



# Success Story

Chonbuk National  
University Hospital | Delphi



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Department of Medical Information for Chonbuk National University Hospital.



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Delphi

## Introduction

Established in 1909, Chonbuk National University Hospital (formerly Jeonju Gwangjae Jah-hye Hospital), is a general hospital that has continued to maintain its status of excellence over the years. As of January 2015, the hospital has a total of 1,160 hospital beds and has serviced 868,000 outpatients and 368,000 inpatients in 2014. Among its many awards and recognitions, the hospital has been ranked number one by the Regional Cancer Center as the best in treating acute Myocardial Infarction nationwide. It was also recognised as number one in liver and kidney transplants in the Chungcheong/Honam region and acknowledged by the Ministry of Health and Well Being as the leader in cardiovascular surgeries.

Since selected general management and medical support departments were computerized in 1989, the hospital has been expanding computing systems more widely. In 2013, a comprehensive medical information service known as CUBIS (Creative Unique Best Information System) was established. The key components of the system are: EMR (Electronic Medical Record), OCS (Order Communication System), and HIMIS (Hospital Integrated Management Information System), all of which were developed using Delphi.

## Challenges

When it came time to develop CUBIS, the objective of the project team was to create an application that was easy to use while minimizing maintenance costs. Most critical of all was the need to identify the appropriate technology that could help the team build an application

with a highly functional user interface.

As part of its criteria, the application had to enable medical staff to quickly view a complete set of patient information on the one screen while allowing them to perform other hospital tasks at the same time. With this in mind, the CUBIS project team considered two options: a virtualized runtime technology (Web Technology and .NET) or a native technology to develop the solution.

In comparing various development tools used by major hospitals nationwide, the team found that applications built on web-based systems appear differently across different browsers such as Internet Explorer or Chrome, or even across different browser versions. The CUBIS project team realized that if were to use web technology, they would have faced issues maintaining a consistent user interface and not been able to meet their objectives.

In addition, it discovered that applications running on virtual machines, such as those written in Java and .NET, need additional software in order to run which would dramatically degrade performance. “We concluded that using Java and .NET could limit CUBIS’ performance and may not display sufficient patient information, which is necessary for deploying medical information system of this scale,” says Sam-Kyeong Kim, IT Manager, Department of Medical Information for Chonbuk National University Hospital.

## Solution

The team decided to move their analysis to native development technologies. As a result, Delphi was selected as the

## ORGANIZATION

General hospital

## APPLICATIONS

CUBIS medical information  
Service

## TOOLS USED

Embarcadero® Delphi®

## CHALLENGES

Application development time  
Ongoing system  
maintenance costs  
Need to improve staff productivity

## RESULTS

Increased productivity  
for medical staff  
Reduced maintenance costs while  
maintaining high quality of service  
Enhanced functionality for  
more widespread distribution

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development tool for its functionality and performance. Compared to other technologies, writing CUBIS in Delphi meant less developers were required to maintain it therefore cutting the ongoing operational costs for the Hospital.

Using Delphi, Chonbuk National University Hospital was able to develop an information system with advanced functionality and fast performance. “Because Delphi runs natively on the Windows operating system, we were able to create an application with a highly functional user interface, which the medical team highlighted as a critical requirement at the start of this project,” says Kim. “Selecting Delphi was an excellent choice for the CUBIS development team.”

Given that developers at Chonbuk National University Hospital had used PowerBuilder in the past, many had limited experience with Delphi. They found that Delphi was not only easy to learn, developers were able to be productive quickly compared to adopting other development tools, Kim explains. “We used Delphi for the first time on the CUBIS project, so we all underwent a three-day Delphi workshop provided by DevGear.

As a result, our developers learned Delphi rapidly and we are now able to maintain the system without seeking assistance from external parties.”

As a well-established Integrated Development Environment that pioneered Rapid Application Development (RAD), Delphi has been actively supported through continuous research and development investment by Embarcadero Technologies, Kim notes. “What sets Delphi apart from other development tools is that it supports not only Windows but also Mac OSX, Android, and iOS platforms. Embarcadero also continues to invest in Delphi by supplying frequent releases that adapt to the rapidly changing IT environment.”

#### Results

CUBIS performance has received positive feedback from the medical staff due to its user- friendly interface which mimics the previous manual approach, Kim notes. “By not disrupting this process, but rather automating it, the system has significantly increased the medical staff’s productivity. It provides convenience and optimal performance, allowing for fast and stable treatment because it runs directly on the operating system.”

Delphi has also significantly reduced maintenance costs, he reports. “Delphi’s excellent framework and object-oriented programming language resulted in high code reusability. After the completion of CUBIS, we were able to maintain the system independently with a small number of developers, while still providing high quality service.”

In order to optimize development productivity, as well as provide the foundations for future deployments, the CUBIS project team introduced a development approach at the onset of the project by establishing a series of packages. “Delphi gives us the flexibility to develop and manage our functionality in reusable packages. This has not only enhanced development productivity but it has allowed us to distribute modified packages separately, making new version rollouts convenient and less time consuming,” Kim says.

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