SOMAIYA VIDYAVIHAR UNIVERSITY

Trim: Jan – Mar 24 **Maximum Marks: 50** **Examination: ETE Exam** **Date: 20/04/24** **Duration: 3 Hrs.**		
Programme code: 10 **Programme: MBA MM Part time 22-25**	**Class:** SY	**Semester/Trimester: VI**
College: K. J. Somaiya Institute of Management	**Name of the department/Section/Center: Marketing and International business**	
Course Code: 217P10C605	**Name of the Course: Marketing of IT services**	
Instructions: Q.1 compulsory, attempt any 3 from Q.2 to Q.5		

Question No.		Max. Marks
Q.1	RFID technology—radio-frequency identification—consists of a small chip, or tag, that can be embedded or placed on items ranging from pets to grocery items to clothing to hospital supplies. Either individual items (say, pill bottles) or cases/pallets can be tagged. The chip or tag sends out information, over its radio transmitter, about what and where the tagged item is. The technology tracks the tagged items wirelessly, transmitting to a central database, which in turn provides a wide range of information ranging from inventory quantity, location of tagged items, freshness dating, handling instructions, and so forth. Tags are one of two types: passive or active. Passive tags are about the size of a postage stamp, and, as of early 2008, cost approximately 15–30 cents each. Active tags are about the size of a credit card and cost $15–20 each; they have enhanced functionality (e.g., they can record cash balances, temperature and exact location data) and require a power supply to function. A complete system consists of the tags (also referred to as *chips* or *labels*); software that encodes the tags about what the item is, and readers that read the tag via wireless technology. The RFID tags pass by an RFID reader—say, at a port, warehouse, or loading dock; the radio in the tag sends out an identifying packet of data; the reader then passes the data to the appropriate software/ database (say, a company's supply chain software). Because the system doesn't require human scanning like barcodes do, it increases productivity and accuracy. Additionally, unlike barcodes, tags can monitor any unauthorized movement of a tagged item and generate an automatic text message that is sent to a manager. Many companies have jumped into supplying parts of the RFID solution. Suppliers include NXP Semiconductors (formerly Philips Semiconductor), Alien Technology, and Motorola (formerly Symbol Technologies), to name a few. Avery Dennison makes every part of the tag except the radio chip. As they state: "We're chip agnostic; we will work with the six or so major RFID chip designs on the market." As is true for so many new technologies, the hype surrounding RFID chips in the earlier years, around 2002—such as the promise to streamline global supply chain management—was overly optimistic. Technology optimists are fond of making statements such as "If Napoleon had had RFID technology, he might have taken Moscow in 1812 instead of running out of supplies" [1] (with obvious reference to military tagging of supplies). For example, the early forecast for RFID predicted an imminent effect on retailers and manufacturers, allowing them to follow products from the factory to store shelves, helping to manage inventory and reduce costs. In addition, in 2003 consulting firms predicted that by 2006, more than a billion RFID tags would be used on cases and pallets in the complex network of suppliers, storage facilities, transporters, distributors, and retailers. In 2006, that forecast was radically revised to only about 350 million tags. Despite the less-than-predicted performance in some areas, item-level tagging is growing faster than expected, from $200 million in 2006 (200 million items) to $13.2 billion (550 billion items) in 2016, according to IDTechEx. In looking back at the evolution and takeoff of RFID technology, some are asking why the "business case [has] not materialized in line with what was expected." **What Went Wrong?** Not only did demand not meet expectations, but technical glitches and vendor instability also made customers a bit wary. Early RFID devices were hard to read. If they got wet or were affixed to metal or liquid, they did not work well (metals reflect radio waves; liquids absorb them). In addition, the placement of tags affected their readability, and depending on the application, group tag interference could occur. Costs were high. Moreover, to work well in a supply chain context, the technology has to be adopted by most, if not all, the companies in a given network (manufacturers, shippers, retailers, etc.).	20 marks

Customer Applications

Surprisingly, RFID technology has experienced greater success in unexpected places. Indeed, "20% of RFID applications are created out of thin air."[3] (Astute readers will recognize this quote as a classic illustration of breakthrough technologies in which the technology was not developed in response to a known need.) Some of these unexpected, novel applications include:

• Automated toll collection on roads, allowing cars with RFID tags to go through tollbooths while the fee is automatically deducted

• Car entry and security

• Contact-less payment options such as ExxonMobil's Speedpass and other credit card uses in which customers can wave tagged cards in front of a reader

• Airline tracking of baggage

• In Japan, cigarette vending machines that sell only to people with chip-equipped ID cards

• In Asia, RFID tags that pay for purchases ranging from train rides to snacks (China has spent $6 billion to issue 1.3 billion RFID cards to people)

• For parts on Boeing's 787 Dreamliner; tags that contain identification information and maintenance/inspection data, helping to reduce maintenance and inventory costs

• Passports, parking lot access passes, and tracking of such diverse objects as pets, library books, hospital equipment, and even prisoners

Health Care. Drilling down into one specific application of RFID technology—hospital applications—offers additional insight into customer behavior issues surrounding this new technology. In hospitals, nurses are sometimes known to hide or "squirrel away" essential equipment so it is available when it is needed. For example, at the Beth Israel Deaconness Medical Center in Boston, nurses sometimes put patient-controlled anesthesia pumps up in the ceiling tiles. The hospital didn't lack sufficient equipment; rather, the nurses couldn't find the equipment at the right time. They felt that by hiding the equipment, they would be able to find it when they needed it. The hospital undertook a pilot project in the emergency department, putting RFID tags on equipment and using an asset-tracking application to tell health care workers where to find intravenous pumps, ventilators, and other devices. The $50 tags contained a battery and a transmitter, using the hospital's high-speed wireless network to broadcast the location of the equipment. The results from the trial showed that health care workers spent an average of 20 fewer minutes per day looking for equipment. The trial also showed a reduction in equipment losses ($600,000 annually), some of which was attributable to theft, but more often to poor handling—for example, when a $1,000 portable monitor was rolled up in a sheet and thrown down a laundry chute. The RIFD tag signal can be read and within five minutes, a clerk can find the item and retrieve it. Another benefit from the trial showed that not stashing equipment at a particular worker's station resulted in maximum use and minimized the need for overstocking expensive devices. For example, the hospital estimated savings of $1–2 million by not buying extra devices: "It's the kind of investment that pays for itself within one year." Moreover, the RFID tags allowed the hospital to prevent errors. For example, RFID tags were placed on breast milk stored for infants. The tag on the milk would be read and matched to the infant's wristband prior to feeding. RFID tags are also used for accuracy in dosages of medication. AstraZeneca began tagging syringes of an anesthetic called Diprivan, used during surgery, for delivery to Europe and Japan. They've tagged 40 million infuser syringes and have totally eliminated errors.

Another health care application is tracking pharmaceuticals. The World Health Organization estimated in 2006 that 10% of global pharmaceutical sales were counterfeit. In December 2006, the Food and Drug Administration began requiring wholesale distributors of prescription drugs to provide a statement of origin that identified each drug prior to sale, purchase, or trade of the drug, essentially ensuring its "pedigree." RFID tags were used for such popular drugs as Viagra and OxyContin, as well as the HIV drug Trizivir. The use of the tags also allowed companies to flag shipments that went missing, battling theft of the drugs from the manufacturer to the pharmacy by people who would try to divert them to "street use" or to people who adulterated them for other purposes.

Retail. Of course, the initial vision of RFID was to smooth supply chain management and retail operations. Wal-Mart, one of the largest users, expects 600 of its 20,000 suppliers to use RFID tags on cases and pallets. Their goal is to reduce the number of out-of-stock items. Industry- wide, 8% of products are out of stock on store shelves at any given time—a whopping 1 of 12 items! In some cases (22% of the time in a sample of Wal-Mart stores), the out-of-stock products were in the store, but not on the shelf. RFID helps reduce such stock-outs by about 30%, and for faster moving items (those that sell 7 to 15 products per day), RFID can reduce stock-outs by 62%. The result is about a 1% uplift in sales for both retailers and suppliers. Other retailers adopting RFID include Best Buy and Target.

Other retail uses include tracking in-store promotional displays and the timing and availability of advertised products. For example, P&G used RFID to monitor the movement

	of promotional displays from Wal-Mart's distribution center to the back room of a specific store, and ultimately to the store floor. This tracking yielded a 19% increase in sales for Gillette products. Moreover, in 2003 a British supermarket chain, Tesco, tested selling Gillette razor blades packaged with RFID tags that triggered a camera when a package was removed from the shelf, and then a second camera at checkout. Security staff then compared the two images, and in at least one case presented photos of a shoplifter to police. (Tesco stopped this practice amid a public outcry over privacy concerns.) Marks & Spencer (a British retailer that sells its own branded products), the world's largest adopter of item-level tags, began its RFID initiative in 2002. The company tagged returnable food-produce delivery trays to track delays in delivery that would indicate perishability. The tagging helped to boost sales via fresher produce. Then, in 2006, it began tagging men's suits at 52 stores. For a company such as this, the RFID technology is easier to deploy because it runs a "closed loop" supply chain composed of its own suppliers. Although all retailers require coordination with suppliers, when the retailer "owns" those suppliers, it can roll out the technology seamlessly rather than waiting for independent players to also adopt the technology. **Continued Adoption Concerns** As is true for many new technologies, for RFID to gain greater market penetration, the industry needs to establish global standards around a compatible set of technical specifications and architecture. In addition, customers' pricing concerns must be addressed. RFID is in a classic catch-22 situation: It needs price to come down to a penny per tag before its usage will become more widespread, but it needs increased demand to drive costs down. Privacy concerns also loom large. RFID can be used in surveillance or to track an individual's buying behavior. As technology experts say, however, it is not the technology that is inherently evil; rather, it's the way the technology is used. Moreover, as with any technology, new breakthroughs are on the horizon. Hitachi has developed a chip only 0.05 mm on a side and 0.005 mm thick—nearly invisible. In a vial of liquid, the tiny particles look like gold dust. These chips can be put on items such as securities, concert tickets, gift certificates, and cash to prevent counterfeiting. They have a 128-bit architecture with an almost infinite number of digit combinations: 10^{38}. Along with a host of possible new uses, like embedding sidewalk tiles or crosswalks with RFID tags to help auto-navigation systems in wheelchairs, the future potential for this technology is wide open. a) Discuss the role of global standards, pricing adjustments, and addressing privacy concerns in facilitating the wider adoption of RFID technology and evaluate the marketing strategies that high-tech companies can employ to overcome these adoption barriers. (7 marks) b) Evaluate the effectiveness of RFID technology in improving supply chain management and retail operations, citing examples from the passage, and discuss how high-tech marketing strategies can enhance the perception and acceptance of RFID solutions among key stakeholders such as retailers, suppliers, and consumers. (6 marks) c) Explore the potential future applications of RFID technology mentioned in the passage, such as Hitachi's ultra-miniaturized chips, and assess the marketing challenges and opportunities associated with introducing innovative RFID solutions to new markets and industries. (7 marks)	
Q.2	a) Explain with example the tree analogy of core competencies in case IT services with the example of your choice. An example can be any IT product. b) Explain the common characteristics of High-tech environment with examples.	10 marks
Q.3	Jane works for a leading electronics company that specializes in manufacturing smartphones. Over the past few years, she has witnessed firsthand the rapid advancements in technology driven by Moore's Law. Just 18 months ago, the company launched their latest flagship smartphone boasting cutting-edge features and performance at a premium price point. However, in line with Moore's Law, competitors have been quick to introduce newer models with even better specifications at lower prices. As a result, Jane's company now faces the challenge of maintaining its market position amidst fierce competition and evolving consumer expectations. Discuss the implications of Moore's Law on the competitive landscape of the high-tech industry, using the smartphone market as an example. In your answer, analyze how companies can leverage this principle to gain a competitive advantage, while also addressing the challenges it presents in terms of pricing strategies, product differentiation, and customer satisfaction.	10 marks
Q.4	What is Chasm in High tech environment? Explain the approaches in crossing the chasm.	10 marks

Q.5	Write short notes on an two a) Market orientation and its dimensions b) Culture and climate in High tech environment with example c) The strategy sweet spot	10 marks