

# Technology Appraisal

**KOTEC (Korea Technology Finance Corporation)**



**KOTEC leads Technology Financing,  
Creating Value through Innovation**



# Technology Appraisal

To evaluate, in a comprehensive manner, the **technology competency, marketability, and business feasibility** related to the technology-based business and to express the results in terms of **opinion, score, rating or monetary value**, etc.

## Essential Tool for Technology Financing

### Technology Financing

Supplying **necessary funds**  
based on **technology appraisal of technologies and ideas with profit potential.**

- Ministerial Committee on Economic Relations (JAN 2004), "Measures to establish technology evaluation system for activating technology financing"

# Credit Rating vs. Technology Appraisal

## Credit Rating

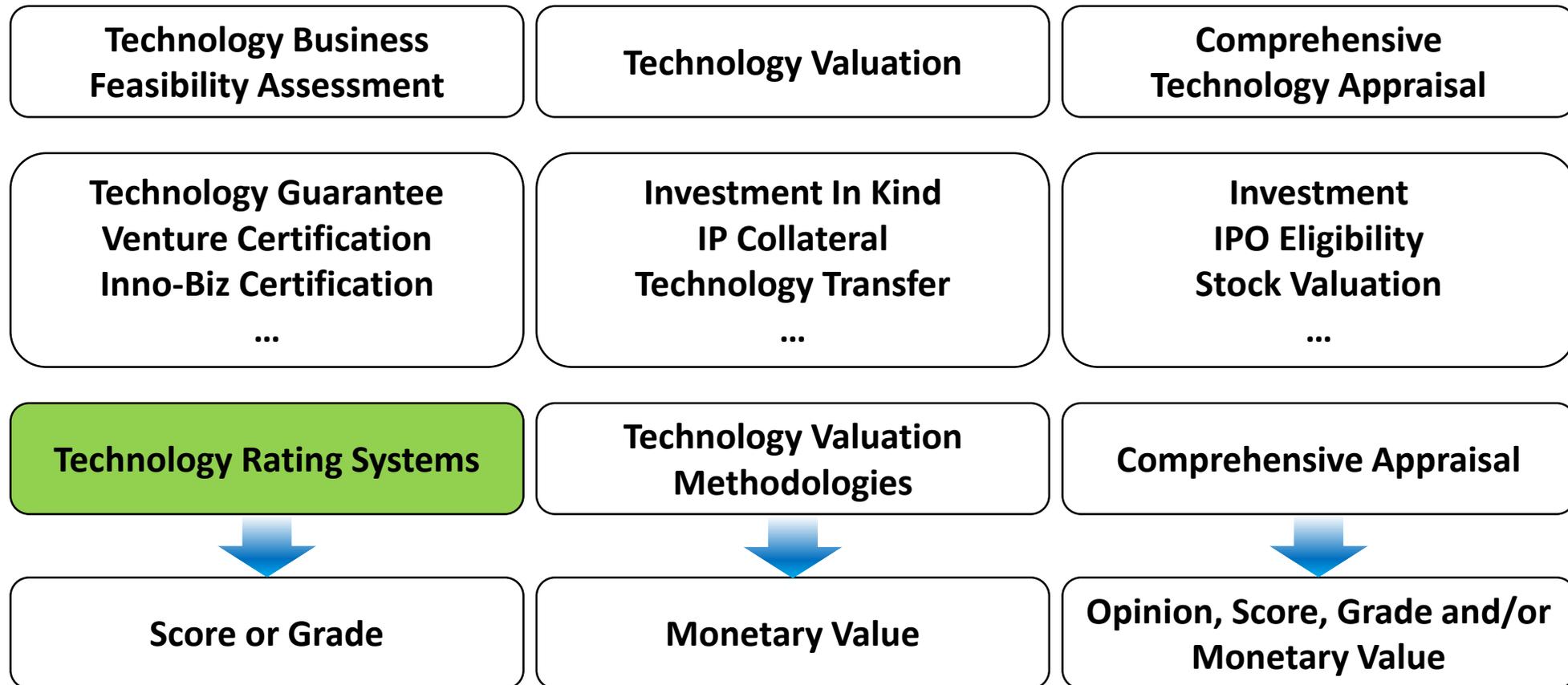
- Evaluates Credit Risk
- Forecasts the Likelihood of Default
- Focuses on Company's Past history  
e.g. Financial Track Records
- Evaluates Tangible Assets
- Financial Measures are dominant
- Suits for Mature Enterprises



## Technology Appraisal

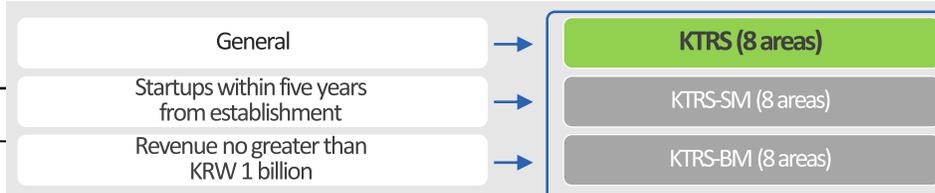
- Evaluates Future Economic Benefits
- Forecasts the Possibility of Successful Technology Commercialization
- Focuses on Company's Future Potential  
e.g. Technology Competency
- Appraises Intangible Assets
- Non-Financial Measures are dominant
- Suits for Startups and Ventures

# Types of Technology Appraisal



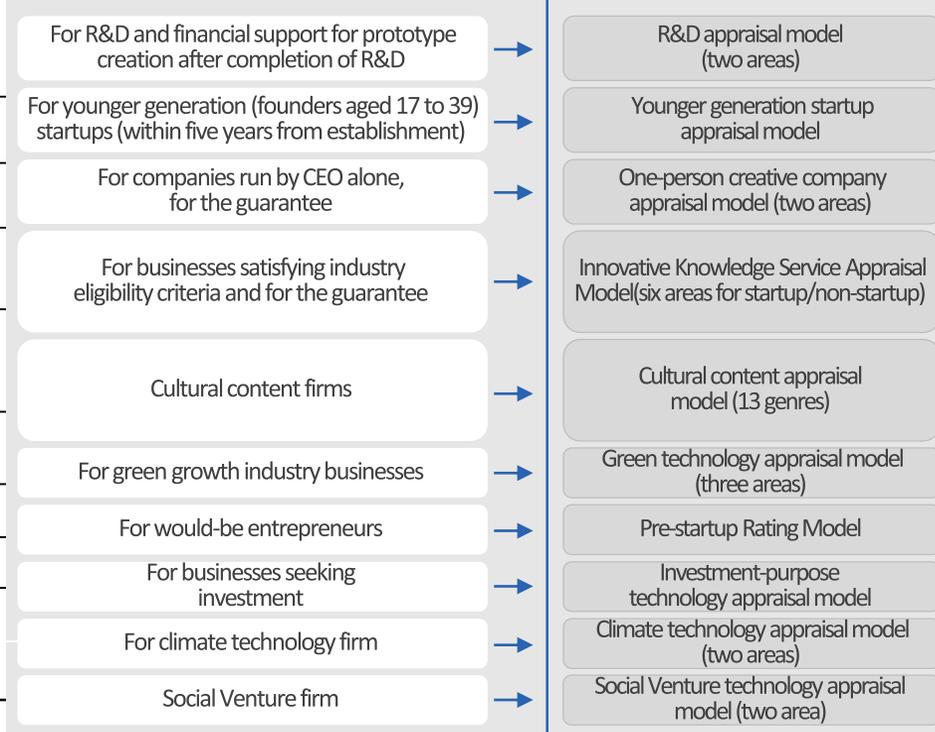
# TECHNOLOGY RATING SYSTEMS

## ● KTRS Series Model



manufacturing	Bio	Environment	SW	Web based	Design	Convergence	IoT
manufacturing	Bio	Environment	SW	Web based	Design	Convergence	IoT
manufacturing	Bio	Environment	SW	Web based	Design	Convergence	IoT

## ● Policy-purpose Model



For R&D company appraisal			For R&D task appraisal				
All business category							
Technology-based companies				knowledge-based companies			
Startup	R&D (engineering)	R&D (liberal arts)	Advertisement development	Security system	Medical	Education	
Non startup	R&D (engineering)	R&D (liberal arts)	Advertisement development	Security system	Medical	Education	
Theater, Film	Drama	Online games	Mobile games	TV animation	Musical performance		
Character business		Other game	Other movie/animations	Other performance	Music		
Energy support technology		High-efficiency technology		Eco-friendly production, and post processing technology			
All business category							
General companies		Startup, Post-commercialization			Startup, Pre-commercialization		
Manufacturing technology				IT			
Manufacturing technology				Others			



# Technology Business Feasibility Assessment: KIBO Technology Rating System

기술금융의 Global Leader

Korea Technology Finance Corporation

도전하는 기술기업의 Partner,

# KTRS (KIBO Technology Rating System)

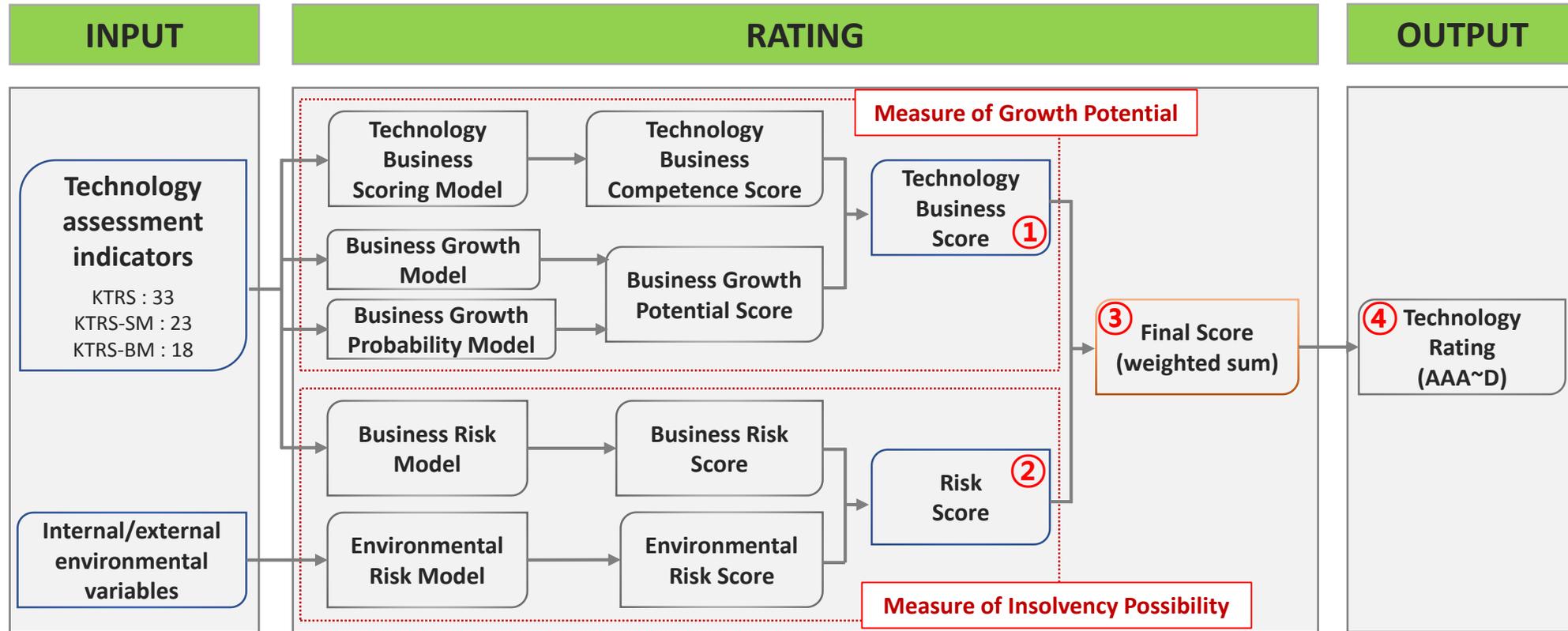
## Overview

- ✓ Systematic Tool for Evaluating Commercial Viability and Risks associated with a Technology Business
- ✓ Produces Technology Rating, which serves as an input to the decision-making process
- ✓ Provides Technology Appraisal Report, which contains the rationales for the technology rating

## Key Features

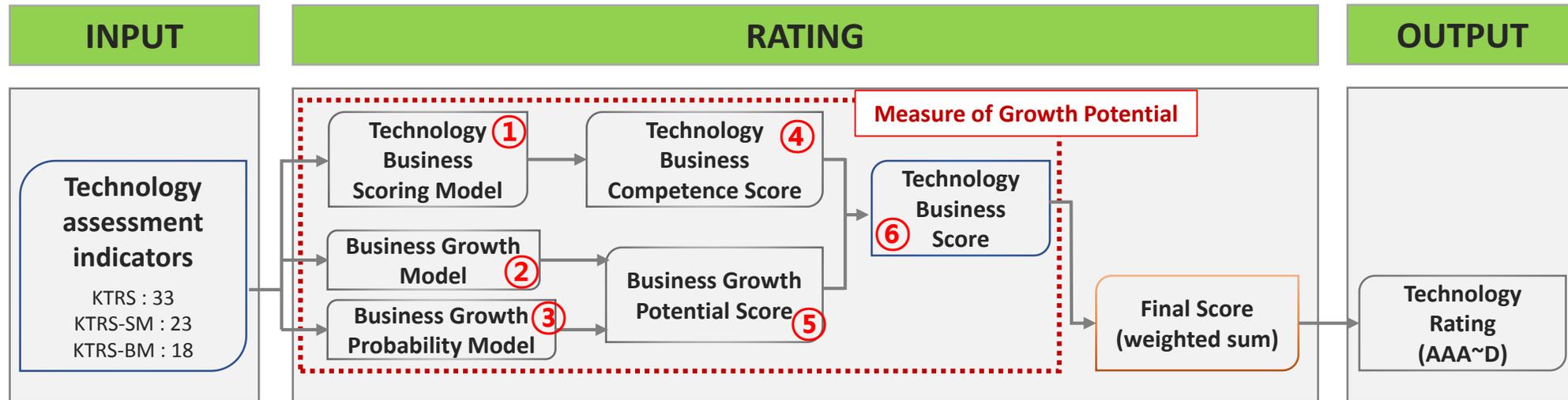
- ✓ Structured Methodology
- ✓ Data-driven Approach
- ✓ Balanced quantitative and qualitative indicators
- ✓ Designed for Efficiency and Consistency

# Structure of KTRS



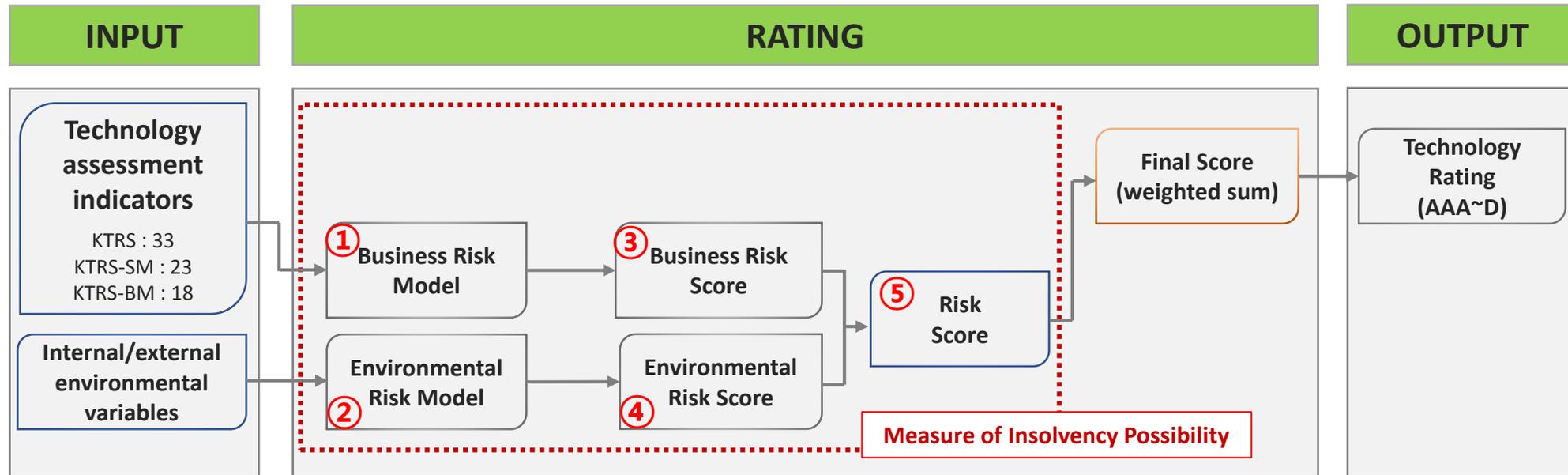
- ✓ ③ Final Score and ④ Technology Rating are calculated by weighting ① Technology Business Score, which measures growth potential, ② Risk Score, which measures the possibility of insolvency.

# Structure of KTRS: Measure of Growth Potential



- ① Technology Business Scoring Model: **Scoring Model** based on **assessment indicators** with **AHP weights**.
- ② Business Growth Model (multiple regression analysis):  
**Statistical Model** based on “**assessment indicators** → **estimated sales**”
- ③ Business Growth Probability Model (logit model):  
**Statistical Model** based on “**assessment indicators** → **sales growth, net income**”

# Structure of KTRS: Measure of Insolvency Possibility



① Business Risk Model (logit model):

**Statistical Model** based on “assessment indicators → corporate insolvency”

② Environmental Risk Model (logit model):

**Statistical Model** based on “internal, external environmental variables → corporate insolvency”

# Assessment Indicators of KTRS

CEO Competencies	Technology Competency	Marketability	Business Feasibility
<ul style="list-style-type: none"> <li>• Knowledge Level</li> <li>• Management Capability</li> <li>• Management Structure and Teamwork</li> </ul>	<ul style="list-style-type: none"> <li>• R&amp;D Capability</li> <li>• R&amp;D Status</li> <li>• Innovation Level</li> <li>• Technology Readiness &amp; Scalability</li> </ul>	<ul style="list-style-type: none"> <li>• Market Status</li> <li>• Competition Factors</li> <li>• Competitiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Commercialization Capability</li> <li>• Profit Potential</li> </ul>
<ul style="list-style-type: none"> <li>• Experience in the industry</li> <li>• Technological expertise</li> <li>• Technological understanding</li> <li>• Management of technical employees</li> <li>• Management competency</li> <li>• Technology management strategy</li> <li>• Professional expertise of the management</li> <li>• Capital participation</li> <li>• Teamwork and relationship between CEO and management</li> </ul>	<ul style="list-style-type: none"> <li>• R&amp;D organization</li> <li>• Technology workforce</li> <li>• Technology development achievements &amp; awards</li> <li>• Retention of IPRs</li> <li>• R&amp;D investment</li> <li>• Uniqueness of technology</li> <li>• Difficulty of imitation</li> <li>• Phases in technology life cycle</li> <li>• Commercialization stage of technology</li> <li>• Independence of technology</li> <li>• Ripple effect of technology</li> </ul>	<ul style="list-style-type: none"> <li>• Size of target market</li> <li>• Market growth potential</li> <li>• Competition</li> <li>• Legal factors</li> <li>• Awareness</li> <li>• Market share</li> <li>• Competitive advantage of product(s)</li> </ul>	<ul style="list-style-type: none"> <li>• Production capacity</li> <li>• Appropriateness of investment size</li> <li>• Funding capacity</li> <li>• Marketing capacity</li> <li>• Diversity and stability of markets</li> <li>• Return on investment (ROI) potential</li> </ul>

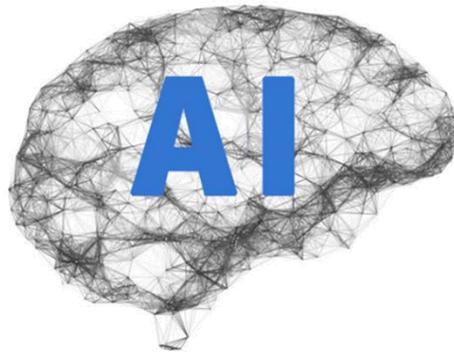
# KIBOT

an artificial intelligence-based autonomous evaluation robot that automatically analyzes technology appraisal big data with artificial intelligence algorithms and automatically predicts the rating for each non-quantitative assessment indicator of KTRS.

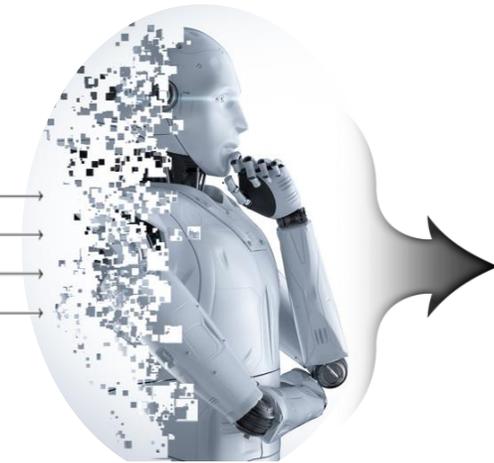
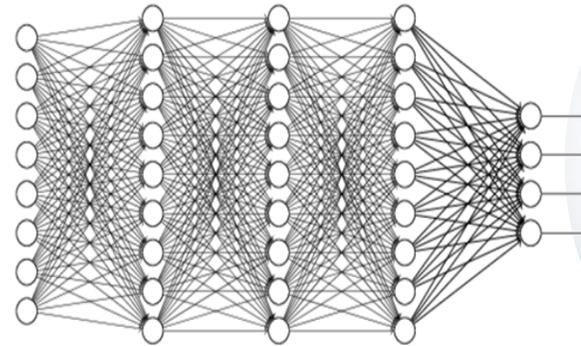
Technology Appraisal

**BIG DATA**

~700k cases accumulated over 20 years



AI (Artificial Intelligence) algorithm (learning evaluation patterns from big data)



KIBOT: AI-based autonomous evaluation system

구분별 (평가대상)	중요도 (중요도)	소속처 (평가대상)	
		분야 (중요도)	등급
기술수준	1.1 기술수준	1.1.1 기술수준평가수준	D
		1.1.2 기술수준평가수준	C
		1.1.3 기술수준평가수준	B
	1.2 관련성	1.2.1 기술수준평가수준	C
		1.2.2 기술수준평가수준	C
		1.2.3 기술수준평가수준	A
기술수준 관련성 및 영향	1.3.1 기술수준평가수준	C	
	1.3.2 기술수준평가수준	C	
	1.3.3 기술수준평가수준	A	
2.1 기술수준추진성	2.1.1 기술수준추진성	A	
	2.1.2 기술수준추진성	D	
	2.1.3 기술수준추진성	C	
2.2 기술수준발전성	2.2.1 기술수준발전성	B	
	2.2.2 기술수준발전성	C	
	2.2.3 기술수준발전성	C	
2.3 기술수준혁신성	2.3.1 기술수준혁신성	B	
	2.3.2 기술수준혁신성	B	
	2.3.3 기술수준혁신성	B	
2.4 기술수준도 및 영향성	2.4.1 기술수준도 및 영향성	A	
	2.4.2 기술수준도 및 영향성	B	
	2.4.3 기술수준도 및 영향성	B	
3.1 시장성	3.1.1 시장성	B	
	3.1.2 시장성	B	
	3.1.3 시장성	B	
3.2 경쟁성	3.2.1 경쟁성	C	
	3.2.2 경쟁성	B	
	3.2.3 경쟁성	B	
3.3 사회적 가치	3.3.1 사회적 가치	B	
	3.3.2 사회적 가치	B	
	3.3.3 사회적 가치	B	

Predicts the rating for each non-metric evaluation indicator



# Globalization of KTRS

## EU IPF (INNO-Partnership Forum)

In 2012, KOTEC's technology rating system also earned recognition from Europe, with its INNO-Partnering Forum (IPF) introducing the system as a "good practice" in a report submitted to the European Commission.

## EIB (European Investment Bank)

In a 2018 EIB report, the KTRS was referred to as a "global best practice"

## Sharing Knowledge on Technology Rating System



**Vietnam**

Vietnam Technology Rating System (2014 – 2016)



**Thailand**

Thailand Technology Rating System (2015 – 2017)



**Peru**

Peru Technology Rating System (2017 – 2018)



**EU**

InnoRate Technology Rating System (2019 – 2021)

