costs, and in particular about the organizational costs when change is generational (as is often the case with the capital acquisition model) vs. incremental (as is more common with the service model).
- Identify costs shared among multiple applications as infrastructure, and evaluate infrastructure costs within the context of all supported applications and operations rather than just the single application that forced an upgrade or replacement

### ***Establish Technology Reserve Funds***

Hotels should establish, and owners should demand, explicit technology reserves, just as they create reserves to refurbish the hotel's physical plant. The need to spend money on an ongoing basis to ensure a stable but evolving technology environment is not optional, but rather is a cost of staying in business. While it may be possible to defer a given expenditure from one year to the next, technology refresh cannot be put off forever any more than can refurbishment of the physical plant.

### ***Budget Technology Infrastructure Costs Independently of Applications***

The need to measure shared infrastructure costs, discussed above, is generated by the need to budget for it separately from end-user projects. A solid technology foundation within each hotel and hotel company

is required to operate any of the more modern hotel systems.

Today, the property management system, the sales system, the local presence of the central reservation system, the office automation software, and many other applications often share the network infrastructure and workstations, which taken together can account for half or more of the hardware costs within a hotel. In the future, PABXs, telephone handsets, in-room entertainment and Internet services, door locking, and energy control systems (among others) will likely share the same infrastructure.

The cost of maintaining reasonably current technology for the shared infrastructure elements cannot reasonably be burdened on any one application and justified by the project's ROI. Rather, infrastructure costs should be determined, component by component, with reasonable lifetimes, and an annual budget established for technology refresh. The particular systems being deployed or upgraded within a given budget year may dictate which infrastructure elements are refreshed first, but should not be expected to provide the financial justification for infrastructure elements that would eventually be needed with or without the project.

An example of this approach is the widespread use in other industries (and in isolated pockets within the hotel industry) of leasing models for technology infrastructure. Many companies, for example, routinely replace all PCs on a three-year cycle. The vendor that provisions the PCs (whether internal or external) charges the users a monthly lease rate that enables it to deliver, install, maintain, and replace PCs. This maintenance and replacement cycle allows every technology project to assume that it has the workstations needed, at a current level of technology. The incremental cost of the project is affected only if it creates the need for additional workstations.

### ***Communicate to Preferred Vendors Your Support for These Standards***

Vendors within the hotel technology community each have their own business models and agendas. Some will embrace many or all of the standards presented in this White Paper, while others will feel threatened. Ultimately, however, the hotels are their customers, and those vendors who listen to hotels and who provide technology that hotels can use more effectively, will prosper along with their clients.

Hotel companies should talk with their current vendors and determine their willingness to commit to the standards. If vendors understand that their future business from enough hotel companies is dependent

on their operating within a standard technical and business framework, most of them will adapt very quickly. There are no requirements imposed by these standards that have not been widely adopted by the technology communities in other industries. Individual vendors may balk, but at the end of the day, it is the hotel's money to spend with the vendors who can best serve their needs.

### ***Recruit and Employ Qualified IT Professionals***

The hotel industry as a whole, and individual hotel properties in particular, have failed to embrace the establishment of adequately funded and qualified technical staff. While there are many structural reasons why hotel technology has failed to deliver to its potential, many could have been avoided, or could be compensated for, if an adequate IT skill base were available. Only a few hotel companies, mostly larger ones, have embraced this concept.

As an industry, we would not promote an accountant or front desk clerk to the top position in food and beverage, yet hotels routinely promote unqualified staff into key technology positions. If the food is bad and the restaurant service surly, we find a qualified F&B manager and give him or her what is needed to succeed. When technology fails to deliver to expectation, we find the staff member who seems to know how to use a computer and ask them to solve it. This is akin to selecting, for the next F&B manager or Executive Chef, someone who likes to eat.

For many hotels, and particularly those lacking centralized support from a chain or management company, hiring qualified IT staff can be an immense challenge. An IT professional sufficiently skilled to manage all of the technology in a mid-sized or large hotel can command a salary equal to or greater than that of the General Manager.

Realistically, a 500-room hotel can easily have US\$2 million to \$4 million in technology costs, which we as an industry have often entrusted to \$40,000-a-year

staff who can, at best, be expected to have minimal experience in a very limited set of technical fields. There are dozens of technical disciplines required to manage technology in a hotel, and an IT person at such a salary level is unlikely to even be aware of many of them, much less competent to manage them.

Larger management companies, chains, and third-party service providers are inherently in a better position to attract qualified staff with the necessary range of expertise. It is for this reason that most larger companies and some service vendors have begun pulling technology out of hotels, wherever feasible, operating it in a centralized or regionalized environment, and delivering it as a service to hotels. This is not to say that hotels do not need their own IT staff, or to suggest that it would allow hotels to continue to get by with the current insufficient levels of IT skills. Rather, it will allow a competent IT manager within a hotel to deliver and support a broad range of technology services cost effectively.

As an industry, we need to upgrade the position of IT manager, in all but the most basic types of hotels, to an executive committee level position, with commensurate pay, so that we can hire IT professionals with the qualifications needed to run the diverse systems we use. Perhaps in the future, if the industry evolves to more standard software delivered by third-parties and management companies, this position can be eliminated, but for the next five to ten years it is likely to be essential for most hotels.

When we hire IT professionals, whether at the corporate or hotel level, we should be looking at their range of technical education and skillsets more than their hotel experience. We need more IT people at all levels who know how problems have been solved in other industries and disciplines, and who have been trained to solve these problems in a professional way. We can teach them what they need to know about hotels; we cannot as an industry teach them what they need to know about technology.

## **Conclusion and Call to Action**

Year after year, hotel technologists flock to HITEC and view the latest technology. Thought leaders within the industry had a vision as long as 15 years ago of a common technology that could be used by multiple hotel companies, that would evolve over time to meet changing needs, and that could be delivered to hotels in a cost-effective manner. Hotel

managers could then concentrate on running their business, and leave technology to the experts. Yet despite the acknowledged need, it has not happened.

By adopting a base set of technology standards and practices, we as an industry can change that. Standards, even if universally embraced, will not create total interoperability. But by eliminating the barriers

## **A Path To Achieving Next-Generation Technology for the Hotel Industry**

*Hotel Technology – Next Generation  
White Paper*

that have consistently prevented large technology providers from succeeding in our industry, we can attract capital that can solve our problems by building a network of service providers offering powerful,

maintainable systems on a global basis. We simply need to do it.

Submitted to the hotel industry and vendor community on June 29, 2002, by the founders of Hotel Technology-Next Generation.

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