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SAMSUNG Nexplant Mobile

Global Manufacturing in Your Hands!
Mobile technologies in manufacturing will invite you to a brand-new world of innovation with the highest possible business efficiency via enabling real-time operations and instant on-site issue handling no matter where you are.

SAMSUNG SDS

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Nexplant
Mobile

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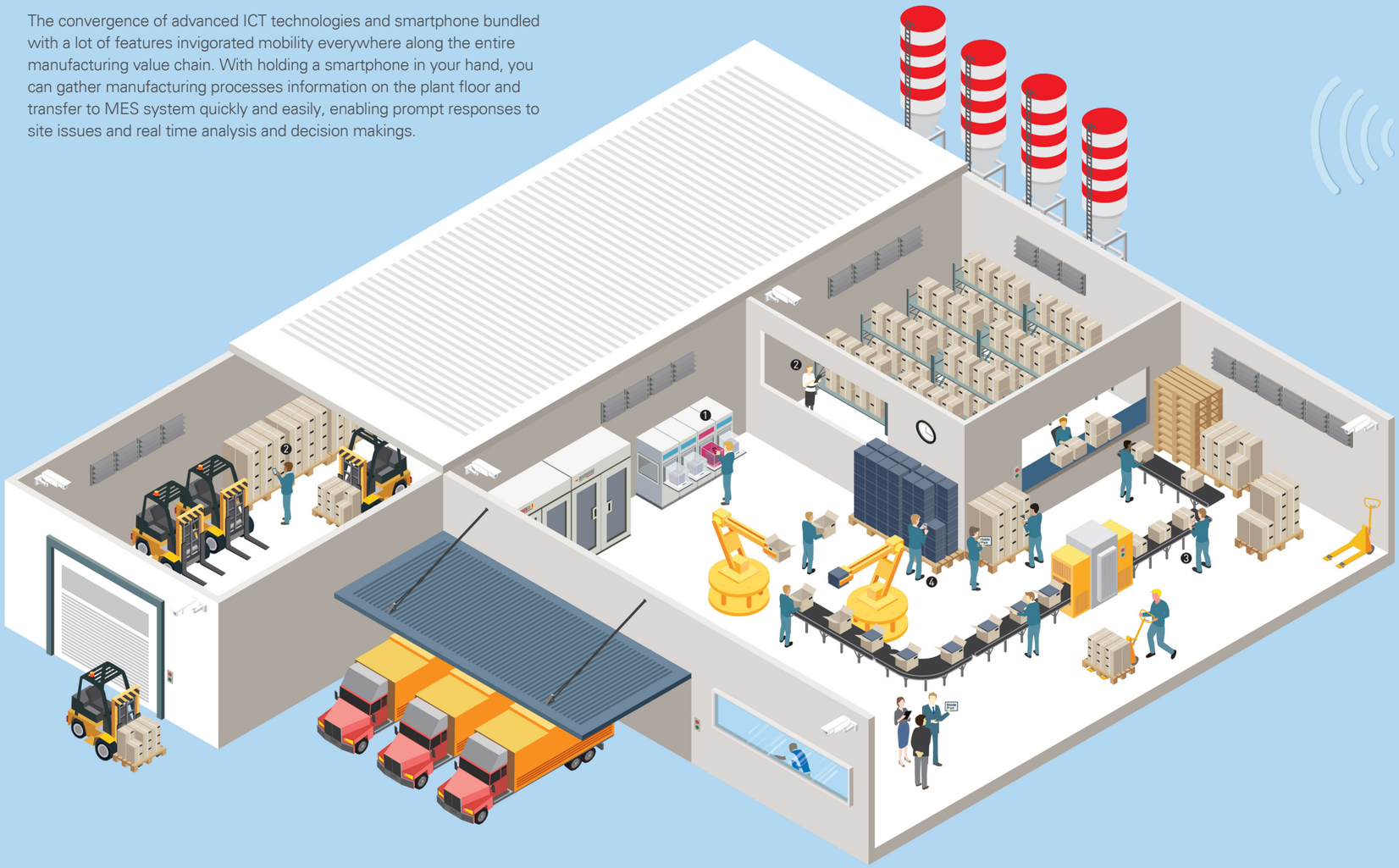
Samsung **Nexplant Mobile**

The convergence of advanced ICT technologies and smartphone bundled with a lot of features invigorated mobility everywhere along the entire manufacturing value chain. With holding a smartphone in your hand, you can gather manufacturing processes information on the plant floor and transfer to MES system quickly and easily, enabling prompt responses to site issues and real time analysis and decision makings.



❶

Real-time image capturing and data transmission as events occur

❷

Multi-user communication (MUC) via smartphones

❸

Goods and materials check using an integrated scanning device

❹

Manufacturing operations using a mobile MES

❺

Real-time information sharing supports accelerating decision-making when events occur

❻

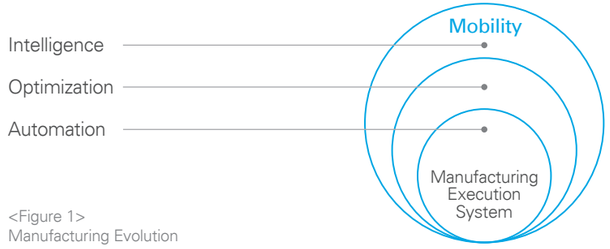
Real-time monitoring production on the go

In the face of a rapidly changing business environment, manufacturers around the globe are in efforts to innovate themselves to stay competitive.
Amid this trend, maximizing manufacturing efficiency by implementing manufacturing mobility solutions within a wireless environment has emerged as a key strategic initiative for businesses.

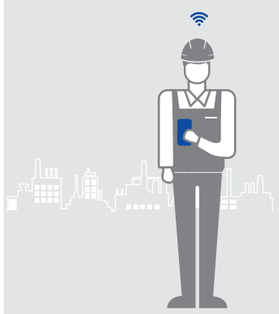
Innovate manufacturing with advanced mobile technologies

For companies with places of manufacture that are geographically separate from one another, the absence of real-time monitoring of diverse issues occurring on site leads to a slow response and decision-making.

In response, manufacturers are developing an integrated mobile solution-based smart manufacturing environment. However, a lack of relevant expertise and experience is hampering their effort to spare workers the inconvenience of having to carry barcode scanners, RFID readers, PDAs, radios and other devices and to allow them to process information required to get work done anytime, anywhere.



<Figure 1>
Manufacturing Evolution



Paradigm shift to mobile-based manufacturing IT

While the evolution of mobile IT has brought about major changes in manufacturing, companies are faced with the challenge of having to support a shift to mobile and ensuring security at the same time.

Requirements for responding to the paradigm shift

Solution-based enterprise mobile system

Secure mobile work environment optimized for manufacturing

Standard security architecture

Protection of valuable data from security threats

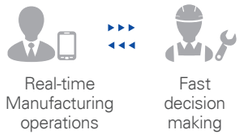
UX-based design from the user's perspective

Competitive manufacturing with improved user convenience

Demands from the Manufacturing Shop Floor

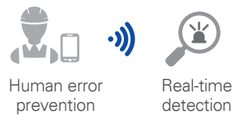
In order to improve manufacturing competitiveness through increased productivity and yield, the workers and their supervisors should have access to information they need anytime, anywhere. The process information in all steps are to be integrated so that they can view, update, transfer data on smartphones.

Samsung Nexplant Mobile has no time or space limitation. This enables fast decision-making and improves work efficiency by preventing mistakes and detecting errors in real time. In addition, the solutions speed up the entire process by providing a paperless work environment and eliminating unnecessary workflow steps.



Requirement for efficient production line:

_Prompt response system to real-time detection
_Quick and accurate measures with standardized defect codes
_Paperless environment
_Free up workers and managers from their desks
_Ease of communication among workforces on the plant floor



Requirement for efficient outbound shipment:

_Human error protection by Fool-Proof system
_Real-time alarming and messaging for anomaly detection
_Expedited shipping by reducing lead times

Requirement for efficient equipment management:

_Preventive inspection / actions taken on the spot (replacing parts, taking photos, etc.)
_Equipment historical data management using ID recognition technology (QR bar code, RFID)
_Inspecting input-to-production-materials and mounted-onto-equipment-materials for quality control

Samsung
Nexplant Mobile

"Global Manufacturing in Your Hands!"

Maximizing manufacturing efficiency requires enhanced manufacturing systems that support mobility. As a solution, Samsung Nexplant Mobile brings together a variety of manufacturing functions based on mobile technologies. Complicated manufacturing work, inconvenient communication, and time and space limitations are now a thing of the past. With Samsung Nexplant Mobile, explore a whole new global manufacturing experience.

Powered by Samsung SDS's unique technologies, Samsung Nexplant Mobile has been implemented and verified by global manufacturers. In addition to providing an integrated mobility platform customized for manufacturing, Samsung Nexplant Mobile allows you to select different mobile applications based on standardized mobile manufacturing architecture, infrastructure, and functionality.
With Samsung Nexplant Mobile, you will enjoy the benefits of the latest security solutions and be provided with strong end-to-end network security.

Powerful, Simple, and Safe

Samsung Nexplant Mobile

Samsung Nexplant Mobile boasts a mobile network environment driven by cutting-edge security technologies and equipped with MES functions, creating a smart manufacturing environment that ensures greater productivity for both workers and managers as well as maximized manufacturing efficiency.

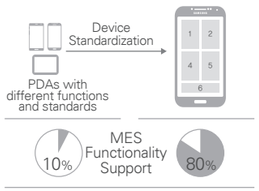
Business Mobile Contents	Production management	Quality control	Equipment management	KPI management	
Mobile Platform	**Security** User authentication Verification Document security MDM		**Additional Functions** File transfer CCTV Radio communication Multi-user voice / video / message communication		
Device	Smartphone	Integrated scanning device		Radio Gateway	

<Figure 2> Samsung Nexplant Mobile Composition

Five Key Attributes

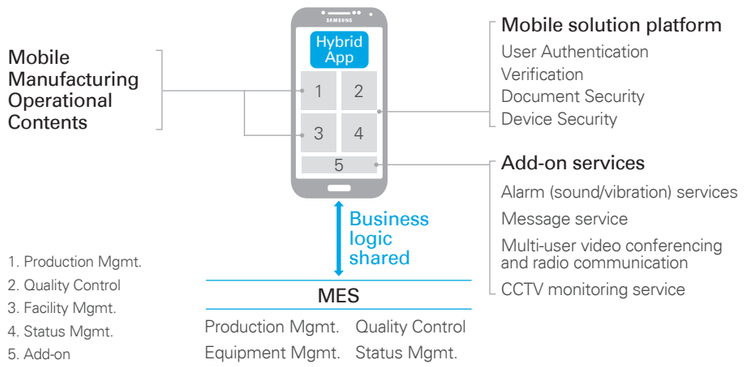
Rich Mobile MES contents	User-friendly MES functionality as well as diverse additional services (alarms, video calls, etc.) provided in a mobile environment
All-in-one integrated scanning device	All-in-one integrated scanning device mounted on the smartphone to allow single-device identification / handling of QR codes, barcodes, RFID tags and other identification codes
Effective approach with Hybrid platform supporting multiple environments	Hybrid platform-based services ensuring a fast, economical, and stable mobile environment on diverse devices
Multi-user video conferencing and digital radio communication	Multi-user support functions enabling two-way video communication, and RoIP* technologies applied to enable seamless digital radio communication
Thorough, multilayered security for wireless networks and mobile devices	u-Ready services to resolve security issues related to vulnerable mobile networks and EMM solutions for mobile device security

* RoIP: Technology that enables communication between people in all corners of the world by connecting two-way radio systems to the IP network. This next generation wireless communication technology enables communication between different devices and has no distance limitation.



Mobile MES

Replaces various types of non-standardized PDAs with smartphone, which makes worker's burden lighter. The manufacturing process information is accessible any place in plant thru full of mobile manufacturing operations system functionality. Add-on services improve communication and collaboration among workers and enhance visibility to production with CCTV monitoring.



Mobile MES Menu

Lot Tracking	Lot Equipment Reservation	Initiation	Closure
	Defect Handling	Product Division	Quality Information
	Lot Inventory, Lot Mapping		Lot Status Check
Product/Materials Mgmt.	Material Addition	Material Replacement	Material Consumption Check
	Material Check	Replacement History Check	Material Check History
Equipment Mgmt.	Tool Status Change	Facility Status Change	
Packaging / Shipping	Inbound Shipping	Outbound Shipping	

Key Characteristics

Mobile MES content realized based on MES logic

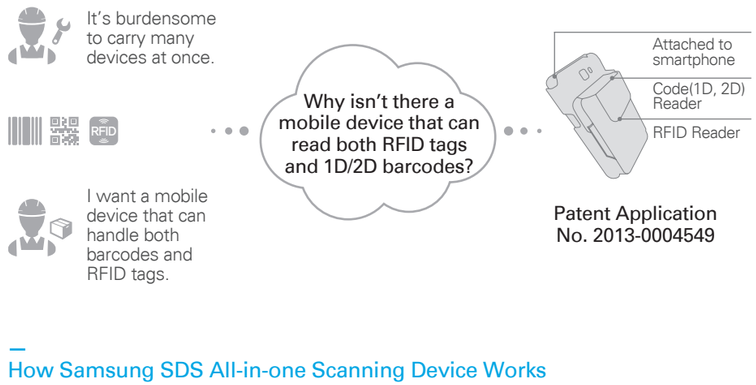
A single smartphone allows for more than 80% utilization of PC MES functions (Existing PDAs can only support less than 10% of MES functions.)

Diverse MES UI contents

Saving industrial PDAs purchasing costs

Samsung SDS All-in-one Integrated Scanning Device

Samsung SDS's all-in-one smartphone-mountable scanning device allows you to handle different types of identification codes such as 1D·2D barcodes, QR codes, and RFID tags with a single device.



Patent Application No. 2013-0004549

How Samsung SDS All-in-one Scanning Device Works

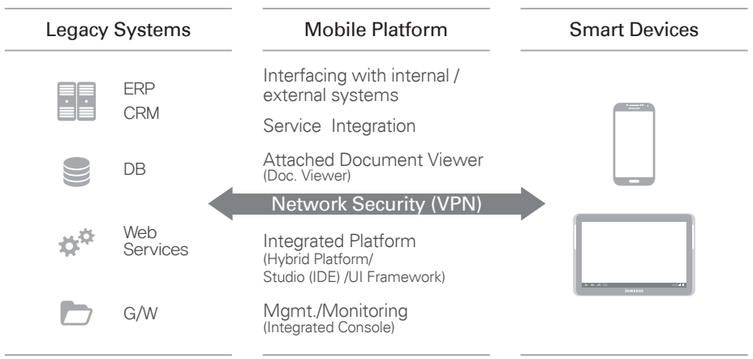
The all-in-one scanner transmits barcode and RFID tag information to the smartphone via Bluetooth.

The application installed on the smartphone receives the information.

The worker on the ground checks the received barcode and RFID tag information using his smartphone and manages the manufacturing site.

Hybrid Platform

Samsung Nexplant Mobile is built on a flexible hybrid platform that allows you to integrate with all types of enterprise systems. In this hybrid platform environment, the wireless network, devices, and security are all integrated and managed easily and one source can be deployed to multiple devices, all of which makes it possible to build the mobile work environment with safety, speed, and economy.



Admin Console

An integrated console allowing managers to get work done via a single screen

- Role-based authority settings
- Log management and statistics analysis
- Central security policy management and monitoring

Key Features of the Samsung Nexplant Mobile Hybrid Platform

Integrated solution management using the Admin Console

One-source multi-use for web-based hybrid platform technologies

Integrating with many different types of legacy systems including SAP ERP / BOE, DB, Oracle CRM, and Web Service.

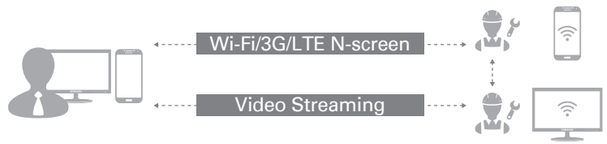
Web-standard HTML5-based development environment enabling efficient scalability to multiple smart devices.

A software development studio allowing consistent mobile app development from UI modeling to app packaging

Multi-user Video Communication Service

Smartphone-based Multi-user Video Communication

Our multi-user video communication service allows smooth communication between workers in remote areas like overseas manufacturing factories using the cameras on smartphones and PCs.



Features of Samsung Nexplant Mobile Multi-user Video Communication

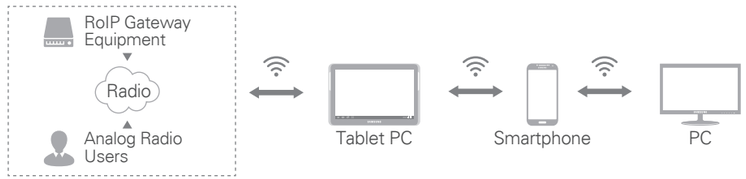
Two-way video service based on video streaming and codec

Stable video transmission in both WiFi and 3G environments

Communication between places of manufacture around the world is possible through the Integrated Control Center

Compatibility with Analog Two-way Radio Enables Digital Radio Communication

Communication between analog two-way radios and smartphones is made possible through the RoIP gateway, which connects different devices. Regardless of the communication tools they use, users will be able to enjoy powerful communication channels no matter how far the physical distance is between them. This, in turn, will maximize communication efficiency.



Characteristics of RoIP

Stable transmission in both Wifi and 3G environments by using minimum bandwidth

Supporting 3,000-client connections per server at the same time.

Enhanced communication security through OTP certification and TLS / SSLv2

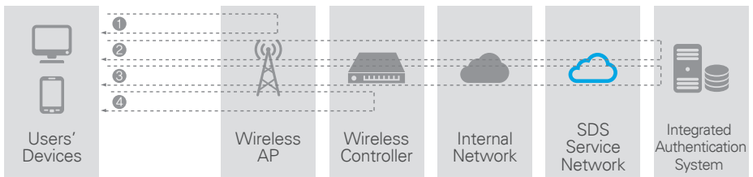
Key Attributes of u-Ready

- Create separate networks for data and voice.
- Remove IDs of unauthorized users.
- Create separate networks for employees, visitors.
- Encrypt manufacturing factories according to their grades (1st grade: AES, 2nd grade: TKIP)

Secure Authentication for Wireless Networks and Mobile Devices

Wireless Network Security through u-Ready

The u-Ready service provides a secure wireless environment so that users can conveniently and safely work using their PCs and mobile devices anywhere within a business site.



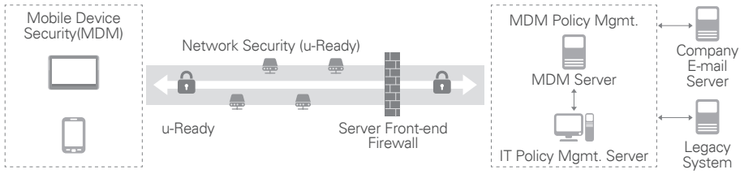
1. Network Access Authentication (802.1x EAP)
2. User Authentication (RAIUS)
3. Different Policies for Different Users (VLAN, IP bandwidth, ACL)
4. Data Encryption Communication (AES/TKIP)

Key Requirements of DISA

Encryption Module	FIPS 140-2 authentication
Integrity Check	Monitoring on jailbreaking / routing technologies / tools
Authority Mgmt.	Role-based access control in admin console
Audit/ Reporting	Audits and reports

Mobile Device Security using Enterprise Mobility Management (EMM) Solution

Samsung SDS EMM solution, which meets the mobile security standard established by DISA*, can protect a company's data from any potential threats.



Security Policy	Mobile Device Policy	Network Policy	Authentication Policy	Remote Control Policy
	Encryption of Stored Data	End-to-end security using AES encryption	Two-factor Authentication	Device lock and remote deletion
	Virtual Keyboard Security	Security using virtual private network (VPN)	Password Policy	Device Control (SD, Bluetooth, Wi-Fi, Camera)
	Anti-Virus		Electronic authentication certificate/Electronic signature	S/W distribution and management
	Attached Document Viewer			Diagnosis and monitoring

Thorough Security Management of Samsung SDS EMM

The MDM's architecture and functions are designed taking into account the mobile security standard established by DISA*.

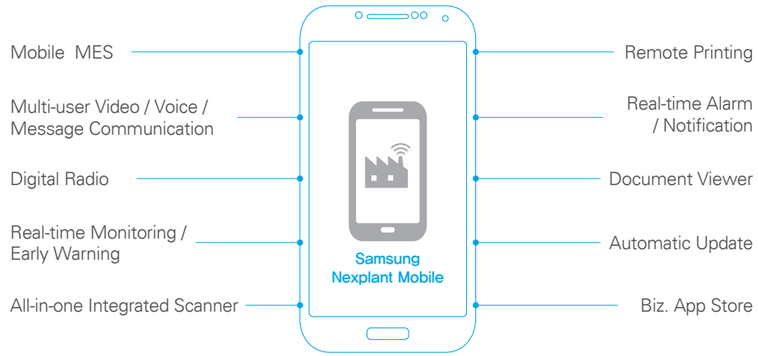
All data are encrypted using FIPS-140-2** authentication module

Authentication / app / communication channels are utilized along with authentication certificate.

* DISA: U.S. Defense Information Systems Agency
** FIPS: Federal Information Processing Standards

Key Features

Samsung Nexplant Mobile enables the user to access needed information anytime, anywhere. Mobile Plant integrates the functions of different devices, creating a simple and efficient shop floor-centered mobile work environment.



<Figure 3> Key Features

Mobile Manufacturing Execution System (MES)

Major MES functions from task order to quality analysis provided via mobile devices

Video / Voice / Text Communication

Video / voice / message communication allowing simultaneous user connections

Digital Radio

Analog radio (UHF, VHF, and TRS)-Smartphone communication via the RoIP gateway

Real-time Site Monitoring and Early Warning

CCTV monitoring and anomaly detection on mobile devices

All-in-one Integrated Scanner

1D / 2D bar code scanning and QR / UV / RFID reading done using a single device

Remote Printing

Remote printing from mobile devices

Real-time Alarm

Real-time alarm via mobile devices in the case of an event

Document Viewer

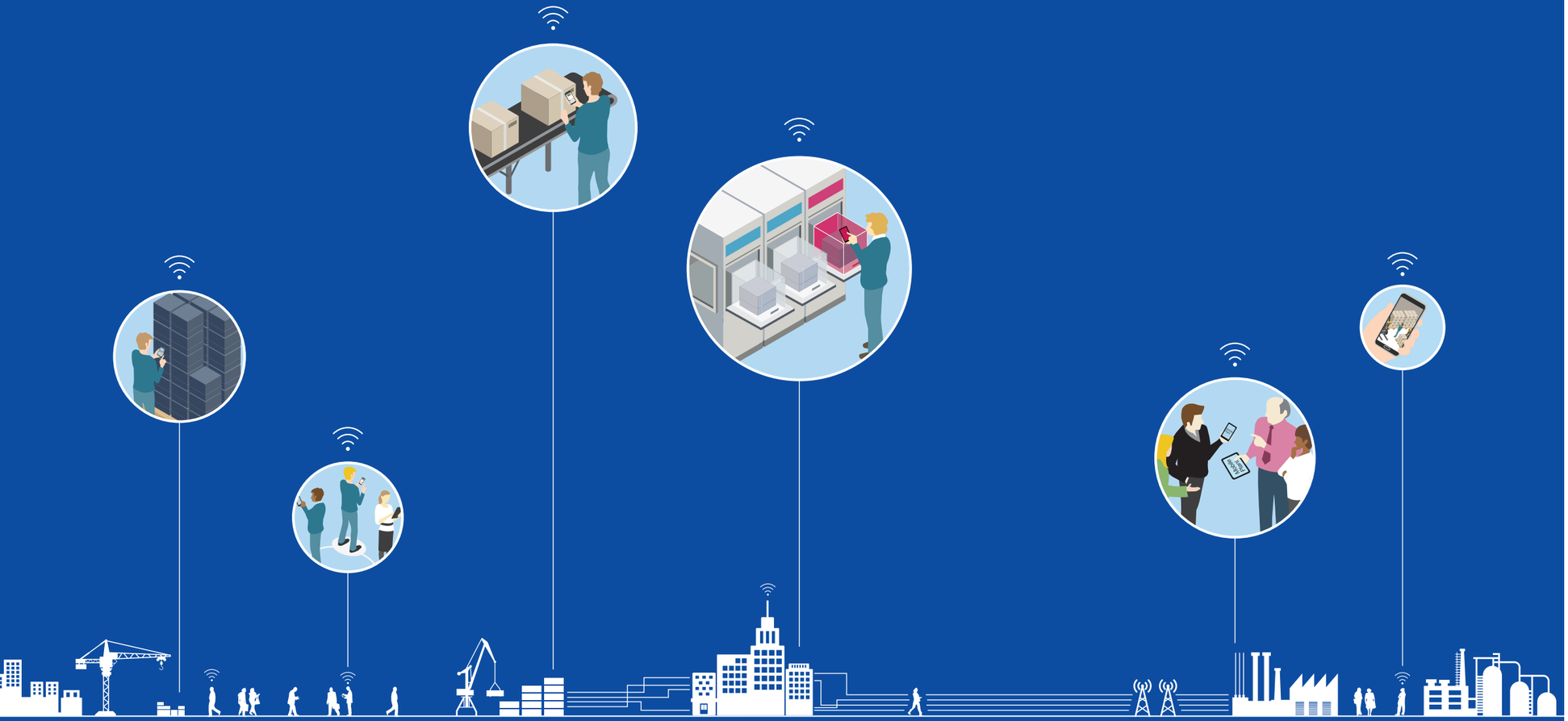
Document check right on mobile devices

Automatic Update

Application update support via push notifications sparing the user from having to take extra action

Biz. App Store

Installation of additional applications via the app store



Samsung Nexplant Mobile allows you to access manufacturing information anytime, anywhere and provides you with a simple and efficient mobile work environment by integrating complex mobile devices into one.

Samsung Nexplant Mobile User Scenario

Persona	On-site worker A
Needs	Wants to efficiently respond to issues on the ground in real time Wants to enhance convenience by simplfying complex equipment
Scenario Background	An on-site worker A inspects a worksite in order to take prompt action in case any issues occur with the manufacturing equipment.

Process		Preparation	Material Check	Modification to Management System Information		Issues with the Equipment / Reporting to Headquarters		Issue Notification and Decision-making	Situation Monitoring and Completion
TO–BE	Technology components		Integrated scanner (QR, barcode, RFID)	Mobile MES		Manufacturing content for mobile devices (Biz. App)		Real-time communication / Alarms for workers	Monitoring the site
	Scenario	1 Material manager "A" enters a warehouse with inspection equipment in order to check materials.	2 "A" views / manages various readers used to recognize materials including QR, barcode and RFID using an integrated scanner mounted on his smartphone.	3 "A" notices some changes in material information, accesses the manufacturing management system via smartphone, and enters / modifies material information.		5 "A" finds out some problems with the equipment, takes a picture of the problematic equipment using a work app, which does not save the pictures taken, and sends it to the person in charge via a mobile hotline. At the same time, "A" enters the situation into the system via mobile devices.		7 Headquarters becomes aware of the issue via the system, announces it and measures to be taken to the relevant manufacturing lines via mobile devices in order to minimize the risks that may arise.	8 After addressing the issue, Headquarters and the facility manager constantly monitor the site using smartphones and CCTV footage being transmitted from the location.
	New Advanced		2 View / manage material information using an integrated scanner.	3 Notice the changes in material information, access the mobile manufacturing management system (MES), and reflect changes that have been made.	4	5 Detect problems with the equipment. Take a picture of the problematic equipment, report the situation, and enter the situation into the system using a work application.	6	7 Alert the manufacturing lines of the issue in real time and inform them of proper measures to address it using mobile devices.	8 After taking proper measures to address the issue, monitor the material warehouse remotely using mobile devices.
AS–IS	Current	1 Enter a material warehouse	2 View / manage material information using multiple scanners	3 Notice the changes in material information and log it on the PDA and in handwriting.	4 Reflect the changes in material information in the manufacturing management system using PCs.	5 Detect problems with the equipment. Take a picture of the problematic equipment and report the situation using a personal mobile device.	6 Report the issue using PCs.	7 Notify the issue to manufacturing lines via landline telephone.	8 Visit the site for monitoring after taking proper action to address the issue.
	Scenario	1 Material manager "A" enters a material warehouse with inspection equipment in order to check materials	2 "A" checks the facility history employing various readers used to recognize materials including QR, barcode and RFID.	3 "A" notices some changes in material information and logs it on the PDA and in handwriting.	4 "A" comes back to his office, accesses the manufacturing management system using his PC, and enters the changes he has logged on the PDA and in handwriting into the system.	5 "A" notices the problematic equipment, calls Headquarters to report the situation, and, if neccessary, sends the picture of the equipment taken using his personal smartphone.	6 "A" downloads the video footage showing the issue onto his PC to write a report and reports the situation to Headquarters.	7 After being notified of the situation, Headquarters notifies the relevant manufacturing lines of the issue via landline telephone.	8 The facility manager takes proper measures on the ground, and frequently visits the site and the CCTV control room for monitoring.
	Pain Point		2 Many different kind of readers need to be purchased for different equipment In addition, workers are inconvenienced by having to use different readers for differet materials.	3 The changes in material information are not readily reflected in the system.	4 Workers are inconvenienced by having to log changes on the PDA and in handwriting first, and later entering it into the system.	5 Describing the situation on the phone does not accurately portray the situation. In addition, the photos and videos taken by a personal smartphone have information about key materials and equipment, which suggests that if leaked, may have serious consequences.	6 Because of the time it takes to gather the information about an issue, organize it, and report it to the relevant parties using the PC, the amount of damage resulting from the issue increases.	7 All relevant parties are not notified, in real time of an issue, causing confusion and delay.	8 Many resources are put in for monitoring, but most of them are wasted by having to move to the site and the CCTV control room.

Reference & Benefits

Samsung Nexplant Mobile has been proven for their efficiency through years of experience with Samsung, which boast world-class manufacturing capabilities, and the best practices that have been developed along the way. We also have the best consulting and system implementation capabilities with the extensive knowledge accumulated in a variety of fields including home appliances, mobile devices, semiconductors and displays.

A real-time response to on-site issues
Improved system performance and easy maintenance
Maximized efficiency with a smart manufacturing environment

Expected Benefits

Samsung Nexplant Mobile enables real-time response to the issues at manufacturing sites and provide excellent performance and maintenance through system integration. In addition, they help realize a smart manufacturing environment, thereby maximizing work efficiency.

From the CEO's Perspective	From the Managers' Perspective	From the Perspective of Working-level Staff
Reduction in device purchase cost and IT service operation cost	Redundant development can be prevented through the use of the same logic in both mobile and PC environments	Real-time response to on-site issues
Decision making is made possible using smartphones	Hybrid apps support adapting to a changed manufacturing process without additional updates	Use of smartphones makes work more convenient and efficient
Overall manufacturing competitiveness is improved by managing the index of all manufacturing factories in real time.	Maintenance becomes easier as device control, and software update and distribution in Wi-fi environments are possible	Utilization of mobile content makes it easier to do works related to MES
Reduction in defection rate as issues are reported via alarm and addressed in real time		Paperless environment is realized and time is saved through reduced simple and repetitive works
		Smooth communication between workers

Smart manufacturing environment equipped with a real-time response system

Client: Manufacturing Company A

Challenges

Manufacturing company A had difficulty monitoring issues at manufacturing sites in real time. It wanted to establish a smart manufacturing environment, which enables real-time response to issues.

Solutions

Samsung SDS suggested a mobile solution tailored to the manufacturing environment of Company A. We integrated the systems based on the standard mobile device and provided the manufacturing execution function on the smartphone so that workers can deal with the issues at manufacturing sites in real time.

Benefits

Company A experienced enhanced efficiency by being able to check manufacturing progress in real time and promptly respond to issues with the mobility it gained. At the same time, it enjoyed improved convenience through better communication between manufacturing managers.

Real-time response improved by **50%**	Defect rate dropped by **18%**	The time required for inputting information saved by **75%**

Samsung SDS, through ICT-led innovation, helps customers succeed by providing a variety of services based on a clear understanding of their needs and a future-oriented vision.

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