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This instructional case, based on an actual firm's experience (name changed), is intended to challenge student thinking with regard to the extent to which information technology (IT) can demonstrably contribute to organizational performance and productivity and to which users of IT can relate their investment decisions to measurable outcomes. Relationships between an organization's investment in IT and the effect of such investments on the organization's performance and productivity have long been the subject of discussion and research. Managers, interested in knowing the "payoff" of such investments, are continually seeking answers to this question. A failure to understand the benefits of IT investment, or an over- or under-estimation of the benefits of a planned investment in IT relative to the costs, will likely result in less than optimal investment decisions.

BACKGROUND

Real estate is a natural and therefore limited resource. The total value of U.S. real estate has grown from the time of the island of Manhattan purchase for $24 to a current day $3 trillion. Whether used for commercial, residential, or federally protected use, land is a commodity that has experienced phenomenal growth over the past three decades, albeit with temporary setbacks. The majority of the world's land remains free of human habitation. It lies in the same natural state as it has since the creation of the earth. However, following a decline in the 1980s, the portions that have been developed for human habitat are experiencing a renaissance in value and, for property owners, increased earnings. As an industry, real estate has been viewed as a fragmented sector of commerce. Ownership was, and in many ways still is, an unsecured risk. As stated in *Forbes* magazine (December 29, 1997), "most of the commercial real estate in the U.S. is owned by private groups or individuals…..Somewhere between $2 trillion and $3 trillion worth, and very little of it publicly owned."

The real estate bandwagon has not always been so robust. During the early 1980s

realty magnates consumed everything they could get their hands on. The cost of capital was low and banks and financial lenders were more than willing to loan cash or provide credit for such investments. Savings and loans institutions were multiplying and growing as fast as deals were brought to their loan officers. The U.S. economy was on a roll and real estate lending was unstoppable. However, all that glitters is not gold. By the mid-to-late 1980s the economy had begun to deteriorate. Over -leveraged financial institutions were faced with declining profits. The once high-flying financial markets were showing signs of correction. Savings and loans were filing for bankruptcy and the federal government was called upon to bail out the millions of dollars in worthless bonds that had flooded the American economy a few years earlier.

Perhaps no other industry better characterizes the decline of the U.S. economy during the 1980s than that of real estate. Potential investors in real estate were weary of the irresponsibility of banks in lending capital to develop shallow development deals and transparent structures. Real estate, ranging from land development to shopping centers, hotels, and apartment complexes, collapsed under the weight of its own rapid growth and over saturation. No one was interested in backing new deals, and it would take years of increased demand before the real estate market would begin to recover.

Real Estate Investment Trusts

President Dwight D. Eisenhower signed the Real Estate Investment Trust Tax Provision into law in 1960. The purpose of the provision was to motivate investment in the U.S. real estate market by granting preferential tax treatment to Real Estate Investment Trusts (REIT), thus allowing greater returns on investments. In order to qualify as a REIT, a firm was required to meet stringent taxable income rules. The optimal benefit of the REIT was that no portion an organization's net income was taxable, either at the local or federal level. However, to maintain REIT status, companies were required to distribute all earnings as dividends. Since REITs were not subject to a corporate tax, the shareholders' distributions were larger than that of a standard publicly held corporation.

Creation of the AMERIREAL Corporation

The formation of AMERIREAL Corporation launched an unprecedented approach to corporate real estate ownership. Prior to that time, the majority of real estate companies and REIT's were privately held and lacked long-term vision. Owners were in the real estate market for a quick return and consequently paid little or no attention to long-term stability and shareholder value. AMERIREAL's founder, Bob Stillman, believed in the value and discipline of securitizing the real estate enterprise. His approach was to establish publicly held companies that were accountable for their actions and guided by strong management and impartial boards of directors.

AMERIREAL Corporation began operations in 1988. Its mission was to become the preeminent provider of real estate research, investment, and management of operating companies. By the end of 1988, AMERIREAL owned over two million shares of True Value Trust (TVT). TVT was a REIT dedicated to luxury residential housing throughout the Midwestern U.S. AMERIREAL had purchased the shares of TVT at a cost of $7.79 per share. According to AMERIREAL's 1988 Annual Report, on December 31, 1988, the closing price on the New York Stock Exchange for TVT was $10.50 per share, resulting in an increase in AMERIREAL's net worth of $24 million. Its strategy had begun to take shape and was

further supported by another development: increased equity ownership in real estate.

Equity ownership in real estate companies had begun to rise in 1990. Given this rise, AMERIREAL continued to venture into long-term affiliations with a variety of firms. The most noteworthy of the affiliates were True Value Trust, Standard Commercial, and Windsor, Inc. All of the affiliated companies were publicly traded organizations, with AMERIREAL a significant shareholder in each. The holdings of AMERIREAL and its affiliates included various types of properties, such as apartments, assisted living facilities, extended stay lodgings, office and retail properties, and others. As part of the overall group structure, AMERIREAL contributed resources and administrative support to help grow the companies.

By 1996 AMERIREAL had amassed a combined equity market capitalization in excess of $11.14 billion. Management had assembled a superior team of operating and investment professionals to carry out the firm's strategy.

SETTING THE STAGE

AMERIREAL'S Information Technology Posture

The real estate sector was historically an industry that had not generally utilized technical equipment or systems. Further, the industry had been slow to invest in technology in large part because of the passive nature of revenue growth after the crash of the 1980s. Thus, through 1996, AMERIREAL had not viewed information technology as an important aspect of its operating performance. However, the company began to recognize that it could distinguish itself from other firms in the industry by addressing its client needs through investment in high-speed telecommunications, Internet home pages, and eApplications for improved business processing. Thus, beginning in 1997, AMERIREAL began to substantially increase its information technology (IT) capability, hiring a large number of MIS professionals and engaging systems consultants. The MIS group began to form a long-term vision that would help launch AMERIREAL into the next millennium.

AMERIREAL, seeing itself buried in paper-based systems for the various accounting and administrative functions, began to install proprietary technical systems, such as accounts payable and timekeeping systems. These gave the firm the capability to access, process, and communicate accounts payable and payroll information to and from any company location in the country.

In another adoption of technology, the True Value Trust affiliate decided to commit over $2 million to upgrade its telephone lines to cable lines to satisfy the demand for Internet access. This allowed TVT to increase client rental fees and revenues by a substantial amount. The company also began to consider the feasibility of combining some administrative functions to take advantage of economies of scale.

Up to this time, each of the affiliates had operated on an independent basis. That is, each provided its own services such as Human Resources, Accounts Payables, Tax Department, and MIS on the premise that the needs of each would be best served by decentralized control of these resources. AMERIREAL in time came to conclude that this was not necessarily an efficient approach, and with approval from each company's board of directors, a Shared Service Center (SSC) was introduced. The purpose within the MIS group was to leverage the knowledge of all the groups into a singularly focused organization. The effect was to gain knowledge from each company and to deploy resources that would be mutually

beneficial to all companies.

In order for each company to have an equal voice in the deployment of IT resources, the affiliates each created an Information Sharing Council (ISC). The ISCs, comprised of various department heads, were responsible for prioritizing the business systems requirements, performing a cost/benefit analysis for each potential project, and submitting the requirements to the centralized IT department. Each organization's ISC team was comprised of representatives from Executive Management, Finance/Accounting, Operations, Development, and Sales/Marketing. Each functional area of the company brought unique needs to the group. Systems projects varied from transactional process enhancements to strategic competitive improvement projects.

Information Technology Initiatives and Company Expectations

As the various IT initiatives emerged from the ISC teams, the prevailing requirement was to streamline mundane and routine processes such as point-of-sale data entry into the company ledgers and operational and development information for financial statement preparation. These changes were designed to reduce or eliminate manual processing and decrease the cycle time for reporting end-user performance results.

Each affiliate gauged the success of these changes by the deliverable timelines and whether the IT department could deliver on time and on budget. These two elements had historically been lacking in IT project management. Expectations for these various IT projects ranged from increased net profit to sustaining current growth trends. As noted by the CEO of Windsor, Inc., " the efficiencies gained by implementing a new Property Management System at each hotel is expected to result in a reduction of administrative costs. The effect of this reduction should flow directly to the bottom-line".

Determining IT Deployment

One of the most difficult tasks assigned to the chief information officer (CIO) was the deployment of IT resources to various projects. The CIO and his team developed a Critical Path Priority Ranking System to help deliver the necessary resources at the appropriate time for each project. In addition to utilizing internal resources, the IT department used either external consultants to supplement its efforts, or completely outsourced portions of individual projects.

The final resource solution was to segregate the IT department into Customer Service groupings. As part of the Shared Service Center vision, each company effectively purchased the IT services. In order to assure an arms length deal for this purchase, the IT department had to determine an appropriate pricing structure to administer its services. This was a critical element since each of the AMERIREAL companies was publicly traded and shareholders' interest could not be compromised. With the help of a business partner, Real Time – Real Costs, the IT department decided to use actual costs as captured by TimeSys to adequately price the time and material used in supporting each affiliate. TimeSys is an automated time clock system that tracks the actual time, travel, and material costs used by each IT professional assigned to a specific project.

With all the elements in place, AMERIREAL was poised to enter the future fully embracing IT. The company, however, was also very interested in determining, if possible, how IT investment was contributing to company performance and productivity. To

investigate the possibility of a relationship between IT investment and company performance and productivity, data was gathered for the years 1996, 1997, and 1998.

CASE DESCRIPTION

Evaluation of AMERIREAL's IT Investment

AMERIREAL's CIO, Larry Price, had read existing literature on research into the relationships between investment in IT and its effect on organizational performance and productivity (e.g., Loveman, 1994; Mahmood & Mann, 1993). Based on these readings, he decided to classify company data into two groups: IT investment data and company performance and productivity data. IT investment was represented by four variables: IT budget as a percentage of total revenue; percentage of the IT budget allocated for IT staff, percentage of the IT budget dedicated to training, and market value of the company's IT as a percentage of annual revenue.

Performance was represented by two variables, growth in revenue and return on investment. Finally, productivity was measured as sales per employee and sales by total assets.

Exhibit 1 presents the results of the analysis of relationships between IT investment in a given year and performance and productivity that same year, as well as changes between years. IT investment data for 1996 was indicative of the fact that AMERIREAL had not yet focused on the use of IT as an integral aspect of management. The IT budget as a percentage of revenues was only 0.5 percent. The percentage of this rather limited IT budget spent on IT staff was 44 percent, and the percent of IT budget spent on training was 2.8 percent. The market value of IT as a percentage of revenue was one percent. Performance and productivity data for 1996 revealed a return on investment of over 33 percent. The 8.3 percent sales by total assets suggested the firm utilized its assets well in producing income. This would be consistent with a more or less typical real estate organization because the revenue generating assets were multifamily apartments, industrial warehouses, hotels, and other facilities that raise funds through operations. The $154,000 in sales per employee was comparable to firms that manage revenue-generating facilities with limited staff and a proportionately sized corporate overhead team.

By 1997 AMERIREAL had begun to strengthen its IT capability, as evidenced by an increase in IT budget to $3 million. This enabled an increase in the IT staff budget of 19 percentage points, to a total of 63 percent, and an 11 percentage point increase, to 14.1 percent, in expenditures for training of IT department staff. Performance and productivity measures reflected a growth in revenue of $109.5 million. In addition, sales per employee and sales by total assets each increased.

AMERIREAL continued to grow at a rapid pace in 1998. The IT investment data demonstrated that the company was continuing its commitment to technology as a means of remaining competitive. The IT budget as a percentage of revenue increased to 1.3 percent, representing a doubling of investment from $3 million to over $6 million, and included such MIS projects as Property Management Systems, accounts payable automation, and a new company-wide core financial system. The percentage of IT budget spent on staff and the percentage of IT budget spent for training increased slightly, while of course increasing even more in absolute amount as components of the larger total IT budget.

There was also an important relationship between IT investment and growth in

Exhibit 1: IT Investment and Performance and Productivity Data

Year of Record		1996	1997	1998
IT Budget for Staff		44%	63%	66%
IT Dept. Budget		$ 1,200,000	$ 3,000,000	$ 6,800,000
# of total employees		1,555	2,099	2,519
Select Investment Variables				
IT Budget to Revenue		0.5%	0.9%	1.3%
Percent IT budget for Training		2.8%	14.1%	14.8%
Market Value of IT to Revenue		1.0%	1.3%	1.0%
Select Performance Variables	1996	1997	1998	
Annual Revenue		$ 240,500,000	$350,000,000	$505,000,000
Assets		$ 2,900,000,000	$4,000,000,000	$5,350,000,000
Market Value		$ 344,022,000	$788,420,000	$1,456,451,000
Return on Investment		33.5%	30.2%	34.7%
Select Productivity Variables	1996	1997	1998	
Sales per FTE		154,662	166,746	200,476
Sales by Total Assets		8.3%	8.8%	9.4%
		1996	1997	1998
IT Dept. Budget		$1,200,000	$3,000,000	$6,800,000
Annual Revenue		$ 240,500,000	$ 350,000,000	$505,000,000
Growth Year over Year in IT Budget			$ 1,800,000	$3,800,000
Growth Year over Year in Revenue			$ 109,500,000	$ 155,000,000
				$ 264,500,000
		1996 vs 1997	1997 vs 1998	1996 vs 1998
Dollar Spent on IT and Revenue Growth		$ 91.25	$ 51.67	$ 220.42

revenue. For each dollar spent on IT in 1996, revenue increased $91 in 1997; for each dollar spent on IT in 1997, revenue increased about $52 in 1998. Except for return on investment, all performance and productivity variables indicated improvements across the several years involved. Return on investment dropped between 1996 and 1997, but increased again in 1998. The CIO felt that these results strongly suggested the probability of a relationship between increased outlays for IT in one year and improved performance and productivity the following year(s).

Was IT Investment a Factor in AMERIREAL'S Performance and Productivity?

James Fulton, AMERIREAL chief operating officer, and Larry Price, CIO, were discussing the analysis that Price had prepared. Price was taking the position that the analysis did indeed suggest a strong relationship between IT investment and company performance and productivity. While admitting that the numbers did seem to relate, Fulton had reservations as to cause and effect. He suggested that other factors be considered before coming to any definite conclusions. One specific item he had in mind was the fact that between 1996 and 1998 AMERIREAL's assets increased by $2.45 billion. Perhaps this, rather than IT improvements, was the actual cause for the increased performance and productivity. Since real estate was AMERIREAL's revenue generator, increases in real estate assets should yield increases in revenues: the more apartments, hotels, and industrial centers the company owns, the more rent which should be collected from tenants.

In reviewing the high return on investment in 1998, Fulton recalled that the industry

average annual return for REIT stocks was over 24 percent. Considering that AMERIREAL's return on investment was 34 percent, he couldn't entirely rule out the possibility that IT might have been a contributor. However, he did tend to feel that the difference between the national average and AMERIREAL's return on investment might be due more to improved operations of the facilities. By improving the apartments, hotels, and industrial centers, AMERIREAL was able to increase rates and maintain profit margins. A leader in the industry, brand recognition allowed AMERIREAL to charge a premium for its facilities.

While understanding Fulton's arguments, but believing strongly in the relationship between IT investment and company performance and productivity, Price decided to approach the discussion from another viewpoint. He believed that the primary technology systems used in a highly distributed real estate company, such as AMERIREAL, were threefold. First, the operating companies relied on individual property management systems to collect, record, analyze, and distribute data on each of their tenants and guests. Second, data transmission was used to transmit the property management system information to a centralized database. AMERIREAL companies relied on 56k modem lines to transfer data from over 500 property locations into their financial center. The final technology system used by each operating company was the core financial system. In the case of AMERIREAL, each operating company used a separate platform that contained a general ledger, accounts payable, accounts receivable, billing, and job costing database. A manual process was used to consolidate each company's results into a final financial statement.

Although the three primary technology systems were used to support operations and distribute data, Price believed that management's usage of the data for decision making was contributing to improved operational performance. For example, one of AMERIREAL'S companies, Windsor Inc., an extended-stay hotel company, utilized its property management system to control room inventory and adjust room rates during historically slow periods. This process was most noticeable during the month of December. By utilizing data stored in the property management system, Windsor was able to manage its room inventory and increase revenue per available room by 11 percent from 1997 to 1998.

Additionally, Windsor's financial management team utilized the data derived from the general ledger system to determine whether commissions paid for credit card processing exceeded the company forecast. By extracting information from the property management systems it was determined that the percentage of guests paying by credit card increased by nearly 20 percent from 1996 to 1998. Based on this information, Windsor was able to renegotiate the credit card processing fees and reduce annual operations costs by half a million dollars.

Price also believed that technology could play a critical role in generating future revenue by linking travel agents to Windsor's reservation system. Through 1997, Windsor had relied exclusively on local direct sales and marketing efforts by the property managers. Although Windsor's average occupancy was high at 74.7 percent for 1997, Price had lobbied for direct access for travel agents to make reservations and help subsidize the local efforts. This global approach would increase revenue and improve operating efficiencies. The front-end costs associated with linking the travel agents to Windsor's reservation system were in excess of $200,000. Additionally, Windsor would pay 10 percent of the first seven nights room revenue to the travel agencies as commissions. Fulton, however, was reluctant to embark on the open travel agency system, know as NetRez. He believed that the local sales efforts were the most appropriate for the company and did not want to tamper with a

successful approach. However, after numerous reviews and evaluations, he did agree to implement the NetRez project.

At the end of 1998 Fulton asked Price to perform a financial evaluation of the success of NetRez. By analyzing Windsor's annual operating costs, Fulton concluded that these increased by $1.7 million as a result of commissions paid to travel agencies. He was unsure of the return of the investment of NetRez and requested that Price provide the data to support what value the system brought to Windsor. Price analyzed the data contained within the property management systems and determined that $11,000,000 of incremental revenue was generated by NetRez. Although the operating income did indeed increase in excess of $80,000,000 from 1997 to 1998, Fulton believed that the increase was a result of additional operating properties, and not a result of NetRez.

Conversely, Price argued that comparing the total amount of revenue year over year was too limiting and believed that the most appropriate financial indicator was revenue per available room. Statistically, Windsor's revenue per available room had grown by 12 percent from 1997 to 1998. Fulton agreed that this increase did occur but was not convinced that it was a result of NetRez. He believed the increase was attributable to improved market share and increased room rates.

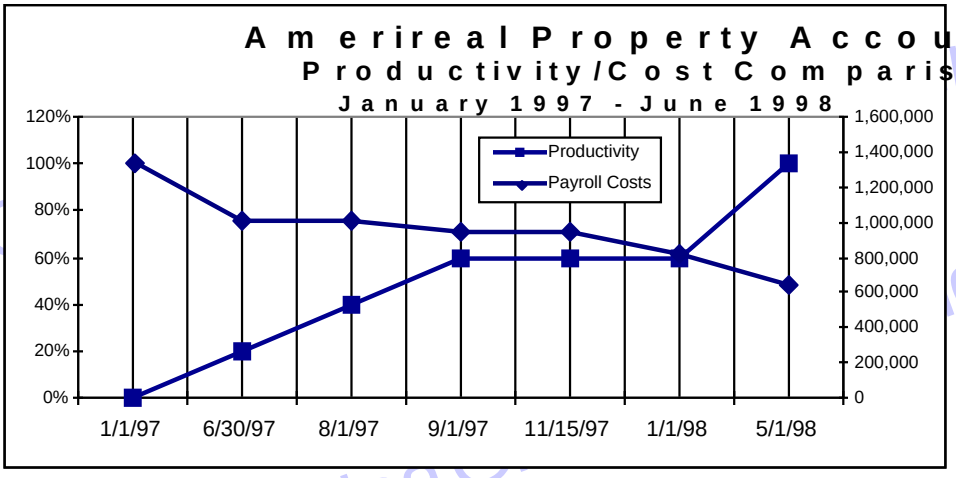
It became clear to Price that Fulton, as an executive officer, was focused on financial concerns, development opportunities, and business partnerships. Price decided to approach Fulton from another angle. Price felt that limiting the analysis of the benefits of IT to primarily financial measures was too restrictive and actually masked IT's contributions. He suggested that, instead of focusing on only financial measures such as return on investment, growth in revenues, and so on, AMERIREAL should begin to use the Balanced Scorecard methodology (Kaplan & Norton, 1992) in evaluating the impact of IT. Specifically, Price suggested that the contributions of IT be evaluated in four areas: (1) the measurable benefits of the reduction in operational costs; (2) the improvements in staff productivity, such as marginal improvements in cycle times; (3) the costs avoided in such functions as recruiting, training, external consulting support, and reduced turnover; (4) and, "soft" benefits such as increased staff knowledge, project collaboration, and sharing of ideas. To make his point, Price used as an illustration AMERIREAL's recent investment in an Enterprise Resource Planning (ERP) System.

Price reminded Fulton that AMERIREAL had invested nearly $10 million in an ERP. The addition of this fully integrated ERP system had helped AMERIREAL achieve a competitive advantage in the real estate market. After working with the vice president, accounting, Price constructed a productivity chart (Exhibit 2) for the accounting department. One of AMERIREAL's objectives had been to reduce the number of accountants required to service the properties. Since AMERIREAL utilized a Shared Service Center, Price believed that the ERP system would allow AMERIREAL to be more productive with fewer resources. He prepared Exhibit 2 in an attempt to prove to Fulton that technology was in fact contributing to the bottom line.

In Exhibit 2, productivity was defined as the number of properties for which each accountant was responsible. As Price pointed out, before the ERP system was implemented in January, 1997, each accountant had handled five properties. After eighteen months of ERP system operation, each accountant was capable of handling nearly 10 properties. The reduction in costs was in excess of $700,000.

Fulton had not previously realized that the ERP system had resulted in an actual reduction in costs. He had considered the ERP to be only a benefit to the IT staff, a qualitative

Exhibit 2: Productivity Contribution of ERP System



improvement rather than something tangible that impacted his overall financial performance. Although he was not convinced that IT was a primary factor in AMERIREAL's success, he was nevertheless impressed with the information presented by Price. Fulton departed the meeting clearly believing that, in at least this once instance, IT had been a contributing factor to AMERIREAL's success.

CURRENT CHALLENGES/PROBLEMS FACING THE ORGANIZATION

Price had been successful, in this one instance of an ERP application, in devising a method for demonstrating the contribution of IT to company performance and productivity. However, almost immediately following his meeting with Fulton, he began to sense the challenge that he faced in providing other such examples in order to further convince management of the value of IT investment. After all, the more proof he could provide of returns on such investment, the more likely management would be to make additional investments in IT, something that Price considered essential to continued company success. On the other hand, if he could provide only limited evidence of the payoff of IT investment, further IT budget increases would probably not be so easily obtained. His potential dilemma was this: He had to find meaningful methods for measuring the benefits of most, if not all, of the various IT applications. Can the contribution of all IT applications be measured somehow? For instance, can cost reductions expected to result from replacing telephone systems and answering agents with a Web site actually be quantified? Or, can the anticipated revenue and cost benefits of moving to an electronic commerce website be measured? Alternatively, should some evaluations be qualitative rather than quantitative? If so, how is the contribution of IT assigned when dollars or other numbers cannot be logically generated? As he left his office for the day, Price realized there were no easy solutions to the problem.

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