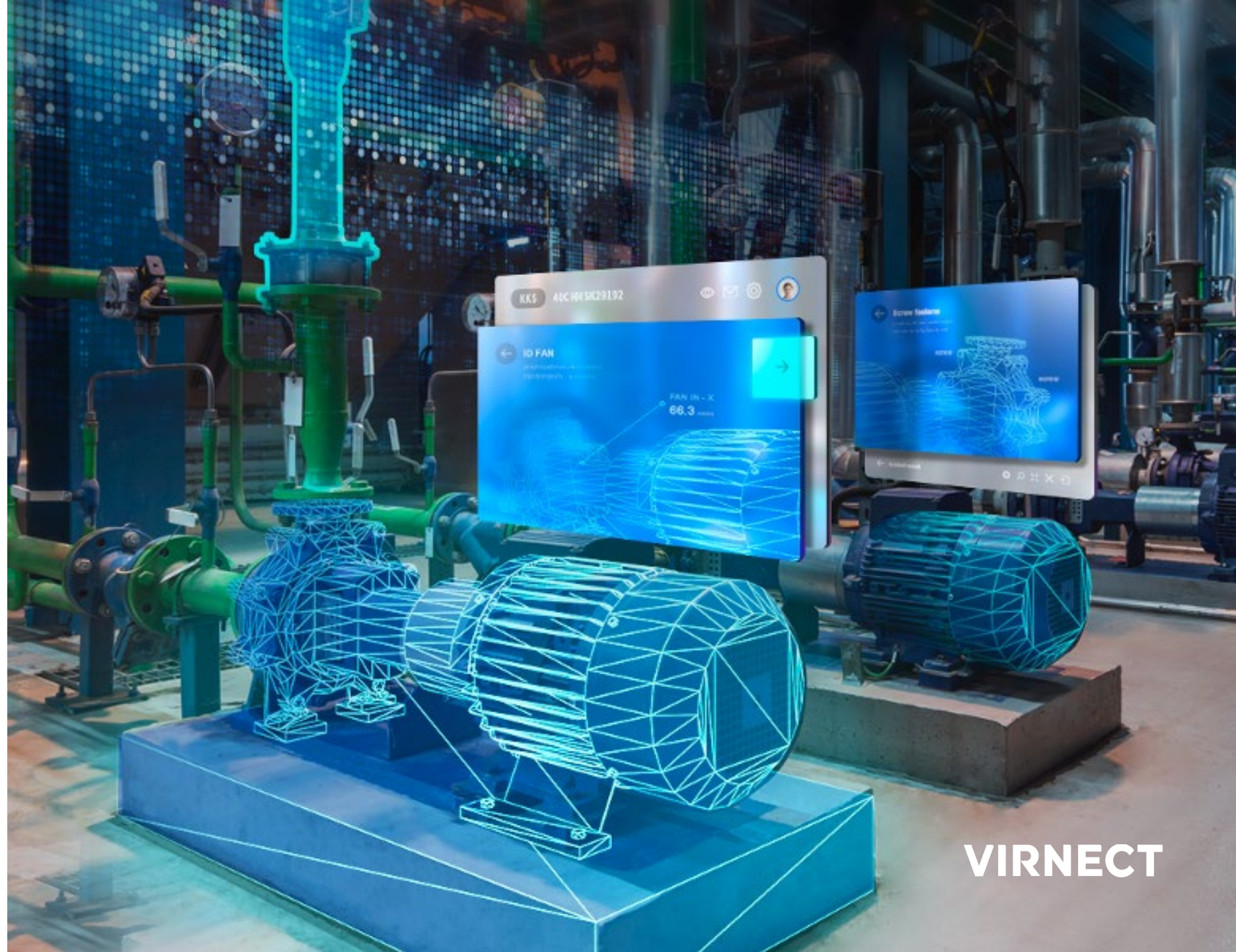# VIRNECT

Era of Coronavirus

Revolutionize industrial site issues through remote collaboration

Q3 2020
contact@virnect.com

VIRNECT

How safe is your worksite?

Harsh industrial site results inefficient performance

5 casualties occur daily due to the industrial accidents*
Low labor productivity compared among OECD countries (28th out of 36 countries) **

Risk of falling and electric shock

Joint responsibility is required between subcontractor and main contractor

Missing/injury/death due to explosion in chemical factories

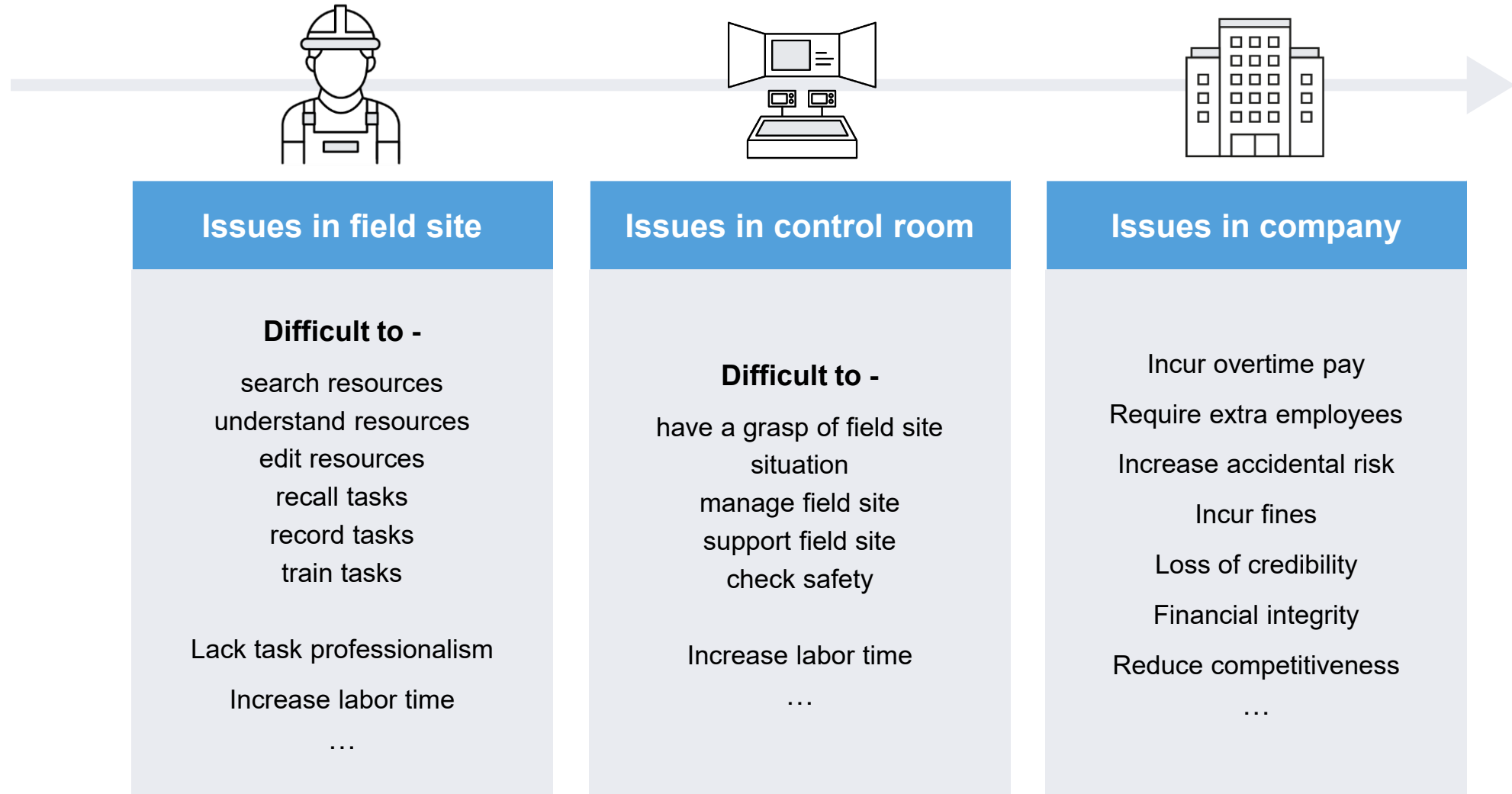Inefficient communication
Inadequate response in worksite

Inefficient inspection
Manual records

Inefficient worksite management
Lack of safety training

2

VIRNECT

What is the cause?

Issues in the field site, control room and company

Issues in field site

Difficult to -

search resources
understand resources
edit resources
recall tasks
record tasks
train tasks

Lack task professionalism

Increase labor time

…

Issues in control room

Difficult to -

have a grasp of field site situation
manage field site
support field site
check safety

Increase labor time

…

Issues in company

Incur overtime pay

Require extra employees

Increase accidental risk

Incur fines

Loss of credibility

Financial integrity

Reduce competitiveness

…

VIRNECT

DT·AR technology can resolve your issues

Realize non-face-to-face work experience with our core technology

Digital Transformation, DT : Digitization of analog information

Augmented Reality, AR : Technology to visualize the digital information in reality

현장   통제실

*VIRNECT Remote use case – Equipment O&M using Smart glasses

- **Safety Insight**

  Augment safety information by creating work safety checklist, danger zone alert etc.

  ▶ **Guarantee safety and reduce work accident**

- **Operation Insight**

  Augment task information by creating task procedure list, equipment layout, operation data etc

  ▶ **Easier to comprehend tasks and increase work efficiency**

- **Business Insight**

  Quick and precise understanding of situations in field sites to resolve issues and increase profit

  ▶ **Reduce expense and decision-making time**

VIRNECT Solution

Era of Coronavirus,
Resolving industrial site issues through remote collaboration

Field site

Control room

Perform effective field site work	Perform effective field site support / understand situation

Remote Field site Real-time remote collaboration	← Collaboration data →	**Remote** Control room Real-time remote collaboration
AR SDK Equipment detection / tracking	Status data	**Twin** 4D field site monitoring
View Augment equipment / task information	Task data	**Make** Create AR training / task materials

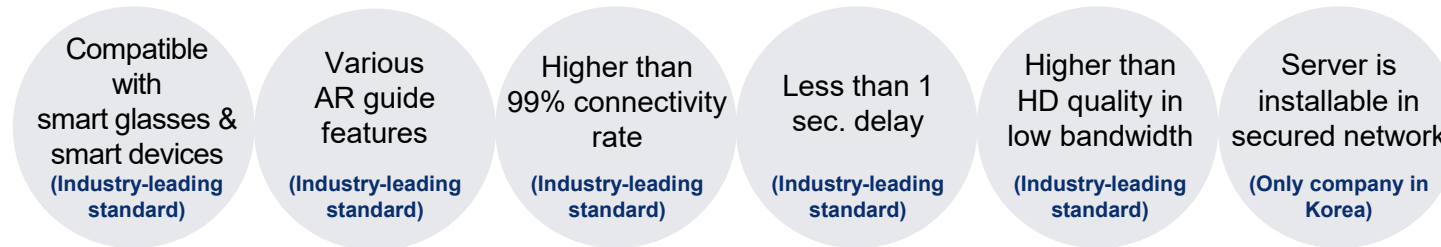| **Platform**
Guaranteed service linkage/stability/scalability |
|---|

VIRNECT

VIRNECT Solution

Remote | AR remote collaboration
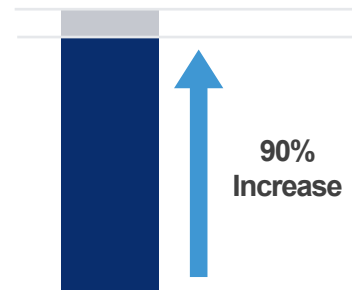
The quick agreement and accurate instruction between the users increase the task performances.

Reduce business trips of specialists and reduce the downtime to increase overall operation efficiency.

| Compatible with smart glasses & smart devices **(Industry-leading standard)** | Various AR guide features **(Industry-leading standard)** | Higher than 99% connectivity rate **(Industry-leading standard)** | Less than 1 sec. delay **(Industry-leading standard)** | Higher than HD quality in low bandwidth **(Industry-leading standard)** | Server is installable in secured network **(Only company in Korea)** |

Work accuracy
Increased by 90%

90% Increase

(Augmented Reality (AR) Trends: The Past, Present & Future Predictions For 2019, Towards Data Science, 2019)

Experts' inspection cost
Reduced by 90%

90% Reduce
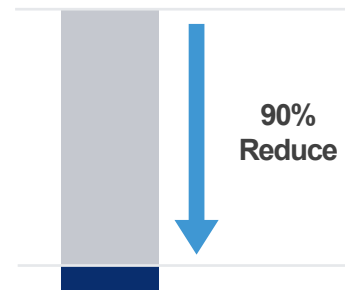
$200K → $20K
Use of VIRNECT Remote
by Hanwha Total Petrochemical Co., Ltd

[▶] Play

원격 전문가 (Remote Expert)

현장 작업자 (Field Worker)

VIRNECT Solution

Make | Create & distribute AR contents
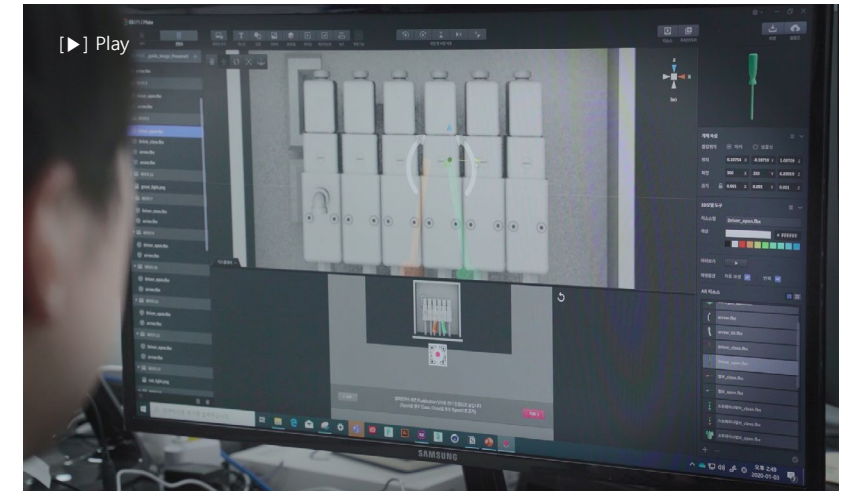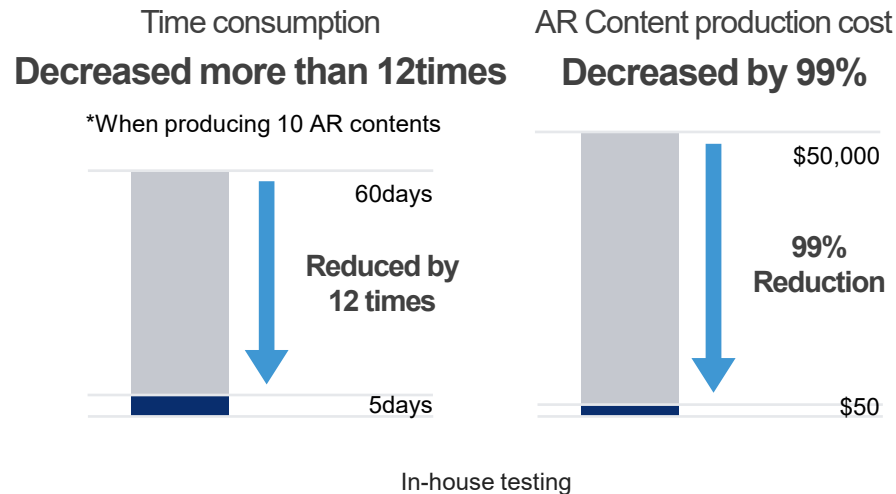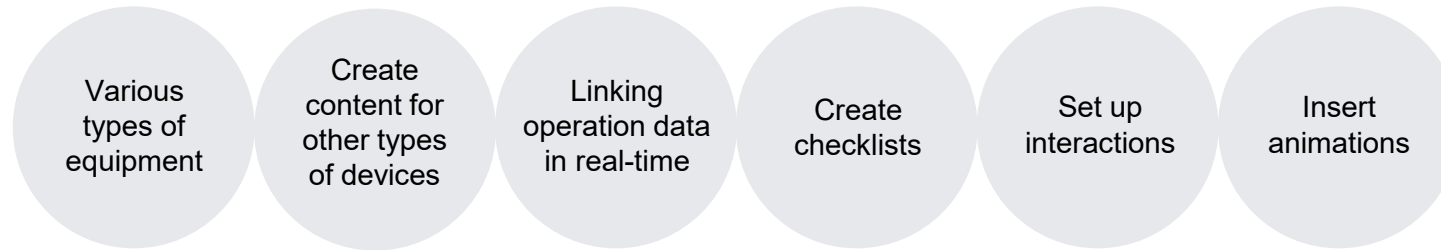
Turn experts' know-how into AR contents without the need of coding skills.
When comparing with the existing AR content development method, it is much easier to create, distribute and perform maintenance at a cheaper price.
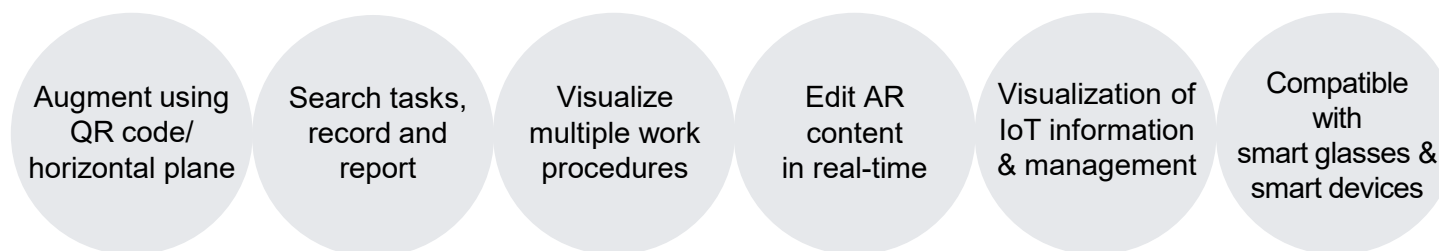
Various types of equipment

Create content for other types of devices

Linking operation data in real-time

Create checklists

Set up interactions

Insert animations

Time consumption
Decreased more than 12times

*When producing 10 AR contents

60days

Reduced by 12 times

5days

AR Content production cost
Decreased by 99%

$50,000

99% Reduction

$50

In-house testing

[▶] Play

VIRNECT
Solution
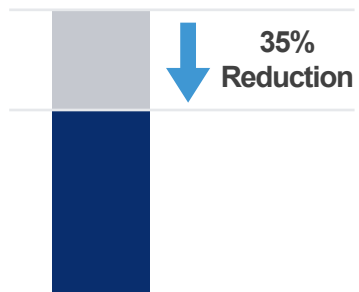
View | Swift augmentation of equipment & tasks

Viewer visualizes the AR content created from the Make product.
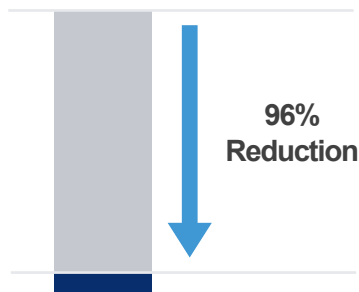
The task details can be quickly and intuitively understood, which lead to faster process of handling tasks.

Augment using QR code/ horizontal plane

Search tasks, record and report

Visualize multiple work procedures

Edit AR content in real-time

Visualization of IoT information & management

Compatible with smart glasses & smart devices

Time consumption of assembly process
Decreased by 35%

35% Reduction

Inspection time
Decreased by 96%

96% Reduction

[▶] Play

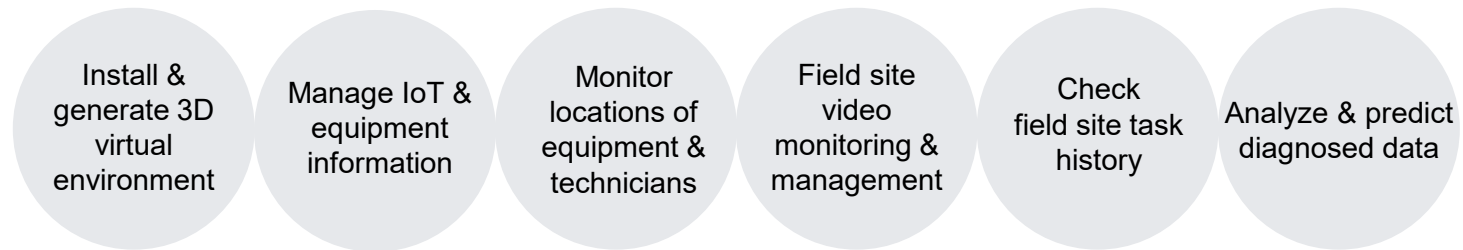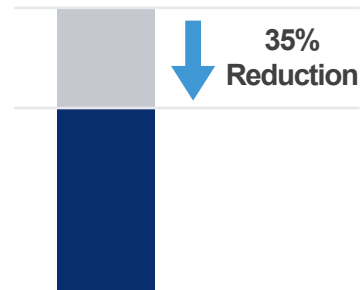Why Every Organization Needs an AR Strategy, Harvard Business Review, 2017
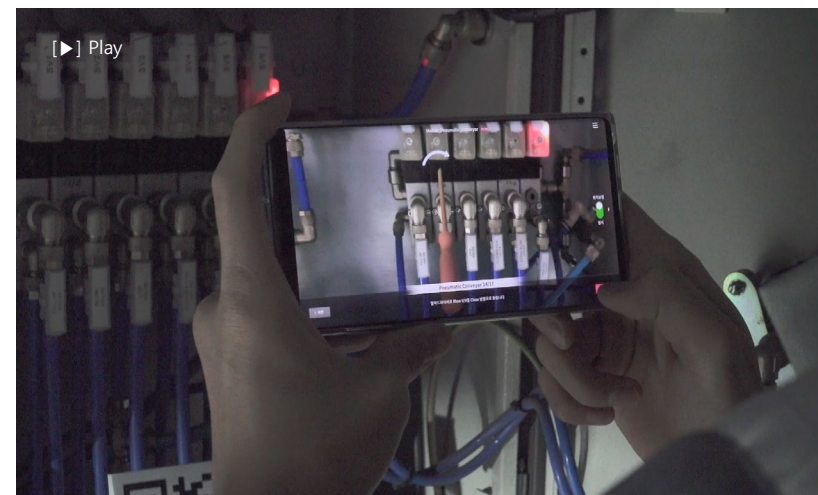
VIRNECT Solution

Twin | Data linkage virtual monitoring & simulation system

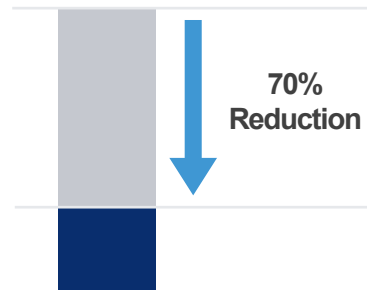Install 3D monitoring system at the field site and increase overall operational insight.

Visualization of data analysis and real-time field site data can improve overall task processes.

| Install & generate 3D virtual environment | Manage IoT & equipment information | Monitor locations of equipment & technicians | Field site video monitoring & management | Check field site task history | Analyze & predict diagnosed data |

Time consumption of assembly process
Decreased by 35%

35% Reduction

Work injury
Decreased by 70%

70% Reduction

Augmented and Virtual Reality in Operations
(Capgemini Research Institute, 2018)
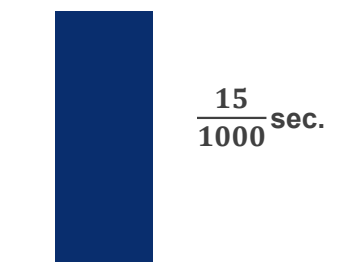
VIRNECT
Solution

AR SDK | Object learning, detecting and tracking AR SDK

It is an AR engine that quickly learn, detect and track objects.

The AR engine's flexible applicability and stability allow the development of AR services suitable for real-world environments.

| QR code detection & tracking | 2D Image detection & tracking | 3D object detection & tracking | Instant detection & tracking | Multi target detection & tracking | Visual SLAM |

Target detection speed
Within 15ms

$\frac{15}{1000}$ sec.

Target detection accuracy
More than 90%

More than 90%

In-house testing

[▶] Play

V-Core Target Detector (QRCode)
6D Pose Detection
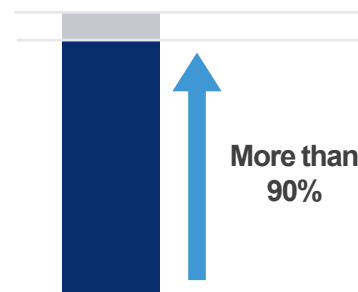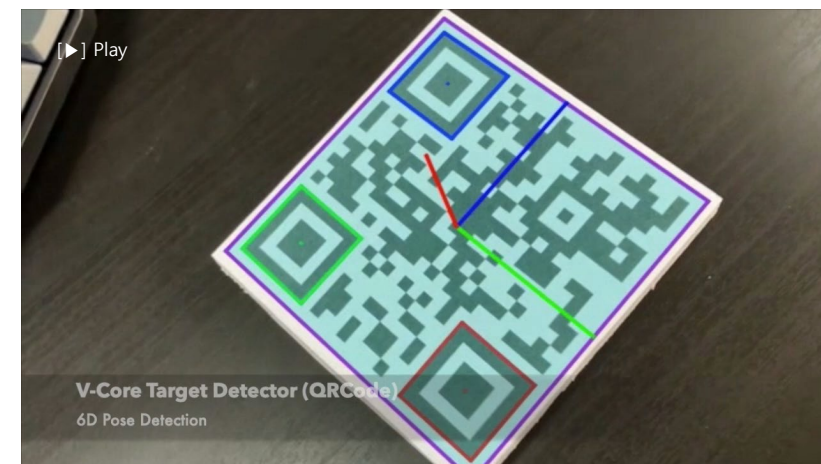
Recent excellent use case

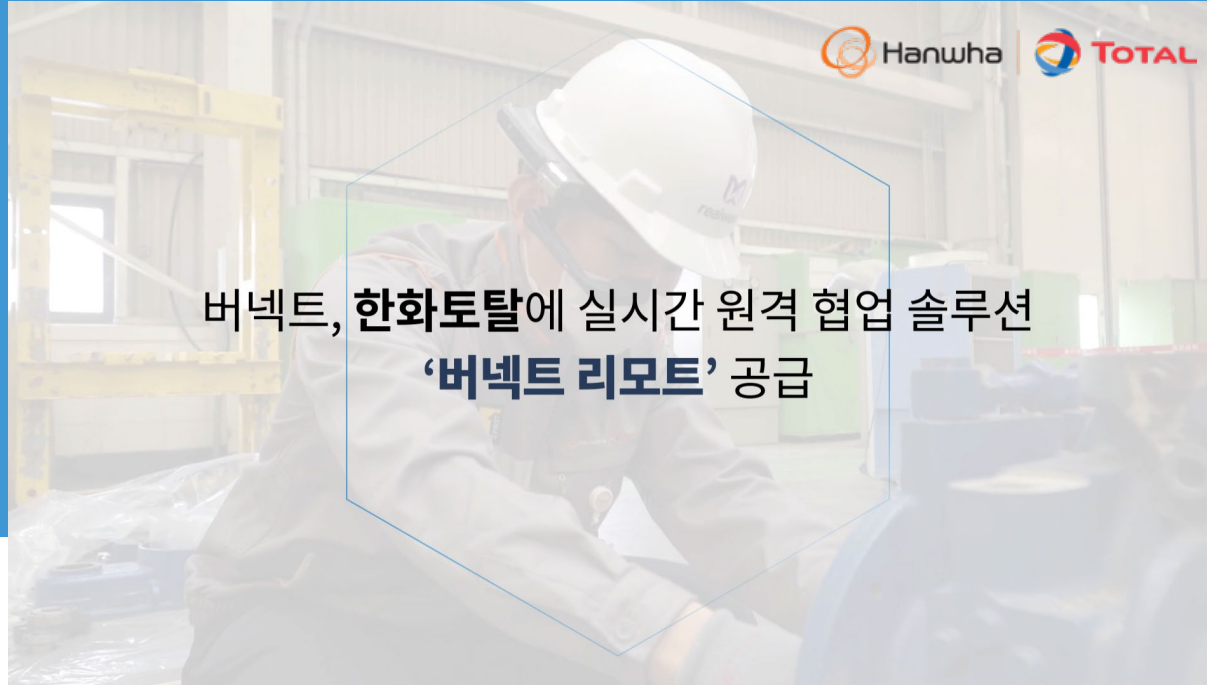**Implementation of VIRNECT Remote for regular maintenance of Hanwha Total's factory in Daesan**

Hanwha | TOTAL

버넥트, **한화토탈**에 실시간 원격 협업 솔루션
'**버넥트 리모트**' 공급

1/

Reduce maintenance time through quick support to field sites

Allows quick tech support during a difficult period to travel eg. Covid-19

2/

Reduce travel expenses through remote support solution

$200,000 (Travel expense for 3 people + 2 week quarantine cost)

↓

$2,000 (Cost for 2hr of tech support)

+ $18,000 (VIRNECT Remote cost)

3/

Introduce non-face-to-face service and refurbish company identity

VIRNECT

VIRNECT
Service

Accurate diagnosis of customer's problems and propose perfect fit solutions

Consultation
- ✓ Analyze work & environment
- ✓ Analyze economic feasibility
- ✓ Analyze stability

Seminar & Education
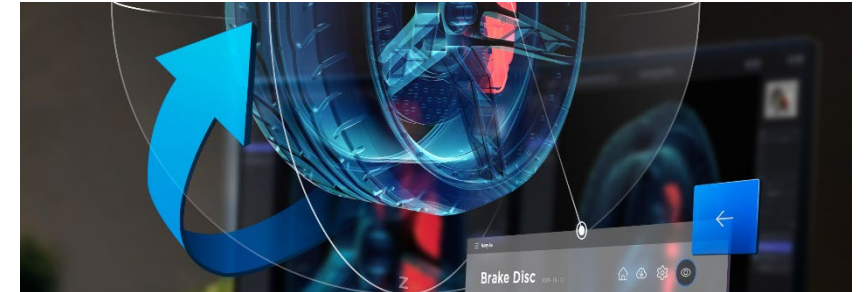- ✓ Technology introduction
- ✓ Introduce successful use cases
- ✓ Experience & train products

Proof of concept (PoC)
- ✓ Minimal use of features
- ✓ Review possibility of implementation
- ✓ Verify effectiveness of implementation

AR, DT content production
- ✓ Digital transformation of information
- ✓ 3D scanning, modeling, transformation
- ✓ AR content planning & production

VIRNECT

VIRNECT

Industry leading
AR company

Mission We strive to provide a safer industrial environment, maximized work efficacy, and the best convenience to our clients.

Vision We are the most customer-centric company, capable of finding the right solutions for our customers.

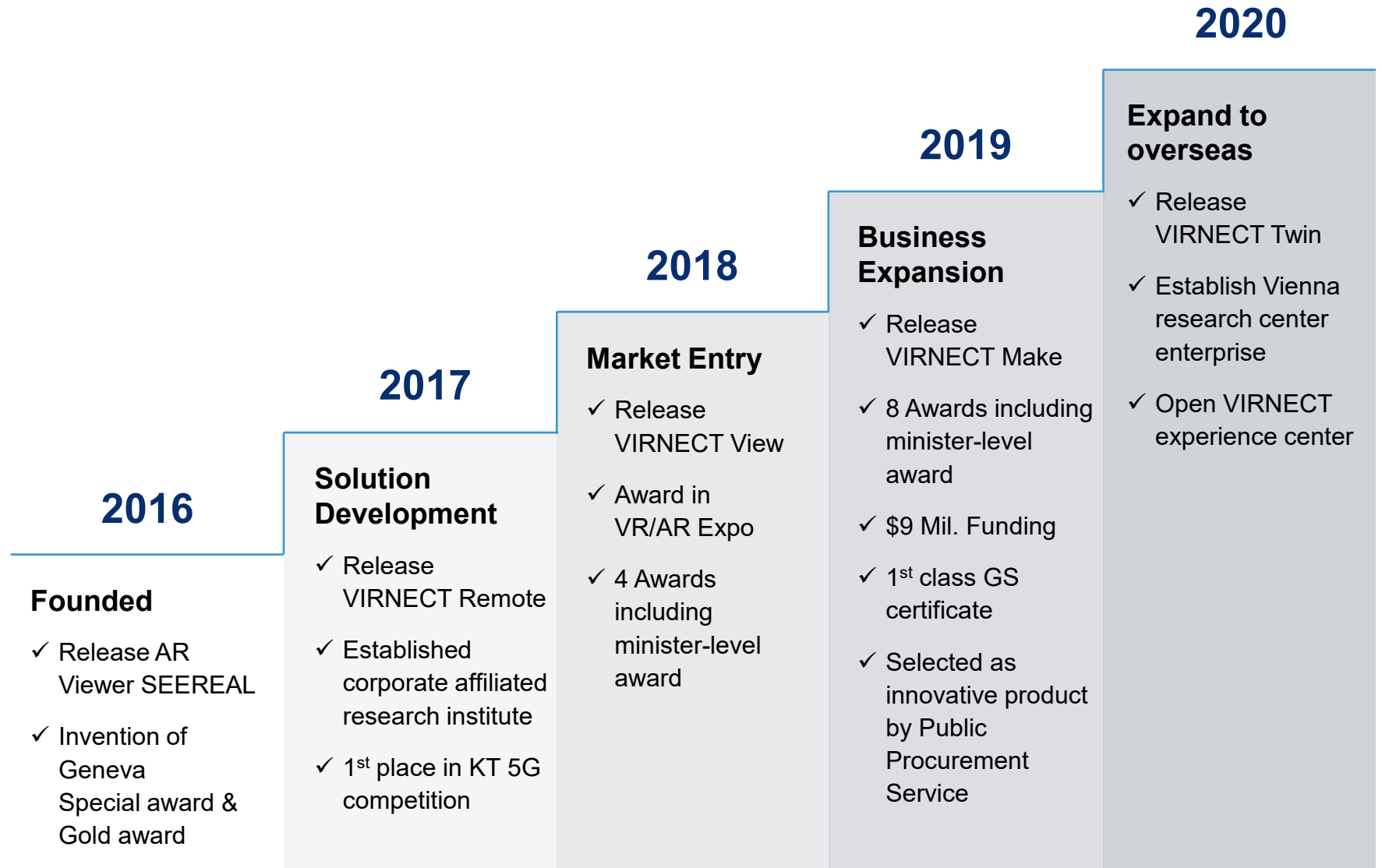| Founded **2016**	Employees **88**	Intellectual Property **60** (Top in domestic market)	Carried out AR projects **110+**	Certification & Awards **20+**

※ **88 employees** (20 Top-tier Master and PhD graduates, 45 R&D, 5 QA)
　more than 100 research papers (Top in domestic market)
　$9 Mil. Funding (Series A round. Top in domestic market)
Compound Annual Growth Rate (CAGR) 75.4%
Company review rate 4.15 (Out of 5 points. 'Work ·Life Balance' Excellent company)

*Based on end of Aug 2020

VIRNECT

We grow
continuously and
exponentially

2020

Expand to overseas

✓ Release VIRNECT Twin

✓ Establish Vienna research center enterprise

✓ Open VIRNECT experience center

2019

Business Expansion

✓ Release VIRNECT Make

✓ 8 Awards including minister-level award

✓ $9 Mil. Funding

✓ 1st class GS certificate

✓ Selected as innovative product by Public Procurement Service

2018

Market Entry

✓ Release VIRNECT View

✓ Award in VR/AR Expo

✓ 4 Awards including minister-level award

2017

Solution Development

✓ Release VIRNECT Remote

✓ Established corporate affiliated research institute

✓ 1st place in KT 5G competition

2016

Founded

✓ Release AR Viewer SEEREAL

✓ Invention of Geneva Special award & Gold award

VIRNECT

VIRNECT

Industry leading
AR/DT company

VIRNECT Experience Center(Seoul)

Taejin Ha, CEO

KAIST Doctor of Engineering (UVR Lab)
前 KAIST Research Professor
International Journal of Prominence (60 papers including ISMAR)
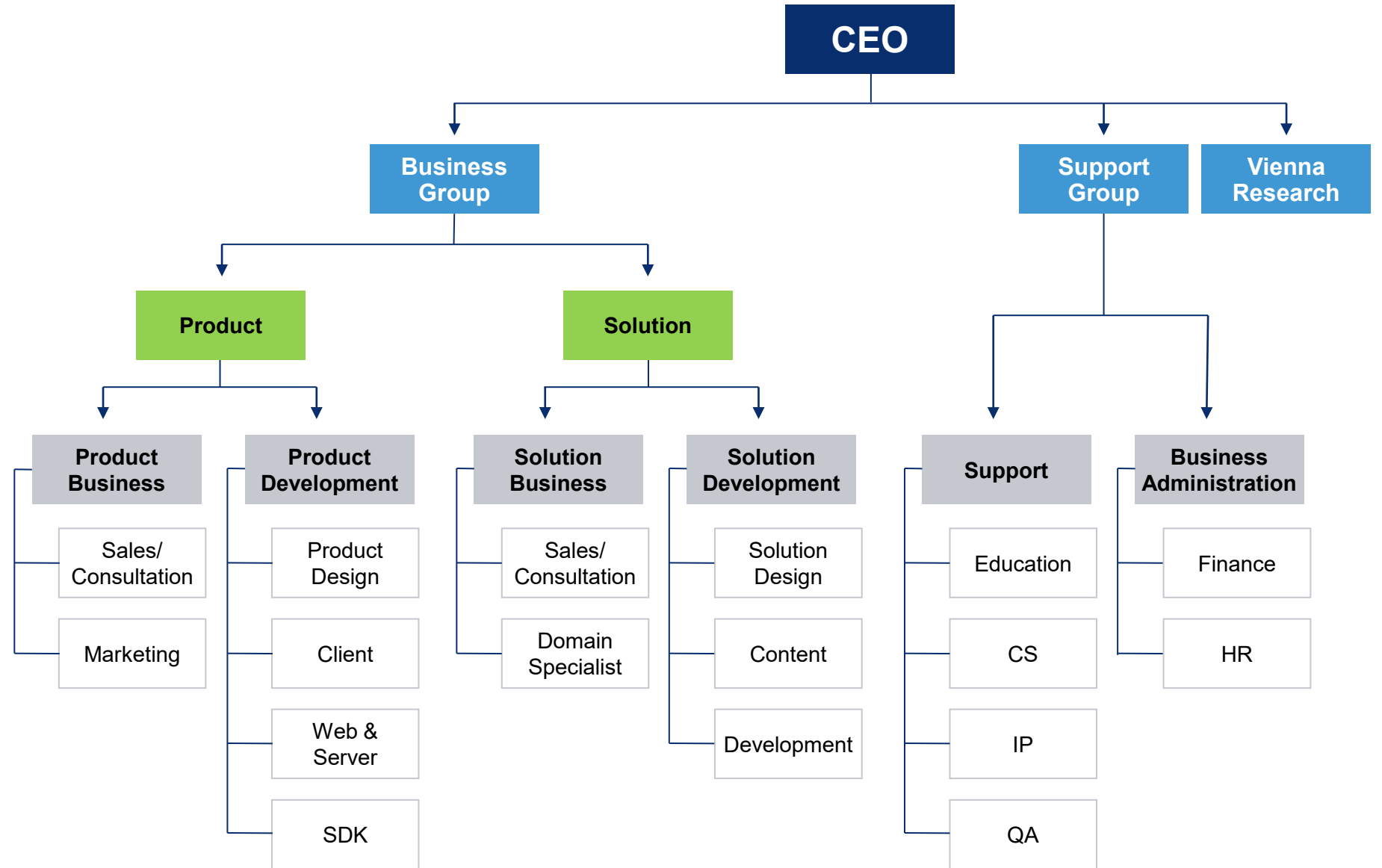4 USA patents

VIRNECT Vienna Research(Austria)

Ki Young Kim, Research Director

GIST Doctor of Engineering (UVR Lab)
Previous Qualcomm Austria(Vuforia Engine), DAQRI
International Journal of Prominence (ISMAR)
7 USA patents

Awards & Certification

Commendation from Ministry of Science and ICT for Digital content industry merit

Special award from Korea ICT Innovation

Listed as Top 10 company at Smart city business fair

Awarded in AR sector from Seoul VRAR Expo

GS 1st Class Certificate (VIRNECT Remote)

GS 1st Class Certificate (VIRNECT Make & View)

WIS 2019 Innovation Award (VIRNECT Make & View)

Innovation Award in Best Content sector from KES (VIRNECT Remote)

Award from Minister of Science and ICT for SW marketability support (VIRNECT Remote)

Grand Award in KT 5G Service Competition 2017 (VIRNECT Remote)

Selected as Innovative Prototype, 2019 (VIRNECT Make & View)

Special Award from K-Startup Challenge!

SMIC Partner

Appreciation plaque from Army M&S International Conference & National Defense ICT Exhibition

Merit plaque from 3D Fusion Industry Association

Excellent Research paper award from Korea BIM Academy

VIRNECT AR SDK V&V Performance Verification

VIRENCT Remote V&V Performance Verification

VIRNECT View V&V Performance Verification

Table Top V&V Performance Verification

Real-time wireless video transfer & Surveillance program V&V performance verification

Measure error range of UWB sensor V&V performance verification

Create AR based equipment operation guide system & Viewer

Customer References

Public Institution

KEPCO · KOGAS (KOREA GAS CORPORATION) · KORAIL · KEPCO Knowledge, Data & Network · KOSMO

해양경찰청 KOREA COAST GUARD · Korea Atomic Energy Research Institute · ETRI Electronics and Telecommunications Research Institute · KISTI Korea Institute of Science and Technology Information · KIAT

KETI · KOPTI

Enterprise

HYUNDAI STEEL · DOOSAN · GS EPS · KB Kookmin Card · LG CNS

LG Electronics · LG Chem · LG Display · Hanwha · TOTAL · DONG YANG PISTON

SAMSUNG SDS · SK C&C · SK chemicals · SK innovation · myunghwa

kt · kt commerce · samyang · Korea Business News · HDC I·CONTROLS

농협정보시스템 · KINTEX · SAMPYO · 종근당건강 · OCI

Educational Institution

KUMC KOREA UNIVERSITY ANSAN HOSPITAL · KOREA NATIONAL UNIVERSITY OF TRANSPORTATION · 3DFIA 3D Fusion Industry Association · kpc · HANBAT NATIONAL UNIVERSITY

multicampus · KAIST · GIST Gwangju Institute of Science and Technology · 치과대학병원 YONSEI UNIVERSITY DENTAL HOSPITAL · 한국기술교육대학교 KOREA TECH

VIRNECT

Customer Referrals
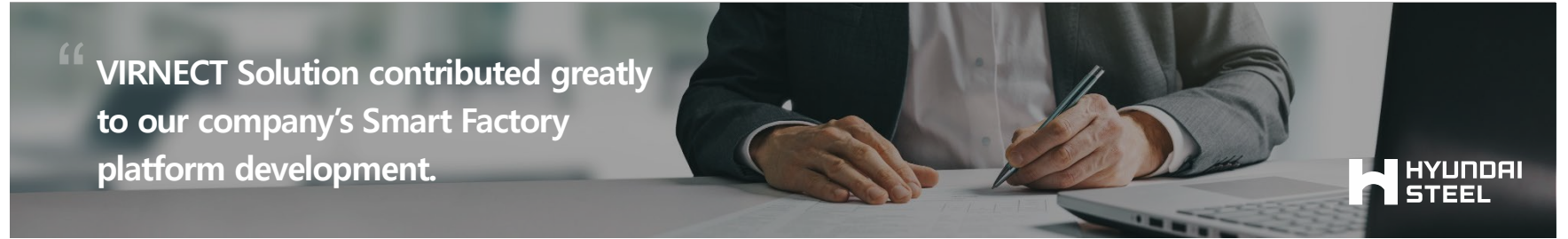
> **VIRNECT Solution contributed greatly to our company's Smart Factory platform development.**

HYUNDAI STEEL

> VIRNECT Remote is actually very helpful in working with our overseas production sites.

LG Chem

> This is a powerful tool that allows quick collaboration of facility maintenance without the limitations of space and time

OCI

> The implementation of VIRNECT Solutio supports enhancement of productivity and sharing of information for fields of developing industries.

DOOSAN

> The AR solution applied to facility maintanance provided an easier understanding of work and improved work efficiency.

SK C&C

> The highly reliable object detection feature of VIRNECT AR SDK can provide industrial worksites with a platform for managing measurement information.

kt

> The VIRNECT AR Solution applied for worker inspections highly improved customer satisfaction.

SAMSUNG SDS

> VIRNECT Solution provides a platform of systematic information management and optimal safety management, even for areas requiring high reliability.

Korea Atomic Energy Research Institute

> The world-class local AR specialized company VIRNECT's core solution surely has its own selling point. It will become an essential partner for increasing industrial productivity.

SEOILE&M

Redefine
your problems
into opportunities with
VIRNECT Solutions.

VIRNECT