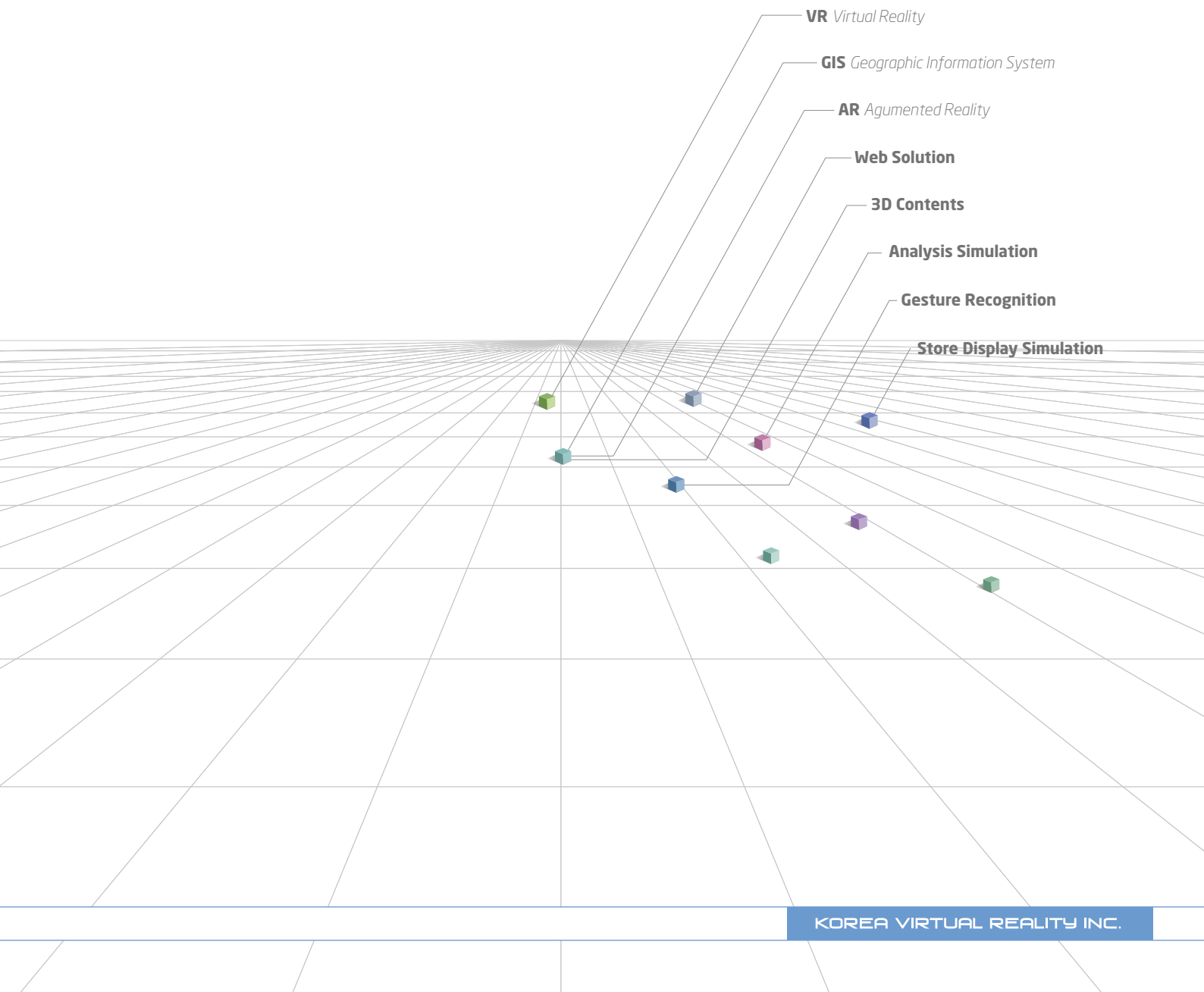


# Korea Virtual Reality Inc.

Creative and innovative KOVI





## Company Introduction

Korea Virtual Reality Inc. is a company specialized in virtual reality that is carrying out businesses in diverse fields such as construction IT, fusion IT and digital contents ranging from major national projects to general industrial fields on the basis of the 3D space information technology, the core technology of 3D virtual reality, independently developed by KOVI.

Since it was established in 1998, KOVI has successfully carried out a number of 3D virtual reality system construction programs using its matchless technical capabilities, on the basis of which endless efforts are made to develop new technologies and create innovative ideas in the fields ranging from augmented reality and motion recognition to Web based application solutions. basis of the 3D space information technology, the core technology of 3D virtual reality, independently developed by KOVI.

**"Changing world always require a new leader."** We will make KOVI the representative of Korean virtual reality company in the world by providing virtual reality services, which fit into new era with higher passion and spirit for visible future.



**KOVI**  
KOREA VIRTUAL REALITY INC.  
KOREAN VIRTUAL REALITY INC.

## Business Scope of KOVI

3D Engine Customizing

### Total Virtual Reality Solution

Digital Contents

Motion Recognition

Augmented Reality (AR)

Virtual Reality (VR)

Interior Building  
Material Contents

Nationwide 3D Apartment  
Size Type Contents

ASP Service

Architecture, Interior  
Construction/consultation  
KOVI on-line service

**ASP solution**

## Intellectual Property Status

- Registered a patent for joint design and distributed presentation method using CAD-virtual reality system on internet.
- Registered a patent for virtual reality based 3D house interior processing method and recording media.
- Applied for a patent for sentence learning method and system using augmented reality technology.
- Registered a patent for animation action experience contents service system and method

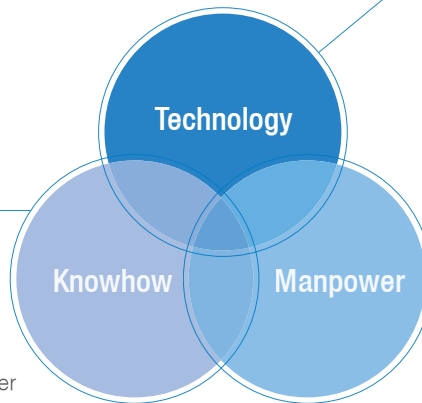
## Award Winning Status

1998	Selected for the two sectors of the 'Venture Foundation Item Contest' (Ministry of Information and Communication)
2006	Selected for the most superior prize among '2006 100 Top Superior Patented Product Grand Prize' (Hankook Daily Newspaper)
2007	'Cyber Engineer U24' jointly developed by KOVI and KITECH won the grand prize (MEST)
2008	KOVI On-line Service selected as the 'best 2008 ASP Service in Korea in '2008 Superior ASP Selection Project' (MKE)
2009	Won the prize from the Minister of Culture, Sports and Tourism in '2009 First Quarter Digital Contents Grand Prize' (MCST)



## Competitiveness

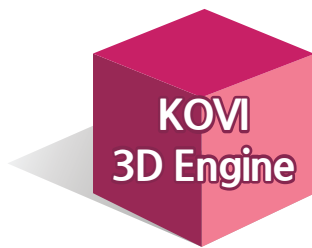
- Researches in the related fields have been conducted for more than 10 years.
- A number of projects in the related fields have been successfully carried out.
- Services are provided to diverse customer classes such as civil, public and general customers.



- Application in diverse environment through Core Engine developed independently by KOVI
- Open architecture that enables easy customization
- Core Engine verified through workshop
- Technology development by the company laboratory and understanding of advance technology trend
- In possession of human resources specialized in marketing and consulting
- In possession of a number of high grade development human resources including professional engineer system



## Technical Capabilities



It can be expanded to diverse shape and platform based applications through highly expandable Core Engine



Architecture Interior

Fire/Disaster Prevention

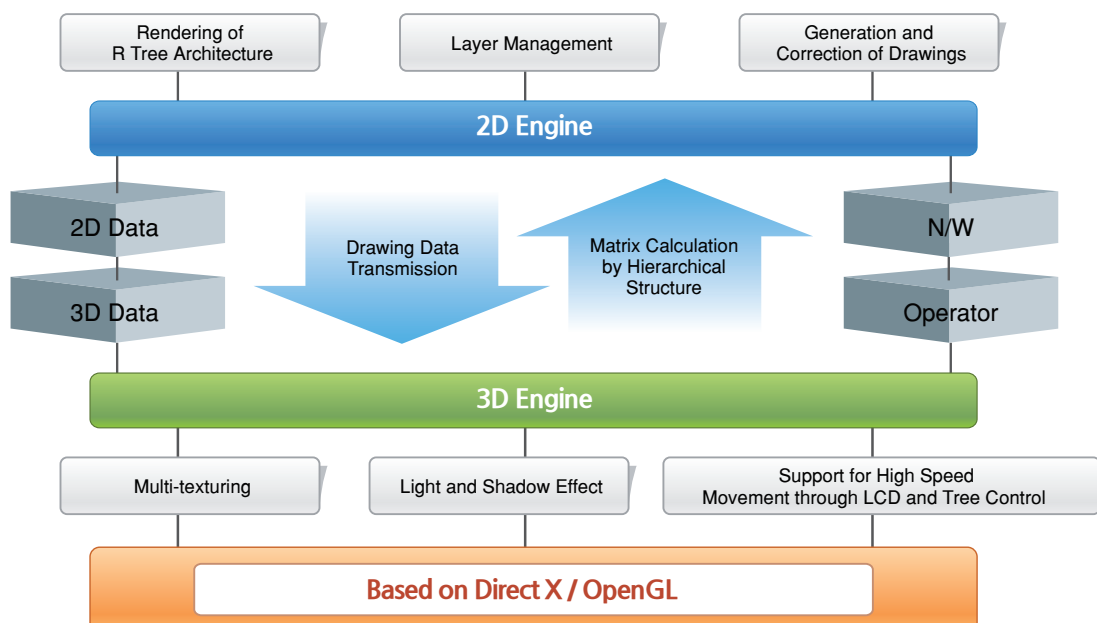
Analysis Simulation

Mobile/Web

Shop Display

Rental/Space Management System

## Organization of KOVI Core Engine





It is an object-based intelligent CAD system, which supports easy and fast 3D VR work of interior and exterior appearance of buildings. It can convert the data designed in a dedicated 2D engine to 3D spatial information in real-time without requiring any separate data work.



## Solution of which the performance is verified

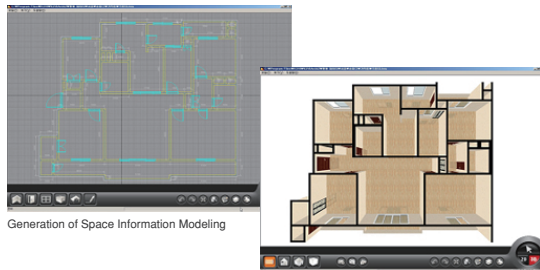
The performance, stability and efficiency of the architecture /interior solutions provided by KIVI have been acknowledged in the related market for last 10 years. In particular, the ASP (Application Service Provider) service, which has about 10,000 medium sized interior work companies as the members all over the country, has been acknowledged for its excellent usability and performance as the first virtual reality based on-line design solution in the world. It has been nominated as the 2003 EC Grand Prize, the most superior prize in 2006, the 100 Superior Patented Products and the 2008 Best ASP Service in Korea in 2008 Superior ASP Selection Project.

## Work time reduction and efficiency improvement

The work time has been reduced to 1/10 of that of the existing CAD system supported by drawing-type structure. The efficiency has been improved through layer control of each building structure.

## Support for easy structure plan method

The drawing design engine, which uses EzCAD developed independently by KIVI, supports drawing-type wall design. A user can design attributes such as thickness and height of wall.



Generation of Space Information Modeling

## Generation of Real-time 3D Space Information Model

The data designed in EzCAD mode can be converted to 3D space information in real-time without any separate work, and the component based objects such as doors, windows and small articles can be visualized in 3D-mode based on each attribute value.

## Linkage with interior construction material DB

KIVI has a library of about 30,000 interior construction materials distributed in Korea such as wallpapers, floorings and furniture, which can be added and linked to the relevant solution.

## Compatibility with diverse file formats

It supports import/exports of files widely used in architecture/interior fields such as DWG, DXF, 3DS, JPEG and DMP.



Convenient Material Change



Free Simulation

## Free simulation

It supports the work-through simulation that can navigate the space reflecting the point in time of an actual person in 3D virtual space.

## High picture quality 2D rendering

More realistic 2D outputs are provided through free setting and edition of the arranged lightings.

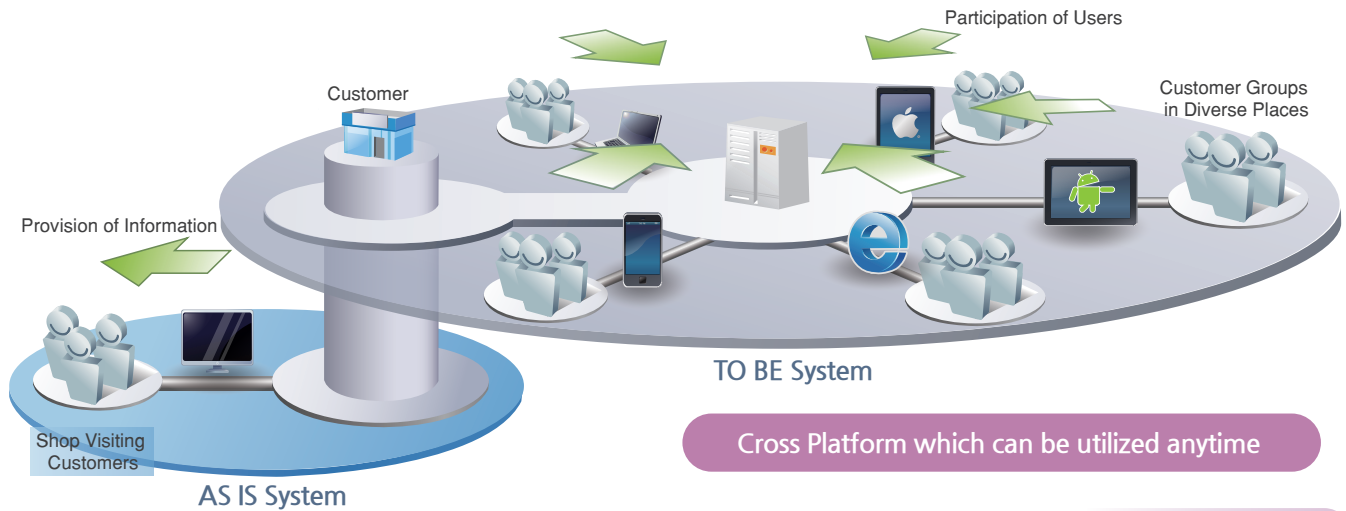
## Convenient material change

The material editing function, which can conveniently change the materials of the space and objects, enables space design in diverse environment.





We provide a cross platform that enables dissimilar models such as the virtual reality solution operated under Android and iOS operating system, the Web, mobile and PC-based systems to share data.



## Compatibility with diverse file formats

It is becoming easy for customers to acquire desired information through the development of media such as Internet. In particular, the trend in the related market is changing to the system which enables customers to directly participate in the decision making, as customers wish to participate in selecting products and presenting opinions for interior design and furniture purchase. During a final purchase, the image of the products that will be placed in house can be demonstrated.

## Elimination of the restrictions on time/place

Customers wish their opinions to be respected and to virtually see how they are reflected. Under existing social conditions, they wish to check and review the design draft irrespective of time in any place like the office, construction site or home. For this reason, a cross platform that enables the developer and customer to share the design draft on a smart device or the Web is essential.

## 'KOVI House' in service in Naver Social Apps

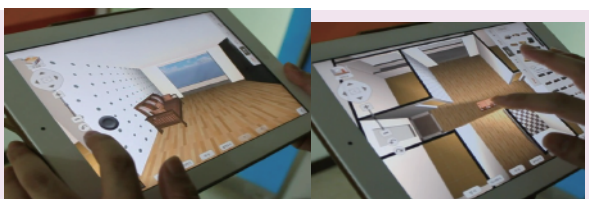
'KOVI House', which is designed to enable ordinary persons to easily and interestingly use the interior design and which has been recognized as a domain of experts, has been in service in Naver Social Apps since December 2010. It has won the Golden Prize and Idea Prize in the contest carried out by Naver, and its performance and idea have been acknowledged.

## A new concepts of living Service Platform on which SNS is grafted

It is a structure in which the user tries interior design in person by utilizing the library of the interior construction materials actually distributed in the market and shares the information with other users or companies. It is an organic system for which manufacturer, distributor, customers and designers become the subjects. It can also provide more information to individual customers through social network structure by which the contents can be reprocessed and spread quickly as a means of publicization for companies.

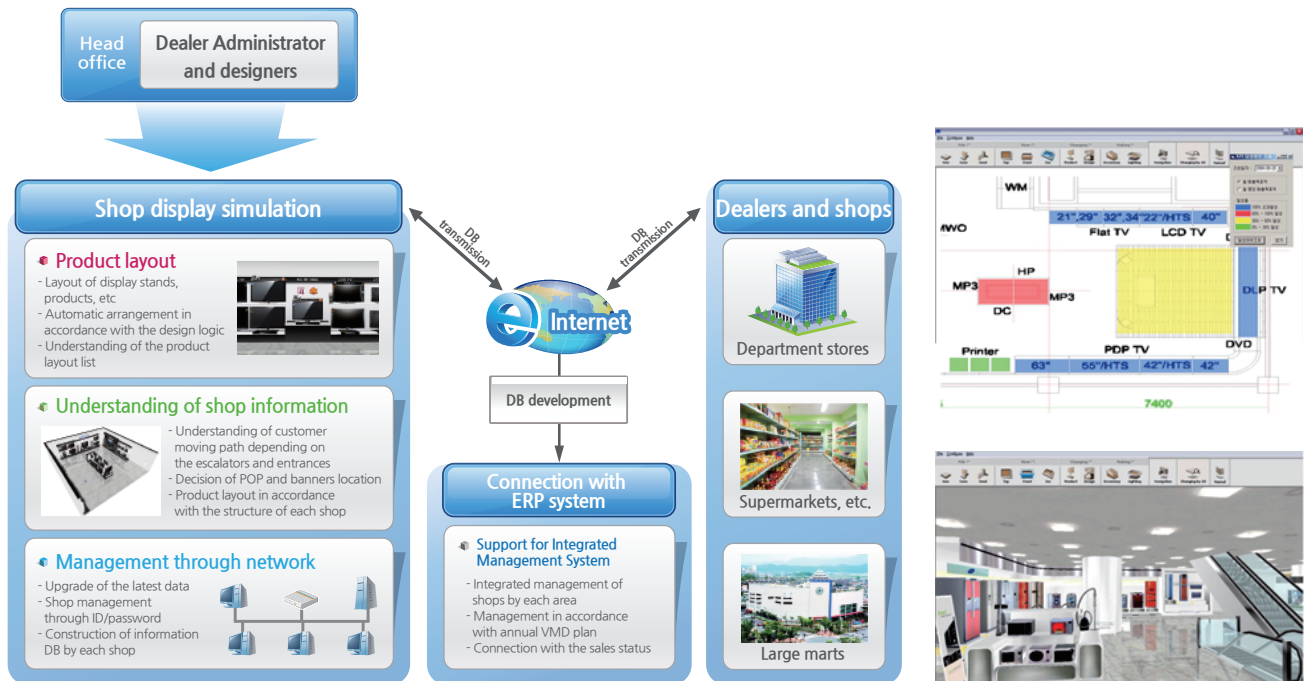
## Operates under smart tablet environment

Performances such as space design, arrangement and change of objects can be carried out under iOS or Android environment. Also, the work results can be shared with the existing PC-based KOVI Archi and Web-based KOVI House.





It is a solution which enables visual check of the relevant data by applying VMD (Visual Merchandising Display) elements such as layout composition, movement line adjustment, and space-considered disposition of products which are important elements of shop display

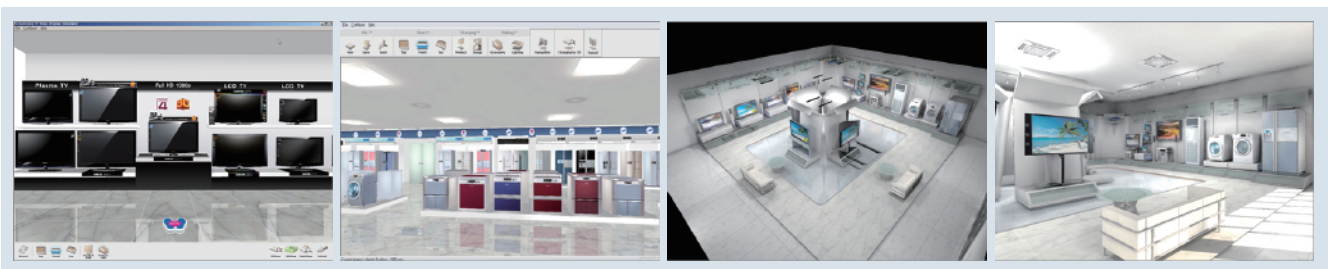


## Provision of the function to systematically manage the database by each shop

It enables the user to propose and manage shop display by each area in accordance with the annual VMD plan by supporting shop display design and utilizing database of each area. As it enables the user to carry out integrated management of not only domestic but also all overseas shops, it makes business undergo smoothly and supports efficient management of each dealers and shops by the head office.

## Application of the VMD-based commodity display logic

The width, height, quantity and type of the display stand can be input to the database and visualized in 3D space in compliance with the requirements from the customer. Also, it provides applicable functions to the staple goods, the goods that can be shopped in a short period of time and the seasonal goods by product's option on the stand.



## Automatic arrangement simulation that analyzes the structure and size of the space

It enables the user to propose and manage shop display by each area in accordance with the annual VMD plan by supporting shop display design and utilizing database of each area. As it enables the user to carry out integrated management of not only domestic but also all overseas shops, it makes business undergo smoothly and supports efficient management of each dealers and shops by the head office.

## Marking of stable goods location through analysis of shop space information

The width, height, quantity and type of the display stand can be input to the database and visualized in 3D space in compliance with the requirements from the customer. Also, it provides applicable functions to the staple goods, the goods that can be shopped in a short period of time and the seasonal goods by product's option on the stand.



The system furniture solution that provides a special design function for each use such as kitchen, built-in closet, office and general furniture is providing a customized integration service, which concurrently links the design with quotation and order placing by reflecting on the customers' needs.



## ■ Maintenance of the latest data through automatic upgrade

The system furniture solution not only has simple design function, but also enhances work's productivity through linkage with the backbone network system such as order placing system. Also, as it consists of a structure that can be expanded to the CRM system such as customer management, an integrated system ranging from customer consultation to the final happy call can be constructed.

## ■ Verification of the usability in real works has been completed.

As it is utilized by preeminent domestic companies such as Borneo, Livart, Iloom, LG, Enex and Paroma Furniture in their business, the usability and stability of the relevant solution have been already verified.

## ■ Provision of customer consulting method utilizing the latest IT technology

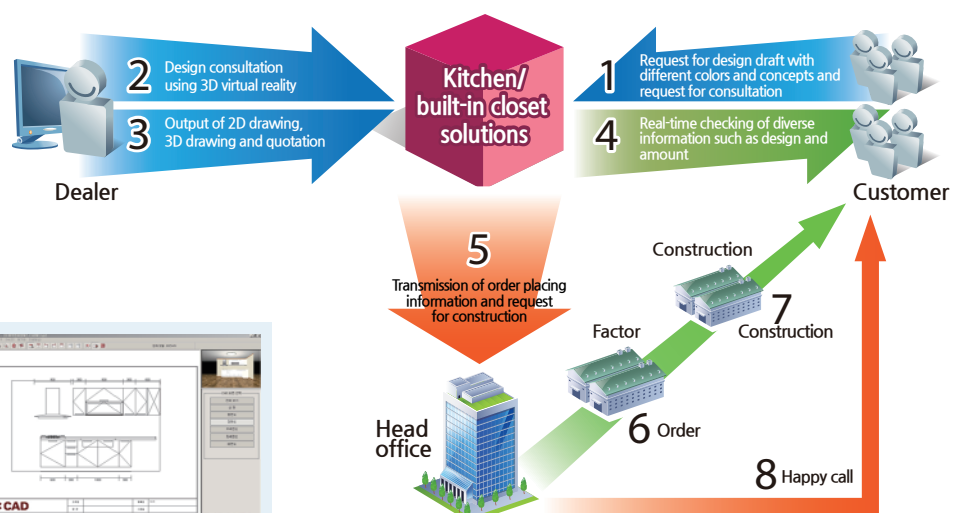
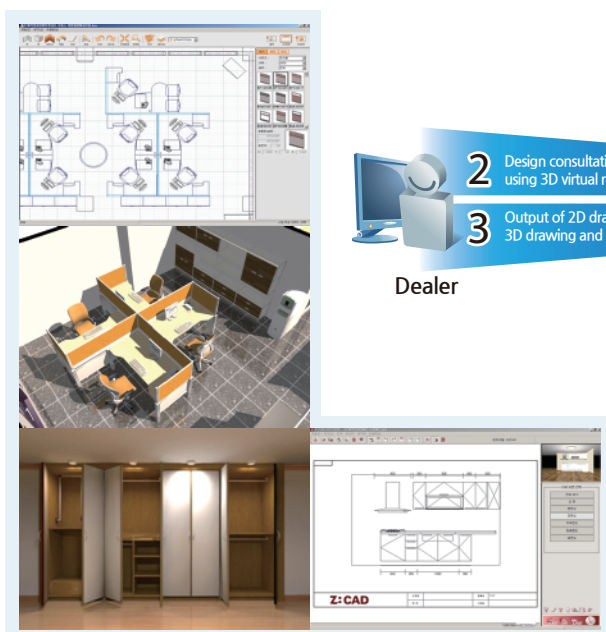
The trend of a recent system furniture market is based on the customer consultation and presentation through 3D virtual reality. Such customer consultation is in the trend of being universalized among domestic companies ranging from representative brand companies to medium/small companies, and most of dealers and shops are using the system furniture solution provided by KIVI.

## ■ Automatic generation of BOM unit quotation

It was difficult for the traditional 2D-based layout design to intuitively convey the size of space and the resulting layout information to customers. Visual conveyance of information through 3D virtual reality will enable the user to be one step ahead of the competing companies in the comparative advantage. It can eventually draw out fast decision on the purchase.

## ■ Maintenance of the latest data through automatic upgrade

It is easy to manage and free from risk of being lost in comparison to the existing hard lock method as the program is executed in ID/password method. Also, as the latest information can be automatically upgraded concurrently with execution of the program, dealers and salesmen can maintain the latest data at all times without a separate work.





# Fire/Disaster Prevention Solution



KIVI - Korea Virtual Reality INC



It enables the user to build the interior and exterior of a fire object in 3D. This makes a solution in which its information can be checked on the mobile-based tablet PCs and in the integrated situation room at the same time. It can be utilized as an effective establishment of suppression operation plans and resource allocation plans during fire and as a mission simulator during normal times.



## On-site response through 3D and execution of fire-fighting training

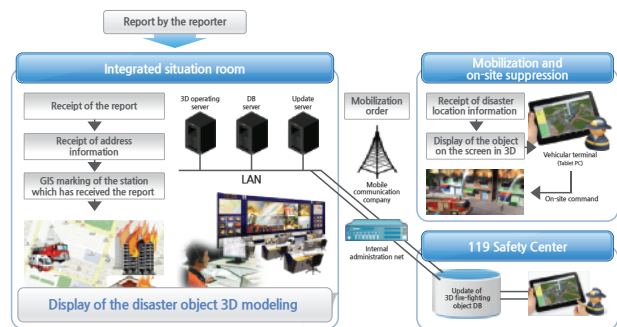
The information about interior/exterior of the objects in the disaster scene, various fire protection systems and dangerous facilities can be checked under 3D virtual reality environment. This enables a quick on-site response when a disaster occurs, and it can be used for virtual fire protection systems, which produce a simulation of fire in normal times.

## Cross platform support

It can be operated on mobile terminals (Android and iOS operation systems are supported) and PC (Windows), and the data can be shared by dissimilar platforms.

## 3D spread of situation being linked with the integrated disaster situation room

The operators in the situation room can check 3D information about the disaster scene as soon as the order is received. The operators in the situation room notify the status of fire in places such as the access road, activity space, and adjacent fire-fighting facilities such as connected water supply pipe using the radio set. This provides safety by understanding the status of buildings interior and the location of emergency exits.



System block diagram



## Provision of fire-fighting (dangerous) facility status

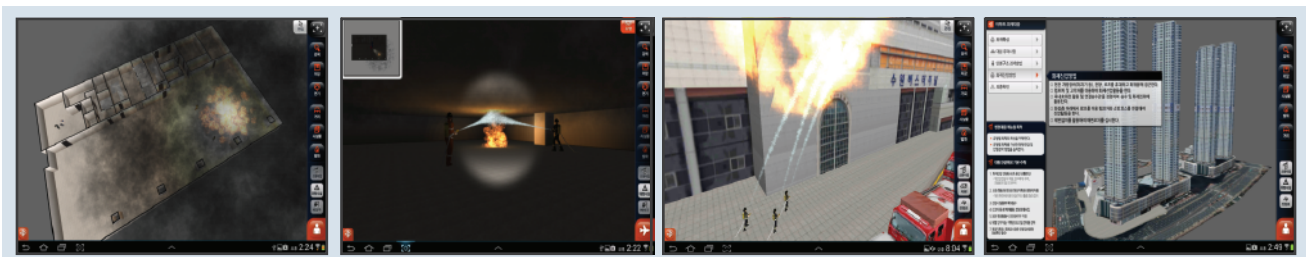
The exterior appearance of the object including the surrounding road status and the interior structure of each floor are provided in realistic 3D animation. Through this, the locations of various dangerous facilities and fire-fighting facilities can be intuitively understood.

## Provision of the function to arrange/edit vehicles and fire-fighting(dangerous) facilities

It enables the user to freely perform arrangement/editing in accordance with diverse training scenarios by providing various fire-fighting vehicles and facilities in 3D library.

## Generation of the expected suppression route and distance

The information about access roads/evacuation routes of each object is provided. The expected route and distance from the access road to the point of ignition or to the point from which lives are requested to be rescued can be checked.





The rental/space management solution operated on Web breaking from the existing C/S environment can be freely linked with the rental management system already established. It is managed/operated being grafted onto the BIM-based 3D drawing design function for efficient drawing management and customer convenience.



## Web-based space management system

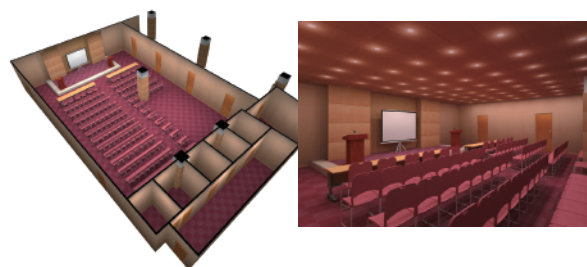
Web-based space management system, which has broken from C/S environment, provides concentration of management information and easiness of service environment. It can overcome the spatial and physical restrictions without limiting it to a specific PC or to the designated user.

## Enhancement of space (drawing) management efficiency through virtual reality

It is constructed in consideration of the administration aspect, marketing and further provision of customer convenience by providing space search, and space/equipment simulation functions depending on the drawing edition and conditions.

## Perfect compatibility with the rental management system already built

The rental and space management system share all information and support faster and provide more accurate decision by making the mutually required information as retrieving in real-time. The customer can intuitively check the rental space and carry out simulation, and the administrator can save time through visual immediacy and fast decision making.



## Provision of intuitive information through visualization

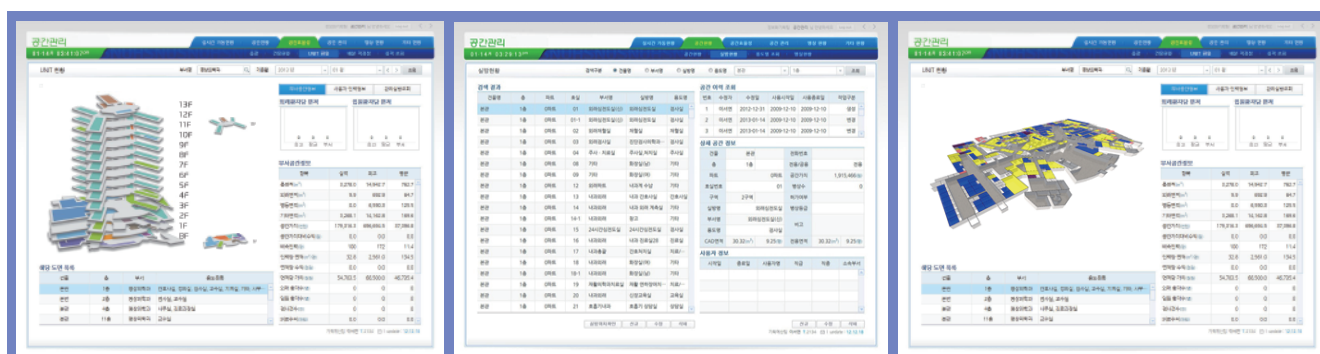
The user can immediately check diverse information by only using a drawing, as diverse information is displayed visually in the space. Through this, it efficiently establishes a space plan and checks the operation information.



Example of COEX Rental Space Management System in 2012

## Provision of integrated information through space management (Digital Information Display)

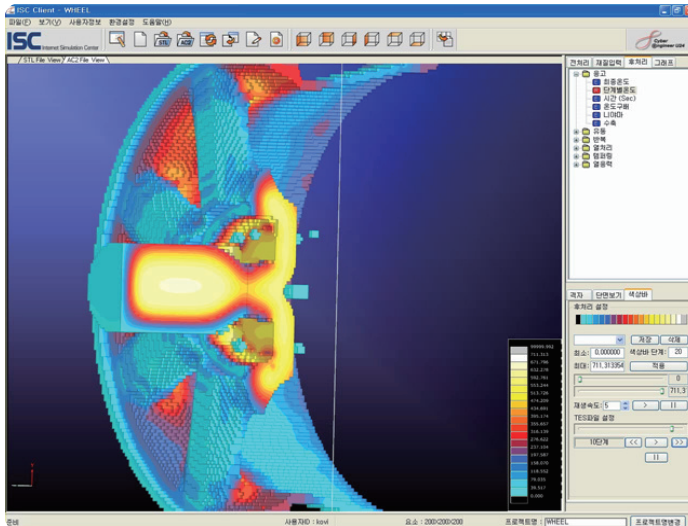
'Space' is the highest asset of any other values. The current information is provided by collecting diverse informational values that occur in the space. The optimum service is provided for creation of higher values by analyzing efficiency of the space.



Example of Seoul National University Hospital Rental Space Management System in 2012



A result of analysis can be simulated using diverse visualization techniques in connection with the analysis modules of the relevant industrial fields such as communication, thermal conduction, lighting and sound based on the space data and 3D objects.



## Open architecture of Core Engine which enables smooth connection with Analysis Modules

The 3D virtual reality Core Engine supplied by KOVI is of an open architecture, which can be customized in connection with the analysis modules of diverse industrial fields. It extracts and provides 3D-face for various environments, which become the foundation for execution of analysis and satisfy the customers' requirements by providing setup and interface of various parameters.

## Check of analysis result by using graphs and charts

It not only enables the user to visually check the analysis result right away under 3D virtual environment, but also supports intuitive and easy understanding by utilizing various charts and graphs. Also, as the relevant result can be exported in a report form such as Excel or Word, it can be utilized as actual works.

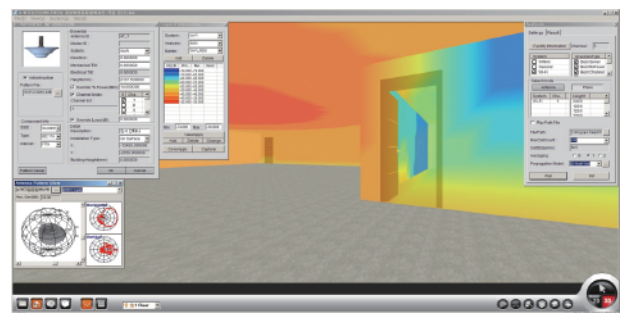
## Casting analysis simulation applied to KITECH

The casing analysis simulation, which is used for process development and product design plan in order to improve the quality and yield of casting products, is expected to bring about the effect of life prediction, prediction of risk factors of the manufacturer and cost reduction by performing analysis connected with flow and coagulation.

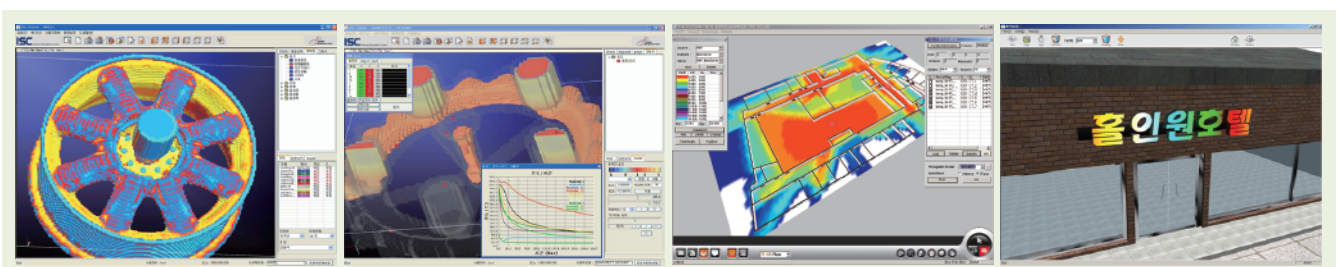
- 3D objects are dynamically varied by changing the relevant meshes using SceneNode structure.
- It supports thermal conductivity simulation by timeline.
- It supports mesh division of the relevant object in rectangular parallelepiped grid unit and section view

## Radio communication analysis simulation applied to KT

It is comprised of a system that can easily and quickly predict indoor wireless net coverage and can set and manage the optimum location of indoor AP under the situation through high speed indoor wireless data communication.



- It optimally sets and manages the location of the base station and antenna.
- Analysis of communication environment in accordance with the space media data
- Analysis of communication environment in accordance with the length and types of cables
- Ray Tracing based RF diffusion model



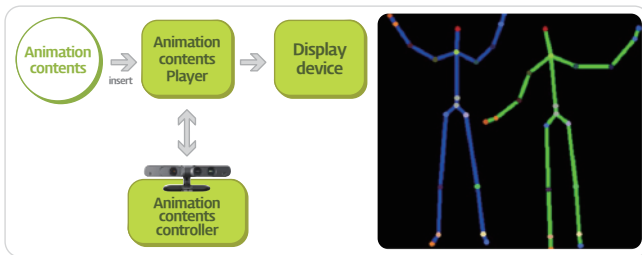




We provide applications for users to produce diverse interactive contents through the motion recognition solution that is on the rise as a significant UX-based interface for next generation.

## Utilized as a UX based Interactive Interface

It enables to identify user's movements in real-time, to express in a 3D virtual space and to produce diverse contents by synchronized movements from a virtual character. The suitability of user's complicate behavioral patterns can be enhanced by extracting the most ideal information for application requirements: in other words, the user's the 3D coordinate information, the user's rotation of force followed by motion and strength versus weakness.



## Patent-related Main Contents

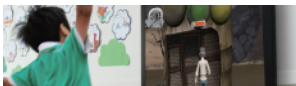
- The Applied Title of the Patent: Animation Action Experience (Contents Service System and Method)
- Application Number: 10-2011-0140187
- Registration Number: 10-1153952

## Production of Interactive Contents through Motion Recognition

KOVI was selected as the 2011 Virtual Reality Support Program supervised by Korea Creative Contents Agency (KOCCA) and developed <FunnyDu>, a motion recognition contents for education. <FunnyDu> detects the user's movements through motion recognition technology based on skeleton models and synchronizes the movement with the character. It will be released as the infant education institutes and individuals version.

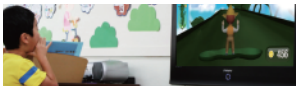


<FunnyDu> is a virtual experience contents used by children to make episodes through learning and physical development games, English, Mathematics and Hangul by becoming a character in animation. It is comprised of diverse learning modes such as physical development [Game Mode], [Quiz Mode] for resolving problems through diverse gestures and [Dance Mode] for dancing through following a dance teacher with exciting music.



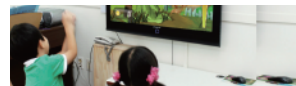
episode #1.  
**Physical Play**

The child carries out a game through motion recognition in a specific episode of an animation. A strong effect on physical development can be naturally obtained by types of game method.



episode #3.  
**Moral Lesson**

Through fairy tales, children can obtain diverse lessons and positive attitudes towards living as well as thoughts about upright behaviors. They can also learn filial duty for parents, relations between brothers and fidelity between friends.



episode #2.  
**Learning by Playing**

As subjects such as Hangul, Mathematics and English may be boring to children, they are provided in a way of game being grafted on animation, which enhance children's concentration and interest. A verified educational services and high quality contents are also provided.



episode #4.  
**Dance Time**

Children can have dancing lessons with a pleasant, enjoyable music. When they dance, the character inside the fairy tale follows children's motions, and the dance routine can be recorded.



## KOVI Solution —————

Innovative ideas are needed to make the business a success

