



# Strategize to Maximize

Consider both hard and soft factors when evaluating technology investments

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If you were told there was one key investment to make or one business practice to adopt that would virtually guarantee your property's success, both from the operational standpoint and from the tenant satisfaction perspective, chances are you would follow that advice. In our new digital economy, that critical step would necessarily include the adoption and implementation of effective technology solutions carefully and thoughtfully designed to further the specific objectives of your company and satisfy the needs of your tenants.

We have entered an era in which the use of technology will influence every aspect of the real estate investment experience from a property's acquisition, design and construction to its leasing, marketing and management, as well as the delivery of tenant services. Progressive owners and managers can no longer view technology simply as a means of increasing operational efficiencies. Rather, technological investments are now necessary to support and enhance the tenant experience. Wireless hotspots, online lease manage-

ment, automatic rental payment systems, automated work orders, Internet-based surveillance and remote diagnostic and preventative maintenance services are just a few examples of the ways in which technology has begun to pervade the real estate industry. Tenants will soon generally expect such services to be offered at their address of choice.

Owners and managers who do not equip their properties with sound technological innovations will, no doubt, be left behind. Their properties will depreciate in value as tenants choose alternative locations with strong technology infrastructures and innovative landlords who demonstrate a visible commitment to increasing efficiency and convenience through the implementation of technology solutions.

Despite today's slow economy and the recent dot com debacle, now is the time for you to plan for and make circumspect investments in technology, particularly those focusing on increasing operational efficiencies and attracting choice tenants in the industry's extremely competitive environment. Through these critical investments, you can be



poised for the market upswing and positioned to keep up with, if not surpass, your competition.

### **Conducting Due Diligence**

Many owners and managers understand the importance of technology investments on an intellectual level, but are understandably anxious about the risks associated with such investments. In light of today's volatile and uncertain technology industry, before committing your resources to technology investments, you must diligently assess whether the technology companies with whom you plan to do business are solid and will generate sufficient real earnings to ensure their future viability. Several years ago this was a challenging exercise. As the innovators in the real estate technology field first emerged, novel ideas to revolutionize the industry abounded, but few tech companies had sound and reliable business plans. However, those tech companies that have succeeded in today's sluggish economy have done so because of more deliberate, thorough and insightful busi-

ness models and after surviving the strict scrutiny of their lenders and venture capital investors.

After conducting a thorough assessment of the technology company with whom you plan to do business, you should next attempt to quantify the potential return on your technology investments (ROI) to assess if they will truly be worthwhile. Technology investments, however, are not easily quantifiable. More often than not, calculating the ROI from real estate technology investments is more an art than a science and more of a "guess-timate" than a mathematic calculation. Certain real estate technology transactions do generate measurable financial returns, such as the revenue share arrangements often included in video and high-speed data service contracts between owners and providers and the license fees payable by providers to owners for rooftop antenna rights. Joint venture transactions between owners and providers to bring communication services to tenants or to roll out new software applications for their business operations will also typically generate measurable results. In the

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# Tech Terms

## A glossary of technology terms and principles

### A

**ASCII**—American Standard Code for Information Interchange computer character set (text and symbols) that enables transfer of text and data between different computing systems. This international standard provides only very plain text without options for font modifications.

**ASP**—Application Service Provider that provides individuals or enterprises access over the Internet to applications and related services.

**Asynchronous Learning Networks**—ALN networks of education and training modules or courses where students learn in self-paced online pedagogy in contrast to synchronized presentations in traditional classrooms or electronic classrooms.

### B

**Back-end**—The final stage in a process not apparent to the user.

**Bandwidth**—Capacity (range) of transmission frequencies on a network as expressed in cycles per second (hertz) or bits per second that determines the amount of data, audio and video that can flow over the network. The higher the frequency, the higher the bandwidth.

**Bookmark**—A user-defined place mark that enables the user to return to a particular screen or starting point after accessing related information through an Internet browser.

**Broadband**—Network transmission capacity that greatly exceeds capacity required for voice transmission over traditional telephone cables.

**Browser**—A type of software that allows you to navigate information databases; examples are Netscape Navigator and Internet Explorer.

### C

**Cache**—A storage area in both RAM (cache memory) and disc drives (cache controllers) that keeps frequently accessed instructions more readily accessible.

**Coaxial cable**—A cable consisting of a single metal wire surrounded by insulation, which is itself surrounded by a braided or foil outer conductor.

**Compression**—In one context, it refers to algorithms for shrinking the storage space required for files stored on discs. In another context, compression refers to the storage of graphics or video files in such a way that they can be stored and/or processed more efficiently on computers.

**Cookies**—Applets that enable a Web site to collect information about each user for later reference (as in finding cookies in the cookie jar). Web browsers like Netscape Navigator set aside a small amount of space on the user's hard drive to record detected preferences. Cookies can be used to collect information for consumer profile databases. Browsers can be set to refuse cookies.

**CPU**—Central Processing Unit that encompasses a computer's RAM, processing and control circuitry, including the arithmetic-logic (ALU) unit. Both the ALU and the control units are wholly contained on the micro-processing chip whereas the primary storage is on the mother board or the expansion bus.

**Cross-platform**—The ability of a software package or an electronic "book" to run in more than one operating system.

### D

**Database**—A computer file or system of data organized in records and fields for fast retrieval and updating.

**Data mining**—The discovery and

modeling of hidden patterns in large amounts of data. Models address why things happened and what is likely to happen next. A user can pose "what if" questions to a data-mining model that cannot be queried directly from the database or warehouse.

**Debugging**—Executing a program, one statement at a time, to identify and fix errors.

**Dial-up connection**—The most popular form of Net connection for the home user, this is a connection from your computer to a host computer over standard telephone lines.

**Direct connection**—A permanent connection between your computer system and the Internet.

**DNS**—Domain Name Server refers to a database of Internet names and addresses which translates the names to the official Internet Protocol numbers and vice versa.

**Download**—To transfer to your computer a copy of a file that resides on another computer.

**DSL**—Digital Subscriber Line technology for transmitting data up to 50 times faster than present analog modem and ISDN alternatives.

### E

**EDI**—The abbreviation for Electronic Data Interchange or Electronic Data Invoicing, this system allows linked computers to conduct business transactions such as ordering and invoicing over telecommunications networks.

**Encryption**—Cryptographic conversion of data into ciphertext in order to prevent any but the intended recipient from reading that data.

**Ethernet**—A widely used interface data processing scheme for managing data transfers on a network. An ethernet board must be put into the computer for network connections.

**Extranet**—A term depicting networks on the Internet dedicated to business communications between a vendor and its suppliers and customers.

### F

**Fiber optic**—Cable that carries light pulses instead of electrical current. A cable comprised of a multitude of fine glass fibers has much more capacity than the previously popular copper cable.

**File attributes**—Access rights attached to each file.

**File server**—A computer running a network operating system enabling other computers to access its files.

**File transfer**—The ability to transfer text, graphics, software, spreadsheets, audio files and video files over vast distances on computer networks such as the Internet.

**Firewall**—Security measures designed to protect a networked system from unauthorized or unwelcome access.

**FTP**—File Transfer Protocol used for downloading files on the Internet.

### G

**Gateways**—Connectors between two or more dissimilar networks that facilitate communication in such instances. Gateways have their own processors to perform both protocol and bandwidth conversions.

**GIF**—Graphic Interchange Format, a commonly used file compression format developed by CompuServe for transferring graphics files to and from online services.

**Groupware**—Software applications that facilitate shared work over long distances on documents and information. Groupware supports person-to-person collaborations.

# H

**Hard drive**—A “hard disk” file storage disk (usually a magnetic disk) on a computer that has higher storage capacity and faster access time (i.e., under 20 ms) than slower devices such as floppy disk drives and optical disk (i.e., CD-ROM) drives.

**Home page**—The document displayed when you first open your Web browser. Home page can also refer to the first document you come to at a Web site.

**Host**—A computer acting as an information or communications server.

**HTML**—Hyper Text Markup Language is the language used to tag various parts of a Web document so browsing software will know how to display that document’s links, text, graphics and attached media.

**HTTP**—Hyper Text Transfer Protocol is used to link and transfer hypertext documents.

**Hyperlink**—Interactive navigation to other parts of a document, other documents and other WWW sites.

**Hypertext**—Pages of computer text that are authored in software allowing for non linear navigation based upon button controls, hot words or other controls that make sequencing of pages virtually irrelevant.

# I

**Icon**—Graphical representation of an object (file, directory, picture, text field, etc.) as a tiny symbol that can be arranged with other icons and clicked on using a mouse.

**Instant Messaging (IM-ing)**—Messaging between two or more individuals who are simultaneously online. In order for IM-ing to work, both users (who must subscribe to the service) must be online at the same time, and the intended recipient must be willing to accept instant messages.

**Interface**—The connection between a computer and its auxiliary equipment such as hard drives, CD-ROM drives, videodisc players, printers, scanners, etc.

**Intranet**—The use of the Internet

and Internet-type software for sub-systems of computing for private organizations and individuals. Most intranets use the “free” connections of the Internet, and turn the Internet into an intranet with passwords or other access barriers to documents and databases.

**IP**—Internet Protocol refers to the set of communication standards that control communications activity on the Internet. An IP address is the number assigned to any Internet-connected computer.

**ISDN**—Integrated Services Digital Network is a means of connecting to digital networks, including the Internet, via a common (digital) telephone line.

**ISP**—Internet Service Provider provides access to the Internet and the World Wide Web.

# J

**JavaScript**—A Web document scripting language introduced by Netscape. These are codes that allow users to go beyond what is possible in HTML coding of Web documents.

**JITT**—Just-In-Time Training refers to a process (usually aided by computers, compact discs, computer networks and/or teleconferencing) in which the person receives training “just-in-time” when it is needed for a particular purpose.

**JPEG**—Joint Photographic Expert Group standards for image compression that is an increasingly popular compressed graphics image file, the extension for which is usually JPG. Because large and high resolution graphics images with considerable color depth require massive amounts of storage (i.e., over 30 Mb) for each image, compression routines that create images almost as good with substantially fewer storage requirements are highly desirable.

# K

**Knowledge management**—In business information technology, an entire integrated system for accumulation, integration, manipulation and access of data across multiple organizations, including such data as credit data,

consumer profiles, market data, product development data, etc.

# L

**LAN**—A Local Area Network depicts any computer network technology that operates at high speed over short distances (up to a few thousand meters). A LAN may refer to a network in a given department or within a given firm or campus.

**Legacy**—Technology associated with old corporate programs, such as those on mainframes.

**Links**—A synonym for hotlinks or hyperlinks, these are the hypertext connections between Web pages.

**Listserv**—An e-mail system where users “subscribe” to join in on group messages. A message sent to the listserv is sent to every subscriber’s mailbox.

# M

**MIME**—Multipurpose Internet Mail Extension to files that tell computers what kind of program to use to view or run a file. Mimes are typically plug-ins to browsers that help launch helper apps or user apps.

**Modem**—Process of converting digitized data into analog form for a carrier wave. Demodulation transforms data transmitted in analog form back into digital form for computer storage and/or processing. Modems modulate and demodulate computer data for transmission on telephone lines.

**Motherboard**—A circuit board or “logic board” inside the computer that contains the central processing unit (CPU), microprocessor support chips, RAM and slots for adding expansion boards such as audio, scanner, SCSI and video boards.

# N

**Network address**—A hexadecimal number used to identify a network cabling system.

**Networks**—Linkages between computers allowing data and other digitized information to be transmit-

ted between computers. Networks may be local, regional, national or international.

**Notebook computer**—A portable computer about the size of a standard ring binder notebook. Although notebook computers do not have expansion slots for hardware modifications, SCSI, Ethernet, ISBN, video capture, and other hardware options are available on PCMCIA cards.

# O

**Operating system**—The master control software system that serves as a foundation for applications software. Examples include MS-DOS, Windows and OS/2.

**Optical drive**—Any medium or device using a laser beam for accessing data stored on an optical disc. Typical optical drives are CD drives and videodisc drives.

# P

**Password**—A secret word used to identify a user.

**PDA**—Personal Digital Assistant, pocket-sized devices for recording of typed or handwritten messages that can later be ported to computers.

**PDA and PDF**—Portable Document Assistant PostScript formatting technology that attempts to provide a viable way of exchanging documents across operating systems and different types of software. One PDA option is the Acrobat tools from Adobe Corporation that gives rise to PDF documents in Portable Document Format file extensions.

**Platform**—A platform can be a chip, a computer, an operating system, an application or any combination. It usually refers to a collection of technology that software companies use in making new products.

**Plug and play**—In the most general sense, it means ease of setup and operation such as when a device can simply be plugged into power and run with ease.

**Plug-in**—The most common meaning in WWW browsers is reader (runtime, playback, view) software that will “plug” into the browser such that when a file extension (i.e.,

PDF, TBK, WAV, AVI, MOV, etc.) is encountered the browser will view or download the file automatically and run that file.

*Portal*—A "one-stop" place of information and services for topical areas.

*Protocol*—Any formal description of message formats and the rules two computers must follow to exchange those messages. Protocols can describe low-level details of machine-to-machine interfaces (i.e., the order in which bits and bytes are sent across a wire) or high-level exchanges between allocation programs (i.e., the way in which two programs transfer a file across the Internet). Files on the Internet are transferred via what is known as FTP.

## R

*RAM*—Random Access Memory portion of a computer. The term "memory" typically refers to RAM as opposed to hard disc and optical disc storage of files that cannot be randomly accessed without searching by sectors. RAM stores instructions and other files potentially needed for immediate processing of a task at hand. Memory usually can be accessed "randomly" at relatively high speeds.

*Remote login*—Refers to the capability of a network user to access databases and software on other computers, possibly computers linked on the Internet in remote parts of the globe.

*Rich-text format*—A text formatting standard established by Microsoft Corporation to enable text to be transferred between a word processor and other software without losing all of its formatting properties. Many modern word processors have the option of saving documents in rich-text format (RTF).

*ROM*—Read-Only Memory files can be accessed, executed and possibly copied. However, ROM files cannot be deleted or otherwise altered on the ROM device.

## S

*Scalability*—How well a system performs as it grows. For example, a central server of some kind with ten

clients may perform efficiently. It has a scalability problem if it fails with an increasing number of clients.

*Scanner*—Both hand-held and flatbed hardware and software for copying graphics images and text into computer files. Both color and black and white options are available.

*Screen capturing*—The "capturing" of images on a computer screen onto a clipboard or a graphics file so they can be imported into other software. Screen captures are analogous to photographs of screen images.

*Search engine*—Web sites that allow users to type in a word or phrase and then search for other sites linked to that word or phrase.

*Security*—Protection against error and fraud. In computing and networking this includes firewall protections (i.e., passwords) for entry and encryptions for messages that contain protected data such as credit card numbers.

*Server*—A computer that shares its resources, such as printers and files, with other computers on the network.

*Shareware*—Software that is available on public networks and bulletin board systems. Users are asked to remit a small amount to the software developer on the honor system.

*Smart card*—A credit card with an embedded microchip that contains extensive information. Smart cards can hold encrypted secure data transferred in from a personal computer.

## T

*Tags*—Formatting codes used in HTML documents that indicate how parts of a document will appear when displayed by browsing software.

*Telnet*—The Internet standard protocol for remote login service that allows users on the Internet to access programs and applications on computers in remote locations.

*TIFF*—Tagged Image File Format graphics file format popularized by Aldus PageMaker for recognizing graphics from different types of software. TIFF graphics files typically have a TIF extension.

## U

*UNIX*—An operating system developed by Bell Laboratories for use on large workstations. UNIX became one of the main operating systems for networked computers, especially Internet networks.

*URL*—Uniform Resource Locator, the addressing system used in the World Wide Web and other Internet resources. The URL contains information about the method of access, the server to be accessed and the path of any file to be accessed.

*USENet or Usenet*—Network of machines that exchange information tagged with labels called "news-groups," transmitted between individuals at universities, secondary schools, government agencies, home computers, etc. USENet traffic can be carried on the Internet but is not restricted to the Internet.

## V

*Virus*—A hardware/software infection designed intentionally to corrupt a computer, computer files and/or networks.

*Visual Basic (VB)*—An extension of Microsoft Basic that allows for GUI controls, animations, and drag-and-drop features.

## W

*WAN*—Wide Area Network of computers spanning hundreds or thousands of miles. Unlike intranets and virtual private networks, WANs do not use public Internet arteries and are totally isolated from the public domain.

*Webcasting*—Use of World Wide Web to broadcast information. Unlike typical surfing, which relies on a pull method of transferring Web pages, webcasting uses a "push" combination of technologies to send information to users' computers. Users get steady updates of streams of information in requested categories.

*Weblog (Blog)*—A Web site of personal or non-commercial origin that uses a dated log format and is updated frequently with new infor-

mation about a particular subject. Generally, Weblogs are devoted to one or several subjects or themes, usually of topical interest, and, in general, can be thought of as developing commentaries, individual or collective on their particular themes.

*Webmaster*—The administrator of a World Wide Web site.

*Web page*—An HTML document that is accessible on the Web.

*Web streaming*—Live playback of media files on the Web. Audio or video files play in real-time without having to wait for full downloads of the files.

*Web surfing*—Browsing the WWW using a browser.

*Workstation*—A networked personal computing device with more power than a traditional PC or Mac. Typically, a workstation has operating systems such as UNIX, OS/2 or Windows 2000 that are capable of running several tasks at the same time. It has several megabytes of memory and a large, high-resolution display.

*World Wide Web*—Hyperlinking system, also known as WWW or W3, that creates a point-and-click way of linking within documents, linking to other documents and searching the Internet.

*WORM*—Write Once Read Many memory device that allows an author to store prepared files once into memory so that other users may read but not alter those files. Alternately WORM also depicts a computer program that replicates itself.

## X

*XBRL*—eXtensible Business Reporting Language. It is a royalty-free, open specification for software that uses XML data tags to describe financial information for public and private organizations.

*XML*—eXtensible Markup Language puts tags on Web pages to facilitate more efficient Web searches.

*Source: Bob Jensen's Technology Glossary (<http://www.trinity.edu/~rjensen/245glos.htm>). For more information, contact Bob Jensen at [rjensen@trinity.edu](mailto:rjensen@trinity.edu) or 210-999-7247.*

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joint venture context, using a typical “real estate industry” approach, owners can evaluate the cash flow generated by the joint venture relative to the capital contributions the owners have made to the venture to determine the returns the owners are realizing on their cash investments.

The benefits produced by most real estate technology investments are not as easily identifiable or quantifiable. Each owner may manage his/her portfolio using a different revenue model and have individual properties that present unique challenges, making it virtually impossible to develop a uniform methodology applicable to all property owners for measuring the benefits of a technology investment. Furthermore, owners are likely to vary in their views of what constitutes being progressive and proactive as they relate to technology and automation as well as how “success” should be measured.

### **The Softer Side of ROI**

As a result, to assess the value of your real estate technology investments, you generally must look beyond immediately tangible monetary rewards to the “softer” and less directly

**Technological investments are now necessary to support and enhance the tenant experience.**

quantifiable benefits realized by your specific portfolios and achieved by your business operations through investment in technology and telecommunications solutions. Owners who expend funds for quality communications services, tenant conveniences or other software applications that enhance “customer satisfaction” at their properties will sustain the marketability of their properties and improve their ability to compete for tenants. Customer satisfaction resulting from access to these services directly contributes to tenant attrac-

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tion and retention, and may also offer companies the opportunity to push rental rates to higher levels. Even though lost rental opportunities and failed tenant retention are difficult to measure, they are nonetheless factors that you must consider before deciding whether to provide or forego essential communications capabilities and other innovative technology solutions for your properties.

From the business operations perspective, technology investments in software applications and Web-based solutions can generate measurable cost savings for owners and managers. For example, you can reduce collection losses by utilizing available applications that help determine the credit-worthiness of prospective residents by assessing past payment records and other credit indicia, as well as those that permit the automated payment of rent, such as electronic funds transfer programs. You can also access real-time information on multiple properties from your desk rather than taking the time to travel to only one property. Real estate companies can conserve energy by having automated, integrated energy control systems. With the successful assimilation of technology, employees will likely increase

**Soft benefits are difficult and often impossible to quantify, but they can be as compelling as hard cost savings.**

their productivity and find greater job satisfaction (resulting in employee retention and reduced human resource costs). One method of assessing the return from these investments is to examine the level of adoption of technology at the company. If employees are utilizing technology solutions to get their jobs done faster and more efficiently, then one can credibly surmise that related financial benefits are accruing to the company. The savings achieved from implementing

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these solutions might easily pay for the cost of the technology. There is little doubt that owners and managers who create a culture within their companies demonstrating their companies' commitment to being at the leading (but not bleeding) edge of the marketplace and fostering the adoption and implementation of technology solutions, will maximize the benefits they realize from their technological investments.

As we enter an age in which the quality of a property will be measured in part from the prospective tenants' perceptions of connectivity and a sophisticated technological infrastructure, real estate companies should continue to strategically devote resources to technology and telecommunications solutions for their portfolios. When evaluating the potential return on your investments, you should keep in mind the monetary as well as non-quantifiable benefits to be realized from these investments. Soft benefits are difficult and often impossible to quantify, but they can be as compelling as hard cost savings and hard revenues impact.

Owners and managers need not be intimidated into thinking that to begin to participate in today's digital revolution they must immediately become the leaders and innovators in the adoption of real estate technology solutions, and necessarily divert their limited resources toward risky, unproven investments. Instead, you should take time in this economic downturn to review the way you think about and use technology. You should assess the strategic roles that technology can play in your businesses, emulating the best practices of other real estate companies who are current industry leaders and who have committed themselves to inculcating technological advancements into the

way they do business. Owners and managers should evaluate and conduct business only with those tech companies that demonstrate they have sound and deliberate business plans and the capacity for longevity and survival. Owners who follow this path will emerge from this period of introspection and technology assessment better positioned to meet the chal-

lenges and opportunities of the new digital era, differentiating themselves from many of their competitors. □

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## Main Stream (1/2) Ad