Radio frequency identification automated technology

Technology

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Introduction

RFID or Radio Frequency Identification is a contactless automated engineering that makes the usage of wireless moving ridges to place physical objects. It is grouped under the wide class of automatic designation engineerings which besides include saloon codifications, optical character readers and some biometric engineerings, such as retinal scans. All these engineerings are used to cut down the sum of clip and labour needed to input informations manually and to better informations truth. While some of the auto-ID engineerings, like saloon codification systems, frequently require a individual to manually scan a label or ticket, RFID captures informations on tickets and transmits it to a computing machine system without necessitating a individual to be involved.

The RFID [1] system consists of a ticket which is made up of a micro chip with a coiled aerial fixed to an object and a reader or inquisitor with an aerial. The micro chip in the ticket has an integrated circuit for hive awaying and treating information, modulating and demodulating a radio-frequency signal. The bit can hive away every bit much as 2 Ks of informations. The intent of aerial is to have and convey the signal. The reader is needed to recover the informations stored on RFID ticket. It has one or more aerials that emit wireless moving ridges and receive signals back from the ticket. This information is so passed in digital signifier to a computing machine system by the reader.

There are three types of RFID Tags- active, inactive or semi-passive. While active RFID ticket usage a battery to power the micro chip 's circuitry and broadcast signals to the reader, inactive tickets are powered by the electromagnetic moving ridges sent out by the reader. The 3rd type i. e. semi-passive utilizations both their ain batteries and moving ridges from the reader. Since active and semi-passive tickets are more expensive, they are typically used for higher-value goods that are scanned over longer distances.

Though several companies have been utilizing RFID [2] for more than a decennary, its cost had limited its usage in the yesteryear. For many applications, such as tracking parts for just-in-time fabrication, companies could warrant the cost of tags- a dollar or more per tag- by the nest eggs an RFID system generates. Besides when RFID was used to track assets or reclaimable containers within the company 's ain premises, the tickets could be reused doing it cost effectual. But the high cost prevented its big graduated table usage in unfastened supply ironss for tracking goods. In these instances, RFID tickets are put on instances and palettes of merchandises by one company and read by another, due to which they ca n't be reused. However, in recent times due to be efficient production, RFID has started to be used in Retail industry to extinguish long client charge waiting lines, aircraft industry for luggage direction and so on.

History

RFIDTechnologyhas been around for a long clip about from the early decennaries of the 18th century - its beginning can be approximately traced to around 1920. It was developed in MIT [3] as a agency of communicating between automatons.

The popular predecessors of RFID could be argued to the following two cases:

§ Radio frequence was used for designation intents in the IFF transponder installed in aircraft. The IFF [4] significance Identification, Friend or Foe - was used to place if the winging aircraft was a friend or a enemy. This application was used in World War II by the British to separate between returning flights as enemy occupied the district which was less than 25 stat mis off. This engineering is used boulder clay day of the month in commercial aircraft.

§ In 1945, Leon Theremin, created an espionage tool for the Soviet Union. Though this innovation carried no ticket as in RFID, it retransmitted radio frequence with audio information.

In 1948, a paper by Harry Stockman titled ``Communicationby Means of Reflected Power '' ( Proceedings of the IRE, pp 1196-1204, October 1948 ) explored the use of RFID. Stockman predicted that `` ... considerable research and development work has to be done before the staying basic jobs in reflected-power communicating are solved, and before the field of utile applications is explored." [5]

With Uranium and atomic engineering deriving importance in the 1960ss, the deathly nature of Uranium led to safety concerns. So employees and equipments were tagged to extenuate such concerns and RFID came into image therefore. This was done in Los Alamos National Laboratory (LANL) on the petition of Energy section of U. S. Government. Transponders were

installed in trucks and readers at the Gatess. The gate aerial would wake up the transponder in the truck, which would react with an ID and potentially other informations, such as the driver 's ID.

In the 1950ss and 1960ss, RF engineering was researched extensively. Scientists from assorted states demonstrated how distant objects could be identified. This was used in electronic surveillance - this is in usage even today. Objects carry a 1-bit ticket which is turned on or off depending on whether the client has paid or non.

The first patent to RFID engineering as used today was registered in 1973 by Mario Cardullo 's. Detailss of the patent are as follows: U. S. Patent 3, 713, 148 on January 23, 1973. The patented merchandise was a inactive wireless transponder with memory, powered by the interrogating signal. It was demonstrated in 1971 to the New York Port. It consisted of a transponder with 16 spot memory for usage as a toll device. The basic Cardullo patent covers the usage of RF, sound and visible radiation as transmittal media. The ticket used had rewritable memory.

In 1973, Los Alamos National Laboratory (LANL) demonstrated the usage of inactive and semi-passive RFID ticket. Around 1977, the engineering was leveraged for civilian intents from LANL - the transferred to two companies - Amtech in New Mexico and Identronix Research in Santa Cruz, California. Therefore, assorted utilizations started acquiring explored. One of the few experiments carried out was put ining a RFID transponder in a diary cow to supervise ID and temperature. This would assist in analyzing the cow 's wellness and prevent overfeeding.

Railwaies shifted to RFID after unsuccessful use of Bar codification to maintain path of turn overing stock.

By the 1880ss, use of RFID shifted to treat betterment. Cost decrease & A ; size decrease were certain illustrations.

Over old ages, these devices were commercialized and companies moved to higher frequence range- which offered faster transportation rates. Today, 13. 56 MHz RFID systems are used for entree control, payment system and smart cards. In the early 1990s, applied scientists from IBM patented an ultra-high frequence RFID system. UHF offered longer read scope and faster informations transportation.

Wide graduated table axial rotation out was initiated by the Army forces - the largest deployment of active RFID was seen in the US Department of Defense. They use active tickets on more than a million transportation containers that travel outside the state.

HOW THE TECHNOLOGY WORKS
Components and Procedure
The basic RFID engineering makes usage of the undermentioned constituents [6] :

1. Active tags - Active tickets require a power beginning. They are either connected to a powered substructure or utilize energy stored in an incorporate battery.

2. Passive tags - The life-time of a inactive ticket is limited by the stored energy, balanced against the figure of read operations the device must

undergo. Passive RFID is of involvement because the tickets do n't necessitate batteries or care. The ticket besides have an indefinite operational life and are little plenty to suit into a practical adhesive label.

3. Tag reader

* The ticket reader is responsible for powering and pass oning with a ticket

* The reader emits wireless moving ridges in scopes of anyplace from one inch to 100 pess or more, depending upon its power end product and the wireless frequence used.

* When an RFID ticket base on ballss through the electromagnetic zone, it detects the reader 's activation signal.

* The reader besides decodes the information encoded in the ticket 's integrated circuit (silicon bit) and the information is passed to the host computing machine for processing.

4. Tag Antenna

* The aerial emits wireless signals to trip the ticket and to read and compose informations to it.

* It captures energy and transportations the ticket 's ID.

* The encapsulation maintains the ticket 's unity and protects the aerial and bit from environmental conditions or reagents. The encapsulation could be a little glass phial or a laminal plastic substrate with adhesive on one side to enable easy fond regard to goods.

RFID V Barcode

Barcode

RFID

RFID Benefit Example

Line of sight

Required

Not Required

No demand to orientate scanned points

Number of points that can be scanned

One

Multiple

Very fast stock list count

Automation and Accuracy

Multiple read mistakes and prone to lose floging

Fully automated and extremely accurate

Error free stock list count

Designation

RFID V Barcode

Merely series or type

Unique point degree

Targeted callback

Data Storage

Merely a meaningless codification

Upto several kilobits

Real clip informations entree in any location

RFID Standards

When an administration trades globally and intends utilizing RFID systems across national boundaries, criterions and ordinances are more of import to guarantee safety and the interoperability of tickets and readers between merchandising spouses. Where an orgainisation wants to run a 'closed-loop ' system which is entirely intended for internal usage within the one administration - so it is comparatively easy to choose and optimize a system for those specific internal demands.

RFID is non regulated by one trade organic structure - nevertheless it is in fact influenced by a figure of official organic structures for different facets. Frequencies, power degrees and operating rhythms are regulated in Europe by the European Telecommunications Standards Institute (ETSI) and in the UK by OFCOM.

Protocols for communicating between tickets and readers are proposed by a figure organic structures and equipment makers. An administration that is new to the topic of RFID frequently believes that there is one criterion engineering called 'RFID ' when in fact there are assorted frequences, criterions, power degrees, protocols, ticket types and architectures with differing operational and public presentation features.

Advantage

· ? Line of sight? [7] is non required to read a RFID ticket as against a barcode. RFID tagged points can be read even if they are behind other points. There is no demand for physical contact between the informations bearer and the communicating device.

· Because line-of-sight is non required to read RFID tickets, stock list can be performed in a extremely efficient method. For illustration, palettes in a warehouse can be read, inventoried, and their location can be determined no affair where the ticket is placed on the palette. This is because the wireless waves from the reader are strong plenty for the ticket to react regardless of location.

· Line of sight demands besides limit theruggedness of barcodesas good as thereusability of barcodes. (Since line of sight is required for barcodes, the printed barcode must be exposed on the exterior of the merchandise, where it is capable to greater wear and rupture.) RFID tickets can besides be implanted within the merchandise itself, vouching greater huskiness and reusability.

· The readability of barcodes can be impaired by soil, wet, scratch, or packaging contours. RFID tickets are non affected by those conditions.

· RFID tickets are really simple to install/inject inside the organic structure of animate beings, therefore assisting to maintain a path on them. This is utile in carnal farming and on domestic fowl farms. The installed RFID tickets give information about the age, inoculations and wellness of the animate beings.

· Barcode [8] scannershave repeatedly failed in supplying security to gems and jewelries in stores. But presents, RFID tickets are placed inside jewelry points and an dismay is installed at the issue doors.

· Barcodes have no read/write capableness ; that is, you can non add to the information written on a printed barcode. RFID ticket, nevertheless, can be read/write devices ; the RFID reader can pass on with the ticket, and alter as much of the information as the ticket design will let. The RFID tickets can hive away informations up to 2 KB whereas ; the saloon codification has the ability to read merely 10-12 figures.

· An RFID ticket could place the point (non merely its maker and class) . Bar codes merely supply a maker and merchandise type. They do n't place alone points.

· RFID engineering is better than saloon codifications as it can non be easy replicated and hence, it increases the security of the merchandise.

· Human intercession is required to scan a barcode, whereas in most applications an RFID ticket can be detected ? hands off.?

· RFID engineering is a labor-saving engineering. This translates to be nest eggs. Using saloon codification engineering costs, on norm, 7 cents in human labour to scan a saloon codification. In add-on, labour is required to set each label right on each plastic crate holder or panel. Add a cost for label alterations and replacings for `` non clear '' codifications. And add another for administrative costs for labels that are n't read decently, which causes stock list mistakes and non-compliant returns and punishments.

· Tags are available in a great scope of types, sizes and stuffs

· [9] Relatively low care cost

· Highly low mistake rate

Disadvantage

· Dead countries and orientation problems- RFID works similar to the manner a cell phone or radio web does. Like these engineerings, there may be certain countries that have weaker signals or intervention. In add-on, hapless read rates are sometimes a job when the ticket is rotated into an orientation that does non aline good with the reader. These issues are normally minimized by proper execution of multiple readers and usage of tickets with multiple axis aerial.

· Since RFID systems make usage of the electromagnetic spectrum (like WiFi webs or cellular telephones) , they are comparatively easy to throng utilizing energy at the right frequence. This could be black in environments like infirmaries or in the armed forces in the field. Besides, active RFID ticket (those that use a battery to increase the scope of the system) can be

repeatedly interrogated to have on the battery down, thereby interrupting the system.

· Interference [10] has been observed if devices such as forklifts and walky-talkies are in the locality of the distribution centres. The presence of nomadic phone towers has been found to interfere with RFID wireless moving ridges. Wal-Mart, the retail sector giant, has installed one million millions of RFID tickets in their merchandises throughout the universe and they have encountered such jobs.

· Security concerns- Because RFID is non a line-of-sight engineering like bar-coding, new security issues could develop. For illustration, a rival could put up a high-gain directional aerial to scan tickets in trucks traveling to a warehouse. From the informations received, this rival could find flow rates of assorted merchandises. Additionally, when RFID is used for high-security operations such as payment methods, fraud is ever a possibility.

· Ghost tickets [11] - In rare instances, if multiple tickets are read at the same clip the reader will sometimes read a ticket that does non be. Therefore, some type of read confirmation, such as a CRC, should be implemented in either the ticket, the reader or the informations read from the ticket.

· Proximity issues [12] - RFID tickets can non be read good when placed on metal or liquid objects or when these objects are between the reader and the ticket. About any object that is between the reader and the ticket reduces the distance the ticket can be read from.

· High cost- Because this engineering is still new, the constituents and tickets are expensive compared to barcodes. In add-on, package and support forces needed to put in and run the RFID reading systems (in a warehouse for illustration) may be more dearly-won to use.

· Unread tags- When reading multiple tickets at the same clip, it is possible that some tickets will non be read and there is no certain method of finding this when the objects are non in sight. This job does non happen with barcodes, because when the barcode is scanned, it is immediately verified when read by a bleep from the scanner and the informations can so be entered manually if it does non scan.

· Vulnerable to damage- Water, inactive discharge or high-octane magnetic rushs (such as lightning work stoppage) may damage the ticket.

· Global Standards: RFID has been implemented in different ways by different makers. There still does non be a individual planetary criterion.

· Consumers may besides hold jobs with RFID criterions. For illustration, ExxonMobil 's SpeedPass system is a proprietary RFID system. If another company wanted to utilize the convenient SpeedPass they would hold to pay to entree it. On the other manus, if every company had their ain `` SpeedPass '' system, a consumer would necessitate to transport many different devices with them.

Applications

WAL-MART (RETAIL)

Retail is one country where RFID has been used extensively. It helps in cut downing cost, increasing gross and leads to increased client satisfaction. Increased and accurate information leads to lesser stock list and stock list cost as a consequence goes down. Other than electronic surveillance, stock list trailing, RFID is used for Brand hallmark as good which guarantee that inexpensive replacements are non sold to clients therefore guaranting client satisfactions. Another application of RFID in retail sector is Promotional show deployment. This was a alternate to analyzing selling impact. Asset tracking applications were besides possible through RFID in retail sector.

It is used in the undermentioned applications:

In-store stock list Management:

Physical stock list is clip devouring - using RFID to take stock of stock list reduces clip taken by physical stock pickings by 90 % . This is more accurate and stock pickings can be done several times a twenty-four hours. Therefore, cost is greatly reduced.

Brand Authentication:

This is used to look into counterfeiting of high-value cosmetics, electronics, dress and pharmaceuticals. This helps in protecting trade name unity by avoiding inexpensive extras. It enhances client satisfaction by guaranting quality and retaining assurance.

Asset Trailing:

This is used to happen lost assets and path assets - this would assist in more efficient use of assets. This would take to back uping concern processed with lesser figure of assets.

Inventory Visibility in the Supply Chain:

The prompt stock list tracking prevents stock outs and loss of client satisfaction. This provides sellers with real-time visibleness of stock list in the supply concatenation, bettering prognosis truth and muffling the stock list whipsaw consequence. [13]

Case survey of WAL-MART

Wal-Mart and U. S. Department of Defence are the chief drivers of RFID engineering. Wal-Mart could drive this engineering to about everyone who did concern with them due to immense graduated table of operations and really high bargaining power. The retail concatenation gave a deadline to all its providers to go RFID enabled by 2005. The quiver of this move was seen in India and package companies in India gained from this move as they got a batch of undertakings. RFID do n't look to be as popular in India because RFID can last in organized retail sector and unorganized retail seems the order of the twenty-four hours in this state.

How RFID helped:

Wal-Mart implemented RFID in 2005 ab initio in seven shops.

" The company has installed RFID readers at the having docks at the dorsum of the edifice, near the rubbish compactors and between the back room and the retail floor. For the instances of goods that are shipped to the shops with RFID tickets, Wal-Mart records their reaching by reading the ticket on each

instance and so reads the tickets once more before the instances are brought out to the gross revenues floor. By utilizing gross revenues informations from its bing point-of-sales system, which is non utilizing RFID, Wal-Mart subtracts the figure of instances of a peculiar point that are sold to clients from the figure of instances brought out to the gross revenues floor. Software proctors which points will shortly be depleted from the shelves. It automatically generates a list of points that need to be picked from the back room in order to refill the shop shelves. By reading the tickets on the instances that are brought out from the back room, we 're able to see what points have really been replenished [14] '' says Langford, caput RFID engineering Wal-Mart

Supply concatenation is besides expeditiously managed with RFID engineering - Once the client picks the information, the provider is informed about the purchase. This helps cut down BULLWHIP EFFECT. This is achieved through Wal-Mart 's Retail Link extranet.

Retail employs immense work force in In-Store Receiving, Stocking, look into out and taking stock list. This can be freed with employment of RFID. It would cut down cases of Fraud, stock-outs. It improves supplier-retailer relationship, client service & A ; plus direction - " The right merchandises are available at the right shops at the right time"

WESTERN STAR TRUCKS (FREIGHTLINER)
Freightliner-Western Star Trucks is the taking heavy-duty truck maker headquartered in Portland, USA. The production installations p across united States, which produce a broad scope of heavyresponsibilitybuilding and

public-service corporation trucks, long haul main road tractors, mid scope trucks for distribution and service, and exigency service setup and recreational hauliers.

Problems faced [15] :

Freightliner was confronting jobs in footings of increasing costs. It therefore wanted to better efficiency and truth of its resources managing in order to better control fabrication costs. It wanted to follow the motion of assorted parts right from stock list to the mill floor in Portland works. It wanted to accomplish a trailing system that has the undermentioned characteristics:

* It should be automatic, so that labor costs associated with stock list handling and trailing could be reduced

* It has to be accurate and efficient, so that expensive holds caused by misdirected and erroneous parts managing could be eliminated

* It should be easy integrable with bing plus direction databases, in order to farther streamline stock list refilling and resource direction

* It should be scalable in order to enable enterprise-wide extension after it is proven in Portland

Integration of the bing procedures into the new system was their major job. This called for parts needed on the production line to be put into stock list carryalls, placed on nomadic jerks and so transferred onto the store floor. The empty carryalls were so returned to the warehouse. The Portland installation used about 750 carryalls of different sizes.

How RFID helped [16] :

RFID was implemented to work out the above job. RFID tickets were attached to the jerks. The tickets were encoded with the GRAI format that is intended for assignment to single objects and is the corporate criterion for tote designation.

The new system identified each carryall and jerk with RFID tickets. Tote and tug motion was so tracked as each passed through one of the two dock door portals equipped with RFID readers and aerials. A dealing reception was so automatically generated and sent to the database on the corporate waiter. The reception inside informations the location, day of the month and clip the dealing occurred, every bit good as the carryall and tug information. The complete parts tracking solution delivered the needful efficiency, truth and ability to pare labour costs.

This solution instantly paid off. It reduced labour costs significantly. Inventory pick mistakes reduced in figure and, mis-ships and production lines started having seasonably and right parts.

LOCKHEED MARTIN (DEFENSE) [17]

Problems faced:

Most naval forcess in the US antecedently employed some type of a decoy-launching system, which had been available for many decennaries. The ALEX (Automated Launch of Expendables) systems were designed to counter inward enemy anti-ship missiles. When it determined that an anti-ship missile is headed its manner, based on cues from shipboard detectors, the steerers were fired consequently. Decoys deploy stuff such as chaff—

aluminum-coated strands of glass or other stuff that emit infrared waves—thus making false marks to confound or counter nearing ASMs, and deviate them from their intended mark. One job naval forcess faced is how to guarantee the right steerer is fired to counter a particular missile menace under conflict conditions. Because there are many types of steerer cartridges, all of a similar size and form, there is a possible for errors being made during the procedure of lading a launcher. Typically, the crew of the combat information centre (CIC) room relied on informations provided on paper, or over a voice nexus with the steerer lading crew.

How RFID helped:

The RFID engineering offered ship 's forces real-time visibleness into which types of steerers were deployed, every bit good as which barrels they were installed in, and helped guarantee that the proper unit of ammunition is fired off, potentially in a split-second determination, while the vas is under onslaught. The RFID-enabled automatic round-identification system (ARID) had been successful with the naval forcess of some states, motivating Lockheed Martin to supply the same characteristic to all of its clients throughout the universe. Mounted onboard the naval forces 's battler vass, the steerer launchers, provided by Lockheed Martin, were outfitted with RFID readers, and decoy cartridges were fitted with RFID tickets.

Each Lockheed Martin steerer launcher (typically two, four or six launchers per battler, depending on ship size) had a set of six tubings, leting 12, 24 or 36 steerers per ship to be loaded and fired. Each launcher contained a low-frequency RFID reader with six channel options for redundancy. The reader was wired to six aerials, one at the base of each barrel. Naval forces attach a

little discoid ticket, compliant with the ISO 11784/5 criterions and encoded with a alone ID figure, to the underside of each steerer cartridge. Sailors could so utilize a handheld inquisitor to read the ticket 's ID figure and associate it to the type of steerer to which that ticket is attached. When the tagged cartridge is loaded in the launch barrel, the reader identifies the ticket 's alone ID figure and transmits that information to the ALEX system.

" To guarantee the RFID system would run decently in the strictenvironmentof a vas at sea, Lockheed Martin put the system through heavy testing" , Porter (Chief Engineer) says. " This included quiver, daze, temperature and wet exposure, every bit good as proving for electromagnetic intervention (EMI) with other systems on a ship. The maritime environment is really rugged, so the testing had to be rather strict, '' he adds.

MUNICH AIRPORT (AEROSPACE) [18]
picture_rfid_technology. jpgMunich Airport, the 7th busiest in Europe, served more than 15 million riders and moved more than 100, 000 metric dozenss of cargo in the first half of 2009.

In July 2009, the airdrome began a trial utilizing Aero Scout 's T6 GPS-enabled Wi-Fi active RFID ticket to track cargo dollies, and to incorporate that information into its airdrome procedure direction (APM) package. The end was to enable directors to turn up dollies immediately, and to cognize instantly which were available for usage.

After acquiring positive consequences from a current pilot undertaking using radio frequence designation to track lading and rider luggage dollies as they

move about its outdoor incline, apron and gate countries, Munich Airport has decided to go on utilizing the engineering after the pilot ends in December 2009.

The trial showed that tracking cargo dollies prevents holds or breaks due to mislay or lost dollies, improves plus management—by enabling the airdrome to be after in progress for the dollies ' usage, every bit good as brand sure they are in the right topographic point at the clip they are needed—and optimizes stock list and care procedures by extinguishing drawn-out hunts for dollies that need to be repaired or inspected due to regulative demands. In add-on, the airdrome will besides be able to bear down lading companies more accurately, based on their usage of rented dollies.

As portion of its trial, the airdrome outfitted about 80 freight dollies with RFID tickets. In add-on, it attached tickets to 10 dollies for LD-2 containers, which are used to hive away up to 120 three-dimensional pess of lading, and to two luggage dollies. The tickets were attached to a dolly 's frame or to the enlistment used to link one dolly to another.

The battery-operated tickets include GPS faculties for finding a dolly 's location out-of-doorss. This GPS information is transferred to the cardinal database by the airdrome 's bing Wi-Fi web, which covers 15 million square metres of the installation, including the terminuss, aprons, Gatess, hangers and track borders.

If a dolly is inside the installation, its ticket detects this, and the system switches manners to cipher the plus 's location, based on the specific Wi-Fi entree points that receive the ticket 's signal.

SOUTHEASTERN CONTAINER (MANUFACTURING) [19]

Southeast Container was formed in 1982 as a in private owned company under the ownership of a group of Coca-Cola® Bottling companies. Today the company operates as a fabricating cooperative with 10 fabricating locations bring forthing plastic bottles. Southeast Container handles about 70 per centum of the bottle production for Coca-Cola in the U. S. and besides works with bottle makers outside of the cooperative. The company keeps quality and service high with a focal point on uninterrupted betterment.

Problems faced:

With roots in the southeasterly U. S. , Southeastern Container now has ten fabricating installations across the East Coast, Illinois and Wisconsin. At the company 's three injection modeling installations, bottle spaces called preforms are manufactured. The plastic preforms are blown into bottles at Southeastern Container 's blow-molding installations and at bottle makers outside of the cooperative.

The preforms are shipped to bottle fabrication workss in composition board containers or bing plastic bins. Ideally, these containers are returned empty to the injection modeling installations to reiterate the rhythm. However, jobs with this return procedure were bing Southeastern Container 1000s of dollars each twelvemonth.

Some containers are lost or damaged in theodolite and must be replaced. In add-on, the design of the bing containers prohibits Southeastern Container from maximising the capacity of transporting dawdlers, ensuing in the company paying to transport " air" for each burden. Finally, composition

board containers are frequently pre-assembled to salvage clip, and the to the full assembled containers take up warehouse floor infinite. In the procedure of transporting one million millions of preforms, these issues add up.

How RFID helped:

Southeast Container planned to turn to these jobs by replacing the bing containers with a new version— a specialised returnable plastic bin. While the new folding bins were designed to significantly cut down costs and increase efficiency, each of them is about 10 times the cost of a composition board container. Therefore, rhythm numeration was introduced to track bin life-times against the figure of rhythms guaranteed by the maker.

" We decided to rhythm count for stock list control, traceability, and to formalize bin life-time, and we chose RFID tracking as the most effectual method, " said John Underwood, Engineering Manager, Southeastern Container, Inc. " We already use barcoding extensively, and have looked at RFID on a figure of occasions during the old ages. RFID was the right pick now because it 's low-cost and the engineering is at a point where it can supply the dependability and truth we need, " he explained.

Southeast Container worked with its spouse, Decision Point systems, to architect an full end-to-end solution to undertake this challenge. The system execution started with a pilot RFID system for rhythm numbering the new bins. The solution includes Motorola fixed RFID readers, Motorola RFID aerial, Motorola RFID rugged hand-held readers, and OAT Systems ' Oat Asset Track package. In add-on, Southeastern Container relies on the Motorola Service

from the Start plan for fix coverage for its Motorola RFID handheld readers. " We worked really difficult to analyse the RFID ticket choice with the Motorola devices to maximise successful reads for both full and empty bins, " said Gary Lemay Senior Solutions Architect for Decision Point systems. " We besides had great success custom-making the Oat Systems package to update both the SQL Server database and supply a web service connexion to Southeastern Container 's warehouse system."

The pilot at one injection-molding installation was really successful, and Southeastern Container is continuing with a phased rollout across its operations. When the system was to the full deployed, each of the about 30, 000 bins were for good identified with an RFID ticket and tracked utilizing Motorola XR440 fixed RFID readers.

In add-on to utilizing the handheld RFID reader at Southeastern Container, the company besides supplies them to the bin maker. As bins were produced, the maker captured the barcode and RFID tag information for each one, enabling Southeast Container to associate the two for guarantee trailing and seller enfranchisement.

" The pilot was really smooth, and the system has proved to be dependable. Once this was to the full rolled out, the ROI improved in less than two old ages, " Underwood said.

The benefits included:
• Salvaging 1000s of dollars a twelvemonth in transit costs

• Reducing container loss and guaranting traceability

• Achieving ROI within two old ages of full execution

• Supplying accurate informations on bin life-times for guarantee contracts

• Establishing a successful use-case with RFID engineering to leverage with a broad scope of future warehouse and stock list control attempts

Looking in front, they are even be aftering to see a similar RFID system for real-time trailing of outward cargos.

SAIPEM (ENGINEERING AND CONSTRUCTION) [20]

Problems faced:

Saipem is an Italian technology and building company for subsea oil and gas production. It began seeking a solution to cut down labour hours spent seeking for losing points, every bit good as to diminish the incidence of holds caused by equipment non geting at the right location at the proper clip, or traveling losing wholly. The other challenge Saipem wanted to turn to was safety. The company wanted to happen a system that would extinguish the demand for field operators to mount onto equipment in order to visually turn up a consecutive figure on an point, which they would so hold to manually enter.

How RFID helped:

The house chose an RFID solution that would enable its direction to cognize the location of equipment on offshore sites throughout the universe, every bit good as allow employees to safely place equipment. The solution, installed by Milan systems planimeter ACM-e, includes inactive ultrahigh-frequency (UHF) ticket provided by Omni-ID, which can be read from a

distance of 8 metres (26 pess) or more. The ticket needed to be tough, so that they could non merely be read in the presence of steel and H2O, but besides withstand temperatures runing from -60 grades to +50 grades Celsius. Therefore, the tickets were enclosed in an impact- and crush-resistant proprietary stuff specifically chosen for this application.

Saipem fastened Omni-ID Max tags to its ain assets, foremost labeling its steel points, so puting tickets on musca volitanss and buoys. When a piece of equipment was found without a ticket, operators could plan a new one, inputting informations sing the point to be linked to the ticket 's alone ID number—such as its consecutive figure, description and manufacturer—and so bolting or welding it to the plus. The information related to that point is stored in Saipem 's ain proprietary logistics support package, known as NAMASTE.

Saipem 's staff used a Motorola handheld computing machine with a constitutional RFID inquisitor around the work site, to turn up losing points and to find which points the company had on site. Using the handhelds, workers were able to identity points without mounting onto hemorrhoids of equipment, or the vehicles onto which they are loaded.

When a piece of equipment was needed, it was foremost requested from its storage location (based on stock list informations maintained in the NAMASTE package) , where its ticket is scanned with a hand-held reader to make a record of its cargo. When that point reached the shore of the boring site, the plus was once more scanned to bring forth a record of which points have been sent to the offshore site. Once an plus was returned to storage,

that same procedure is carried out, with the tickets being scanned as they reach shore, and one time more when they are placed in one of Saipem 's storage installations. The Motorola handheld computing machine could hive away the read informations, which was so uploaded to a Personal computer at the terminal of a twenty-four hours via a USB connexion.

Saipem 's employees could log into the NAMASTE system to see what had been shipped out of storage or to the offshore site, and when. The system could besides alarm users if a requested point had non been shipped, or if a piece of equipment destined for one location was received at a different one.

The tickets were besides scanned when assets were certified by an inspector as safe for usage, and recertified one time they leave the drill site and are once more inspected. In this manner, the company 's direction knows when each piece of equipment was last certified, and can supply that record for insurance intents, if necessary.

The RFID system went unrecorded in November 2009, with the purpose of tracking 20, 000 points, including offshore vass (used to entree oil boring site) , every bit good as Cranes, boring rigs, steel pipe, slings, bonds and buoys. Approximately 1, 000 points have been tagged.

Saipem expects the RFID system to cut down the pattern of geting extra stock list due to points stoping up losing. The company besides expects the system will diminish the sum of waste it generates. Without an RFID-based trailing system, assets frequently had to be scrapped, because it was

impossible to follow how old they were, or when they had been inspected and certified.

The RFID solution, utilizing Omni-ID tickets, improved safety and security, and helped the employees better perform their occupations in a unsafe environment. That was the biggest benefit gained by Saipem.

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