

# Analysis Procedures Which Used to Take 2-3 Days Took Only a Surprising 1-2 Hours in the Demo!

Industry Construction

No. of employees 7,400<sup>\*1</sup>

Sales revenue 1.3 Trillion Yen<sup>\*2</sup>

\*1: As of January 2018; \*2: Consolidated, Fiscal 2017

## Issue

before introduction

Visual checks and tallying on-site were inefficient, and there were issues with data accuracy as well.



## Result

after introduction

Video could be analyzed from variety of angles with high accuracy in the office.

### Company profile

## Takenaka Corporation



- Founded  
February 16, 1899
- Head Office  
4-1-13 Hommachi, Chuo-ku, Osaka, Japan, 541-005
- Business Areas
  - 1) Contracting, design, and management of construction work, as well as civil engineering works.
  - 2) Engineering and management for the inspection, research, surveying, planning, evaluation, and diagnosis of projects including construction work, regional development, urban development, marine development, space development, and energy supply, as well as environmental improvement.

### Interviewee



from left

#### Mr. Toyoki Sakurai

Group Leader,  
Construction Robotics Promotion Group,  
Western Japan Engineering Depot

#### Mr. Kohei Nagata

Chief  
Construction Robotics Promotion Group,  
Western Japan Engineering Depot

#### Mr. Hiroki Yamazoe

Construction Robotics Promotion Group, Western  
Japan Engineering Depot

### Introduction Background (Issues)

#### Checks and tallies requiring employees to be on site were far too inefficient.

The Construction Robotics Promotion Group (the Group), Western Japan Engineering Depot (the Depot) of Takenaka Corporation (Takenaka) promotes the development and implementation of construction robots replete with ICT in an effort to optimize construction work in the construction industry. When performing development, they must first analyze and ascertain which parts (processes) of what operations are ineffectual. However, the existing method of having employees remain on site to perform analyses and checks visually was putting far too much of a burden on the team members. Furthermore, because it was unrealistic to expect a single person to check the work of nearly 20 workers on site, they were forced to use the work sampling method every five minutes to get a rough estimation of what sort of work was being performed. The data collected in this way was inaccurate and lacked credibility and persuasive power.

“Survey analysis at outdoor sites in environments of intense heat and cold were harsh, and the long hours this process required where incredibly agonizing. What’s more, even if we were to go so far as to enter the data on-site, we still had to spend many hours tallying and analyzing the data and turning it into graphs by hand after returning to the office. These issues made implementing a solution to improve operational efficiency an urgent issue.”

Toyoki Sakurai, the leader of the Group, made the comment above in this regard.



### Reason #1 for Choosing OTRS

#### Recorded video could now be taken back and analyzed at the office.

Given these circumstances, the recommendation made by Okaya & Co., Ltd., who has long had dealings in the procurement of tools, machinery, and similar items and who also takes part in the joint development of construction robots, was the work analysis tool known as OTRS.

“OTRS allows us to take recorded video back to the office to perform analysis. We still have to go to the work site, but we are able to leave once we have set up the video cameras and started recording. This also does away with the worry of getting in the way of the work being done on site.”  
(Mr. Yamazoe)



There are only three team members taking part in development at the Group in contrast to the several hundred regular work sites they have nationwide. It goes without saying that they can only survey a small fraction of those sites. With OTRS, which allows for analysis via recorded video, the team can entrust camera installation and recording to others and simply go to retrieve the data when the work is complete, freeing them from lengthy time requirements on site.

### Reason #2 for Choosing OTRS

#### Analysis which used to take days now only takes hours! Multi-axial analysis is simple as

A demonstration of OTRS was performed by Okaya & Co. and Broadleaf in June 2018. A video recording was taken of the interior of a construction elevator at an actual work site, and the members of the Group say that seeing the data analysis using that video was a surprising experience.

**"I watched the analysis take place in 1–2 hours using OTRS, but that process would have undoubtedly taken 2–3 days using our existing methods. There is no need to start over from the beginning in resetting work elements because this can be easily accomplished with a few clicks. My honest impression was 'Wow. I never thought it would be able to do this much.'"**

(Kohei Nagata – Chief of the Group)



**"We were able to quickly and easily display graphs from the analysis results. Another attractive feature was the ability to perform analysis from a variety of different perspectives, such as number of floors traveled, people on board, and type of cargo on board."** (Mr. Sakurai)

Because it was clearly a tool that could solve the company's urgent issue of optimizing the analysis process, the decision to implement OTRS was almost instantaneous.

#### Introduction Process

### Dedicated Support With a System Also Including Broadleaf's Account Sales Operations

Takenaka claims that the appeal of OTRS is not only in the user-friendliness of the tool's functions. Despite the fact that OTRS is a system with intuitive controls which anyone can quickly learn to use, it goes without saying that unclear points may surface during the process of mastering the tool. The lifeline in such times of need was the support provided by Broadleaf.

**"Broadleaf accepted our phone inquiries even at a slightly late hour, and that was greatly helpful. Generic software support services have issues such as no longer accepting calls after 5:00 PM or having to call the customer back after they get in touch with the call center, making it take quite a while to receive an answer. With OTRS, however, the person from Broadleaf in charge of our account, who we met at the information session for implementing the service, personally answers our inquiries. This makes for a very smooth and accurate support system which I believe is wonderful."** (Mr. Yamazoe)

#### Introduction Results

### Presentation materials at company-wide project meetings were quite well-received.

Takenaka periodically holds company-wide machinery development meetings in which the relevant departments make presentations on information concerning machinery currently in development as well as the effects and outcomes gained from the implementation of machinery which has already been developed.

When analysis data materials created using OTRS were presented at one such meeting, they were extremely well-received because of how the graphs and other elements consolidated the data in an easy to understand way and led to new realizations for those present.

**"When we presented materials made using OTRS, participants from other departments exclaimed 'Wow!' in surprise. We were able to create easily understandable materials in less time than ever before, and it made me glad that we implemented OTRS."**

(Mr. Nagata)



#### Looking Ahead

### Fully mobilize AI/IoT technologies and accelerate the development and launch of robots.

Optimization and manpower reduction via the implementation of construction robots is a major topic in dealing with the construction industry's so-called Problem of 2025, workforce insufficiencies, as well. Takenaka plans to work to solve these issues by using OTRS to reveal the areas of inefficiency and excess hidden in all sorts of construction sites and developing/launching robots equipped with the latest technology, such as AI and IoT.

#### Users' Voice

## Using OTRS to Design Best Practices for a Variety of Construction Methods

"Here at Takenaka, we have already developed and launched robots on work sites, such as the autonomous gathering robot "TO Gather," which contributes to labor reduction for cleaning tasks at the work site, and the crawler-type transport support robot "Crawler TO," which contributes to labor reduction for the transportation of materials. In moving forward, we would like to investigate best practices for a variety of construction work while using OTRS to verify to what degree performance has been improved by the implementation of such robots."



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