SPIF2023
SCIENCEPARK INNOFAIR

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2023

SPIF

SCIENCEPARK INNOFAIR

사이언스파크 이노페어

PROGRAM BOOK

2023. 6.14. Wed ~ 16. Fri

HICO, Gyeongju, KOREA

HOST GYEONGSANGBUK-DO DAEGU METROPOLITAN CITY ASPA Asian Science Park Association

ORGARNIZER Asian Science Park Association Secretariat

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행사개요

행 사 명	2023 사이언스파크 이노페어
기 간	2023년 6월 14일(수)~16일(금) / 3일간
장 소	경주 화백컨벤션센터
주 제	디지털 시대의 산업과 더 나은 삶을 위한 기술
주 최	경상북도, 대구광역시, (사)아시아사이언스파크협회
주 관	ASPA 본부사무국
홈페이지	www.spif2023.com

Overview

Title	SCIENCEPARK INNOFAIR 2023
Date	June 14. (Wed) – 16. (Fri), 2023
Venue	HICO, Gyeongju, Republic of Korea
Theme	Industry in the Digital Age and Technology for a Better Life
Hosted by	Gyeongsangbuk-do, Daegu Metropolitan City, Asian Science Park Association (ASPA)
Organized by	Asian Science Park Association Secretariat
Website	www.spif2023.com

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Speaker Dr. Dae-Shik Kim (KAIST, Neuroscientist)
발표자 김대식 교수 (카이스트, 뇌과학자)

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· Role of STPs for Fostering Future Industry
· Cooperation between STPs for the Regional Development
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Class 1 Future Car & Mobility & Future Fuel 미래차, 모빌리티, 미래연료
Class 2 Smart Manufacturing Innovation 스마트 제조혁신
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231 **Sciencepark Forum 1** 사이언스파크 포럼 1
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291 **Sciencepark Forum 2**
(Collaboration between Innovative Institutions and Enterprises - Gyeongbuk TP Session)
사이언스파크 포럼 2 (혁신 기관 · 기업 상생 협력 - 경북TP 세션)
Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region
지역내 산학연관의 글로벌 협력

프로그램

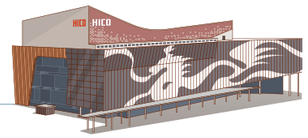
일 자		장 소	프로그램
1일차 6월14일 (수)	15:00~16:00	HICO 3층 300A	개회식, 기조강연
	16:10~17:30		리더스 라운드테이블 미팅
	16:10~17:10	HICO 2층 201~204	마스터클래스 1
	17:20~18:20		마스터클래스 2
	10:00~17:00	HICO 2층 101~104	기술 · 비즈니스 상담회
	14:00~18:00	HICO 2층 205	2023 혁신클러스터학회 하계 학술대회 (특별세션)
	18:30~20:00	HICO 3층 300A	공식만찬
2일차 6월15일 (목)	10:00~11:30	HICO 2층 201~204	사이언스파크 포럼 1
	11:30~13:00		사이언스파크 포럼 2 (경북TP세션)
	13:00~14:00	중식	
	14:00~15:00	HICO 2층 201~204	마스터 클래스 3
	15:10~16:10		마스터 클래스 4
	10:00~17:00	HICO 1층 101~104	기술 · 비즈니스 상담회
	18:00~20:00	경주 일원	만찬 (해외 참가자 대상)
3일차 6월16일 (금)	08:30~18:00	포스코, 체인지업 그라운드 포항 및 경주 일원	산업시찰, 문화시찰 (해외 사전 신청자에 한함)

Program at a Glance

Date		Venue	Program
Day 1 June 14 (Wed)	15:00~16:00	3F HICO 300A	Opening Ceremony / Keynote Speech
	16:10~17:30		Leaders Round Table Meeting
	16:10~17:10	2F HICO 201~204	Master Class 1
	17:20~18:20		Master Class 2
	10:00~17:00	1F HICO 101~104	Technology · Business Meeting
	14:00~18:00	2F HICO 205	IIC 2023 Summer Conference (Special Session)
	18:30~20:00	3F HICO 300A	Welcome Dinner
Day 2 June 15 (Thu)	10:00~11:30	2F HICO 201~204	Sciencepark Forum 1
	11:30~13:00		Sciencepark Forum 2 (Gyeongbuk TP Session)
	13:00~14:00	Lunch	
	14:00~15:00	2F HICO 201~204	Master Class 3
	15:10~16:10		Master Class 4
	10:00~17:00	1F HICO 101~104	Technology · Business Meeting
	18:00~20:00	Gyeongju	Gala Dinner (International Participants Only)
Day 3 June 16 (Fri)	08:30~18:00	POSCO, Change Up Ground and Gyeongju	Technical Tour / Cultural Tour (Pre-registered Inernational Participants only)

환영사

2023년 6월 14일부터 16일까지 경주 화백컨벤션 센터에서 개최되는 2023 사이언스파크 이노페어에
여러분을 초대합니다.



Yeong Junaq Wang

SCIENCEPARK INNOFAIR 2023
조직위원장

아시아사이언스파크협회 회장

대만 신주사이언스파크 회장

2021년도에 이어 2회째 개최되는 사이언스파크 이노페어는 사이언스파크 및 유관기관, 기업, 대학 등 지역 혁신을 선도하는 국내외 혁신 주체들 간의 진지한 논의와 실질적 협력을 모색하기 위해 ASPA 본부 사무국에서 주관하는 행사입니다.

올해 사이언스파크 이노페어는 "디지털 시대의 산업과 더 나은 삶을 위한 기술"을 주제로 오는 6월 14일~16일까지 경주에서 개최됩니다.

본 행사에서는 사이언스파크 간 국제협력 사례와 사이언스파크 개발 과정에서 직면하는 기업육성 정책, 기술개발 지원, 조직 발전 및 혁신역량 강화 등의 이슈를 논의할 수 있는 사이언스파크 포럼과 세계 각국의 사이언스파크에서 육성된 중소벤처기업이 참여하는 비즈니스 상담회, 마스터클래스 등 다양한 세션이 진행됩니다.

ASPA는 '지역 대 지역'의 교류협력을 통해 상호 이해와 공동체 의식을 강화해 나가는 것을 추구하고 있습니다.

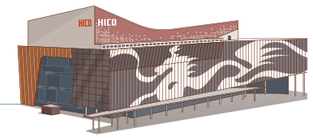
이번 행사를 통해 지역의 다양한 혁신주체들이 사이언스파크를 중심으로 실질적으로 협력하고 상호 발전할 수 있는 것을 찾고, 이를 통해 각 지역 모두가 함께 발전해 나갈 수 있기를 기원합니다.

2023 사이언스파크 이노페어에 많은 관심과 지원을 부탁드립니다.

감사합니다.

Welcome Message

We cordially invite you to the 2nd SCIENCEPARK INNOFAIR 2023 which will be held in Hwabaek International Convention Center, Gyeongju, Korea from June 14 to 16, 2023.



Yeong Junaq Wang

Chair, Organizing Committee of SCIENCEPARK INNOFAIR 2023

President, Asian Science Park Association (ASPA)

Director General, Hsinchu Science Park Bureau, Ministry of Science and Technology

SCIENCEPARK INNOFAIR, which was held for the first time in 2021, is a new regional cooperation activity of ASPA. It is our pleasure to gather together innovation leading subjects, such as Science & Technology Parks (STPs) and related organization, universities and venture enterprises from all parts of the world to have in-depth discussions and practical cooperation through the event.SCIENCEPARK INNOFAIR 2023 under the theme of 'Industry in the digital era and Technologies for a better life' consists of various programs such as LEADERS Round Table Meeting, Sciencepark Forum, Master Class, Business Meeting, etc.During the event, experts from STPs will exchange their view on the practice of international cooperation between each other, policy of nurturing local companies, support for technology and organizational development, and ways to strengthen innovation capabilities. Also, outstanding venture companies will be provided with opportunities of participating in Technology·Business Meeting for the technology exchange with international buyers who have common business interests and mutually beneficial products.ASPA is seeking ways to strengthen mutual understanding and a sense of community through exchange and cooperation among regions. We hope participants take advantage of SPIF 2023 via open discussion, practical schemes centered on a lot of innovation subjects to enhance cooperation.I appreciate for your attention and support on SPIF 2023.

2023
SCIENCEPARK INNOFAIR
사이언스파크
이노페어

Keynote Speech 기조강연

범용 인공지능 시대의 기회와 리스크
Steps towards Artificial General Intelligence: Risks and Opportunities

SPEAKER

Keynote Speech

김 대 식 Dae-Shik Kim

카이스트 교수 (뇌과학자) / KAIST, Neuroscientist

범용 인공지능 시대의 기회와 리스크
Steps towards Artificial General Intelligence: Risks and Opportunities

BIOGRAPHY

Education

≫ **1987 ~ 1992** Darmstadt University of Technology, Bachelor of Science in Psychology
≫ **1991 ~ 1992** Master of Science in Brain Science, Max Planck Institute of Brain Research
≫ **1992 ~ 1994** Doctor of Brain Science, Max Planck Institute of Brain Research

Career

≫ **1999 ~ 2003** Postdoctoral researcher at Massachusetts Institute of Technology in the United StatesResearcher at Riken, Institute of Physical and Chemical ResearchAssistant Professor of Magnetic Resonance Research Center, University of Minnesota Medical School, USA
≫ **2003 ~ 2009** Boston University in the United State
≫ **2009 ~** Professor of Electronics and Electrical Engineering, KAIST University of Information Science and Technology
≫ **2011 ~ 2012.5** Vice President of Electrical and Electrical Engineering, KAIST University of Information Science and Technology
≫ **2011 ~** Director, Kolon KAIST Lifestyle Innovation Center
≫ **2015.3 ~** Science Management Committee Member of GunMyungWon

Research Performance

≫ “Global and Local fMRI Signals Driven by Neurons Defined Optogenetically by Type and Wiring” Nature, 465(7299), (2010)
≫ “High-resolution Mapping of Iso-orientation Columns by fMRI” Nature Neuroscience, 3(2), 164-169, (2000)
≫ “Reverse Occlusion Leads to a Precise Restoration of Orientation Preference Maps in Visual Cortex” Nature, 370(6488), 370-372, (1994)

Abstract

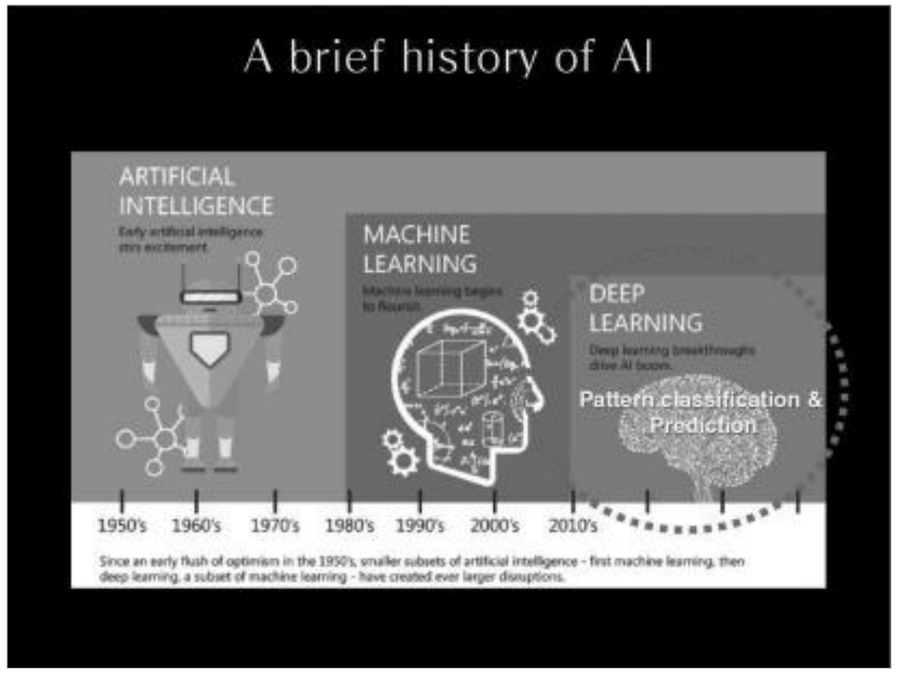
"Steps towards Artificial General Intelligence: Risks and Opportunities"

Recent advances in generative AI have attracted a wide variety of interests ranging from general audiences to government representatives.
In this presentation, I will describe the major technological breakthroughs in Large Language Models (LLM) and their economic and societal implications.
Moreover, this presentation will elucidate how "emergent properties" may arise as LLMs increase in scale.
Finally, I will discuss whether current LLMs, such as GPT-4 are the harbingers of a future Artificial General Intelligence (AGI).

"범용 인공지능 시대의 기회와 리스크"

최근 생성형 AI의 발전은 일반 청중부터 정부 대표에 이르기까지 다양한 관심을 불러일으키고 있다.
본 강연에서는 대규모 언어 모델(LLM)의 주요 기술 혁신과 그 경제적, 사회적 영향에 대해 설명한다.
또한 LLM의 규모가 커지며 발생하는 '창발적 속성'을 살펴본다.
마지막으로 GPT-4와 같은 현재의 LLM이 미래의 인공 범용 지능(AGI)의 선구자인지에 대해 논의할 것이다.

Steps towards Artificial General Intelligence:
Risks and Opportunities
Dae-Shik Kim (daeshik@kaist.ac.kr)
ChatGPT


A brief history of AI
ARTIFICIAL INTELLIGENCE
Early artificial intelligence stirs excitement.
MACHINE LEARNING
Machine learning begins to flourish.
DEEP LEARNING
Deep learning breakthroughs drive AI boom.
Pattern classification & Prediction
1950's
1960's
1970's
1980's
1990's
2000's
2010's
Since an early flush of optimism in the 1950's, smaller subsets of artificial intelligence - first machine learning, then deep learning, a subset of machine learning - have created ever larger disruptions.

Problem of Language ☹☹☹
alexa
Hi, I'm Cortana.

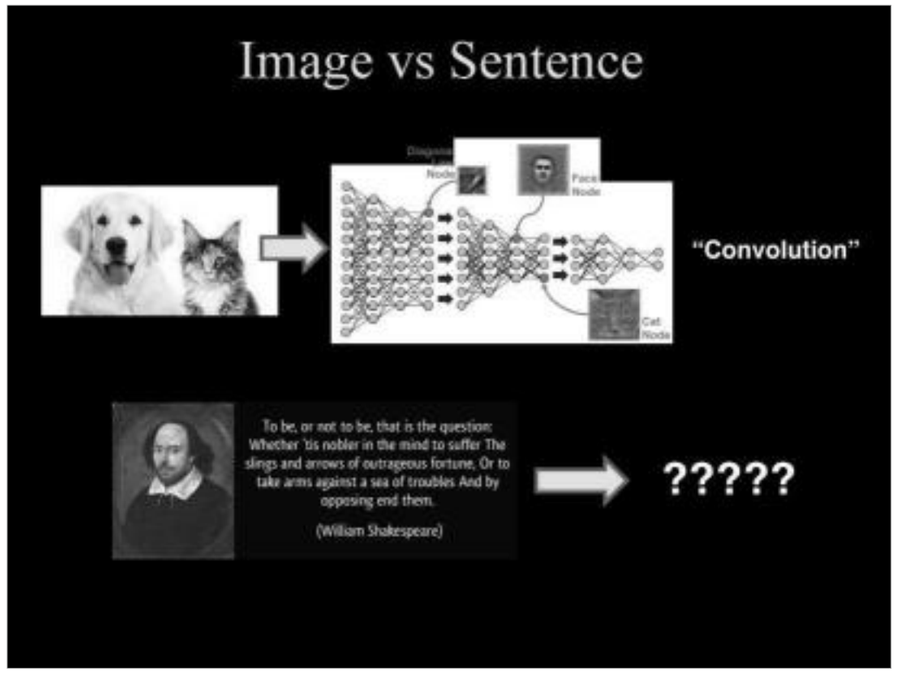
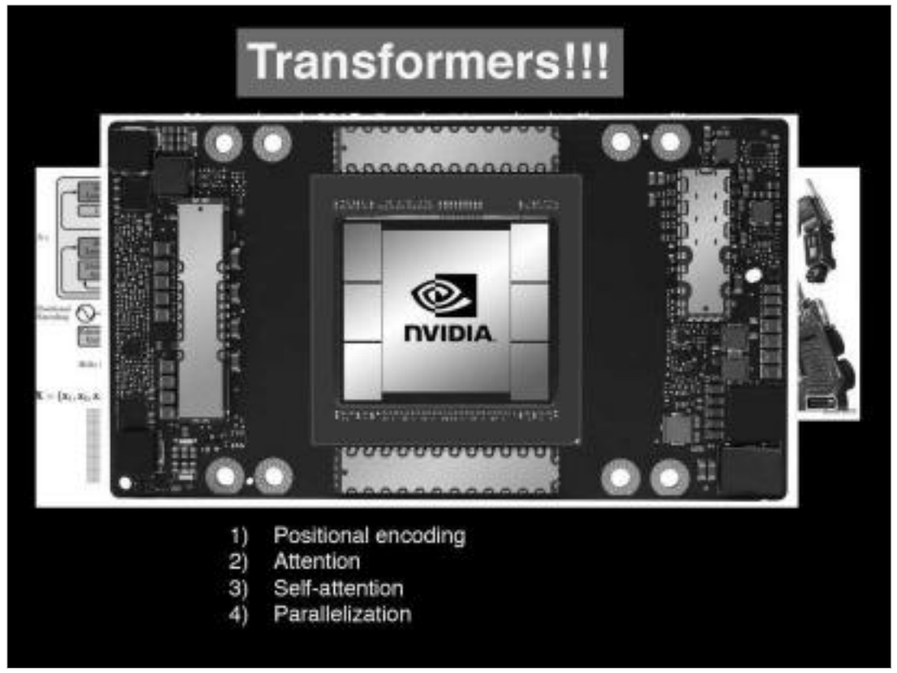
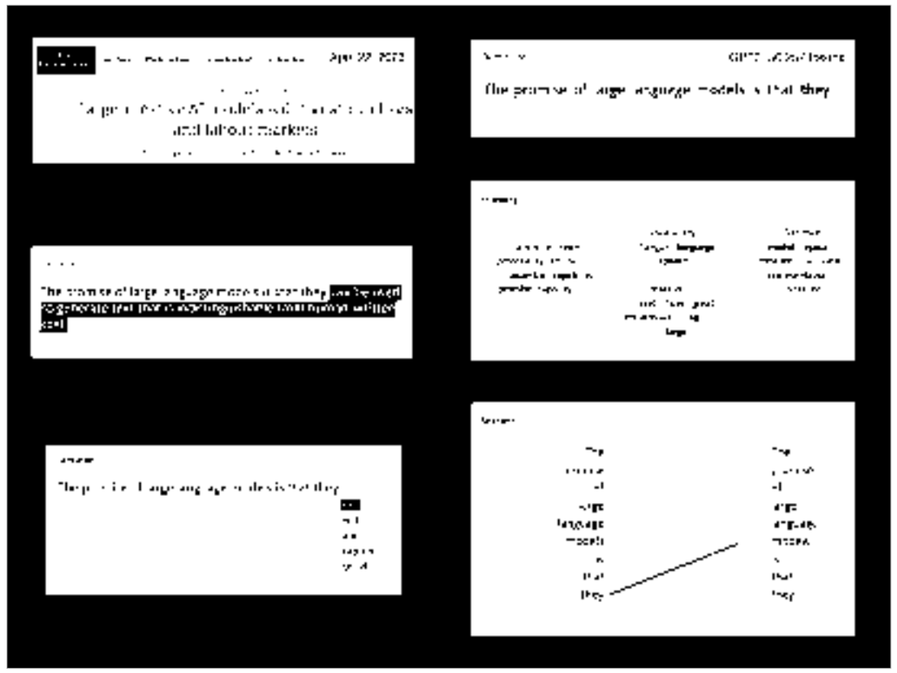
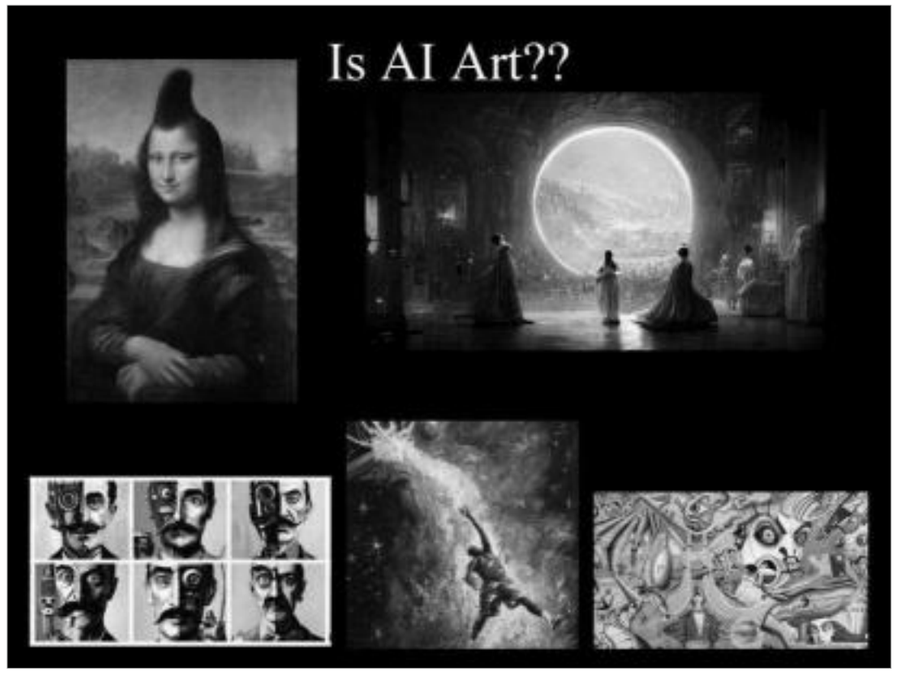


Image vs Sentence
"Convolution"
To be, or not to be, that is the question: Whether 'tis nobler in the mind to suffer The slings and arrows of outrageous fortune, Or to take arms against a sea of troubles And by opposing end them.
(William Shakespeare)
?????

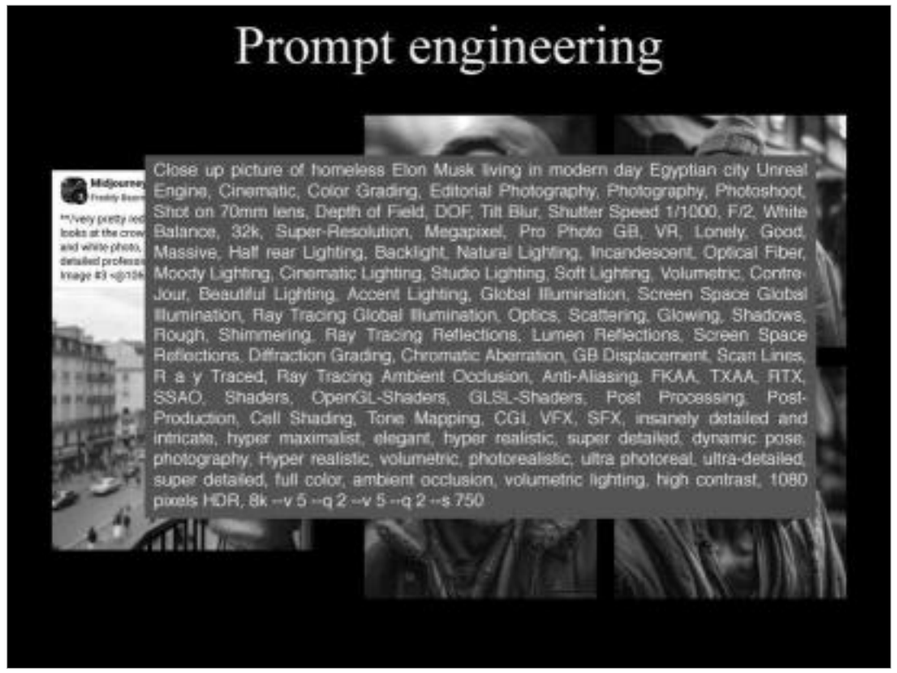

Transformers!!!
NVIDIA
1) Positional encoding
2) Attention
3) Self-attention
4) Parallelization

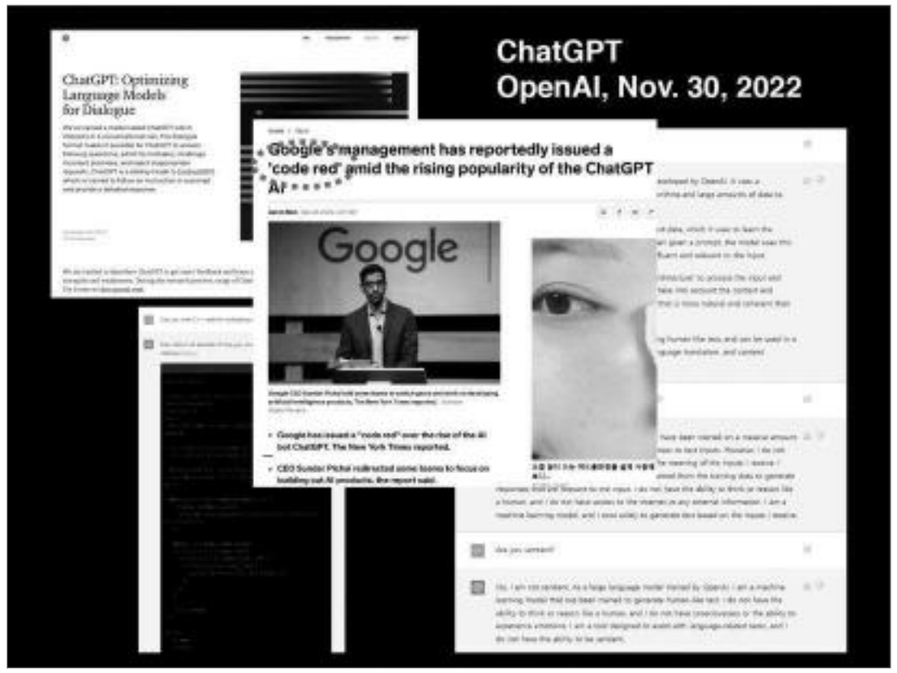


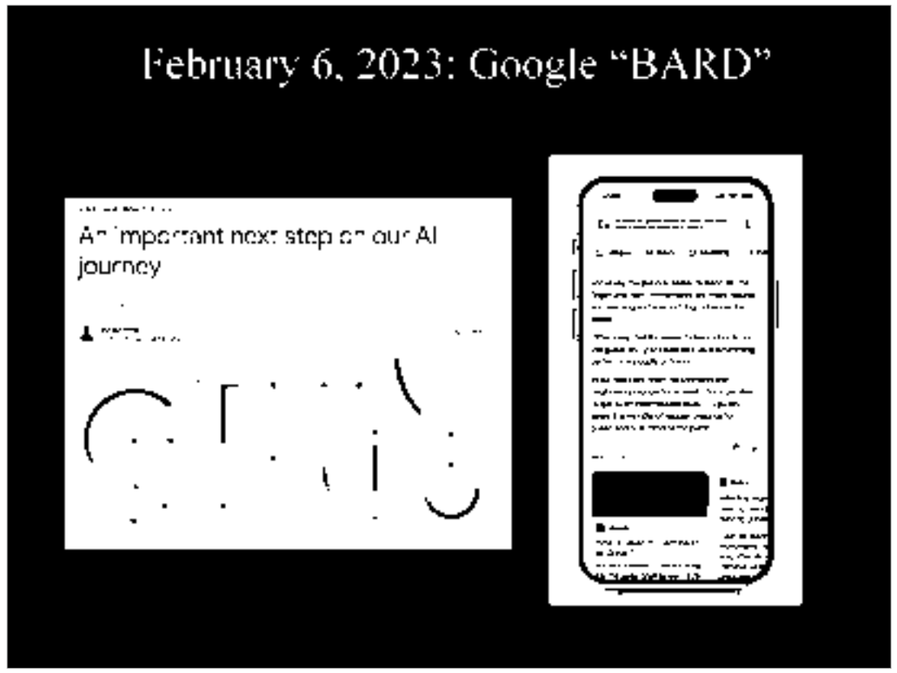
Midjourney
DALL·E2
The Economist
AI'S NEW FRONTIER
COSMOPOLITAN
Meet the World's First Artificially Intelligent Magazine Cover
June 11, 2022
June 21, 2022
"a teddy bear riding a skateboard in Times Square"


Is AI Art??

What is real?
BALENCIAGA
Photographer admits prize-winning image was AI-generated


Prompt engineering
Close up picture of homeless Elon Musk living in modern day Egyptian city Unreal Engine, Cinematic, Color Grading, Editorial Photography, Photography, Photoshoot, Shot on 70mm lens, Depth of Field, DOF, Tilt Blur, Shutter Speed 1/1000, F/2, White Balance, 32k, Super-Resolution, Megapixel, Pro Photo GB, VR, Lonely, Good, Massive, Half rear Lighting, Backlight, Natural Lighting, Incandescent, Optical Fiber, Moody Lighting, Cinematic Lighting, Studio Lighting, Soft Lighting, Volumetric, Contre-Jour, Beautiful Lighting, Accent Lighting, Global Illumination, Screen Space Global Illumination, Ray Tracing Global Illumination, Optics, Scattering, Glowing, Shadows, Rough, Shimmering, Ray Tracing Reflections, Lumen Reflections, Screen Space Reflections, Diffraction Grading, Chromatic Aberration, GB Displacement, Scan Lines, R a y Traced, Ray Tracing Ambient Occlusion, Anti-Aliasing, FKAA, TXAA, RTX, SSAO, Shaders, OpenGL-Shaders, GLSL-Shaders, Post Processing, Post-Production, Cell Shading, Tone Mapping, CGI, VFX, SFX, insanely detailed and intricate, hyper maximalist, elegant, hyper realistic, super detailed, dynamic pose, photography, Hyper realistic, volumetric, photorealistic, ultra photoreal, ultra-detailed, super detailed, full color, ambient occlusion, volumetric lighting, high contrast, 1080 pixels HDR, 8k --v 5 --q 2 --v 5 --q 2 --s 750

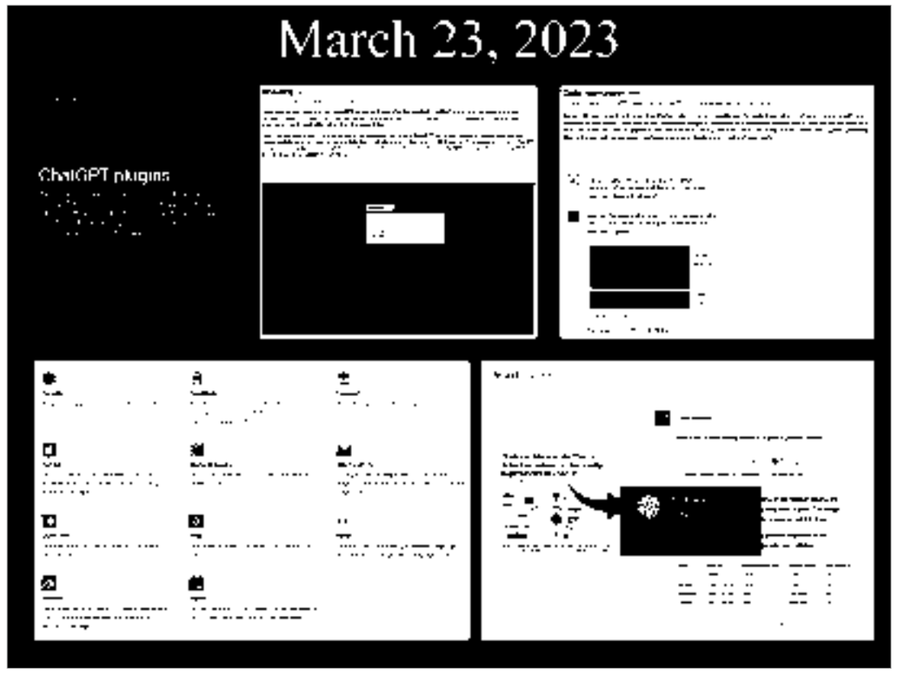

ChatGPT
OpenAI, Nov. 30, 2022
ChatGPT: Optimizing Language Models for Dialogue
Google's management has reportedly issued a 'code red' amid the rising popularity of the ChatGPT AI
Google
Google has issued a "code red" over the rise of the AI bot ChatGPT, The New York Times reported.
CEO Sundar Pichai redirected some teams to focus on building out AI products, the report said.

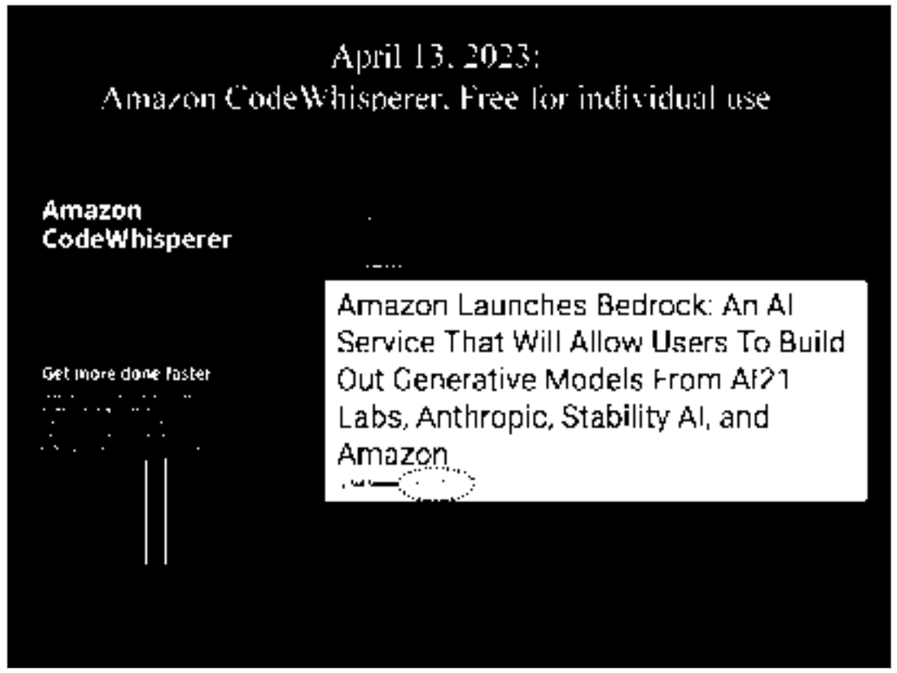

February 6, 2023: Google “BARD”
An important next step on our AI journey

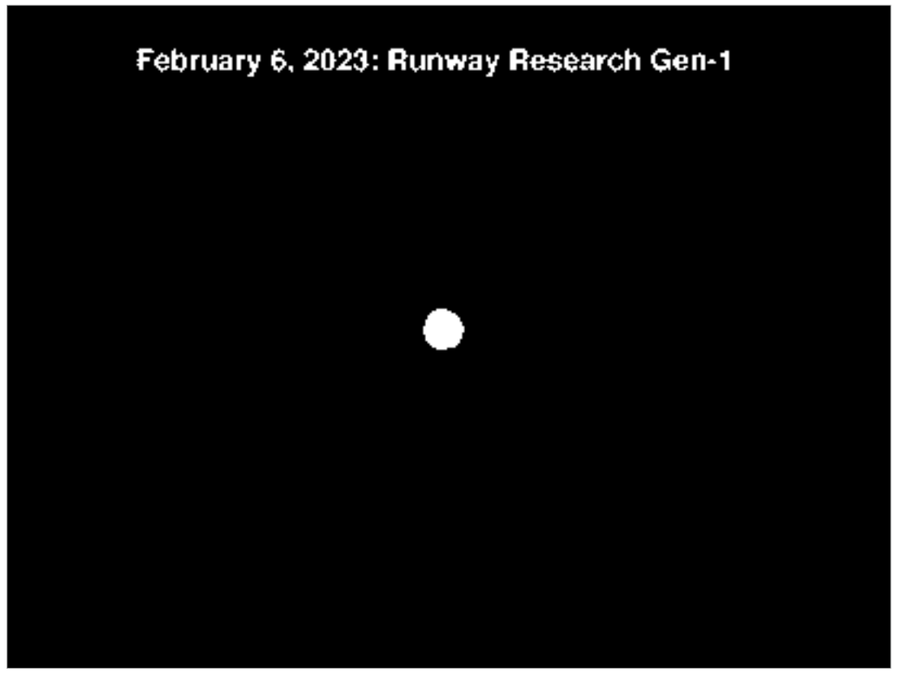
April 16, 2023: Google’s new AI-based search engine; “Project Magi”
Google Devising Radical Search Changes to Beat Back A.I. Rivals
After internal 'panic', Google is rushing to unveil a new AI-powered search engine to compete with Microsoft Bing, report says
Google planning new search engine while working on new search features under Project Magi
Project Magi will help searchers complete transactions while incorporating search ads on the page.

MS: “Reimagining work”
Introducing Microsoft 365 Copilot – your copilot for work
skype
GitHub Copilot

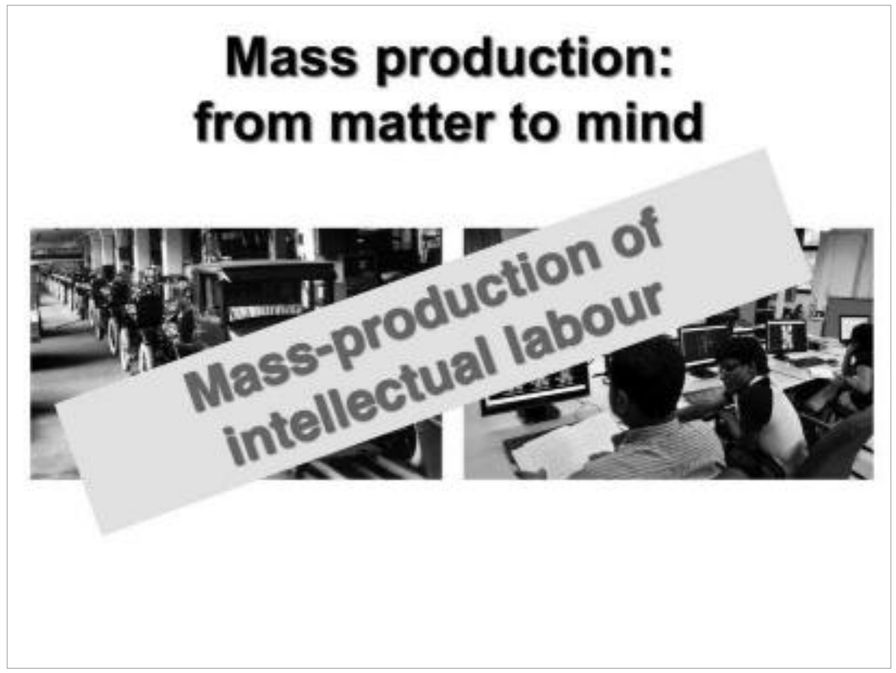
In ONE day: March 21st
Google opens early access to its ChatGPT rival Bard – here are our first impressions
Create images with your words – Bing Image Creator comes to the new Bing
Bing
Adobe made an AI image generator – and says it didn't steal artists' work to do it
NVIDIA Unveils Large Language Models and Generative AI Service to Advance Life Sciences R&D

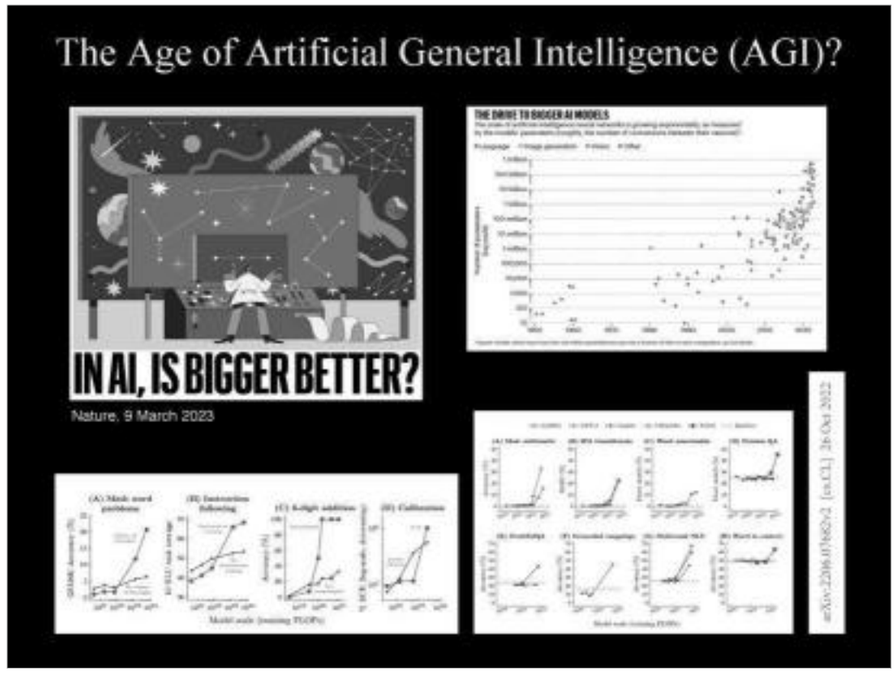

March 23, 2023
ChatGPT plugins

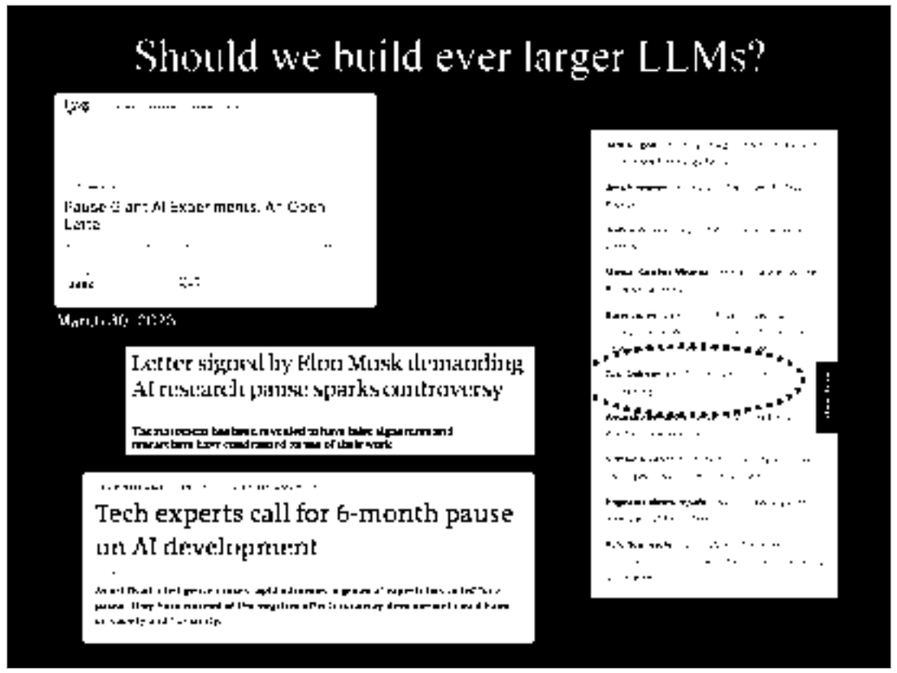

April 13, 2023:
Amazon CodeWhisperer, Free for individual use
Amazon
CodeWhisperer
Get more done faster
Amazon Launches Bedrock: An AI Service That Will Allow Users To Build Out Generative Models From AI21 Labs, Anthropic, Stability AI, and Amazon


February 6, 2023: Runway Research Gen-1

March 20, 2023: Runway Research Gen-2


Mass production:
from matter to mind
Mass-production of intellectual labour


The Age of Artificial General Intelligence (AGI)?
IN AI, IS BIGGER BETTER?
Nature, 9 March 2023
THE DRIVE TO BIGGER AI MODELS
arXiv:2206.07682v2 [cs.CL] 26 Oct 2022


Should we build ever larger LLMs?
Pause Giant AI Experiments: An Open Letter
March 29, 2023
Letter signed by Elon Musk demanding AI research pause sparks controversy
Tech experts call for 6-month pause on AI development

2023
SCIENCEPARK INNOFAIR
사이언스파크
이노페어

LEADERS Round Table Meeting 리더스 라운드 테이블 미팅

미래산업 육성을 위한 사이언스파크의 역할 및 지역 발전을 위한 협력

· Role of STPs for Fostering Future Industry
· Cooperation between STPs for the Regional Development

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Moderator

권 선 국 Sunkook Kwon

아시아사이언스파크협회 사무총장

Secretary-General of Asian
Science Park Association

Panel

Yeong Junaq Wang

아시아사이언스파크협회 회장

President of Asian
Science Park Association

Janekrishna Kanatharana

태국 국립과학기술원 부원장

Executive Vice President of
National Science and Technology
Development Agency (NSTDA)

김 영 집 Young Jib Kim

한국테크노파크진흥회 회장

President of Korea Technopark
Association

박 윤 하 YunHa Park

대구경북ICT산업협회 회장

President of Daegu-Gyeongbuk
ICT Industry Association

Abdulahad Kuchkarov

IT PARK Uzbekistan 부원장

First Deputy Director of IT Park
Uzbekistan

Nguyen Nghia Hiep

사이공하이테크파크 부원장

Vice President of Saigon
Hi-Tech Park

MEMO

MEMO

MEMO

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2023
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이노페어

Master Class 마스터 클래스

미래 유망산업의 전망과 기업사례 소개

Prospects of Future Promising Industries and Introduction of Business Cases

- Class 1 Future Car & Mobility & Future Fuel 미래차, 모빌리티, 미래연료
- Class 2 Smart Manufacturing Innovation 스마트 제조혁신
- Class 3 Public Safety & Traffic Management 공공안전 & 교통관리
- Class 4 Technology for Healthy Life 헬스케어 테크놀로지

SPEAKER

Master Class 1 - Future Car & Mobility & Future Fuel

Nizmar Mohd Nazar

Deputy CEO of Malaysia Automotive, Robotics and IoT Institute (MARii)

미래 인재를 위한 EV 및 전기 자동차 생태계 설계
Designing the EV & Electromobility Ecosystem for the Future Talent

BIOGRAPHY

Nizmar bin Mohd. Nazar is the Deputy Chief Executive Officer (DCEO) at Malaysia Automotive, Robotics and IoT Institute (MARii) with more than 15 years of experience in Information Technology, Mobility as a Service (MaaS) & Automotive industry. Strategizing from the NAP 2020 core value to transform the Malaysia Automotive Industry moving towards Connected Mobility Ecosystem by year 2030.

Involved in the Intelligent Transportation Systems (ITS) for mobility as a service (MaaS) development under automated drive, telematics implementation, simulation & virtual/ augmented reality (VR/AR) integration for Next Generation Vehicle (NxGV) development.

Lead MARii as a focal point in technology coordination center for the development of the Malaysian automotive (NxGV – Electric Vehicles (EV) & Autonomous Vehicles (AV)), IoT & Robotics deployment in all matters related to automotive industry, IoT, Robotics & Industry 4.0 technology, including formulating of the national automotive policy (NAP) and Industry4WRD policy and its expansion technology programmes, managing talent I4.0 development programme formulating and coordinating industry 4.0 and automotive related research.

Supporting the Government through NAP for the Infrastructure, Platform & Software as a Service (IaaS, PaaS & SaaS) development under Automotive Cloud Web Services development (MACWES) for services and new mobility functions enhancing the MaaS/AV & Intelligent Transportation System (ITS) making transport and travelling safer, green, more efficient & intelligence for NxGV ecosystems.

Abstract

Designing the EV & Electromobility Ecosystem for the Future Talent

This abstract highlights Malaysia's progressive efforts in adopting electric vehicles (EVs) and establishing a comprehensive electromobility system. The government's initiatives, such as tax exemptions and incentives, coupled with the development of charging infrastructure, have encouraged EV adoption. The country's automotive industry is also embracing EV production through partnerships and indigenous models, fostering technological advancements and job creation. Malaysia's integration of renewable energy sources further supports sustainable electromobility. Despite challenges like standardization and consumer awareness, Malaysia's collaborative approach positions it as a regional leader in EVs and electromobility, with benefits including reduced emissions, economic opportunities, and improved quality of life.

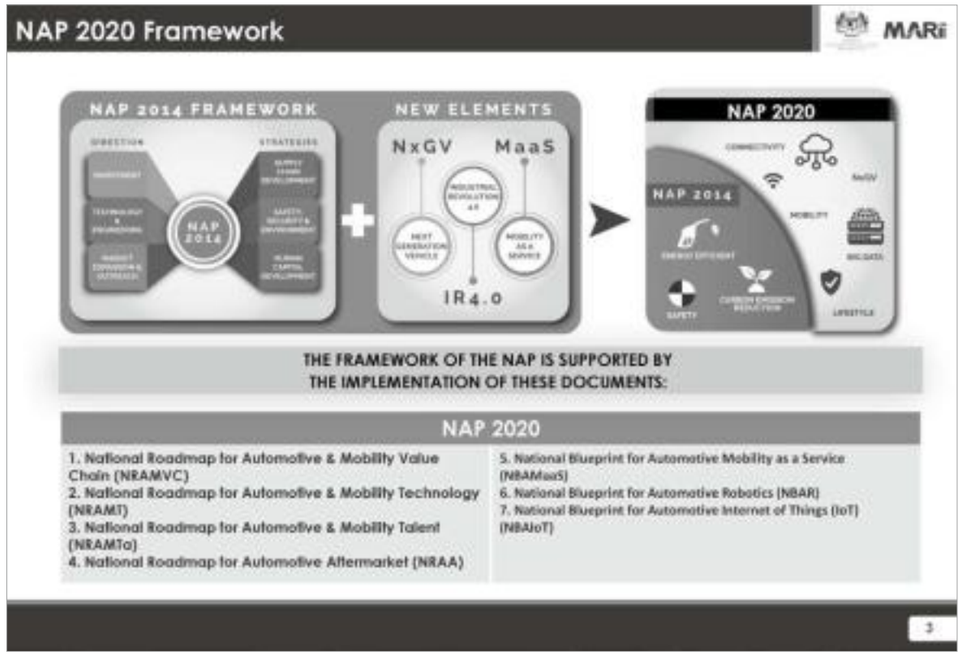
It also highlights Malaysia's government support for companies developing critical components and electronic and electrical (E&E) products related to automotive, particularly in the context of electric vehicles (EVs). Programs such as the Automotive Supplier Excellence Program (ASEP), Lean Production System Program (LPS), and Digital Engineering & Prototyping Program (DEP) by the Malaysia Automotive, Robotics and IoT Institute (MARii) have been instrumental in fostering the development of battery management systems (BMS), thermal management systems (TMS), Light Detection and Ranging (LIDAR), and Radio Detection and Ranging (RADAR) networks. These initiatives demonstrate Malaysia's commitment to encouraging local expertise and fostering innovation in the EV sector, ultimately contributing to the country's electrification efforts.

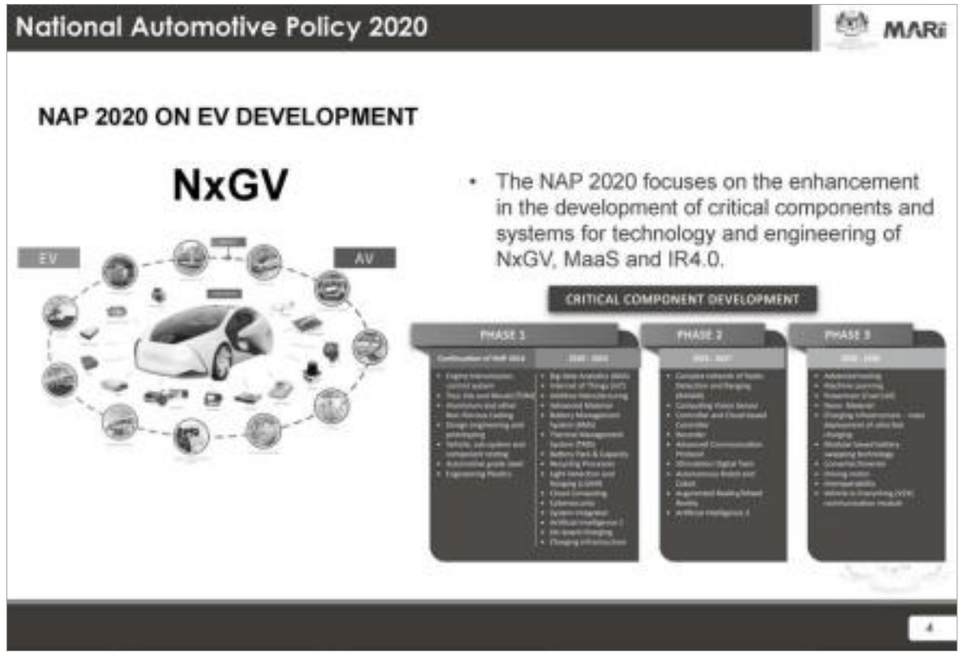
미래 인재를 위한 EV 및 전기 자동차 생태계 설계

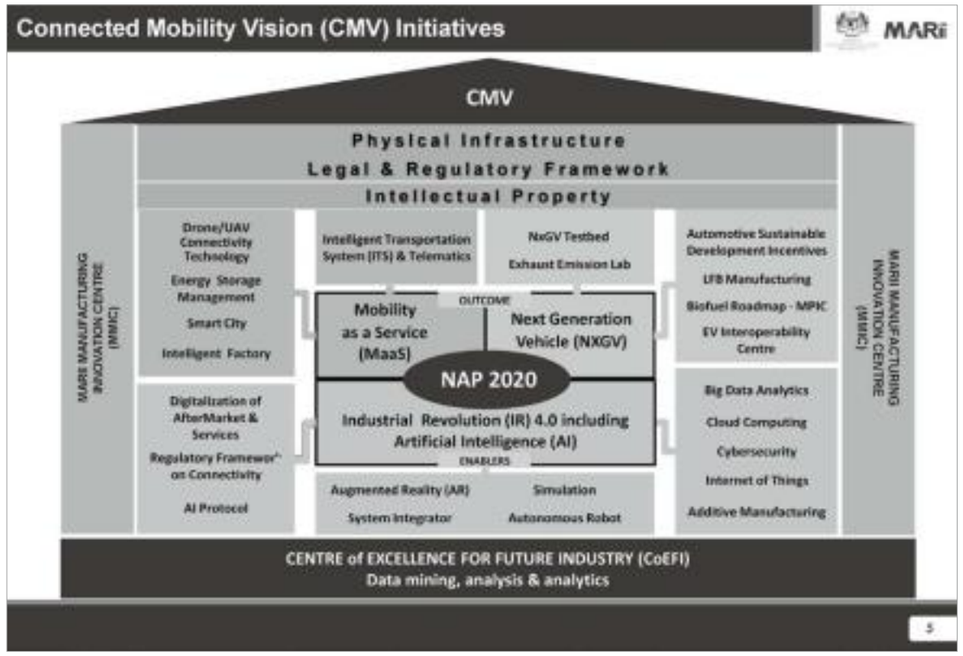
전기자동차 보급을 확대 하고 포괄적인 e-모빌리티 시스템을 구축하려는 말레이시아의 진보적인 노력에 대해서 얘기하고자 합니다. 충전소 인프라 개발과 함께 세금 면제 및 인센티브와 같은 정부의 정책은 전기차 구매를 장려했습니다. 말레이시아의 자동차 산업은 또한 파트너십과 고유모델, 일자리 창출과 기술 개발을 통해 전기자동차 생산증가를 촉진하고 있습니다. 말레이시아의 재생 가능 에너지원 통합은 지속 가능한 e-모빌리티를 더욱 지원할 것 입니다. 표준화 및 소비자 인식과 같은 문제에도 불구하고 말레이시아의 협력적 접근 방식은 탄소 배출 감소, 경제적 기회 및 삶의 질 향상을 포함한 이점을 통해 전기자동차 및 e-모빌리티 분야의 지역 리더로 자리매김하고 있습니다.

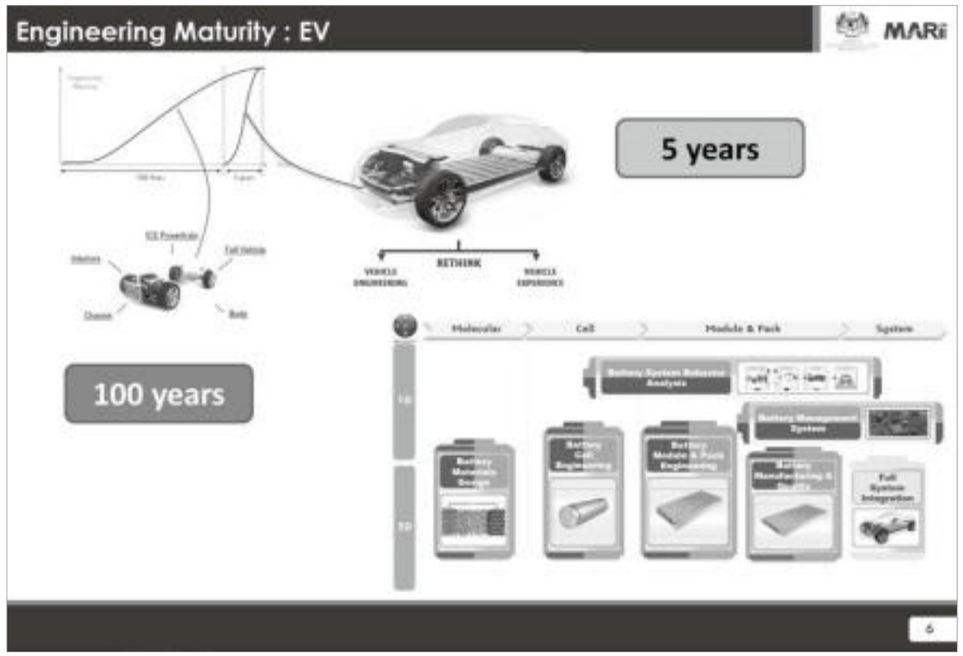
또한 특히 전기 자동차와 관련하여 자동차와 관련된 중요 부품 및 전자 및 전기(E&E) 제품을 개발하는 회사에 대한 말레이시아 정부의 지원을 얘기하고자 합니다. MARii(Malaysia Automotive, Robotics and IoT Institute)의 ASEP(Automotive Supplier Excellence Program), LPS(Lean Production System Program) 그리고 DEP(Digital Engineering & Prototyping Program)와 같은 프로그램은 Battery Management Systems (BMS), Thermal Management Systems (TMS), Light Detection and Ranging (LIDAR) 그리고 Radio Detection and Ranging (RADAR) networks과 같은 기술들의 개발을 촉진하는 데 중요한 역할을 했습니다. 이러한 계획은 국내 고유 기술 개발과 전기자동차 부문의 혁신을 촉진하여 궁극적으로 국가의 전기자동차 보급에 기여하려는 말레이시아의 의지를 보여줍니다.

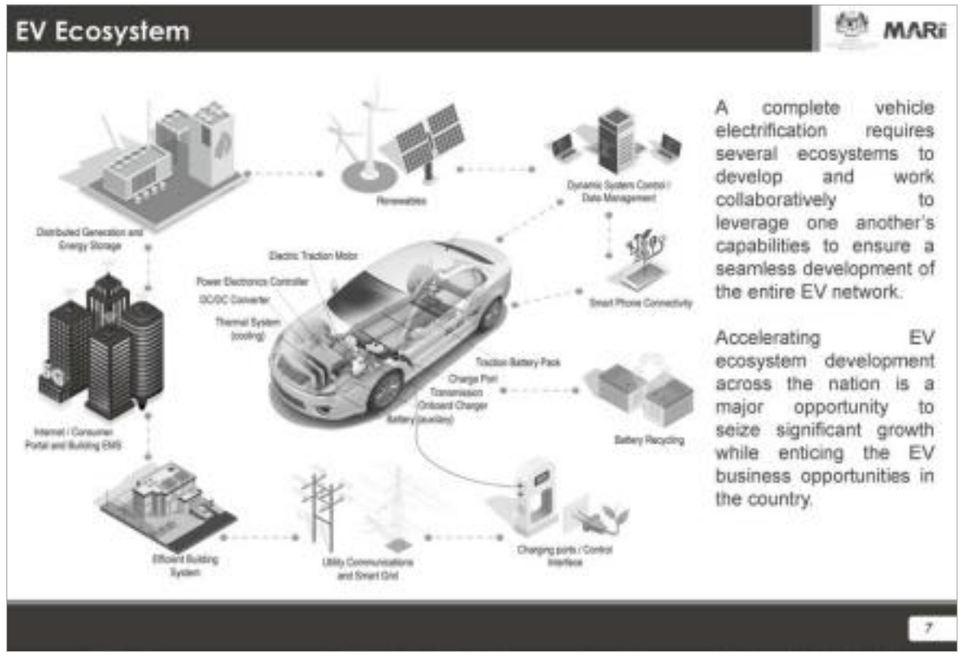
NAP 2020 - NxGV
EV : The Game Changer






Connected Mobility Vision (CMV) Initiatives
MARii
CMV
Physical Infrastructure
Legal & Regulatory Framework
Intellectual Property
MARii MANUFACTURING INNOVATION CENTRE (MMIC)
Drone/UAV Connectivity Technology
Energy Storage Management
Smart City
Intelligent Factory
Intelligent Transportation System (ITS) & Telematics
NxGV Testbed
Exhaust Emission Lab
OUTCOME
Mobility as a Service (MaaS)
Next Generation Vehicle (NXGV)
NAP 2020
Industrial Revolution (IR) 4.0 including Artificial Intelligence (AI)
ENABLERS
Augmented Reality (AR)
Simulation
System Integrator
Autonomous Robot
Automotive Sustainable Development Incentives
LFB Manufacturing
Biofuel Roadmap - MPIC
EV Interoperability Centre
Big Data Analytics
Cloud Computing
Cybersecurity
Internet of Things
Additive Manufacturing
MARii MANUFACTURING INNOVATION CENTRE (MMIC)
Digitalization of AfterMarket & Services
Regulatory Framework on Connectivity
AI Protocol
CENTRE of EXCELLENCE FOR FUTURE INDUSTRY (CoEFI)
Data mining, analysis & analytics
5


Engineering Maturity : EV
MARii
5 years
RETHINK
VEHICLE ENGINEERING
VEHICLE EXPERIENCE
100 years
Molecular
Cell
Module & Pack
System
Battery System Behavior Analysis
Battery Management System
Full System Integration
6


EV Ecosystem
MARii
Distributed Generation and Energy Storage
Renewables
Dynamic System Control / Data Management
Electric Traction Motor
Power Electronics Controller
DC/DC Converter
Thermal System (cooling)
Smart Phone Connectivity
Traction Battery Pack
Charge Port
Transmission
Onboard Charger
Battery (auxiliary)
Battery Recycling
Internet / Consumer Portal and Building EMS
Efficient Building System
Utility Communications and Smart Grid
Charging ports / Control Interface
A complete vehicle electrification requires several ecosystems to develop and work collaboratively to leverage one another's capabilities to ensure a seamless development of the entire EV network.
Accelerating EV ecosystem development across the nation is a major opportunity to seize significant growth while enticing the EV business opportunities in the country.
7

EV TRANSFORMATION : Four (4) Major enhancement
MARii
Aggressive goals for Evs require investment & Multinational cooperation
1 - Enhanced Supply Chain
1
grid operations
service providers
energy generation and distribution
communications networks
2 - 'EV-Ready' Infrastructure
2
3 - Harmonized Standards and Regulations
3
4
- NxGV FUTURE TALENTS
8

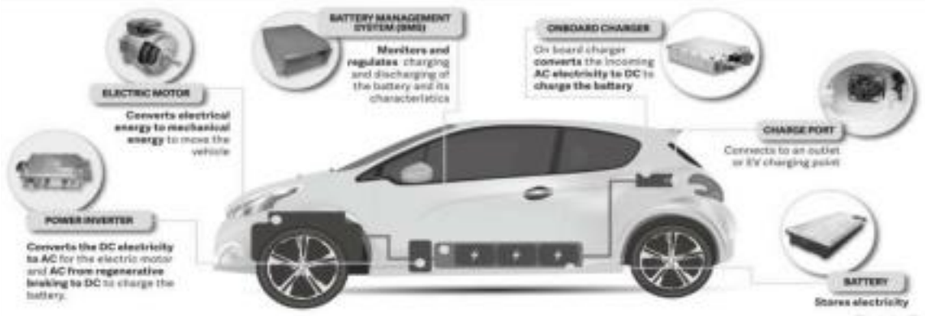
1 Enhanced Supply Chain

MAJOR CRITICAL PARTS AND COMPONENTS OF EV TO BE DEVELOPED

MARii

1

MAJOR COMPONENTS OF ELECTRIC VEHICLE



10

SUSTAINABILITY THROUGH EXCELLENCE

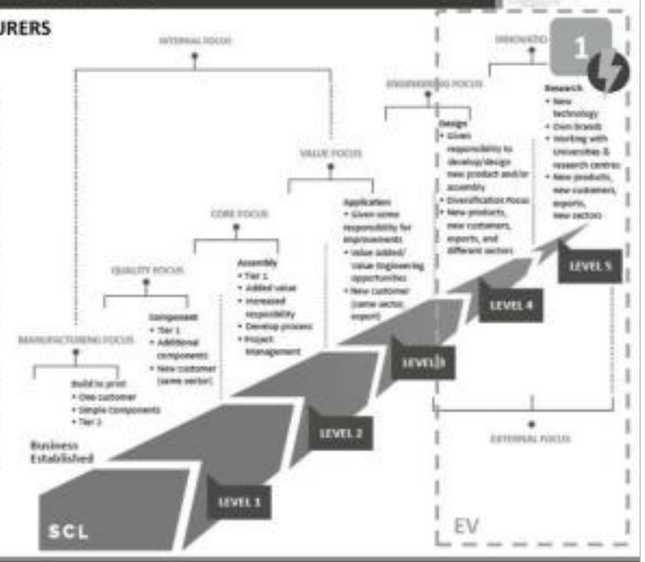
MARii

DEVELOPING LOCAL MANUFACTURERS AS GLOBAL VENDORS

The action plans to achieve the world class status amongst the capable local vendors, starting with the internal focus, followed by external focus as the vendors capabilities are gradually elevated were illustrated from the National Roadmap for Automotive & Mobility Value Chain (NRAMVC) under the National Automotive Policy 2020.

The minimum requirement for the automotive manufacturers capable to produce EV parts and components starts at SCL Level 4 with the capability to design the product itself.

Source: National Automotive Policy 2020



11

SUSTAINABILITY THROUGH EXCELLENCE

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LISTS OF POTENTIAL/CURRENT EV VENDORS

1

EV SUPPLY CHAIN – OEMS + VENDORS + STARTUP

12

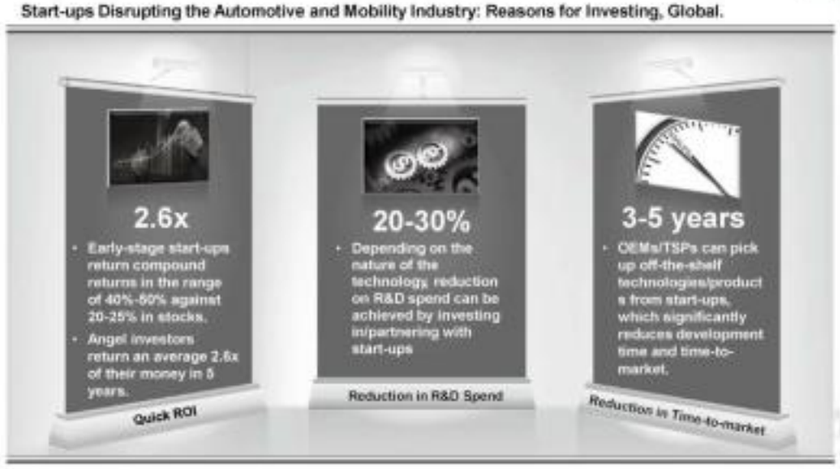
WHY START-UPS & VENDORS ? REASONS FOR INVESTING

MARI

Investment in a successful start-up can yield up to 5x to 100 times the initial investment.

1

Start-ups Disrupting the Automotive and Mobility Industry: Reasons for Investing, Global.



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Snapshot of Major Automakers' Investment and M&A Activity

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Most of the investments/acquisitions have taken place in the mobility space.

1

Start-ups Disrupting the Automotive and Mobility Industry: Snapshot, Global.

Key: C—Connectivity/M—Mobility, P—Parking, EV—Electric Vehicle, A—Autonomous

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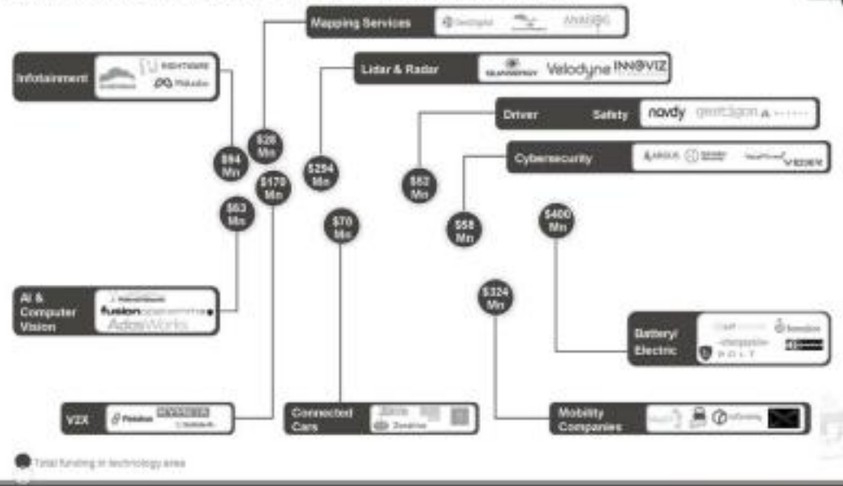
TOP-LEVEL SNAPSHOT OF FUNDING ACROSS TECH.

MARI

The total funding across various technological verticals was $1.55 billion, with major investment focused on mobility, electrification, and connected car technologies.

1



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Implications—Over ~1,700 Start-ups are Disrupting the Automotive Industry Supply Chain

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1

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Mobility as a Service (MaaS) – Cluster

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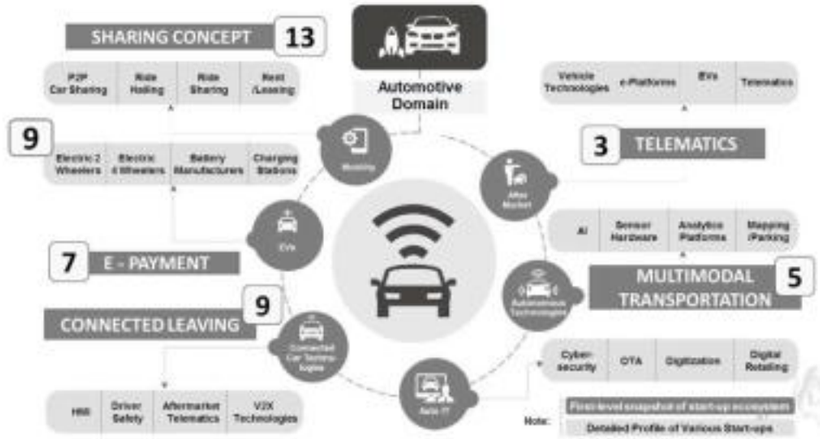
MaaS start-up ecosystem & cluster in verticals such as AI, mobility, aftermarket, and connected car technologies.



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MARii Programme for Supply Chain Development

MARii

LIST OF PROGRAMS OFFERED BY MARii FOR SUPPLY CHAIN DEVELOPMENT

- AUTOMOTIVE SUPPLIER EXCELLENCE PROGRAMME (ASEP)
- LEAN PRODUCTION SYSTEM (LPS)
- CEO / OWNER GROWTH MINDSET PROGRAMME (COGMP)
- CENTRE WITH OEM COMPUTER AIDED ENGINEERING (CAE)
- MARii INDUSTRY4WRD TECHNOLOGY PLATFORM (MITP)
- MARii SIMULATION AND ANALYSIS CENTRE (MARSAC) TRAINING PROGRAM
- DEALERS ENTREPRENEURSHIP ENHANCEMENT PROGRAMME (DEEP)
- MARii ADDITIVE MANUFACTURING TECHNOLOGY CENTRE (MAMTEC)
- DIGITAL DESIGN SMART COLLABORATIVE PLATFORM (D3SCOP)
- SMART PREDICTIVE MAINTENANCE DATA SYSTEM (SPMDS)
- MARii ENTERPRISE RESOURCE PLANNING (MARii ERP)

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AUTOMOTIVE START-UP HOTSPOT BY REGION

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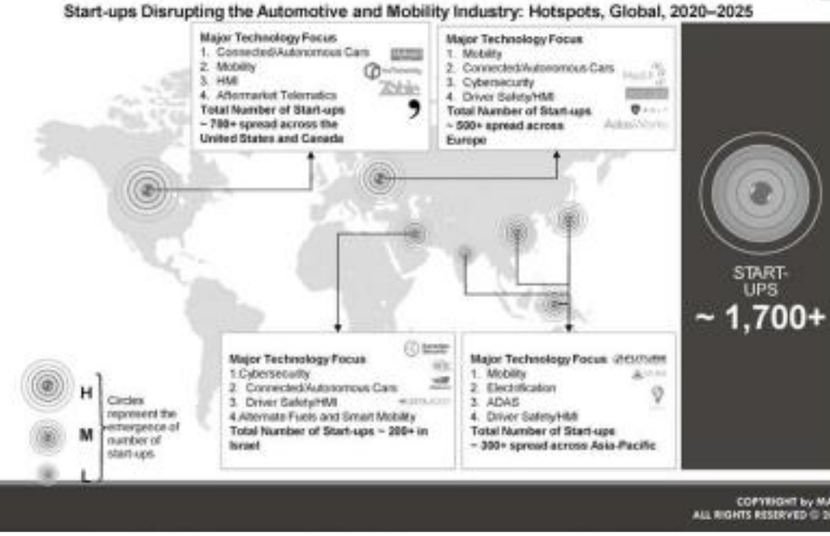
The start-up landscape has evolved over the years - with just about 450 in 2010, the number Reached ~1,700+ in 2016. North America leads the start-up culture, closely followed by Europe.

Start-ups Disrupting the Automotive and Mobility Industry: Hotspots, Global, 2020–2025



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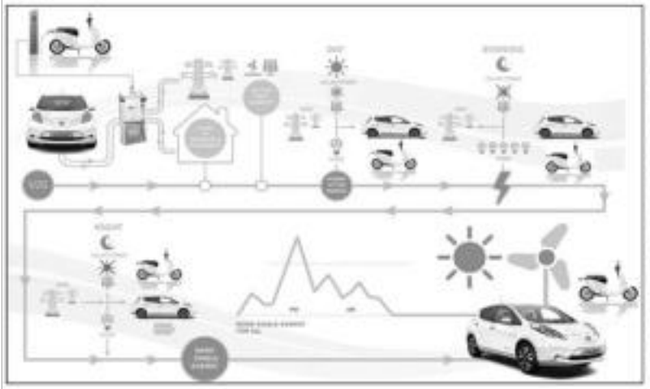
2 EV ready Infrastructure

Electric Vehicle Interoperability Centre (EVIC)

MARii

Whole EV Ecosystem – Well-to-Wheel

2



Charging Systems: Studying and validating AC, DC and wireless electric vehicle supply equipment (EVSE) to ensure any EV can plug into any EVSE safely and reliably.

Communications Technology: Developing and verifying software, embedded systems and messaging protocols to support standard connectivity and communication between the EV, EVSE and energy service (grid) interface.

Networks: Examining infrastructure-related systems to help develop a robust and reliable vehicle-to-grid network.

Vehicle and Component Testing: Two- and four-wheel drive dynamometers; thermal and multi-fuel capability; PEV and HEV test procedure development; and component hardware-in-the-loop testing at the Advanced Powertrain Research Facility.

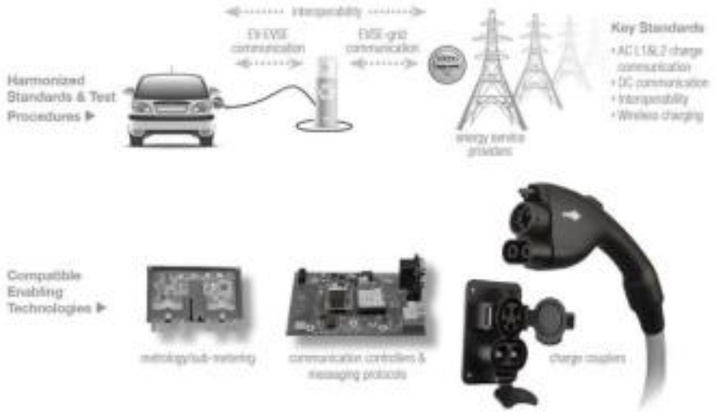
21

Electric Vehicle Interoperability Centre (EVIC)

MARii

Interoperability will provide standardized devices that are capable of functioning as intended with each other – without special effort by the user.

2

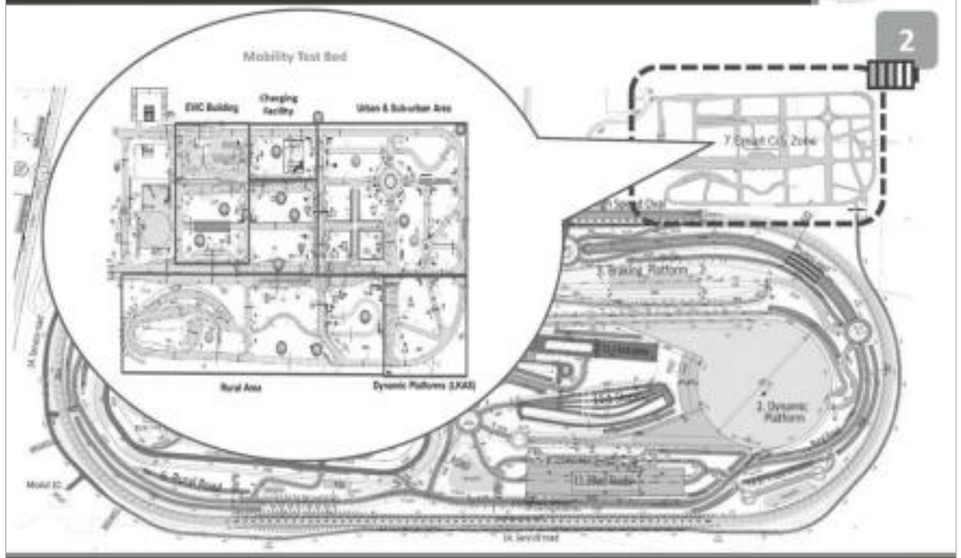


22

TEST BED DESIGN PROPOSAL

MARii

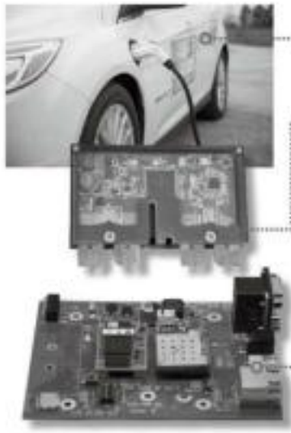
2



23

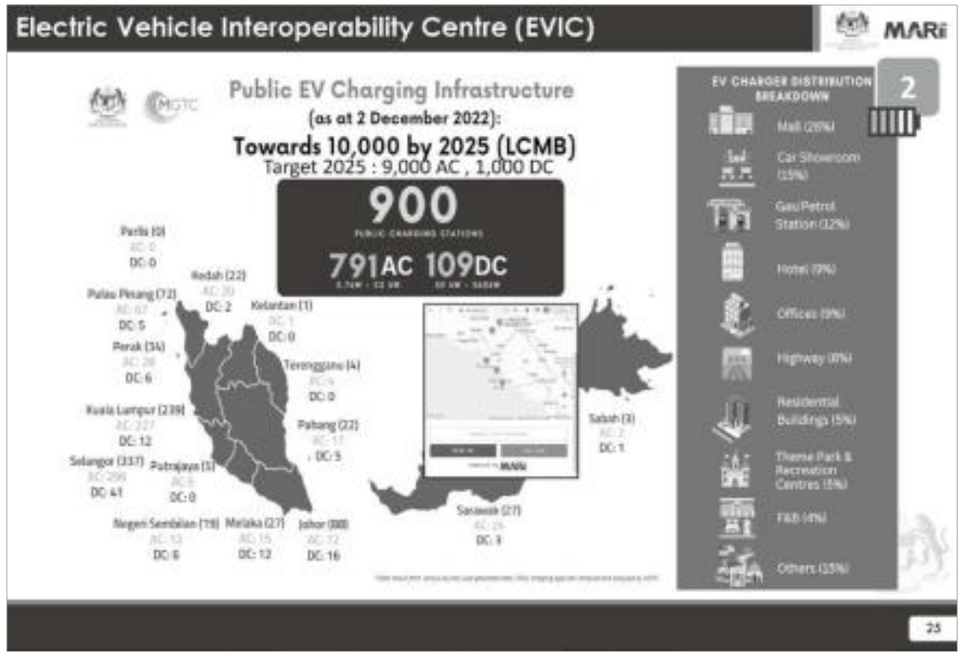
Electric Vehicle Interoperability Centre (EVIC)

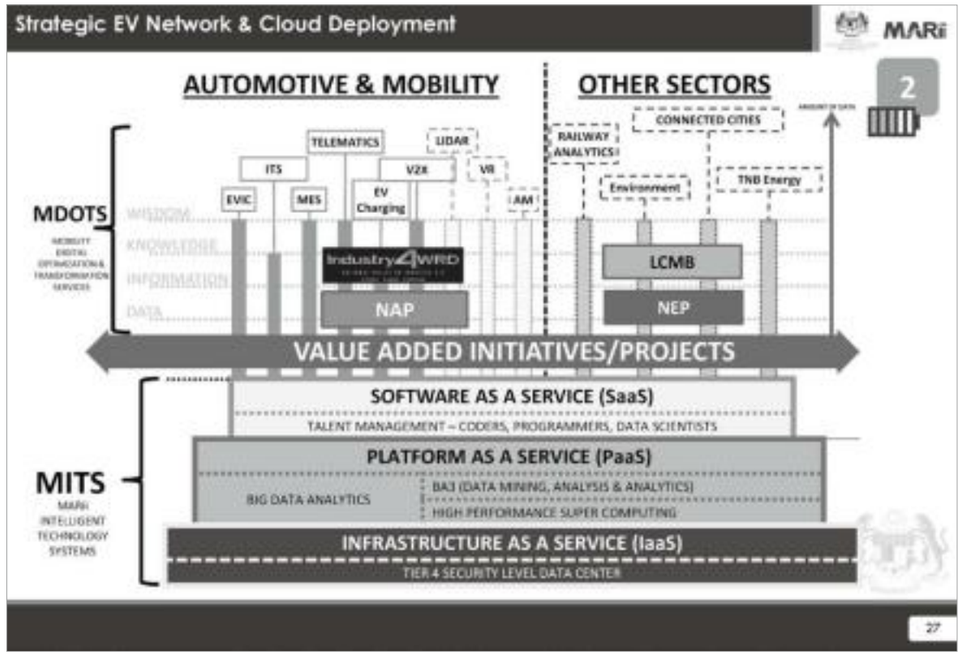
MARii

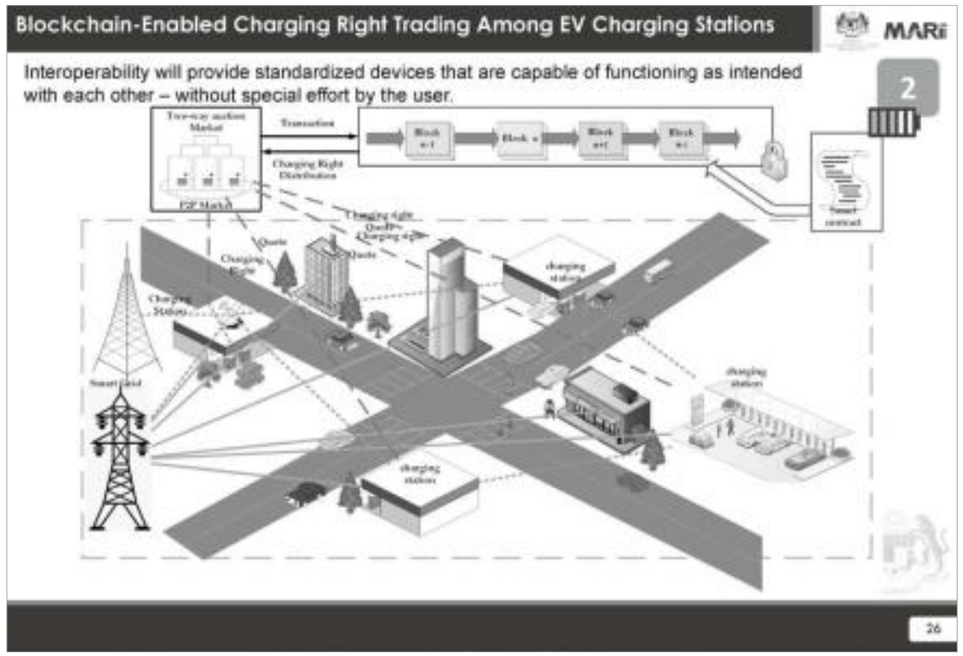


- **Codes and Standards:** Helping to develop and refine EV standards to enable smart, convenient and safe interaction with the electric grid; e.g., IEC/IEC 15118, SAE J1772 (conductive charge coupler), SAE J2954 (wireless charging) and SAE J2953 (interoperability).
- **Compact Metrology System:** Development of proof-of-concept device to measure and communicate charge energy.
- **Smart Energy Profile:** Developing a gateway to bridge the existing messaging infrastructure used by utilities (SEP 1.1) to SEP 2.0, including the adaption of off-the-shelf hardware for use in field trials to encourage commercial development.
- **Wireless Charging:** Developing the test requirements, protocols and a standard test fixture for wireless charging systems.
- **Electric Vehicle Communication Controller (EVCC) and Supply Equipment Communication Controller (SECC):** Creating test methods to evaluate power line communication (PLC) technologies that enable messaging between EVs and EVSE as well as EVSE to the grid.

24



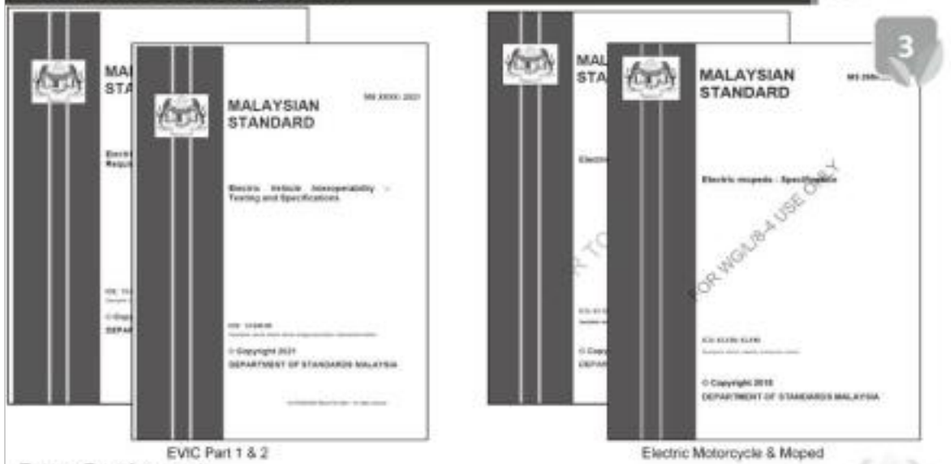




3 Harmonised Standard & Regulations

Standards Development

MARii



EVIC Part 1 & 2

Electric Motorcycle & Moped

Future Development:

- Harmonisation of Charging, Wireless Charging
- Battery Swapping
- Battery and Thermal Management System

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Standards Development

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LIST OF GENERAL STANDARDS

- MS 2722:2021: Energy Efficient Vehicle (EEV) - Requirements gazetted on 22nd April 2021
- MS 2730:2021: Next Generation Vehicle (NxGV) – Terminology, definition and levels od Autonomous, Automated and Connected Vehicle (AACV) gazetted on 28th July 2021.
- MS 2697:2018: Motor Vehicle Aftermarket – Repair, reuse, recycle and remanufacture (4R) for parts and components – Code of practice gazetted on 13th September 2018.
- MS 2696:2018 (Motor vehicle aftermarket - Service and Spare parts (2S) gazetted on 13th September 2018.
- MS 2725: 2021 Motor vehicle – Sales - Requirements gazetted in 2021.

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Standards Development

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LIST OF EV STANDARDS

- Passenger Car :
  - United Nations Regulations No. 100
- Electric Motorcycle :
  - MS 2413 : Electric motorcycle (>50 km/h)
  - MS 2688 : Electric moped (25-50 km/h)
  - United Nations Regulations No. 136
- Electric Bicycle :
  - MS 2514 : Electric bicycle (<25 km/h)
- EV Battery & Chargers :
  - MS IEC 62196 : EV Connectors & Inlet
  - MS IEC 61851 : EV Conductive Charging System
  - MS IEC 62660 : Li-Ion Testing for EV
  - SAE 1772 : EU-Type 2

*Development of standards for EVIC related (including charging protocols) is on-going with DSM.

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Standards Development

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NATIONAL OCCUPATIONAL SKILLS STANDARDS

NOSS
DEPARTMENT OF SKILLS DEVELOPMENT

NOSS outlines the skills required by an employee working at a certain level of employment to achieve specific competency.

NOSS is developed by a pool of the industry expert and skilled workers in the area of performed job.

The NOSS can be used for

- Pengiktirafan Pencapaian Terdahulu (PPT)/Recognition of Prior Achievement certification for experienced manpower.
- SLDN stands for National Dual Training System is for graduates which includes actual workplace (company) of 70% to 80% practical training (performance) and 20% to 30% theoretical learning (knowledge).

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NxGV FUTURE TALENTS

Talent Development
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Areas identified to be developed in the human capital of the automotive industry
2030- Connected Mobility Vision (CMV)
AUTOMOTIVE HUMAN CAPITAL DEVELOPMENT
3
FUTURE AUTOMOTIVE
EEV
Connected Vehicle
Next-Gen Vehicle
Autonomous Vehicle
Unmanned Aerial Vehicle
2
TECHNOLOGY AUTOMOTIVE
Smart Factory
Transmission manufacturing
Transmission design
Vehicle Electronics
Telematics
Remanufacturing
1
MANUFACTURING, ASSEMBLY & SERVICES
Design & Development
Testing
Production
Maintenance & Quality
PPC & Logistic
Distribution & After sale
Lean Technology
Productive Technology
INDUSTRIAL MASTER PLAN 3 (2006-2020)
Areas to be developed through enchancing R&D and Design Capabilities
Current Areas to be enchanced
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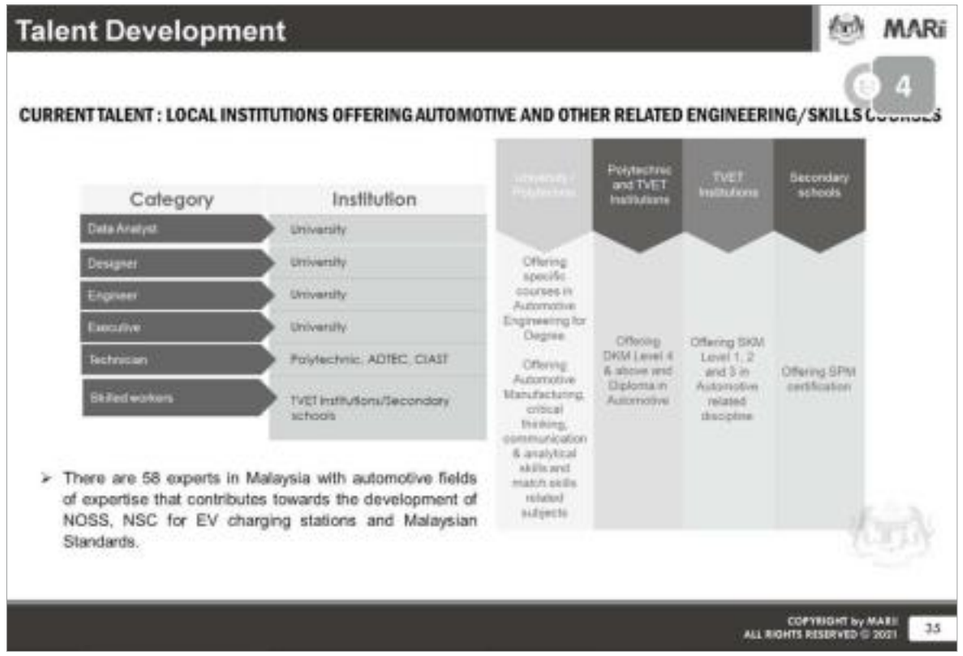
Talent Development
MARii
4
CURRENT TALENT : LOCAL INSTITUTIONS OFFERING AUTOMOTIVE AND OTHER RELATED ENGINEERING/SKILLS COURSES
Category
Institution
Data Analyst
University
Designer
University
Engineer
University
Executive
University
Technician
Polytechnic, ADTEC, CIAST
Skilled workers
TVET Institutions/Secondary schools
University / Polytechnic
Polytechnic and TVET Institutions
TVET Institutions
Secondary schools
Offering specific courses in Automotive Engineering for Degree
Offering Automotive Manufacturing, critical thinking, communication & analytical skills and match skills related subjects
Offering DKM Level 4 & above and Diploma in Automotive
Offering SKM Level 1, 2 and 3 in Automotive related discipline
Offering SPM certification
There are 58 experts in Malaysia with automotive fields of expertise that contributes towards the development of NOSS, NSC for EV charging stations and Malaysian Standards.
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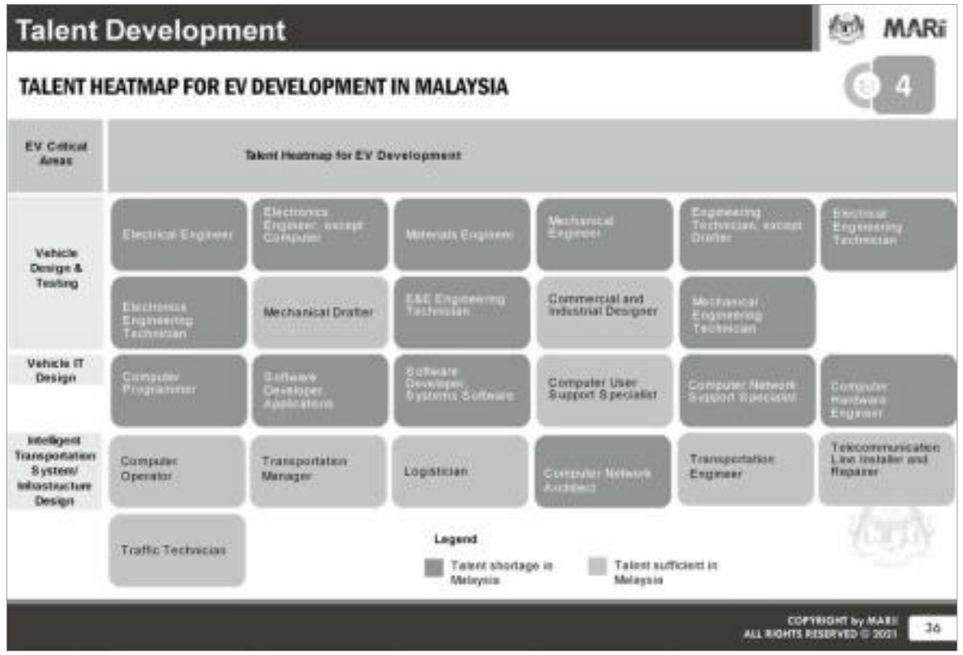
Talent Development
MARii
TALENT HEATMAP FOR EV DEVELOPMENT IN MALAYSIA
4
EV Critical Areas
Talent Heatmap for EV Development
Vehicle Design & Testing
Electrical Engineer
Electronics Engineer, except Computer
Materials Engineer
Mechanical Engineer
Engineering Technician, except Drafter
Electrical Engineering Technician
Electronics Engineering Technician
Mechanical Drafter
E&E Engineering Technician
Commercial and Industrial Designer
Mechanical Engineering Technician
Vehicle IT Design
Computer Programmer
Software Developer, Applications
Software Developer, Systems Software
Computer User Support Specialist
Computer Network Support Specialist
Computer Hardware Engineer
Intelligent Transportation System/ Infrastructure Design
Computer Operator
Transportation Manager
Logistician
Computer Network Architect
Transportation Engineer
Telecommunication Line Installer and Repairer
Traffic Technician
Legend
Talent shortage in Malaysia
Talent sufficient in Malaysia
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Talent Development

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LIST OF PROGRAMMES BY MARii

ENHANCEMENT OF CURRENT PROGRAMMES

- Automotive Industry Certification Engineering (AICE)
- Industry Led Professional Certificate (IPC)
- IPC – *Pengiktirafan Pencapaian Terdahulu* (Recognition of Prior Achievement)
- IPC – *Sistem Latihan Dual Nasional* (National Dual Training System)
- IPC Industry4WRD Programme
- Industry4WRD Additive Manufacturing – Generative Design Explorer Programme (IAMP)
- Industry4WRD Mixed Reality Programme (IMRP) – AR/VR
- Industry4WRD Simulation Computer Aided Engineering (CAE) Programme (ISCAE)
- Peneraju Skil AICE DEP Programme
- PENJANA KPT Career Advancement Programme (Industry Certification Engineering)
- Graduate Apprenticeship (GA)
- Employability and Re- Training Local Talent Programme (ERT)
- Reskilling and Re-Employment with Perodua and Ecosystem Programme (REPEAT)

APPRENTICESHIP
AUTOMOTIVE GRADUATE APPRENTICESHIP PROGRAMME

AICE
AUTOMOTIVE INDUSTRY CERTIFICATION ENGINEERING

IPC

penjana

NEW PROGRAMMES

- Industry4WRD IoT Engineer Programme (IIEP)
- Industry4WRD Autonomous Robotics Engineer Programme (IAREP)
- Industry4WRD Data Scientist Analytics Programme (IDSAP)
- Industry4WRD Cybersecurity in Smart Manufacturing (ICISM)
- Industry4WRD Vertical & Horizontal Programme (IVHP)
- Industry4WRD Digital Twins (DT) Programme (IDTP)

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Battery Management System (BMS)

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Battery Pack with BMS

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Electric Bus

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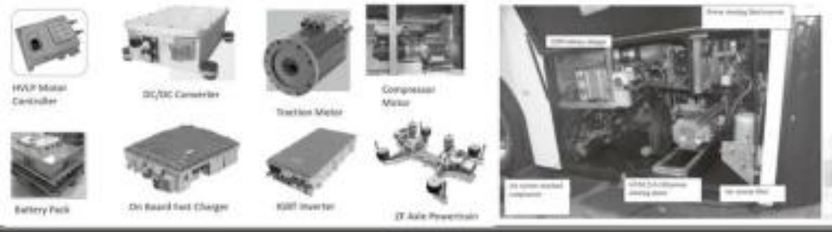
4

Electric bus developed by MARii with academia partner.



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Talent Development

MARii

4

LIST OF UNIVERSITIES AND RESEARCH INSTITUTE ON EV

- Optimisations for the health prognostic of lithium-ion battery management in EV applications and remanufacturing
- Develop BMS and battery packs for energy storage applications & Battery capacity 100V – 350V.
- EV charging in a power distribution system and thermal management systems
- Develop Range Extended Electric Vehicle (RE-EV) for Motorcycle with MIMOS
- Develop BMS and Battery pack through reverse engineering
- ICE to EV conversion
- Talent and expertise development for EV
- Develop technology centers:
  - MARii Academy of Technology
  - MARii Design Center
  - MARSAC
  - MAMTEC
  - National Digitalisation Center

MALAYSIA TECHNICAL UNIVERSITY NETWORK (MTUN)

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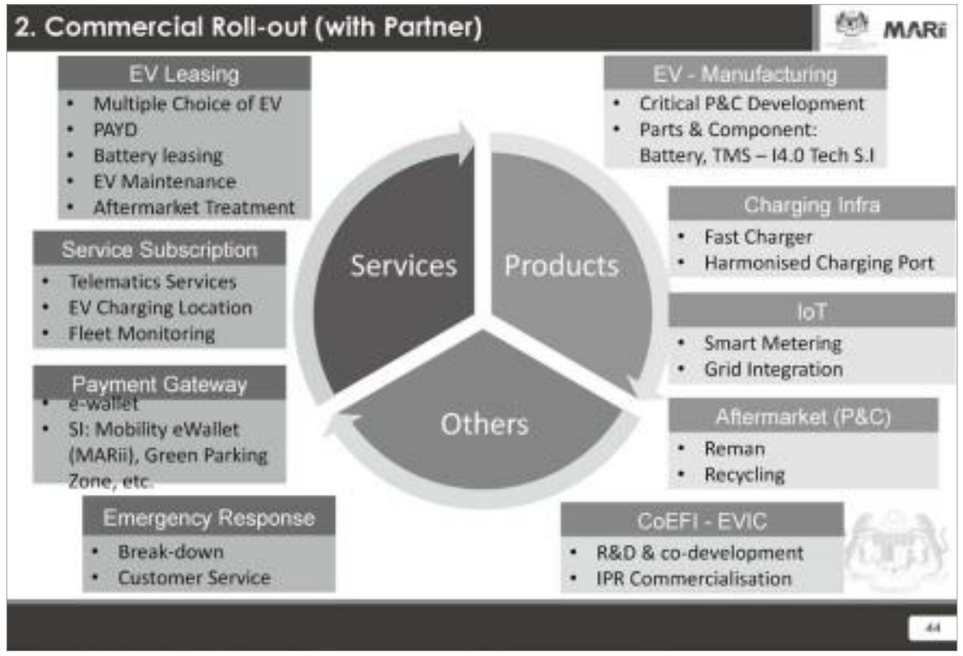
Strategic Action Plan



2. Commercial Roll-out (with Partner)

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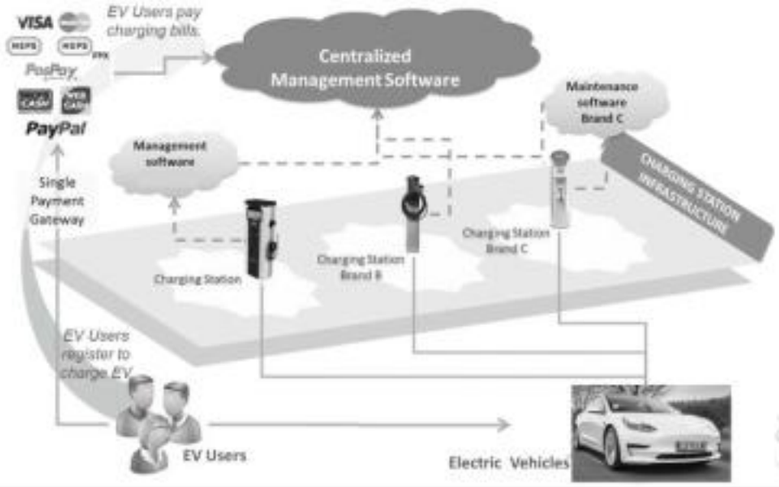
Example: EV Network Management



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3. Promotion and Awareness

MARii

EXCITING AUTOMOTIVE. REBORN.

MALAYSIA INTERNATIONAL MOTOR EXPO

03·04·05 NOVEMBER 2023

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4. Embracing E-mobility 2020-2030

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MALAYSIA AUTOMOTIVE ROBOTICS AND IOT INSTITUTE
Block 2280, Jalan Usahawan 2, Cyber 6, Cyberjaya,
Selangor, 63000, Malaysia.

THANK YOU

SPEAKER

Master Class 1 - Future Car & Mobility & Future Fuel

전 규 태 Gyu Tae Jun

탑테크㈜ 대표 / CEO of TopTech

지역사회와 함께 발전하는 탑테크
TOPTECH growing together with local communities

BIOGRAPHY

CEO Jun Gyu Tae established Top Tech in 2008 based on Pyunghwa Valeo and small and medium-sized business experience, and has been growing as a professional technician for more than 25 years. He obtained a master's degree in automotive engineering and a master's degree in business administration, achieved steady research and development performance, and won awards such as the 2020 Small and Medium Business Excellence Award and the 2022 Minister of Small and Medium Venture Business Award for profit generation and sales growth.

'Based on the creative spirit of challenge, all executives and staff members work together to produce the highest quality products through product development and process development for customer satisfaction.

Under the management philosophies of ‘corporate change', 'individual development', and 'mutual respect', we are working with the mindset of growing and developing together.

In addition, in order to help young people in the local community with field work, we are providing local students with learning opportunities by linking lectures and field trips on field work, job creation and social contribution activities.

Like this, he is still working hard to become a respected entrepreneur.

Abstract

TOPTECH growing together with local communities

Toptech Co., Ltd. designs, processes, and manufactures automated inspection devices with its own technology by investing in development of new technologies such as production process efficiency and automation line establishment of manufacturing production facilities, so it is growing more and more by creating profits and increasing sales through reducing manufacturing costs and improving productivity.

The main business divisions consist of the automobile parts division, the automation division, and the company-affiliated research institute.

The Automotive Division produces more than 20 types of products, including hybrid SUB ASS'Y, transmission parts DCT forks, and engine support brackets through state-of-the-art cutting processing.

The Automation Division conducts its own design, manufacture, development, and sales of auto parts inspection checker gauges and automatic/semi-automatic inspection devices.

The company-affiliated research center has secured 12 patents for core technologies and secured future food sources with a combination of industrial robot convergence systems and new convergence technologies based on various product design and automation equipment-based technologies.

In addition, to diversify new businesses, we plan to expand overseas market development as a strategy to diversify business partners and expand exports.

As an expansion plan, we are seeking cooperation with Top Tech's technology and competitiveness for local companies that feel a lack of technology and competitiveness.

By participating in joint development and continuous improvement activities with us, we will be able to increase corporate profits, improve productivity, and maximize quality stability.

In other words, we are confident that our current partner companies will apply new technologies and become the world's best technology holding company, supplementing each other's lacking parts through technology cooperation transfer.

Abstract

지역사회와 함께 발전하는 탑테크

탑테크㈜는 자동차부품을 주생산품목으로 성장 발전하였으며, '기술력이곧 경쟁력'이라는 믿음으로 생산공정 효율화와 제조생산설비의 자동화 라인구축 등 신기술개발에 집중 투자하여 자동화 검사장치를 자체기술로 설계, 가공, 제작하기에 제조비용 절감과 생산성 향상 등을 통한 이익창출과 매출증대로 더욱 더 성장하고 있습니다.

주요 사업부로는 자동차부품사업부, 자동화사업부, 기업부설연구소로 이루어져 있습니다.

자동차사업부는 최첨단 절삭가공을 통한 하이브리드 SUB ASS'Y, 트렌스미션부품 DCT포크, 엔진 서포트 브라켓 등 20여종 이상의 제품 생산합니다.

자동화사업부는 자동차부품 검사 체커 게이지, 자동/반자동 검사장치 등 자체 설계 및 제작, 개발완료 판매를 시행하고 있습니다.

기업부설연구소는 핵심 기술에 대한 특허권 12건 확보하고, 다양한 제품 설계 및 자동화장비 기반 기술로 산업용 로봇융합시스템과 융복합 신기술 조합으로 미래 먹거리를 확보하고 있습니다..

그리고, 신사업 다각화를 위해 거래선 다변화 및 수출확대를 위한 전략으로 해외시장 개척을 확대 할 계획입니다.

확대방안으로는 기술력과 경쟁력 부족을 느끼는 현지기업에 탑테크의 기술력과 경쟁력 등의 협력을 모색하고 있습니다.

당사와 공동개발 및 지속적 개선활동 협력에 동참함으로써 기업 이윤 증가와 생산성 향상, 품질 안정 극대화를 실천 할 수 있을 것입니다.

즉, 당사의 기술협력 이전을 통해 부족한 부분을 상호보완해주며 현재 협력기업은 신기술 적용과 세계 최고 기술 보유 기업이 될 것으로 확신합니다.

MEMO

Company Profile
TOPTECH
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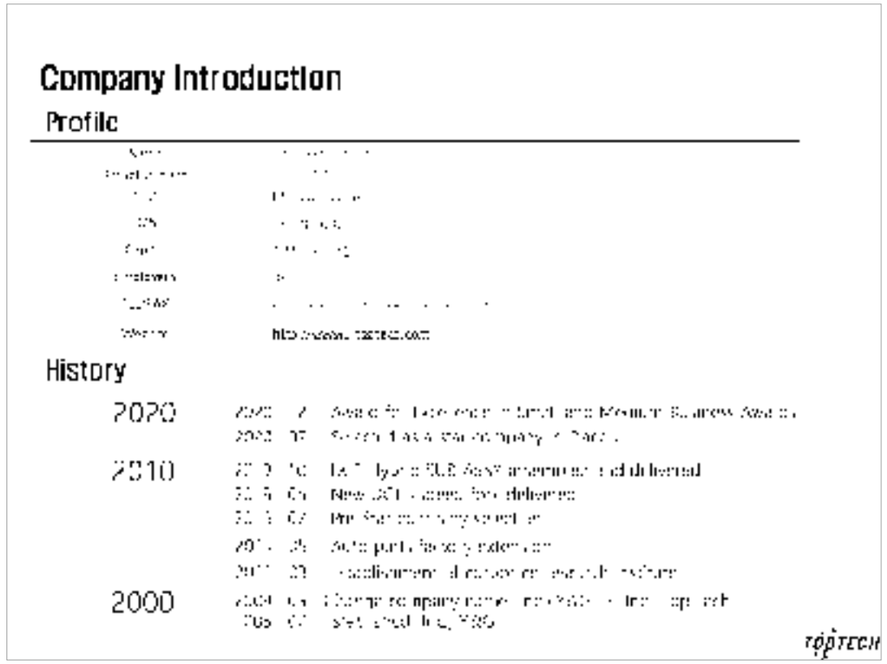
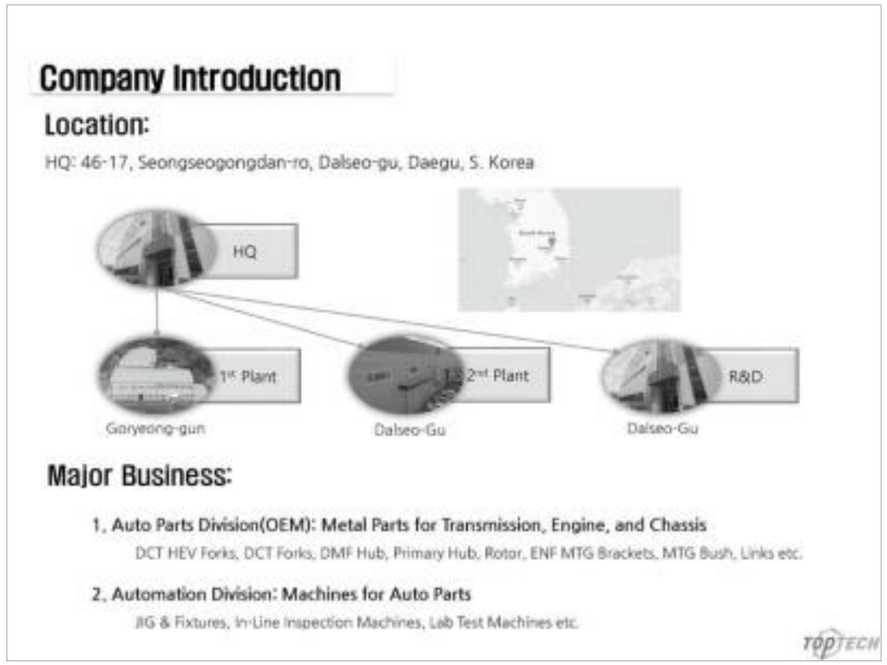
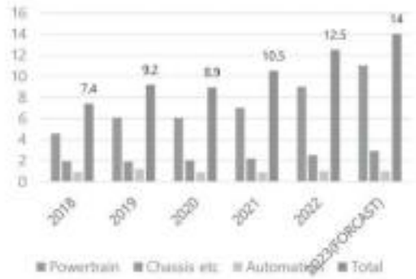
Contents
I. Company Introduction
II. Sales(inc. Manpower) & Customer
III. Manufacturing Capabilities
IV. Process Equipment
V. Quality Assurance


Company Introduction
Profile
History
2020
2010
2000
TOPTECH


Company Introduction
Location:
HQ: 46-17, Seongseogongdan-ro, Dalseo-gu, Daegu, S. Korea
HQ
1st Plant
2nd Plant
R&D
Goryeong-gun
Dalseo-Gu
Dalseo-Gu
Major Business:
1. Auto Parts Division(OEM): Metal Parts for Transmission, Engine, and Chassis
DCT HEV Forks, DCT Forks, DMF Hub, Primary Hub, Rotor, ENF MTG Brackets, MTG Bush, Links etc.
2. Automation Division: Machines for Auto Parts
JIG & Fixtures, In-Line Inspection Machines, Lab Test Machines etc.
TOPTECH

Sales & Customer

Sales Performance & Forecast (Manpower)



Key customers

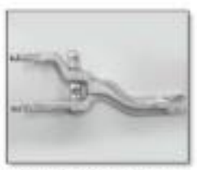
HYUNDAI MOTOR GROUP · KIA · Valeo · HYUNDAI TRANSYS · SL Corporation · PHC Valeo

TOPTECH

Manufacturing capabilities

Auto Parts for Powertrain (Engine & Transmission)

DCT HEV FORK1 Ass'y


DCT HEV FORK2 Ass'y

DCT 7 SPEED FORK1

DCT 7 SPEED FORK2

PRIMARY COVER(ED)

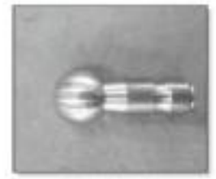
PRIMARY COVER(DMF)

HUB(DMF)

TOPTECH

Manufacturing capabilities

Auto Parts for Chassis


BALL STUD

ENG MTG BRAKT

ROTOR

LINK

LEVER PART

MOUNTING BUSH

TOPTECH

Manufacturing capabilities

Automation for Test machine, Check & Gauge

FRANGE LEAK TEST M/C

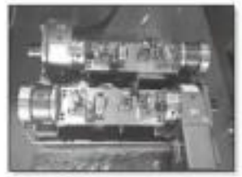
KNOB INDENTATION & SEPERATION FORCE TEST M/C

SHAFT TEST M/C

TOPTECH

Manufacturing capabilities

Automation Index Jigs for Machining Center Machine



INDEX JIG

MCT JIG

TOPTECH

Process Equipment

- Manufacturing Machines and Facilities

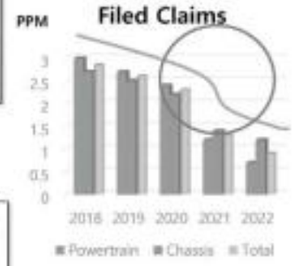
Name	Standard	Quantity
NC Automatic Lathe	6"	12
NC Automatic Lathe	8"	2
Machining Center (MCT)	No. 4	26
Machining Center (MCT)	No. 5	18
Robot		9
Excluding Universal Milling M/C		2
Complex Milling M/C	No.2	2
Drill & Tap M/C		2

- Digital Precise Measuring Machines

Name	Standard	Quantity
3D Measuring M/C(CMM)		3
2D Measuring M/C (TRIMOS)	600H	2
Roughness Measuring M/C		1
Shape Measuring M/C		1
Height gauge		4

TOPTECH

Quality Assurance



TOPTECH

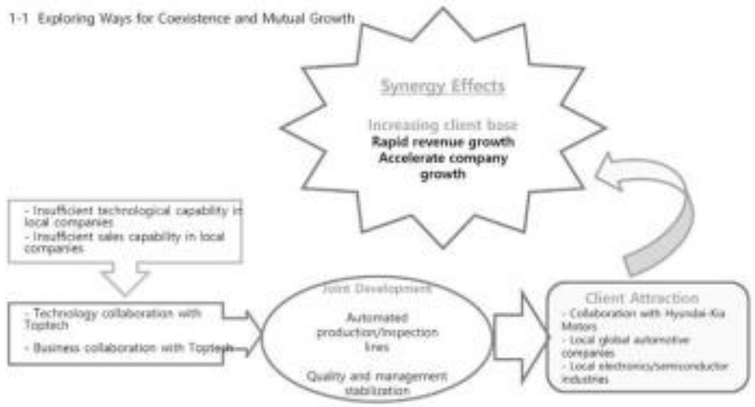
Global Marketing Strategies

Technology Collaboration and Transfer

TOPTECH

1. Purpose and Necessity of Technology Transfer

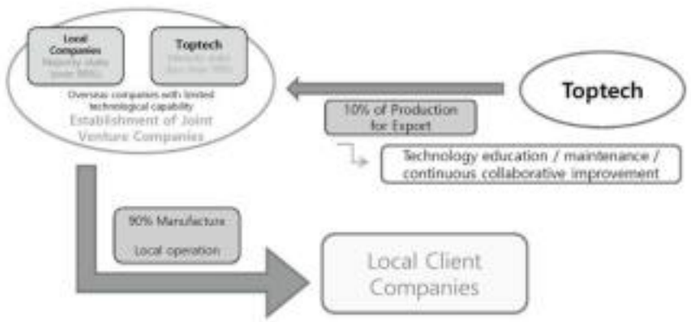
1-1 Exploring Ways for Coexistence and Mutual Growth



2. Expected Benefits

2-1 Implementation Methods

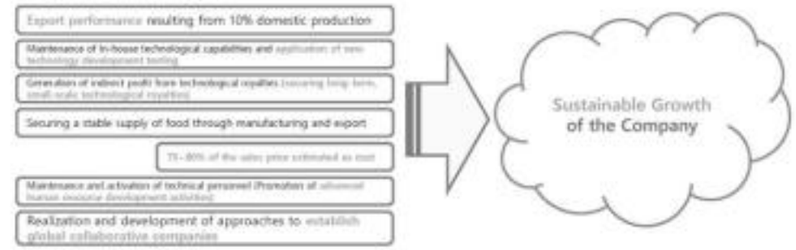
a) How will the collaboration be carried out?



3. Expected Benefits

3-1 Expected Benefits of Local Companies

3-2 Expected Benefits of Toptech



Always Be With Your Best Business Partner

THANK YOU !

SPEAKER

Master Class 1 - Future Car & Mobility & Future Fuel

정 명 호 Myungho Jung

경진기계㈜ 대표 / CEO of Kyung-Jin

경진의 과거, 현재, 미래
Kyungjin's past, present and future

BIOGRAPHY

≫ **1998. 01** Joined Kyungjin
≫ **2005. 01** Appointed as CEO of Kyungjin
≫ **2019. 03** Keimyung University Graduate School of Intelligent Automotive Engineering (Master's degree)

Abstract

Kyungjin's past, present and future

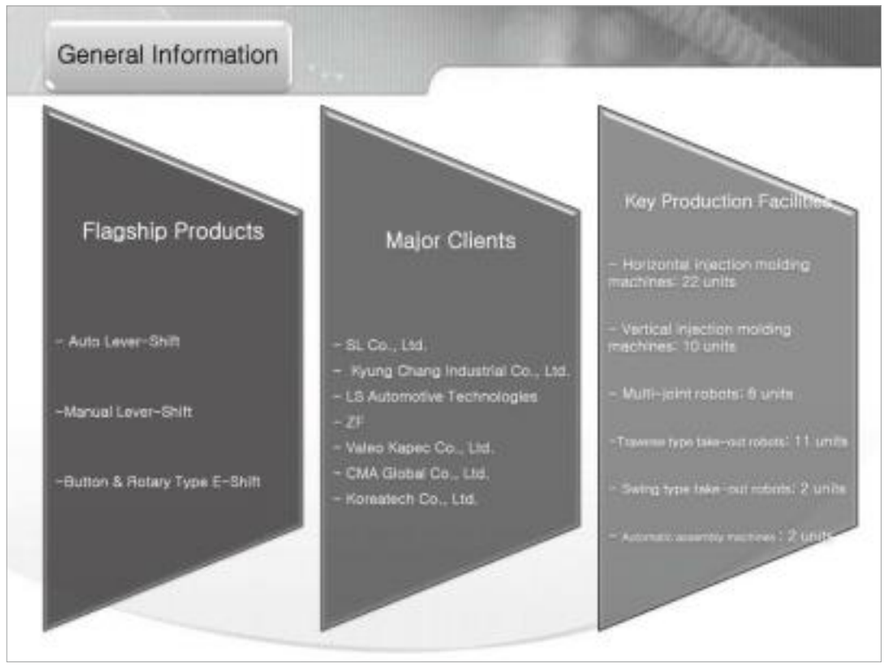
Kyungjin is a secondary partner of Hyundai-Kia Motors, which mainly produces Auto & Manual Lever-Shift and Button & Rotary Type E-Shift for vehicles.In addition to the product introduction of Kyungjin, we will introduce examples of innovation in manufacturing technology compared to the past production methods of injection and assembly processes, and introduce the direction for future growth of Kyungjin.

경진의 과거, 현재, 미래

경진기계는 차량용 Auto & Manual Lever-Shift, Button & Rotary Type E-Shift를 주요 생산 품목으로하는, 현대기아차 2차 협력사이다.

경진기계의 생산제품 소개와 더불어, 사출 및 조립공정의 과거 생산 방식 대비 현재의 제조 기술 혁신사례를 소개하며, 향후 경진기계의 성장을 위한 방향을 소개하고자 한다.

KYUNGJIN
MACHINE CO., LTD.
Present, and Future
KYUNG-JIN


General Information
Flagship Products
- Auto Lever-Shift
-Manual Lever-Shift
-Button & Rotary Type E-Shift
Major Clients
- SL Co., Ltd.
- Kyung Chang Industrial Co., Ltd.
- LS Automotive Technologies
- ZF
- Valeo Kapec Co., Ltd.
- CMA Global Co., Ltd.
- Koreatech Co., Ltd.
Key Production Facilities
- Horizontal injection molding machines: 22 units
- Vertical injection molding machines: 10 units
- Multi-joint robots: 9 units
- Swing type take-out robots: 2 units

History
1977.03 Establishment of Kyung-Jin Machinery
1994.03 Initial transaction with SL
2005.01 Conversion to a corporation
2009.05 Initial transaction with ZF (Direct export)
2013.08 H/KMC SQ Certified
2015.07 Factory expansion
2017.12 Establishment of MES
2018.03 Initial transaction with Kyungchang Industrial
2023.03~ Initial transaction with LS Automotive, Valeo Kapec, and KDS

Products
A/T
LEVER-SHIFT
Auto Transmission이 장착된 차량에 적용되는 부품으로
운전자가 직접 조작하는 품목으로 일반적인 차량에 적용되는
기계식타입과 고급차량에 적용되는 전자식타입이 있으며,
높은 수준의 기능품질과 감성품질을 만족하여야 합니다.
It should be easily controlled by driver on the road, being
asked Sensitive and Functional Quality mechnically
and electronically in many kinds of public
and/or expensive cars

Products
BUTTON & ROTARY TYPE E-SHIFT
차세대 형식의 E-SHIFT로 높은 수준의 조작감과 외관 품질이 요구되는 제품으로, 가장 최신의 레버 형태입니다.
This Button typed Shifter is a kind of Electronic Shifter, which requires a high level of operation and appearance quality as one of the latest lever type of Shifter.

Products
POWER-WINDOW BUTTON
높은 수준의 조작감과 외관 품질이 요구되는 제품
Products requires a high level of operation and appearance quality

Products
M/T LEVER-SHIFT
일반적인 Manual Transmission이
This Lever-Shift, being asked high stamping tech, to make it bent and inserted molding to manufacture, is connected to the Manual Transmission in general cars
HIGH PERFORMANCE M/T LEVER-SHIFT

Products
BATTERT MODULE BUS-BAR GUIDE
전기차 배터리 모듈간 직렬연결을 해주는 부품으로, 고내구성과 고내열성을 요하는 부품입니다.
It is a component that connects battery modules in series, that requires high durability and heat resistance.

Products

Lifestyle Products

As a part of business diversification, we are planning to enter the lifestyle market in addition to our automotive components, including eyeglass cases and combs.

Glasses & Contact lenses Case

BRUSH

Innovation in Manufacturing Technology

Plastic Injection Molding

1) Insert Injection Molding

Past	Present
-Productivity and quality varied based on workers' skill and commitment -Possibility of defects increased	-Contributed to productivity improvement -Decreased defect rate

Innovation in Manufacturing Technology

Plastic Injection Molding

2) GATE Cutting

Past	Present
-Increased worker fatigue -Increased staffing required based on order volume -Increased defect rate	-Improved productivity -Flexible response to orders

Innovation in Manufacturing Technology

Plastic Injection Molding

3) Heat Staking Injection Molding

Past	Present
-Manual injection followed by individual manual heat staking processes -Decreased production volume -Excessive inventory for processing -Increased defect rate	-Automated injection and heat staking processes -Reduced labor cost -Decreased inventory for processing -Increased productivity

Innovation in Manufacturing Technology

LEVER-SHIFT Assembly

1) Automated Assembly Process

Past	Present
-Limited to simple SUB component assembly -Worker-dependent tactile and visual inspection only -Decreased productivity -Increased defect rate	-Automated production of SUB components assembly and grease injection processes -Improved quality including prevention of component omission -Significant improvement in productivity -Reduced staffing requirements

Innovation in Manufacturing Technology

LEVER-SHIFT Assembly

2) Assembly & Inspection Process

Past	Present
-Worker-dependent tactile and visual inspection only -Decreased productivity -Increased defect rate	-Utilizes various sensors and machines for inspection -Significant improvement in quality reliability -Reduced inspection time

Innovation in Manufacturing Technology

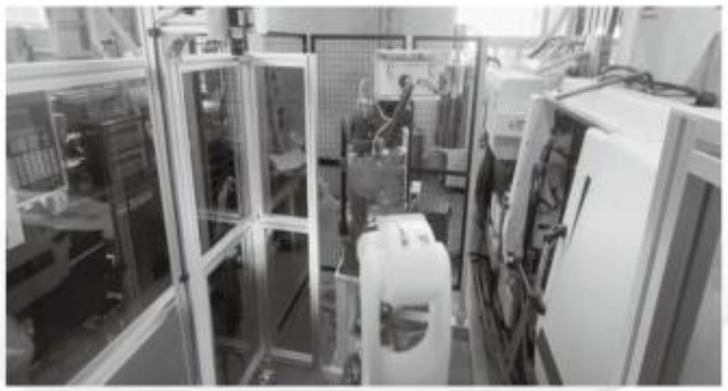
Miscellaneous Machining Processes

Past	Present
-Individual processes such as M.C.T, press, etc. -Complex logistics movement and excessive inventory for each process	-Automated composite manufacturing processes for machining, pressing, etc. -Improved productivity -Reduced logistics movement and costs

Growth Strategy

Sustainable growth through the adoption of advanced manufacturing technology!!!

1. Implementation of Collaborative Robots



Growth Strategy

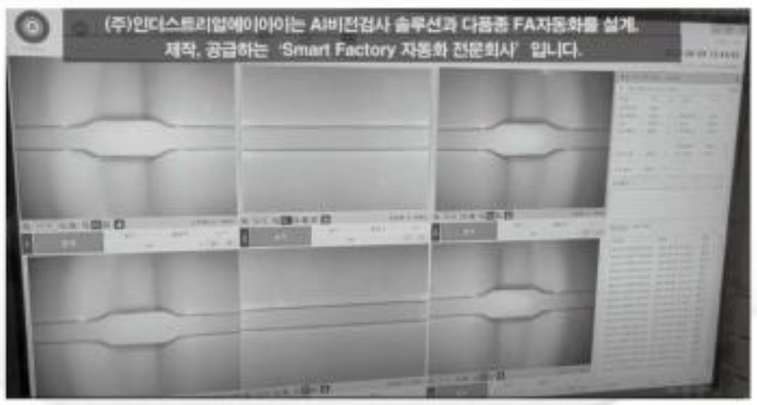
Sustainable growth through the adoption of advanced manufacturing technology!!!

2. Mixed-Model Assembly Automation

Growth Strategy

Sustainable growth through the adoption of advanced manufacturing technology!!!

3. Production Utilizing AI & Vision



Growth Strategy

Sustainable growth through the adoption of advanced manufacturing technology!!!

4. Logistics Automation

SPEAKER

Master Class 2 - Smart Manufacturing Innovation

최 광 훈 Kwanghoon Choi

㈜알엠소프트 대표 / CEO of RMSOFT

아카이브 시스템과 오토스토어
Archive system and Autostore

BIOGRAPHY

Choi Kwang Hoon is an CEO of an archive company. In the 12 years since the establishment of an archive management company in 2011, 600 project orders have been received. As of 2022, it recorded sales of 24 billion won, and has been reborn as the No. 1 company in the Korean archive industry. Choi Kwang Hoon, the CEO, obtained a Ph.D. in archiving and information science from Jeonbuk National University, and participated in various consulting projects and IT development projects.As a result, RM Soft was awarded the Prime Minister's Award in 2020 and has achieved many achievements, including being designated as a "company that is great for younger employees to work (small and medium-sized companies in Seoul)" among small and medium-sized enterprises certified by the Seoul Metropolitan Government and public institutions. Over 200 employees are constantly working to expand our reach into different areas of archive management.

Abstract

Archive system and Autostore

In 2022, the number of requests for information disclosure by the Korean public was about 1.8 million, with an average of more than 5,000 cases occurring per day. Requests for information disclosure must be processed in only 10 days, but public institution resources (human resources, time, etc.) are currently insufficient to handle this task. At RM Soft Co., Ltd., we thought about how people who manage documents can handle above tasks in a more efficient way.

First, we realized automation by introducing "AutoStore," a logistics automation system, into the archives. We have reduced the time in minutes to look for documents in the archives, and you would not have to look for them yourself.

Second, implement archive through document digitization. RM Soft's archive system, Archivist, not only stores digitized image files of archives, but also uses them for retention and utilization. All people in charge can easily check documents by searching on their computers in their own places. In addition, agents can link "Archivist" and "AutoStore" to take out and import documents with a click.

The third is to automatically upload the time of shipment and return, and the borrowers' information by applying RFID. The RM Soft's RFID system features work with "AutoStore" and "Archivist" to update loan information in real time and systematically manage document history. In addition, the RFID system automatically operates at "AutoStore" without any additional operation, enabling full automation of the library.

In addition to building a more efficient work environment, RM Soft is working to combine various new technologies such as NFT, Blockchain, Metaverse, and AI Solution in various forms.

아카이브 시스템과 오토스토어

2022년 대한민국 국민이 신청한 정보공개청구 건수는 약 180만건으로 하루평균 약 5천건 이상이 발생되고 있습니다.
정보공개 청구는 단 10일만에 처리해야 하는데, 현재 공공기관 자원(인력, 시간등)으로는 이 업무를 처리하기 턱없이 부족한 상황입니다.
알엠소프트에서는 문서를 관리하는 사람이 더 효율적인 방법으로 업무를 처리 할 수 있는 방법을 고민했습니다.

첫번째, 물류 자동화 시스템인 "AutoStore"를 문서고에 도입하여 자동화를 실현하였습니다. 문서고에서 문서를 찾는 시간을 분단위로 단축시켰으며, 사람이 직접 문서를 찾지 않아도 됩니다.

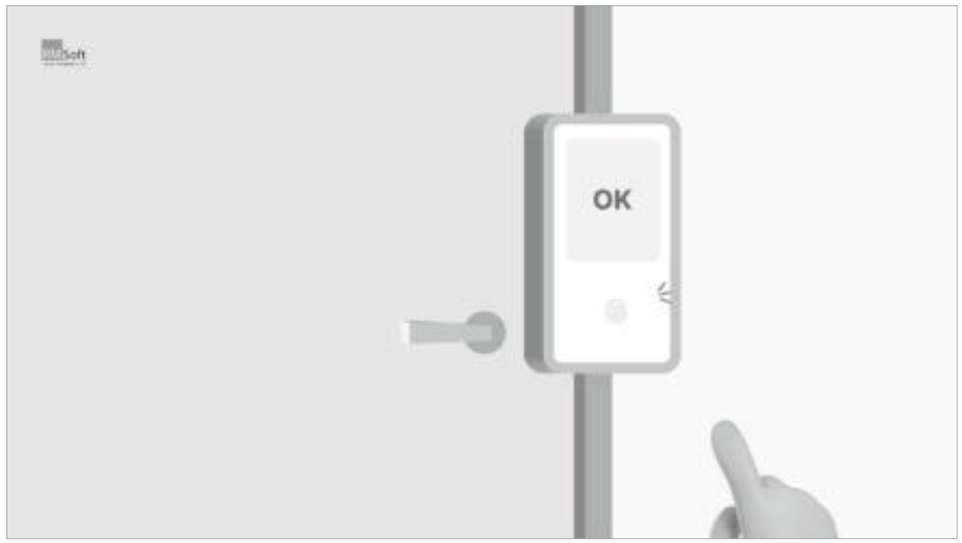
두번째, 문서 디지털화를 통해 아카이빙을 실시합니다. 알엠소프트의 아카이브 시스템인 "Archivist"에서는 기록물의 디지털화 이미지 파일을 저장할 뿐만 아니라 보존 및 활용에도 활용하고 있습니다.
모든 담당자들은 각자의 자리에서 컴퓨터를 통해 문서를 검색하여 쉽게 확인 할 수 있습니다. 또한, 담당자들은 "Archivist"와 "AutoStore"를 연동하여 클릭한번으로 문서를 반출 및 반입할 수 있습니다.
세번째는 RFID를 적용하여 반출 및 반납 시간, 대출자 정보들을 자동으로 업로드하는 것입니다.
알엠소프트 RFID 시스템 특징은 "AutoStore"와 "Archivist"와 연동하여 대출 정보를 실시간으로 업데이트 하고, 문서의 이력관리를 체계적으로 할 수 있습니다.
또한 별도의 작동 없이 "AutoStore"시 자동으로 RFID시스템이 작동하므로 서고의 전 자동화가 가능하게 됩니다.

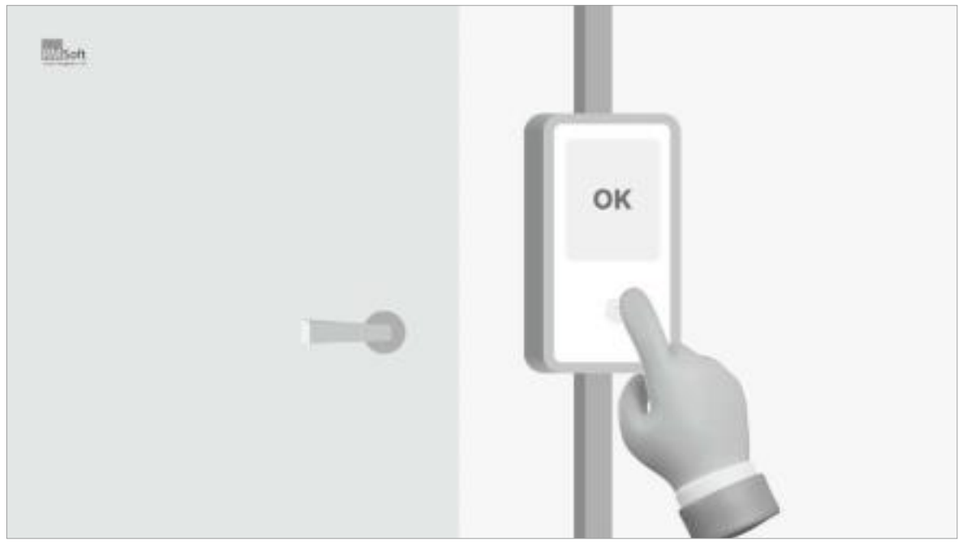
알엠소프트는 이처럼 좀 더 효율적인 업무환경 구축과 함께 NFT, Blockchain, Metaverse, AI Solution 등 다양한 신기술을 여러가지 형태로 접목시키는 일들을 하고 있습니다.

Archive system and AutoStore

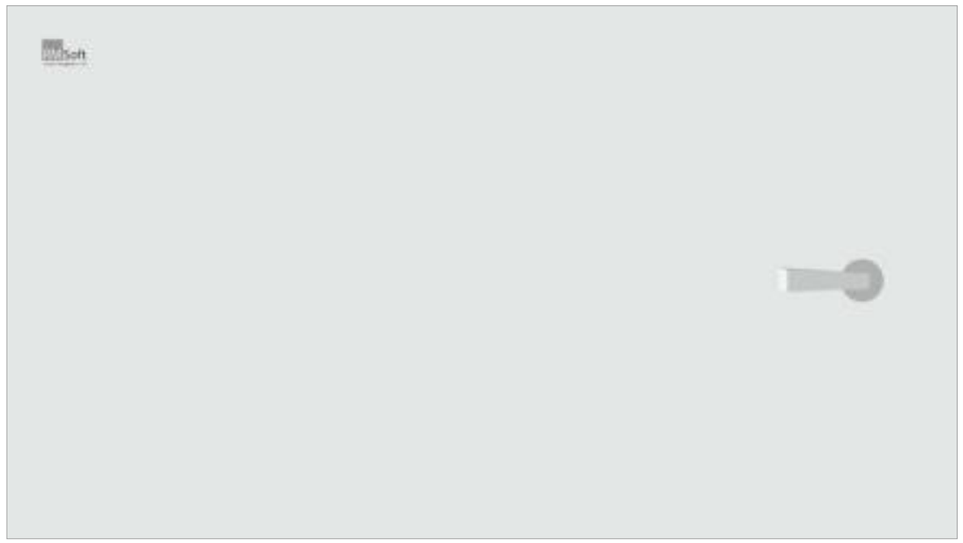
came to
request disclosure of information

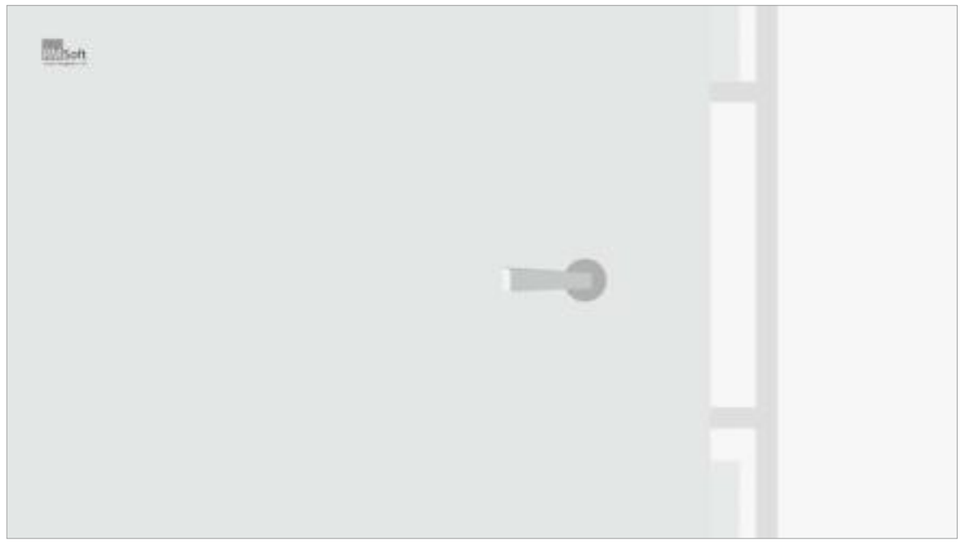
[Video Clip]


OK


OK

[Video Clip]





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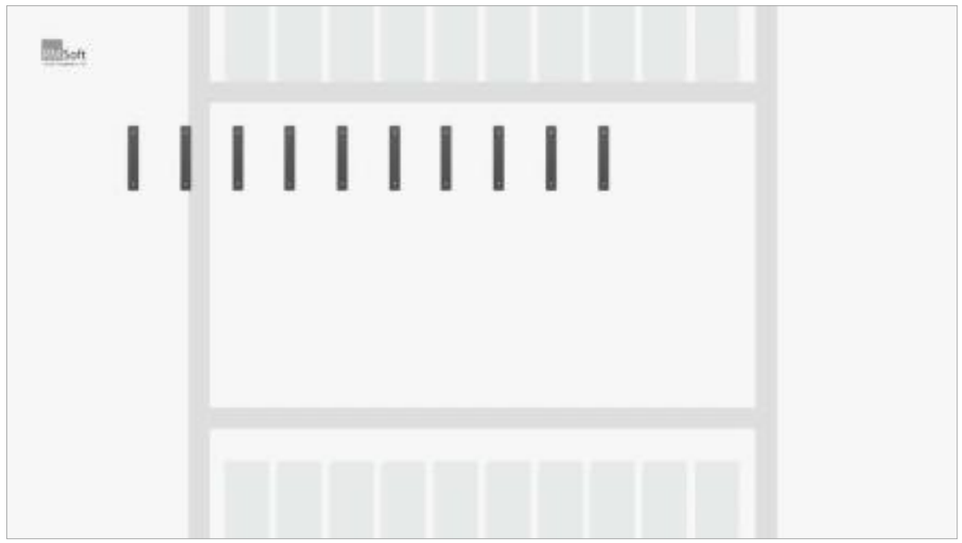
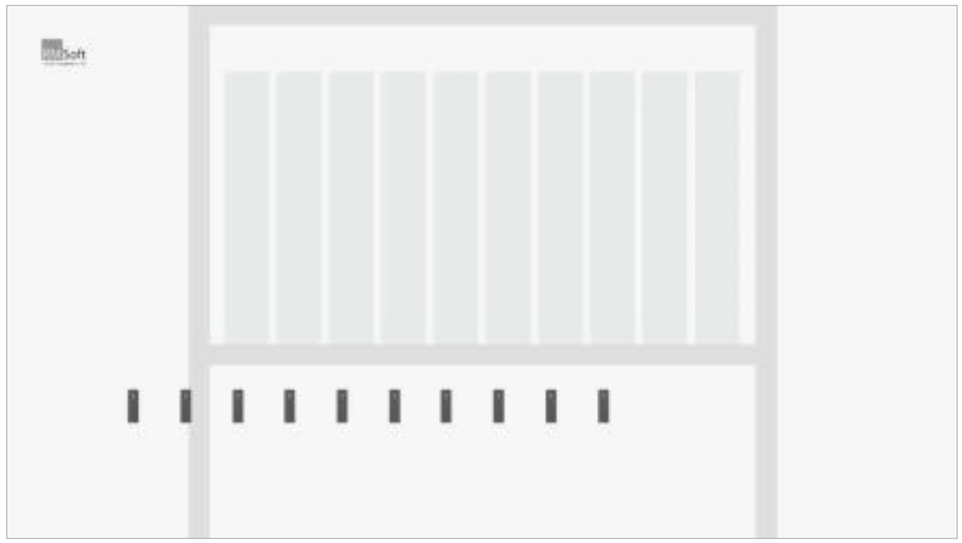
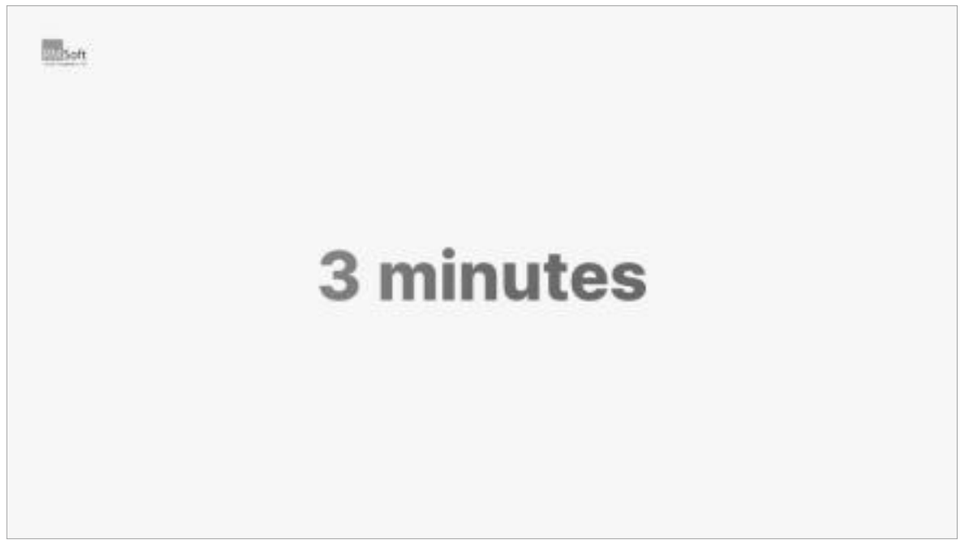
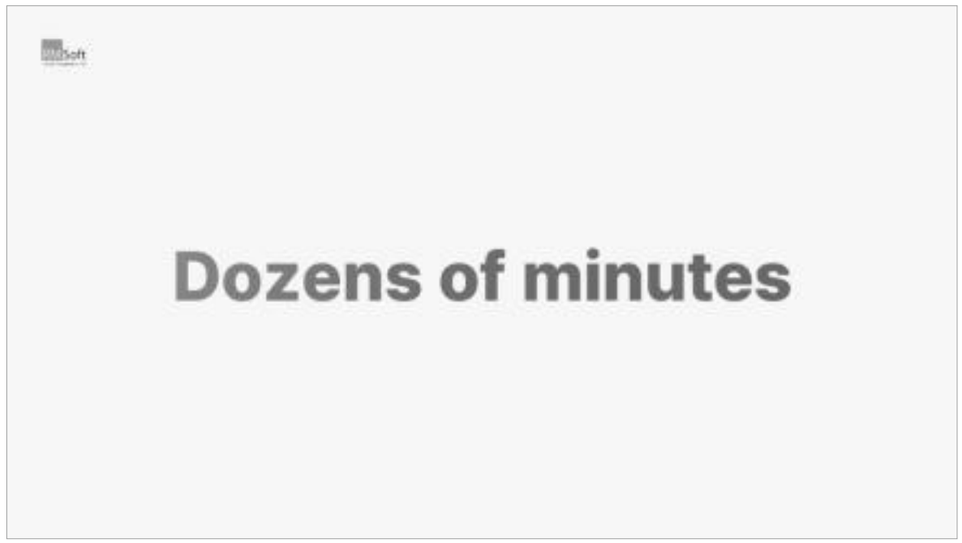
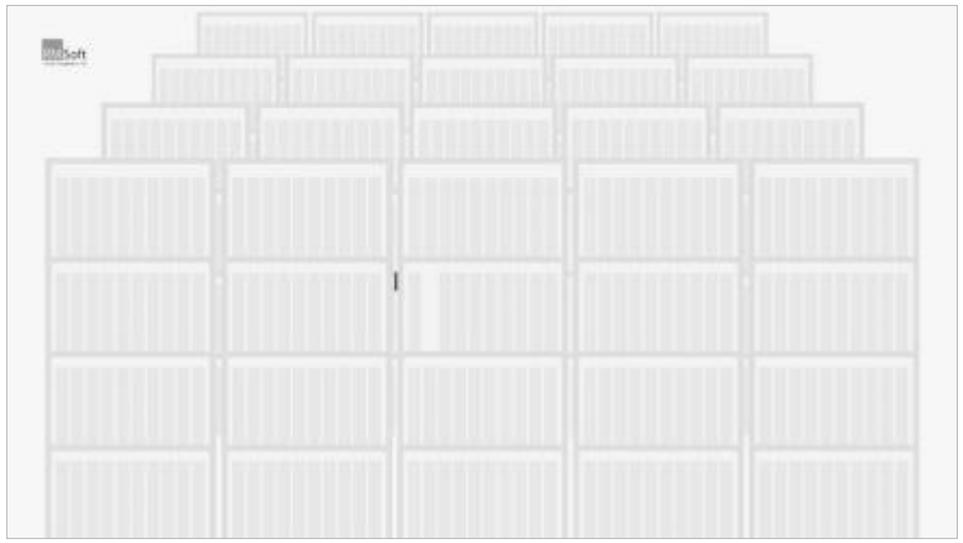
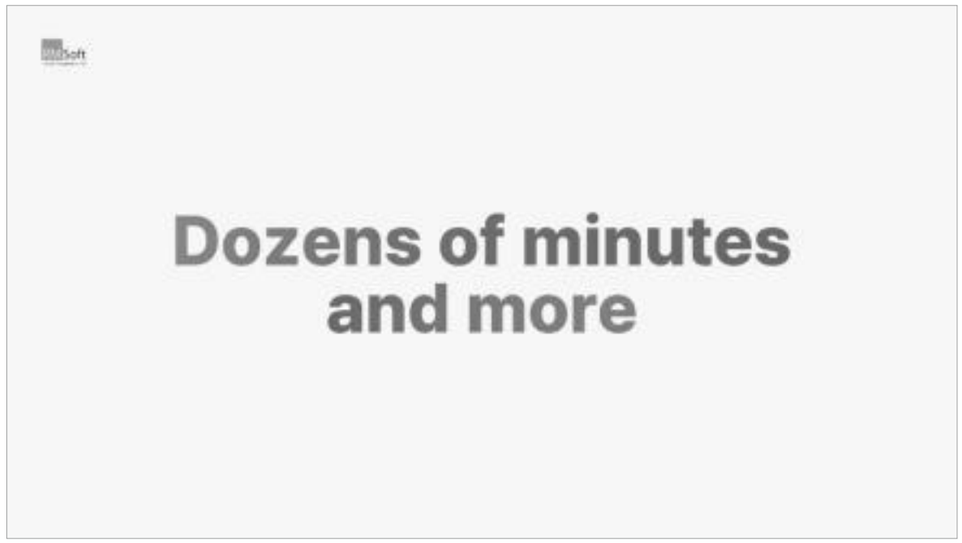





3 minutes

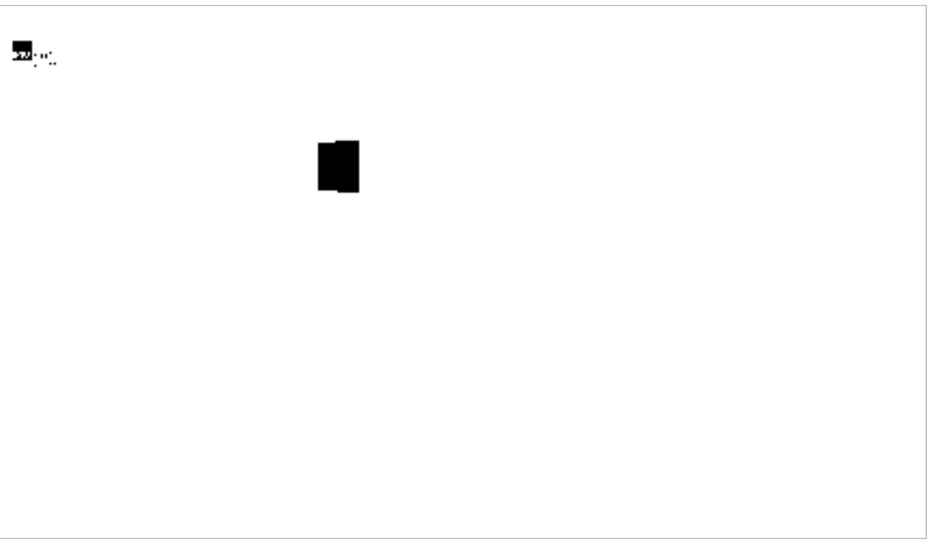

Dozens of minutes




Dozens of minutes
and more

much more

[Video Clip]



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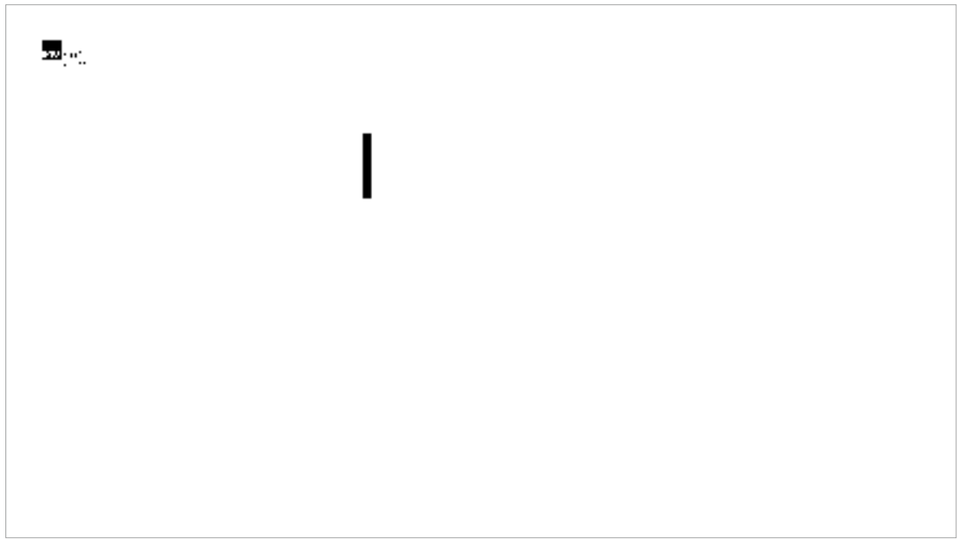
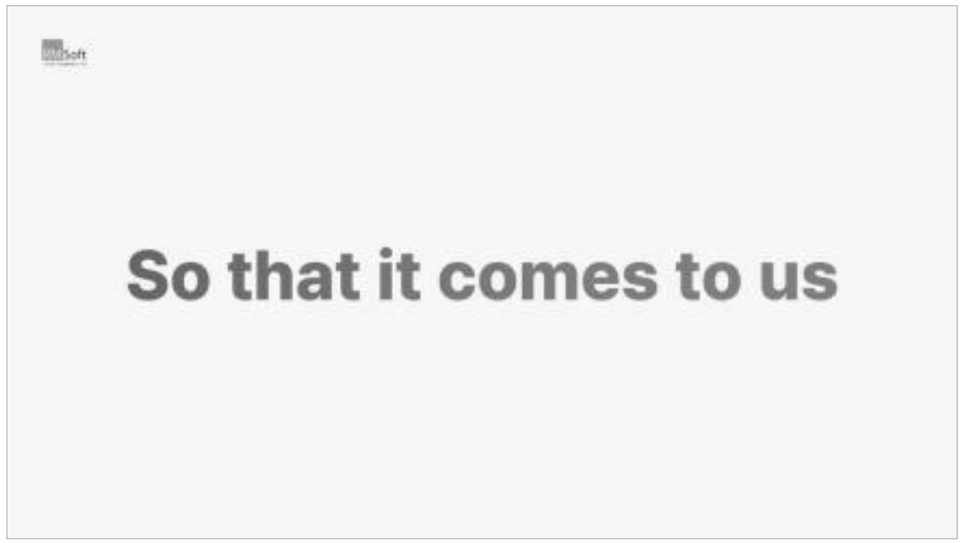


1 million copies

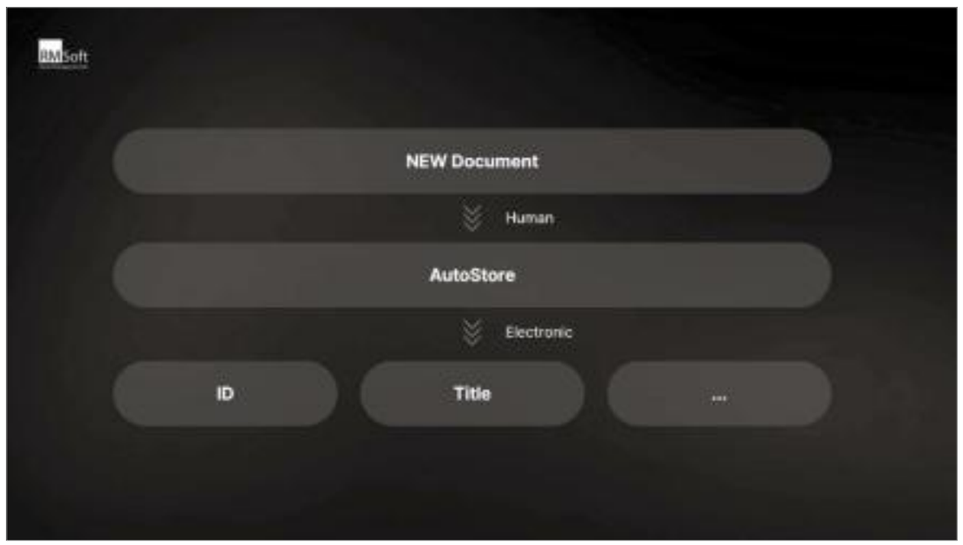
No. of records held by Korean government

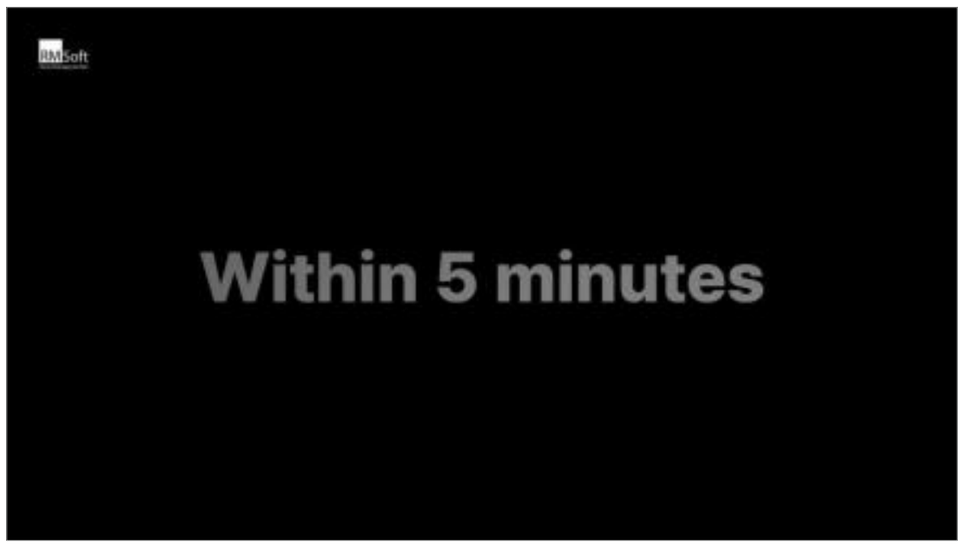
More efficient,

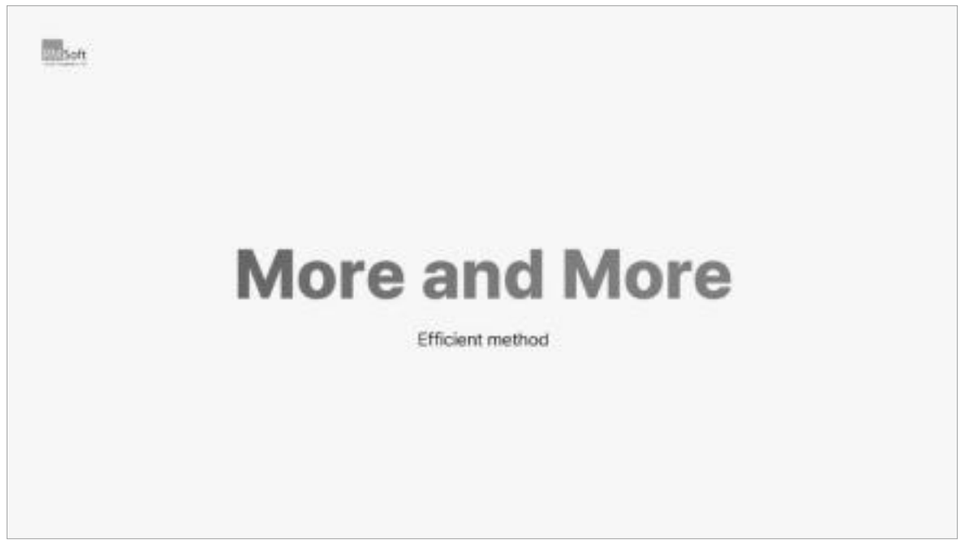
More efficient, More comfortable

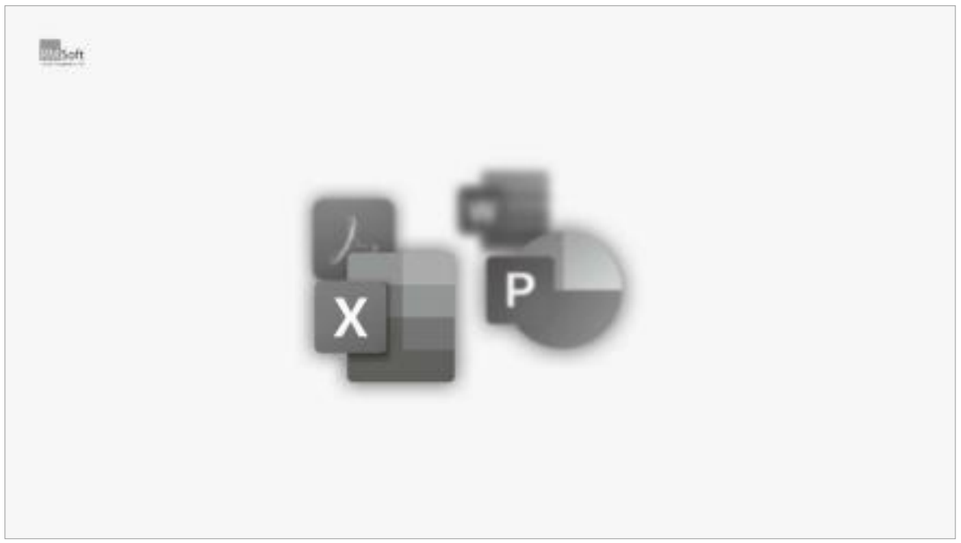

So that it comes to us

SURPRISINGLY,


NEW Document
Human
AutoStore
Electronic
ID
Title
...


Within 5 minutes


More and More
Efficient method


X
P

Archivist

Archivist

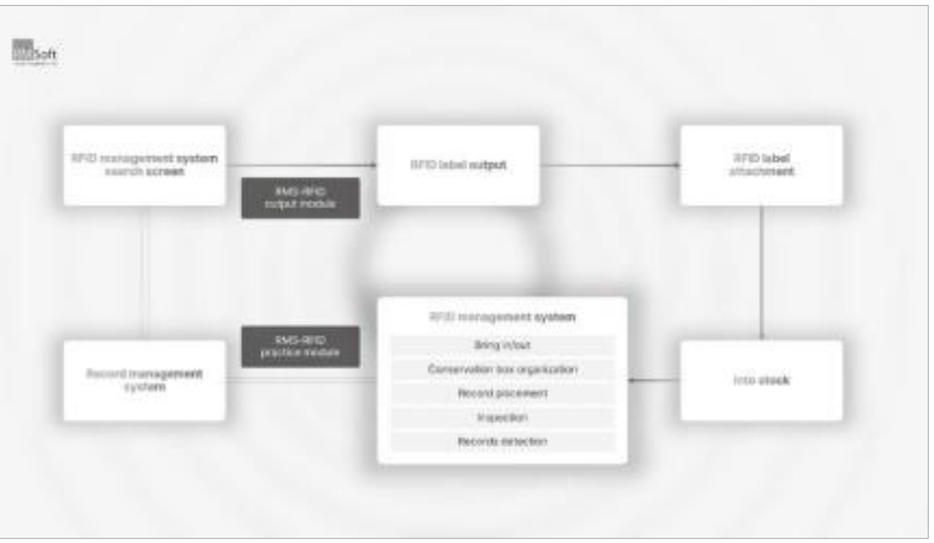
Client
Client's Documents
Scanning Center
Checking & Sorting
Client's ERP System
Data Validation
OCR Extraction
Scanning
Barcodes Labeling
Archive

Record Management System Legal Affairs
My records
Integrated Search
Administrative information data management
Intelligent Service

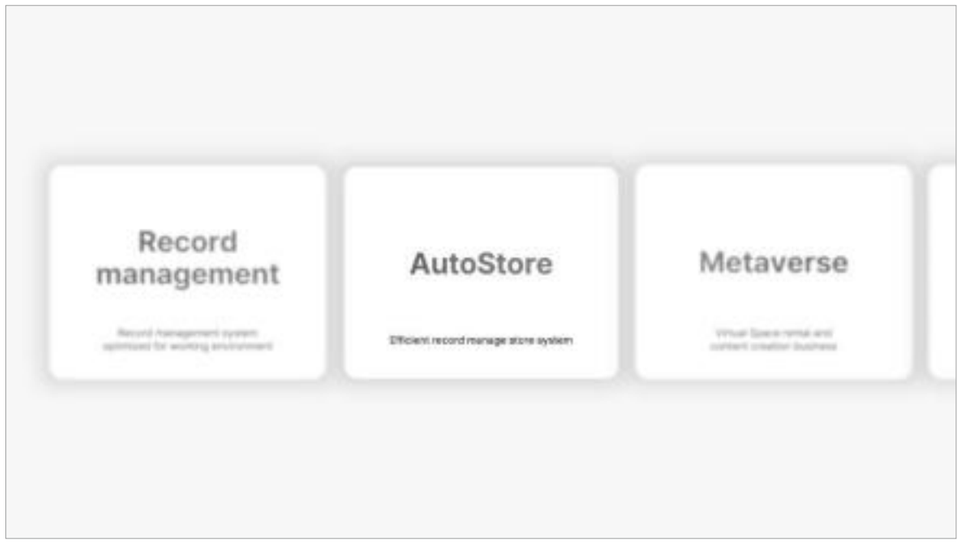
Whenever, Wherever
Convenient document searching through Archivist

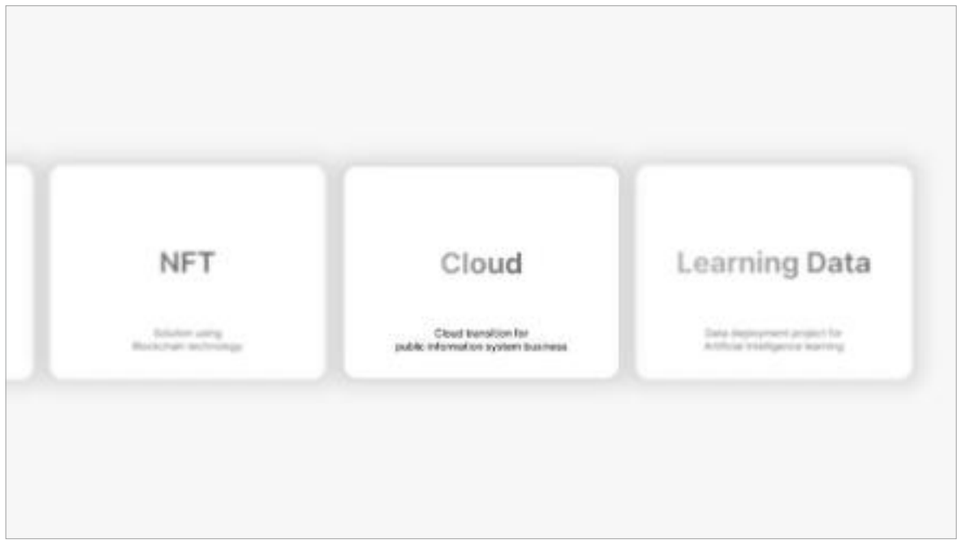
AutoStore
Archivist

Identification



RMSoft
Record Management Soft





Challenging Technique
Leaping Records

SPEAKER

Master Class 2 - Smart Manufacturing Innovation

강 태 훈 TaeHoon Kang

㈜지오로봇 대표 / CEO of ZioRobot

인간-로봇 & 로봇-로봇 협동 이송작업이 가능한 모듈형 이동로봇 플랫폼 및 서비스
Modular Mobile Robot with Human-robot and Robot-robot Collaboration Function

BIOGRAPHY

- ≫ **2022 ~ Present** CEO, Zio Robot
- ≫ **2021 ~ Present** Director, ICT Research Institute, DGIST
- ≫ **2020 ~ Present** Director, Digital Productivity Innovation Cluster, DGIST
- ≫ **2020 ~ 2022** Division Head, Division of Robot Strategy Network, MOTIE
- ≫ **2019 ~ 2021** Division Head, Division of Intelligent Robot, DGIST
- ≫ **2018 ~ 2019** Director, Collaborative Robotics Research Center, DGIST
- ≫ **2018 ~ Present** Planning Director, Korean Society of Rehabilitation Robotics
- ≫ **2018 ~ 2020** Director, Korea Robotics Society
- ≫ **2013 ~ Present** Senior Researcher, Research Department, DGIST
- ≫ **2013 ~ Present** Mentor, INNOPOLIS Research Institute Spin-off Company
- ≫ **2006 ~ 2011** Leader, R&D Team, PIRO (currently KIRO)

Abstract

Modular Mobile Robot with human-robot and robot-robot Collaboration Function

≫ Zio Robot was founded by DGIST resarchers in 2022 year. We forcus on the understand of robot technolgy and its field application for leading a future industry.

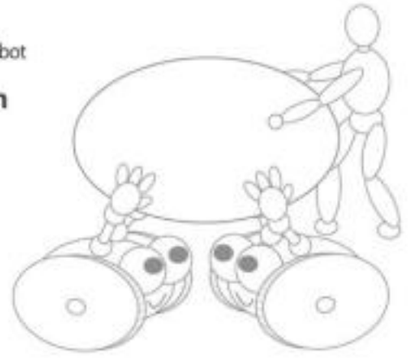
≫ Zio Robot already have enoguh technology and know-how for smart factory, collaborative robot, and smart healthcarem etc.

인간-로봇 & 로봇-로봇 협동 이송작업이 가능한 모듈형 이동로봇 플랫폼 및 서비스

≫ 지오로봇은 2022년 DGIST 연구원들에 의해 설립되었습니다. 미래산업을 선도하기 위한 로봇기술의 이해와 현장적용에 중점을 두고 있습니다.

≫ 지오로봇은 스마트팩토리, 협동로봇, 스마트 헬스케어 등에 대한 충분한 기술과 노하우를 가지고 있습니다.

Modular Mobile Robot with Human-Robot and Robot-Robot Collaboration Function

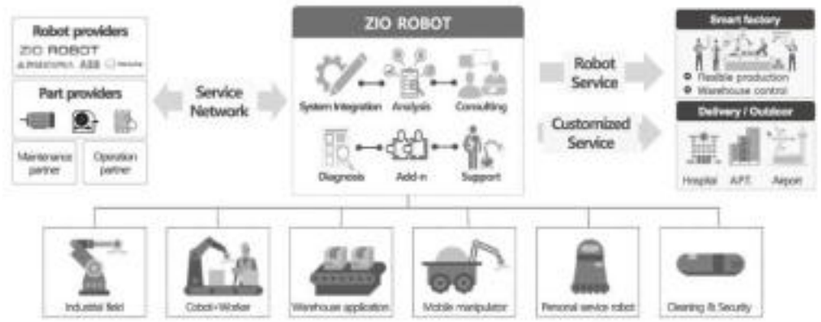


ZIO ROBOT 강태훈 CEO

http://www.ziorobot.com | thkang@ziorobot.com | +82-10-3306-1943

Advanced Step for Better Life

We service **Robot as a Service (RaaS)** based on robotics and software technology



Our Team

Tae Hun Kang | CEO

Ph.D. Mechanical Eng, Sungkyunkwan Univ.
M.S. Mechanical Eng, Sungkyunkwan Univ.
B.S. Mechanical Eng, Sungkyunkwan Univ.

Ministry of SMEs and Startups, Minister's Citation (2021)
Gangu Mayor's Award for Achievement (2020)
DGIST Excellence Researcher Prize/ Top Researcher Prize (2019, 2016)

Work Experience

2022 – Present	CEO, Zio Robot
2021 – Present	Director, ICT Research Institute, DGIST
2020 – Present	Director, Digital Productivity Innovation Cluster, DGIST
2003 – 2022	Division Head, Division of Robot Strategy Network, MOTIE
2019 – 2021	Division Head, Division of Intelligent Robot, DGIST
2018 – 2019	Director, Collaborative Robotics Research Center, DGIST
2018 – Present	Planning Director, Korean Society of Rehabilitation Robotics
2019 – 2020	Director, Korea Robotics Society
2013 – Present	Senior Researcher, Research Department, DGIST
2013 – Present	Mentor, INNOPOLIS Research Institute Spin-off Company
2006 – 2011	Leader, R&D Team, PIRO (currently KIRO)

Achievements

Technology Transfers: 7 (KRW 70 million)
Patents: 32 (International: 5, Domestic: 27)
Research Project (Director): 16 (over KRW 20 billion)
International Journal: 14
Conference: 78 (International: 39, Domestic: 39)

Dooho Kim
Executive director
Commercialization

Heejin Park
Researcher
Control algorithm

Donghyn Kim
Researcher
Software

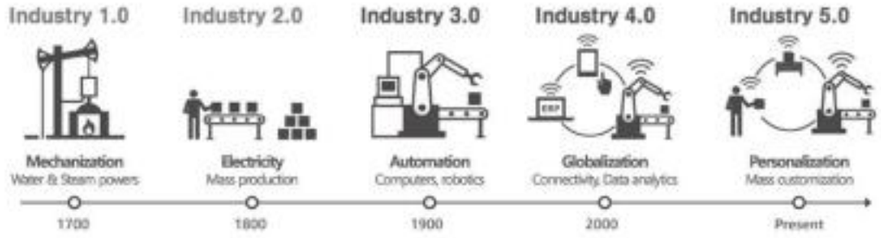
Sanghyeon Jin
Planning director
AI, Software

Daehan Hong
Team leader
Software

Sunkyung Kim
Data mining

Hungo Lee
Mechanical engineer

Collaborative mobile robot

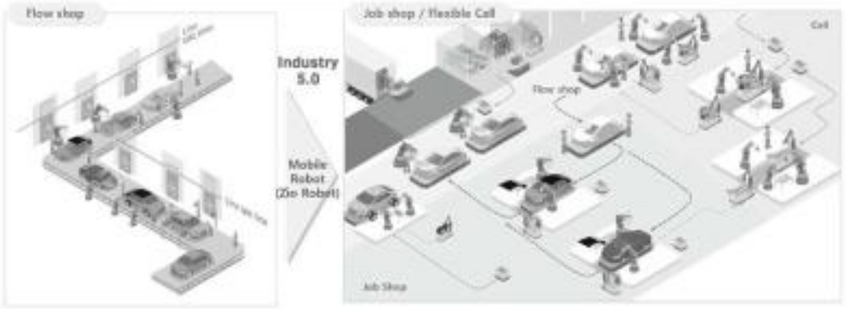


- Optimizing people's efficiency and productivity
- "A factory is a place where creative people work. Craftsmanship is required for mass customization." (Universal Robots, CTO)
- "Mass Customization is possible when human and machine are interconnected." (Rogers Corporation, Marx Beulque)

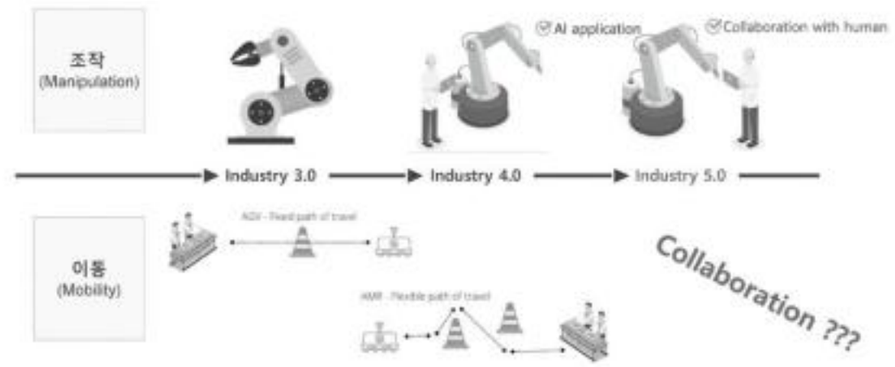
※ Source: European Commission

Collaborative mobile robot

Category	Flow shop	Job shop	Cell
Features	Mass production	Small quantity batch production	Small quantity batch production
Advantages	Standardize manufacturing processes, low prices	High Flexibility, Low installation/maintenance costs	High Flexibility, Reduction of transport costs
Disadvantages	Low Flexibility, Full shutdown in the failure event	high variable costs, Increased space requirements, management difficulties	Increase in facility investment cost, decrease in machine utilization rate
Effects	Production flexibility ↑, Productivity ↑, **Facility investment cost ↓**		



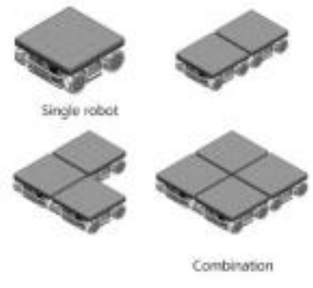
Collaborative mobile robot



Mobile Worker, ZIO ROBOT

Robot-Robot Cowork

- **Combination like LEGO** → various size and payload
- Collaboration with robot and robot → **IT resource saving**



Human-Robot Cowork

- Flexible production process → Customizing production
- Improving production efficiency using human's know-how

Mobile Worker, ZIO ROBOT

Human-Robot Cowork

Robot-Robot Cowork

Mobile Worker, ZIO ROBOT

	MW-50	MW-200	MW-500	MW-X
Payload (kgf)	70	200	500	Over 1,000
Size (mm)	650(L) x 650(W) x 300(H)	800(L) x 800(W) x 350(H), 1100(L) x 1066(W) x 370(H)	780(L) x 740(W) x 440(H)	User Consultation
Max. speed (m/sec.)	1	1.5	1	
Option	• Collaboration function with workers • Navigation method: Guided control, SLAM • Others : Safety sensor (ISO 13482), Suspension for MW-X, etc.			

Our Deep Tech

Our Deep Tech

Our Deep Tech

Advanced Step for Better Life
ZIO ROBOT

MEMO

SPEAKER

Master Class 2 - Smart Manufacturing Innovation

Yeong Che Fai

Chairman of DF Automation & Robotics

4차산업혁명을 위한 자율 이동 로봇(AMR) 기술
Autonomous Mobile Robot (AMR) Technology for Industry 4.0

BIOGRAPHY

Dr. Yeong Che Fai is a highly accomplished professional who serves as the Chairman DF Automation and Robotics, as well as an Associate Professor at Universiti Teknologi Malaysia. Dr. Yeong earned his PhD from Imperial College London and specializes in robotics and entrepreneurship. Dr. Yeong has co-founded several companies. One of his most notable ventures is DF, which produces Industry 4.0-enabled robots that have been successfully exported to various countries including to Asia, Mexico and Europe. Dr Yeong is also a frequent keynote speaker and three-time TEDx speaker.

Abstract

Autonomous Mobile Robot (AMR) Technology for Industry 4.0

DF Automation & Robotics is a Malaysia-based robotics company specializing in the design and manufacture of Autonomous Mobile Robots (AMRs) for a range of industries. AMRs are mobile robots that are capable of autonomous movement, enabling them to transport heavy payloads, which is particularly beneficial for material handling and intralogistics applications. By utilizing AMRs, companies can decrease their reliance on manual labor, while also improving efficiency and productivity. During this presentation, Dr. Yeong Che Fai will discuss how DF has leveraged innovative technologies to overcome multiple challenges, including market competition, supply chain disruptions, COVID-19, and talent readiness. Over the course of a decade, DF has developed numerous robot models that are Industry 4.0-ready, and has successfully exported these products to several countries, including Singapore, Thailand, Indonesia, the Philippines, Vietnam, India, Mexico, and Europe.

Soft is working to combine various new technologies such as NFT, Blockchain, Metaverse, and AI Solution in various forms.

4차산업혁명을 위한 자율 이동 로봇(AMR) 기술

DF Automation & Robsotics는 말레이시아에 본사를 둔 다양한 산업 분야의 AMR(Autonomous Mobile Robots) 설계 및 제조를 전문으로 하는 로봇 공학 회사입니다.

AMR은 자율 이동이 가능한 모바일 로봇으로 무거운 짐들을 운반할 수 있어 자재 취급 및 내부 물류 응용 분야에 특히 유용합니다.

AMR을 활용함으로써 회사는 육체 노동에 대한 의존도를 줄이는 동시에 효율성과 생산성을 향상시킬 수 있습니다.

이 프레젠테이션에서 Young Che Fai 박사는 DF가 어떻게 혁신적인 기술을 활용하여 시장 경쟁, 공급망 중단, COVID-19, 인재 준비 등 여러 과제를 극복했는지에 대해 설명합니다.

10년 동안 DF는 4차산업혁명에 대비한 수많은 로봇 모델을 개발했으며 이러한 제품을 싱가포르, 태국, 인도네시아, 필리핀, 베트남, 인도, 멕시코 및 유럽을 포함한 여러 국가에 성공적으로 수출했습니다.

Autonomous Mobile Robot (AMR) Technology for Industry 4.0

Yeong Che Fai, PhD
Chairman & Co-founder
cfyeong@dfautomation.com

Any information, data and drawings enclosed in this Proposal are strictly confidential and are supplied on the understanding that they will be held confidentially and not disclosed to third parties without the prior written consent of DF Automation & Robotics Sdn. Bhd.

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Company Overview

Company name	: DF Automation & Robotics Sdn Bhd
Website	: www.dfautomation.com
Founded	: June 2012
HQ	: Johor Bahru
Branches	: Kuala Lumpur, Penang & India
Capital	: RM 4 million
Business Focus	: Autonomous Mobile Robot (AMR)
	: Automated Guided Vehicle (AGV)

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Team

DF Team (2022):

- Management : 20%
- Engineer: 60%
- Technician: 10%
- Admin: 10%

Total around 80 staffs

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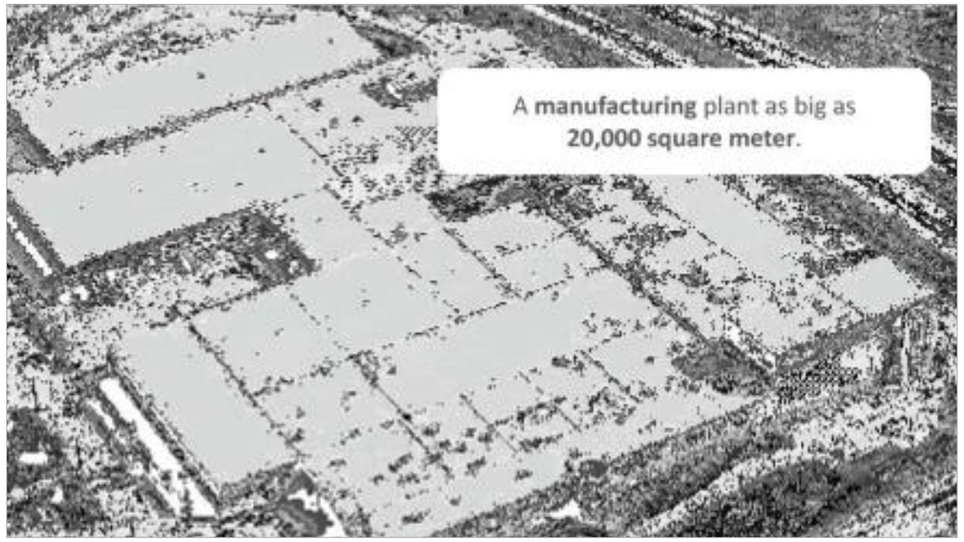

Thousand of goods movement between locations daily.

PROBLEM: Rely on physical workforce
weight up to
500kg
walk average
3000m
Low skill job: labour intensive, tiring and dangerous.
Human factors: inefficient, foreigner workers' issues, theft, etc.
Cost: minimum wages increased.

Current Automated Guided Vehicle (AGV) Solution
AGV has been used extensively in solving this issue since 1950.
It works but unable to achieve full usability/adoption.
Challenges in implementing current AGV solution are:
Difficult to program
Not Flexible
Costly
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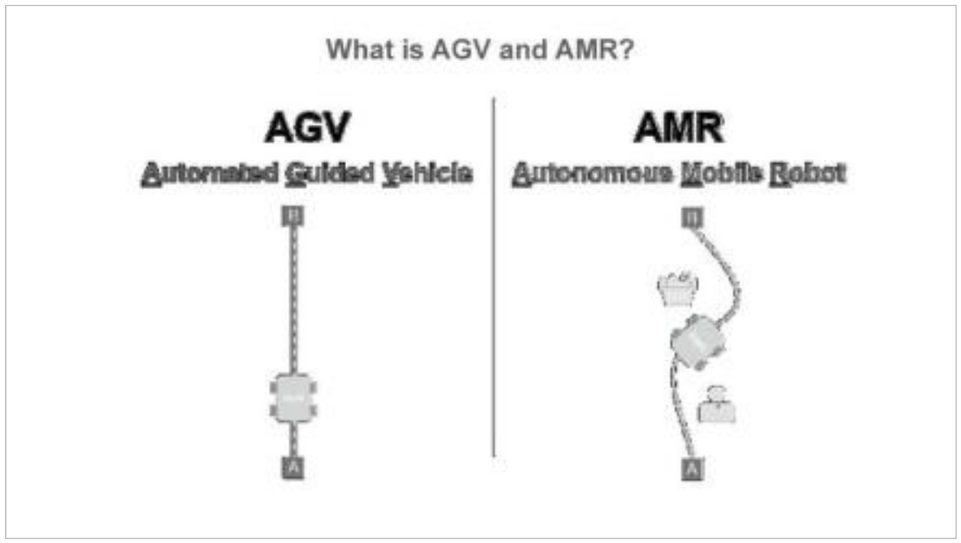
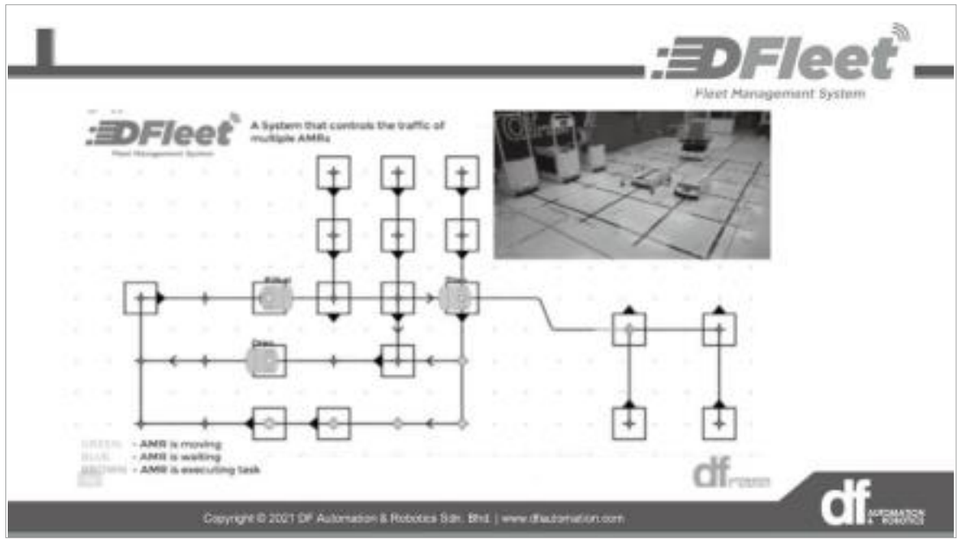

What is AGV and AMR?
AGV
Automated Guided Vehicle
AMR
Autonomous Mobile Robot

df AUTOMATION & ROBOTICS
NavWiz
DFleet
VISION
To be the **global market leader** and expert in providing Industry 4.0 enabled **autonomous mobile robot** (AMR) products and solutions.
MISSION
To provide **high quality and efficient** autonomous mobile robot (AMR) products and solutions to our **valued customers**.


DFleet
Fleet Management System
DFleet
A System that controls the traffic of multiple AMRs
- AMR is moving
- AMR is waiting
- AMR is executing task
df
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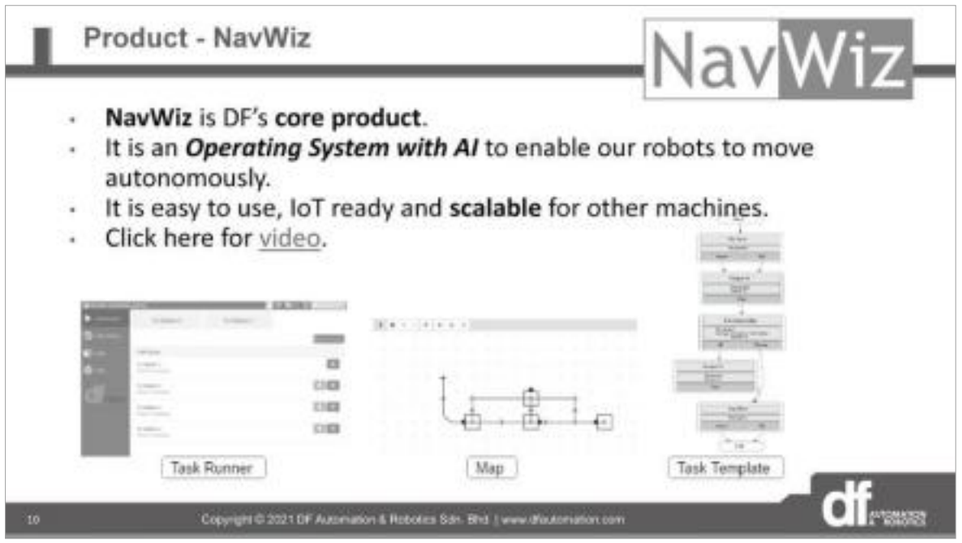
Product - NavWiz
NavWiz
- **NavWiz** is DF's **core product**.
- It is an ***Operating System with AI*** to enable our robots to move autonomously.
- It is easy to use, IoT ready and **scalable** for other machines.
- Click here for video.
Task Runner
Map
Task Template
10
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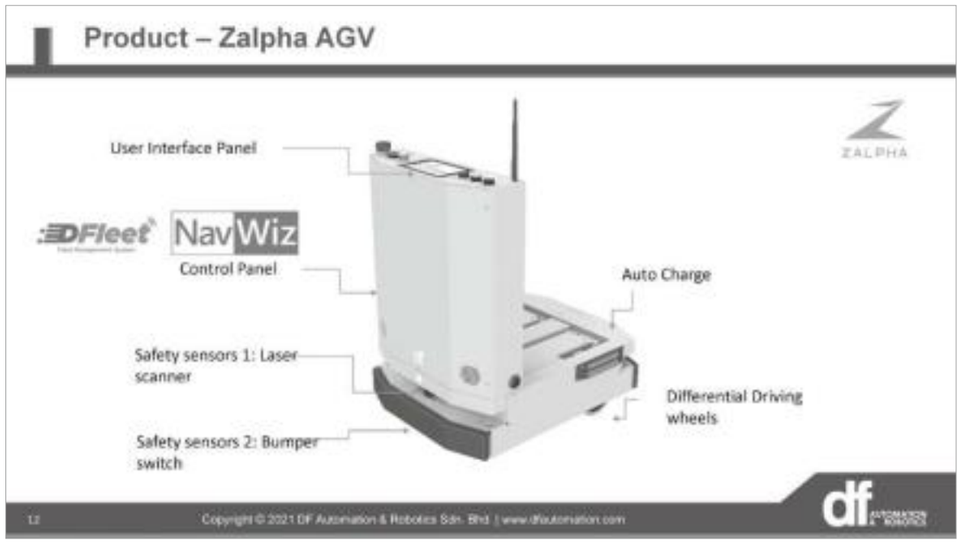
Product – Zalpha AGV
ZALPHA
User Interface Panel
DFleet
NavWiz
Control Panel
Auto Charge
Safety sensors 1: Laser scanner
Differential Driving wheels
Safety sensors 2: Bumper switch
12
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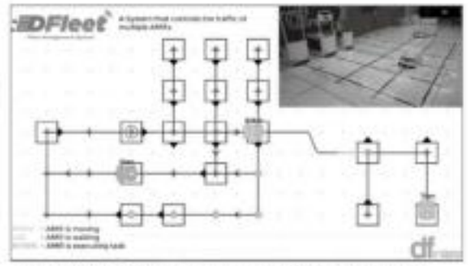
Video link: https://bit.ly/2VCZM7M

Food Delivery Robot

Video: https://www.youtube.com/watch?v=7bYaQgdOHbQ

Video: Smart Manufacturing Demonstration

Video link: https://www.youtube.com/watch?v=dsOsGGlpjAI



Video link: https://www.youtube.com/watch?v=HtpBsCf-ThQ

Revenue Model

Revenue Model

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Products

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Product Sales

- DF **designs and manufactures** series of **standard products - AGV and AMR**.
- **Focus on selling** DF's standard products and accessories (Catalogue sales)

DF Industrial AMR Product

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DF Healthcare series Product

Food Delivery Robot

UV Disinfection Robot

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Core Technology

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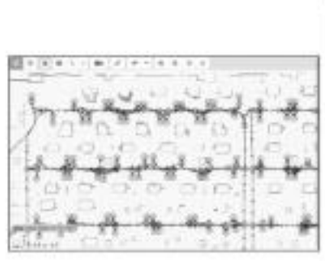
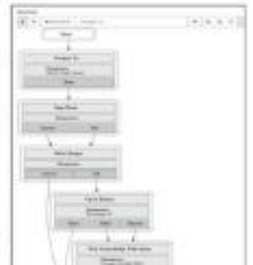
NavWiz

- **NavWiz** is the **main software system** which powers all our AMRs.
- Three **Main Components**: Map Editor, Task Template Editor, and Task Runner





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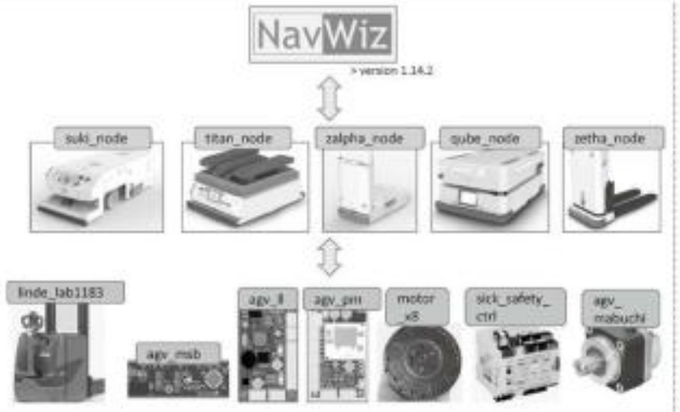
NavWiz System Integration to Hardware



NavWiz release independent from Hardware & AMR

Standardized NavWiz Input/Output layer

AMR node developed during integration of Hardware to AMR. AMR node perform integration for all hardware, and act like translator between NavWiz to Hardware.

Hardware node input/output all hardware feature. EG, motor speed, line information, safety input status

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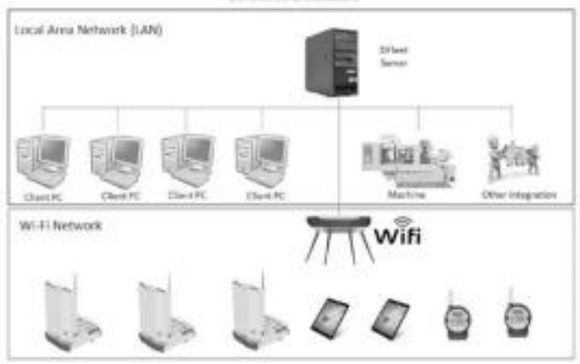
DFleet (Fleet Management System)

DFleet Architecture



DFleet Features:

1. Traffic controller
2. Task assigner and scheduler
3. Monitoring dashboard
4. Centralized AMR configuration
5. Data logger and reporting system

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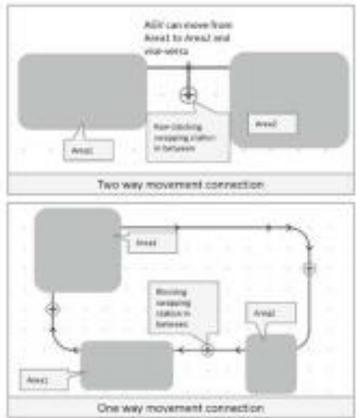
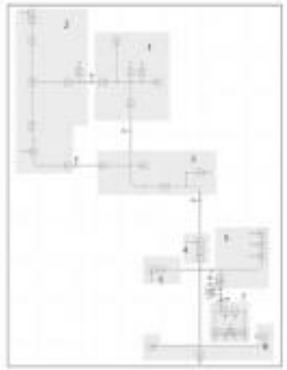
DFleet Traffic Control





Map Zones

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DFleet Monitoring Dashboard

The *Dashboard* allows user to create, prioritize, cancel or abort a task. Besides, information about the AGVs and current running tasks are updated in real-time.

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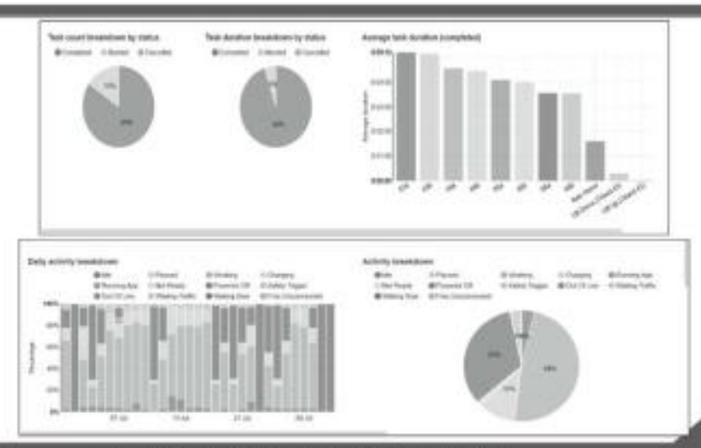
DFleet Reporting



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Patent and IPs

- Patent
  - PI2017701872 – Guidance System for Driverless Vehicle **(NavWiz)**
  - PI2015702254 – Automated Guided Vehicle
  - PI2017704258 – Occupancy Grip Map for Dynamic Environment
  - PI2018702685 – Lifter Module
- Industrial Design
  - 16-E0297-0101 – AGV Zalpha
  - 17-E0179-0101 – AGV Zalpha Slim
  - 17-E0312-0101 – AGV Zalpha with robot arm
  - 18-E0127-0101 – AGV (Suki)
- Trademarks
  - NavWiz
  - Zalpha
  - Suki
  - Titan

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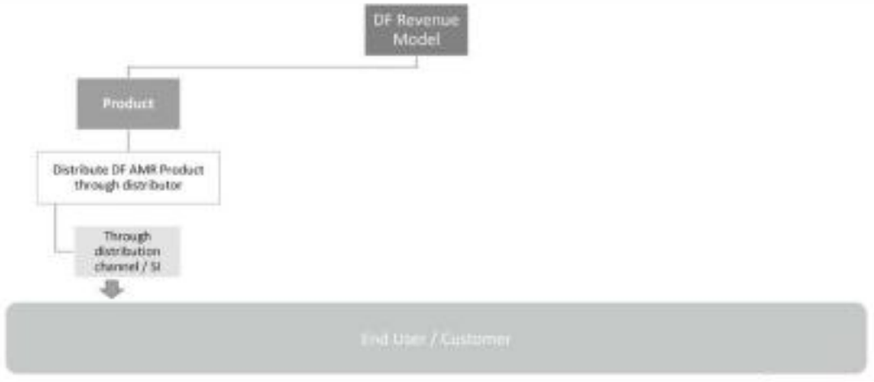
Revenue Model



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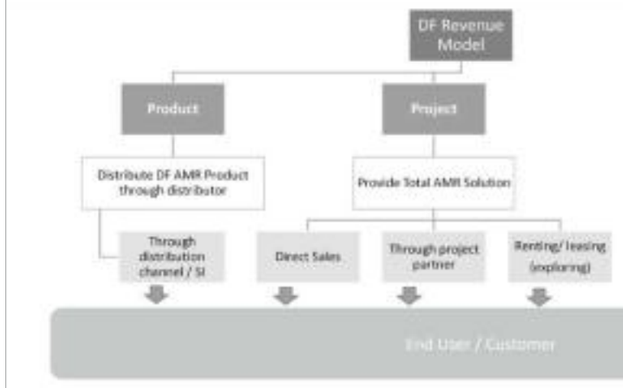
Revenue Model



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Project Sales

- Focus on providing **Total AMR Solution** to customer
- Total solution include:
  - **Integration** with **third party software** like ERP, MES & WMS
  - **Integration** with **third party equipment** like machine, conveyor, automation & etc
  - **Integration** with **factory facilities** like lift, door, gate & etc
  - Interfacing with **human** like call system, visual or sound acknowledgement and etc
  - **Custom made** in payload handler, AMR system and accessories
  - **Custom design** in mechanical, E&E & Software

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DFleet | AGV Fleet Management System (FMS)

- DFleet FMS is used to optimized AGV's Traffic
- Handles up to 30 AGVs
- Automatic prioritization and selection of the robot best suited for a job, based on position and availability
- Live view of status & position of AGVs

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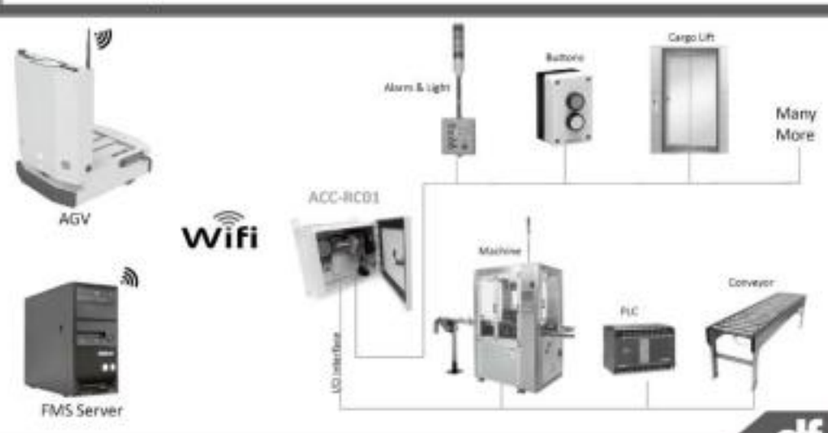
ACC-RC01 | Wi-Fi Controlled Remote IO Module



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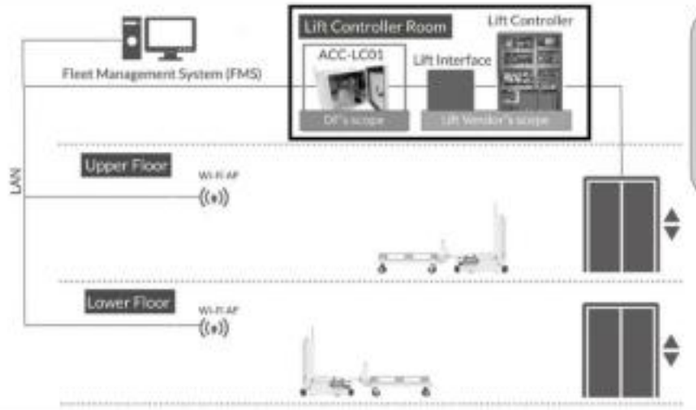
ACC-LC01 | Lift Interface Controller



ACC-LC01 | Allow AGV to transport multi storey!

- Used to interface with lift controller to give command to the lift
- Work with lift vendor to ensure safety

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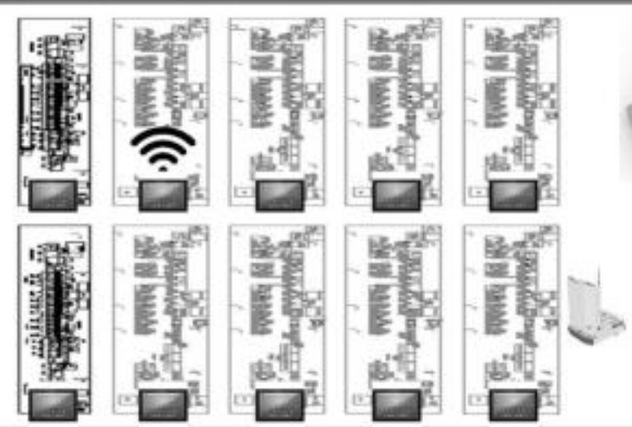
ACC-CB07 | Wi-Fi Call Station



Call System Usage:

- Used to summon AGV wirelessly to specific location
- Monitor AGV current task list/task queue
- Monitor AGV status
- Remotely control AGV

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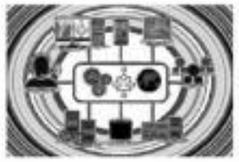
Ability to Custom Design for special requirement

PC based Software & GUI Design

Embedded System Design

Mechanical Design



System Integration & interfacing

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Existing customers

2016 Malaysia Electronic	2016 Malaysia Electronic	2016 Malaysia Hard disk	2017 Thailand Electronic	2017 Malaysia Electronic	2017 Malaysia Automotive
2017 Malaysia Electronic	2017 Singapore Electronic	2017 Mexico Electronic	2017 Singapore Electronic	2017 Indonesia Consumer goods manufacturing	2017 Indonesia Consumer goods manufacturing

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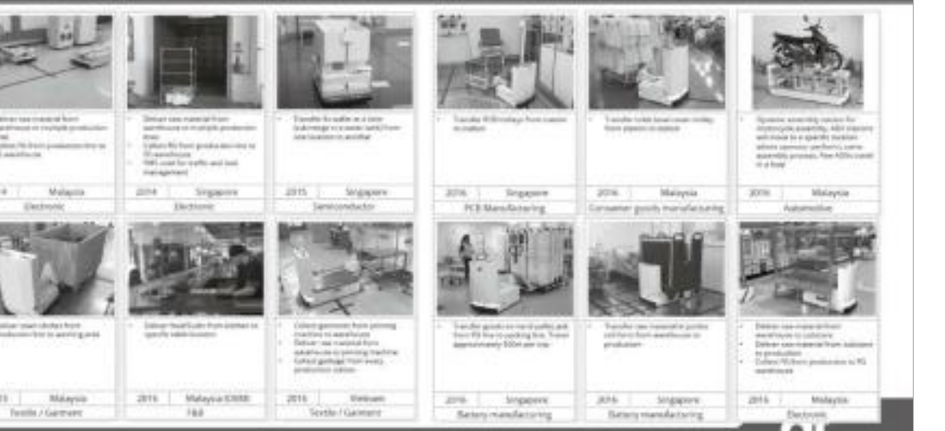
Existing customers



2014 Malaysia Electronic	2014 Singapore Electronic	2015 Singapore Semiconductor	2016 Singapore PCB Manufacturing	2016 Malaysia Consumer goods manufacturing	2016 Malaysia Automotive
2015 Malaysia Textile / Garment	2015 Malaysia (OEM) F&B	2015 Vietnam Textile / Garment	2016 Singapore Battery manufacturing	2016 Singapore Battery manufacturing	2015 Malaysia Electronic

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Existing customers

2017 Malaysia Mixers manufacturing	2017 Malaysia Aerospace	2017 Singapore Aerospace	2018 Singapore Warehouse	2018 Singapore Aerospace	2018 Singapore Healthcare
2018 Malaysia Consumer goods manufacturing	2018 Singapore Battery manufacturing	2018 India Automotive	2018 Malaysia Consumer goods manufacturing	2018 Vietnam Textile / Garment	2018 Malaysia Semiconductor

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Revenue Model

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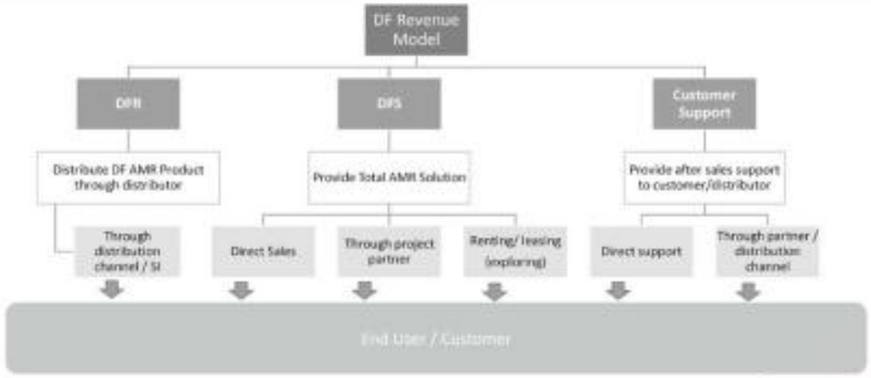
Revenue Model



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Customer Support

- Focus on **after sales support** to customer & distribution channel to ensure system uptime
- Focus on generate after sales revenue from **spare parts** selling and different kind of after sales services.

AGV Preventive Maintenance DF provides preventive maintenance package to ensure that the product / solution provided is always in good condition for operation	**AGV Troubleshooting & Repair** DF has engineers on stand-by to provide emergency on-site troubleshooting and repair services	**Spare Parts Management** DF provides spare part management service to customer to manage spare parts and to ensure stock availability
System Overhaul, Upgrade, Reconfiguration DF provides system overhaul, upgrade and reconfiguration services to ensure the system is always up to date and fully optimized	**Technical Support & Consultancy** DF service team is equipped with state-of-the-art technical knowledge to be able to provide technical support & consultancy	**Training** DF provides training programmes to ensure users are fully trained to use and service the system provided

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Current End Customer List

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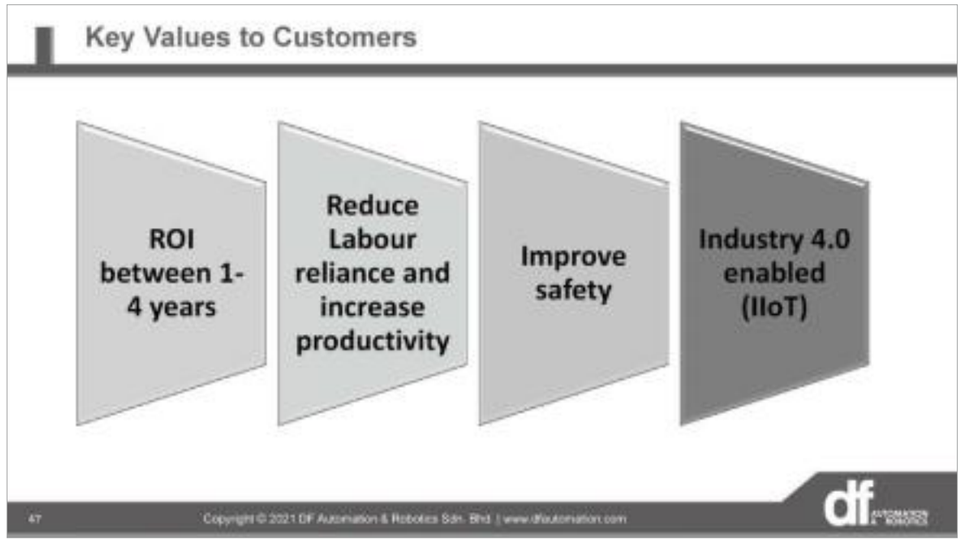
Key Values to Customers
ROI between 1-4 years
Reduce Labour reliance and increase productivity
Improve safety
Industry 4.0 enabled (IIoT)
47
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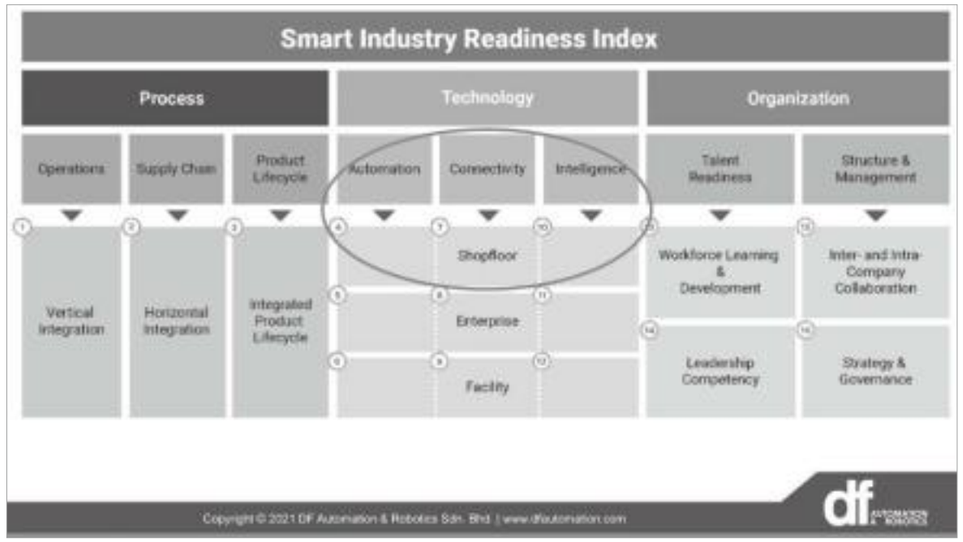
Smart Industry Readiness Index
Process
Technology
Organization
Operations
Supply Chain
Product Lifecycle
Automation
Connectivity
Intelligence
Talent Readiness
Structure & Management
Vertical Integration
Horizontal Integration
Integrated Product Lifecycle
Shopfloor
Enterprise
Facility
Workforce Learning & Development
Inter- and Intra-Company Collaboration
Leadership Competency
Strategy & Governance
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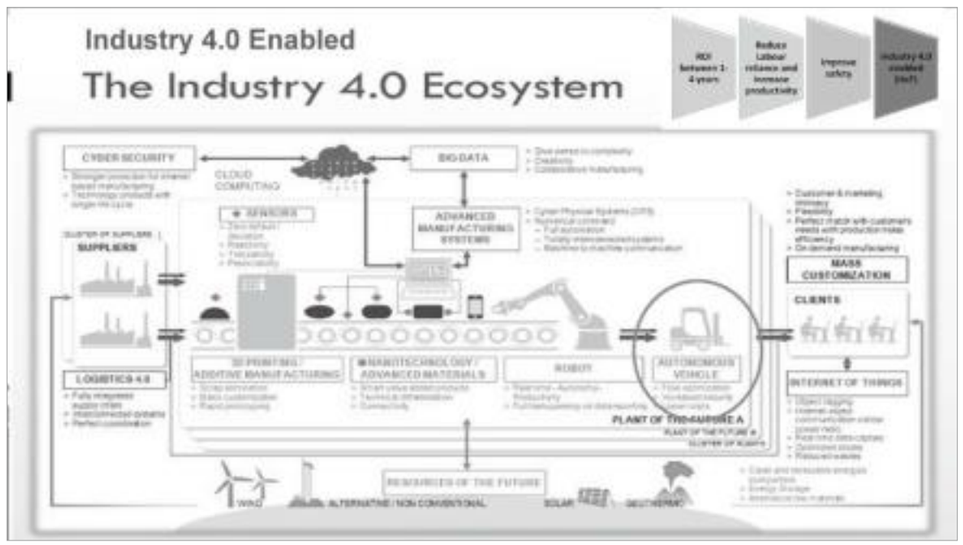

Industry 4.0 Enabled
The Industry 4.0 Ecosystem
CYBER SECURITY
BIG DATA
CLOUD COMPUTING
SENSORS
ADVANCED MANUFACTURING SYSTEMS
SUPPLIERS
MASS CUSTOMIZATION
CLIENTS
LOGISTICS 4.0
INTERNET OF THINGS
ROBOT
AUTONOMOUS VEHICLE
RESOURCES OF THE FUTURE
WIND
SOLAR
GEOTHERMAL

NavWiz
DFleet
Thank you very much.
For more info, feel free to contact us.
www.dfautomation.com

SPEAKER

Master Class 3 - Public Safety & Traffic Management

김 승 용 Seungyong Kim

코코넛사일로㈜ 대표 / CEO of Coconut Silo

벤처 기업으로서의 아세안 진출기 및 현지화 전략
The ASEAN Expansion Journey and Localization Strategies as a SME (Small-Medium Enterprise)

BIOGRAPHY

Coconut Silo, a Hyundai spin off company, is solving problems especially in logistics/ commercial vehicle industries. Compared to the personal mobility industry, logistics/ commercial vehicle areas are still one of the most outdated industries. In an era in which the importance of digital transformation is being emphasized worldwide, digital transformation of the industry is no longer a distant future, but a reality. To get ready for this upcoming reality, Coconut Silo is providing an AI digital logistics forwarding platform COCOTRUCK in the global market, and "Truck Doctor," a digital truck maintenance platform based on big data, in Korea. Based on the services that we provide, we are eager to meet and greet the new digitized era.

Abstract

The ASEAN Expansion Journey and Localization Strategies as a SME(Small-Medium Enterprise)

≫ The vision as an entrepreneur by highlighting the challenges and opportunities in emerging markets.

≫ Collaboration and cooperation with local companies to build a solid local connections in the middle of unstable global financial status.

≫ The value and potential that ASEAN has and Korea as a key partner

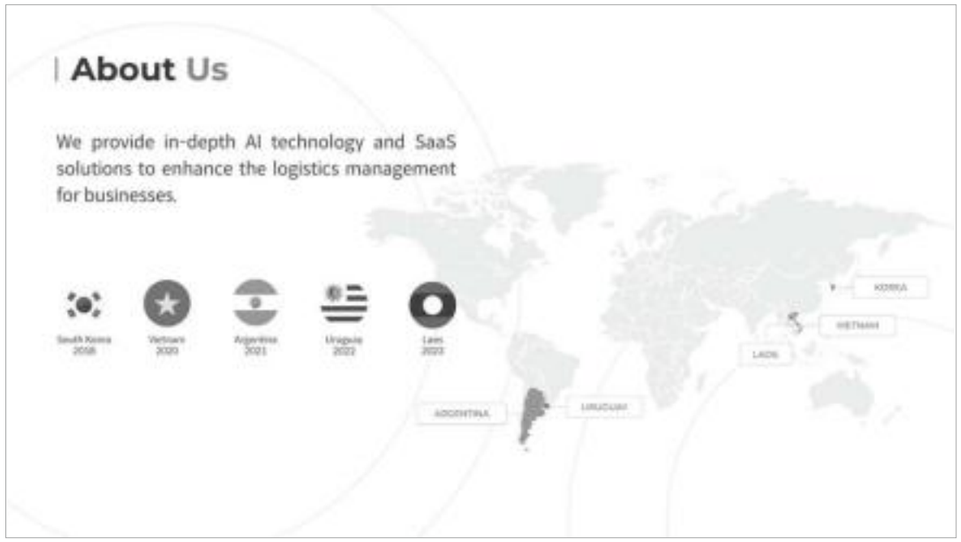
벤처 기업으로서의 아세안 진출기 및 현지화 전략

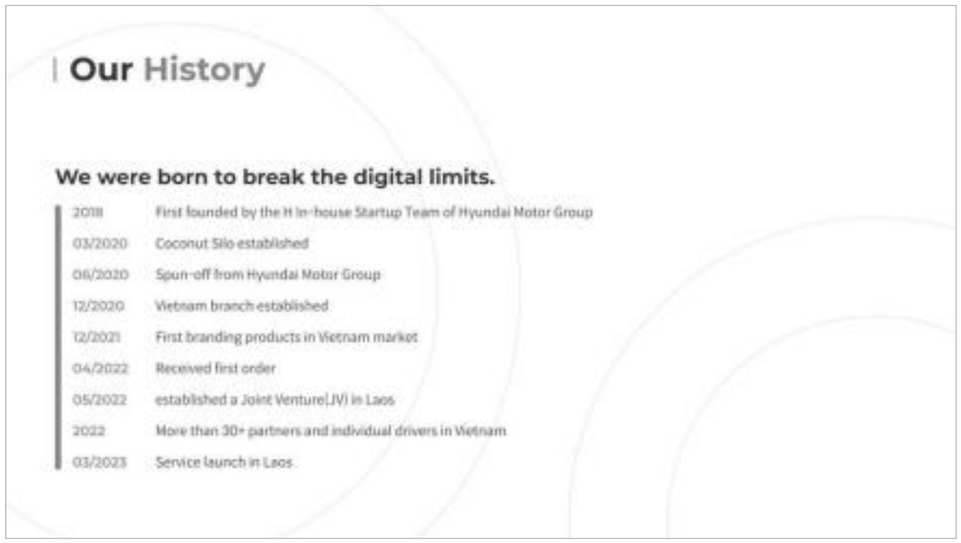
≫ 벤처 기업들의 신규 시장에 대한 도전과 이에 대한 조명을 통해, 급변하는 시장 상황 속에서 벤처 기업인으로서 갖고 있는 비전을 설명하고자 함.

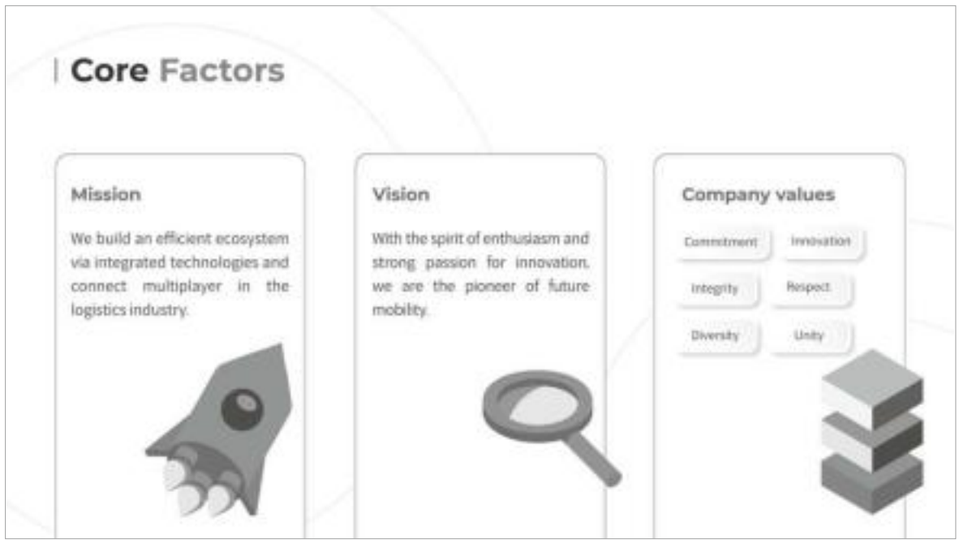
≫ 대외적인 금융 시장의 불안으로 인하여 위축된 투자 시장이 지속 되고 있으나, 국외 시장에서 현지 기업들과의 기술 협력과 생태계 구축을 진행하는 배경을 소개하고자 함.

≫ 아세안이 지니고 있는 잠재적인 가치와 대한민국과의 긴밀한 협력적 가치를 설파하고, 현지 국가들이 지니고 있는 대한민국에 대한 시각을 소개함으로써, 아세안 시장의 중추적인 입지를 설명하고자 함

ENTRY INTO ASEAN AND LOCALIZATION STRATEGIES AS A VENTURE COMPANY







Coconut Silo's Message

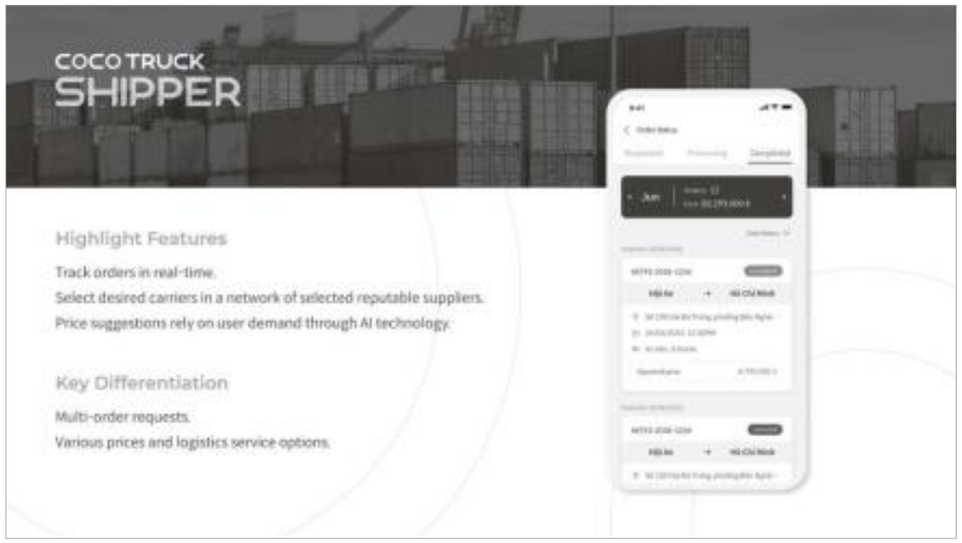
We accelerate the logistics value chain via innovative ways. Our advanced freight logistics platform "COCOTRUCK" connects all types of players in the logistics market into a single place. With big data, we enhance efficiency and enable logistics companies to maximize the number of orders received. Not only that, we enrich the ecosystem by providing a SaaS (Software as a Service) platform for B2B users to manage their resources easier and to become a greener company.

About

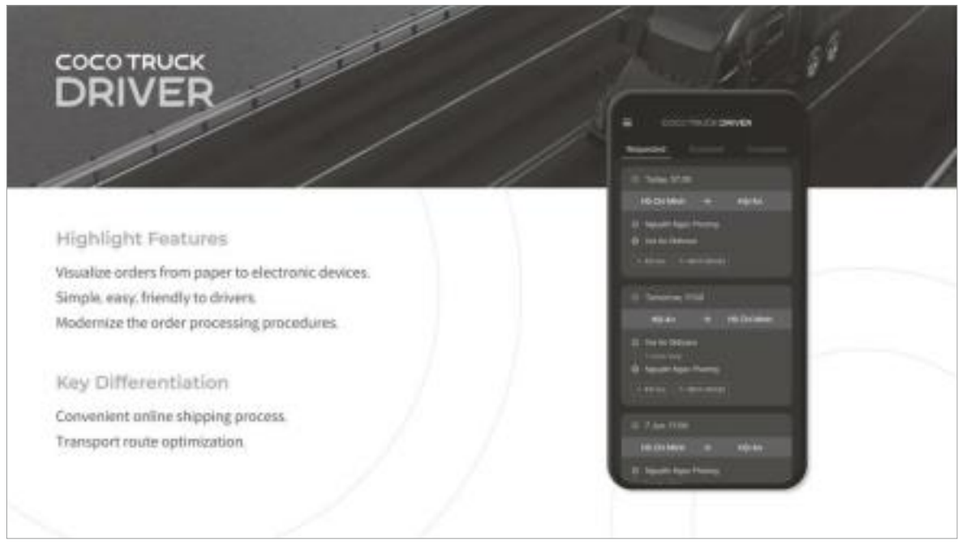
COCOTRUCK Introduction

COCOTRUCK - A digital platform integrates artificial intelligence, SaaS cloud-based, and wireless GPS technology. We support connecting all types of players in the logistics market and providing a solution for optimizing the transportation process.

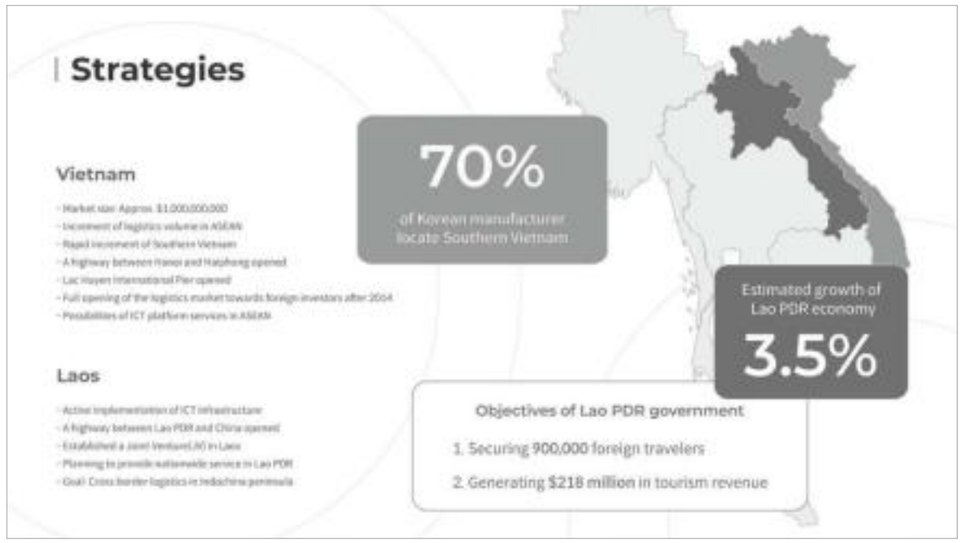
Why
COCOTRUCK
Provide customized solutions based on customer requirements.
Our support team is ready to assist our customers wherever they are located.
Our IT team from Korea is expertise to update and improve the app continuously.
COCOTRUCK will reduce businesses' carbon footprint and unnecessary paperwork.


COCO TRUCK
SHIPPER
Highlight Features
Track orders in real-time.
Select desired carriers in a network of selected reputable suppliers.
Price suggestions rely on user demand through AI technology.
Key Differentiation
Multi-order requests.
Various prices and logistics service options.

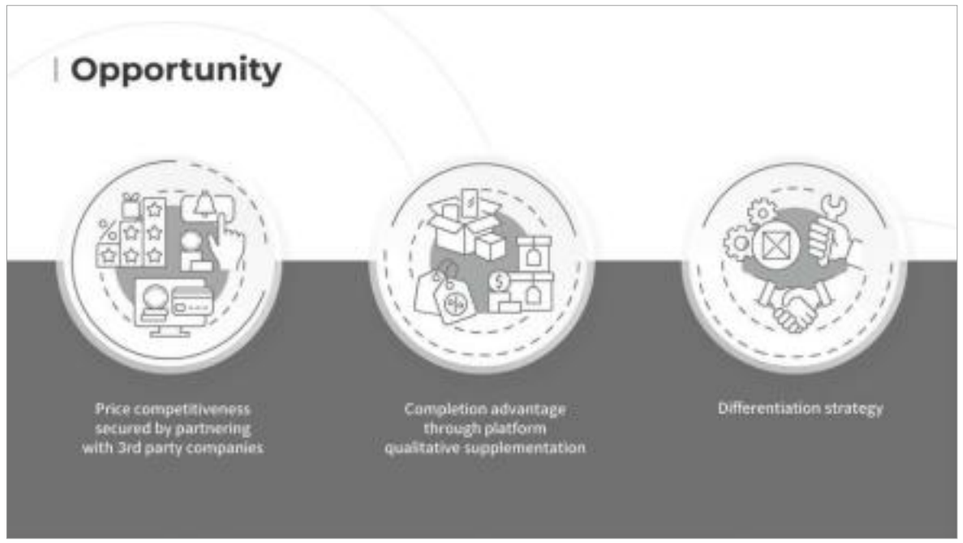
COCO TRUCK
CARRIER
Highlight Features
Flexibility in placing online/ offline orders receiving from Shippers or traditional channels.
Handle real-time orders, parking, and driver status via a cloud-based SaaS platform.
Assist carriers in obtaining more orders.
Extract data & reports simply.
Key Differentiation
Operation system management.
Big data storage and analysis.


COCO TRUCK
DRIVER
Highlight Features
Visualize orders from paper to electronic devices.
Simple, easy, friendly to drivers.
Modernize the order processing procedures.
Key Differentiation
Convenient online shipping process.
Transport route optimization.

3.
Business
Strategy


Strategies
Vietnam
- Market size: Approx. $1,000,000,000
- Increment of logistics volume in ASEAN
- Rapid increment of Southern Vietnam
- A highway between Hanoi and Haiphong opened
- Lac Huyen International Pier opened
- Full opening of the logistics market towards foreign investors after 2014
- Possibilities of ICT platform services in ASEAN
Laos
- Active implementation of ICT infrastructure
- A highway between Lao PDR and China opened
- Established a Joint Venture(JV) in Laos
- Planning to provide nationwide service in Lao PDR
- Goal: Cross border logistics in Indochina peninsula
70%
of Korean manufacturer
locate Southern Vietnam
Estimated growth of
Lao PDR economy
3.5%
Objectives of Lao PDR government
1. Securing 900,000 foreign travelers
2. Generating $218 million in tourism revenue

Crisis
Vietnam in the time of COVID-19
LOCKDOWN
- Nationwide lock down in June 2021
- Very first minus growth after 2000(3Q 2021)
- Entry limitations(company invitation, approval from the government)
- Only passers-by could pass through
NOW
- Resumption of entry for foreign tourists without VISA in 15th March 2022
- New normal conversion(fully normalized of March 2022)
Legal regulations
- Limitations for certain industries
- Preparations such as market research and entry strategy are required
- E-Commerce platform for instance, additional paperworks like MOIT registrations are required
Marketing strategy
- As of 2022, Vietnam's smartphone penetration rate is 62.5 million, ranking 15th in the world
- Establish an appropriate marketing strategy considering the average age of about 31 years
- The main marketing channels: Zalo, Facebook, and Instagram
- As of 2019, Vietnam ranks among the top 5 markets in the world in terms of hours spent on YouTube
Cultural characteristics
- Need to acknowledge/understand cultural differences between the two countries reflecting geographical/ historical characteristics (different titles appropriate to gender/ age, etc.)
- In 1885, the Vietnamese writing system was changed from Chinese characters to Roman characters, but similar words still exist
- There are additional dialect/cultural differences in each region, so it is necessary to establish a strategy suitable for each region


Opportunity
Price competitiveness
secured by partnering
with 3rd party companies
Completion advantage
through platform
qualitative supplementation
Differentiation strategy

Reason of the development

- Target ASEAN
- Digital transformation of the logistics industry
- Core technologies protected through 21 patents in total
- Targets all the players(shippers, drivers and carriers)
- Optimization of logistics management procedure through cloud based SaaS for carriers
- Targeted SaaS services for logistics companies
- Real time communication supported

Core Algorithms

- Smart consolidation algorithm
- Process optimization based on deep learning analysis
- Real time dashboard and statistical processing algorithm
- Route optimization algorithm based on the consolidation possibility

Business Model

Truck hailing in Vietnam

Increase profitability.
Based on the above, established an initial strategy for 'cargo transportation brokerage platform' and 3rd party model.

3rd Party Model

Additional services such as insurance, fueling and maintenance provided based on the needs.
Additional revenue model and business expansion.

Market access strategy

Initial market entrance strategy

- Korean logistics companies in Vietnam
- Korean manufacturers in Vietnam

Maturity stage strategy

- Talent acquisition for global expansion
- Global platform linkage and cloud expansion to secure server stability
- Commerce industry expansion

Logistics/cargo market

1. Shipper

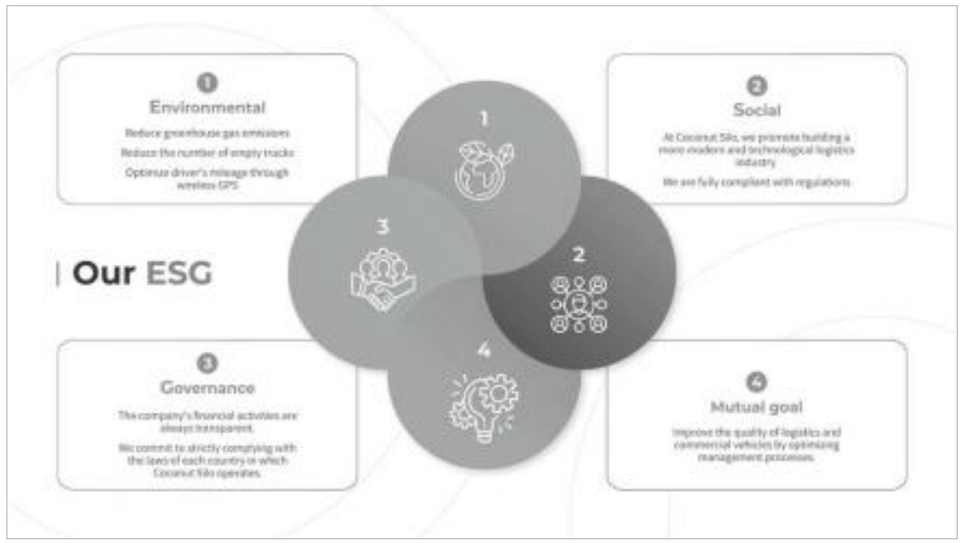
- Move goods without owning truck
- Realtime tracking

2. Carrier

- Tax and accounting through SaaS
- Management of logistics process

3. Driver

- Efficient transportation
- No action needed while driving
- Eco friendly driving assistance system


Our ESG
1
Environmental
Reduce greenhouse gas emissions
Reduce the number of empty trucks
Optimize driver's mileage through wireless GPS
2
Social
At Coconut Silo, we promote building a more modern and technological logistics industry
We are fully compliant with regulations
3
Governance
The company's financial activities are always transparent
We commit to strictly complying with the laws of each country in which Coconut Silo operates
4
Mutual goal
Improve the quality of logistics and commercial vehicles by optimizing management processes

Future Plans
Direct entrance
Vietnam
Joint Venture
Laos
Argentina

SPEAKER

Master Class 3 - Public Safety & Traffic Management

김 광 휘 Kwanghwee Kim

㈜우경정보기술 해외영업 파트 차장 / Deputy General Manager of Wookyoung Information Technology

A.I.와 함께하는 스마트하고 안전한 삶
Smart & Safe Life with A.I

BIOGRAPHY

≫ Bachelor of European Studies, Keimyung University
≫ A Deputy General Manager of Overseas Sales Department of WKIT
≫ Business Session Speaker of SCIENCEPARK INNOFAIR 2021

Abstract

Smart & Safe Life with A.I

≫ We Know IT changes your life
≫ Introduce WKIT's efforts to solve problems in society and realize a safe and smart life with artificial intelligence-based video analysis technology.

A.I.와 함께하는 스마트하고 안전한 삶

≫ We Know IT changes your life
≫ 인공지능 기반 영상분석 기술로 사회에 일어나는 문제점을 해소하고 안전하고 스마트한 삶을 구현하기 위한 우리 기업의 노력을 소개하고자 한다.

Overview

Our vision

Our technology

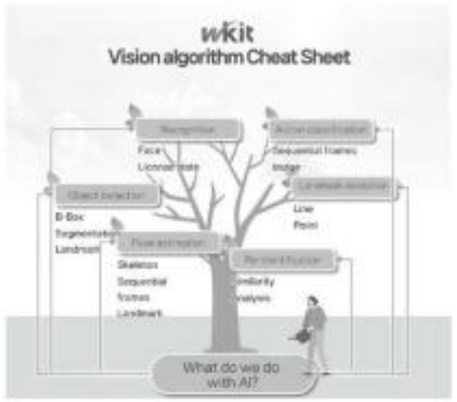
Core Technology

Core Technology

Overview Our technology Our product About WKIT | 6

WKIT's data-set

Object	Feature	Details
People	Object detection	People, Face, Glasses, Color of clothes
	Re-identification	Similarity analysis in multi-channel
	Action classification	Fight, Fall Down, Collapse, Abnormal behavior (Gathering, Loitering)
	Pose estimation	Skeleton
Vehicle Vessel Airplane	Object Detection	Model, Color, Number Plate, Direction
	License Recognition	License Plate (Korea, Japan), Thailand, Cyrillic...)
Animal	Object detection	Dog, Cats, Raccoon, Elk
	Action classification	Cow (Sitting, Walking, Lying down), Mourning)
Face	Face recognition	People and Face detection
	Face analysis	(Gender, Age, Mask)
Forest Fire	Object detection	Smoke, Fire
Medical Video / Image	Object detection	X-ray (Lung Opacity)
	Segmentation	Bone, Blood Vessel
	Lesion detection	Bone angle



wkit

Core Technology

Overview Our technology Our product About WKIT | 8

Re-identification technology

Recognizes the same object in multi-channel CCTV footages and matches objects based on similarity evaluation

1 Object Detection and Object Tracking

2 Objects that found from CCTV footage

3 Comparing the similarity between the objects detected in CCTV footages and the object to be searched

4 Shows 'search target objects' in order of similarity

wkit

Core Technology

Overview Our technology Our product About WKIT | 7

Real-time video analysis technology

Video analysis of related image information, real-time recording & alarm when a specific event occurs in multi-channel CCTV footage

Intrusion

Unauthorized object detection in a certain area

Loitering

Detecting objects that roam within a certain area

Line Cross

Calculate the number of objects passing through a specific line

Crowd

Detect a group of objects within a certain area

Collapse

Recognizing fallen and immobile objects

Fight

Detect objects who show violent behavior

wkit

Core Technology

Overview Our technology Our product About WKIT | 10

Video security & personal information protection technology

Real-time object detection de-identification, copyright information management for high-definition, large-capacity video (based on domestic standard lightweight model)

Object Detection

Automatic detection of moving objects (people, vehicle)

De-identification

Provides de-identification (Masking function) for specified objects

Watermark

Insert the copyright information of the video owner as a watermark

wkit

Our product

VISCOPER

VISCOPER

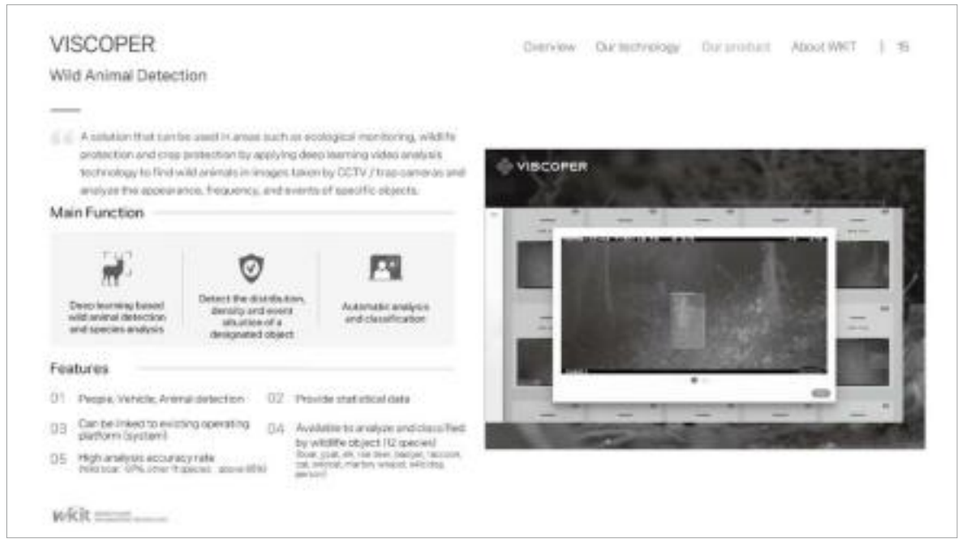
FIREWATCHER

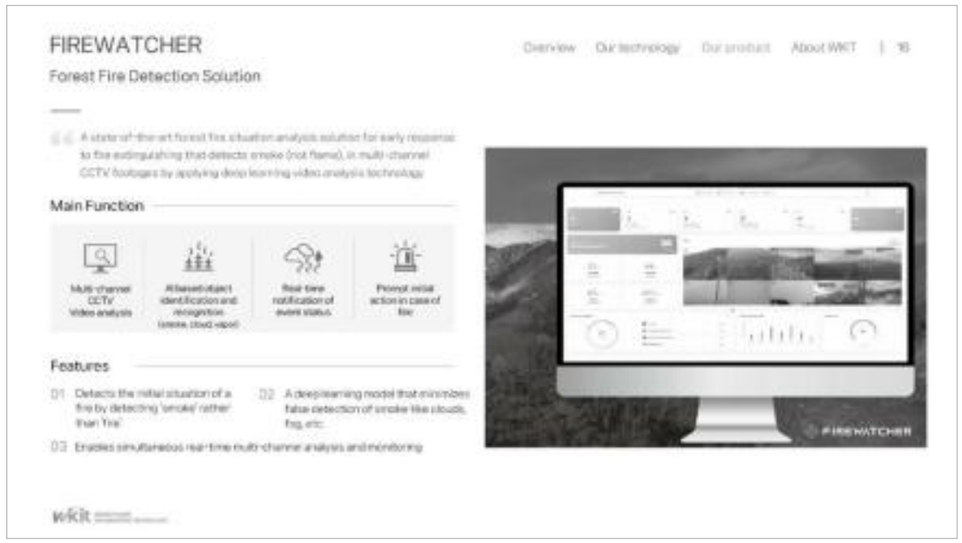
CROWDWATCHER

SECUWATCHER

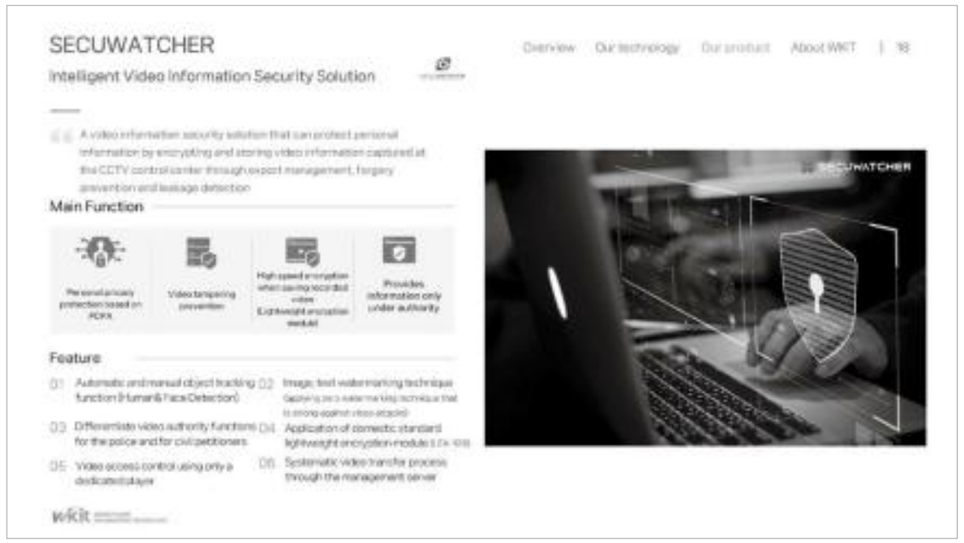
MOSAICER

AI Vision Analysis platform





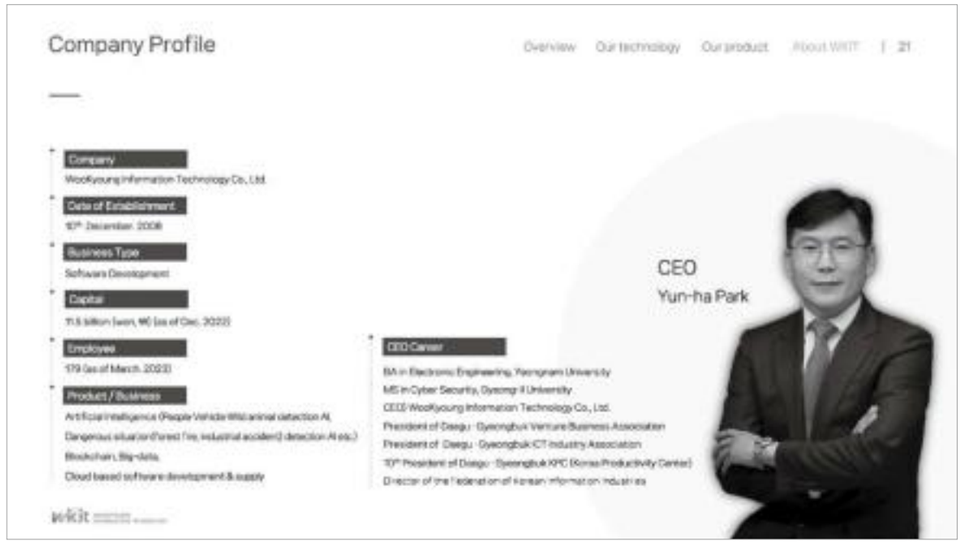
CROWDWATCHER
Intelligent Crowd Characteristic Analysis Solution
Overview Our technology Our product About WKIT | 17
Main Function
Features

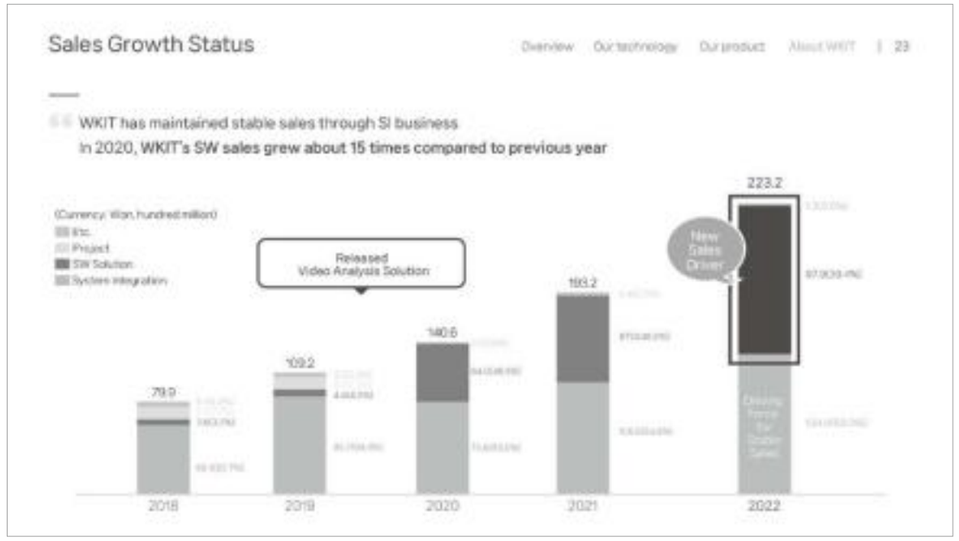

SECUWATCHER
Intelligent Video Information Security Solution
Overview Our technology Our product About WKIT | 18
Main Function
Feature

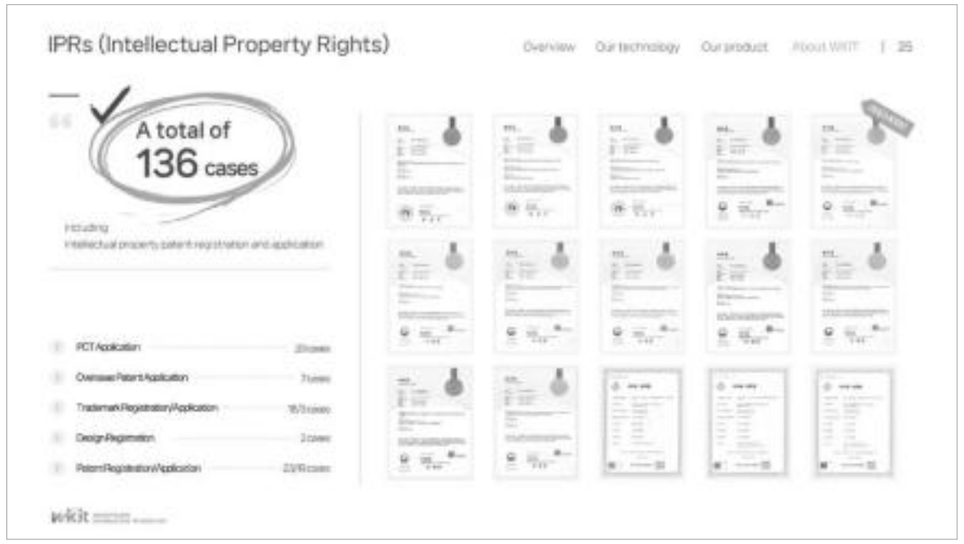
MOSAICER
AI based Video Masking Web-service
Overview Our technology Our product About WKIT | 19
How to use
1. Plan Selection
2. Upload a video
3. Convert masking image
Features

dara
Cloud based AI video analysis platform
Overview Our technology Our product About WKIT | 20
Dara is an AI video analysis platform that utilizes the GPU resource pool of cloud infrastructure.
By applying WKIT's AI engine (ai dara), it analyzes objects such as people and cars in real time and provides various services.
Features

About WKIT


Company Profile
Overview Our technology Our product About WKIT | 21
Company
WooKyoung Information Technology Co., Ltd.
Date of Establishment
10th December 2008
Business Type
Software Development
Capital
11.5 billion (won, ₩) (as of Dec. 2022)
Employee
179 (as of March. 2023)
Product / Business
Artificial intelligence (People Vehicle Wild animal detection AI,
Dangerous situation(forest fire, industrial accident) detection AI etc.)
Blockchain, Big-data,
Cloud based software development & supply
CEO Career
BA in Electronic Engineering, Yeungnam University
MS in Cyber Security, Gyeongil University
CEO WooKyoung Information Technology Co., Ltd.
President of Daegu · Gyeongbuk Venture Business Association
President of Daegu · Gyeongbuk ICT Industry Association
10th President of Daegu · Gyeongbuk KPC (Korea Productivity Center)
Director of the Federation of Korean Information Industries
CEO
Yun-ha Park


Sales Growth Status
Overview Our technology Our product About WKIT | 23
WKIT has maintained stable sales through SI business
In 2020, WKIT's SW sales grew about 15 times compared to previous year
(Currency: Won, hundred million)
Inc.
Project
SW Solution
System integration
Released
Video Analysis Solution
New Sales Driver
79.9
109.2
140.6
193.2
223.2
2018
2019
2020
2021
2022


IPRs (Intellectual Property Rights)
Overview Our technology Our product About WKIT | 25
A total of
136 cases
including
Intellectual property patent registration and application
PCT Application
Overseas Patent Application
Trademark Registration/Application
Design Registration
Patent Registration/Application

Global Marketing
Overview Our technology Our product About WKIT | 26
THAILAND
JAPAN
VIETNAM
MALAYSIA
Global Competence
Marketing Competence
Technical Competence
Human Competence

WKIT,
We Know IT changes your life
THANK YOU

MEMO

SPEAKER

Master Class 3 - Public Safety & Traffic Management

Tulga Galbadrakh

CEO of Systems Engineering Mongolia

몽골의 장애아동 지원 : 생체 공학 팔 개발을 통한 삶의 질 향상

Empowering Children with Disabilities in Mongolia: Developing Bionic Prosthetic Hands to Improve Quality of Life

BIOGRAPHY

≫ Tulga Galbadrakh is an accomplished entrepreneur and technologist with a passion for developing innovative products that make a positive impact on society. As the founder of SEM LLC and SEM BIONICS LLC, Tulga has dedicated his career to the development of bionic prosthesis and green energy technologies that push the boundaries of what is possible. With his background in engineering and programming, Tulga is able to provide expert guidance on a variety of systems, including automatic fuel, water, and electricity dispensers, as well as online monitoring systems. He has overseen multiple projects in this capacity, from the engineering and installation of self-service fuel and LPG dispensers, EV chargers, to the creation of automatic freshwater dispensers.

Abstract

Empowering Children with Disabilities in Mongolia: Developing Bionic Prosthetic Hands to Improve Quality of Life

Our pitch focuses on empowering children with disabilities in Mongolia by developing bionic prosthetic hands to enhance their quality of life. The prevalence of disabilities among children in Mongolia is a significant concern, often resulting in limited opportunities and challenges in daily activities. This project aims to address these issues by designing and producing advanced bionic prosthetic hands tailored specifically for children with upper limb disabilities.

Through collaborative efforts between engineers, prosthetics specialists, and healthcare professionals, the project aims to develop affordable and functional prosthetic hands that mimic natural movements and provide increased dexterity. The bionic prosthetic hands will be customized to meet the unique needs and preferences of each child, allowing them to regain independence and actively participate in various activities, including self-care, education, and social interactions.

The project will also focus on providing training and support to both the children and their families, ensuring proper fitting, maintenance, and skill development for optimal use of the prosthetic hands. Furthermore, awareness campaigns will be conducted to reduce stigmatization and promote inclusivity within Mongolian society.

By empowering children with disabilities through the development of bionic prosthetic hands, this project strives to improve their overall well-being, boost self-confidence, and enable them to lead fulfilling lives. The positive impact of this initiative extends beyond the individual children, creating a more inclusive and compassionate society that values diversity and equal opportunities for all.

몽골의 장애아동 지원 : 생체 공학 팔 개발을 통한 삶의 질 향상

SEM는 삶의 질을 향상시키기 위해 생체 공학적 의수를 개발하여 몽골의 장애 아동에게 권한을 부여하는 데 중점을 둡니다. 몽골 아동의 장애 유병률은 심각한 우려 사항이며 일상 활동에서 기회와 도전이 제한되는 경우가 많습니다. 이 프로젝트는 상반신에 장애가 있는 어린이를 위해 특별히 제작된 첨단 생체 공학적 의수를 설계하고 생산함으로써 이러한 문제를 해결하는 것을 목표로 합니다.

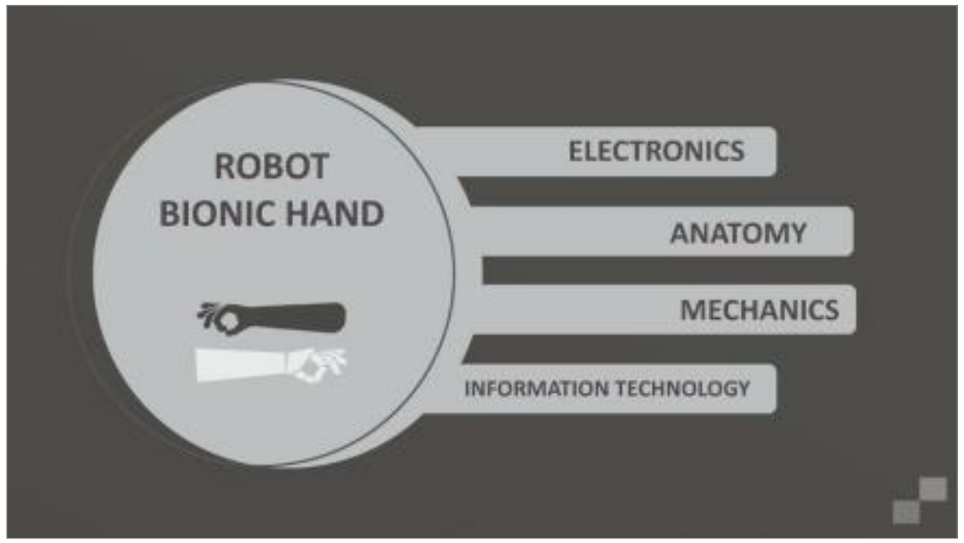
엔지니어, 보철 전문가 및 의료 전문가 간의 협력 노력을 통해 이 프로젝트는 자연스러운 움직임을 모방하고 향상된 손재주를 제공하는 저렴하고 기능적인 의수를 개발하는 것을 목표로 합니다. 생체 공학 의수는 각 어린이의 고유한 요구와 선호도에 맞게 맞춤화되어 독립성을 기르고 자기 관리, 교육 및 사회적 상호 작용을 포함한 다양한 활동에 적극적으로 참여할 수 있습니다.

이 프로젝트는 또한 의수를 최적화하기 위한 적절한 피팅, 유지 관리 및 기술 개발을 보장하면서 어린이와 그 가족 모두에게 교육 및 지원을 제공하는 데 중점을 두고 있습니다. 또한 몽골 사회 내에서 차별을 줄이고 포용성을 증진하기 위한 인식 캠페인을 실시할 것입니다.

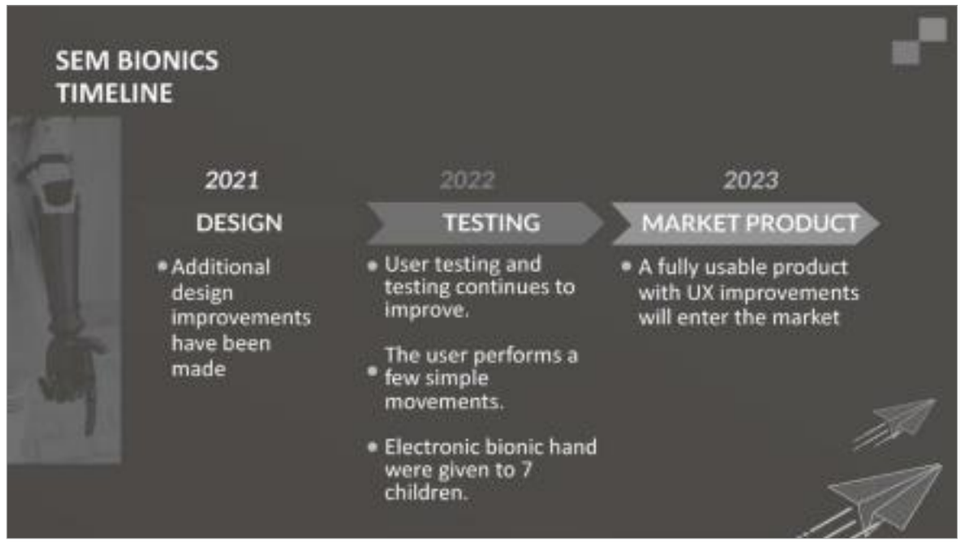
바이오닉 의수 개발을 통해 장애 아동의 역량을 강화함으로써 이 프로젝트는 장애 아동의 전반적인 삶을 개선하고 자신감을 고취하며 만족스러운 삶을 영위할 수 있도록 노력합니다. 이 프로젝트는 프로젝트 참여 어린이들을 넘어 다양성과 모두를 위한 평등한 기회를 중시하는 보다 포용적이고 온정적인 사회를 만들어 나갈 것 입니다.

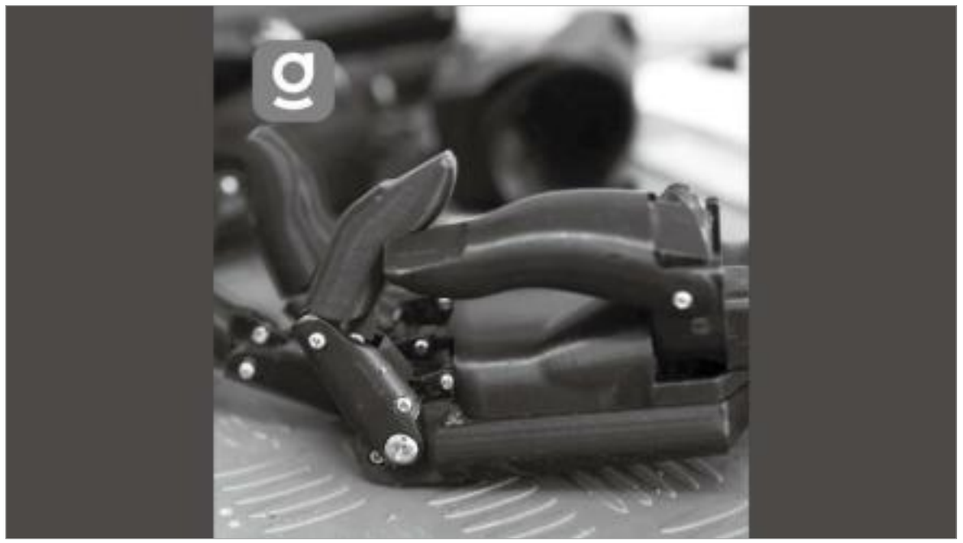
Teenager BIONIC hand:
Length: 43cm
Palm size: 8cm x 7.5cm
User: Male, 17 years old, left hand
d, right hand
SEM BIONICS LLC
EMPOWERING CHILDREN WITH DISABILITIES IN MONGOLIA:
DEVELOPING BIONIC PROSTHETIC HANDS TO IMPROVE
QUALITY OF LIFE

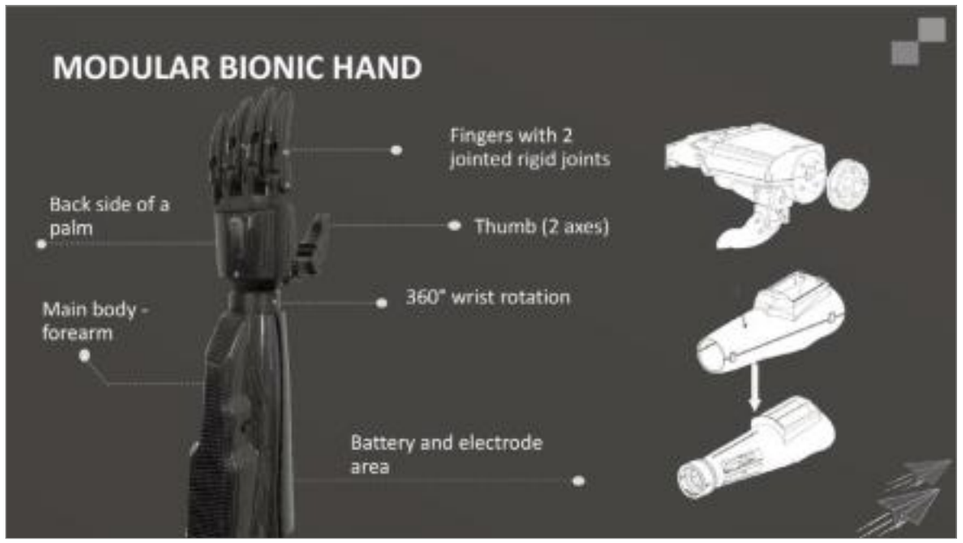
OUR PARTICIPANT
CHILDREN


ROBOT
BIONIC HAND
ELECTRONICS
ANATOMY
MECHANICS
INFORMATION TECHNOLOGY

SEM BIONICS
TIMELINE
2019
IDEATHION
First idea of the project
2020
FEASIBILITY STUDY
• Defined project scope and requirements
• Research has begun
2021
DEVELOPMENT
• A project team has been formed
• Development has begun
• Handed out the first hand to 5 children.


SEM BIONICS
TIMELINE
2021
DESIGN
• Additional design improvements have been made
2022
TESTING
• User testing and testing continues to improve.
• The user performs a few simple movements.
• Electronic bionic hand were given to 7 children.
2023
MARKET PRODUCT
• A fully usable product with UX improvements will enter the market




MODULAR BIONIC HAND
Back side of a palm
Main body - forearm
Fingers with 2 jointed rigid joints
Thumb (2 axes)
360° wrist rotation
Battery and electrode area

SEM BIONICS BIONIC HAND

SEM Bionics uses a 3D printers to print the main material of the PLA, make the outer carbon coating in Mongolia, and buy auxiliary parts from the United States, China, and Hong Kong.

LABORATORY IN MONGOLIA

Assembly and production are carried out in our own laboratory

MARKET PRICE COMPARISON

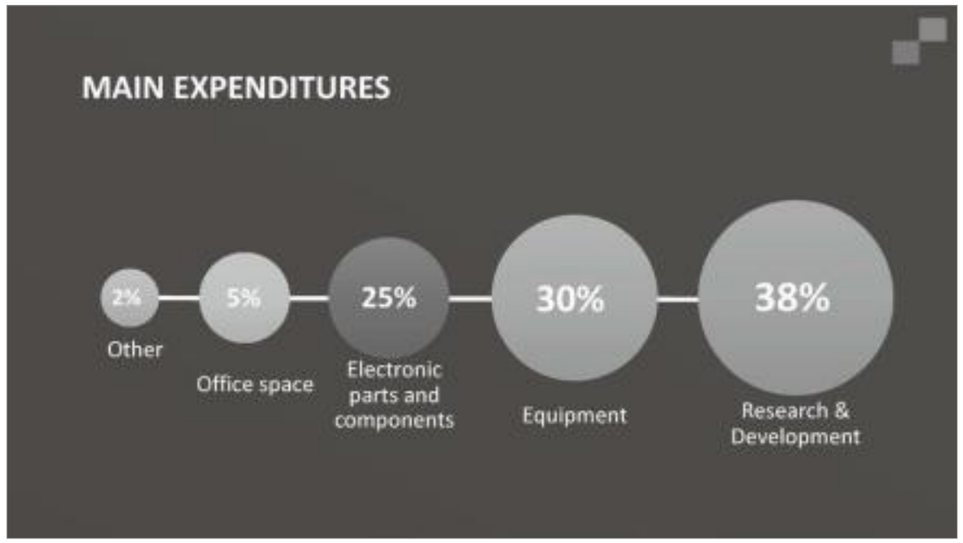
Description	"Ottobock" Bebionic Hand		"i_-Limb" Ossur Hand		"Skywalker" SEM Bionics	
Price	$ 30,000	$ 35,000	$ 45,000	$ 70,000	$ 5,000	$ 7,000
Sensor type		myoelectric		myoelectric		myoelectric
Max lift weight	35 kg	45 kg	80 kg	90 kg	5 kg	8 kg
Modular structure		No		No		YES
Main material		ABS		ABS		PLA, Nylon
Separate finger control		YES		YES		YES
Number of gesture positions		14		36		8

PRODUCT COMPARISON

OTTOBOCK company's BEBIONIC hand

SEM BIONICS bionic hand 5.0

MONGOLIAN MARKET
The number of special necessities in the Mongolia
BIONICS hand companies:
• SEM BIONICS LLC: One hand 5000$.
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
6,671
1,334
Total number
Adults
Children


MAIN EXPENDITURES
2%
Other
5%
Office space
25%
Electronic parts and components
30%
Equipment
38%
Research & Development

VISION AND GOALS
LOCAL MARKET
Pre-Order list:
25 adults
25 children
1,000 PEOPLE
INTERNATIONAL MARKET
EAST EUROPE
SOUTH EASH ASIA
10,000 PEOPLE

Team leader: M.Sc., G. Tulga
Advisor doctor: M.Sc., Ts. Tsolmonbayar
Project manager: B. Tsengel
Electronics Engineers: J. Adiyasuren, Ch. Galsandorj, G. Oyunchuluun
Product design engineer: Z. Aldajan

WE ARE RAISING DONATION FUNDING
2.5 MLN USD
500 CHILDREN
SEM BIONICS LLC

WE ARE RAISING EQUITY FUNDING
1 MLN USD
30%
SEM BIONICS LLC

Thank you for attention
JOIN US!

SPEAKER

Master Class 4 - Technology for a Healthy Life

김 선 우 Seonwoo Kim

㈜딥바이오 대표 / CEO of Deepbio

디지털 병리학 시대에 AI를 활용한 현대 암 진단, 예후 및 치료
Modern Cancer Diagnosis, Prognosis and Treatment using AI in the Era of Digital Pathology

BIOGRAPHY

Sun Woo Kim, the founder and CEO of Deep Bio Inc., has a proven record of over 20 years in executive management as well as computer science expertise. He founded Deep Bio based on the firm belief that AI can revolutionize healthcare and address some of the existing challenges, starting with improved diagnostic processes. Prior to founding Deep Bio, he served as the Chief Technology Officer of Pinion Industries, and automotive software and security start-up. He was also the deputy directory of KT, the largest telecommunications company in Korea, where he led the global venture capital team.

Abstract

Modern Cancer Diagnosis, Prognosis and Treatment using AI in the Era of Digital Pathology

Digitization brought dramatic changes to the different parts of the healthcare industry. Pathology, a field in which the adoption of digitization has been quite slow compared to other fields, is now poised for the long-awaited transition to digitization. Gaining momentum as a proven and essential technology, digital pathology can be a great solution to resolve problems pathologists are facing: increasing workload but not enough human resources to deal with it.This presentation introduces an AI-powered cancer diagnostic support software for prostate cancer, the most common cancer among males. Integrated to the current workflow, the diagnostic support software can provide pathologists with meaningful benefits including minimizing the risk of human errors from the subjectivity of pathologist assessments, leading to more precise and consistent diagnostic results, and improved reproducibility. At the same time, the talk elaborates on the cutting-edge deep learning system applied to the diagnostic software space, which overcame its limits for better performance and higher utilization. At the end of the speech, the values of the cutting-edge technology that encompasses the entire journey of cancer care will be presented: diagnosis, prognosis, treatment. The speech will enable the audience to gain a better understanding of the AI capabilities that can be integrated into the existing pathology workflow and change the current cancer treatment environment.

디지털 병리학 시대에 AI를 활용한 현대 암 진단, 예후 및 치료

디지털화는 의료 산업의 다양한 부분에 극적인 변화를 가져왔습니다.
다른 분야에 비해 디지털화의 도입이 상당히 느린 병리학은 이제 오랫동안 기다려온 디지털화로의 전환을 앞두고 있습니다. 검증된 필수 기술로 추진력을 얻고 있는 디지털 병리학은 병리학자가 직면하고 있는 문제, 즉 작업량은 증가하지만 이를 처리할 인적 자원은 부족한 문제를 해결하는 훌륭한 솔루션이 될 수 있습니다.
이 프레젠테이션에서는 남성에게 가장 흔한 암인 전립선암에 대한 AI 기반 암 진단 지원 소프트웨어를 소개합니다.

현재 워크플로에 통합된 진단 지원 소프트웨어는 병리학자 평가의 주관성으로 인한 인적 오류 위험 최소화, 보다 정확하고 일관된 진단 결과 및 향상된 재현성 등 의미 있는 이점을 병리학자에게 제공할 수 있습니다.
동시에 더 나은 성능과 더 높은 활용도를 위해 한계를 극복한 진단 소프트웨어 공간에 적용된 최첨단 딥러닝 시스템에 대해 설명한다.

강연 말미에는 암 치료의 전 과정을 아우르는 첨단 기술의 가치인 진단, 예후, 치료가 제시될 예정이다.
강연을 통해 청중은 기존 병리학 워크플로에 통합될 수 있는 AI 기능에 대해 더 잘 이해하고 현재 암 치료 환경을 바꿀 수 있습니다.

deep bio

Dive Deeper into Data-Driven Medicine

SPIF2023

Modern Cancer Diagnosis, Prognosis and Treatment using AI in the Era of Digital Pathology

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1

Deep Bio Inc. is an AI healthcare company with in-house expertise in deep learning and cancer pathology. Our vision is to radically improve efficiency and accuracy of pathologic cancer diagnosis and prognosis, by equipping pathologists with deep learning-based IVD SaMDs[1] (In Vitro Diagnostics Software as a Medical Device), for optimal cancer treatment decisions.

1. IVD SaMD: In Vitro Diagnostic Software as a Medical Device including Diagnostics (Dx), Companion Diagnostics (CDx), Prognostics (Px)

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2

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Cancer Diagnostic Process in General

Step 1	Step 2	Step 3
Clinical Diagnosis	Imaging Diganosis	Pathological Diagnosis
Biomarkers (i.e. blood test) indicative of cancer presence are screened in a clinical test	If cancer is suspected after clinical test, appropriate imaging tests (the X-Ray, CT, MRI, PET-CT, Ultrasound, Endoscopy, etc.) may be conducted	For cancer confirmation and the determination of its severity, a tissue biopsy may be performed for pathological cancer diagnosis

3

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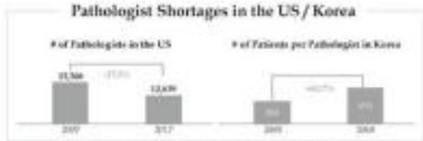
The Problems with Traditional Cancer Pathology

Pathologist Shortages in the US / Korea

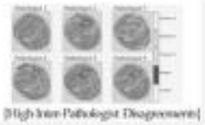


Shortage of Pathologists and Heavy Workload

Traditional workflow faces major challenges

Diagnostic Variability

Variable diagnosis among pathologists after microscopic examination



[High Inter-Pathologist Disagreement]

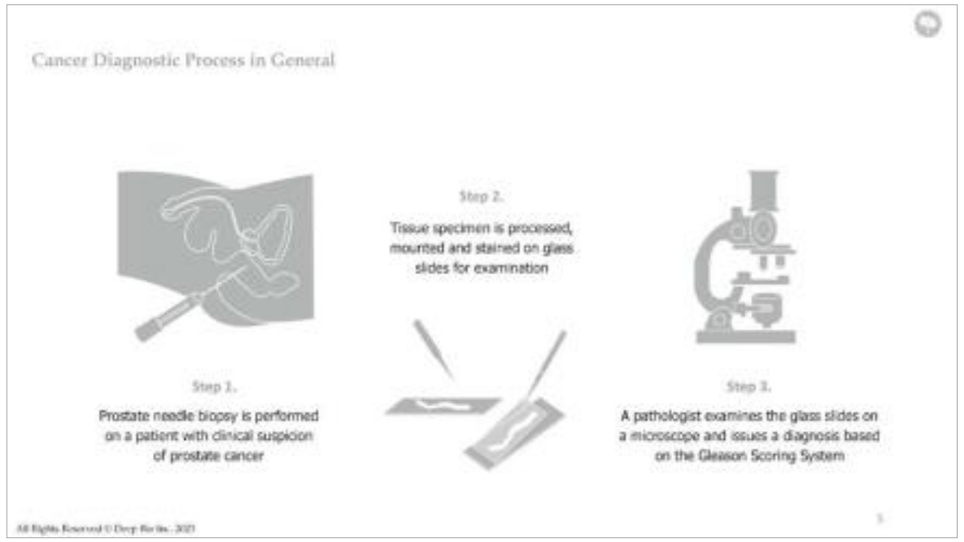
Traditional Pathology Workflow

Prostate needle biopsy is performed on a patient with clinical suspicion of prostate cancer

Tissue specimen is processed, mounted and stained on glass slides for examination by a pathologist

A pathologist examines the glass slides using a microscope and issues a diagnosis based on the Gleason Scoring System

4


Cancer Diagnostic Process in General
Step 1.
Prostate needle biopsy is performed on a patient with clinical suspicion of prostate cancer
Step 2.
Tissue specimen is processed, mounted and stained on glass slides for examination
Step 3.
A pathologist examines the glass slides on a microscope and issues a diagnosis based on the Gleason Scoring System
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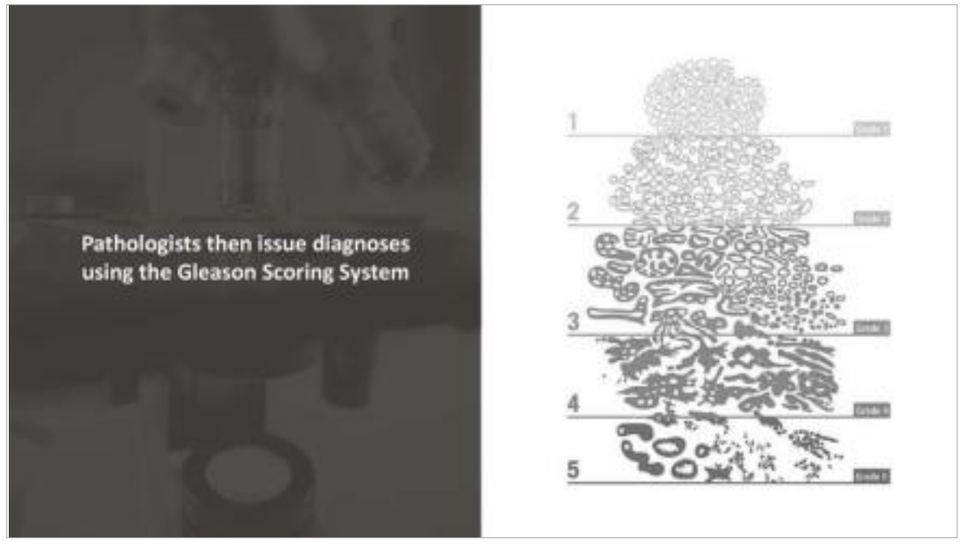
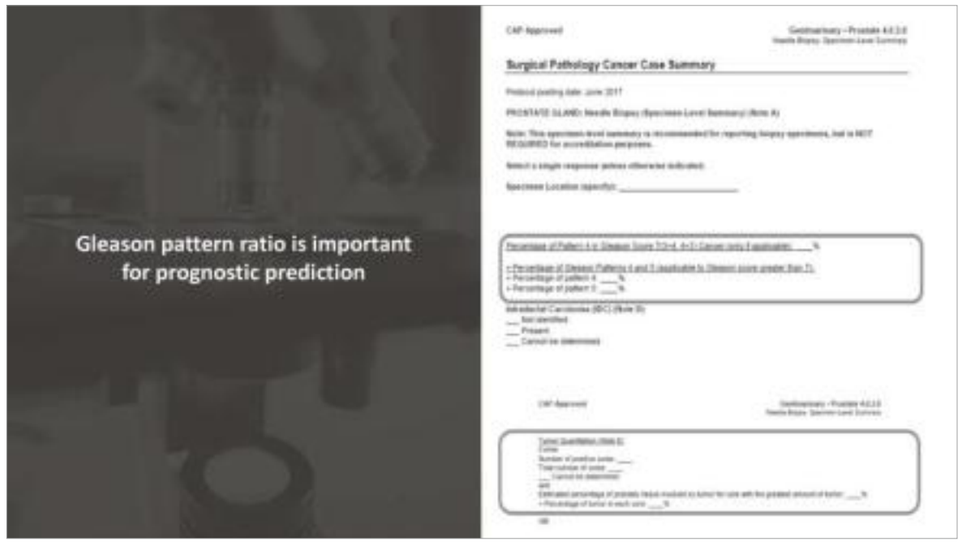
Pathologists examine prostate needle biopsies through microscopes


Pathologists then issue diagnoses using the Gleason Scoring System
1
2
3
4
5


Gleason pattern ratio is important for prognostic prediction
CAP Approved
Surgical Pathology Cancer Case Summary

SPIF2023

The Problems with Traditional Cancer Pathology (ex. Prostate)

Prostate Tissue Under the Microscope

Gleason Scoring based on Cell-level Morphology

CAP Requirements: Ratios of Gleason patterns 4, 5 Tumor Ratio

※ Gleason Pattern: Severity of Prostate Cancer

※ CAP : College of American Pathologists

Subjectivity and variability in quantifying metrics such as the tumor ratio, Gleason pattern ratios

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Whole Slide Images (WSI)

Digital images generated from the given diagnostic slides

- Whole slide area scanned at the given magnification level (20x, 40x)
- Scanning takes a few minutes for a single scan at 40x
- Multi focal plane scanning (z-stacking) takes up to several hours

WSI can be used for the primary diagnosis at U.S.

- Whole-slide imaging system = scanner + display + viewer software
- Color reproducibility is a major concern in FDA approval

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Outstanding Deep Learning Technology for Image Classfication

Machine Learning

Domain experts extract features for classification and machine learning is used to train algorithms with the features

Deep Learning

Deep learning is used to extract features for classification and train algorithms which leads to performance improvement

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Challenges in Dealing with WSI

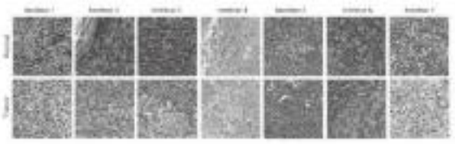
Image size is very large

- Scanning 2cm x 3cm area at 40x
  = around 80,000 x 120,000 pixels
  = ~ 10G pixels = 30GB at no compression

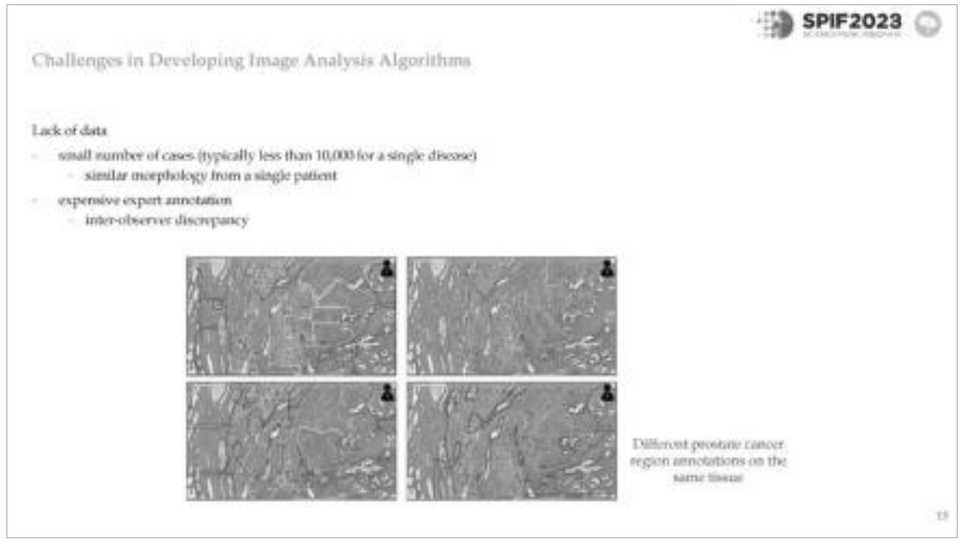
Image colors can vary significantly

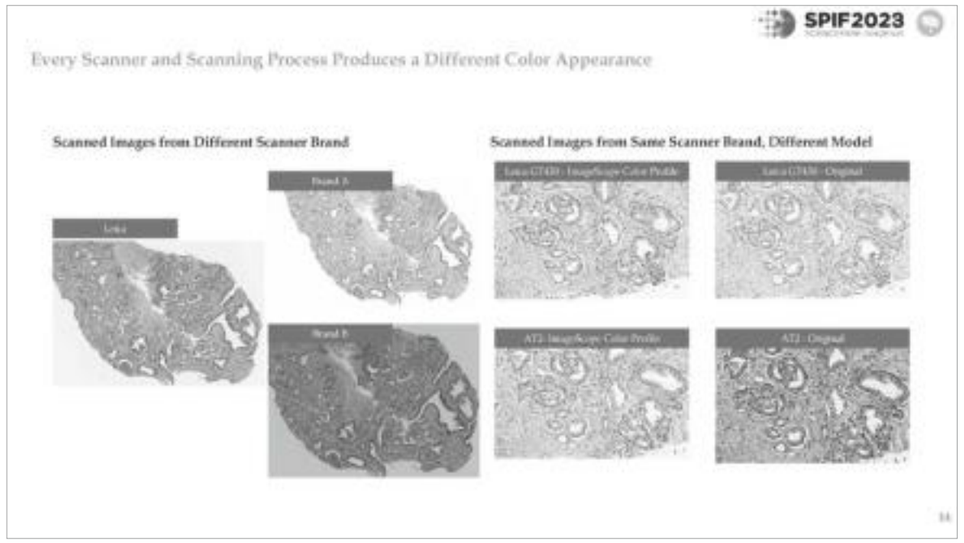
- Scanner
- Tissue thickness
- Staining dye

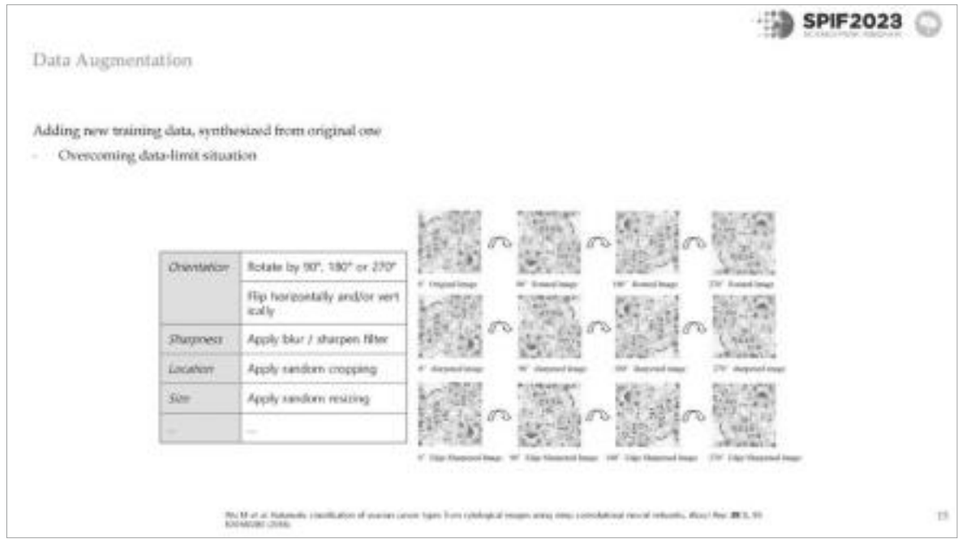
Sample WSI from TCGA

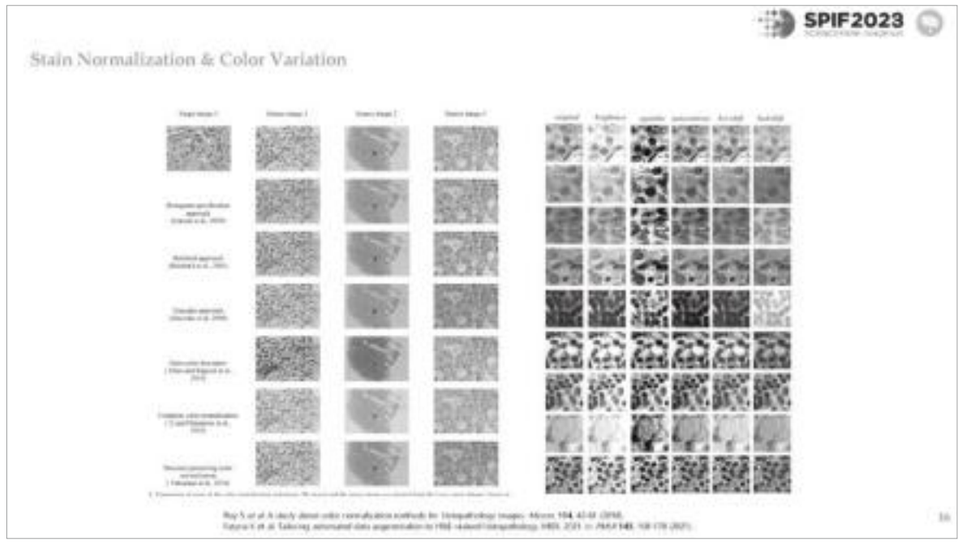


Breast lymph node images from various institutions (Camelyon16)


SPIF2023
Challenges in Developing Image Analysis Algorithms
Lack of data
- small number of cases (typically less than 10,000 for a single disease)
  - similar morphology from a single patient
- expensive expert annotation
  - inter-observer discrepancy
Different prostate cancer region annotations on the same tissue

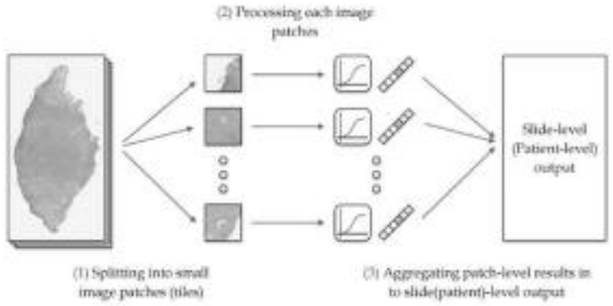

SPIF2023
Every Scanner and Scanning Process Produces a Different Color Appearance
Scanned Images from Different Scanner Brand
Scanned Images from Same Scanner Brand, Different Model


SPIF2023
Data Augmentation
Adding new training data, synthesized from original one
- Overcoming data-limit situation
Orientation
Rotate by 90°, 180° or 270°
Flip horizontally and/or vertically
Sharpness
Apply blur / sharpen filter
Location
Apply random cropping
Size
Apply random resizing


SPIF2023
Stain Normalization & Color Variation

SPIF2023

Typical WSI Analysis Pipeline



17

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Differentiated Deep Learning Technology for Better Performance

- Advanced and improved deep learning algorithm beyond the limits

Based on Real Clinical Diagnostic Practice

Performs the diagnosis in the same way a pathologist would in a real-world clinical practice

Intelligent Annotation Technique

Generate high quality training data set with our own intelligent annotation technique

Continuous Improvement

Control the training of the algorithm to continuously improve the performance

19

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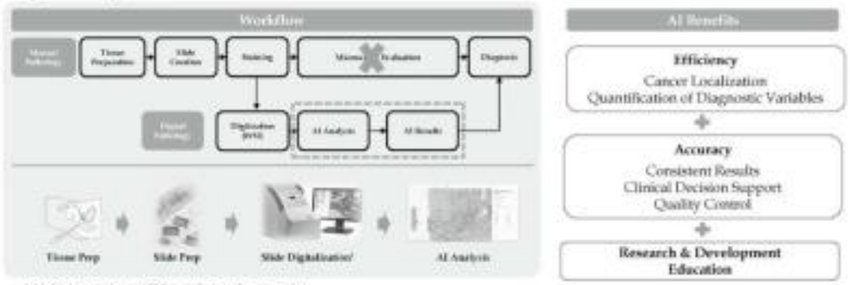
AI for Pathologic Cancer Diagnosis

Deep learning was applied to cancer tissue image analysis to enable faster and more consistent diagnosis

Digital Pathology & AI



AI Benefits

Efficiency
Cancer Localization
Quantification of Diagnostic Variables

Accuracy
Consistent Results
Clinical Decision Support
Quality Control

Research & Development
Education

1. Model shown is Aperio AT2 Scanner by Leica Biosystems, Inc.

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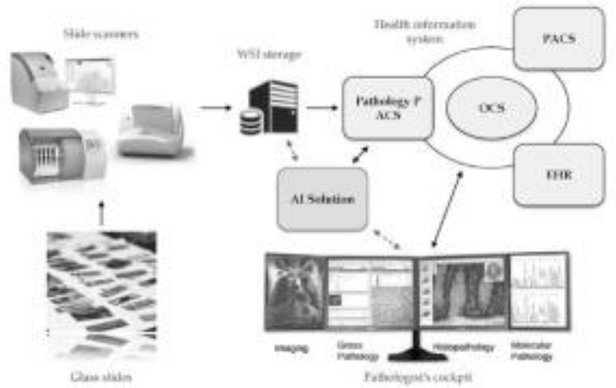
Digital Pathology Workflow



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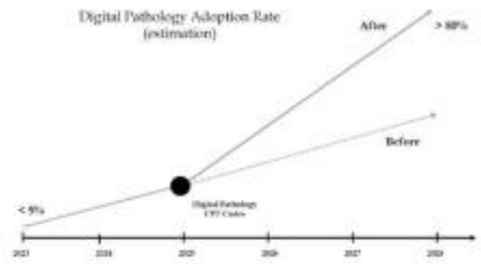
Rapid Adoption of Digital Pathology in the US

In July 2022, the AMA (American Medical Association) announced 13 Category III CPT codes for digital pathology, effective January 1, 2023.

AMA CPT Announces New Digital Pathology Codes

The CAP successfully advocated for the inclusion of new CPT digital pathology codes for 2023. The CAP worked with the American Medical Association (AMA) CPT Editorial Panel to add 13 new digital pathology add-on codes. The new digital pathology Category III CPT codes will be used to report additional clinical staff work and service requirements associated with digitizing glass microscopic slides for primary diagnosis. The AMA CPT will also add a new heading in the Category III section and guidelines to define digital pathology digitization procedures. The CAP applauds the AMA for their public release of this information, and the CAP will provide resources throughout 2022 to educate CAP members about anticipated CPT changes.

Through its advocacy, the CAP worked with the AMA CPT Editorial Panel to improve reporting of digital pathology services. As a result, the new codes will help pathologists, pathology practices, and laboratories providing digital pathology digitization procedures appropriately report these services. The new digital pathology codes will be published on July 1, 2022, and effective on January 1, 2023.



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DeepDx® Prostate

Clinically-Validated AI for Prostate Core Needle Biopsy Tissue Image Analysis

- Detects cancer and grades its severity on WSIs of prostate core needle biopsy samples, based on the Gleason scoring system
- Use cases are extensive: first read, concurrent read, quality control, education and R&D
- Extensively tested at a US CLIA lab (> 700k cores as between 2019 and 2021)
- Alleviates the shortage of pathologists and the general increases in workload
- Reduces diagnostic subjectivity and variability

1. Disclaimer: All products are for Research Use Only (RUO) or Investigational Use Only (IUO) and not for clinical primary diagnosis, unless indicated otherwise.

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Product Introduction Video

INTRODUCING

DeepDx® Prostate

deepbio

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Variety of Applications

- Deep Learning that Empowers Pathologists: Prostate Cancer Diagnostic Support Software

Screening	Clinical Decision Support	Quality Control	Research & Development
Quickly screens through the work to flag suspicious cases	Fewer diagnostic errors	Reduces false negatives and positives	Deployed in reference labs and research institutions
Decreases turnaround times	Automatically calculates quantitative parameters	Decreases the need for time-consuming second consults	Pioneer new medical developments

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End User Testimonials & Product Info

The Pathologist Magazine – March 2021 Issue

"I can instantly check the results from DeepDx Prostate with a simple click of a button- sometimes revealing small areas of concern that I would have missed had I not had the tool running in the background."

- PathNet CEO -

Laboratory Economics Volume 16, No.5 – May 2021 Issue

"This tool is very helpful for quality assurance in that it enables the pathologist to re-look at areas that they did not annotate originally, but that the AI algorithm did, and determine if there are additional areas of interest that require their attention"

- Hillel Kahane, MD -

DeepDx® Prostate is backed by medical research and has undergone extensive clinical testing (700k+ cores processed between 2019 and 2021) by our CLIA lab partners in the United States. DeepDx® Prostate provides board-certified pathologist level of support

Product Info	
License Type	• SaaS Online Cloud Access
Price Options	• SaaS Fee per Case • SaaS Annual Subscription (25% Discount)
Compatibility	• Scanners: Leica, Hamamatsu, 3DHISTECH • Image File Formats: svs, ndpi, tif, tiff, others
Online Access (Cloud)	• DeepDx® Prostate • DeepDx® Prostate API
Performance Indicators[1]	
Sensitivity	86%
Specificity	97%
Quadratic-Weighted Kappa & Time Reduction	
Pathologist with AI	0.92 (34% Reduction in Reading Time)
Pathologist without AI	0.88

1. Based on 2021 clinical validation results of an upgraded version of DeepDx® Prostate

USCAP AACR American Association for Cancer Research American Urological Association DPA

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Deep learning algorithm can provide specialist-level support to pathologists

DeepDx – Prostate

cancers Title: Automated Gleason Scoring and Tumor Quantification in Prostate Core Needle Biopsy Images Using Deep Neural Networks and its Comparison with Pathologist-Based Assessment (Published in Cancers 2019, vol.11, no.12 (Nov. 25, 2019)) deepbio

Background

- The Gleason score is a grading system widely used for evaluating prostate cancer tissues and is the standard for prognosis prediction a nd treatment selection
- However, as the score is qualitative and subjective, it considerably varies with respect to inter- and intra-observer variability among pa thologists
- Recently, several attempts to apply deep learning to whole slide images(WSIs) diagnosis in prostate cancer have been made to detect c ervical cancer and Gleason scoring using tissue microarrays (TMA), prostatectomy and core needle biopsy samples
- In the paper, **the researchers proposed automated Gleason scoring system for prostate core needle biopsy samples - DeepDx® Prost ate and evaluate its performance**

Methods

- **A total of 1,133 hematoxylin and eosin (H&E) stained glass slides o** f prostate needle biopsy cores along with their original hospital diagn oses were collected from two hospitals (Korea University Guro Hospital, Hanyang University Medical Cente r)
- After anonymizing patient data, the slides were digitized using Aperio AT2 scanners (Leica Biosystems Inc.) at ×40 magnification, (i. e., resolution of 0.25 μm/pixel)
- After digitization, **700 images were selected for the validation set an** d balanced according to the grade groups reported in the original dia gnosis. The remaining **1,133 cases were used for the discovery set**

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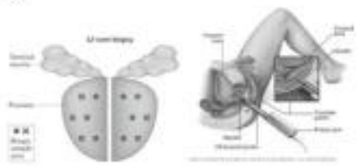
Prostate Cancer AI Clinical Performance

Very common type of cancer in men

- Increasing number of newly diagnosed patients
- Well-established histologic grading guideline; inter-observer discrepancy ratio is high (~ 40%)
- Many research groups & companies developed AI-based prostate cancer diagnostics
- Top-notch algorithms present similar slide-level performance values
  - Cancer detection: AUC ~ 0.99
  - Histologic grading: Cohen's kappa ~ 0.6
- Regulation-cleared In-vitro diagnostic devices (IVDs) for prostate cancer
  - DeepDx-Prostate & DeepDx-Prostate Pro (Deep Bio Inc., Korea)
  - Paige Prostate (Paige.AI, US)



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cancers Title: Automated Gleason Scoring and Tumor Quantification in Prostate Core Needle Biopsy Images Using Deep Neural Networks and its Comparison with Pathologist-Based Assessment (Published in Cancers 2019, vol.11, no.12 (Nov. 25, 2019)) deepbio

Results

The system-based diagnosis results were compared with reference standards derived from three certified pathologists.

Kappa(Quad. kappa)	Reference Standard	Deep Learning Algorithm	Hospital Diagnosis
Reference Standard		0.615/0.907	0.524/0.870
Deep Learning Algorithm	0.615/0.907		0.440/0.811
Hospital Diagnosis	0.524/0.870	0.440/0.811	

High diagnostic concordance was shown between DeepDx® and the reference standard compared to the original hospital diagnoses. **: 0.907 quadratic-weighted Cohen's kappa coefficient**

Deep learning algorithm can provide specialist-level support to pathologist

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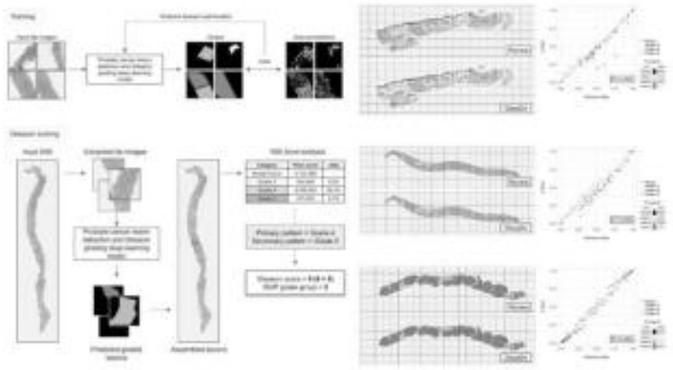
DeepDx – Prostate Pro



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Converting Gleason Pattern Ratio Values into Prognostic Factors

Direct use of Gleason pattern rates as prostate cancer BCR (biochemical recurrence) predictor

- 3, 4, 5 rates - proportions of the cancerous tissue composed of Gleason patterns 3, 4 and 5, respectively.
- Modeled on TCGA-PRAD data
- Cox PH model used
- 5-fold cross validation output
- Confidence intervals by bootstrapping

	Point estimate	95% confidence intervals
C-index with ratios	**0.708**	[0.638, 0.809]
C-index without ratios	0.675	[0.588, 0.773]
Difference	0.033	[-0.032, 0.119]

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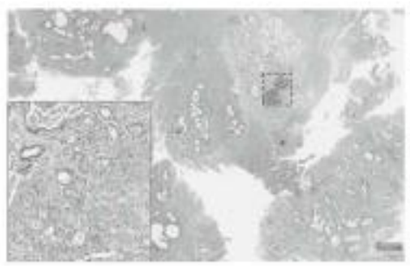
Applying to TURP (Transurethral resection of prostate) Tissue

TURP = typical treatment of BPH (Benign prostatic hyperplasia)

- Prostate cancer is found in 4.1~16.7% of TURP cases
- Unseen morphologies (bladder tissues, cauterization artifacts, etc.) require additional training



Confusion Matrix		Reference		
		Cancer	Benign	Total
Model	Cancer	52	29	81
	Benign	3	481	484
	Total	55	510	565
Accuracy		0.943		
Sensitivity		0.945		
Specificity		0.943		
PPV		0.642		

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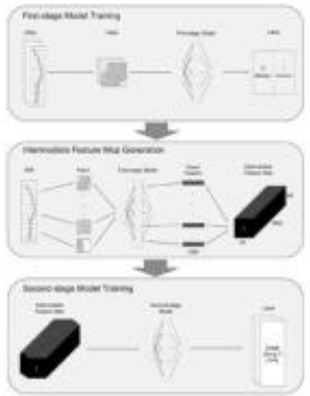
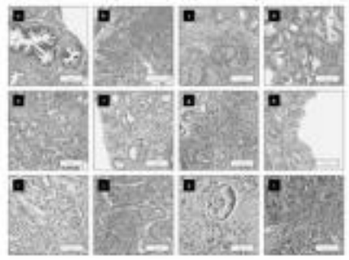
Histologic Grading without Detailed Gleason Pattern Annotation



Representative patch images



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Is Annotation Necessary to Train Deep Learning Algorithm?

npj | Digital Medicine Title: Yet Another Automated Gleason Grading System (YAAGGS) by weakly supervised deep learning (Published in npj Digital Medicine 2021, vol. 4 (June. 14, 2021)

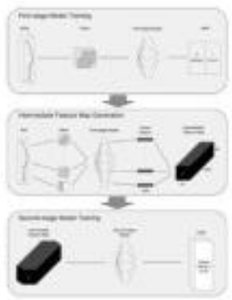
deepbio

Background

- The Gleason score contributes significantly in predicting prostate cancer outcomes and selecting the appropriate treatment option, which is affected by well-known inter-observer variations
- To develop deep learning based automated Gleason grading system, extensive region level manual annotations by experts are required. However, the manual annotation process is highly inefficient in terms of development time and cost
- In the study, the researchers presented a novel **weakly supervised deep learning-based automated Gleason grading system (YAAGGS) trained only from the original hospital diagnoses (slide-level annotations)**

Methods

- 7,788 Hematoxylin and eosin (H&E) stained glass slides each containing a single prostate needle biopsy core and their respective diagnoses were collected from two hospitals (Korea University Guro Hospital, Hanyang University Medical Center)
- After anonymizing patient data, the slides were digitized using Aperio AT2 scanners (Leica Biosystems Inc.) at ×40 magnification (i.e., resolution of 0.25 μm/pixel)
- After digitization, **6,664 slides were selected for the validation set** and **936 slides were used for the discovery set**



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Esternal Clinical Validation in Modern Pathology 2022

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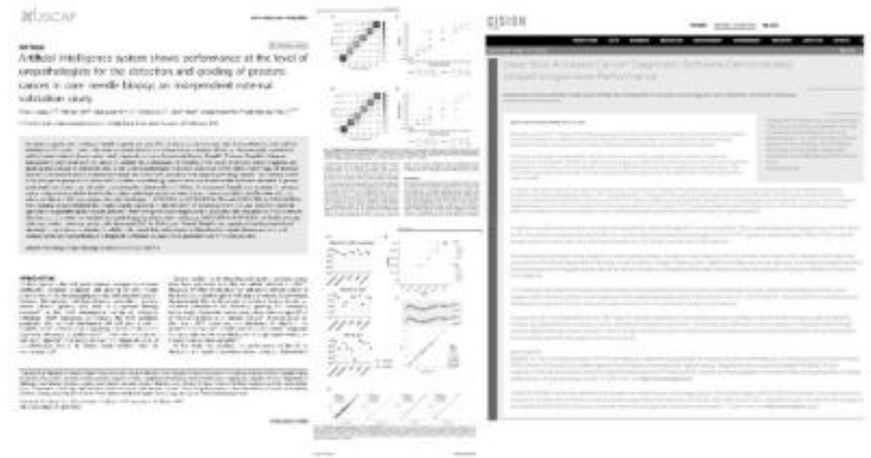

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npj | Digital Medicine Title: Yet Another Automated Gleason Grading System (YAAGGS) by weakly supervised deep learning (Published in npj Digital Medicine 2021, vol. 4 (June. 14, 2021)

deepbio

Results

Cancer Detection	
ROC-AUC	0.998
Sensitivity	93.6%
Specificity	96%

Grade Group Prediction	
Cohen's kappa	0.650
Quad. kappa	0.897

In regard to **cancer detection performance**, the YAAGGS model exhibited a ROC AUC value of **0.998**. **The sensitivity and specificity were 93.6%, and 96.0% respectively.**

For the **grade group prediction**, the YAAGGS model showed a **Cohen's kappa score of 0.650 and a quadratic-weighted kappa score of 0.897.**

- **YAAGGS, a novel two-stage WSI prostate cancer grade group prediction system trained only with slide labels provides specialists-level support**
- **The method can be used to expedite the development of additional diagnostic models.**

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Potential Utilization of Algorithm in Analyzing TURP WSIs

USCAP Title: Fine Tuning of Deep Neural Networks(DNN) Trained on Prostate Needle Biopsies to Diagnose Transurethral Resection of Prostate Images (Poster presentation at USCAP 2021 Annual Meeting) deepbio

Background

- Incidental prostate cancer is reported in 4.1-16.7% in TURP cases.
- In the very large tissue area of TURP, the proportion of the cancerous lesion area is very small. Such small cancerous area may be missed during microscopic diagnoses.
- In the previous study, the researchers reported an automatic diagnosis of TURP whole slide images (WSIs) by translationally applying a DNN model which was developed for the diagnosis of prostate needle biopsy.
- In this study, **the researchers performed a fine tuning of DNNs using benign TURP and transurethral resection of bladder (TURB) WSIs to advance our model's performance.**

Methods

- **A total of 3,098 hematoxylin and eosin (H&E) stained glass slides of TURP and 22 H&E stained glass slides of TURB** were collected from Seoul National University Hospital
- All slides were scanned using Aperio AT2 digital slide scanner (Leica Biosystems Imaging, Inc.)
- After digitization, **3,682 TURP WSIs (565 cases) were selected for the validation set. For the discovery set, 216 TURP WSIs 22 TURB WSIs were used. Cases used for the discovery and the validation are independent.**

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Assist with the cases: original diagnosis of the slide is bening, algorithm found cancerous regins

Diagnostic Result by Our Algorithm

CK(Immunohistochemical) Staining Result

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Potential Utilization of Algorithm in Analyzing TURP WSIs

USCAP Title: Fine Tuning of Deep Neural Networks(DNN) Trained on Prostate Needle Biopsies to Diagnose Transurethral Resection of Prostate Images (Poster presentation at USCAP 2021 Annual Meeting) deepbio

Results

		Original Hospital Diagnosis (case)		
		Cancer	Benign	Total
Deep Learning Algorithm	Cancer	52	29	81
	Benign	3	481	484
	Total	55	510	565

In this study, the researchers focused on the weaknesses of the previous model which showed false positive detections for cauterization and squeezing artifacts of tissue periphery. Adding benign tissues in training, the performance of the model was significantly improved compared to the previous model. The algorithm's detection accuracy, sensitivity, and specificity were 94.3%, 94.5%, and 94.3% respectively.

Deep learning algorithm intended to diagnose prostate needle biopsy can be utilized in prostate cancer diagnosis based on TURP

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AI Assisted Diagnosis Leads Better Productivity

Time spent in diagnosis without deep learning aid vs with deep learning aid

UT1	UT2
55.6 sec / slide	36.91sec / slide

UT1: Diagnosis without deep learning algorithm, UT2: Diagnosis with deep learning algorithm

Deep learning-powered algorithm empowers pathologists with faster diagnose

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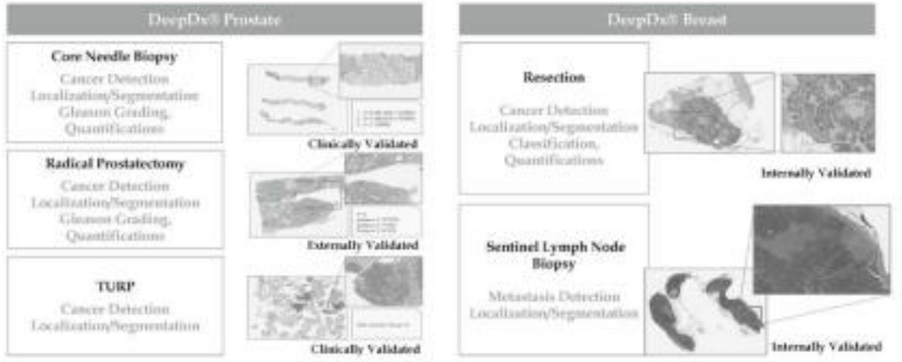
Product Portfolio

DeepDx® is the platform for AI-powered IVD SaMD for pathologic cancer diagnosis.



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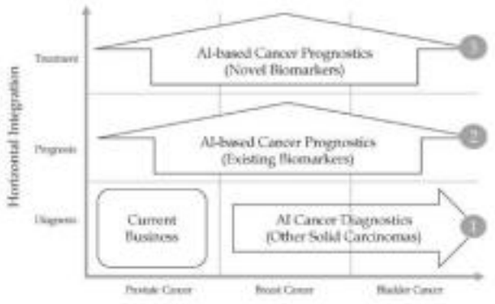
Product Category



Product Portfolio Expansion

1. Expansion of AI Cancer Diagnostics

Expand to other solid carcinomas based on the knowledge and know-hows gained from AI development for prostate cancer solutions

2. AI-based Cancer Prognostics (Existing Biomarkers)

Development of prognostic models by combining image data with clinical data

Collaboration with Genecurix, a Korean biotech with its own breast cancer prognostics

3. AI-based Cancer Prognostics (Novel Biomarkers)

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Global Partnerships

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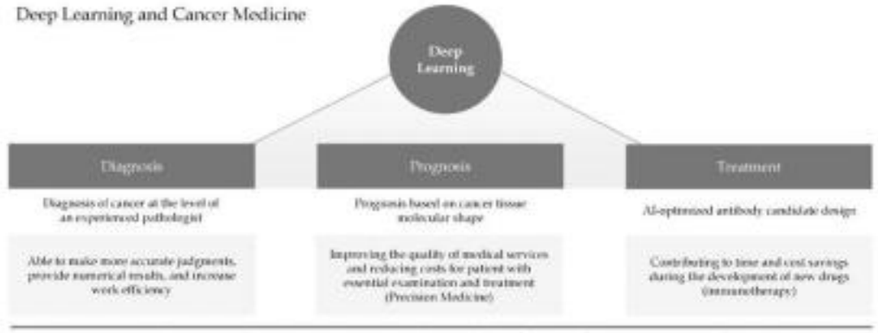
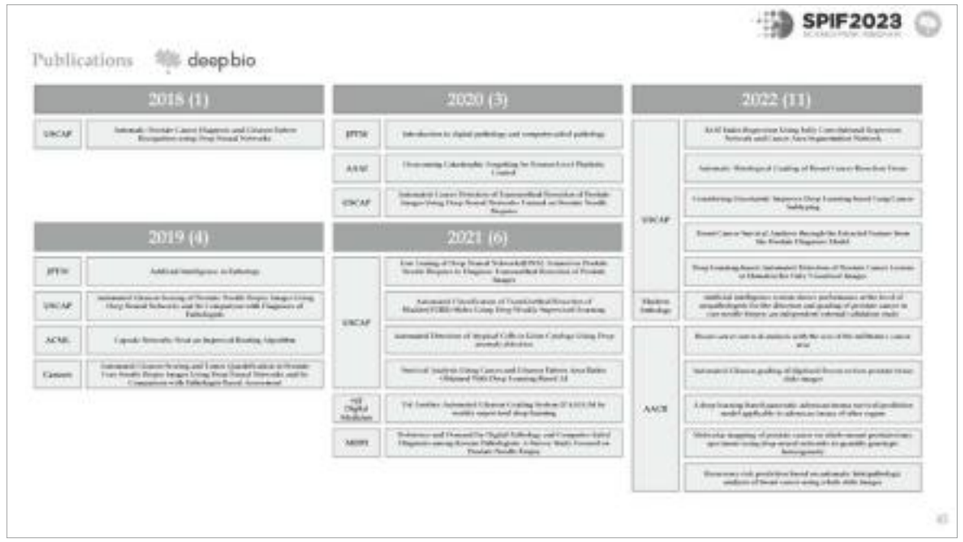
Providing ways to create value for medical staffs and patients in cancer

- Deep Learning and Cancer Medicine



It aims to contribute to medical society through AI by enabling faster and better treatment decision making for medical staff and patients with intelligent medical data analysis software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Publications
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2018 (1)
2019 (4)
2020 (3)
2021 (6)
2022 (11)

deepbio
Dive Deeper into Data-Driven Medicine
SPIF2023
THANK YOU
Head Office

MEMO

SPEAKER

Master Class 4 - Technology for a Healthy Life

이 인 호 Inho Lee

인피닉스 대표 / CEO of INFINYX

인공지능 기반 팜 로빌리티 시장 전략
AI-based Farm Robility Market Strategy

BIOGRAPHY

≫ HanYang Univ. Ph.D. in Business Administration
≫ KMAC Senior Consultant
≫ KSA Senior Consultant
≫ INFINYX. INC CEO

Abstract

AI-based Farm Robility Market Strategy

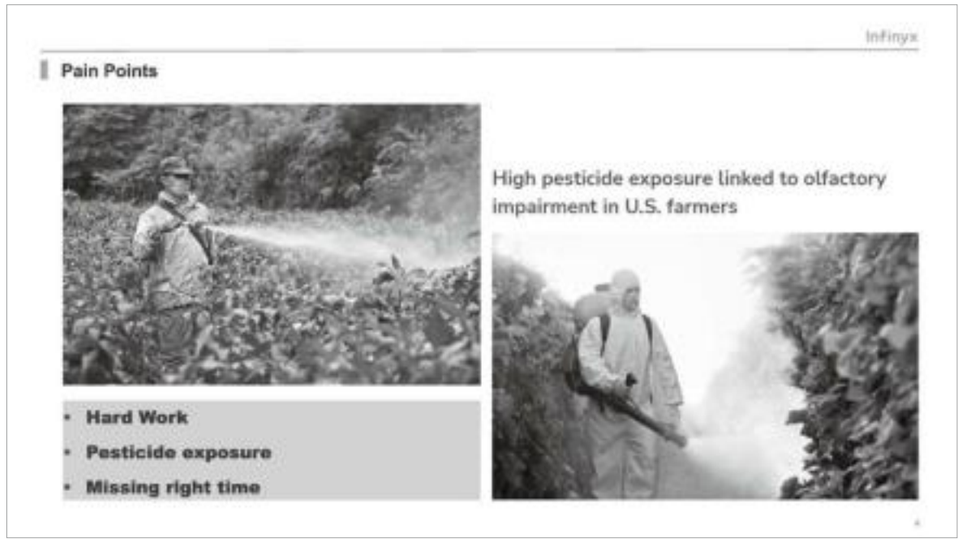
Introducing the current state of farm mobility solution technology and market conditions that combine robots and mobility in agricultural fields amid changes and crises in global agriculture.

인공지능 기반 팜 로빌리티 시장 전략

글로벌 농업의 변화와 위기속에서 농업현장에 로봇과 모빌리티를 복합구현하는 팜 로빌리티 솔루션 기술 현황 및 시장상황을 소개함.

Think Life Sync AI
INFINYX Inc.

InFinyx
AMR in Farm
Self-driving system with Speed Spray(SS Mobility) AI Solution.
Offering AI solution of major in house SS Mobility production company.
Processing to expand capability into various mobilities.


InFinyx
Pain Points
High pesticide exposure linked to olfactory impairment in U.S. farmers
Hard Work
Pesticide exposure
Missing right time

InFinyx
Pain Points
These pesticides are causing the unacceptable poisoning of those who produce our food, but also chronic health effects such as cancer
44% of farmers and farmworkers are poisoned by pesticides globally every year
385 million farmers and farmworkers poisoned by pesticides every year

InFinyx
Agriculture Drone
Drones are innovative tools but limited in application
Suitable for wheat or rice, but not for fruit trees

InFinyx
Speed Sprayer
Pesticide exposure is still a problem
Rollover accident

InFinyx
Speed Sprayer

InFinyx
Cabin Type Speed Sprayer
High price
(20% more expensive)
Need wide driving width
(reduced cultivated area)

InFinyx

AGV(Automated Guided Vehicle) / **AMR**(Autonomous Mobile Robot)

- Detect and move buried lines
- Incurring line disconnection and maintenance costs
- Farmers don't like it(burial work)

- No need for burial lines
- Need to learn various cultivation environment data
- RTK GPS -- significantly affected by obstacles (suitable for open filed, not orchard)

InFinyx

Autonomous **Speed Sprayer** – Demo Video

InFinyx

Autonomous **Speed Sprayer** – Demo Video

InFinyx

Autonomous **Speed Sprayer** – Demo Video

InFinyx

Autonomous Speed Sprayer

- NVIDIA Xavier NX

- 6 Core CPU
- Embedded GPU
- RAM 6G
- M2 SSD 128G
- Ubuntu 18.04

- RGB-Depth Camera : Intel Realsense D455

InFinyx

Autonomous Speed Sprayer – Straight run

Necessary to recognize the driving route that reflects the various farming environments.

InFinyx

Autonomous Speed Sprayer – Straight run

AI Recognizes the structure area on the left/right side of the floor, not on the farm floor.

InFinyx

Autonomous Speed Sprayer – Dataset

Image data processing for driving route recognition.

Autonomous Speed Sprayer - rotation

- In using RTK GPS, it is difficult to implement **rotational driving** at present (Unable to recognize the width of the rotation section)
- Environment variable such as driving width in the same farm as well as in each farm
- Rotational driving is possible only after sufficiently reflecting the physical characteristics and control conditions of mobility
- We have fully implemented **rotational driving with AI**

Market reaction

Market reaction

SPEAKER

Master Class 4 - Technology for a Healthy Life

Mira Syahirah

Chief AI of Twistcode

건강한 기술, 건강한 삶의 방식
Healthy Technology, Healthy Lifestyle

BIOGRAPHY

Mira Syahirah joined Twistcode since 2017 with finance engineering as her background. From there, she rise spectacularly from fundamental of finance into artificial intelligence related finance technology since then. Now, she embarks and widen her journey into other verticals related to AI inclusive of healthcare, computer vision, manufacturing and engineering. Now she's leading the AI as a Chief AI at Twistcode.

Abstract

Healthy Technology, Healthy Lifestyle

Manufacturing and semiconductors' advancement produces a cheaper, more competitive rich-features product and services throughout cross-vertical in the industries worldwide. Whether these advancement is and was from military usage to space exploration's purposes, the research and advancement of the technology in this area is progressing in an extremely exponential mode – more competitions from various startups, small-medium enterprises, both from hardware manufacturers and software developers around the world hand-in-hand to create a standard, modular and scalable framework that can be used widely as much as possible, as affordable as possible to the masses. These efforts made the healthy lifestyle together with a healthy technology advancement, possible.

건강한 기술, 건강한 삶의 방식

제조 및 반도체의 발전은 전 세계 산업 전반에 걸쳐 더 저렴하고 경쟁력 있는 풍부한 기능의 제품 및 서비스를 생산합니다.
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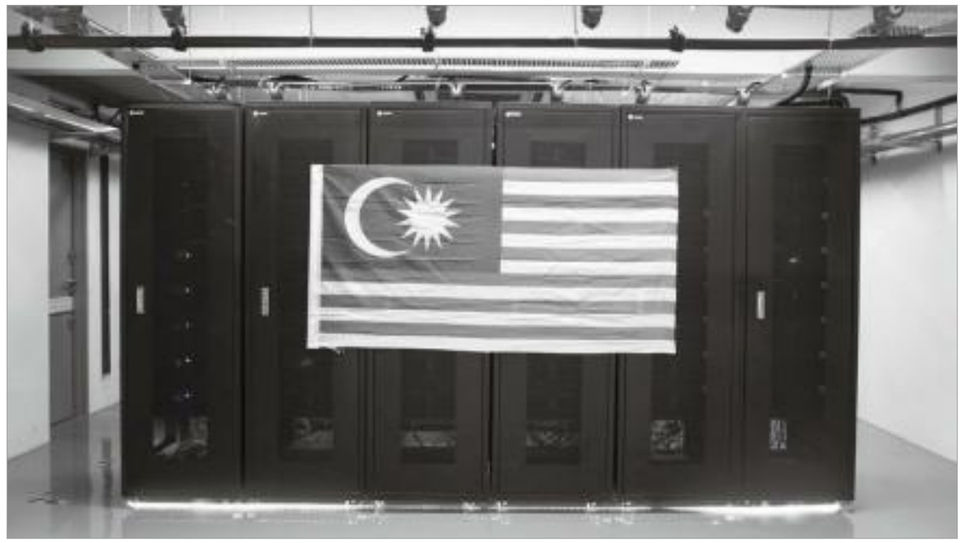

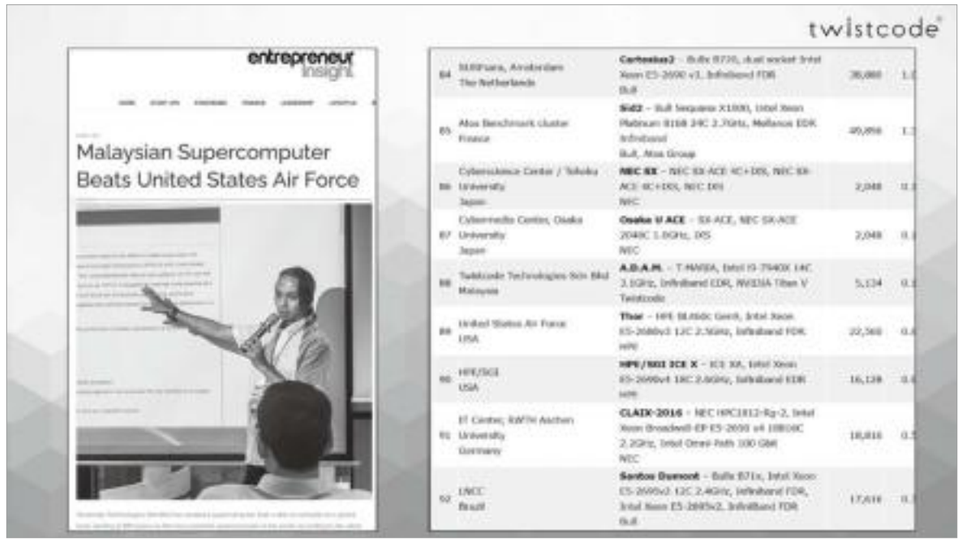
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entrepreneur insight
Malaysian Supercomputer Beats United States Air Force
64 SURFsara, Amsterdam The Netherlands Cartesius2 – Bullx B710, dual socket Intel Xeon E5-2690 v3, Infiniband FDR Bull 30,000
65 Atos Benchmark cluster France Sid2 – Bull Sequana X1000, Intel Xeon Platinum 8168 24C 2.7GHz, Mellanox EDR Infiniband Bull, Atos Group 49,896
66 Cybermedia Center / Tohoku University Japan NEC SX – NEC SX-ACE IC+DIS, NEC SX-ACE IC+DIS, NEC DIS NEC 2,048
67 Cybermedia Center, Osaka University Japan Osaka U ACE – SX-ACE, NEC SX-ACE 2048C 1.0GHz, DIS NEC 2,048
68 Twistcode Technologies Sdn Bhd Malaysia A.D.A.M. – T-MARSA, Intel i5-7640X 14C 3.1GHz, Infiniband EDR, INVIDIA Titan V Twistcode 5,124
69 United States Air Force USA Thor – HPE SL450c Gen9, Intel Xeon E5-2680v3 12C 2.5GHz, Infiniband FDR HPE 22,560
70 HPE/SGI USA HPE/SGI 8600 – ICE XA, Intel Xeon E5-2690v4 18C 2.6GHz, Infiniband EDR HPE 16,128
71 IT Center, RWTH Aachen University Germany CLAIX-2016 – NEC HPC1812-Rg-2, Intel Xeon Broadwell-EP E5-2690 v4 18C 2.2GHz, Intel Omni-Path 100 Gbit NEC 18,816
72 LNCC Brazil Santos Dumont – Bullx B71x, Intel Xeon E5-2695v2 12C 2.4GHz, Infiniband FDR, Intel Xeon E5-2697v2, Infiniband FDR Bull 17,616

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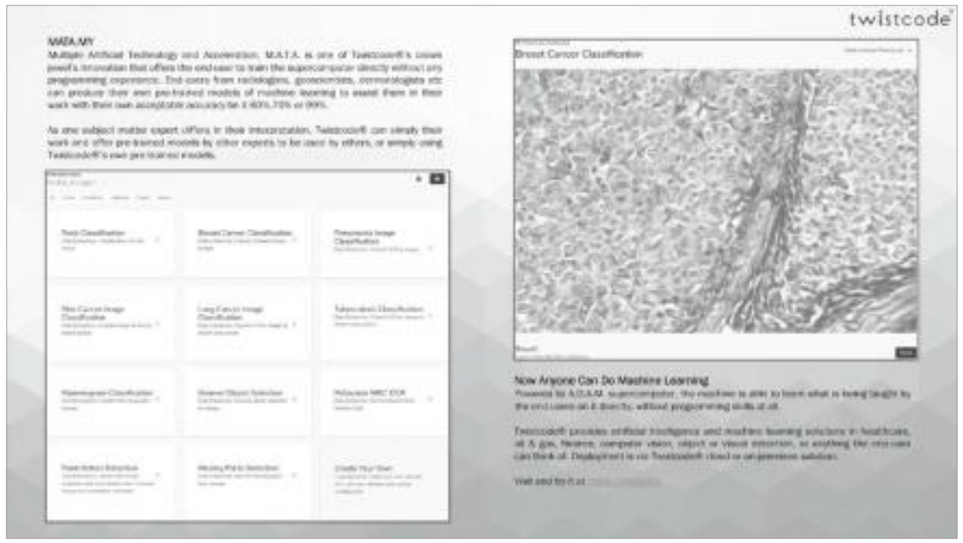
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Sciencepark Forum 1　사이언스파크 포럼 1

미래산업 육성을 위한 사이언스파크 모델과 지역에서의 역할

STP Model for the Development of Future Industry and STP's Role in the Region

MODERATOR

Sciencepark Forum 1 - STP Model for the Development of Future Industry and STP's Role in the Region

이 재 훈 JaeHoon Rhee ㈜아이스퀘어벤처스 대표 / CEO of Isquareventures

미래산업 육성을 위한 사이언스파크 모델과 지역에서의 역할

STP model for the development of future industry and STP's role in the region

BIOGRAPHY

Jaehoon Rhee is currently CEO of IsquareVentures, former CEO of Gyeongbuk Technopark Foundation, and chairman of Korean Technopark Promotional Association (KTA). He used to be a Professor of School of Business at Yeungnam University since he got his Ph.D from Cornell University in USA. Recently, he founded a venture capital, ISquareVentures and is nurturing healthy and sustainable venture ecosystem as a venture capitalist .He was involved in planning 'Korean Technopark Project' in 1996, played a key role in establishing Gyeongbuk Technopark, and made it the first Unicorn Technopark in Korea where tenant companies' sales volume exceeded one billion dollars in 2017. He is both globally and nationally well known as one of the authentic Technopark professionals. Thus he was accepted and included in 2018 Marquis Who's Who.

MEMO

SPEAKER

Sciencepark Forum 1 - STP Model for the Development of Future Industry and STP's Role in the Region

Yeong Junaq Wang

President of Asian Science Park Association / Director General of Hsinchu Science Park

미래 산업 육성을 위한 사이언스파크 모델과 지역에서 사이언스파크의 역할
STP Model for the Development of Future Industry and STP's Role in the Region

BIOGRAPHY

Yeong-Junaq Wang has been the President of Asian Science Park Association and Director General of Hsinchu Science Park Bureau, Hsinchu, Taiwan, ROC since 2016. Earlier he was the Director General of Central Taiwan Science Park Bureau from 2013 to 2016. Prior to science park management, he worked at Ministry of Science and Technology, and National Science Council as Director General of Department of Planning & Evaluation, and Director of Secretariat.

Abstract

STP Model for the Development of Future Industry and STP's Role in the Region

In recent years, the world has encountered severe challenges such as the pandemic, Ukraine-Russia war, severe inflation, and geopolitics conflict, whereas, the impact of the pandemic is long-lasting and irreversible. In the middle of political and economic turmoil, science and technology parks (STP) play a crucial role in maintaining the global industrial order and balancing the demand and supply of high-tech products. The successful development and business model of the science parks in the past has brought prosperity to the global technology industry. However, while facing the foreseeable challenges in the future, how the science parks keep pace with the changes in global environment turns out to be an important issue.Inspect status quo and challenges of high-tech industries nowadays, including restructuring of supply chain and redistribution of global production caused by pandemic, global economic competition and cooperation strengthened by rapid rise of emerging regional economies, the importance of sustainable development of environment and energy, and together with the corresponding impacts and opportunities brought by aging population and declining birthrate. Hence, science parks have to rethink its own core value and vision and possess innovative thinking for the development of technology and economy based on innovation, inclusiveness, and sustainability in response to human's unmet needs in the future. Meanwhile, face up to the rise of emerging industry and continuously promote digital transformation and industrial upgrade.The science parks must envisage future scenarios and major issues and then connect related technical fields and industries to initiate a blueprint for future industry development, formulate development strategies and business models for emerging markets, and solve social problems. It can be foreseen that emerging industrial application fields such as smart life, health care, and sustainable security will be connected and developed by the three key technical fields including big data, artificial intelligence, and the Internet of Things. A brief description is as follows:1. "Smart life" covers areas such as smart manufacturing and digital economy, and its derivatives including digital technology industry and related integrated applications.2. "Health care" covers areas such as biotechnology and medical care, human-oriented technology that improves quality of life, food and food safety, etc., and its derivatives including industries of medicine, digital medical care, health management, and new agriculture.3. "Sustainable safety" covers areas such as circular economy, net-zero emissions, and environmental and biological governance, and its derivatives including industries of green energy, energy conservation and environmental protection and other applicationsFacing future social and environmental impacts and industrial changes, science parks not only act as the management operators and service providers, but also play crucial roles in driving regional innovation with the goal of establishing a sustainable social mechanism and economic system. Thus, the importance of future science park development is manifested in the following four aspects: first, cross-domain integration is to merge cooperation among different industries, guiding industrial innovation and transformation; second, trust network formulation is to integrate industries, governments, academic institutions, and R&D parties, and promoting inter-regional cooperation by a multi-party mechanism; third, solidifying a driving force for innovation via digital platforms or virtual communities, and further forming an environment for cultivating new technologies and stimulating industrial innovation; last, being the role player of integration and distribution of local resources to strengthen inter-regional sharing of resources and information, and eventually maximizing the efficiency of existing resources through virtual and real integration.

Abstract

미래 산업 육성을 위한 사이언스파크 모델과 지역에서 사이언스파크의 역할

최근 몇 년 동안 세계는 코로나 19, 우크라이나-러시아 전쟁, 심각한 인플레이션, 지정학적 갈등과 같은 심각한 문제에 직면했지만 코로나19의 영향은 오래 지속되고 돌이킬 수 없습니다. 정치 및 경제 혼란 속에서 사이언스 파크(STP)는 세계 산업 질서를 유지하고 첨단 제품의 수요와 공급의 균형을 유지하는 데 중요한 역할을 합니다. 과거 사이언스 파크의 성공적인 개발과 비즈니스 모델은 글로벌 기술 산업의 번영을 가져왔습니다. 그러나 앞으로 예상되는 도전과제에 직면하면서 사이언스 파크가 지구환경의 변화에 어떻게 보조를 맞추느냐가 중요한 문제임이 드러난다.

인구 고령화와 출산율 감소와 함께 코로나 19로 인한 공급망 구조 조정 및 글로벌 생산 재분배, 신흥 지역 경제의 급속한 부상으로 강화된 글로벌 경제 경쟁 및 협력, 환경 및 에너지의 지속 가능한 개발의 중요성과 같은 오늘날 첨단 산업의 현 실태 및 앞으로의 과제들이 존재합니다. 따라서 사이언스파크는 미래 인간의 미충족 니즈에 대응하여 혁신, 포용, 지속가능성을 바탕으로 기술과 경제의 발전을 위한 혁신적 사고와 핵심가치와 비전을 재고해야 합니다. 한편, 신흥 산업의 부상에 직면하고 디지털 전환과 산업 업그레이드를 지속적으로 촉진합니다.

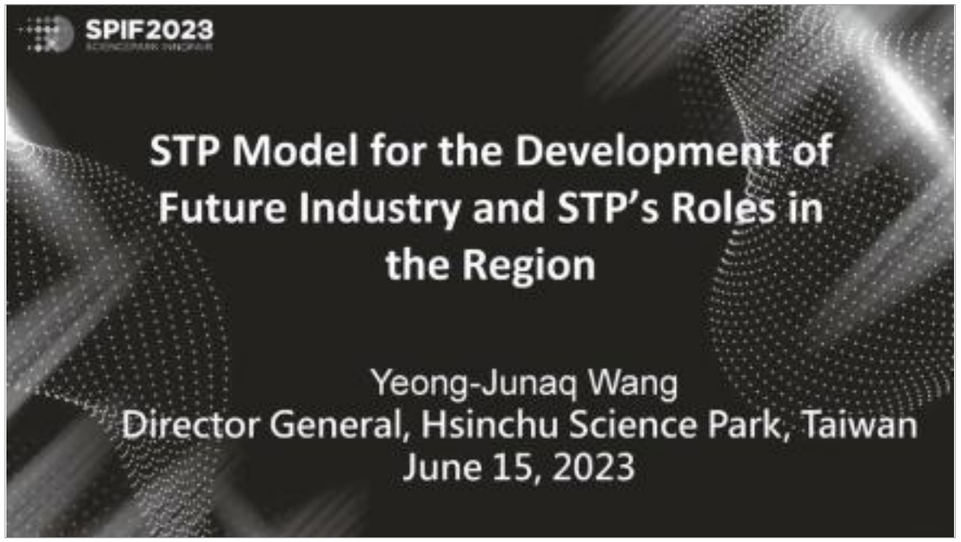
사이언스 파크는 미래 시나리오와 주요 이슈를 예측하고 관련 기술 분야와 산업을 연결하여 미래 산업 발전을 위한 청사진을 제시하고 신흥 시장에 대한 개발 전략과 비즈니스 모델을 수립하며 사회 문제를 해결해야 합니다. 빅데이터, 인공지능, 사물인터넷 등 3대 핵심 기술 분야로 스마트 라이프, 헬스케어, 지속가능한 보안 등 새롭게 부상하는 산업 응용 분야가 연결되고 발전할 것을 예견할 수 있습니다. 간략한 설명은 다음과 같습니다.

1. "스마트 라이프"는 스마트 제조 및 디지털 경제와 같은 영역과 디지털 기술 산업 및 관련 통합 응용 프로그램을 포함한 파생 상품을 포함합니다.
2. "헬스케어"라 함은 생명공학 및 의료, 삶의 질을 향상시키는 인간중심기술, 식품 및 식품안전 등의 분야와 그 파생산업인 의약, 디지털의료, 건강관리, 신 농업 등을 말한다.
3. "지속 가능한 안전"은 순환 경제, 넷 제로 배출, 환경 및 생물학적 거버넌스와 같은 영역과 녹색 에너지 산업, 에너지 절약 및 환경 보호 및 기타 응용 분야를 포함한 파생물을 포함합니다.

미래의 사회적, 환경적 영향과 산업 변화에 직면한 사이언스 파크는 관리 운영자 및 서비스 제공자 역할을 할 뿐만 아니라 지속 가능한 사회 메커니즘 및 경제 시스템 구축을 목표로 지역 혁신을 주도하는 데 중요한 역할을 합니다. 따라서 미래 사이언스 파크 개발의 중요성은 다음과 같은 네 가지 측면에서 드러난다.

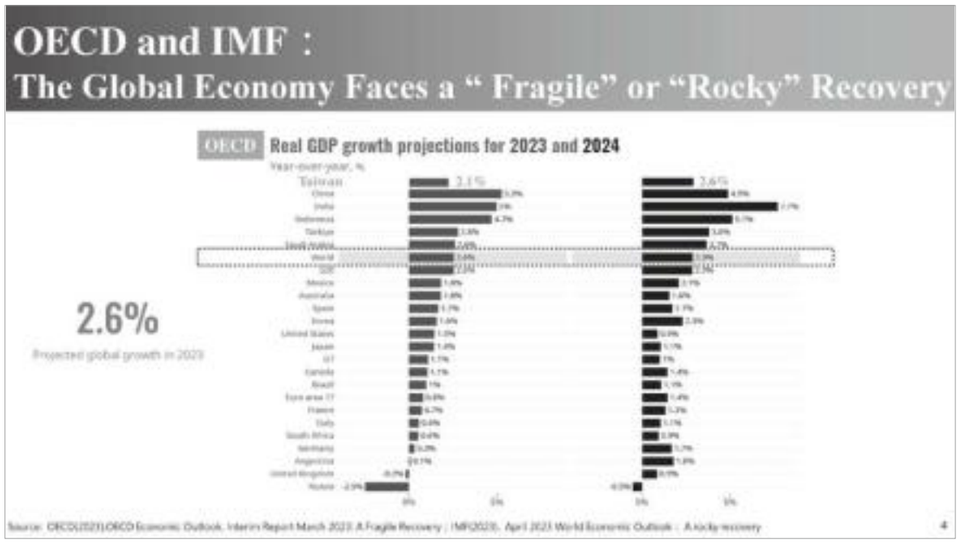
첫째, 도메인 간 통합은 서로 다른 산업 간의 협력을 병합하여 산업 혁신과 변화를 유도하는 것입니다.
둘째, 신뢰 네트워크 형성은 산업, 정부, 학술 기관 및 R&D 당사자를 통합하고 다자간 메커니즘을 통해 지역 간 협력을 촉진하는 것입니다.
셋째, 디지털 플랫폼이나 가상 커뮤니티를 통해 혁신의 동력을 공고히 하고, 나아가 신기술 육성 및 산업혁신 촉진을 위한 환경을 조성합니다.

마지막으로 지역 자원의 통합과 배분의 역할 주체가 되어 지역 간 자원과 정보의 공유를 강화하고 궁극적으로 가상과 현실의 통합을 통해 기존 자원의 효율성을 극대화합니다.


SPIF2023
STP Model for the Development of Future Industry and STP's Roles in the Region
Yeong-Junaq Wang
Director General, Hsinchu Science Park, Taiwan
June 15, 2023

1
Trends and Disruptions in Future Industry Development

Outline
1 Trends and Disruptions in Future Industry Development
2 Emerging Trends and Opportunities in Future Industry Development
3 Operation Overview, Development Models, and Local Roles of Science Parks in Future Industry Development
4 Conclusion


OECD and IMF :
The Global Economy Faces a " Fragile" or "Rocky" Recovery
OECD Real GDP growth projections for 2023 and 2024
2.6%
Projected global growth in 2023

Trade War and Pandemic to Accelerate Global Supply Chain Restructuring

Nearly 80% of supply chain leaders say their digital transformation has accelerated due to the pandemic.

Source : MHI and Deloitte(2022), Evolution to Revolution: Building the Supply Chains of Tomorrow

5

2050 Net Zero Carbon Emission Is a Big Challenge after the Pandemic

International governments and global brands are accelerating net-zero actions

MNCs say...

- 67% •that reduction of supply chain emissions is the first step in their net zero strategy
- 78% •that they will start removing slow to transition suppliers by 2025.
- 35% •of the current MNCs suppliers expected to be cut as they respond to net zero pressure
- 46% •that unreliable data from suppliers is a barrier to reducing emissions.

Build a Net-Zero Supply Chain

Source: Standard Chartered(2021),Carbon Dated:https://www.sc.com/en/insights/carbon-dated/

6

Roland Berger : Megatrend in 2050 (global megatrends)

1 Population and Society

- Population: There will be more of us, older, and more urban – but dynamics are very different worldwide.
- Migration: people migrate within and between countries – voluntarily and forced.
- Values: A complex issue in our increasingly diverse societies – but fundamental to our coexistence.
- Education: More and more people are getting access to good education – the key to social advancement as well as economic growth.

2 Health & Care

- Pandemics and other challenges: It wasn't the first nor the last – but other important health challenges are rising to the top of the global agenda.
- Diseases & Treatments: From cells to systems – our concept of health goes beyond the mere absence of disease.
- Caregiving: An aging society and its increasing need for care.

3 Environment & Resources

- Climate change and pollution: All eyes are on CO2 emissions and keeping global warming contained. Air pollution is a major environmental threat to humanity to 2050
- Resources – Abundance versus scarcity: A more considered balancing act of abundance and scarcity of resources is called for.
- Ecosystems at risk: It's all connected, and we must understand what it means.

4 Economics & Business

- Receding globalization: A new, slower phase of globalization lies ahead.
- Power shifts: Economic power is shifting further toward emerging countries. By 2050, Asia is expected to generate half of global GDP.
- Sectoral transformations: Digitalization, sustainability and socio-demographic factors drive industries to transform.
- Debt challenge: The increase of public and private debt levels raises a lot of questions for the future.

5 Technology & Innovation

- Value of innovation: Innovation is the key to sustainable growth.
- Technologies of the future: A whole bundle of new technologies will shape the time until 2050.
- Humans and machines: As machines become more intelligent, the relationship between humans and machines needs to be re-discussed.

6 Politics & Governance

- Future of democracies: Democratic erosion is on the rise.
- Governance challenges: There is much to do – in many areas.
- Geopolitics and global risks: The future of the global power balance appears to be in a state of flux while global risk perceptions have shifted from the economy to the environment.

Source : Roland Berger. https://www.rolandberger.com/de/Insights/Global-Topics/Trend-Compendium/

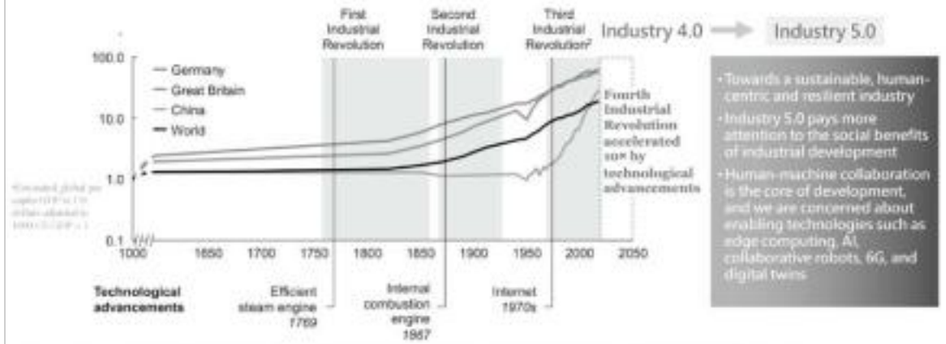
7

Faced with a highly uncertain environment, the STPs will be tested for its bold future potential pulsation and agility resilience abilities.

8

The Era of "Acceleration of Technological Progress"

The next decades promise to be a time in which technologies progress ever-more quickly from before



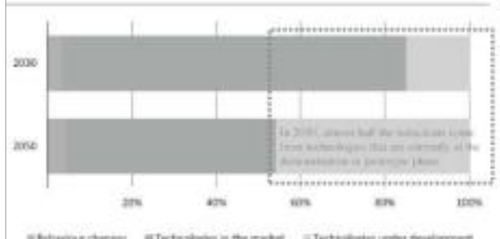
Source: McKinsey(2021) The Top Trends in Tech; European Commission, Industry 5.0, https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/industry-50_en

10

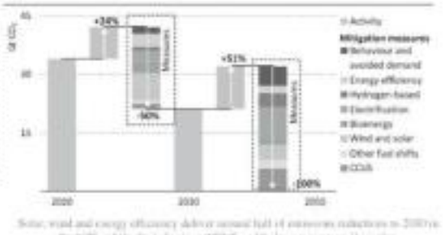
Net Zero by 2050 Requires Huge Leaps in Clean Energy Innovation

•There is a global market opportunity for key mass-manufactured clean energy technologies worth around USD 650 billion a year by 2030 – more than three times today's level – if countries worldwide fully implement their announced energy and climate pledges.

Annual CO2 emissions savings in the net zero pathway, relative to 2020



Emissions reductions by mitigation measure in the NZE, 2020-2050



Solar, wind and energy efficiency deliver around half of emissions reductions to 2030 via the NZE, while electrification, CCUS and hydrogen ramp up thereafter.

Source: IEA(2021) Net Zero by 2050 – A Roadmap for the Global Energy Sector ; IEA(2020), Energy Technology Perspectives 2020.

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Net Zero by 2050 Requires Huge Leaps in Clean Energy Innovation

- The key pillars of decarbonization of the global energy system are energy efficiency, behavioral changes, electrification, renewables, hydrogen and hydrogen-based fuels, bioenergy and CCUS.
- Net zero by 2050 hinges on an unprecedented clean technology push to 2030.
- In 2050, almost half the reductions come from technologies that are currently at the demonstration or prototype phase.
- The biggest innovation opportunities concern advanced batteries, hydrogen electrolysers, and direct air capture and storage.
- Reaching net zero by 2050 requires further rapid deployment of available technologies as well as widespread use of technologies that are not on the market yet.
- Clean energy innovation must accelerate rapidly, with governments putting R&D, demonstration and deployment at the core of energy and climate policy.

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McKinsey Technology Trends Outlook 2022(1/2)

1. Advanced connectivity	2. Applied AI	3. Cloud and edge computing	4. Immersive-reality technologies
• Optical fiber, 5G/6G, Low-power & wide-area (LPWA) networks, Wi-Fi 6, low-Earth-orbit(LEO) satellites	• Machine learning, Computer vision, Natural-language processing, Deep reinforcement learning, Knowledge graphs	• Data center, Edge device, Networking infrastructure, IoT	• Spatial computing, AR, VR, MR, 3D sensor, On-body and off-body sensors, Haptics, Location services
5. Industrializing machine learning	**6. Next-generation software development**	**7. Quantum technologies**	**8. Trust architectures and digital identity**
• Data management, Model development, Model deployment, Live-model operations, Integrated hardware, Heterogeneous computing	• Low-code and no-code platforms, Infrastructure as code, Microservices, AI pair programmer, AI-based testing, Automated code review	• Quantum computing, Quantum communications, Quantum sensing	• Zero-trust architecture (ZTA), Digital identity, Privacy engineering, Explainable AI (XAI)
9. Web3	**10. Bioengineering**	**11. Clean energy**	**12. Mobility**
• Blockchain, Smart contracts, Digital assets	•Tissue engineering, Biomaterials, Omics	• Solar photovoltaics, Low-wind-speed onshore and offshore generation, Hydrogen, Electrolyzers, Long-duration energy storage, Smart grid	• Autonomous, Connected-vehicle technologies, Electrification technologies, Smart-mobility solutions, Lightweight technologies, Value-chain decarbonization
13. Space technologies	**14. Sustainable consumption**		
• Satellites, Launchers, and Habitation technologies innovative	• Sustainable agriculture and alternative proteins, Circular technologies, Green construction, Carbon capture, use, and storage, Carbon removal		

Source : McKinsey(2022) McKinsey Technology Trends Outlook 2022

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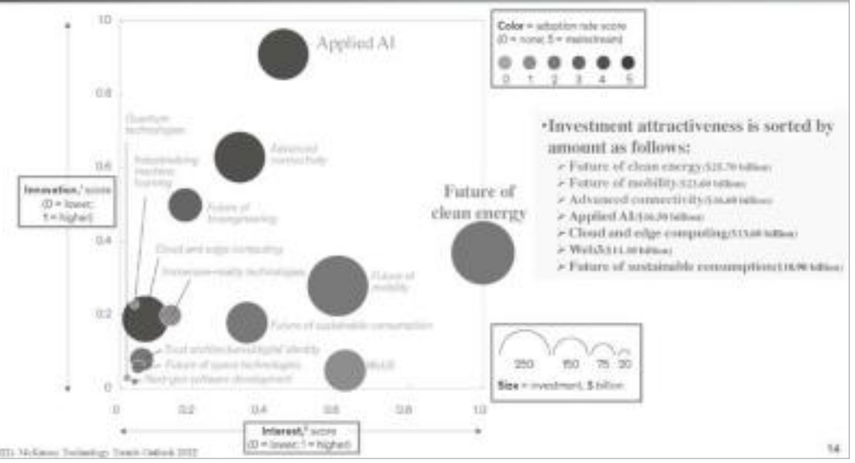
McKinsey Technology Trends Outlook 2022(2/2)



•Investment attractiveness is sorted by amount as follows:

- Future of clean energy ($)
- Future of mobility ($)
- Advanced connectivity ($)
- Applied AI ($)
- Cloud and edge computing ($)
- Web3 ($)
- Future of sustainable consumption ($)

Source : McKinsey(2022) McKinsey Technology Trends Outlook 2022

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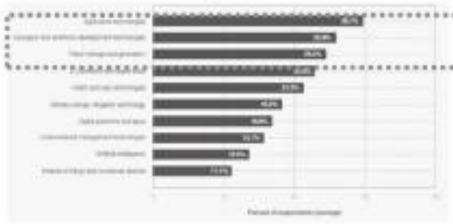
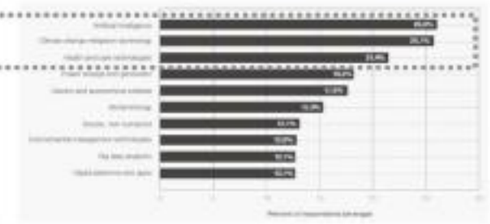
WEF : Markets of Tomorrow Report 2023 (1/3)

-Which technologies are of strategic importance for your country in the next 10 years?

Global top ten technologies of strategic importance



Top ten technologies of strategic importance in five high-innovation economies



Source : WEF (2023) Markets of Tomorrow Report 2023: Turning Technologies into New Sources of Global Growth

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WEF : Markets of Tomorrow Report 2023 (2/3)

-Global top ten sectors where new market creation is most likely

"Information and technology services" ranks first in the world where new market creation is most likely (24.1%)

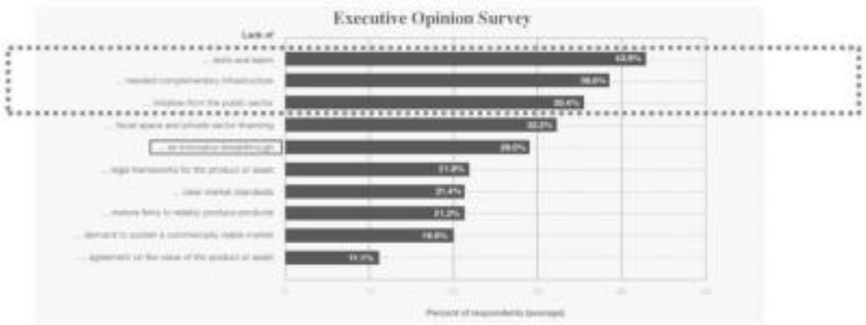
Source : WEF (2023) Markets of Tomorrow Report 2023: Turning Technologies into New Sources of Global Growth

16

WEF：Markets of Tomorrow Report 2023 (3/3)

-Global top ten obstacles to the growth of new markets

"Lack of skills and talent" ranks first **of potential barriers to creating new markets globally, especially in** high-income economies



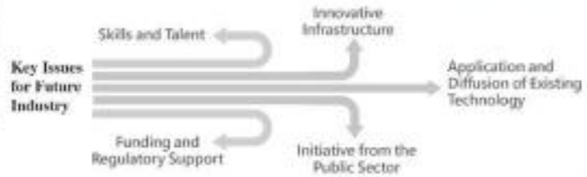
17

•Future industry...

Based on social demands, future industry development lies in breakthrough and transformation of current industry technologies via innovative ideas.

•STPs…

The key characteristics, needs or pain points of future industrial development will be the opportunity to explore the development model of the new generation STP and its innovation role in local.



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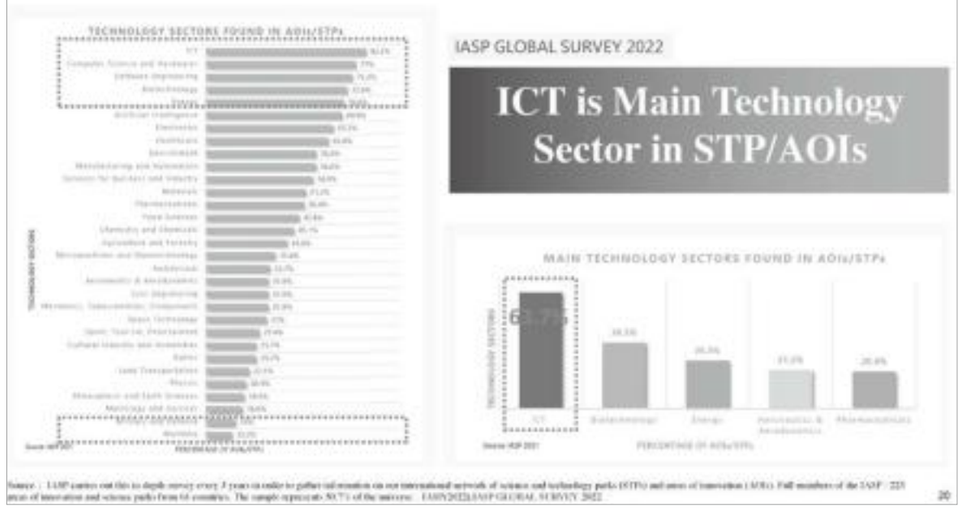
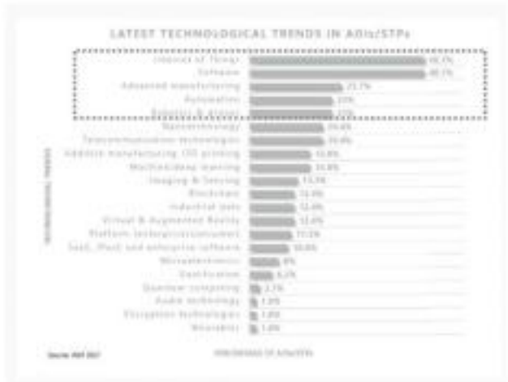


20

IASP GLOBAL SURVEY 2022

The Top Five Latest Technological Trends are Internet of Things (IoT), software, advanced manufacturing, automation, and robotics & drones

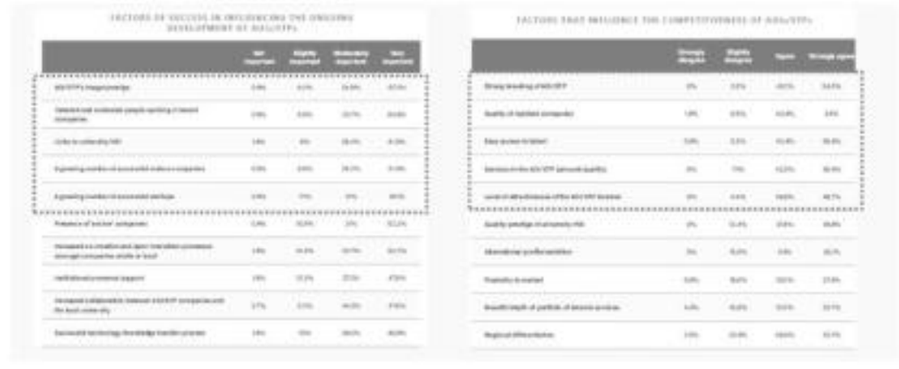


Source : IASP(2022) IASP GLOBAL SURVEY 2022

21

IASP GLOBAL SURVEY 2022

Key Success Factors in AOIs/STPs are" Strong Branding of AOI/STP, Quality of Resident Companies, Easy Access to Talent"

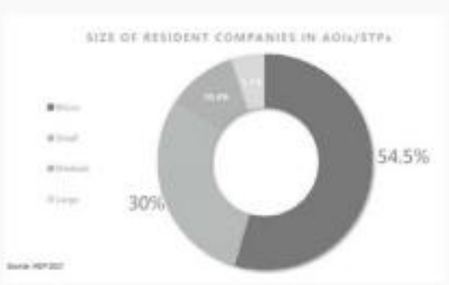


Source : IASP(2022) IASP GLOBAL SURVEY 2022

23

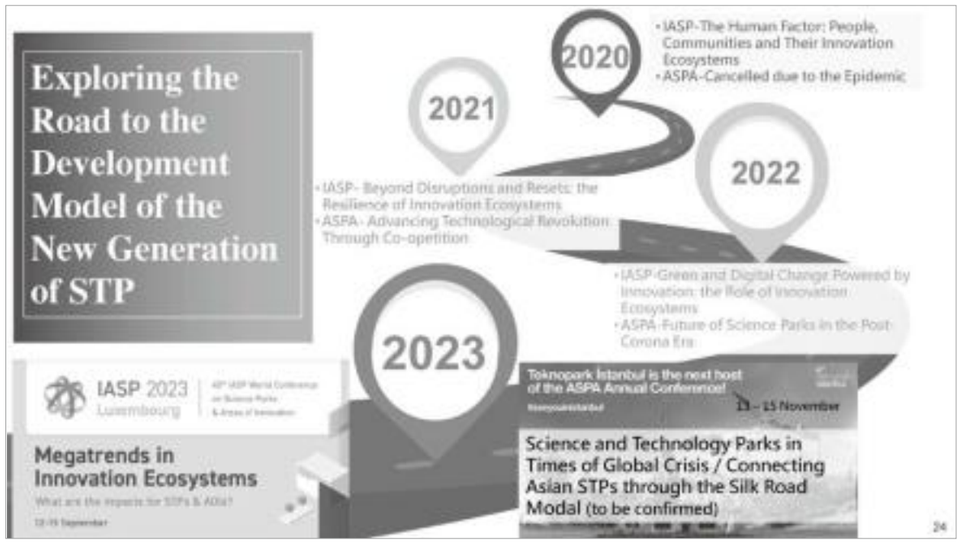
IASP GLOBAL SURVEY 2022

The Majority Resident Companies are "Local" and "Micro and Small"



Source : IASP(2022) IASP GLOBAL SURVEY 2022

22



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Key Points of Development Model of New Generation STP

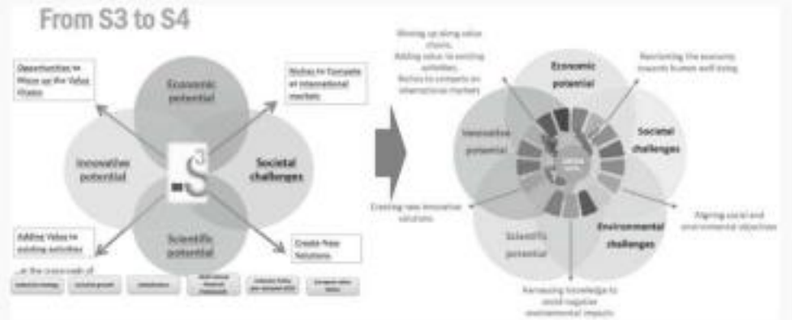
	Traditional Paradigm	New Paradigm
Innovation Drive	•Future industries from "linear innovation" model	•Future industries from "non-linear innovation" model
Development Positioning	•STPs serve as a bridge for the transfer of technology between industry and academia, promoting R&D	•STPs attaché greater importance to "people-oriented", and serve as accelerators of social change
Development Planning	•Geographically located around the university. •Establishment of scientific research institutions in the suburbs of cities to converge on new urban sites •Build a science city by gathering scientific research institutions in the suburbs of cities	•Continue to be close to universities and tend to be urban areas •Pay more attention to creating a common living area and natural ecology in the area and construction planning leads to sustainable (e.g. SDGs, ESG), intelligent development •Explore the" Virtual Park"
Operations Management	•Land and management rights are dominated by universities, central or local governments	•Development and operation of expanded public-private partnerships (PPP), such as joint ventures, outsourcing, franchises •Enhancement of digital management and service capabilities of STPs operations Team
Innovative Services	•Single window administrative services, rent-only no-sale model, etc.	•Building the ecosystem of innovation and entrepreneurship, such as incubators, accelerators, community building, office sharing, financial technology services, etc. •Establishment of Innovative Testbeds to provide new technological experiments, testing, demonstration such as test platform, pilot plant, living lab , regulatory sandbox, and so on

Source : STP

25

New Generation STP is the Enabler of Localized Innovation for Sustainability

Sustainable Smart Specialisation Strategies (S4)
as the Enablers of Co-Creation of Innovative Green Circular Solutions



Source : McCann,P and Soete,L.(2020).Place-based innovation for sustainability : Sustainable smart specialisation strategies (S4) as the enablers of co-creation of innovative green circular solutions(2021).

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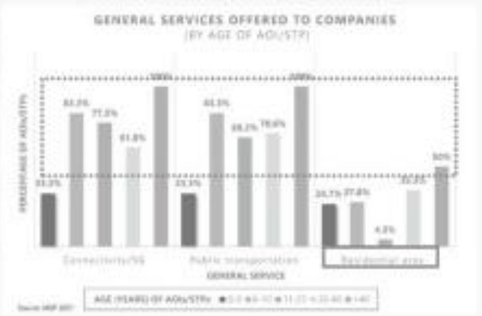
Creating an Innovative Ecosystem that Integrates Production, Life, and Ecology



Source : Jurong Innovation District, https://www.ura.gov.sg/Corporate/Planning/Master-Plan/Regional-Highlights/West-Region ; IASP(2022).IASP GLOBAL SURVEY 2022

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New Generation STP is an Innovation Hub for Digital and Net-Zero Transformation

Source : Johannesberg Science Park, https://www.johannesbergsciencepark.com/project/fed-fossil-free-energy-districts ; High Tech Campus Eindhoven, https://www.hightechcampus.com/ai

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New Generation STP is a Collaborator
in the Development of Local Smart Cities
Smart Transportation
- Self-Driving Bus and Delivery Robot
Smart House
- Positive Footprint Housing
Smart Medicine
-Connected Ambulance

4 | Conclusion

Future enterprise competitiveness consists of
three growth drivers
Intelligent Growth
Sustainable Growth
Inclusive Growth
Emphasis on the intelligent growth of innovation and digital capabilities
Pursuing sustainable growth of energy conservation and green transformation
Inclusive growth that provides equal opportunities and does not allow anyone to be sacrificed in the development of the digital economy

STP's Roles in the Region
Living lab for urban air mobility
Urban Co-Creation Lab
Urban co-creation lab
•The Next Generation STPs will lead and promote the development model of new industries, new life and new ecosystems in the future.
•The STPs promote local cities, regions, nations, and cross country to co-creation and cooperation to meet the challenges of future social needs.

SPEAKER

Sciencepark Forum 1 - STP Model for the Development of Future Industry and STP's Role in the Region

Janekrshna Kanatharana

Executive Vice President of National Science and Technology Development Agency (NSTDA)

태국의 STP 모델: 개발 목표에 대한 다양한 대응
STP Models in Thailand: A Variety in Response to the Development Objectives

BIOGRAPHY

Dr. Kanatharana has been involved with STP development in Thailand ever since he joined the National Science and Technology Development Agency (NSTDA) in 2004. He held the position of the Director of Thailand Science Park during 2004-2017 and then became the founding Executive Director of the Eastern Economic Corridor of Innovation (EECi) during 2019 – early 2023. In addition, He was engaged in the early phase development of the so-called regional science parks in Thailand and was instrumental in the setup of Thai Business Incubators and Science Parks Association (Thai-BISPA). In 2010, He was elected as the Asia Pacific President of the International Association of Science Parks and Areas of Innovation (IASP) and finished his term in 2012.

Currently, he is the Executive Vice President of NSTDA for Industry and Community Engagement. The Thailand Science Park, the Software Park Thailand, the Food Innopolis are within the span of his responsibility.

Abstract

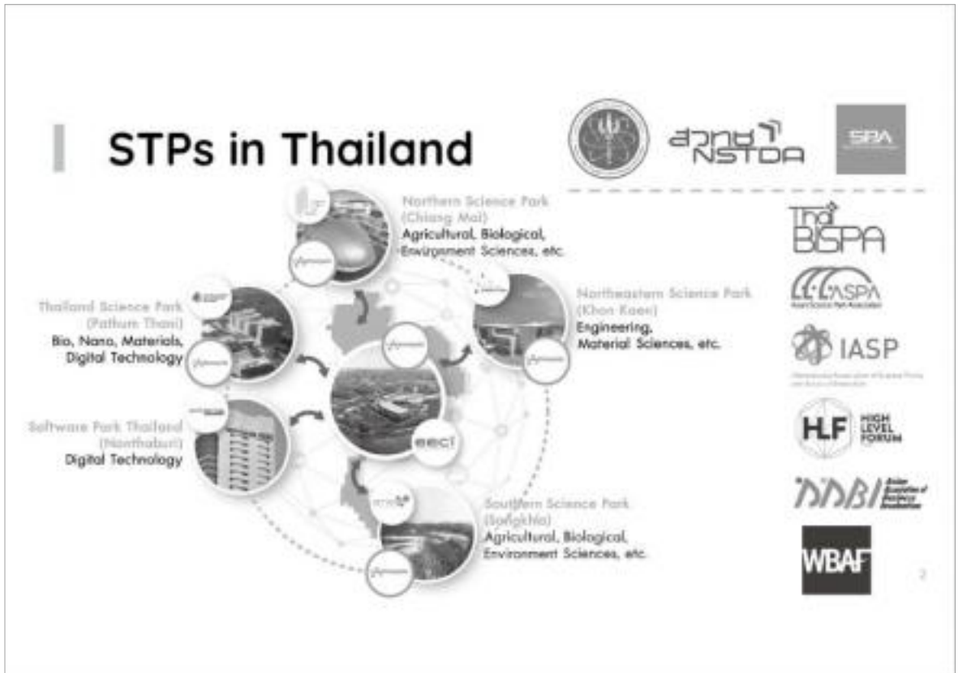
STP Models in Thailand: A Variety in Response to the Development Objectives

STP development in Thailand rooted back to the 1980's when the Thai Cabinet approved the conceptual study of science park development that subsequently led to the development of the Thailand Science Park (TSP). TSP, the first science park in Thailand, is under the management of the National Science and Technology Development Agency (NSTDA) and is located at the northern outskirts of Bangkok on a land plot connected to 2 major universities: Thammasat University and the Asian Institute of Technology. The focuses of TSP are to develop a hub of research and development for both the public and private sectors as well as being a hub of science and technology personnel development. As TSP is maturing with over 150 tenant companies of which one-thirds are international

태국의 STP 모델: 개발 목표에 대한 다양한 대응

태국의 STP 개발은 1980년대 태국 내각이 사이언스 파크 개발에 대한 개념 연구를 승인하여 이후 태국 사이언스 파크(TSP) 개발로 이어진 때로 거슬러 올라갑니다.
태국 최초의 사이언스 파크인 TSP는 NSTDA(National Science and Technology Development Agency)의 관리를 받고 있으며 방콕 북쪽 외곽에 위치한 2개의 주요 대학인 Thammasat University와 Asian Institute of 기술. TSP의 초점은 공공 및 민간 부문 모두를 위한 연구 개발 허브를 개발하고 과학 및 기술 인력 개발의 허브가 되는 것입니다.
TSP는 1/3이 해외기업인 150개 이상의 입주기업과 입주기업 및 NSTDA, 산하기관 국가연구기관에서 상근인원 4,000여 명과 함께 성숙기에 접어들고 있어 식품특구 및 지류발전의 발판이 되고 있습니다.
EECi 개발을 위한 엔진. Food Innopolis와 EECi는 강연에서 다뤄질 예정입니다.

NSTDA
SPIF2023
STP Models in Thailand:
a variety in response to the development objectives
Janekrishna Kanatharana
Executive Vice President- Industry and Community Engagement
National science and technology development agency
15 June 2023

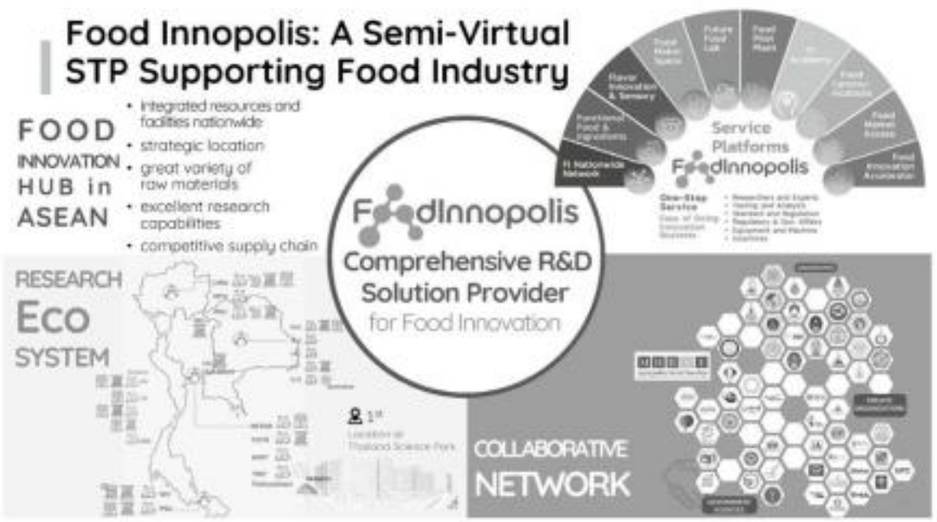

STPs in Thailand
NSTDA
SIRA
Northern Science Park
(Chiang Mai)
Agricultural, Biological,
Environment Sciences, etc.
Thailand Science Park
(Pathum Thani)
Bio, Nano, Materials,
Digital Technology
Northeastern Science Park
(Khon Kaen)
Engineering,
Material Sciences, etc.
Software Park Thailand
(Nonthaburi)
Digital Technology
eeci
Southern Science Park
(Songkhla)
Agricultural, Biological,
Environment Sciences, etc.
ThaiBISPA
LaSPA
IASP
HLF
HIGH LEVEL FORUM
WBAF

THAILAND SCIENCE PARK
eeci
SOFTWARE PARK THAILAND
STPs under
NSTDA Supervision
Over 150 Tenant Companies of which
One-Thirds are International Firms.

Thailand Science Park: A Hub of R&D
and S&T Personnel Development
THAILAND SCIENCE PARK
Established : 2002
80 Acres
300,000 sq.m.
>100 companies,
1/3 are international
NSTDA HQ &
5 National Centers
>1,300 R&D projects
11% Joint or contract proj.
>2,900 RDDE
personnel
Economic impact :
> $1.0 Billion annually
Innovation Cluster
Future Development
Pilot Plant
Convention Center
Multi Purpose Building
Co-Working Space
Innovation Cluster
Garden of Innovation
MTEC
BIOTEC
NECTEC
TMC
NSTDA

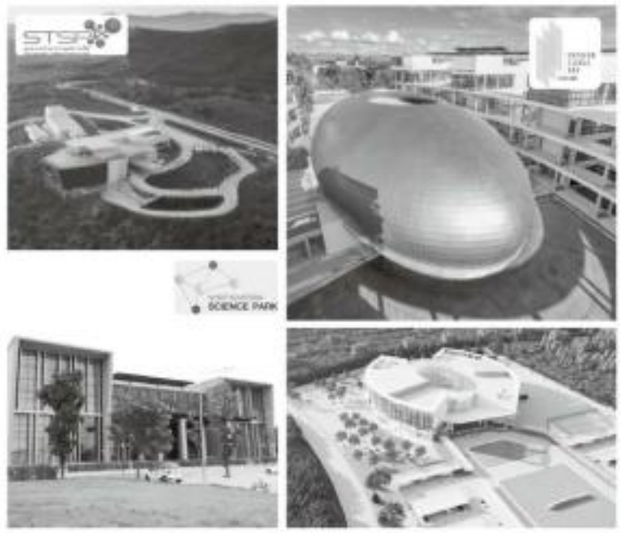
Software Park Thailand: An STP with a Focus on ICT Skill, Industrial Capability, and Biz Promotion

Food Innopolis: A Semi-Virtual STP Supporting Food Industry

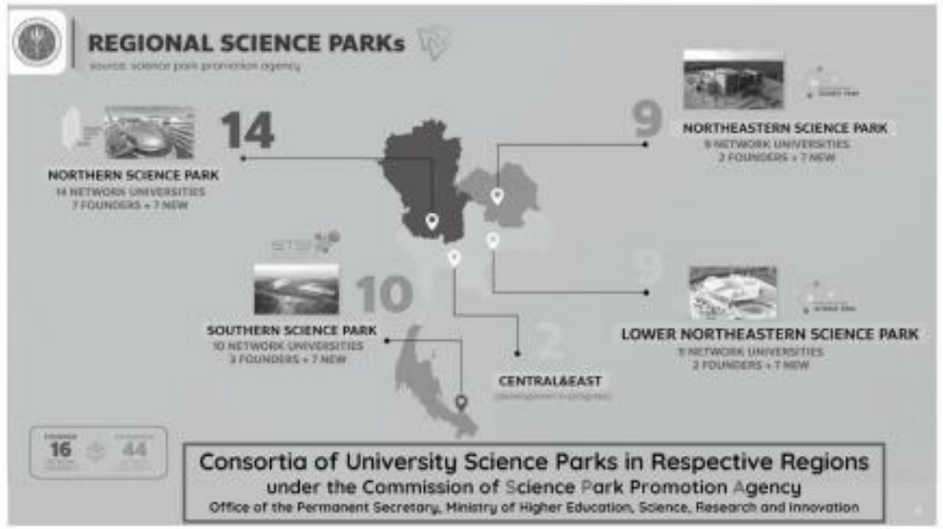


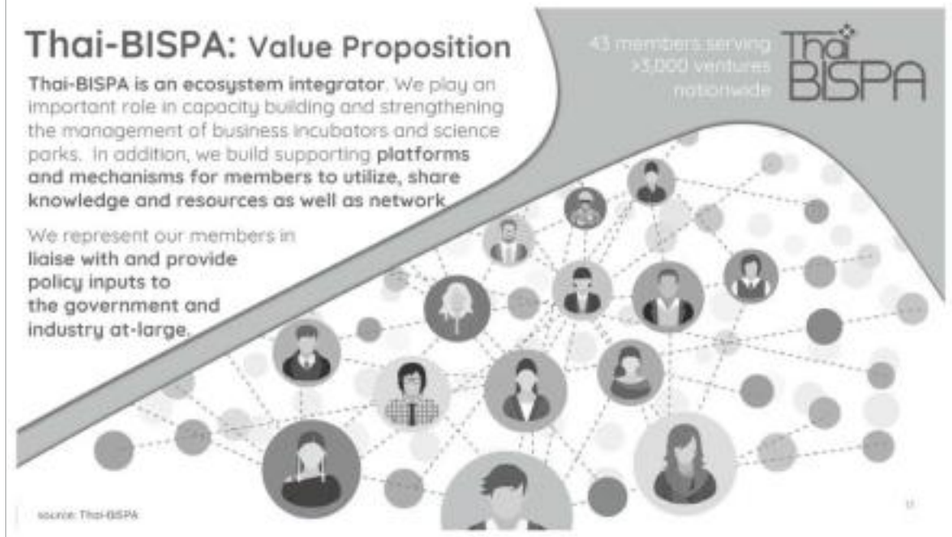
EECi: An STP Supporting Target Industry Development

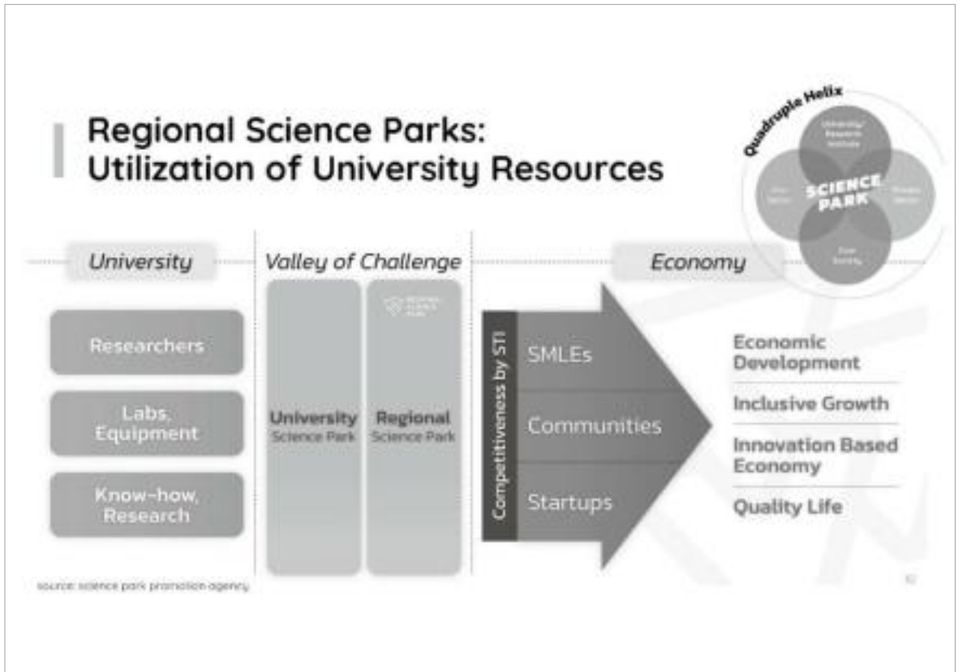
STPs under Supervision of Science Park Promotion Agency



REGIONAL SCIENCE PARK


REGIONAL SCIENCE PARKs
source: science park promotion agency
14
NORTHERN SCIENCE PARK
14 NETWORK UNIVERSITIES
7 FOUNDERS + 7 NEW
9
NORTHEASTERN SCIENCE PARK
9 NETWORK UNIVERSITIES
2 FOUNDERS + 7 NEW
10
SOUTHERN SCIENCE PARK
10 NETWORK UNIVERSITIES
3 FOUNDERS + 7 NEW
LOWER NORTHEASTERN SCIENCE PARK
9 NETWORK UNIVERSITIES
2 FOUNDERS + 7 NEW
CENTRAL&EAST
16
44
Consortia of University Science Parks in Respective Regions
under the Commission of Science Park Promotion Agency
Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation


Thai-BISPA: Value Proposition
Thai-BISPA is an ecosystem integrator. We play an important role in capacity building and strengthening the management of business incubators and science parks. In addition, we build supporting platforms and mechanisms for members to utilize, share knowledge and resources as well as network.
We represent our members in liaise with and provide policy inputs to the government and industry at-large.
43 members serving >3,000 ventures nationwide
Thai BISPA
source: Thai-BISPA


Regional Science Parks:
Utilization of University Resources
Quadruple Helix
SCIENCE PARK
University
Valley of Challenge
Economy
Researchers
Labs, Equipment
Know-how, Research
University Science Park
Regional Science Park
Competitiveness by STI
SMLEs
Communities
Startups
Economic Development
Inclusive Growth
Innovation Based Economy
Quality Life
source: science park promotion agency

Thank you
N
Nation First
S
Science & Technology Excellence
T
Teamwork
D
Deliverability
A
Accountability and Integrity
www.nstda.or.th

SPEAKER

Sciencepark Forum 1 - STP model for the development of future industry and STP's role in the region

도 건 우 GunWoo Do

대구테크노파크 원장 / President of Daegu Techno Park

미래산업육성을 위한 대구테크노파크의 혁신
Innovation of Daegu Technopark for Future Industry Development

BIOGRAPHY

Education

≫ Ph.D. in Economics, Korea University, Seoul, Republic of Korea, **2004**
≫ M.A. in Economics, Korea University, Seoul, Republic of Korea, **1997**
≫ B.A. in Economics, Korea University, Seoul, Republic of Korea, **1995**

PREVIOUS POSITIONS

≫ Commissioner (First-degree civil officer), Daegu Gyeongbuk Free Economic Zone Authority (DGFEZ), **2014**
≫ Research Fellow, Samsung Economic Research Institute (SERI), **2008**
≫ Deputy Director, The Ministry of Economy and Finance (MOEF), **2006**
≫ Deputy Director, Board of Audit and Inspection (BAI), **2005**
≫ Deputy Director, The National Assembly Budget Office (NABO), **2004**
≫ Research Professor, Korea University, **2004**
≫ Visiting Researcher, Vanderbilt University (USA), **2000**

Abstract

Innovation of Daegu Technopark for Future Industry Development

During the period of rapid growth in Korea in the 1960s and 1970s, Daegu led the growth of the national economy as one of the three largest cities in Korea as peripheral industries such as machinery and parts centered on the textile industry. However, since the mid-1970s, Korea's main industry has shifted to heavy chemical industry, and as China entered the world economy in the 1980s, the labor-intensive textile industry was pushed out of competition with China and other developing countries. Thanks to the remarkable development of the automobile industry, including Hyundai Motor Company, in the 2000s, the automobile parts industry replaced the textile industry and grew into a new representative industry in Daegu. However, it is difficult to create high added value only by supplying parts rather than producing finished cars, and parts companies that inevitably depend on finished car makers have limitations in growth. For the past decade, Daegu has had the stigma of being a local government with the lowest GRDP per capita. To address this, extensive industrial structural reform was desperately needed. Over the past 20 years, Daegu's leaders have become mayors by expressing their aspirations to foster future high-tech industries. However, the results were not very good. With the inauguration of Mayor Hong Joon-pyo last year, Daegu Metropolitan City decided to foster a new future industry and build a large-scale new airport in the region as an infrastructure for this purpose. The goal is to open an airport that handles about 30% of Incheon Airport's air logistics, provides direct flights to the US and Europe, and can be operated 24 hours a day by 2030. In addition, an ambitious plan was presented to attract a large number of high-tech industries that require export and import through air logistics to the region by creating a high-tech industrial complex and logistics complex with a population of 200,000 behind the airport. In line with this, Daegu Technopark is accelerating the fostering of Daegu's five future industries (ABB, semiconductor, healthcare, UAM, and robots) through preemptive industrial policy analysis and planning together with local governments and local innovative organizations. In particular, we are making great efforts to develop the ICT industry based on AI, big data, and blockchain technologies and to establish a manufacturing innovation ecosystem through digital transformation centered on ABB technology. Established in 1998, Daegu Technopark is faithfully fulfilling its role as a base institution for fostering future new industries in line with the innovation direction of the 8th civil election launched last year. In particular, by integrating the policy planning group and corporate support group for the first time among 19 techno parks nationwide, planning and execution functions were more organically connected, and a foundation for more effective corporate support was laid. In order to foster ABB-related industries in earnest, we established the ICT Industry Headquarters. In particular, to foster the ABB industry, we select 50 innovative ABB companies, centered on Dongdaegu Venture Valley and Suseong Alpha City, to nurture leading companies, while supporting ABB fund creation and technology certification through test beds. In addition, in order to apply ABB technology to the manufacturing industry and create a model for large-scale manufacturing innovation, local governments are promoting the 'Powerful ABB Factory Project' for the first time. From technology development support to marketing through the establishment of a commercialization support system for the entire life cycle of the company, local start-up companies from pre-star companies to world-class companies and mid-sized companies through a scale-up fostering strategy is unfolding. The 'star company fostering project' that Daegu Technopark has been carrying out for over 16 years has recently spread to a nationwide project and has achieved great results, such as being recognized as an exemplary case by the government. In addition, we support joint technology development with local companies by securing government projects, and contribute to mutual development between countries and overseas expansion of local companies through official development assistance (ODA) projects. Daegu Technopark will continue to play its role as an innovative institution that leads the revitalization of the local economy centered on corporate growth in line with the industrial development policy of Daegu Metropolitan City.

Abstract

미래산업육성을 위한 대구테크노파크의 혁신

대구는 1960~1970년대 대한민국 고도성장 시기에 섬유산업을 중심으로 기계, 부품 등 주변산업이 함께 발전하면서 대한민국 3대 도시로서 국가경제 성장을 이끌었습니다.
그러나 1970년대 중반 이후 대한민국의 주력산업이 중화학공업으로 전환하고, 1980년대 들어 중국이 세계경제에 진입하면서 노동집약적인 섬유산업은 중국 등 개발도상국들과의 경쟁에서 밀려나게 되었습니다.
현대자동차 등 자동차산업의 눈부신 발전에 힘입어 2000년대에는 자동차부품 산업이 섬유산업을 대신하여 대구의 새로운 대표 산업으로 성장하였습니다. 하지만 완성차 생산이 아닌 부품 공급 만으로는 높은 부가가치를 창출하기 어렵고, 완성차 메이커에 의존적일 수 밖에 없는 부품기업은 성장에 한계가 있어 지난 십 수년 동안 대구는 1인당 GRDP가 가장 낮은 지방정부라는 오명을 가지고 있습니다.
이를 해소하기 위한 대대적인 산업구조 개혁이 절실하였습니다. 지난 20년 동안 대구의 지도자들은 미래 첨단산업을 육성하겠다는 포부를 밝히면서 시장이 되었습니다. 하지만 결과는 그리 좋지 않았습니다.
지난 해 홍준표 시장이 취임하면서 대구광역시는 새로운 미래산업을 육성하기로 하고, 이를 위한 기반시설로 지역에 대규모 신공항을 건설하기로 했습니다.
인천공항 항공물류의 약 30%를 처리하고, 미국과 유럽으로 직항 노선을 취항할 수 있는, 그리고 24시간 운영할 수 있는 공항을 2030년까지 개항하겠다는 목표입니다.
또한 공항 배후에는 인구 20만명 규모의 첨단산업단지와 물류단지를 조성하여, 항공물류를 통한 수출입이 필수적인 첨단산업을 지역에 대거 유치하겠다는 야심찬 계획도 제시하였습니다.
이에 발맞추어 대구테크노파크는 지방정부와 지역의 혁신기관들과 함께 선제적인 산업 정책분석 및 기획을 통해 대구 5대 미래산업(ABB, 반도체, 헬스케어, UAM, 로봇) 육성에 박차를 가하고 있습니다. 특히 AI, 빅데이터, 블록체인 기술을 기반으로 한 ICT 산업 발전과 ABB기술 중심의 디지털 전환을 통한 제조혁신 생태계 구축에도 많은 노력을 기울이고 있습니다.
1998년 설립한 대구테크노파크는 지난 해 출범한 민선8기 시정의 혁신 방향과 발맞추어 미래신산업 육성의 거점기관으로 충실하게 역할을 수행하고 있습니다.
특히 전국 19개 테크노파크 중 최초로 정책기획단과 기업지원단을 통합함으로써 기획과 실행기능을 더욱 유기적으로 연결하고, 보다 효과적으로 기업지원을 할 수 있는 기반을 마련하였습니다.
ABB 관련 산업을 본격적으로 육성하기 위하여 ICT산업본부를 신설하였습니다.
특히 ABB 산업 육성을 위해서 동대구벤처밸리와 수성알파시티를 중심으로 ABB 혁신기업 50개사를 선발하여 리딩기업을 육성하는 한편, ABB 펀드조성과 테스트베드 통한 기술인증 등을 지원하고 있습니다.
또한 제조업에 ABB 기술을 적용하여 대구형 제조혁신의 모델을 만들기 위해서 지방정부 최초로 '파워풀 ABB 팩토리 사업'을 추진하고 있습니다.
기업 생애 전주기 사업화 지원체계 구축을 통해 기술개발 지원부터 마케팅까지 지역의 창업기업들이 Pre-스타기업에서 스타기업을 거쳐 월드클래스기업, 중견기업에 이르기까지의 기업 성장사다리 체계를 통한 스케일업 육성전략을 펼쳐나가고 있습니다.
대구테크노파크가 16년 넘게 수행해 온 '스타기업 육성 사업'은 최근 전국적인 사업으로 확산되었고, 정부로부터 모범사례로 인정받는 등 큰 성과를 거두었습니다.
이밖에도 국비사업 확보를 통해 지역기업과 공동기술개발을 지원하고 있으며, 공적개발원조(ODA) 사업을 통해 국가간 상호발전과 지역기업의 해외진출에도 기여하고 있습니다.
앞으로도 대구테크노파크는 대구광역시의 산업육성 정책에 발맞춰 기업성장 중심의 지역경제 활성화를 주도하는 혁신기관으로서의 역할을 다하겠습니다.

01.

Changes in Daegu Metropolitan City

Textile City, Daegu

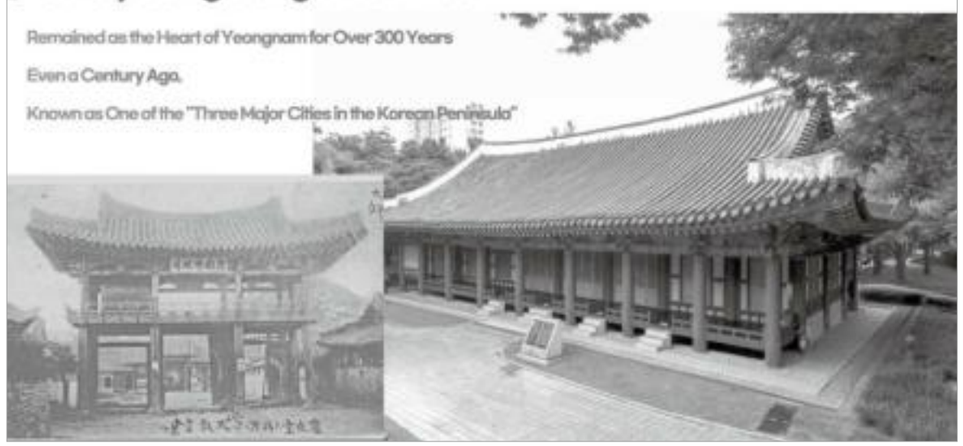
- 1960s~70s, Cheil Textile, Kolon, etc. -> 1980s, the rise of China -> 1990s, a big shift to foreign markets -> Milano Project (1999~2003)

1601, Daegu as the Capital of Gyeongsang Province

Remained as the Heart of Yeongnam for Over 300 Years

Even a Century Ago,

Known as One of the "Three Major Cities in the Korean Peninsula"



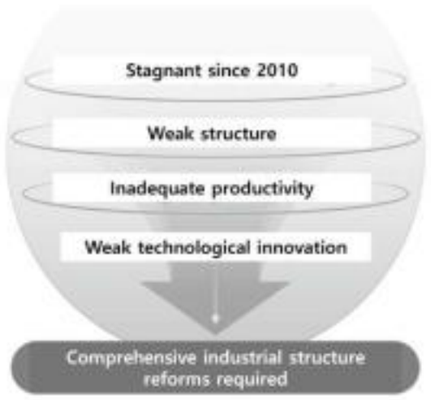
Failure of Industrial Restructuring

- remained as the only metropolitan city without a national industry complex until 2010
- Samsung Motors bankrupted and withdrew in 2000
- automotive components remained the largest industry until recently

대구 시가총액 상위 7개 기업 변화

	2013년	2001년
1	DGB금융지주 (2조2,116억원)	엘앤에프 (6조1,886억원)
2	에스엘 (5,536억원)	한국가스공사 (4조4,910억원)
3	평화정공 (4,504억원)	한국비엔씨 (2조5,173억원)
4	제이브이엠 (3,114억원)	DGB금융지주 (1조6,796억원)
5	이수페타시스 (2,814억원)	에스엘 (1조3,159억원)
6	세원정공 (2,651억원)	씨아이에스 (1조2,309억원)
7	대구백화점 (2,142억원)	에스앤에스텍 (7,267억원)

The Reality of Daegu's Industrial Structure



(Daegu Policy Institution, 2023)

06

02.

Powerful Daegu, Overflowing with Freedom and Energy

The 8th Local Election Daegu Administration

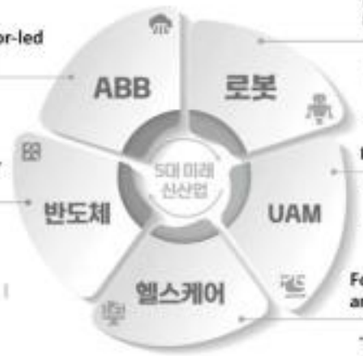
08

Year 1 of Daegu's Great Leap: Reclaiming the title, "The Three Major Cities in the Korean Peninsula"

"Continuous population decline, diminishing competitiveness of local manufacturing industries."

"To transform Daegu from a city people leave to a city people gather, it is necessary to secure new sources of growth and foster advanced industries, creating high-quality jobs"

Nurturing the Five Future Industries



Expansion of Private-Sector-led ABB Industrial Ecosystem

- Establishing a foundation for the digital industry
- Activating the ABB + Metaverse industrial ecosystem

Creating a Semiconductor New Industry Ecosystem

- Establishing and operating a research institution for advanced sensors
- Promoting domestication of advanced sensors
- Attracting advanced sensor manufacturing companies, fabless, and sensor demand companies by utilizing D-fab foundry

Establishing the "National Robot Industry Capital"

- Enhancing the production and technology of robot components
- Strengthening the value chain of robot end-products
- Expanding overseas market opportunities

Leading the Commercialization of UAM

- Establishing a specialized city for UAM commercialization
- Nurturing UAM manufacturing industries

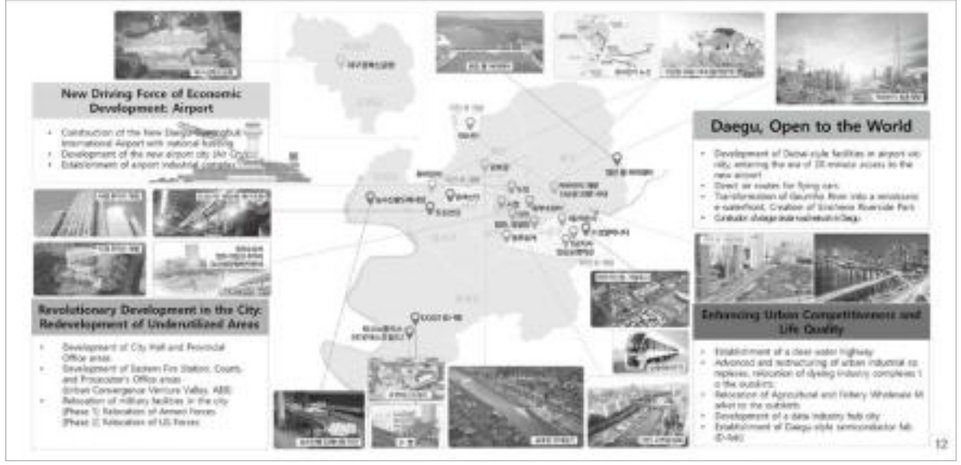
Fostering the Advanced Medical and Healthcare Industry

- Providing comprehensive support for the development of digital healthcare products
- Nurturing the digital dental industry
- Establishing a foundation for the development of digital therapeutics

[Daegu Policy Institution, 2023]

10

Daegu's Future 50 Years



12

03.

Daegu's Vision for the Next 50 Years

11

Opening of the New Daegu-Gyeongbuk Integrated Airport Targeted for 2030

- On July 1st, Gunwi County merged with Daegu

Mega Project for Urban Transformation for the Next 50 Years

- **"Opening of the New Integrated Airport"** (Construction to start in 2022, targeted opening in 2030)
- **"Development of Airport Industrial Complex" (67 million sqft)** Designation announcement in 2025, construction in 2026, completion in 2030
- **Development of Former K2 Air Base** (70 million sqft) **"24-hour Smart City"**

13

04.

The Role and Innovation of Daegu Technopark

Deagu Technopark…

serves as a hub for the regional network of industry, academia, research, and government organizations. Its primary focus is on integrating infrastructure for fostering local industries and driving regional economic revitalization through the discovery and nurturing of new technologies.

Legal Basis	Civil Law, Special Act on Support for Industrial Technology Complexes, Law on Industrial Concentration and Establishment of Factories
Establishment	December 2, 1998
Participating Organizations	Ministry of SMEs and Startups, Daegu Metropolitan City, Kyungpook National University, Keimyung University, Yeungjin College
Chairpersons	Mayor of Daegu Metropolitan City, President of Kyungpook National University
Organizational Structure	3 Headquarters, 1 Division, 2 Offices, 23 Centers

Facility Infrastructure Status

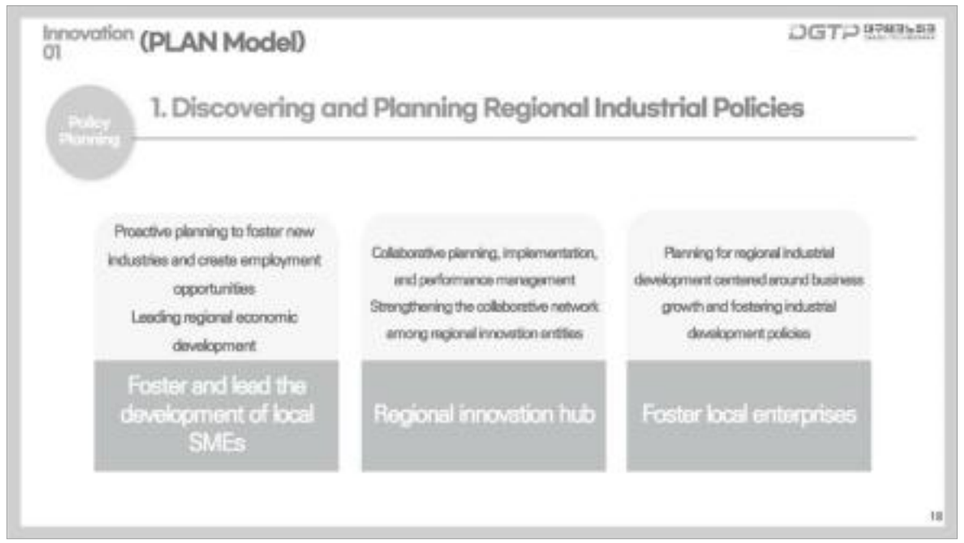
- 12 buildings in 6 regions with a total of 170 companies in occupation

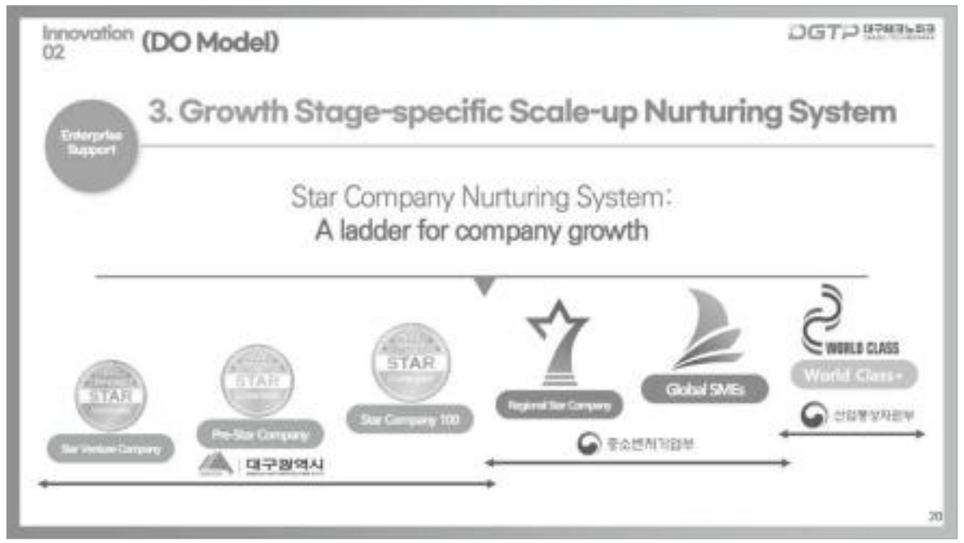
Infrastructure Support for Companies
- Facilities: 31 units, 17 types
- Equipment: 440 units, 356 types

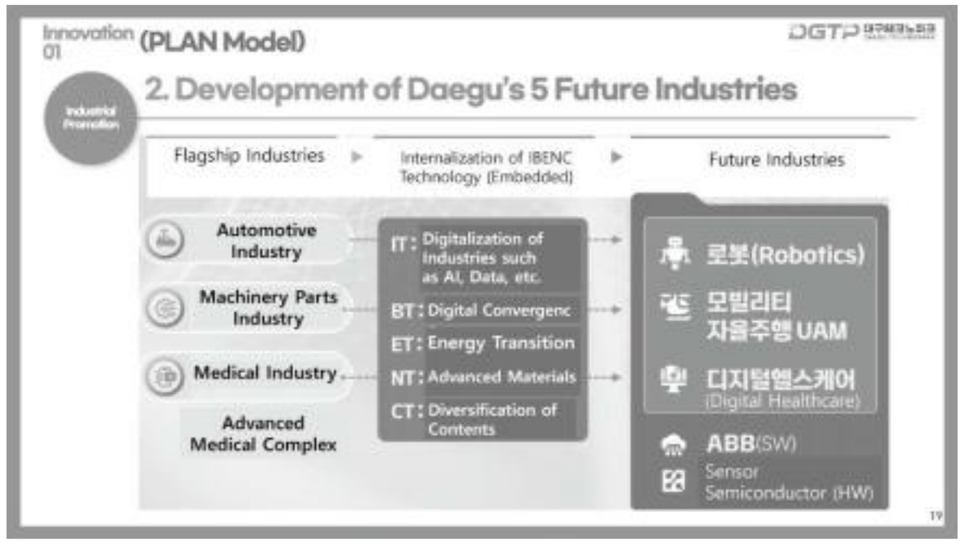
Preparing for a New Leap, Daegu Technopark

Direction	Strengthening the development of knowledge-based service industries and ABB industries -> Establishing a hub for future industries
Approach	(Daegu Technopark) Fostering knowledge-based service industries / Fostering ABB Industries → Establishing an ICT industry headquarters → (Daegu Technopark) DGTP 대구테크노파크
Process	'22.7.29. Enactment of regulations (Enactment of Daegu Technopark Support Ordinance) → '22.8.8. Launch (Inauguration Ceremony · Appointment of President) → '22.11.1. Articles of Incorporation and Organizational Development → '22.11 ~ Stabilization (Organizational restructuring, Employee relocation)

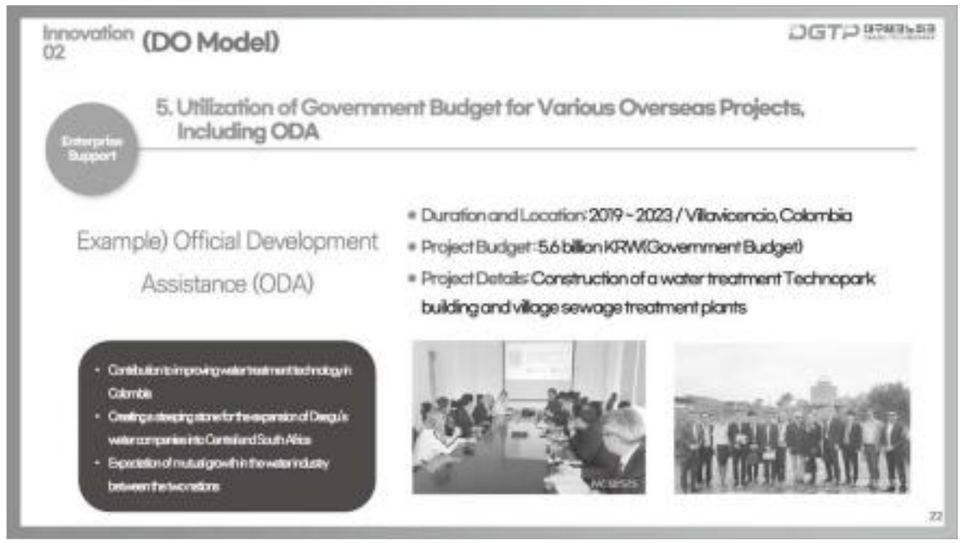
→ Expansion of support for companies in the design field, establishment based on ABB


Innovation 01 (PLAN Model)
DGTP
Policy Planning
1. Discovering and Planning Regional Industrial Policies
Proactive planning to foster new industries and create employment opportunities
Leading regional economic development
Foster and lead the development of local SMEs
Collaborative planning, implementation, and performance management
Strengthening the collaborative network among regional innovation entities
Regional innovation hub
Planning for regional industrial development centered around business growth and fostering industrial development policies
Foster local enterprises
18


Innovation 02 (DO Model)
DGTP
Enterprise Support
3. Growth Stage-specific Scale-up Nurturing System
Star Company Nurturing System:
A ladder for company growth
STAR
Star Venture Company
STAR
Pre-Star Company
대구광역시
STAR
Star Company 100
Regional Star Company
중소벤처기업부
Global SMEs
WORLD CLASS
World Class+
산업통상자원부
20

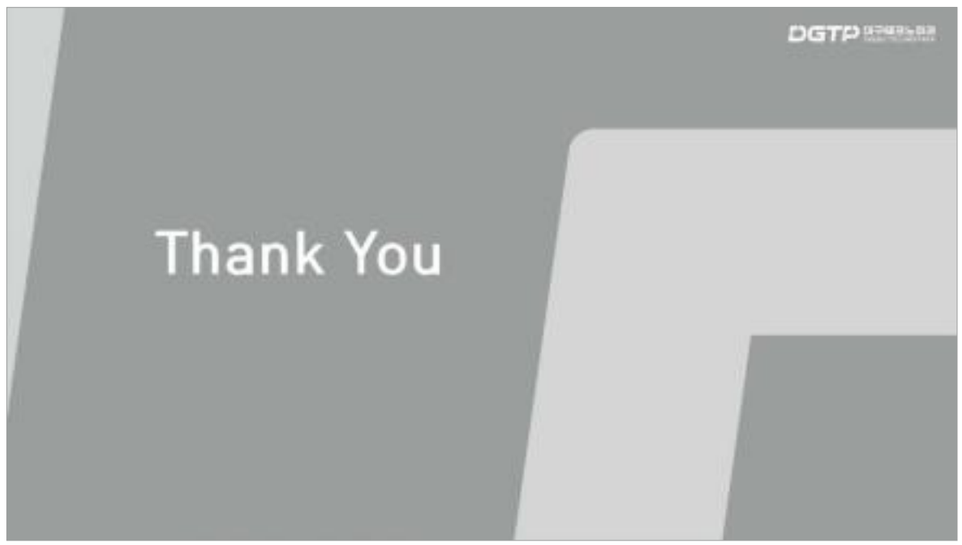

Innovation 01 (PLAN Model)
DGTP
Industrial Promotion
2. Development of Daegu's 5 Future Industries
Flagship Industries
Internalization of IBENC Technology (Embedded)
Future Industries
Automotive Industry
Machinery Parts Industry
Medical Industry
Advanced Medical Complex
IT : Digitalization of industries such as AI, Data, etc.
BT : Digital Convergenc
ET : Energy Transition
NT : Advanced Materials
CT : Diversification of Contents
로봇(Robotics)
모빌리티 자율주행 UAM
디지털헬스케어 (Digital Healthcare)
ABB(SW)
Sensor
Semiconductor (HW)
19

Innovation 02 (DO Model)
DGTP
Enterprise Support
4. Support System for Business Commercialization throughout the Enterprise Lifecycle
Integrated and Customized Support Mechanisms: Promoting Business Commercialization
Development of Growth Strategies : Matching PM, growth stage roadmap consulting, product targeting
Commercialization R&D Planning : Market information, technology, product development planning
Technology and Research Development Support : Technology transfer (Consulting), collaborative R&D, technology development support
Technology Commercialization Support : Prototype production, certification support, manufacturing, marketing, investment attraction support
"One Round Table" : Collaboration system with participating organizations (25) and collaborative organizations (16)
21


Innovation 02 (DO Model)
DGTP
Enterprise Support
5. Utilization of Government Budget for Various Overseas Projects, Including ODA
Example) Official Development Assistance (ODA)
• Duration and Location: 2019 ~ 2023 / Villavicencio, Colombia
• Project Budget : 5.6 billion KRW(Government Budget)
• Project Details: Construction of a water treatment Technopark building and village sewage treatment plants
• Contribution to improving water treatment technology in Colombia
• Creating a stepping stone for the expansion of Daegu's water companies into Central and South Africa
• Expectation of mutual growth in the water industry between the two nations
22

SCIC
DGTP
5G DAEGU
023 Road to the British Capital Ma
DGTP
The Rise of Daegu, Daegu Technopark and ASPA will Push through Together!
24

Innovation 02 (DO Model)
DGTP
Specialized Enterprise Support
6. Tangible Future Projects Focused on Performance Diffusion
『Powerful ABB Factory』 Establishing Open Innovation
26℃
98%
Total 51.2%
1740
1650
23


DGTP
Thank You

SPEAKER

Sciencepark Forum 1 - STP Model for the Development of Future Industry and STP's Role in the Region

Nguyen Nghia Hiep

Vice President of Saigon Hi-Tech Park

베트남 내 하이테크 산업 육성을 위한 사이공 하이테크파크의 역할
Role of Saigon Hi-Tech Park in Fostering the Hi-tech Industry in Vietnam

BIOGRAPHY

≫Vice President of Saigon Hi-tech Park since **2021**.
≫Master in Project Management of RMIT University.
≫Former Vice Chairman of the People's Council of District 2, HCMC (**2019 – 2021**).
≫Former Vice Chairman of the People's Comittee of District 2, HCMC (**2016 – 2019**).

Abstract

Role of Saigon Hi-Tech Park in Fostering the Hi-tech Industry in Vietnam

Saigon High-Tech Park (SHTP) was established in 2002 by the decision of the Prime Minister of Vietnam government. SHTP is located in Ho Chi Minh City and covers an area of 913 hectares with the aim of fostering the development of high-tech industries and promoting innovation and creativity in the region. The park is home to more than 160 companies, including multinational corporations, research institutions, and startups. With the goal of becoming a key driver of economic growth in the region and attracting local and foreign investment, SHTP is committed to promoting technology transfer, talent development, and collaboration between academia and industry to accelerate innovation and promote sustainable development.

베트남 내 하이테크 산업 육성을 위한 사이공 하이테크파크의 역할

사이공 하이테크파크(SHTP)는 2002년 베트남 국무총리의 허가 아래 설립되었습니다. SHTP는 호치민시에 위치하고 있으며 913헥타르의 면적을 차지하며 하이테크 산업의 발전을 촉진하고 이 지역의 혁신과 창의성을 촉진하는 것을 목표로 합니다. 이 공원에는 다국적 기업, 연구 기관 및 신생 기업을 포함하여 160개 이상의 기업이 있습니다. SHTP는 이 지역 경제 성장의 핵심 동력이 되고 지역 및 해외 투자를 유치한다는 목표로 혁신을 가속화하고 지속 가능한 개발을 촉진하기 위해 기술 이전, 인재 개발, 학계와 산업계 간의 협력을 촉진하는 데 전념하고 있습니다.

Role of Saigon Hi-tech Park in fostering the Hi-tech industry in Vietnam

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Ho Chi Minh City, June 15, 2023

Content

1. Overview
2. Strategy map
3. What's next

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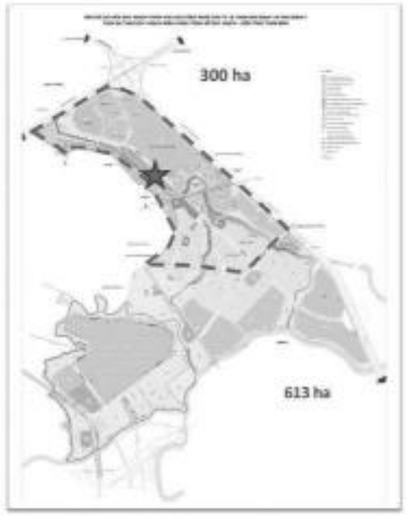
OUR VISION

Who we are?

- Established in 2002
- One of the only three national hi-tech parks in Vietnam
- Initiated and invested by central and local goverments budget
- Locates in the focal economic region of Southern Vietnam - accounted of 30% FDI capital of the country

Vision

- A technology and science city that will greatly enhance the economic, technological, and intellectual base of Ho Chi Minh City and the Southern Focal Economic Region of Vietnam
- A model for Vietnam technological innovation, intellectual capital development, and innovation economy

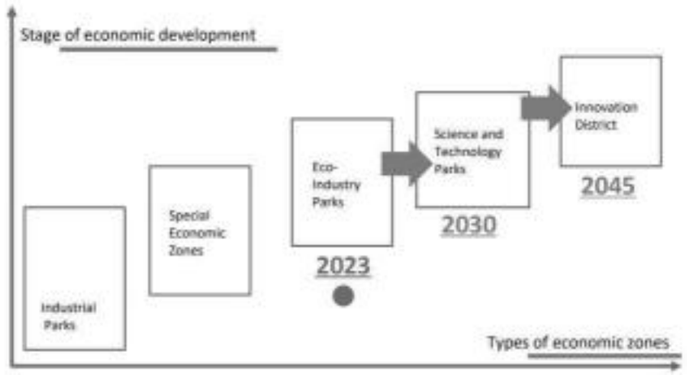


Total area: 913 hectares
Phase 1: **300 hectares** ***(land for hi-tech manufacturer is fully occupied 100%)***
Phase 2: **613 hectares** ***(land for hi-tech manufacturer is occupied 90%)***

MASTER PLAN

- High-tech production
- High-tech services
- Residential area for experts
- Logistics and Bonded Warehouse
- R&D – Training – Incubation

OUR VISION



Source: UNIDO, 2015, country office, Viet Nam.

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OUR VISION

By 2045, SHTP will become

Science – Technology, Innovation Urban Area,

as the **nucleus**, **the new driving force** of growth for the Southeastern Region and Vietnam.

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OUR MISSION

Building and developing foundational/strategic industries for the country (focusing on high value-added stages and stages).

Specific Industry?: Electronic, Semiconductor industry, Bio-Technology, Aerospace industry.

Focus on?: Developing local hi-tech enterprises.

08/4/2021 26/8/2022 22/10/2022

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OUR GOAL

By 2030, SHTP become

Science Park meets international standards

as the **nucleus**, **the new driving force** of growth for the Southeastern Region and Vietnam.

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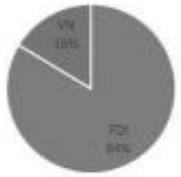
INVESTMENT STATISTIC (updated: 4/2023)

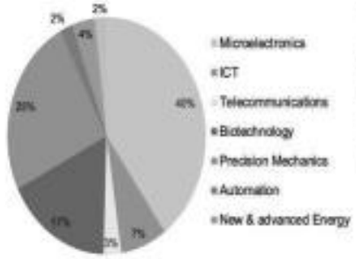
Total number of investment: 160



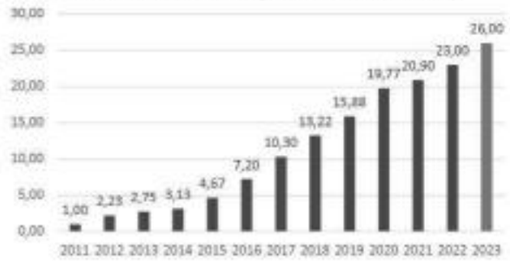
Total capital:
$ 12,08 bil USD

	FDI	VN
Nations	51	109
Capital	10,106 bil USD	1,974 bil USD

Sectors



Hi-tech Products Export Value (bil USD)



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Content

1. Overview
2. Strategy map
3. What's next

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STRATEGY MAP

MISSION:
"Building and developing foundational/strategic industries for the country"

ENTRUSTMENT **ASPECT**:

[UT1] Creating the foundation for new economic development	[UT2] Developing a strong system of technology enterprises	[UT3] Enhancing productivity and innovation	[UT4] Creating high-skilled employment

INTERNAL **ASPECT**:

[I1] Innovating the management activities of SHTP Board Management	[I2] Upgrading the specialized units (SHTPLabs, SHTP Training, SHTP.IC)	[I3] Promoting R&D&I actitivities at enterprises	[I4] Strenthening the link of "3 house +" inside and outside SHTP	[I5] Upgrading and Expanding SHTP (building Science Park)

LEARNING AND DEVELOPMENT **ASPECT**:

[GL1] System of applications/software for administration		[GL2] System of Databases	
[GL3] Development Advisory Council and Scientific Advisory Councils		[GL4] Department in charge of digital transformation	
[GL5] Service culture	[GL6] A culture focused on strategy	[GL7] Culture of collaboration	[GL8] Culture of Innovation (taking risks)

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Content

1. Overview
2. Strategy map
3. What's next

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HCMC SCIENCE PARK

Total: 197,2 hectares
Location: Long Phuoc isle, Long Phuoc Ward, District 9, HCMC.
Vision:
✓Develop new technologies, key-advanced manufacturing industries.
✓ The best environment for the development of R&D activities, link with universities and businesses, to promote endogenous capacity in science and technology.
✓ SHTP 2 is planned to be ready to call for investments in 2025.

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Thank you!

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Appendix

Electronics AND Semiconductor: What strategy for Viet Nam?

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Electronics AND Semiconductors? /1

"No **strong** industrial society can survive without a **strong and dynamic** electronics industry and... a strong electronics industry cannot exist without **controlled access to** advanced semiconductor technology"

(Pistoria, President and CEO of SGS Thomson Microelectronics, **1989**)

Source: Strategic Industries in a global economy: policy issues for the 1990s, OECD International Futures Programs (1991)

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Electronics AND Semiconductors? /2

IJPDLM
43,8

660

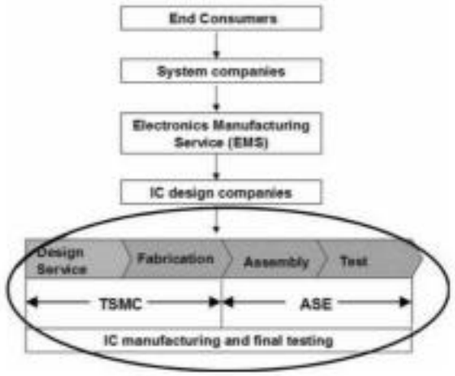

Figure 1.
Value chain of semiconductor industry

Source: Key success factor analysis for e-SCM project implementation and a case study in semiconductor manufacturers, Bang-Ning Wang and Ta-ping Lu (2012)

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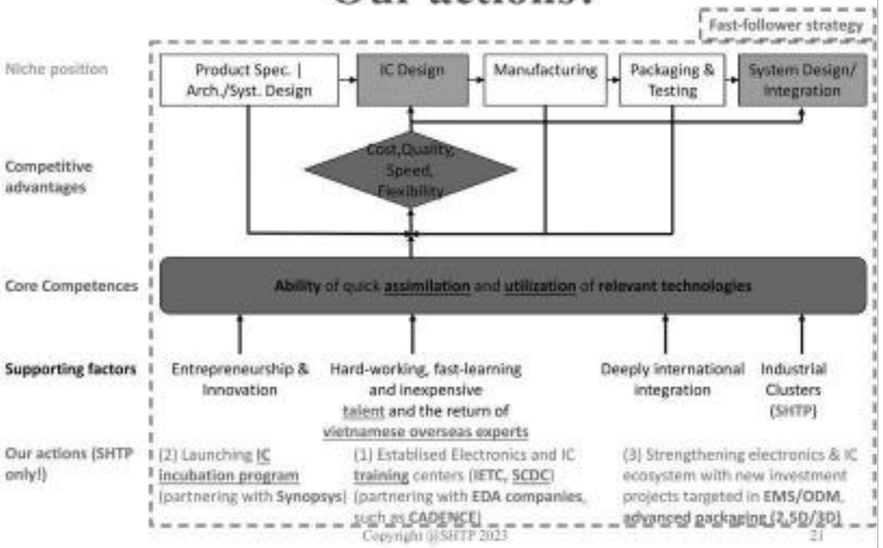
Our actions?



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Strategy for Viet Nam?

50+ companies,
5000+ engineers

Becoming a Worldwide IC design hub: Top5 by 2030?

Intel VN (Chiplet, Advanced Packaging (2.5D,3D)), Samsung, Amkor

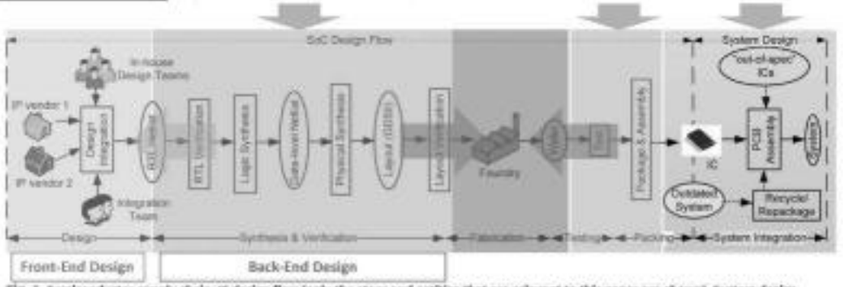

Fig. 1. Semiconductor supply chain: IC design flow (only the steps and entities that are relevant to this paper are shown). System design (the dotted lines represent how the fake and low-quality components enter the supply chain). Source: [13].

Source: A primer on hardware security: models, methods and metrics, A. Rostami et al. (2014)

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SPIF

2023
SCIENCEPARK
INNOFAIR
사이언스파크
이노페어

Sciencepark Forum 2
(Collaboration between Innovative Institutions and Enterprises - Gyeongbuk TP Session)
사이언스파크 포럼 2 (혁신 기관 · 기업 상생 협력 - 경북TP 세션)

지역내 산학연관의 글로벌 협력

Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region

MODERATOR

Sciencepark Forum 2 (Gyeongbuk TP Session) - Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region

임 덕 순 DeokSoon Yim Senior Research Fellow of Science and Technology Policy Institute

지역내 산학연관의 글로벌 협력

Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region

BIOGRAPHY

As the researcher and practitioner on science and technology policy, Dr. Yim has conducted many research projects, run science and technology parks and provided consulting services to the government. His special interest ranges from the subject of science and technology parks, regional innovation cluster and globalization of R&D. He has published more than fifty research reports and papers on technology management and technology policy both domestically and internationally. Currently, he is supporting the development of Science, Technology and Innovation of developing countries in Science and Technology Policy Institute. He also severed as the president of International Society for Innovation Cluster. He has made new terminology “Innovation Cluster” first in the world and consulted Korean government for Daedeok Science Town, which later expanded to become Daedeok Innopolis of today. He has wide experience on both international and regional development of industry and technology and has organized many international conferences and established global expert network.

MEMO

SPEAKER

Sciencepark Forum 2 (Gyeongbuk TP Session) - Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region

박 성 덕 Park SungDug

경북테크노파크 정책기획단장 / Director of Policy Planning Agency, Gyeongbu Technopark

한국의 테크노파크
Technoparks in Korea

BIOGRAPHY

≫ **2023.01 ~ Present** : Director of Policy Planning, GYEONGBUK TECHNOPARK
≫ **2009.01 ~ 2022.12** : Associate Research Fellow, Daegu Gyeongbuk Research Institute
≫ **2015.01 ~ 2019.12** : Head of Daegu-Gyeongbuk Public Investment Center
≫ **2004.10 ~ 2008.12** : Researcher, Daegu-Gyeongbuk Research Institute
≫ **1998.01 ~ 1999.12** : Employee at LG Distribution Co., Ltd.

Abstract

Technoparks in Korea
(The case of business support program of GYEONGBUK TECHNOPARK)

Gyeongbuk TP promotes expansion of the Korean technopark model beyond representative innovation base institutionsSince its establishment in August 1998, Gyeongbuk Technopark has been leading the revitalization of the local economy by supporting the advancement of local industries and corporate growth as an innovation hub in Gyeongbuk. At the pivotal position of Gyeongsangbuk-do's industry-academia-research-research-government network, it leads the continuous innovation and development of Gyeongsangbuk-do, discovers and nurtures promising technology companies in the region, and serves as a support and guide for corporate growth. made progress. Gyeongbuk Technopark has a new high mission of “contributing to technological innovation and enhancement of corporate competitiveness through support for the growth of local companies”, and as a successful partner for Gyeongbuk companies, we are going through the era of the 4th industrial revolution together with Official Development Assistance (ODA). We will focus on spreading the Korea Technopark model through the installation of the internal Gyeongbuk International Development Cooperation Center.

한국의 테크노파크
(경북테크노파크의 사업지원 프로그램)

경북TP, 대표 혁신거점기관을 넘어 한국형 테크노파크 모델 확산 추진
경북테크노파크는 1998년 8월 설립된 이래 경북의 혁신거점기관으로서 지역산업 고도화와 기업 성장을 지원하며 지역경제 활성화를 주도해왔습니다.
경상북도의 산 · 학 · 연 · 관 네트워크의 중추적인 위치에서 경북의 지속적인 혁신과 발전을 이끎과 동시에 지역의 유망 기술기업을 발굴하고 육성하며 기업 성장의 버팀목이자 안내자로서 끊임없는 열정과 노력으로 경북의 발전을 일구어냈습니다.
경북테크노파크는 “지역기업 성장지원을 통해 기술혁신과 기업경쟁력 향상에 기여한다”는 높은 사명을 새로이 품고 경북 기업의 성공파트너로 4차 산업혁명 시대를 함께 나감과 동시에 공적개발원조(ODA)분야에서 내부 경북국제개발협력센터 설치를 통해 한국테크노파크 모델의 확산을 집중하여 추진하고자 합니다.

경북테크노파크

Korea Technopark

The case of business support program of Gyeongbuk Technopark

Park Sung Dug, Dr.
Director, Policy Planning Agency
Gyeongbuk TechnoPark

CONTENTS

I Korea Technopark
II About Gyeongbuk Technopark
III The Business Support Program of GBTP
IV International Development Cooperation project of GBTP

Korea Technopark

경북테크노파크

Driving Balanced National & Regional Economic Development

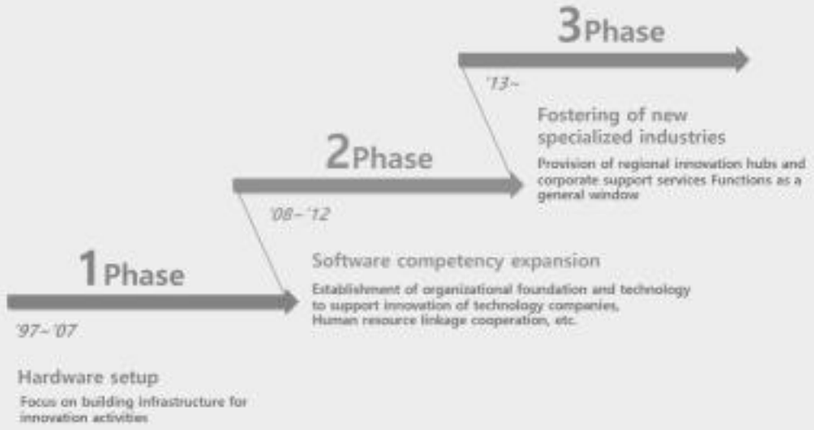
Technopark

01 Technopark Overview

Purpose	Business	Function
● Technopark : A institution that nurtures knowledge-based small but strong tech. companies through industry-university-affiliated networks ● Basis : Special law of support for industrial technology complexes	● Providing technology and business support services to enhance corporate capability ● Job creation through start-up support and investment attraction ● Discovery of large-scale projects through industry-university cooperation network	● Initially focused on corporate incubation and technical support ● Since then, it has been expanded to include regional policies, planning, and corporate support services ● Recently, it serves as an integrated platform for corporate support

02 ▸ Korea TP creation process

❑ Technopark in Korea started to be created in 1997 with a focus on space, and developed with a focus on fostering new specialized industries.



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03 ▸ The role of TP in fostering specialized industries

❑ Create the following 5 infrastructures of Korea Technopark to foster specialized industries

- Korea Technopark as a vision presenter, infrastructure builder, & corporate support organization

Key Role 1
Infrastructure Builder
Establishment and connection of industrial infrastructure

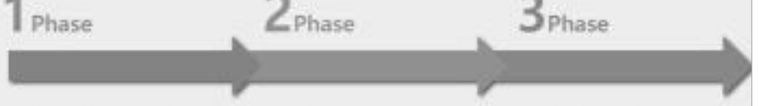
Key Role 2
Vision Provider
Establishment of local industry promotion policy

Key Role 3
Company Supporter
Establishment and connection of corporate support system

6

04 ▸ Step-by-step development of Korea Technopark

❑ Simultaneously promote projects suitable for business support, establishment of industry fostering policies, and linkage functions with business support organizations by stage of development

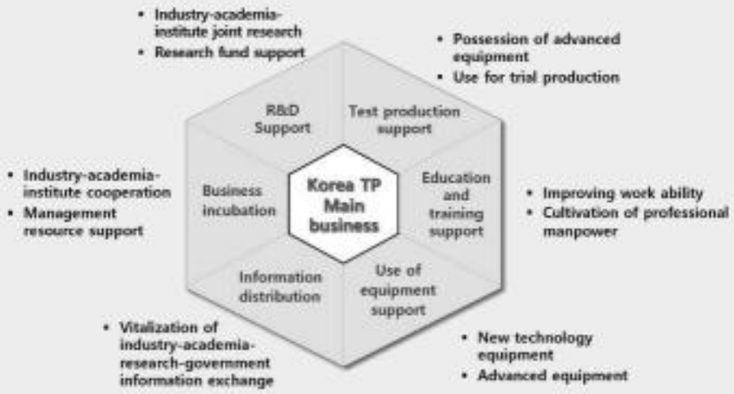


Supporting Business	Space provision	Establishment & operation of a business promotion organization	Industry-University-Research Collaboration Council(Centered on tenant companies)
Developing business promotion policy	Installation of shared-use equipment	Establishment & operation of an industrial planning organization	Industry-University-Research-Government Collaboration Council
Connecting with business supporting agencies	Equipment information sharing in the region	System of collaboration among promotional organizations	Industry-University-Research Collaboration Council (by industry)

7

05 ▸ 1 Phase : Center for creating space for business

❑ In the 1st stage, the core business of Technopark consists of 6 purpose businesses



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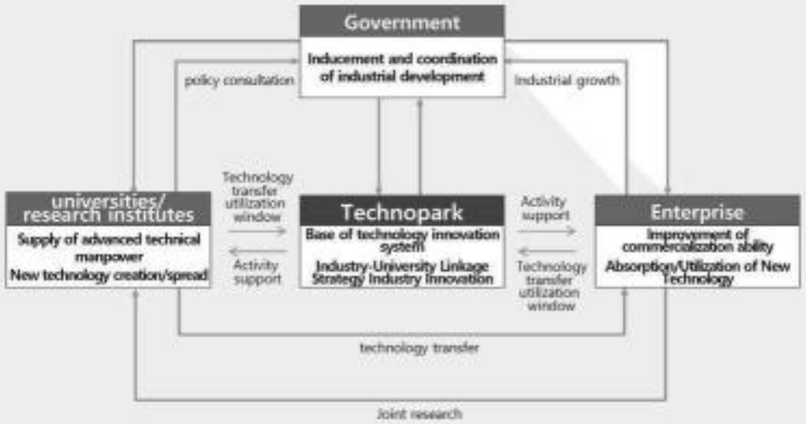
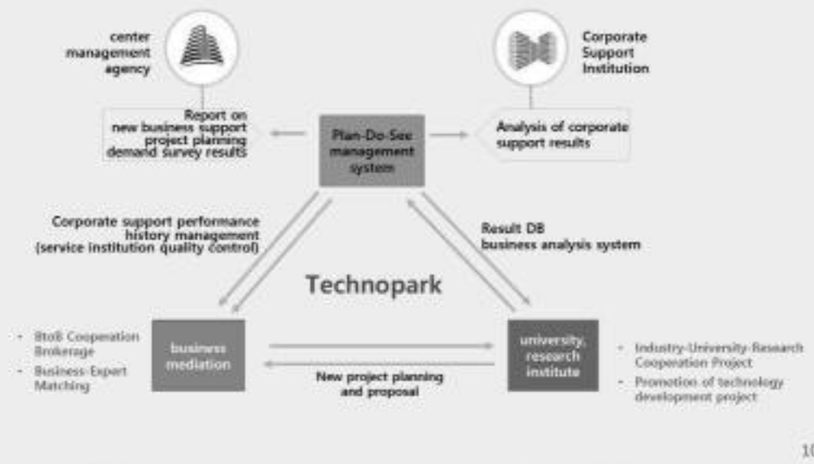
06 ▸ 2 Phase : Establishment of Industry promotion policies

❑ Technopark plans industrial policies as a base for fostering strategic industries



07 ▸ 3 Phase : Enterprise Network Hub

❑ Technopark, as a network hub institution, builds a cooperation network with business support institutions and plays a central role in linkage, exchange and cooperation between institutions



01 ▸ Infra of GBTP : Complex I (Headquater)

02 ▸ Infra of GBTP : Complex II

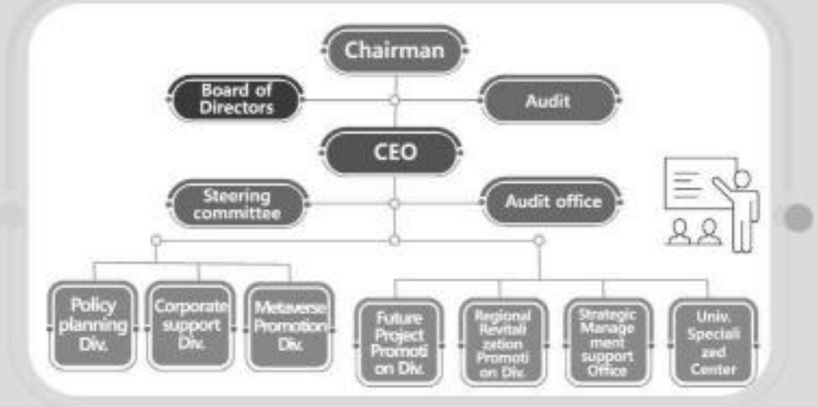
: Located in the Gyeongsan Knowledge Economy Industrial District

* Total area : 40,942 ㎡

03 ▸ Facilities : Overview

04 ▸ Organization status

Organizational Chart(2023) 5 Divisions, 2 Offices, 5 Universities Specialized Centers



15

The Business Support Program of GBTP

Anchor company fostering

GBTP!

01 ▸ GBTP, Regional Innovation Base Agency

Doctor of Corporate Growth (2022)

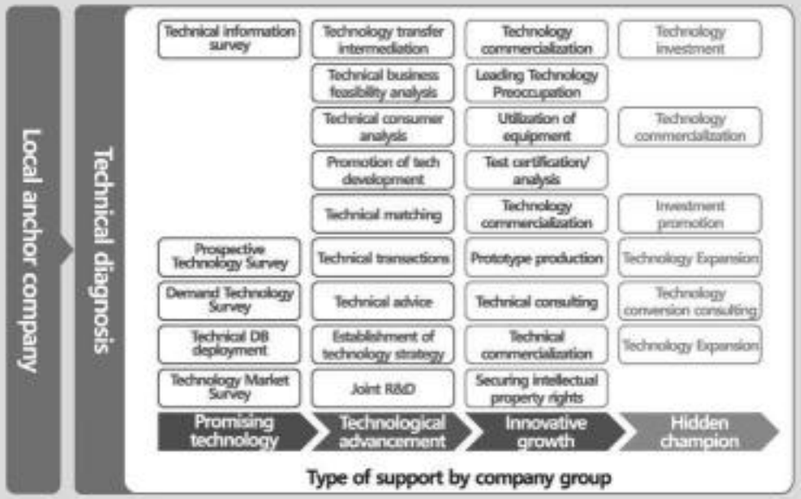
Corporate Fostering	Support New Tech	Tech. difficulties support	Manage. marketing support		Support Com. 5,800 IPO 13 WC300 18 Global Com. 45 Local star com. 57
Cooperation Network	Industry Network	Manage. Network	R&D Network	Industrial DB	DB 72,000 Cooperation 76,000 Business discovery 650
R&D	Seminar	Tech. Develop.	Tech. edu.		Patent 35 Thesis 60 Tech. intermediation 900 Tech. transfer 20
Infrastructure Construction	Industrial complex	Shared equipment			Site area120,889㎡ N.of building 19 Equipment 315(utilization100%)
Infrastructure Application	Joint use of equip.	Attracting tenants			tenants 119 Sales of tenants 1,971.2 million USD employee 1,888

02 ▸ Start-ups Platform

GBTP Start-Ups Platform

	Original Start-ups	GBTP Start-up Platform	Start-ups with GBTP
Idea, evaluation, practice	By individual	"Vitalize the idea" (BI Business)	Idea only, Platform charges the rest
Prototyping	Purchasing equipment, Extra expenditure	"Visualize the dream" (Maker space, 3D Printing)	Free use of high-tech utilities
Market Search	Searching market demands by oneself	"Toward Global market" (OKTA)	Search global demands
Finance (investment)	Dependent on equity or venture capital	"All for one" (Crowd Funding)	Advertising the products, Raise the funds
Education	Non or limited education	"Amateurs to Pros" (Start-up Academy)	Provide Start-up Education And Mentors
Technological Difficulties	Difficulties in R&D	Tech-Error solution (Tech-Doctor 911)	Transfer and commercialize the technology
Spatial problem	High expenditure on office rent	"Best place for Start-up" (GB Start-up Center)	Provide office with lower rent fee
Network	Limited communications	"Communicate with Pioneer" (The youth CEO Committee)	Networking with CEOs

03 ▸ Spread Customized Enterprise Support Platforms



04 ▸ Operation of enterprise support programs by growth stage

Fostering the regional representative Korean hidden champion
by intensively fostering the regional main industry

Start-up/post-startup Support	Local Star Companies Support	Regional Innovation Leading Company	Global Hidden Champion 1000+
● POST-BI comprehensive support project and customized program operation ● Target : BI graduate companies and start-ups for more than 3 years	● Dedicated PM matching, commercialization promotion, commercialization R&D support (Ministry of SMEs & Startups) ● Target : Average sales over 3 years (5 to 40 billion won)	● Dedicated PM matching, commercialization promotion, commercialization R&D support (Ministry of SMEs & Startups) ● Target : Average sales over 3 years (more than KRW 17 billion))	● Overseas market marketing and growth strategy consulting support ● Target : Sales of the previous year (KRW 10 billion ~ KRW 100 billion), direct and indirect exports (over 5 million USD)

IV
International Development Cooperation
Project of GBTP
Mutual Growth
Win-Win ODA Model
GBTP
KOREA
Partner Country

01 Sustainable Joint Growth ODA : Korea Style ODA
Support improving the quality of life by contributing to industrial development in emerging countries
Share Korea's government-led SMEs promotion experience
Support strengthening industrial competitiveness of developing countries in the global value chain
Sharing Fish
Coaching Fishing
Fishing Together
22

02 Purpose of Korean-Style Support Project
Korea-Partner Country
Strengthen Industrial and Economic Cooperation
Korea
Utilization of Korean production technology, Improvement of competitiveness of local companies, Establishment of new production base
Partner Country
Building a foundation for industrial growth by creating a Korean-style support project; Cultivation of professional technical manpower
Give & Take ODA Model
Give
Nurturing professional manpower, Strengthening industrial competitiveness
Take
New global production base of Korea, Pioneering overseas markets
Building a New Win-Win Model
23

03 International Development Cooperation Project of GBTP
Currently carrying out ODA project in 8 countries
Strategic strongholds in Central Asia, Asia, Central America and Africa
A bridgehead for Korean companies to enter new markets
Uzbekistan
Kyrgyzstan
Tajikistan
Cambodia
Indonesia
Guatemala
Ghana
Ethiopia
24

04 ▸ ODA Project Case 1 : Uzbekistan Textile Technopark Project

Location	Uzbekistan Tashkent Babur Street
Agency	KIAT (2015~2020)
Consortium	KITECH, GBTP
Plottage	0.7ha(7,025㎡)
Floor Area	7,245.30㎡
Budget	15 million USD
Buildings	Education & Training Bldg., Pilot Plant
Function	R&D, Pilot Plant, Education, Laboratory, Administration

Division	Education & Training	Pilot Plant
Floor Area	4,432 ㎡ 1st basement level, 6th floor	2,979 ㎡ 1st floor
Usage	Administration, Test, Certification, Evaluation, Analysis	R&D, Prototype production
Facilities	▸ Office, Research Room, Test & Evaluation facilities, Classroom, Meeting Room, Exhibition Hall etc. ▸ Tenant Office	▸ Pilot Plant equipment for prototype production ▸ Analysis / Evaluation

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04 ▸ ODA Project Case 2 : Uzbekistan IT Park Project

Location	Uzbekistan Tashkent
Period	2021~2025
Budget	4.5 million USD
Agency	KOICA
Consortium	GBTP, KTPA, Dain Leaders
Contents	Establishing an Operation Model, Reinforcement of Capabilities of Operational Manpower & Tenant Company, Establishing an IT Network

IT PARK
START local IS GO global

26

04 ▸ ODA Project Case 3 : Uzbekistan INNO Technopark F/S

Location	Uzbekistan Tashkent
Period	2024~2027
Budget	5.5 million USD
Agency	Ministry of SMEs & Startups
Consortium	GBTP
Contents	Establishing Innovation Lab(3D printing, Mobile, ICT, Robot, Makerspace), Technical Education, Reinforcement of Startups, Accelerating, One-stop supporting manual

INNO TECHNOPARK

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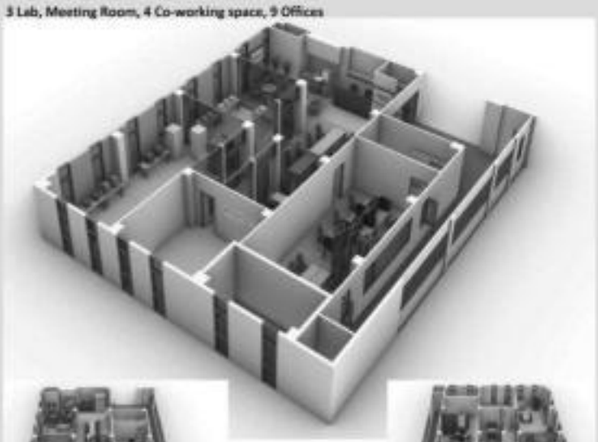
04 ▸ ODA Project Case 3 : Uzbekistan INNO Technopark F/S

IoT Lab

3 Lab, Meeting Room, 4 Co-working space, 9 Offices



3D Printing Lab

Mobile Lab

28

04 ▸ ODA Project Case 4 : Ethiopia Textile Technopark Project

Period
: 2018~2023

Agency
: KIAT

Consortium
: GBTP, FITI, DYETEC, KOFOTI

Location & Size
: Bole Lemi Complex 15,000㎡

Budget
: 7 million USD

Buildings
: Head-quarter Bldg., Pilot Plant, Others

Ethiopia Textile Technopark Main Building

Ethiopia Textile Technopark Pilot Plant

Division	Head-quarter Bldg.	Pilot Plant	Wastewater Treatment Bldg.	Others
Plottage	2811.00㎡	1953.77㎡	273.76㎡	-
Total Floor Area	9850.00㎡	1953.77㎡	273.76㎡	-
Usage	▶ Civil affairs, Administrative affairs, ▶ Education complex space, etc. ▶ Business incubator, tenant enterprises, etc.	▶ Test analysis lab., ▶ Pilot production factory ▶ Dyeing & Finishing	▶ Wastewater treatment facility	▶ Parking lot, ▶ Rest area, ▶ Cargo space, etc.

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04 ▸ ODA Project Case 5 : Guatemala Textile TASK Center F/S

Location Guatemala, Guatemala City

Period 2024~2027

Budget 7.5 million USD (expectation)

Agency KIAT

Consortium GBTP, FITI, KOFOTI

Contents Remodeling, Equipment, Education Support
Operation Manual & Attracting Overseas Investment Support

30

SPEAKER

Sciencepark Forum 2 (Gyeongbuk TP Session) - Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region

Bolor-Erdene Otgonbaigal

Chief International Relations and Project Development Officer of Sciencepark of Mongolia

몽골의 산학연 협력과 국제 협력 기회

Cooperation between Industry-University-Institutes in Mongolia and Global Cooperation Opportunities

BIOGRAPHY

≫ **February 2019 ~ March 2022** : Institutional Strengthening Project for the Implementation of Montreal Protocol in Mongolia by Ozone Secretariat, UNEP– Project staff

≫ **May 2022 ~ March 2023** : Science Park Administration of Mongolia – Project Implementation & Foreign Relations Officer

≫ **March 2023 ~ Present** : Science Park Administration of Mongolia – Chief International Relations and Project Development Officer

Abstract

Cooperation between Industry-University-Institutes in Mongolia and Global Cooperation Opportunities

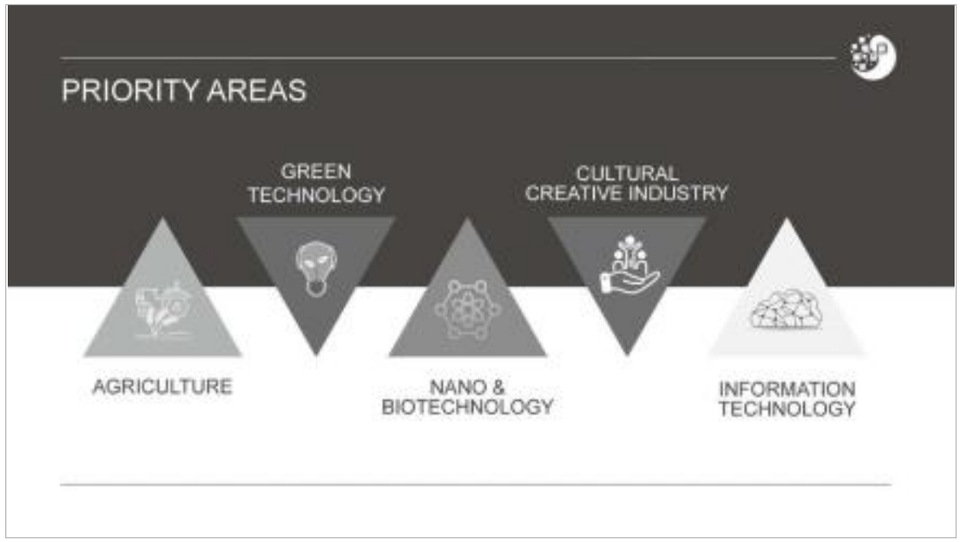
Mongolia has been striving to enhance its science, technology, and innovation and create favorable ecosystem in line with its long-term development policy, Vision-2050. This policy places significant emphasis on the establishment of science parks and innovation tax-free zones, achieved through cooperation among industry, universities, and research institutes. Such collaboration is deemed critical to driving the country's growth and enhancing its competitiveness in the global market. During my presentation, I will discuss the challenges and opportunities associated with industry-university-institute collaboration in Mongolia. Although Mongolia faces challenges like a lack of a collaborative culture and a shortage of skilled human resources, its strategic location, rich natural resources, and increasing global recognition offer opportunities for global cooperation. The Science Park Administration of Mongolia is instrumental in fostering collaboration and regional development by supporting startups, linking innovative ideas with potential partners and investors, and facilitating knowledge sharing among all partners.

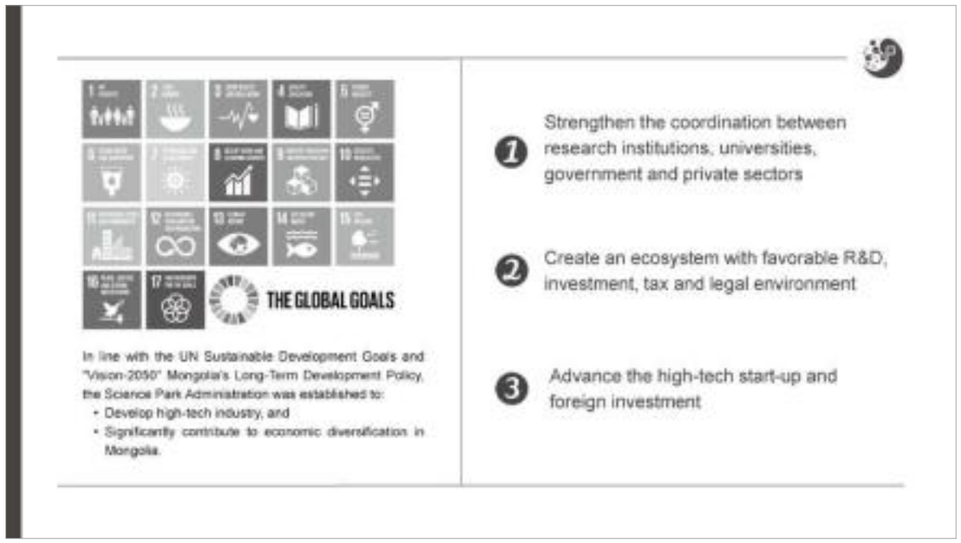
몽골의 산학연 협력과 국제 협력 기회

몽골은 장기 개발 정책인 Vision-2050에 따라 과학, 기술 및 혁신을 강화하고 유리한 생태계를 조성하기 위해 노력해 왔습니다.
이 정책은 산업, 대학 및 연구 기관 간의 협력을 통해 달성되는 사이언스 파크 및 혁신 면세 구역의 설립에 중점을 둡니다.
이러한 협력은 국가의 성장을 견인하고 글로벌 시장에서 경쟁력을 강화하는 데 매우 중요합니다.발표하는 동안 몽골의 산학연 협력과 관련된 도전과 기회에 대해 논의할 것입니다.
몽골은 협력 문화 부족과 숙련된 인적 자원 부족과 같은 도전에 직면해 있지만 전략적 위치, 풍부한 천연 자원, 증가하는 세계적 인지도는 글로벌 협력의 기회를 제공합니다.
몽골 사이언스 파크 행정부는 신생 기업을 지원하고, 혁신적인 아이디어를 잠재적 파트너 및 투자자와 연결하고, 모든 파트너 간의 지식 공유를 촉진하여 협력 및 지역 개발을 촉진하는 데 중요한 역할을 합니다.

SPIF2023
MONGOLIAN SCIENCE PARK ADMINISTRATION
Industry-University-Institute Partnerships

SCIENCE, TECHNOLOGY AND INNOVATION
EMPLOYMENT AND START-UP BUSINESS
COMPETITIVE BRAND PRODUCTS
VISION 2050
MONGOLIA


PRIORITY AREAS
GREEN TECHNOLOGY
CULTURAL CREATIVE INDUSTRY
AGRICULTURE
NANO & BIOTECHNOLOGY
INFORMATION TECHNOLOGY


THE GLOBAL GOALS
In line with the UN Sustainable Development Goals and "Vision-2050" Mongolia's Long-Term Development Policy, the Science Park Administration was established to:
• Develop high-tech industry, and
• Significantly contribute to economic diversification in Mongolia.
1 Strengthen the coordination between research institutions, universities, government and private sectors
2 Create an ecosystem with favorable R&D, investment, tax and legal environment
3 Advance the high-tech start-up and foreign investment

DEVELOPMENT PLANNING

- ✓ **Management Team**

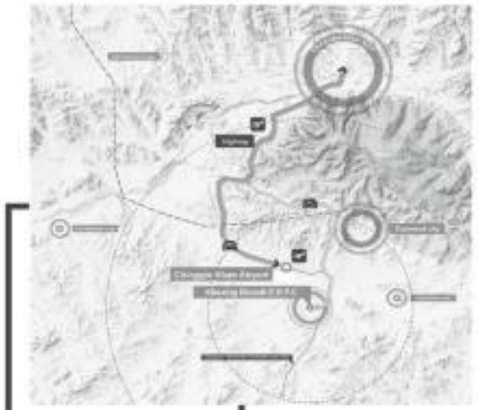
  Management team of the administration incorporating different activities, from strategic planning to coordination of various stakeholders.

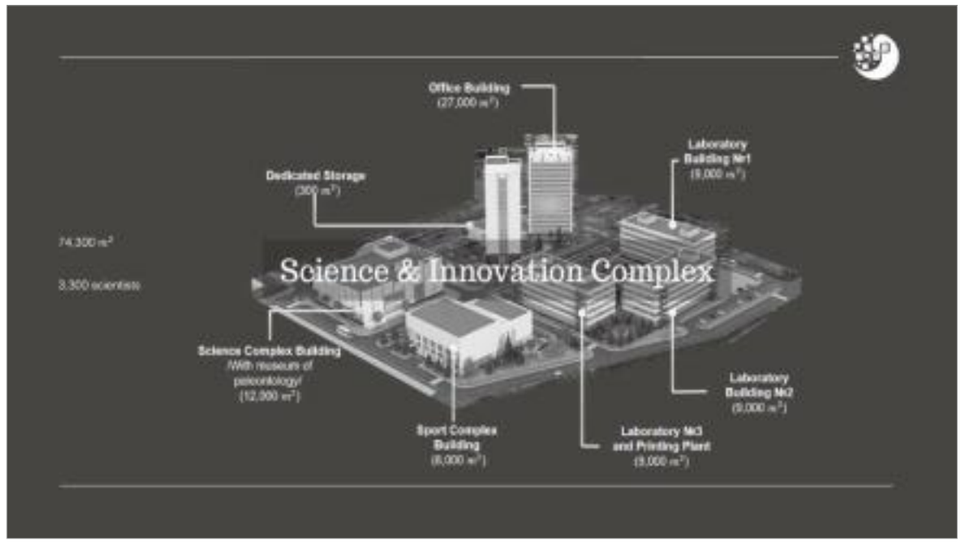
- ✓ **Science and Innovation Complex**

  Being planned to cover around 4.5 hectares of land composed of various purpose buildings including national research institutes

- ✓ **Science Park Area of the Khushig Khundii E.R.P.C**

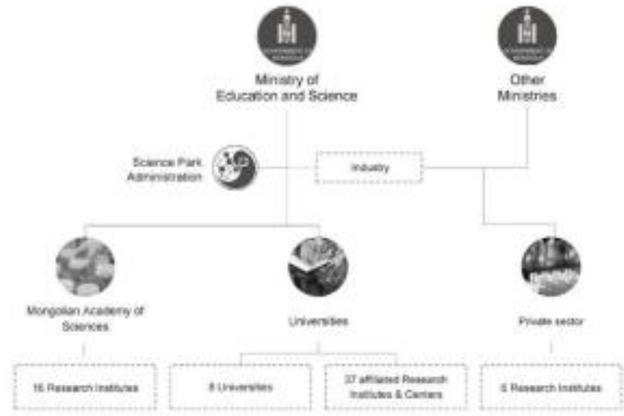
  An area of science park in the "Education-Research-Industry Complex" will be composed of innovation center, laboratories, incubation center and R&D center with the total area of 65 hectares land.

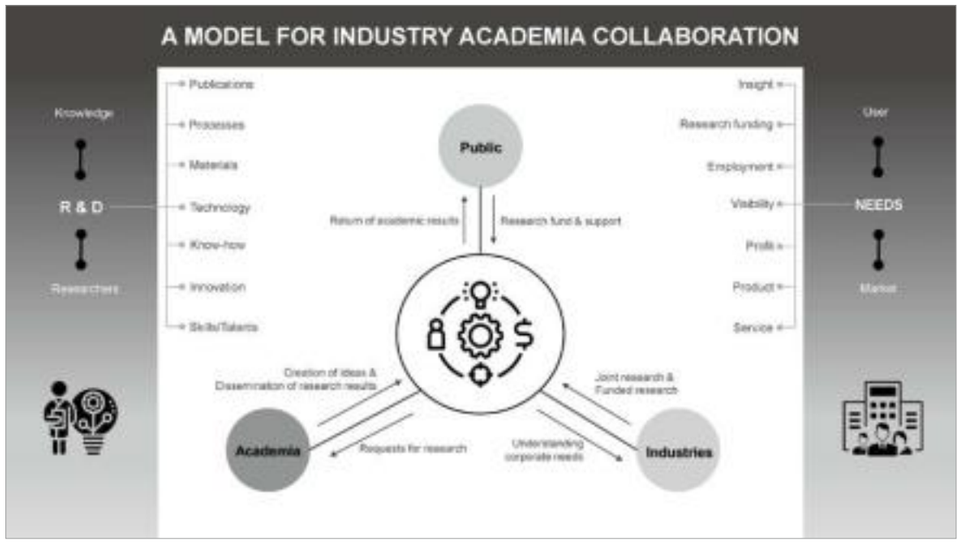


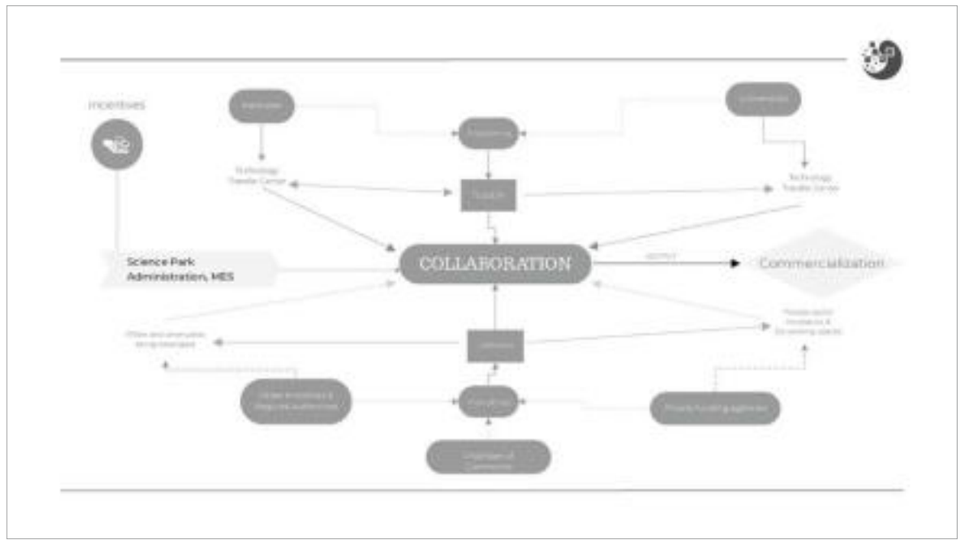


Creating enabling environment for a partnership between state-science-production and business underpinned by a multi-source financing system of research, development and innovation in order to use knowledge as an economic asset.

Vision 2050






Incentives
COLLABORATION
Science Park
Administration, MES
Commercialization

IT PARK
INNOVATION
HUB
INNOVATION &
TECHNOLOGY
TRANSFER
CENTER OF NUM
INNOVATION &
TECHNOLOGY
TRANSFER
CENTER OF MUST
State related & University's Innovation Hub & Technology Transfer Centers

M-STARS HUB
SOCRATUS
STARTUP
STUDIO
INNO
hub
INNO
HUB
Private sector Incubation & Co-working Spaces

TAX INCENTIVES
Corporate
income tax
exemption
VAT
exemption
Customs duty
exemption

INITIATIVES AND SUPPORTS OF SCIENCE PARK ADMINISTRATION

Supporting startups and fostering entrepreneurial culture

Providing resources and guidance to help startups succeed

Development of the Law on Legal Status of Science Park

Creating opportunities for collaboration and investment

Facilitating knowledge sharing and collaboration among all partners

Encouraging communication and exchange of ideas

The Science Park Administration provides a range of initiatives and support to help foster innovation, collaboration, and entrepreneurship.

Thank you for your attention!

CONTACT US

Peace Avenue, Ulaanbaatar 13330, Mongolia

+976-51-265256

info@sciencepark.gov.mn

Global Cooperation Opportunities

- Knowledge and Skills Exchange
- Tax exemptions for foreign start-ups
- Mongolia's strategic location as a gateway between Europe and Asia

SPEAKER

Sciencepark Forum 2 (Gyeongbuk TP Session) - Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region

Koredianto Usman

Director of Bandung Techno Park

창업촉진을 통해 실업률 해결을 위한 테크노파크의 역할

The Role of Technopark for the Micro and Small Scale Entreprises to Reduce Unemployability.

BIOGRAPHY

≫ **2019 ~ 2022** : Deputy Dean of Resources of the Faculty of Engineering, Electrical Engineering, Telkom University

≫ **March 2022 ~ Present** : Director of Bandung TechnoPark

Abstract

The Role of Technopark for the Micro and Small Scale Entreprises to Reduce Unemployability.

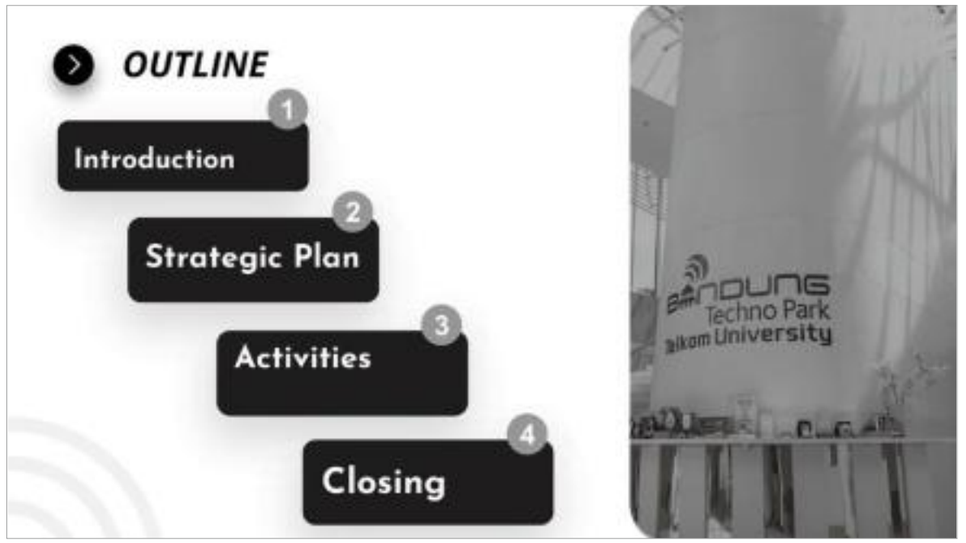
In West Java Region, Indonesia, one of the main social problems is high umemployability rate. Unemployability is due to the high rate of high school and university graduates are much higher than the available working place provided by industry. To reduce unemployability, Indonesia government, through Ministry of Labour, has created training to improve the skill of high school and university in entrepreneurship, especially to create a micro and small business. There are a lot of possible problems that can be solved using innovation in micro and small business in various fields, such as agriculture support business, food and culinary business, environment-related and so on. It is in the creation of micro and small business that the Techno Park has the role boost and incubates this newborn business and start up. Several examples of businesses that help Bandung Technopark to grow are, for example: Payuoge (micro and small business finance management), Smash-ID (waste management), and so on. As the number of unemployable people is high in East Java Province, then more and large-scale entrepreneurships are necessary to be cultivated in the future.

창업촉진을 통해 실업률 해결을 위한 테크노파크의 역할

인도네시아 서부 자바 지역의 주요 사회 문제 중 하나는 높은 실업률입니다. 실업률은 높은 고등학교 졸업률과 대학 졸업자의 비율이 산업계에서 제공하는 일자리보다 훨씬 높기 때문입니다. 실업률을 줄이기 위해 인도네시아 정부는 노동부를 통해 특히 초소형 기업을 만들기 위해 고등학교와 대학의 기업가 정신을 향상시키는 훈련을 만들었습니다. 농업지원사업, 식품외식사업, 환경관련 등 다양한 분야에서 영세 소기업의 혁신을 통해 해결할 수 있는 문제가 많습니다. 테크노파크가 이 신생기업과 스타트업을 인큐베이팅하는 역할을 하고 있는 것은 중소기업 창출에 있습니다. Bandung Technopark의 성장을 돕는 비즈니스의 몇 가지 예는 예를 들어 Payuoge(소규모 비즈니스 재무 관리), Smash-ID(폐기물 관리) 등입니다. 동 자바지역의 실업자 수가 많기 때문에 향후 더 많은 대규모 기업가 정신을 배양해야 합니다.

SPIF2023
Telkom University
The Role of Bandung Techno Park to Reduce Unemployability Rate in West Java by Promoting Micro and Small-scale Enterprises
Dr. Koredianto Usman
Director of Bandung Techno Park
"Initiating The Future"
btp.telkomuniversity.ac.id

Bandung Techno Park Telkom University


OUTLINE
1 Introduction
2 Strategic Plan
3 Activities
4 Closing
Bandung Techno Park Telkom University

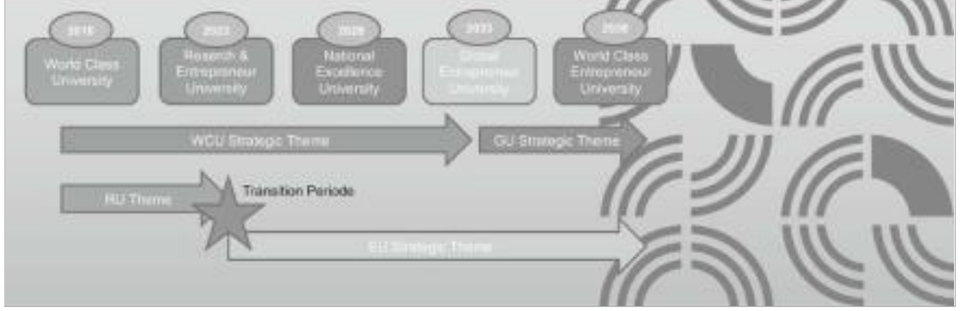
Introduction

Foundation for Three Strategic Goals (2023):
1. Invest in People
2. Digital Transformation
3. Sustainable Growth

Introduction

Bandung Techno Park

Telkom University Vision and Mission



Tel-U Entrepreneurial Target

Main

1
- *Start-up representative from every faculty*
- Number of start-up and spin-off
- Property Right improvement
- Commercialization

Additional

2
- Serving Tel-U internal business through innovation and internal start-ups

Long term target

3
- Entrepreneurship become habit in TelU and Alumni

Specific challenges and problems

Item	Estimated Val*
Yearly High School Graduation	5 million
Yearly university admittance	2,4 million
Number of unemployement (2022)	8.4 million
West Java unemployment rate (contribute to national unemployement)	8,3%

* **Source**: BPS-Biro Pusat Statistik, 2022

Bandung Techno Park

Strategic Plan.

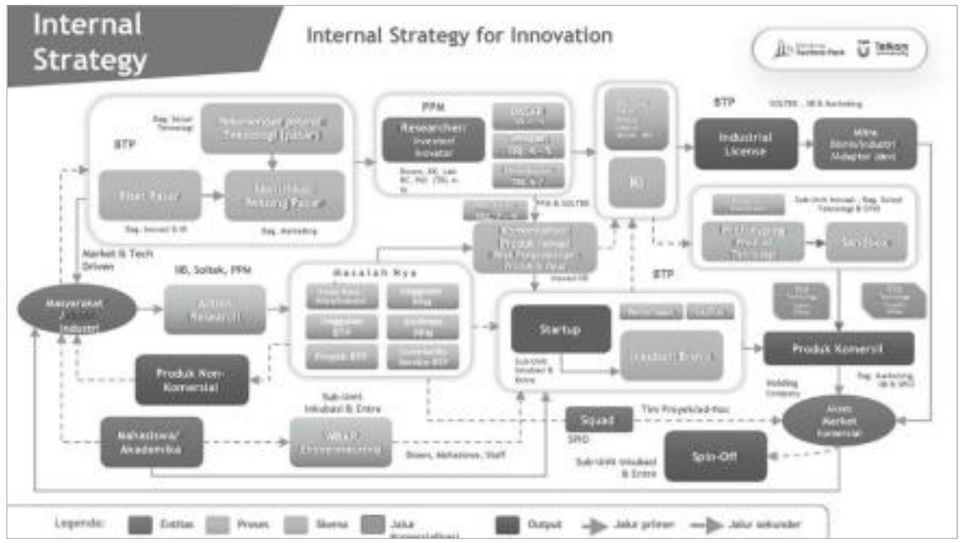
1. Internal Collaboration with Tel-U internal directorate (PPM and SDGs)
2. Partnerships
3. Pioneering in related innovation and product
4. Collaboration with related government ministry (specifically: Kemenperin, Kemenkop, Kemenaker)

Partnership

2015-2022

Partner	Scale	Start	End	No MoU
MDI Ventures (Indonesia, Singapore & US)	Global	2022	*On review*	*On review*
Innovation Factory (Block71)	Global	2022	2025	063/SAM3/BTP/2021
PT Logicom Integrasi Teknologi	National	2022	2025	073/SAM4/BTP/2022
9Sky Ventures	Global	2022	2026	050/SAM3/BTP/2022
Badan Kepegawaian Negara	National	2021	2024	006/SAM3/KST/2021
Cluj IT Cluster	Global	2021	2024	076/SAM3/BTP/2021
PT. Sucofindo Advisory Utama	National	2020	2025	034/SAM3/BTP/2020
PT. Kertas Padalarang	National	2020	2024	097/SAM3/BTP/2020
Balai Besar Pengembangan Pasar Kerja dan perluasan Kesempatan Dirjen Pembinaan Penempatan Tenaga Kerja dan Perluasan Kesempatan Kerja Kemen Ketenagakerjaan Rep Indonesia	National	2020	2024	121/SAM3/BTP/2020
PT. Inovasi Edukasi Bangsa	National	2019	2024	23/CEO-MRK/SCL/III/2019
Universitas Islam Negeri Sulthan Thaha Saifuddin Jambi	National	2018	2023	030/SAM3/BTP/2018

Internal Strategy

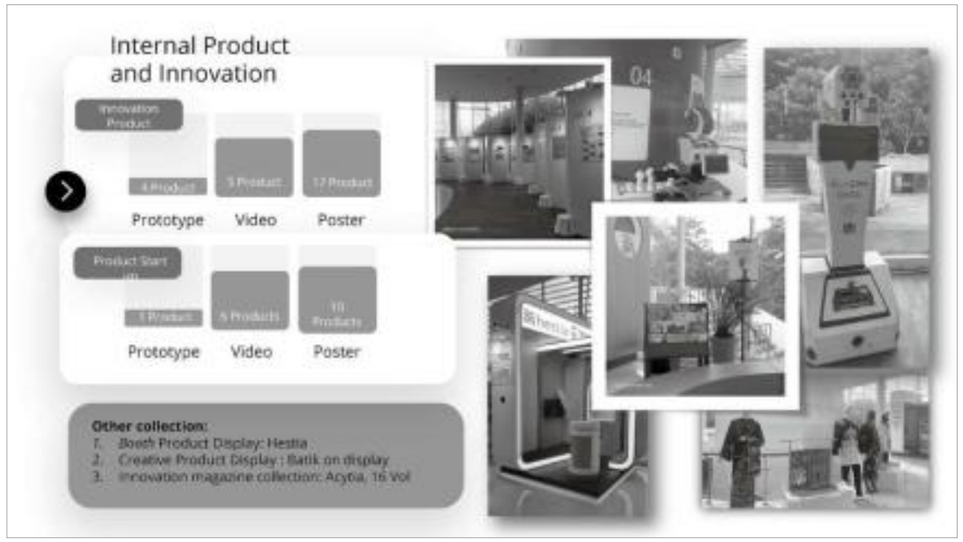


BTP Partners

MoA

2015-2025

Partner	Scale	Classification	Period
Asia Pasific University	Global	Educational Institution	2022 - 2025
PT Logicom Integrasi Teknologi	National	Private	2022 - 2025
Cluj IT Cluster	Global	Private	2021 - 2021

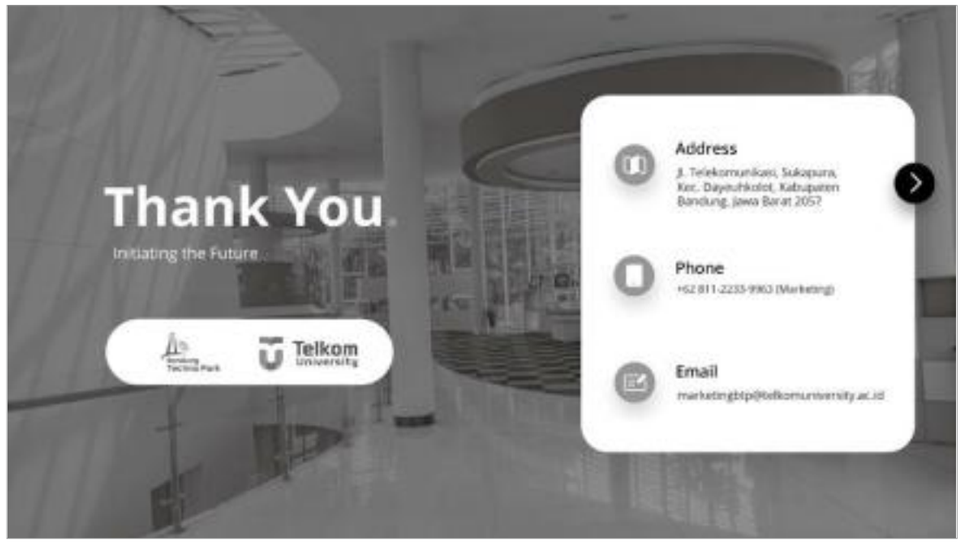

Internal Product
and Innovation
Innovation Product
Prototype
Video
Poster
Product Start up
Prototype
Video
Poster
Other collection:
1. Booth Product Display: Hestia
2. Creative Product Display : Batik on display
3. Innovation magazine collection: Acyba, 16 Vol

Bandung Techno Park
Activities
Strengthening local enterprise in waste management
Incinerator product, by local small entreprise, incubated by BTP

Bandung Techno Park
Hai Mentor
Start Up Incubation
Startup: Hai Mentor
Members:
Eva Dwi Astuti (Founder/CEO)
Fauzan Azima Putra (Co-Founder/CMO)
Ari Yustia Saputra (Fullstack Developer)
Erlangga Mandela Pratama Nesta (UI/UX Designer)
Bayu Octaviandy Muslim (Content Creator
Seilo.
Startup: Natural Me
Members:
Arifian Tri Lakeita (CEO)
Ratih Rachmatika (CBDO)
Vemen Nadhifa Sukma (CPO)
Wahyu Kurniawan (CTO)
Finsiana Istiqomah (CMO)
NATURAL ME
Startup: Sportgather
Members:
Usein Akbar (CEO)
Kemal Aziz (COO)
Ranggo Leomana (CDO)
Muhammad Rafli Ramadhan (CTO)
SPORT GATHER
PAYUOGE
Startup Afasleam
Startup: Creducent
Members:
Benedicta Bulanbulan (CEO)
Fathan Zain Hardianto (CTO)
Muhammad Fauzi Uada (Co-CTO)
Putri Ryassani (CFO)
CREDUCENT
eazy
Startup: Merempah Indonesia
Members:
Nadiya Fitriana (Founder)
Awdia Hana' Qatrunnada Salsabila (Co-Founder)
merempah

Bandung Techno Park
Activities
Waste Management Products
Incinerator product, by local small entreprise, incubated by BTP

Activities
Bandung Techno Park
Traino, training platform for Job seekers


Thank You
Initiating the Future
Telkom University
Address
Jl. Telekomunikasi, Sukapura, Kec. Dayeuhkolot, Kabupaten Bandung, Jawa Barat 2057
Phone
+62 811-2233-9963 (Marketing)
Email

MEMO

SPEAKER

Sciencepark Forum 2 (Gyeongbuk TP Session) - Global Cooperation between Industry, Academies, Research Institutes and Governments in the Region

Abdulahad Kuchkarov

First Deputy Director of IT Park Uzbekistan

우즈베키스탄 – 중앙아시아 IT 허브
Uzbekistan - IT Hub of Central Asia

BIOGRAPHY

IT-Park was initated by the order of the President of Uzbekistan with the aim to further develop IT and Startup ecosystem in the region. Mr.Kuchkarov has been a crucial member of ITpark team since the very start, 2019. First as a COO and now the First Deputy Director. Mr.Kuchkarov is a Member Board of Directors at Khan Academy Uzbek since2019. Prior to IT Park, 2017-2019,Mr.Kuchkarov was Chief Executive Officer at Groundzero Co-working center, where he scaled up the co-working network from 1 to 5 in Tashkent. And between 2013 and 2017, He acted as Business Courses Coordinator at Uzbekistan-Japan Center.

Abstract

Uzbekistan - IT Hub of Central Asia

On November 20, 2019, the President of the Republic of Uzbekistan, Shavkat Mirziyoyev laid a symbolic capsule in a stone and began a new stage of construction of the technology park.

The global mission of IT Park is to become the biggest Central Asian IT Hub that supports the development of innovative projects, facilitates international IT integration, releases breakthrough IT companies, and trains a critical mass of young and talented IT specialists. IT Park unites and develops the IT ecosystem of Uzbekistan and operates in five areas, such as:

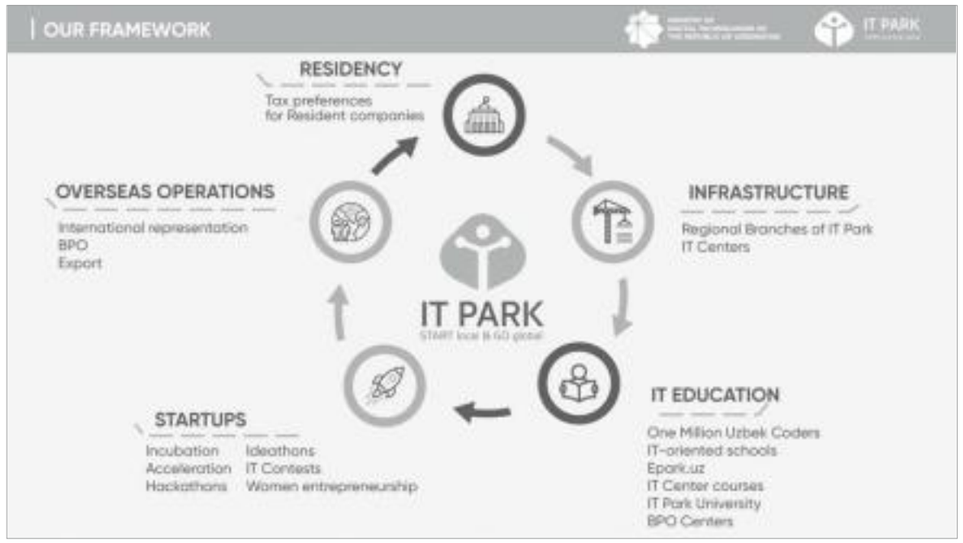
≫ RESIDENCY that provides Tax Preferences to 1300+ IT and BPO companies. 0% Corporate tax and relocation program benefits.
≫ INFRASTRUCTURE of brand-new IT cluster with area of 6.3 hectars. As well as 14 branches, 205 IT centers across Uzbekistan.
≫ IT EDUCATION online and offline programs with more than a million graduates. Collaborations with universities and international organizations. Launch of the first digital university in Central Asia- IT Park University.
≫ STARTUP ecosystem development programs and challenges. Incubation Centers, Corporate Accelerators, Venture Funds.-INTERNATIONAL ACTIVITIES that connect IT Park with 40+ International partners.Foreign representative offices in Germany and the USA, Collaboration with International/foreign organizations.

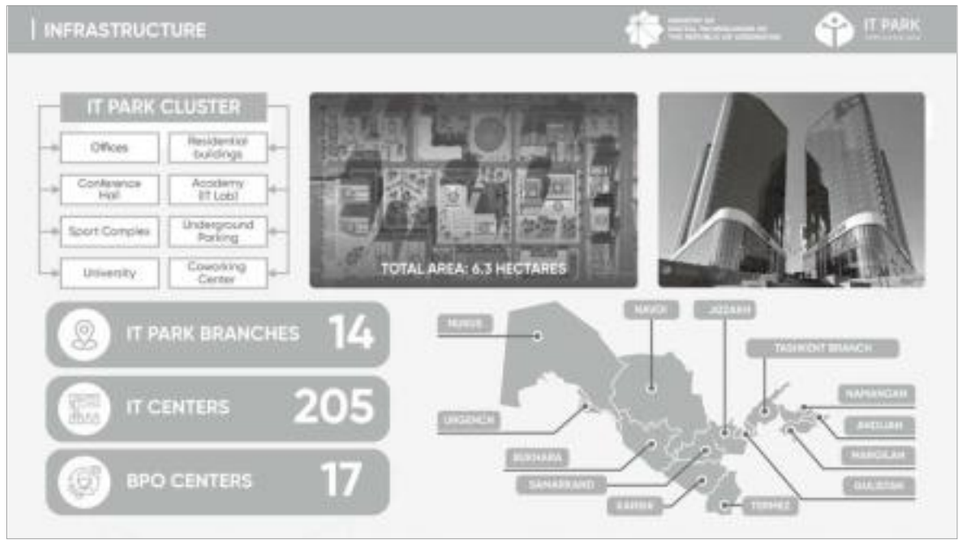
우즈베키스탄 – 중앙아시아 IT 허브

2019년 11월 20일, Shavkat Mirziyoyev 우즈베키스탄 공화국 대통령은 돌에 상징적인 캡슐을 놓고 기술 단지 건설의 새로운 단계를 시작했습니다.
IT Park의 글로벌 사명은 혁신적인 프로젝트 개발을 지원하고, 국제 IT 통합을 촉진하고, 획기적인 IT 회사를 출시하고, 젊고 재능 있는 IT 전문가를 양성하는 가장 큰 중앙아시아 IT 허브가 되는 것입니다. IT Park는 우즈베키스탄의 IT 생태계를 통합하고 개발하며 다음과 같은 5개 영역에서 운영됩니다.

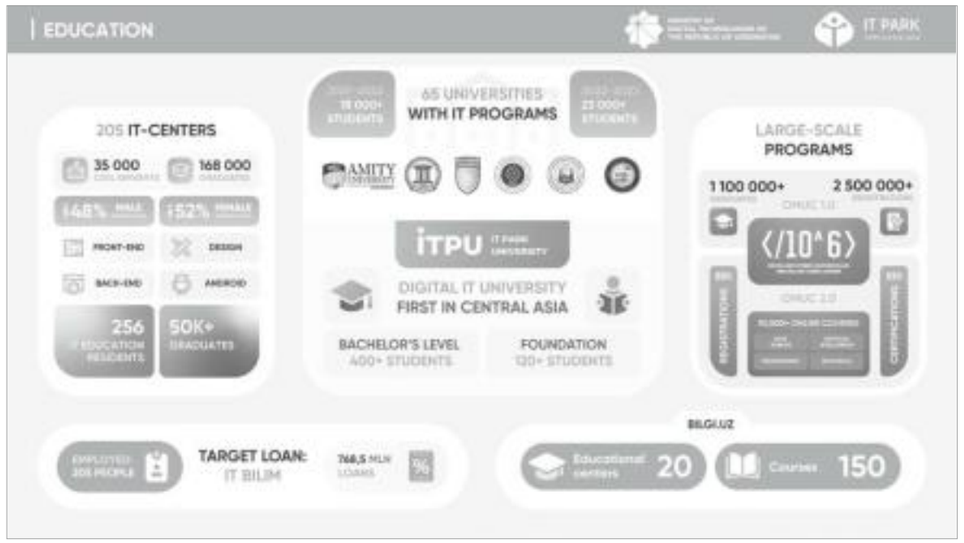
≫ 1300개 이상의 IT 및 BPO 회사에 세금 특혜를 제공하는 거주지. 0% 법인세 및 재배치 프로그램 혜택.
≫ 6.3헥타르 면적의 새로운 IT 클러스터 인프라.우즈베키스탄 전역에 14개의 지사, 205개의 IT 센터가 있습니다.
≫ 100만 명 이상의 졸업생이 있는 IT EDUCATION 온라인 및 오프라인 프로그램.대학 및 국제기구와의 협력. 중앙아시아 최초의 디지털 대학인 IT Park University 출범.
≫ STARTUP 생태계 개발 프로그램 및 과제.인큐베이션 센터, 기업 액셀러레이터, 벤처 펀드.
≫ IT Park를 40개 이상의 국제 파트너와 연결하는 국제 활동. 독일 및 미국의 외국 대표 사무소, 국제/외국 기관과의 협력.

IT PARK
UZBEKISTAN – THE NEW IT HUB OF CENTRAL ASIA

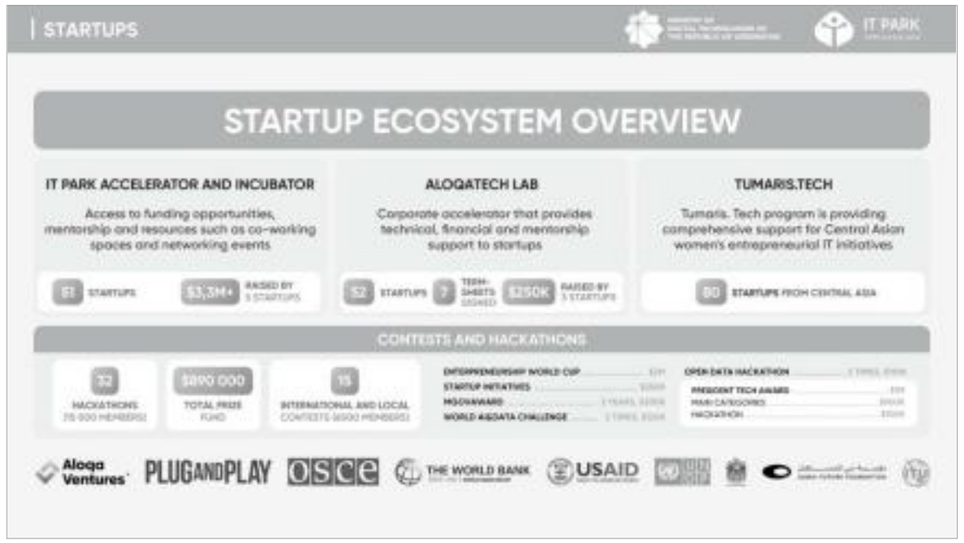

OUR FRAMEWORK
IT PARK
RESIDENCY
Tax preferences for Resident companies
INFRASTRUCTURE
Regional Branches of IT Park
IT Centers
IT EDUCATION
One Million Uzbek Coders
IT-oriented schools
Epark.uz
IT Center courses
IT Park University
BPO Centers
STARTUPS
Incubation
Acceleration
Hackathons
Ideathons
IT Contests
Women entrepreneurship
OVERSEAS OPERATIONS
International representation
BPO
Export
IT PARK


INFRASTRUCTURE
IT PARK
IT PARK CLUSTER
Offices
Residential buildings
Conference Hall
Academy (IT Lab)
Sport Complex
Underground Parking
University
Coworking Center
TOTAL AREA: 6.3 HECTARES
IT PARK BRANCHES 14
IT CENTERS 205
BPO CENTERS 17

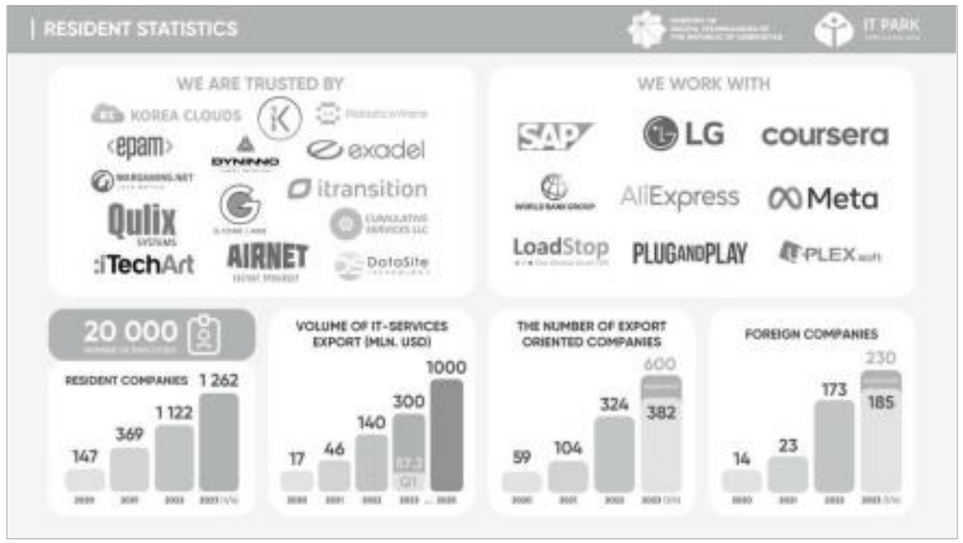
EXPLORE UZBEKISTAN
IT PARK
36+ MLN
The population in the Republic of Uzbekistan is close to the number of all Central Asian countries combined.
19,3 mln
6,5 mln
6,2 mln
10 mln
GDP growth rate: 5,7 % (2022)
Cost of living: 4th most affordable city in the world (Tashkent)
Safety Ranking: 9th in the world
Internet cost: 15th lowest in the world
Internet coverage: 99%
AVERAGE AGE 29 Y.O
LABOUR FORCE 20 mln
FOREIGN UNIVERSITIES 36
IT UNIVERSITIES 65
ANNUAL GRADUATES 120k+
ANNUAL GRADUATES IN IT 25k+
ENGLISH SPEAKERS 5+ mln
KOREAN SPEAKERS 310k+


EDUCATION
IT PARK
205 IT-CENTERS
35 000
168 000
+48% MALE
+52% FEMALE
FRONT-END
DESIGN
BACK-END
ANDROID
256
EDUCATION RESIDENTS
50K+
GRADUATES
65 UNIVERSITIES
WITH IT PROGRAMS
AMITY UNIVERSITY
ITPU
DIGITAL IT UNIVERSITY
FIRST IN CENTRAL ASIA
BACHELOR'S LEVEL
400+ STUDENTS
FOUNDATION
120+ STUDENTS
LARGE-SCALE
PROGRAMS
1 100 000+
2 500 000+
ONLINE 2.0
REGISTRATIONS
CERTIFICATIONS
TARGET LOAN:
IT BILIM
BILGI.UZ
Educational centers 20
Courses 150

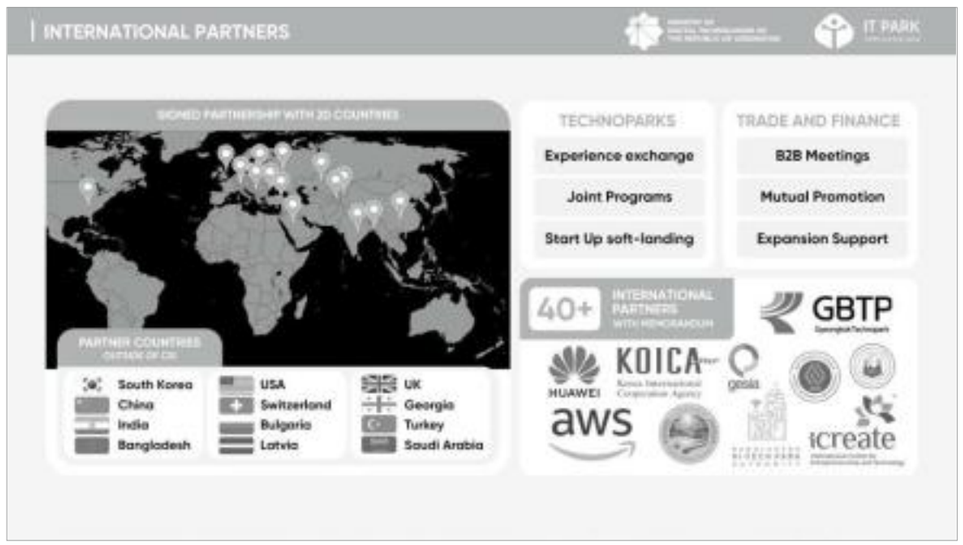
STARTUPS
IT PARK
STAGES OF STARTUPS IN PROGRAMS
PRE-SEED
SEED
$17M
TOTAL FUND RAISED BY GRADUATES OF PROGRAMS
INCUBATOR IN UNIVERSITIES: 42
INFRA-STRUCTURE
INCUBATION PROGRAMS
CONTESTS AND WORKSHOPS
AVERAGE START UP
AGE OF FOUNDERS
AVERAGE TEAM SIZE
VENTURE CAPITAL
5 LOCAL FUNDS
TOTAL CAPITAL – $43.5M
Aloqa Ventures
UzVC
Sturgeon Capital
UZCARD VENTURES
semurg.vc
PROSPECTIVE STARTUPS FROM UZBEKISTAN
IMAN
TASS VISION
zip24
BILLZ
ArzonApteka
sug'urta bozor


STARTUPS
IT PARK
STARTUP ECOSYSTEM OVERVIEW
IT PARK ACCELERATOR AND INCUBATOR
Access to funding opportunities, mentorship and resources such as co-working spaces and networking events
61 STARTUPS
$3,3M+ RAISED BY 5 STARTUPS
ALOQATECH LAB
Corporate accelerator that provides technical, financial and mentorship support to startups
52 STARTUPS
7 TECH-SHEETS LOADED
$250K RAISED BY 1 STARTUPS
TUMARIS.TECH
Tumaris. Tech program is providing comprehensive support for Central Asian women's entrepreneurial IT initiatives
80 STARTUPS FROM CENTRAL ASIA
CONTESTS AND HACKATHONS
32 HACKATHONS (15 000 MEMBERS)
$890 000 TOTAL PRIZE FUND
15 INTERNATIONAL AND LOCAL CONTESTS (6500 MEMBERS)
ENTREPRENEURSHIP WORLD CUP
STARTUP INITIATIVES
MOONWARD
WORLD 4@DATA CHALLENGE
OPEN DATA HACKATHON
PRESIDENT TECH AWARD
MAIN CATEGORIES
HACKATHON
Aloqa Ventures
PLUG AND PLAY
OSCE
THE WORLD BANK
USAID

RESIDENT PREFERENCES
IT PARK
PREFERENCES FOR FOREIGN COMPANIES
RELOCATION
NO WORK PERMIT REQUIRED
IT VISA FOR INVESTORS, IT SPECIALISTS, FOUNDERS
IT VISA IS VALID FOR UP TO 3 YEARS
WORKPLACE
OFFICE BUILDINGS
COWORKING CENTERS
VIRTUAL OFFICES
ONE STOP SHOP
REGISTRATION OF A LEGAL ENTITY
OPENING A BANK ACCOUNT
REGISTRATION WITH THE TAX AUTHORITIES
TAX PREFERENCES
RESIDENTS OF IT PARK
NON-RESIDENTS
7.5% Personal Income Taxes 12%
0% Corporate Taxes 5-10%
0% Social Tax 12%
NO Imported Goods VAT YES


RESIDENT STATISTICS
IT PARK
WE ARE TRUSTED BY
KOREA CLOUDS
epam
exadel
itransition
Qulix SYSTEMS
iTechArt
AIRNET
DataSite
WE WORK WITH
SAP
LG
coursera
AliExpress
Meta
LoadStop
PLUGANDPLAY
PLEXsoft
20 000
RESIDENT COMPANIES
147
369
1 122
1 262
VOLUME OF IT-SERVICES EXPORT (MLN. USD)
17
46
140
300
1000
THE NUMBER OF EXPORT ORIENTED COMPANIES
59
104
324
382
600
FOREIGN COMPANIES
14
23
173
185
230

IT PARK
UZBEKISTAN
WELCOME
TO UZBEKISTAN
IT PARK


INTERNATIONAL PARTNERS
IT PARK
SIGNED PARTNERSHIP WITH 20 COUNTRIES
PARTNER COUNTRIES
South Korea
China
India
Bangladesh
USA
Switzerland
Bulgaria
Latvia
UK
Georgia
Turkey
Saudi Arabia
TECHNOPARKS
Experience exchange
Joint Programs
Start Up soft-landing
TRADE AND FINANCE
B2B Meetings
Mutual Promotion
Expansion Support
40+
INTERNATIONAL PARTNERS
GBTP
HUAWEI
KOICA
aws
icreate

MEMO

SPIF2023
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