

Leveraging IT As A Core Competency To Enter New Businesses: The UPS Case

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ABSTRACT

In a very competitive and constantly changing business world, firms must develop innovative methods to accomplish their goals by listening to customers and then delivering quality products and services clients want at a price they will pay. Depending on the firm's strategy, rapid technology developments and globalization can be key in this need to innovate to become and remain competitive. Successful companies thus are customer-centric and use technology to compete globally and accomplish their ends. By being successful competitors, they serve employees, customers and shareholders.

In the book Information Technology Strategies, the author identifies 3 types of IT strategists, excluding ones having no strategy and only using IT to operationally run their organizations. But the most advanced level-3 strategists use IT to achieve and sustain a competitive advantage by changing their industries' long-term competitive dynamics to their advantage in ways difficult and expensive for competitors to copy. This forces rivals to respond to these initiatives costing time and money. In this paper the authors have identified that among level-3 strategists, there is a sub-group for whom using IT strategically has become a core competency. Thus strategically using IT permeates every aspect of these firms' products and operations and has enabled them to successfully enter new businesses. Effectively these firms leveraged their competency in IT strategy to grow and diversify while achieving IT economies of scope, scale and learning. For them this is a powerful business model that helps them achieve higher growth rates even when basic businesses are mature. We term them three plus (3+) IT strategists.

The authors examine United Parcel Service (UPS), the world's leading package delivery company, as a 3+-strategy example. UPS is a pioneer in providing very high quality services to its customers by leveraging the latest IT technology throughout its businesses. Reliable, up-to-the minute information is very important to its customers and is the driving factor for the heavy investment in IT and its development as a core competency. This paper first sets forth the 3+ paradigm and then describes how UPS's business and IT strategies competitively illustrate it by showing how its leadership in using IT to advance its competitiveness in package delivery has enabled it to successfully enter several new higher growth businesses, including logistical services, supply chain management and e-Commerce. From this analysis one can see that through a relentless focus on customers, top quality products and services and the strategic use of IT, UPS has developed IT into a core competency and has leveraged it to enter new businesses.

INTRODUCTION - The 3+ IT Strategy Paradigm¹

The strategic levels of IT use² are set forth in Information Technology Strategies based on how a firm treats IT in its business operations and the results expected. Each level is a general characterization of what is a continuum. Level 1 is a weak strategy that merely copies what is available to other competitors, though it is more advanced than those with no strategy at all only using IT as necessary to operationally run their organizations. Conversely Level-3 IT strategists strategically use IT to integrate their management and business environments in ways that change their industries' competitive dynamics to their advantage on a long-term basis and that are difficult and expensive for competitors to emulate.

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² The following description of Best Practice or 3d level IT strategies is excerpted from Information Technology Strategies (William Rapp, Oxford Press 2002).

This classification thus defines strategy levels by how IT is integrated into a firm's overall business strategy to create functional benefits that establish a sustainable advantage. The best firms use a mix of customized and packaged IT to enhance firm-specific advantages that create value and competitive barriers. Thus a higher-level firm must successfully use IT to differentiate its products/services from competitors' in kind, quality, or price on a long-term basis that cannot be replicated easily or cheaply. (See Point List.)

Point List

Strategy Level Determinants

- Extent IT is integrated into overall business strategy.
- Extent and nature of how IT is used to create functional benefits.
- Extent and nature of how IT is used to create competitive advantage.
- Nature of mix of customized and packaged IT.

Moving To The Highest Level

Level-3 strategists see IT as integral to their corporate strategies and competitive success and use IT as a competitive tool to help them own the future of their industry's evolution. They therefore make IT and software choices for rational reasons and use proprietary software as an essential input into virtually all their activities. They realize though readily available packaged IT systems seem cost-effective, pure off-the-shelf IT solutions give little advantage because benefits can easily be competed away by relatively low cost emulation.

Therefore level-3 strategists use semi-customized and customized vertical application software because they believe packaged IT solutions available to all can only improve competitiveness if linked to larger proprietary systems and the organization's unique operations. Success depends on mixing physical production, organization and delivery with IT to achieve a result satisfactory to customers since software related to a firm's organization and business strategy is not easy for competitors to emulate, establishing a competitive barrier.

A good business strategy includes IT as an integral element, and there is no free standing or purely IT-based strategy. The business strategy and its IT component emerge from the firm's competitive environment and reflect its need to differentiate its products and services from its rivals. The goal is to give customers a reason to do business and thus achieve (and sustain) a competitive advantage. Often, firms meld IT into already successful strategies, extending and enhancing their value. For advanced IT strategists IT is integrated into the firm's strategy, its operations and its organization and is seen as a key to business success. The firm thus must have a good understanding of its business and industry, including its own and rivals' competitive strengths. With such a clear competitive vision, the firm can properly select, develop, and use the IT required to achieve a competitive advantage. Absent that all other goals are unachievable or unsustainable: the firm simply will lack the resources.

IT's role is therefore to enable users to do better what they do well; i.e. enhance core competencies. IT is coupled with marketing, sourcing, customer service, new product development, inventory control, and constant cost reduction to support the firm's products in accord with its business objectives. A goal that should be measurable is to create competitive barriers, leading to greater returns that give the firm more strategic flexibility in pricing, IT development, and product R&D. For leading IT strategists all elements must be in place and working together in the same direction for successful IT use. Personnel organization, physical plant, and IT must mesh, and IT must be coupled with appropriate approaches to marketing, customer service, and new product development. This is why a higher-level IT user typically develops IT that builds on existing competencies as UPS has built its logistical services on its package delivery system. Adding IT does not inherently add competency – it can be disruptive and alienating for staff and customers.

This is why for leading IT strategists using IT to enhance existing advantages has itself become a core competency that over time continuously improves their ability to integrate IT with organization and strategy. It also achieves economies of scope, scale and learning as the firm learns to spread IT costs over more businesses. This then undercuts competitors' ability to follow using a quick adoption of best practice because doing so involves both copying the IT and emulating the organization. This is a time consuming and expensive process.

Higher-level IT strategies combine cost containment and revenue enhancement. Not only does IT help control costs by improving consistency, performance, and productivity, it can improve product quality and value, leading to greater net revenues. Data needed to link strategic elements together are systematically collected, managed, and analyzed. The information then is integrated with the firm's supply, production, and delivery systems to improve productivity and increase customer satisfaction. As databases and data mining are widely recognized ways of establishing a competitive advantage, the real edge comes from integrating data collection and its utilization into the firm's strategy and operation.

The IT can be part of what the company sells too by being embedded such as UPS's on-line package tracking service. This can be a way to sell customers a wider range of specialized products and services. But as

the IT is embedded, the firm must couple it with marketing, product design, customer service, and constant cost reduction to appeal directly to customers since an effective IT strategy must both add value and frustrate emulation. This is a critical element separating Level-3 IT strategists from firms using IT available to all and reflects their ability to creatively mix customized and packaged IT to create value and competitive barriers in ways rivals cannot easily match. This involves developing personnel who understand the production system, know the product, and are IT literate. All three aspects are critical to strategic success because all three technical streams are needed to develop new products, production technologies, and IT support systems.

For level-3s organizational structure and IT support each other on an interactive basis. Just as business units determine a firm's need and use of IT, so the CIO and IT support group participate in general decision-making. This is logical because the CIO's charge is to oversee development and maintenance of IT and its integration with the overall strategy and organization. This is demonstrated in mission statements and actions that explain IT as important to achieving the firm's long-term success. This integration, and the involvement of users in the design and selection of IT, helps ensure purchase decisions are made for business suitability rather than the convenience of IT specialists. Often value added comes from aligning IT with non-price variables such as time and quality management. These reduce the ease with which competitors can emulate IT-supported technical and product advances with "me-too" responses using reverse engineering. The objective is to develop an IT mix to support firm strategies and differentiate them so as to enhance existing strengths. This means recognizing that functional and market gains can justify the expense of customizing systems, integrating them, and training workers to use them.

What Makes A Level-3 Strategist?

There are important characteristics that distinguish Level-3 IT strategists from other organizations. A commitment by senior executives, especially the CEO, to provide resources for IT projects is essential, but not sufficient. Level-3s also have IT fluency throughout top management. This is more than a simple grasp of what IT means and the available choices; that is IT literacy. IT fluency means senior executives can comfortably discuss IT in terms of what you do to be on the leading edge. This is important because IT specialists cannot be expected to know an industry or company as well as a firm's managers. Managers do not need to understand the IT mechanics. But they do need to know what IT can do for the company and to see that firm needs drive IT selection and use. For example, level-3s understand the imperative of differentiation and have successfully extended the paradigm to influence the behavior of their customers and suppliers in ways that change their industry's competitive dynamics to their advantage. Their actions affect the competition. This could involve other firms joining a real-time on-line network the lead strategist controls or influences, or by adopting the firm's systems as actual or de facto standards. If other firms make IT investments specific to the network or standard, it ties them to it and gives them an interest in its success. Suppliers or customers often will do this because of their feeling of support during a long-standing business relationship. (See Appendix.)

How advanced users decide and implement IT strategies, how they measure success, and how they select IT to achieve goals vary with each firm's situation and strategy. Further within the context of IT being an integral part of a strategy, there are differences among leaders in how they link IT with corporate goals. But one feature is common: user needs drive IT development and selection. This means extensive customization and gradualism in implementation with an over-riding criterion that IT must work strategically and be cost effective.

As described above, Level-3 strategists use IT to add value and reduce costs on a long-term basis in ways that alter industry dynamics through creating barriers that make emulation difficult, time consuming, and very costly. This can establish beneficial loops where such advantages and barriers lead to increased sales and lower costs through economies of scope, scale and learning, that further increase sales and earnings while hurting competitors' capacities to counter. However, the authors have identified even among level-3s, there is a sub-group for whom using strategically IT has become a core competency. As such IT strategy permeates every aspect of the firm's products and operations and has enabled them to successfully enter new businesses. These firms have leveraged their core competency in IT to grow and diversify while achieving IT economies of scope, scale, and learning. For them this has become a powerful business model that has helped achieve higher rates of growth even if their basic business such as package delivery is relatively mature. We term them three plus (3+) IT strategists. We will now examine one, United Parcel Service or UPS in more detail.

The United Parcel Service (UPS) Example – Background

United Parcel Service (UPS), headquartered in Atlanta is the #1 package delivery company in the US. Founded in 1907 in Seattle under the name 'American Messenger Company', it has grown into a \$33.5 billion corporation by focusing on the mission of worldwide commerce. UPS has over 360,000 employees operating

more than 500 aircraft, 157,000 vehicles and 2,400 package-sorting centers to provide service in over 200 countries and territories. It delivers 13.6 million packages each business day for 8 million worldwide customers. Its primary business is the time-guaranteed global delivery of packages and documents. Its commanding position is due to its vast transportation infrastructure and promise of guaranteed delivery, supported by advanced technology that helps maintain efficiency and keep prices competitive. It thus “offers customers the most comprehensive range of services in the industry, from logistics to trade finance” via any mode (“ground, air, ocean or rail”) for any size shipment (“documents to jet engines”) of “any weight”. The idea is to succeed by giving customers “a competitive edge”, which it does by capturing the transaction services related to the physical movement of goods through “Synchronizing the World of Global Commerce”. Thus UPS’s history spans the bicycle to the Internet, while it handles about 6 percent of US daily gross domestic product (GDP) and has been rated “America’s most admired mail, package and freight delivery company” for nineteen consecutive years in Fortune surveys. It has also been recognized as a top innovator in using IT.

“Every transaction on the planet in which physical goods change hands involves three flows. There’s the transport of goods from buyer to seller. There is also an exchange of information – whether electronic or paper – about those goods in the form of shipping documents and inventory lists and signatures and customs declarations. And there is an exchange of funds to pay for the goods.”

UPS has also shown significant growth in new business and services such as logistics, supply chain management and e-Commerce by using technology to sustain rapid growth in providing such services and in entering markets such as Europe and Asia. As a company UPS has never shied away from reinventing itself, showing a willingness to innovate, change and evolve that is characteristic of level 3 strategists. The company’s competitive development demonstrates this. The principles, which guide UPS today, are summarized by its founder’s slogan: **“Best Service and Lowest Rates.”**

In 1952 it expanded by acquiring “common carrier” rights to deliver packages between all customers, becoming a direct competitor to the Postal Service. It started air service in 1953, offering two-day service to major cities. In 1975, it became the first package delivery company to serve every address in the contiguous US. It purchased its first aircraft in 1981 as a result of deregulation in the airline industry and started international service in 1985 between the US and six European countries.

Deregulation

US airlines were deregulated in 1978 and this significantly changed the package delivery business. Prior to deregulation carriers like UPS used passenger and freight aircraft for air transport since they could not own and operate aircraft. After deregulation, they purchased their own fleets and became integrated air carriers, offering a complete solution for express delivery needs while giving them better control over air delivery service and costs. The result is that today UPS Airlines is among the ten largest US airlines and serves customers in 200 countries and territories. With its international service, UPS can reach over four billion people, twice the number that can be reached by any phone network.

Embracing Technology

Technology at UPS spans a large range from handheld devices to specially designed delivery vehicles to global communication systems. In 1989 UPS decided to invest heavily in a strategic shift from a paper based information system to one dependent on IT. Over the next 15 years it invested more than \$15 billion in technology. Electronic tracking of all ground packages started in 1992 and by 1993 UPS was delivering 11.5 million such packages and documents a day for more than one million regular customers.

With this huge volume UPS realized the need to develop an even more highly sophisticated IT system to maintain its competitive position as the industry leader. The result was development of a handheld device called DIAD carried by UPS drivers to immediately record and upload delivery information to the UPS network. In 1994, its award-winning website made its debut. In December 1998, online tracking requests for UPS.com exceeded one million. Today, UPS delivers 13.6 million packages and documents a day for 7.9 million customers (1.8 million pickups; 6.1 million deliveries) and during 2003 averaged more than 7.9 million on-line tracking requests per day. To maintain its technology and competitive edge UPS currently invests more than US\$1 billion a year on IT.

Business Strategy

While still focused on serving the customer at low cost, UPS’s strategic vision has changed over time, given changing trends and technological advances. In 1991, their basic strategy was to be the package delivery leader. By 1999, it wanted to be “the enablers of global e-commerce” because technical

developments in transportation and communication had accelerated the trend towards globalization of supply and markets. This strategically impacted UPS and their traditional customers as well as opening the opportunity to serve new customers such as on-line retailers or new clients in other countries. They thus changed their strategy to reflect this recognition of a worldwide business model driven by advancements in technology and the Internet that had shifted power from sellers to buyers. In 2003, "Synchronizing the World of Global Commerce" further expressed this evolving strategy and is displayed on its delivery trucks. The idea captures its growing role as a broker of goods, funds, and information between millions of buyers and sellers every day (24X7). This changed its business model from a traditional push-oriented model, where manufacturers, suppliers, distributors and marketers are relatively stronger to a customer-driven pull model, where goods are assembled based on customer demand, and inventory is adjusted to buffer demand fluctuations. This is because there are more firms such as Amazon that ship products directly to customers that order for their own use and bypass traditional supply chains.

In this new competitive environment UPS's strategy is to sustain their core package delivery business but prepare for the future by using technology to introduce new products and services. Key strategies are: 1) Worldwide distribution and logistics, 2) Combining e-commerce and logistics, 3) Customer relationship and service, 4) Technology, 5) Culture, 6) Funds: UPS Capital. In Logistical Services, supply chain improvements and financial power give UPS a competitive edge over FedEx and DHL. Furthermore UPS's business strategy has integrated its traditional infrastructure with the Internet.

As explained by Kelly, the company's former CEO: *"There is a second major way to ensure that e-commerce empowers rather than electrocutes your company. It involves combining e-commerce and logistics management. It's about merging virtual and physical infrastructures to integrate and tighten the supply chain. After all, once you've given more power to the end customer to direct your supply chain, you've then got to make sure the various members of the supply chain react as if they were a single company. That means getting the product to the customer quickly, accurately, and at a reasonable cost."*

Customer Service

UPS management considers their customer relationships and service key business factors as reflected in "Best Service, Lowest Rates". Many firms substitute technology for people as they automate and lose personal touch with customers. But UPS uses technology to enhance customer service, a typical characteristic of level-3 strategists since a customer centric IT strategy is critical for all level-3s. The firm implements a change only after a thorough analysis of customer needs indicates a measurable service improvement and profits to the company. Therefore it has established rules and routines for developing and implementing new IT services or support systems. Even though the company has on-line help and voice mail services, it always makes sure customers can reach a live person if needed. This ability to mix human and IT information requirements successfully is another characteristic of leading IT strategists.

Organizational Structure

UPS is organized as follows: UPS Air Cargo - provides freight forwarders direct, airport-to-airport deliveries to over 150 airports worldwide; UPS Aviation Technologies - offers products for airlines, corporate operators, general aviation, and air-traffic control. UPS Aviation Technologies is the leading designer of new ADS-B technology, which allows pilots and air-traffic controllers to see air traffic with greater precision; UPS Capital Corporation - is UPS's supply-chain-financing that provides small businesses working capital; UPS Mail Innovations - offers clients faster First Class mail service at lower cost; Mail Boxes Etc., Inc. (also UPS Stores) - delivers convenient, personalized business solutions through a global network of independently owned and operated business, communication, and shipping centers; UPS Professional Services - delivers strategic business solutions by leveraging innovative technologies, expert financial analysis, and time-proven logistics; UPS TeleServices - provides a full range of call-center services for call volumes generated by 13 million package deliveries daily, using the industry's most advanced computer telephone technology; UPS Supply Chain Solutions - provides ways to access UPS's portfolio of services designed to meet customer's worldwide supply chain needs.

Its strategy to grow worldwide is based on access, integration, and globalization by being a business partner to companies globally and helping make their customers more successful through enabling global commerce. The company works hard to be within reach of every customer by all means possible. Activities and acquisitions aim to make customer access to its services easy. They utilize many different channels and devices, including wireless and the Internet. The idea is to provide easy access by whatever devices a customer uses so as to seamlessly connect the physical and virtual world. The firm provides an

integrated global service to customers for supply chain management too. The strategy is to maintain long lasting client relationships, thereby creating more opportunities to serve them, a beneficial loop.

Globalization

UPS's growth nationally and internationally has been threefold: funding start-ups, buying other companies, and forming alliances with strong partners. In Europe it expanded after purchasing sixteen European companies. In Asia-Pacific they increased accessibility by forming alliances with convenience stores. Customers can now send packages from 7-Eleven in Hong Kong and Singapore, and Family Mart in Taiwan. UPS formed UPS-Yamato Co., Ltd. in Japan in 1990 as a joint venture with Yamato Transport Co., Ltd, the company with the most extensive express parcel delivery network in Japan.

In logistical services, UPS Logistics group (UPSLG) has formed a strategic alliance with Shinkai Corporation, a leading Japanese logistical services company. In 2001, UPS acquired six direct flights into Beijing and Shanghai from the US, becoming the first company to offer non-stop flights between the US and China, cutting delivery time by one day. Prior to this, UPS had had to unload packages in Hong Kong. For delivery within China, UPS has partnered with Sinotrans, one of China's largest transportation companies. In Latin America it has created UPS Trade DirectSM Cross Border, a unique international trade solution streamlining movement of freight and packages from Mexico to the US by providing customers a single carrier advantage against companies that use a freight forwarder, a customs broker and a carrier.

IT Strategy

Technology and IT use pervades UPS's thinking about its business and competitive strategy. As Ken Lacy, UPS's CIO, explains, "*Technology is a fundamental element of our strategy to help businesses achieve their goals through a UPS network that integrates transportation, supply chain, information and financial resources.*" Therefore "*within UPS, this embrace of technology not only generates efficiencies in our core operations, but makes it possible for us to extend our integrated network into new areas*".

Transformation

IT has enabled UPS to take its business to another level - from a transportation to a technology-driven global company offering a range of services. Transforming this traditional shipping giant into a technology-driven global company was not easy. UPS didn't enter the overnight delivery business until 1988 and was very late in going global. The reason lies in a corporate culture emphasizing communication and consensus. Before any decision is made it has to be communicated to different levels of management and a consensus obtained. This might take awhile but implementation is then very fast as all agree on the objective and what has to be done. There is no silent organizational sabotage.

This is seen in its use of IT where it has invested over \$12 billion from 1991 to 2001, more than it spent on trucks. But even with that investment and UPS's new global outlook, it still took a lot of internal discussion to get the big globe logo and www.ups.com Internet address on all trucks. Traditionalists wanted only "ups" in small letters and an 800-phone number. But after consensus, it moved ahead with UPS's transformation, and IT is now one of its most important business drivers as well as highest non-building capital expense. But as already explained, a company must first have a strategic plan and opportunity for which IT is integral. Developing a business strategy comes first; then the organization that has developed the strategy and will implement it determines the IT required. This determines the critical IT strategy path.

This complex iterative process is why few companies have perceived the strategic advantages of IT or have successfully adopted an IT strategy that helps them implement their business strategy to achieve firm goals. But because UPS had a clear business vision and corporate strategy they have successfully implemented over several years, it could respond quickly to developing IT that would serve its needs and those of its customers in ways that aligned technology and its successful business strategy.

Importantly the IT systems have to be very powerful and reliable to process the information related to all the millions of daily shipments as they move on time worldwide. To ensure packages and documents get where they need to go on time, the data must flow seamlessly. The technology must be highly reliable, scalable and cost-effective and be available 24 hours a day, seven days a week (24X7). Further it should support the growing needs of customers and shifts in market demand such as those generated by the rapid growth in Internet shopping, especially during peak seasons such as Christmas. In sum, UPS realized to remain dominant in package delivery they had to respond to rivals such as FedEx in using IT. More importantly to remain leaders they had to be even better in using IT to achieve similar or superior tracking services as compared to FedEx since they were catching-up. This "wake up call" drove

home the need for the substantial IT investment noted above. Technology is therefore key to UPS's recent growth and entry into new markets such as logistics, e-commerce, and consulting.

Heavy investing in technology is based on the belief that by separating data flow from package flow it can gain better control over the delivery system and increase productivity. This translates into better customer service and logistical control. Accomplishments include being the 1st in package delivery to offer shipping data via a wireless device and building the world's largest private wireless network and largest private database. This is reflected in the growth of the technology division from 100 employees in 1986 to around 3750 today (2004). Also 8,000 PCs in 1991 grew to 90,000 in the mid-90s and about 260,000 today. In 2004 the data centers in NJ and Georgia contained 15 mainframes with a capacity of 22,249 millions of instructions per second (MIPS). These centers provide reciprocal back-up and support. Currently the company's website receives 115 million hits and 7.9 million tracking requests per business day.

DIAD

UPS pioneered the use of handheld computers in 1991 for shipping when it introduced the first DIAD. The wireless, handheld computer Delivery Information Acquisition Device (DIAD), carried by every UPS driver, was developed to immediately record and upload delivery information to the UPS network. The DIAD information even includes digital pictures of a recipient's signature, thus giving customers real-time information about shipments. This *proprietary* device allows drivers to stay in constant contact with headquarters, keeping abreast of changing pickup schedules, traffic patterns, and important messages. UPS unveiled the fourth generation, DIAD IV, in April 2003 incorporating new radio links to ensure communication anywhere anytime. The DIAD IV is the first handheld computer to include built-in wireless connectivity options for maximum data transmission flexibility for drivers, resulting in customers having the most up-to-the-minute tracking information at all times. Drivers can complete the transaction and distribute data instantaneously without the need to activate a cell phone or return to the vehicle to place the device in a transmission cradle. The UPS Network, which is global, has links to 1,748 UPS distribution sites in 200 countries and tracks 7.9 million packages daily. Online tracking software launched in 1996 provides a real-time image of receiver's signature and allows a customer to track up to 100 packages at a time. In addition to tracking a shipment, one can check rates and verify the receipt signature. UPS was the first delivery company to offer such a digitized signature receipt. At the website, transit times can be calculated and pickups scheduled while supplies can be ordered as well.

UPS OnLine®:

United Parcel Service (UPS) developed a package of Internet-based tools in 1999 for companies conducting business over the web. Now called UPS OnLine® Compatible Solutions, one can find them under "Business Solutions". They include *Campus Ship, Connect Ship, UPS Internet Shipping, iShip, Online Tools, Host Access, and World Ship*. They support everything in the fulfillment cycle at the front-end, from just-in-time inventory to address validation to accounts receivable. UPS offers shipping and tracking services to B2B companies by integrating tracking, rating, address validation, and a number of other functions. E-commerce vendors and systems integrators can use them to link their intranets and Internet web sites with UPS to allow their customers to quickly calculate shipping costs, select and compare shipping services, and track packages from the point of order entry to delivery. In 2000, it added the capability to calculate rates and find transit times for shipments on any digital wireless device in the US. Customers can access these services from many devices - a one or two-way text-messaging or web-enabled phone, personal digital assistant, pager, or other common wireless device. In 2002 UPS estimated it delivered more than 9 million packages worldwide each day through online activity.

Global Positioning Systems (GPS) is used to gather even more accurate data on delivery routes. Mapping and route optimization software uses the information gathered to ensure the most efficient routing. Voice Recognition Systems and Optical Character Readers are used to automate sorting. Web-based communications and voice recognition automate customer interaction. For example, UPS's automated pickup system lets a customer order a package pickup for next-day delivery by saying his or her phone number. The system confirms the pickup and provides the caller's phone number as reference and records the request for pickup within 90 seconds. It uses automated package tracking in the new \$1.1 billion hub in Louisville to speed delivery of international shipments by allowing US Customs to process shipments by using any search query officials choose. They can also use filters to scan for patterns that require further inspection. The system gives officials new tools to identify and stop potentially dangerous or illegal imports. Features of the system allow sorting of 304,000 packages an hour, speeding international

shipments. According to UPS, it has saved approximately \$70 million by eliminating the need for a separate Customs building. Because the system tracks the packages as they move through the sorting process, the hub qualifies as a "controlled building" as required by federal law.

Role Of IT In The Value Chain

UPS saves hundreds of thousands of dollars per day in customer support costs by providing the ability to track packages on its 7.9 million tracking requests via the Internet (UPS.com). It costs UPS \$0.10 per piece to serve that information via the web versus \$2 to provide it over the phone. If only 1/3 of the customers checking the status of their deliveries on the web called instead, the cost savings would be US\$433,333 per day. Further, a major disadvantage of e-commerce has been retail customers may want to return goods they have ordered on-line. In the case of product returns, a Pricewaterhouse Coopers survey in December 1999 showed that 39% chose not to shop online because of difficulties with returns. This resulted in many on-line companies losing customers and some of them going out of business.

In 2000, UPS launched an online system, "UPS Returns", which allows merchants to process and track returns. Customers can print shipping labels from the website after approval from the retailer and drop the package at a location for pickup or hand it to a driver. Both the customer and the retailer can track the location of the return online. Buy.com is using the system and reported that its processing time of return labels has been cut from two weeks to two minutes! Before the advent of the service, customers wishing to return items had to wait up to a week for a shipping label to be mailed. FedEx and The US Postal Service offer similar services but don't provide tracking capability.

Competitive Advantage (UPS vs FedEx)

Federal Express (FedEx), UPS's main competitor, has made similar IT investments. The products and on-line capabilities of UPS and FedEx are identical. But UPS, by leveraging its technological investment, has taken business away from FedEx at a rapid pace. In the US and several foreign markets, UPS has grabbed a commanding lead over FedEx. A report published in 2000 of online buyers' shipping preferences states "given the choice of UPS, US Mail, and FedEx, 62% of online buyers go with UPS most often." UPS handles more than 50-53 % of all net purchases while the US Postal Service only takes care of about 30% and Federal Express roughly 11%. The reason is FedEx offers customers limited choices, forcing them to ship everything the most expensive way (via overnight air express) even if a shipment doesn't require that kind of speed. Conversely, UPS targets customers with a wide range of choices: fast flights vs. cheap ground delivery, simple shipping or manufacturing, warehousing, and supply-chain services. UPS currently has nine different delivery service options (i.e., ground, 3 day, 2 day, etc.).

UPS now has a commanding lead over FedEx not only in package delivery but also in the logistics business where FedEx has failed miserably. UPS logistics grew at 40% a year through 2002 to \$1,969 million and rose to \$2,126 in 2003. Even in sectors where FedEx still rules, UPS is catching up quickly. FedEx leads in the profitable overnight delivery service but UPS grew faster than FedEx from 1999 to 2002. In 2000, UPS's overnight business grew at 8%, compared with FedEx's 3.6%. The reason for its growth in overnight delivery is primarily attributed to their decision in 1999 to use its huge ground transportation network to assist with overnight deliveries. They use trucks to deliver up to 400 miles rather than plane, giving them a great cost advantage over rival FedEx. As a result, cost per package was estimated to be \$6.65, compared to FedEx's \$11.89.

Also due to ground transportation package size is heavier than FedEx. This demonstrates UPS's core strength in its fleet of 152,000 trucks. In response FedEx has recently begun to build its own home-delivery system. But the cost of duplicating a system UPS has spent nearly 100 years building could prove prohibitive. And with \$3 billion in cash on hand, UPS could easily wage a price war against FedEx, which doesn't have sufficient spare cash to compete. That leaves FedEx dependent on air-delivery that is increasingly expensive. UPS and FedEx have also taken different approaches to the IT they provide major clients. It took UPS 15 years to build a computer system that rivaled FedEx's renowned Cosmos system. But UPS chose more wisely. While FedEx forced customers to adopt its proprietary software, UPS designed logistics software that worked with any system. UPS thus has an open systems strategy, which means its systems are available where customers do business rather than forcing customers to come to them. Therefore UPS functionality is built into its clients' web sites. UPS has also developed strategic alliances with major IT players such as Oracle Corporation and IBM that FedEx had avoided. In sum UPS's approach should help it maintain its strong competitive position since from the consumer's viewpoint in an Internet-based economy it provides the best Internet tools.

That is because many of the online services that FedEx and UPS offer are identical with similar rates. So differentiation boils down to the experience customers have on the Web and the different options available. Since unlike FedEx UPS saw the web as a unique channel to build relationships with customers, it kept its ups.com Web site standard around the globe. The contents vary by country but they have the same look and feel since it believed it made sense to keep the organization of the different country sites similar. This way the customers know where to look whether they are visiting a Spanish or Japanese site.

Competitive Advantage For The Future

Not surprisingly UPS's vision of the future goes beyond package delivery. The company added value through supply chain management by creating a new business called **UPS Logistics** in 1994. Growth has been phenomenal with revenues exceeding \$2 billion in 2003. At a huge warehouse in Louisville, UPS Logistics handles distribution for many companies like Nike, Sprint, HP and Fender Guitars. Worldwide it offers about five million square feet of distribution space and 35 centralized locations. Many companies are turning to 3d party logistics providers to help integrate their supply chain due to the increased challenges of managing global manufacturing platforms and the complex IT systems used by diverse members of a supply chain. UPS logistics management includes functions such as facility planning and design, customs and brokerage services, quality assurance and testing, warranty repair, order processing and fulfillment, after-sale servicing, customer-service call centers, private fleet management, inter-modal delivery and state-of-the-art supply-chain information systems that track products through the entire product lifecycle.

Success is demonstrated in their project with Ford Motor tracking 4 million cars and trucks through their supply chain annually. This resulted in a US\$1 billion reduction in vehicle inventory, more than US\$125 million in inventory carrying costs and reduced delivery times of 26% that created savings of \$240 million per year. UPS achieved this by reducing the delivery cycle by four days and reengineering the delivery network. UPS also manages Ford's transportation system to shorten time to market by 40%.

UPS is in the process of implementing a new wireless scanning system that will tie virtually every employee in its sorting centers into the computer system. They have also invested in a company called Savi Technology that makes radio frequency identification tags that can further automate scanning, sorting and delivery operations. Reliable, fuel-efficient airplanes guided by sophisticated satellite navigation and weather systems enable shipments to be moved very quickly between points on the globe.

At the same time, the price-performance of IT systems and telecommunications has improved tremendously. A megabyte of storage, which cost about \$100 in the early 1980s, costs 10-cents today and is expected to decline further. This means UPS can vastly expand the information stored in their DB2 database, already the largest in the world. Likewise, shrinking costs for their cellular network, also world's largest, means UPS customers will receive a lot more real-time information about their shipments.

Challenges

Nevertheless as UPS continues to try to expand its global reach and build a bridge between the physical and virtual worlds, it faces a number of challenges. FedEx and the US Postal Service have teamed up on the overnight and ground parcel deliveries by which most customers receive their e-commerce purchases. This move by FedEx is an attempt to get a foothold in the e-commerce parcel business where UPS holds a 60% to 70% market share. USPS is 2d; hence this partnership poses a challenge to UPS to maintain its lead. FedEx has another agreement with USPS for the right to place its drop boxes at post offices, which expands FedEx's retail presence nationwide. In exchange USPS will get FedEx help in the air delivery to carry Express Mail and Priority Mail as well as some first-class mail. As a counter measure against the exclusive rights of FedEx, UPS is providing a contract-based service to certain select customers called "UPS Basic" that utilizes USPS. Modernizing customs clearance in many countries would certainly help UPS's business because if a package is held by customs for several days then it affects the efficiency of delivery. NAFTA hasn't helped UPS much due to restrictions imposed in the agreement.

The advent of electronic (digitized) signatures being recognized as legal poses another challenge. Part of UPS's profitability stems from overnight document delivery. So the ability to transmit such documents in digital rather than in hard copy form could result in much less overnight document delivery traffic. But UPS is trying to turn this challenge into an opportunity with an approach that would enhance its revenue stream. It has agreed with Hewlett-Packard Company to develop the world's first digital-delivery solution for sending and tracking paper-based documents over the Internet with the push of a button. The solution comprises of two products - UPS Document Exchange, the first trackable, secure, digital document delivery service, and the HP 9100C Digital Sender, which electronically sends the physical documents in a

single step. This is the first commercial solution enabling secure delivery of paper-based documents across the Internet. Now, critical paper-based documents once sent via overnight delivery can be sent in digital form to recipients almost instantaneously at a fraction of the cost but still arriving to the customer in paper form. Critical questions are of course whether UPS will continue to embrace technology and stay agile? UPS executives attribute success to UPS's ability to transform itself over time, its strong culture, united vision, IT fluency and customer-centered approach. All of which should continue into the future.

Conclusion

UPS has dramatically transformed itself into a 3+ IT strategist. It no longer considers itself just a delivery company but in the customer satisfaction business with customer needs being the firm's driving force. It continues to find new ways to provide customer services by leveraging their assets and investing in new ways to integrate the virtual and physical world. Its traditional package delivery service is quite simple and not glamorous. But it remains critical to its many users and the way UPS responds to customer needs has made them the industry leader. Thus its highest priority over the next few years is to continue to deploy technology that allows it to introduce new services, provide customers with total information about shipments, and provide training so that all employees clearly understand its services and the technologies that make them possible so they can leverage and communicate that information for the customer.

REFERENCES AND SOURCES - Available On Request (rappw@adm.njit.edu)

APPENDIX

Attributes of Firms Using Level 3 and 3+ IT Strategies

Business Strategy

- Focus on customer and customer satisfaction
- Clear competitive vision and conscious quest to build competitive advantages
- IT is an integrated organizational and strategic element

Organizational Structures

- Evolutionary change, attention to detail and quality, continuous improvements in efficiency

IT Strategy

- Sees IT as a tool, subordinate to people and supporting organizational structures interactively
- Develops and grows databases that are intensively used and analyzed
- Relies on proprietary customized software
- Focuses on limited, realizable goals and results
- Is judged on results, ease of use, and overall cost-revenue benefits

IT Functions

- Extend and enhance human resources, contain costs, increase capabilities and improve products

IT Interactions

- Technology, organization, and personnel closely integrated with IT design and selection driven by users
- IT group participates in general decision-making

Industry Impact

- Changes competitive dynamics to its long-term advantage
- Difficult, time-consuming and high cost for competitors to copy
- Frequently involves developing and setting industry standards

Level-3 IT Strategist

- IT fluency, ability influence competitive environment to one's advantage, totally integrated management (TIM)

Level-3+ Strategies

- Develop IT strategy into a Core Competency that by definition permeates whole firm, adds value, and creates entry barriers. Use this competency to successfully enter new business (e.g. UPS's supply of logistical services and related financing).
- Grow faster than underlying traditional product market through gains in market share and new business growth (e.g. UPS's traditional US package service has grown at about the rate of growth in US Real GNP).