INERNSHIP PROJECT REPORT

ON

“LINE WALK SERVICE DESK”

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under Tata Steel Ltd Khopoli. Tal- khalapur,District- Raigad,
Maharashtra Pin code: 410203.

Submitted By,

KRUTIKA SHINDE

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Approved By,

Mrs. Shweta thikekar

HR Department

Guided By,

Mr. Raj kumar

IT Department

Contains Of The Report

Systems Applications and Products in Data Processing

1.1 What is SAP?

SAP is one of the world's leading producers of software for the management of business processes, developing solutions that facilitate effective data processing and information flow across organizations.

Overview

Founded in 1972, the company was initially called System Analysis Program Development (Systemanalyse Programmentwicklung), later abbreviated to SAP. Since then, it has grown from a small, five-person endeavor to a multinational enterprise headquartered in Walldorf, Germany, with more than 105,000 employees worldwide.

With the introduction of its original SAP R/2 and SAP R/3 software, SAP established the global standard for enterprise resource planning (ERP) software. Now, SAP S/4HANA takes ERP to the next level by using the power of in-memory computing to process vast amounts of data, and to support advanced technologies such as artificial intelligence (AI) and machine learning.

The company's integrated applications connect all parts of a business into an intelligent suite on a fully digital platform, thereby replacing the process-driven, legacy platform. Today, SAP has more than 230 million cloud users, more than 100 solutions covering all business functions, and the largest cloud portfolio of any provider.

Christian Klein leads the company, heads up the Executive Board of SAP SE, and, at 41, is the youngest CEO of any major enterprise on Germany's DAX blue chip market index.

1.2 Understanding SAP

What does SAP stand for? (What is SAP full form?)

The name is an initialism of the company's original German name: Systemanalyse Programmentwicklung, which translates to System Analysis Program Development. Today the company's legal corporate name is SAP SE — SE stands for societas Europaea, a public company registered in accordance with the European Union corporate law.

How do you pronounce SAP?

People often ask, “How do you say SAP?” It is an initialism, not an acronym, therefore, it is pronounced as individual letters (S-A-P). SAP is not pronounced as a word (“sap”).

1.3 SAP Software

What is SAP software used for?

Traditional business models often decentralize data management, with each business function storing its own operational data in a separate database. This makes it difficult for employees from different business functions to access each other’s information. Furthermore, duplication of data across multiple departments increases IT storage costs and the risk of data errors.
By centralizing data management, SAP software provides multiple business functions with a single view of the truth. This helps companies better manage complex business processes by giving employees of different departments easy access to real-time insights across the enterprise. As a result, businesses can accelerate workflows, improve operational efficiency, raise productivity, enhance customer experiences – and ultimately increase profits.

What is ERP software?

ERP stands for “enterprise resource planning.” ERP software includes programs for all core business areas, such as procurement, production, materials management, sales, marketing, finance, and human resources (HR).
SAP was one of the first companies to develop standard software for business solutions and continues to offer industry-leading ERP solutions.

1.1 What does SAP do?

SAP helps companies and organizations of all sizes and industries run their businesses profitably, adapt continuously, and grow sustainably.
The company develops software solutions that are used by small businesses, midsize companies, and large corporations. With standard applications, industry solutions, platforms, and technologies, every business process can be mapped and designed. The software collects and processes data on one platform, from raw material purchasing to production and customer satisfaction. SAP solutions can be installed “on premise” at a user’s location(s) or used from the cloud, helping companies analyze and efficiently design the entire value chain. SAP solutions can also be used to create forecasts, such as when a machine needs to be repaired or how revenue will develop in the next half year.
In addition, SAP helps customers seamlessly link operational data on business processes with experience data on emotional factors such as purchase experience and customer feedback. This enables companies to better understand and respond to their customers.

What SAP solutions are available?

SAP offers solutions across a wide range of areas:

- ERP and Finance
- CRM and Customer Experience
- Network and Spend Management
- Digital Supply Chain
- HR and People Engagement
- Experience Management
- Business Technology Platform
- Digital Transformation
- Small and Midsize Enterprises
- Industry Solutions

Manufacturing Execution System

2.1 What is an MES (Manufacturing Execution System)?

A manufacturing execution system, or MES, is a comprehensive, dynamic software system that monitors, tracks, documents, and controls the process of manufacturing goods from raw materials to finished products. Providing a functional layer between enterprise resource planning (ERP) and process control systems, an MES gives decision-makers the data they need to make the plant floor more efficient and optimize production.

No matter the size of a manufacturing operation, an MES can contribute to overall productivity and profitability by making the manufacturing process information driven. Regulated industries such as pharmaceuticals, food and beverage, medical devices, aeronautics and aerospace, defense, and biotechnology particularly benefit – because regulated companies must adhere to strict regulations to ensure traceability compliance. They must make sure that appropriate procedures are in place for building compliant products, that these procedures are documented, and that the resulting products can be easily recalled if necessary.An MES is essential to drive optimal performance in today's competitive and rapidly changing manufacturing environment. A Transparency Market Research report projects that the global MES market will "generate revenue of US$18.06 billion by the end of 2025." This growth is being driven by an increase in the use of industrial automation in process and discrete industries, the growing need for regulatory compliance, and the low deployment cost of manufacturing execution systems.

2.2 Top 5 benefits of MES

Manufacturing execution systems track a huge amount of data, producing real-time insights that can boost production efficiency and save costs. Other benefits of an MES include:

1. **Improved quality control:** As quality control information is transmitted in real time, companies with an MES can immediately halt production as soon as issues are identified. This reduces waste, scrap, overages, and re-work.
2. **Increased uptime:** An MES generates realistic production schedules by balancing personnel, material, and equipment resources. It integrates scheduling and maintenance to maximize product flow and asset utilization – increasing uptime and improving overall equipment effectiveness (OEE).
3. **Reduced inventory:** A manufacturing execution system updates inventory records with new production, scrap, and non-conforming material so that your purchasing, shipping, and scheduling departments know exactly what material is on hand at all times. This reduces just-in-case inventory and work-in-progress (WIP) inventory – saving money on manufacturing, transportation, storage, and inventory monitoring.
4. **Paperless shop floor:** Eliminating paperwork means there is less chance for human error. It also means that the data recorded from the shop floor is immediately available to decision-makers across all integrated systems, to inform real-time decision-making.

5. **Improved product tracking and genealogy:** An MES follows the entire production cycle from beginning to end, grouping final parts or batches with the corresponding manufacturing data. 2.3 Core MES features

In 1997, the Manufacturing Enterprise Solutions Association International, or MESA, defined the 11 core manufacturing execution system functions. Although the MESA-11 model has evolved over time, those original 11 core functions provide the base to run almost any type of plant and are integral to today's manufacturing execution systems. They are:

- **Resource allocation and status:** Use real-time data to track and analyze the status of resources, including machines, materials, and labor, to make allocation adjustments.
- **Operations/detailed scheduling:** Optimize performance by scheduling, timing, and sequencing activities based on priorities and resource capacity.
- **Dispatching production units:** Manage production data flow in real time to easily make quick, calculated adjustments in production dispatching.
- **Document control:** Manage and distribute documents – including work instructions, drawings, standard operating procedures, batch records, and more – so they're accessible and editable.
- **Data collection and acquisition:** Track and collect real-time data about processes, materials, and operations and use it to make better decisions and increase efficiency.
- **Labor management:** Track worker schedules, qualifications, and authorizations to optimize labor management with less investment of time and resources from management.
- **Quality management:** Track quality deviations and exceptions for improved quality control management and documentation.
- **Process management:** Manage the entire production process from order release to finished goods. Gain insight into bottlenecks and points that affect quality while creating full production traceability.
- **Maintenance management:** Use data from your MES to identify potential equipment issues before they happen and adjust equipment, tool, and machine maintenance schedules to reduce downtime and increase efficiency.
- **Product tracking and genealogy:** Track the progress of your products and their genealogy for informed decision-making. Having the data of a product's full history is extremely useful for manufacturers who must comply with government or industry regulations.
- **Performance analysis:** Compare results and goals to identify strengths and weaknesses in the overall process and use that data to make systems more efficient.

2.3 The evolution of MES standards

While the MESA-11 model focuses on core MES functions, the International Society of Automation (ISA) saw the need for consistent terminology and a consistent information model to define and integrate the activities between enterprise and control systems – so they developed the ISA-95 standard in the late '90s. By standardizing terminology, ISA-95 makes effective communication between stakeholders, such as suppliers and

manufacturers, easier. And consistent models reduce the risk of error when integrating manufacturing sites with business systems.

ISA-95 defines the interface between control and enterprise functions to create levels of technology and business process. A simplified model of that hierarchy puts manufacturing execution systems at level three, between business planning and logistics and process control systems:

- Level 4 – ERP: Business planning and logistics
- Level 3 – MES: Manufacturing operations management
- Level 2 – Process control systems: Batch control
- Level 1 – Process control systems: Continuous control
- Level 0 – Process control systems: Discrete control

2.4 MES and ERP integration

In today's manufacturing environment, it's not a case of MES versus ERP; together MES and ERP bring operational clarity that neither system can provide on its own.
ERP focuses on creating and managing plant schedules including production, material use, delivery, and shipping – as well as gathering information about your business. Manufacturing execution systems, on the other hand, focus on managing and monitoring manufacturing operations and reporting on production line activities in real time.
Together, an ERP and an MES create an integrated ecosystem, offering a holistic view of finance, procurement, supply chain management, manufacturing logistics, and more. Combining that information increases agility and provides robust data that improves forecasting on everything from sales to asset utilization to manufacturing management.
ERP systems give you the data to determine *what* products to manufacture, while an MES integrates ERP data with plant floor information to determine *how* to produce those products with less waste and more profit.

2.5 MES trends and new technologies

Fueled by advanced technologies, manufacturing execution systems are evolving to become service-oriented, modular, and connected.
Cloud connectivity is the backbone of smart factories, allowing advanced manufacturing systems, devices, products, and equipment to interact autonomously. IIoT (Industrial Internet of Things) devices and sensors across the supply chain are continually gathering and generating data. This real-time sharing of data helps smart factories to continually improve their operations – automating better workflows, customizing products and services, and growing smarter and more efficient over time.
MES software can also help manufacturers take advantage of a key trend in the evolution of manufacturing execution systems: customized production. Instead of mass production, your smart factory could move to mass personalization – and meet the demand for less expensive, highly tailored products with speed and affordability.
While personalization makes manufacturing more complex, advanced technologies can help manufacturing systems to react and pivot in real time. Artificial intelligence (AI) can improve production efficiency, handle predictive maintenance, and reduce waste. Tapping into machine learning capabilities, production lines can become increasingly smart and efficient.

LINE WALK SERVICE DESK (PROJECT)

3.1 Introduction to the Line Walk Service Desk

Monthly walk through for GAS line inspection service desk is generated with the help of our project (Line Walk Service Desk). The desk provides weekly assignments for the inspectors. Desk assign a particular line walk type to an individual inspector with respective inspection date and time details and the area of visit.

3.2 Working of the Line Walk Service Desk

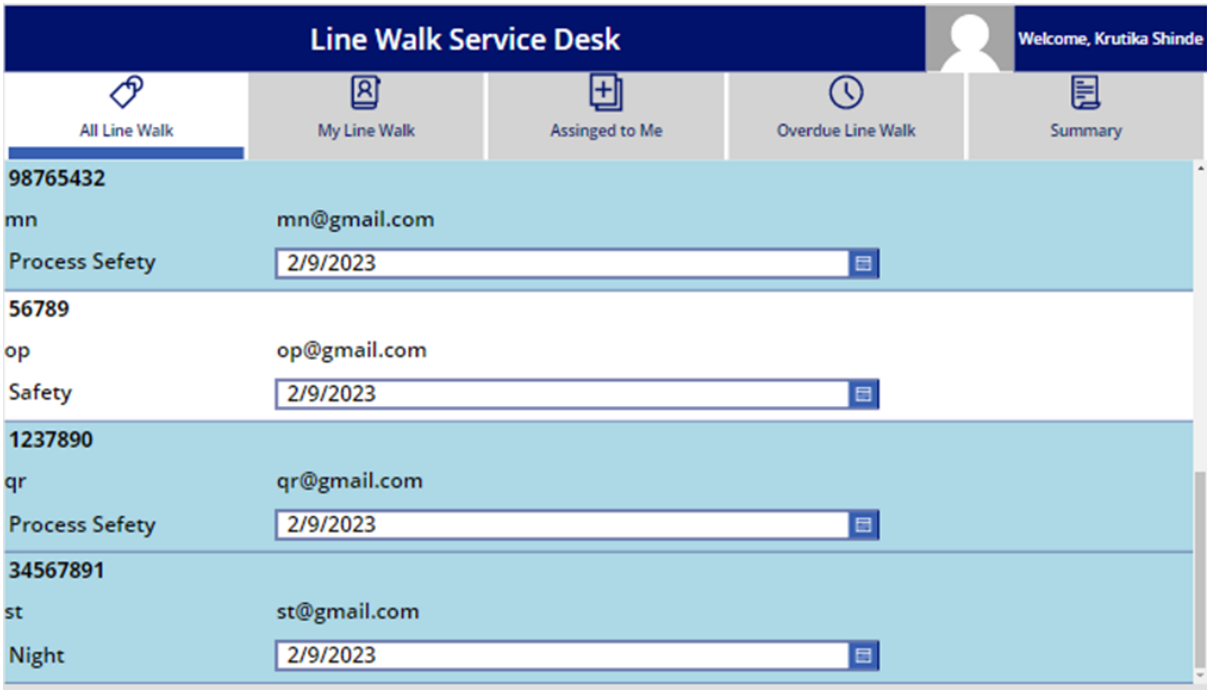
The inspector can log in into the service desk with the help of employee code or employee email-id provided by the company.
After logging into the desk, the inspector can access the details of **'All Line Walks'** to be conducted with in the month,
line walks completed by the logged in user (inspector) which in specified in **'My Line Walk'** section,
all the remaining line walks of the inspector for the month will be shown within the **'Assigned To Me'** section,
The line walks that have been due even after the inspection day would be appeared in **'Overdue Line Walk'** section and
the overall summary of the month for the logged in inspector is determined in **'Summary'** section.
An automated notification is processed on email as an alert to an instructor to conduct the inspection. The alert email is sent with an entry to verify the inspection with the 48hrs of inspection.

3.4 Database for the Service Desk

An excel file is maintained with all the details of all the respective inspectors that as supposed to perform inspection in particular type of line walks in corresponding area of visit with an planed date of inspection.
The database is connected to the app with the help of flow through excel and the table contains are uploaded to the app.

Employee Code	Employee Name	Employee Mail ID	Inspection Date/Time	Verification Date/Time	Line Walk Type	Area of Visit	X	Y	Z
EID_1	ab	ab@gmail.com	01-12-2022	03-12-2022	Safety				
EID_2	cd	cd@gmail.com	03-12-2022	05-12-2022	Process Sefety				
EID_3	ef	ef@gmail.com	05-12-2022	07-12-2022	Night				
EID_4	gh	gh@gmail.com	07-12-2022	09-12-2022	Safety				
EID_5	ij	ij@gmail.com	09-12-2022	11-12-2022	Process Sefety				
EID_6	kl	kl@gmail.com	11-12-2022	13-12-2022	Safety				
EID_7	mn	mn@gmail.com	13-12-2022	15-12-2022	Process Sefety				
EID_8	op	op@gmail.com	01-01-2022	03-01-2022	Safety				
EID_9	qr	qr@gmail.com	03-01-2022	05-01-2022	Process Sefety				
EID_10	st	st@gmail.com	05-01-2022	07-01-2022	Night				

3.5 The Actual Outlook of the Line Walk Service Desk



Internet Of Things

4.1 What is IoT?

The Internet of Things (IoT) describes the network of physical objects—“things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. These devices range from ordinary household objects to sophisticated industrial tools. With more than 7 billion connected IoT devices today, experts are expecting this number to grow to 10 billion by 2020 and 22 billion by 2025. Oracle has a network of device partners.

4.2 Why is Internet of Things (IoT) so important?

Over the past few years, IoT has become one of the most important technologies of the 21st century. Now that we can connect everyday objects—kitchen appliances, cars, thermostats, baby monitors—to the internet via embedded devices, seamless communication is possible between people, processes, and things.

By means of low-cost computing, the cloud, big data, analytics, and mobile technologies, physical things can share and collect data with minimal human intervention. In this hyperconnected world, digital systems can record, monitor, and adjust each interaction between connected things. The physical world meets the digital world—and they cooperate.

4.3 What technologies have made IoT possible?

While the idea of IoT has been in existence for a long time, a collection of recent advances in a number of different technologies has made it practical.

- **Access to low-cost, low-power sensor technology.** Affordable and reliable sensors are making IoT technology possible for more manufacturers.
- **Connectivity.** A host of network protocols for the internet has made it easy to connect sensors to the cloud and to other “things” for efficient data transfer.
- **Cloud computing platforms.** The increase in the availability of cloud platforms enables both businesses and consumers to access the infrastructure they need to scale up without actually having to manage it all.
- **Machine learning and analytics.** With advances in machine learning and analytics, along with access to varied and vast amounts of data stored in the cloud, businesses can gather insights faster and more easily. The emergence of these allied technologies continues to push the boundaries of IoT and the data produced by IoT also feeds these technologies.

- **Conversational artificial intelligence (AI).** Advances in neural networks have brought natural-language processing (NLP) to IoT devices (such as digital personal assistants Alexa, Cortana, and Siri) and made them appealing, affordable, and viable for home use.

4.4 What is industrial IoT?

Industrial IoT (IIoT) refers to the application of IoT technology in industrial settings, especially with respect to instrumentation and control of sensors and devices that engage cloud technologies. Refer to thisTitan use case PDF for a good example of IIoT. Recently, industries have used machine-to-machine communication (M2M) to achieve wireless automation and control. But with the emergence of cloud and allied technologies (such as analytics and machine learning), industries can achieve a new automation layer and with it create new revenue and business models. IIoT is sometimes called the fourth wave of the industrial revolution, or Industry 4.0. The following are some common uses for IIoT:

- Smart manufacturing
- Connected assets and preventive and predictive maintenance
- Smart power grids
- Smart cities
- Connected logistics
- Smart digital supply chains

4.5 What industries can benefit from IoT?

Organizations best suited for IoT are those that would benefit from using sensor devices in their business processes.

Manufacturing

Manufacturers can gain a competitive advantage by using production-line monitoring to enable proactive maintenance on equipment when sensors detect an impending failure. Sensors can actually measure when production output is compromised. With the help of sensor alerts, manufacturers can quickly check equipment for accuracy or remove it from production until it is repaired. This allows companies to reduce operating costs, get better uptime, and improve asset performance management.

Automotive

The automotive industry stands to realize significant advantages from the use of IoT applications. In addition to the benefits of applying IoT to production lines, sensors can detect impending equipment failure in vehicles already on the road and can alert the driver with details and recommendations. Thanks to aggregated information gathered by IoT-based applications, automotive manufacturers and suppliers can learn more about how to keep cars running and car owners informed.

Transportation and Logistics

Transportation and logistical systems benefit from a variety of IoT applications. Fleets of cars, trucks, ships, and trains that carry inventory can be rerouted based on weather conditions, vehicle availability, or driver availability, thanks to IoT sensor data. The inventory itself could also be equipped with sensors for track-and-trace and temperature-control monitoring. The food and beverage, flower, and pharmaceutical industries often carry temperature-sensitive inventory that would benefit greatly from IoT monitoring applications that send alerts when temperatures rise or fall to a level that threatens the product.

Retail

IoT applications allow retail companies to manage inventory, improve customer experience, optimize supply chain, and reduce operational costs. For example, smart shelves fitted with weight sensors can collect RFID-based information and send the data to the IoT platform to automatically monitor inventory and trigger alerts if items are running low. Beacons can push targeted offers and promotions to customers to provide an engaging experience.

Public Sector

The benefits of IoT in the public sector and other service-related environments are similarly wide-ranging. For example, government-owned utilities can use IoT-based applications to notify their users of mass outages and even of smaller interruptions of water, power, or sewer services. IoT applications can collect data concerning the scope of an outage and deploy resources to help utilities recover from outages with greater speed.

Healthcare

IoT asset monitoring provides multiple benefits to the healthcare industry. Doctors, nurses, and orderlies often need to know the exact location of patient-assistance assets such as wheelchairs. When a hospital's wheelchairs are equipped with IoT sensors, they can be tracked from the IoT asset-monitoring application so that anyone looking for one can quickly find the nearest available wheelchair. Many hospital assets can be tracked this way to ensure proper usage as well as financial accounting for the physical assets in each department.

General Safety Across All Industries

In addition to tracking physical assets, IoT can be used to improve worker safety. Employees in hazardous environments such as mines, oil and gas fields, and chemical and power plants, for example, need to know about the occurrence of a hazardous event that might affect them. When they are connected to IoT sensor–based applications, they can be notified of accidents or rescued from them as swiftly as possible. IoT applications are also used for wearables that can monitor human health and environmental conditions. Not only do these types of applications help people better understand their own health, they also permit physicians to monitor patients remotely.