"NAMAKIZU-SOKURAN System": UC to Reform Staff Consciousness

Conveying crucial information quickly and securely has become a major proposition for all enterprises regardless of their fields. At NEC, we have been able to securely share in real time the quality information that is of utmost importance to us as a manufacturer, through the integration of our base system and unified communication system. As a result, we have been able to expedite countermeasures to quality problems more rapidly and have increased quality consciousness. Such results will be introduced through specific examples within our company's manufacturing, as well as cases where this system was adopted for use in other operations, successfully achieving business reorganization.

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Introduction

NEC Tohoku is mainly in charge of manufacturing network products that comprise data communication networks, mobile phone networks, land line networks, and corporate networks.

As the products in our field require a high degree of reliability, we established our base system for quality management called the "NAMAKIZU-SOKURAN System" ten years ago in 1998 in order to sustain and further improve our high quality. This system was used to manage information on quality problems such as phenomenon, cause, countermeasure and effect. It was equipped with an approval function, image (photo) storage function, and mail sending function, making it an advanced system at the time.

By integrating this "NAMAKIZU-SOKURAN System" with our "UC (Unified Communications) System," we have been able to securely communicate information in real time, and expedite countermeasures to quality problems more rapidly while increasing the quality consciousness of our staff. Furthermore, through implementation in other systems such as Schedule Management, we achieved a successful reorganization.

Overview of "NAMAKIZU-SOKURAN System"

The "NAMAKIZU-SOKURAN System" is our company's main system for quality management, which promptly communicates information regarding any quality problem found at
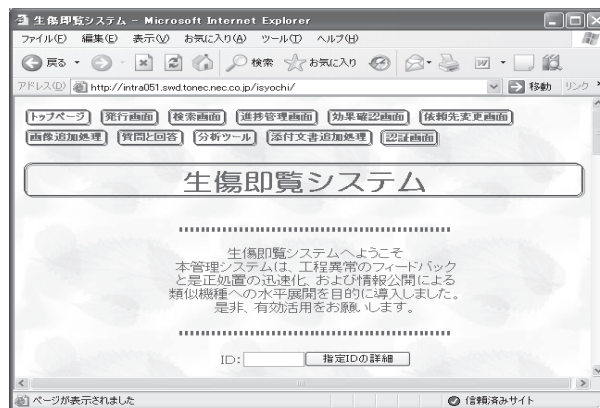

Fig. 1 NAMAKIZU-SOKURAN system.

the production line as soon as they occur. It includes management of content information for problems including phenomenon (with photos) and cause, tentative and permanent countermeasures, as well as functionality to report to the officials and sections involved (**Fig. 1**).

Issues with the System

When the "NAMAKIZU-SOKURAN System" was first released, it registered a quality problem and informed involved personnel by sending messages to their e-mail addresses. Involved personnel would be able to recognize the problem immediately if they were using their PCs, but if they were not, a time lag would develop before they were able to check the in-

Line is stopped when quality problem occurs

Those involved (Line Supervisor, Production Engineer, Quality Control, Materials, etc.) gather on-site to immediately start deducing the cause and implementing countermeasures.

Report filed to executives and related sections after returning to normal and securing approval.

Line Supervisor calls up involved personnel to gather them.

Burden

Cause is investigated on-site.

File report after getting approval from immediate superior.

Time-lag

Fig. 2　Issues with conventional system.

Equalization Post

9:00　11:00　14:00　16:00　18:00　20:00

Assembly & Inspection Line

The schedule for assembly/inspection through shipping is equalized at the Equalization Post to match the delivery schedule (times and routes).

If a delay results and delayed goods cannot be accommodated by extra space on next departure, it is necessary to arrange for a non-scheduled delivery. (Major impact on cost and environment.)

4 Departures per Day (2-hour intervals)

Dep. 1　11:00AM

Dep. 2　3:00PM

Dep. 3　5:00PM

Dep. 4　7:00PM

Customers

Delivery trucks (reserved space)

| E | R | R | R |
| E | R | R | R |

R: Reserved
E: Extra

Fig. 3　Production equalized for delivery departures.
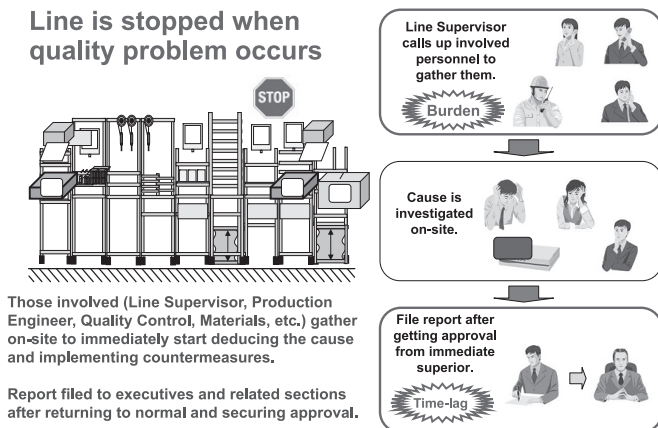
formation.

Moreover, since the fundamental rule for when a quality problem occurs is to stop the production line, a Line Supervisor gathers the persons in charge on-site which required either calling them on the phone or visiting them face-to-face, and figure out the cause of the problem, it took an excessive amount of time and effort just to get the investigation started. And since reporting to officers and related sections required the approval of a superior officer, some times it took several days (**Fig. 2**).

Moreover, it was necessary to carry around a PC in order to check information while out of the office, which could lead to a security risk.

Importance of Reducing Information Lead Time at Production Site

As part of our administration innovation efforts, our production lines are equalized in accordance to the departure times of delivery trucks as you can see in **Fig.3** .

When a quality problem occurred, the production line was stopped. The longer the line is stopped, the more delayed production becomes; and since more and more products miss their prescheduled departure times, it was necessary to arrange for additional unscheduled transport. These additional deliveries not only add extra cost, they also increase CO_2 emissions that much more and are therefore undesirable from an ecological standpoint as well. Whenever a line was stopped, it was crucial to gather the persons involved as soon as possible, identify the cause of the problem, take appropriate countermeasures, and resume production.
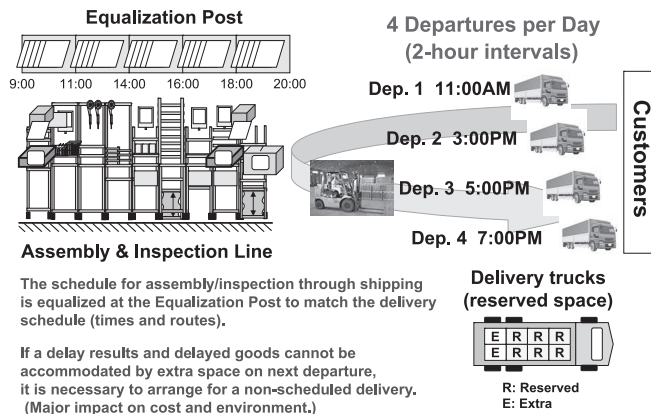
It was necessary to prevent problems from reoccurring to avoid stopping the line, and to keep new problems from developing there was a need to heighten quality awareness among the staff.

Moreover, since line stoppages were crucial and could potentially lead to delays in supplying our products to our customers, our corporate executives had requested to be notified of such situations even if through just a brief report.

Considering Introduction of UC System

In 2006, our company began considering the introduction of the UC System, a UNIVERGE solution centered on the SV7000, as a way to upgrade from a deteriorating PBX and PHS system, and as part of our efforts to innovate our business.

(1) Previous Work Style

Our work style until now necessitated that we phone or directly visit people to gather them on-site. So when a quality problem occurs, the production line manager who already has his hands full is burdened with extra work. Moreover, reporting to officers and related sections was a process that took much time and effort.

(2) Ways of Accessing Information from Outside the Office

Executives frequently travel to various locations including overseas to meet with vendors and customers, and their means of accessing information from remote locations were the notebook PCs they carried with them. However, this was always accompanied by the risk of theft or loss. We therefore focused on the mobile phone as the means of communication while traveling, and considered the system architec-

Table   System architecture.

No.	System	Equipment/Software	Units	Remarks
1	SIP server	UNIVERGE SV7000	1	
2	L3 switch	UNIVERGE IP8800/S302	1	
3	L2 switch	UNIVERGE IP8800/S2430	7	
4	Wireless controller	UNIVERGE WL2024	5	
5	Wireless LAN access point	UNIVERGE WL1250	115	
6	Wireless LAN/FOMA dual mobile phone	FOMA® N900iL	200	
7	Wireless LAN/FOMA dual mobile phone	FOMA® N902iL	95	Added in 2007
8	Presence	UNIVERGE PS1000	1	
9	Messenger	UNIVERGE IM1000 + SMTP option	1 each	
10	Security	UNIVERGE RD1000	1	

ture (see **Table**).

The following functions were especially given high priority when considering the system architecture.

(3) Selection of Mobile Phone Models

Since it was necessary to be able to check information using just a mobile phone whether in the office or traveling, we needed a mobile phone model that was compatible with both wireless LAN and FOMA (R) , and based on the amount of information that could be displayed on-screen, a model that was equipped with a browser as well.

(4) Individual/Batch Message Sending and Presence

In order to minimize the information lead time, distribution had to take place on a push basis, and the information had to be delivered not to PCs but rather the mobile phones that people carried with them at all times. Being able to distribute information free of charge while within the range of our company's wireless LAN system, without having to use a charged public system, would be a key point in recovering the cost of our investment.

What's more, it was necessary to be able to distribute information by specifying individual recipients, as well as batch sending to all mobile phones in the system.

Deliberations for the introduction of this system took place over 6 months, including the implementation plan spanning 3 years after the initial launch.

Integration of UC System Architecture with Raw Wound Immediate Observation System

After launch planning discussions were finished, we built the system's infrastructure by implementing the wireless LAN system (UNIVERGE WL Series), presence (UNIVERGE PS1000), security (UNIVERGE RD1000), instant messaging and mobile phones (N900iL/N902iL), and created the foundation for the UC System. After the UC System's foundation was created, integration with the "NAMAKIZU-SOKURAN system" took place in June 2007 and the UC System began running at full scale (**Fig. 4**).

Whenever a quality problem occurs at the production line, the information is immediately logged at the "NAMAKIZU-SOKURAN System." Based on preset rules, the problem is categorized as either "Contact" or "Abnormal" according to its contents.

If information is registered as "Abnormal," the messaging system sends an instant message to the mobile phones of all personnel at a supervisory or higher position. The message includes the URL for the information browser screen so it is possible to check the details at the mobile phone's LCD screen.
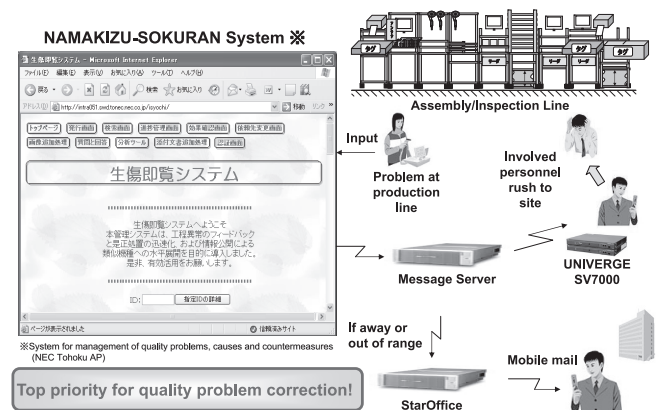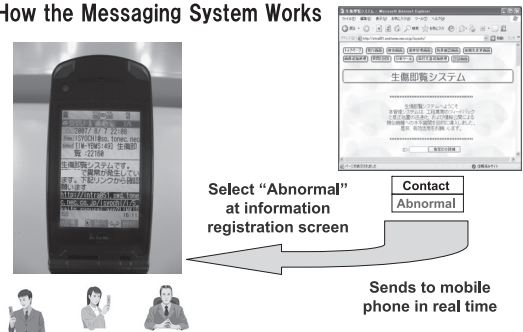

Fig. 4   Integration with "NAMAKIZU-SOKURAN system."

Fig. 5   How the messaging system works.

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Upon checking the information, if it is found to be a product that the recipient is in charge of, that person must swiftly head to the site of the problem. So there is no need for the line supervisor to call those involved on the phone or visit them personally in order to gather the necessary persons in charge on-site.

And since messages are sent to all executives as well, the time-lag for reporting to executives and related sections has been eradicated, giving them a heads-up in real-time (**Fig. 5**).

Implementation into Other Systems

By integrating our StarOffice groupware with the UC System, we decided to send message to mobile phones 5 minutes prior to an event in cases where events are registered in StarOffice's scheduler.

Since the mobile phone functions as a Concierge, it helps prevent users from missing appointments and meetings, and enables them to concentrate on the job at hand without having to worry about what's scheduled next.

Moreover, the scheduler has a coordinated transmission function which allows the host of a meeting to register it in the schedules of all of the attendees together. Through the use of this system, meeting attendees are freed from having to register the event themselves, and will be able to receive the 5-minute notification messages.

Additionally, meeting attendees that receive notification of the next event coming up will try their best to end the current meeting by the schedule time (**Fig. 6**).
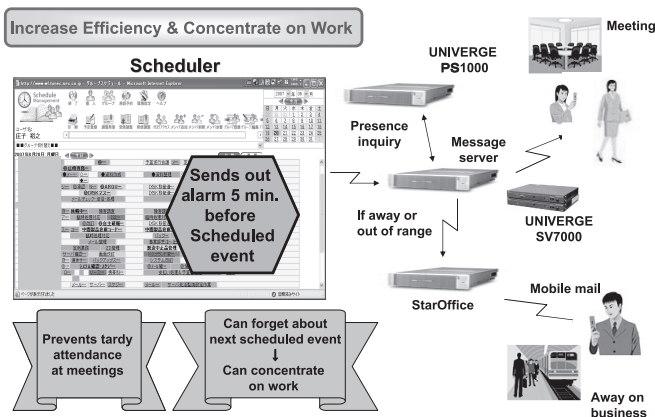

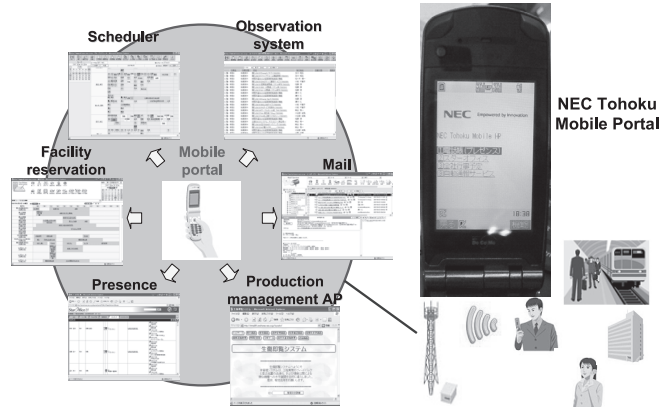Fig. 6   Integration with Scheduler.

Fig. 7   Usage of mobile portal.

Usage of Mobile Portal

The services introduced up until now can be used via the mobile portal from remote locations being visited with the same convenience of inside the office (**Fig. 7**).

As a result, we were able to concentrate most mobile communication methods at the mobile phone, and the instances of carrying notebook PCs outside the office as well as the security risk it posed have been dramatically reduced. Moreover, by using mobile phones that are capable of global roaming, we have been able to provide the same services as within Japan even for those who are traveling overseas on business.

Conclusion

Our UC System constructed in this manner provides an environment in which all personnel involved are given the same information at the same timing, achieving true "equity of information."

By nature, information can become distorted within the chain of communication, and the value of information can be degraded if is received later than others. In this day and age where information has become an important management resource, it would be unrealistic to expect high morale and motivation from employees that are only able to receive devalued or worthless information.

We believe that "equity of information" will lead to improving employee motivation, enabling their teams to realize their

full potential, and ultimately bolster the competitiveness of the company itself.

Future Implementation

(1) Distribution of Messages from Top Management
Sending messages from top management simultaneously to all employees will serve to further increase motivation.
(2) Accommodating Emergency Alerts
By integration with Emergency Alert System, we can provide timely information in case of fire or other disaster.
(3) Sending Information from Mobile Phones
Although the current system only allows information sending from a PC, this will be changed so that information can be sent from mobile phones to allow information sharing even while away from the office.
(4) Usage from Overseas Locations
In order to offer the exact same service as in Japan while traveling overseas on business, we are considering the introduction of 3G + GSM compatible mobile phone handsets.

We will be resolving these issues and further developing our system so that the mobile phone can become the core tool for business communications.

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