

A.I.



Which **countries** or **companies** in the world have high competitiveness in AI technology?



What is the technology gap between the **China** and **US**?

IBM**FANUC**

What is the technology gap between the **IBM** and **FANUC**?

Learning Intelligence

REPORT



Artificial Intelligence

**Machine Learning
Inference & Knowledge Representation**



AMUR Inc. Seoul, Korea

www.amur.zone

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Seoul, Korea

CONTENTS

Overview
... 7		
Vision
... 7		
Business Information
		8
I. Learning
Intelligence	10
1.
Trend
10		
1)	Statistical	
data.....	10
2)	Trends by	
Technology.....	11
3)	Citation	
Trends.....	12
4)	Market	
Trends.....	13
5)	Activity	
Trends.....	14
2. Countries
Trend	15
1)	Statistical	
data.....	15
2)	Trends by country.....	
16		
China	
16		
The United States.....	
16		

INTEL CORP.....	
<u>24</u>	
UNIVERSITY	
ZHEJIANG.....	<u>24</u>
SAMSUNG ELECTRONICS CO	
LTD.....	<u>25</u>
ETRI.....	
<u>25</u>	
UNIVERSITY	
TSINGHUA.....	<u>26</u>
STATE GRID CORP	
CHINA.....	<u>26</u>
4. Technology Influence.....	
.....	<u>27</u>
1) Global country Ranking.....	
.....	<u>27</u>
2) Citation Index.....	
<u>28</u>	
3) Detailed	
Analysis.....	<u>29</u>
4) Global company	
Ranking.....	<u>31</u>
5) Citation Index.....	
<u>32</u>	
6) Detailed	
Analysis.....	<u>33</u>
5. Market	
Outlook.....	<u>35</u>
1) Global country Ranking.....	
.....	<u>35</u>
2) Market Index.....	
.....	<u>35</u>

The United States.....	53
China.....	
55	
Japan.....	5
7	
Korea.....	
59	
Netherlands.....	
... 61	
France.....	
63	
Canada.....	
65	
Britain.....	
67	
Germany.....	
69	
Switzerland.....	
71	
2) Tech Competitiveness by Country.....	73
3) Strength and Weakness diagnosis by Country.....	73
4) Company Diagnosis.....	71
Microsoft.....	
74	
Microsoft Technology.....	76
IBM.....	
78	
Google.....	
80	
Fanuc	

9. Smart	
Solutions.....	<u>103</u>
1) Country Diagnostic	
Solutions.....	<u>103</u>
United States.....	<u>103</u>
China.....	<u>1</u>
<u>05</u>	
Japan.....	
<u>107</u>	
Korea.....	<u>1</u>
<u>09</u>	
Netherlands.....	
<u>111</u>	
France.....	
<u>113</u>	
Canada.....	
<u>115</u>	
Britain.....	
<u>117</u>	
Germany.....	
<u>119</u>	
Switzerland.....	
<u>121</u>	
2) Company Diagnostic	
Solutions.....	<u>123</u>
Microsoft.....	
<u>123</u>	
Microsoft Technology.....	
<u>125</u>	
IBM.....	
<u>127</u>	
Google.....	
<u>129</u>	

Overview

AMUR

Develops various solutions to analyze information technology for development in an easy, fast, and convenient way. It diagnoses with objective numbers for the technological capacity of 38 countries, 15,000 companies, and 5,000 universities worldwide by applying bid data such as patents and papers.

Now, AMUR takes the lead in enhancing the efficiency of R&D, achieving data-based management innovation through such solutions.

Vision

AMUR, a creative company, creating new values to apply science and technology big data to AI.

Creates new values of science and technology big data, thinking creatively with its differentiated technological skills, know-how, and passion undiminished.

Business Information

Big Data Solution

Performs batch processing for collecting, cleaning, labeling, machine learning, database, and visualization of patents and papers resulted from R&D in science and technology.

Applied Solutions



- Data Preprocessing Solution
- Frontier Preprocessing
 - * Frontier Pre-patent (Patent only)
 - * Frontier Pre-paper (Paper only)



- Data Labelling Solution
- Frontier Labelling
 - * Frontier Lab-patent (Patent only)
 - * Frontier Lab-paper (Paper only)



- Visualization Solution
- Frontier Visualization

Data Search

Technology Trend Search

Enables you to search the latest technology R&D trends of 38 countries, 15,000 companies, and 5,000 universities worldwide simply and conveniently. You can also search for the newest information about 400 industrial technologies such as bio, chemical, semiconductor, information and communication, software, AI, blockchain, autonomous cars.

Technology Prospect Search

Searches for information about technological influences, market outlook, and R&D activities of over 400 industrial technologies, 38 countries worldwide, 15,000 companies, and 5,000 universities.

Applied Solutions



• Data Labelling Solution

Frontier Labelling

- * Frontier Lab-patent (Patent only)
- * Frontier Lab-paper (Paper only)



• Visualization Solution

Frontier Visualization

Diagnosis & Prediction

Diagnosis Services

Diagnoses the technological capacity of 38 countries, 15,000 companies, and 5,000 universities worldwide with objective numbers using machine learning algorithms. Its results will show the fields with a large or weak technological capacity of 38 countries, 15,000 companies, and 5,000 universities worldwide.

Prediction Services

Provides a prediction service to allow you to see the differences in the technological capacity between 38 countries, 15,000 companies, or 5,000 universities worldwide using time-series forecasting algorithms. You can search for how long there has been a difference in technology between 38 countries, 15,000 companies, or 5,000 universities worldwide as well.

Applied Solutions



• Diagnosis and Prediction Solution

Frontier Diagnosis

- * Frontier Dia-patent (Patent only)
- * Frontier Dia-paper (Paper only)
- * Frontier Dia-2P

Data Management

One Page Planning Service

Figures out your competitor in other countries, companies, or universities and write a one-page plan for a specific technology utilizing the data management service.

In-depth Planning Service

Investigates 38 countries, 15,000 companies, and 5,000 universities worldwide by making the best use of utilizing trends, diagnosis, and prediction results.

Customized Service

Provides the latest information that each client needs with data obtained from all processes for collecting, cleaning, labeling, machine learning, and visualization of patents and papers of specific technologies for companies, universities, and research institutes worldwide.

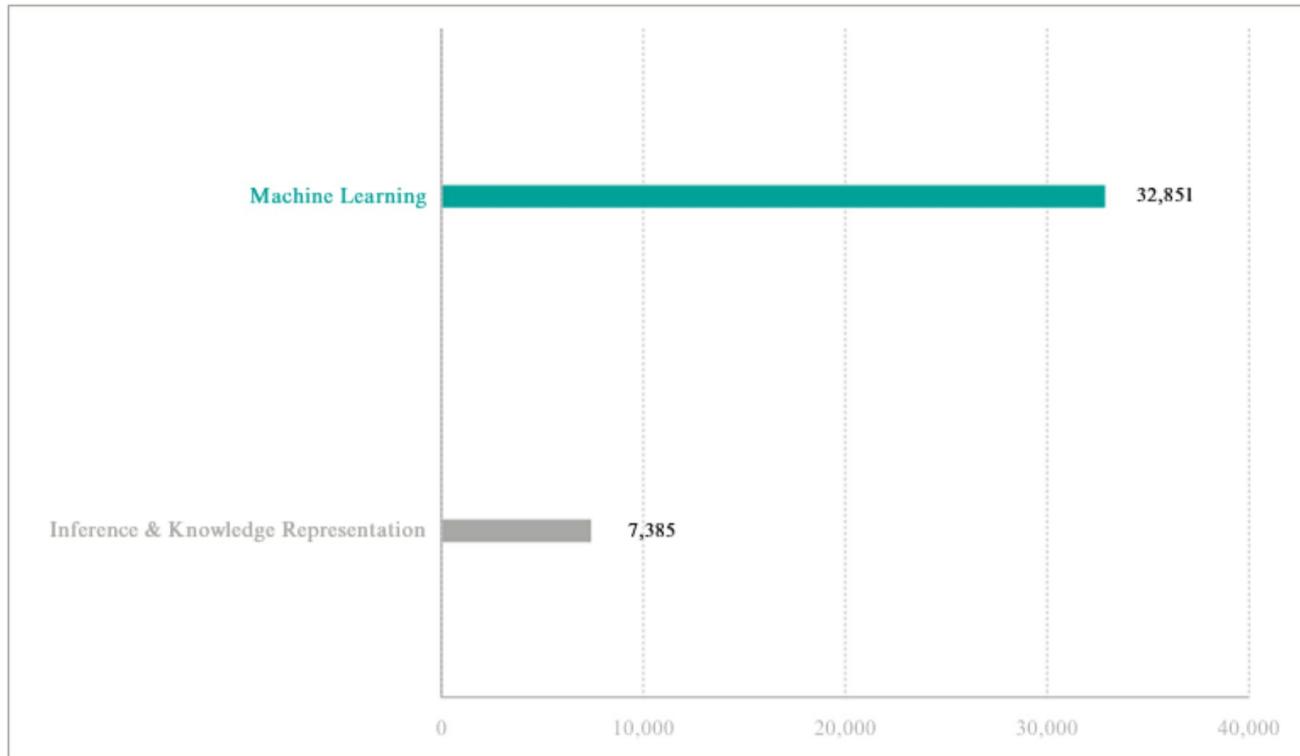


I. Learning Intelligence

1. Trend

1) Statistical data

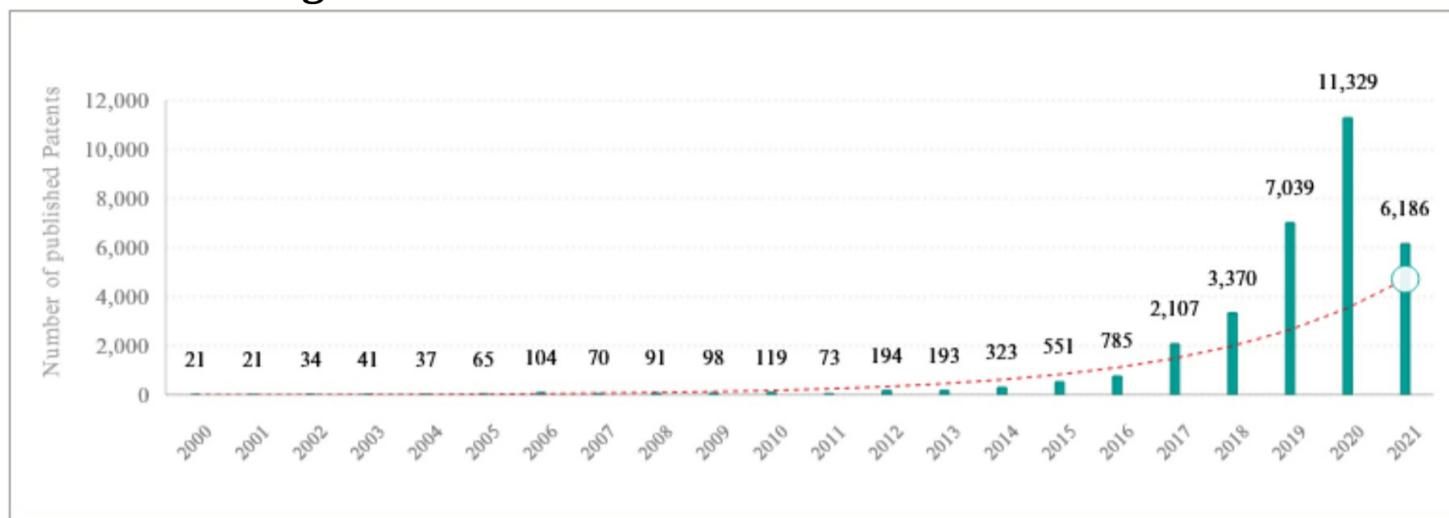
The figure below shows the trends of the industrial technologies based on comprehensive patent data. The number of published patents in the industrial technologies is ranked in Machine Learning (1st), and Inference & Knowledge Representation (2nd). Given these rankings, we can see that companies around the world are investing heavily in research and development of Machine Learning and Inference & Knowledge Representation technology.



* This score represents the sum of the published patents during the analysis period (2000~2021).

2) Trends by Technology

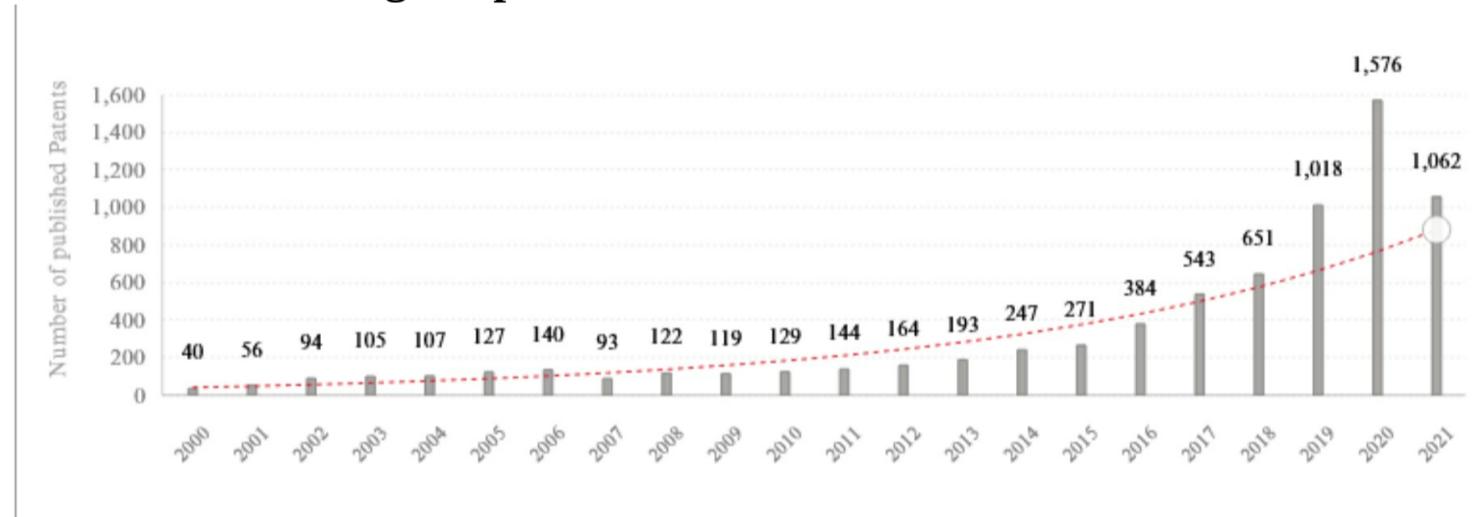
Machine Learning



* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Machine Learning technology based on comprehensive patent data. Over the past 21 years, from 2000 to 2021, about 32,851 patent data have been published by the companies around the world. There are about 21 cases documented for the Machine Learning technology in 2000 and 6,186 cases in 2021. These numbers are growing at an annual average of 37.0%. Given this trend, global companies seem to be actively in research and development investment on Machine Learning technology.

Inference & Knowledge Representation

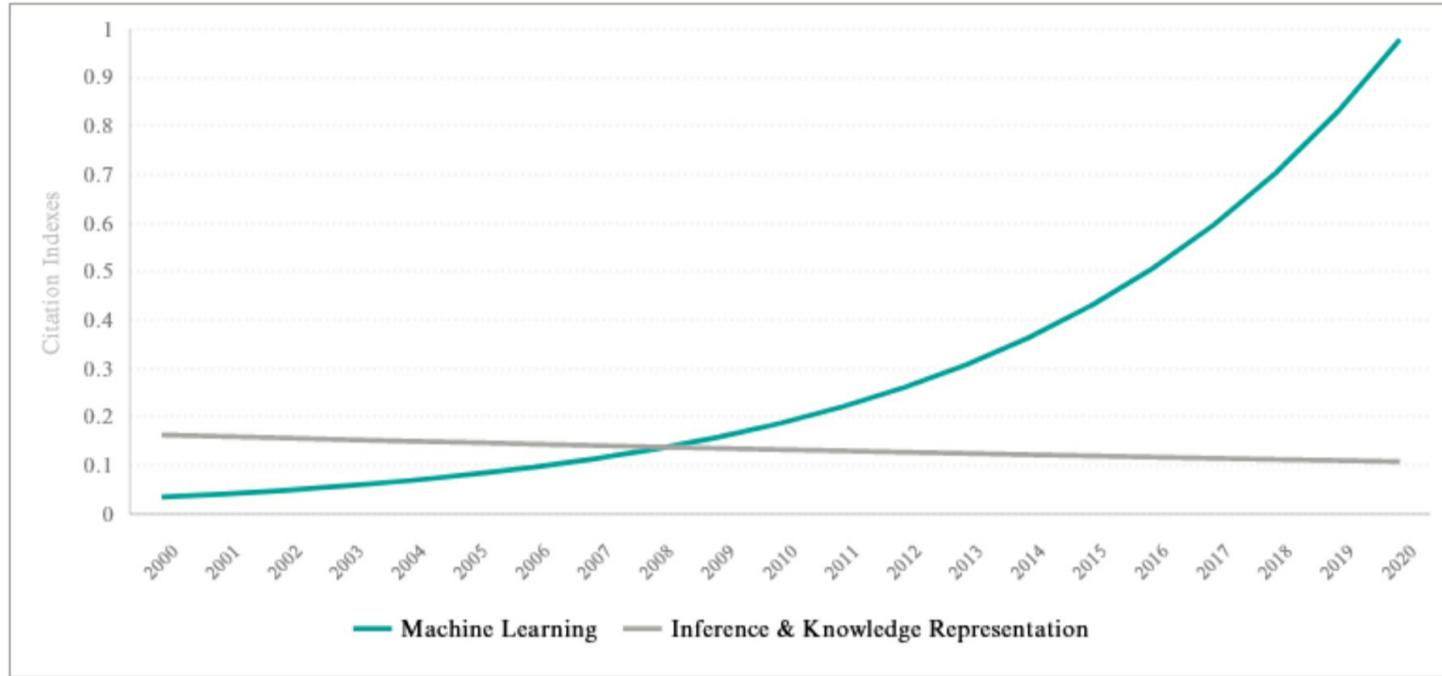


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Inference & Knowledge Representation technology based on comprehensive patent data. Over the past 21 years, from 2000 to 2021, about 7,385 patent data have been published by the companies around the world. There are about 40 cases documented for the Inference & Knowledge Representation technology in 2000 and 1,062 cases in 2021. These numbers are growing at an annual average of 20.2%. Given this trend, global companies seem to be actively in research and development investment on Inference & Knowledge Representation technology.

3) Citation Trends

The figure below shows the trend of citation index of each industry technology.



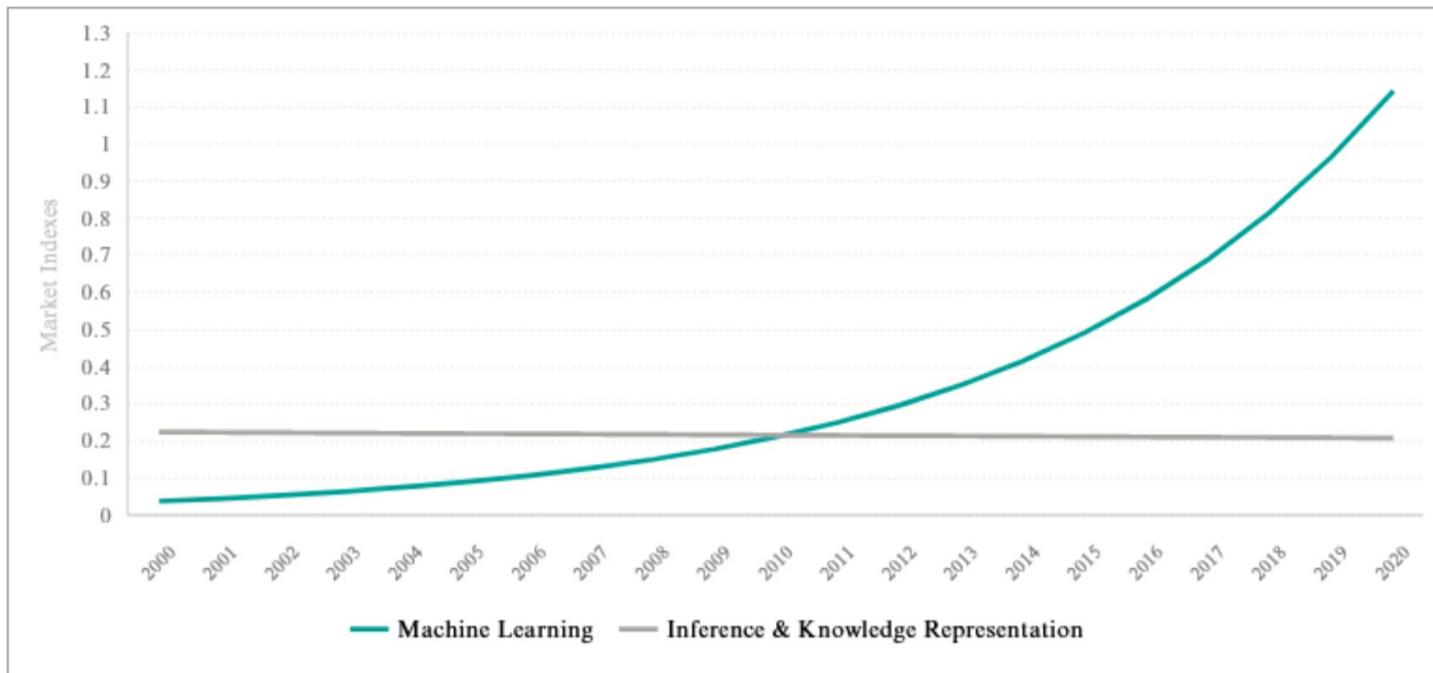
* This score represents the citation index during the analysis period (2000~2021).

The **Machine Learning** technology is on an upward trend. Given this trend, we can see that the impact of Machine Learning technology on industries around the world is growing.

The Inference & Knowledge Representation technology is on a downward trend. Given this trend, we can see that the impact of Inference & Knowledge Representation technology on industries around the world is declining.

4) Market Trends

The figure below shows the trend of market index of each industry technology.



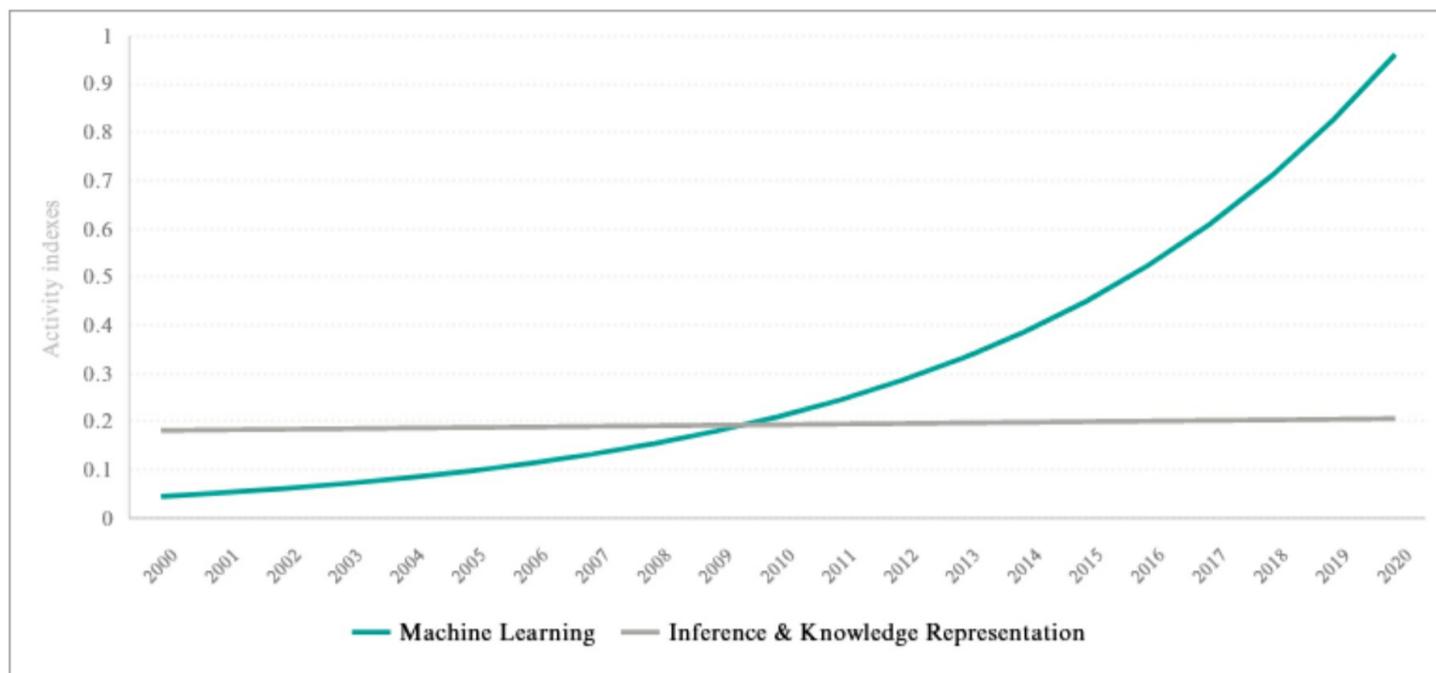
* This score represents the market index during the analysis period (2000~2021).

The **Machine Learning** technology is on an upward trend. Given this trend, we can see that global companies are positively evaluating the market prospect of Machine Learning technology.

The Inference & Knowledge Representation technology is almost unchanged in trends. Given this trend, we can see that global companies are negatively evaluating the market prospect of Inference & Knowledge Representation technology.

5) Activity Trends

The figure below shows the trend of activity index of each industry technology.



* This score represents the activity index during the analysis period (2000~2021).

The **Machine Learning** technology is on an upward trend. Given this trend, we can see that global companies are actively in research and development investment on Machine Learning technology.

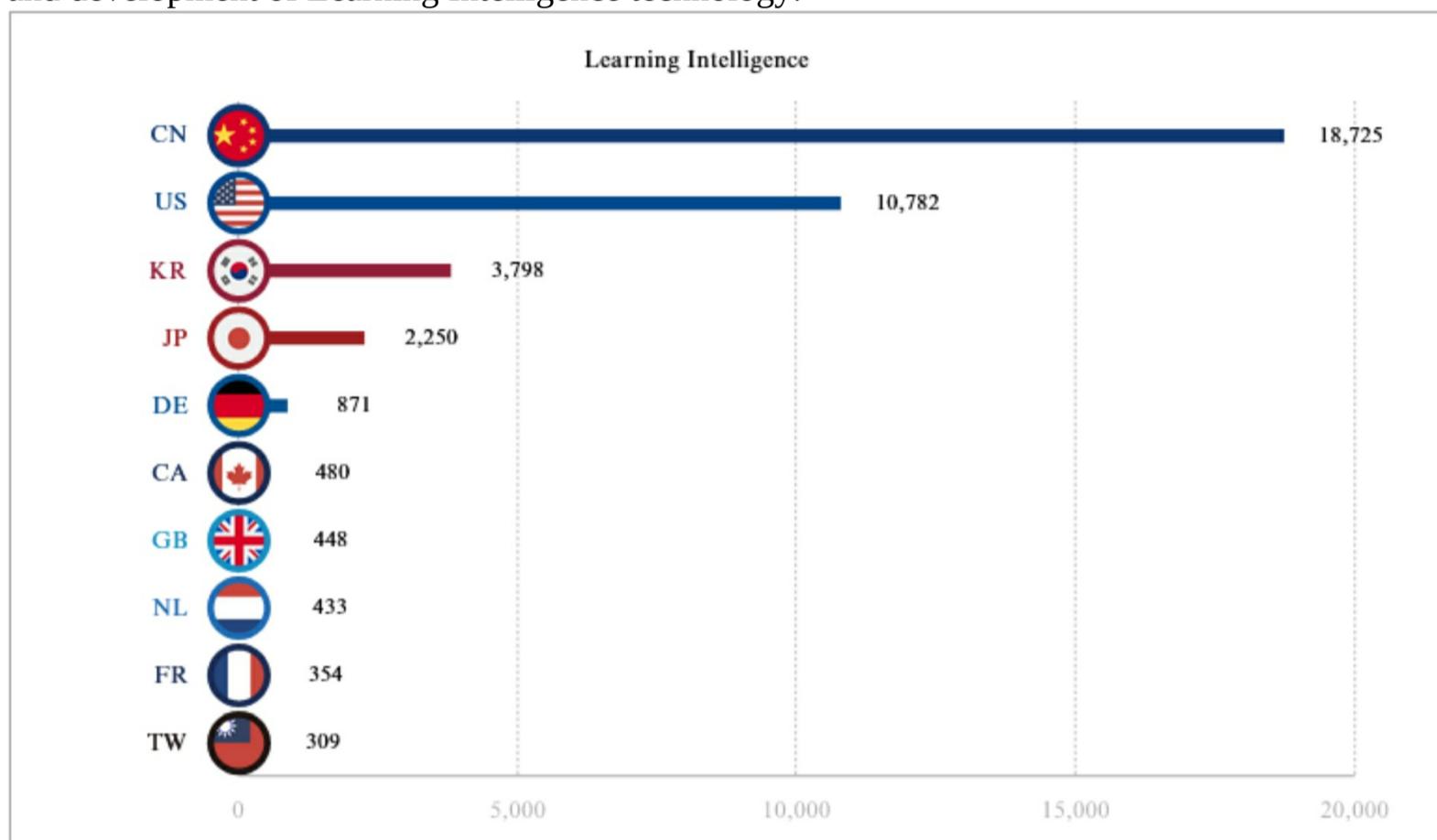
The Inference & Knowledge Representation technology is almost unchanged in trends. Given this trend, we can see that global companies are actively in research and development investment on Inference & Knowledge Representation technology.

2. Countries Trend

1) Statistical data

The figure below shows the trends of global countries in Learning Intelligence technology based on comprehensive patent data.

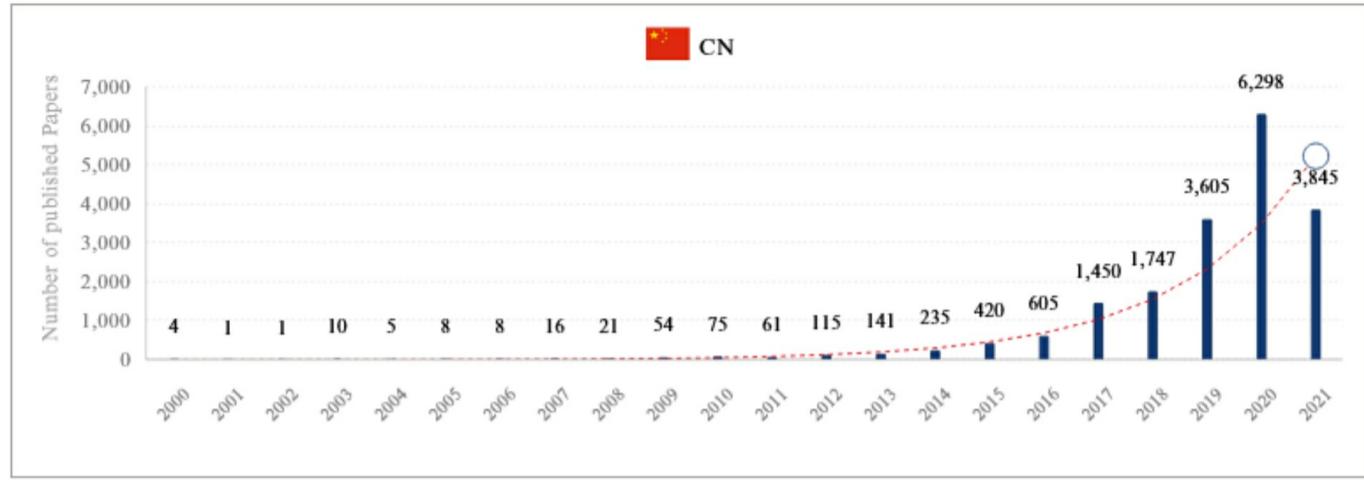
The number of published patents in the Learning Intelligence technology is ranked in China (1st), U.S.A (2nd), Korea (3rd), Japan (4th), Germany (5th), Canada (6th), Britain (7th), Netherlands (8th), France (9th), and Taiwan (10th). Based on the global rankings, we can see that China and U.S.A play the leading roles in research and development of Learning Intelligence technology.



* This score represents total number of the published patents during the analysis period (2000~2021).

2) Trends by country

China

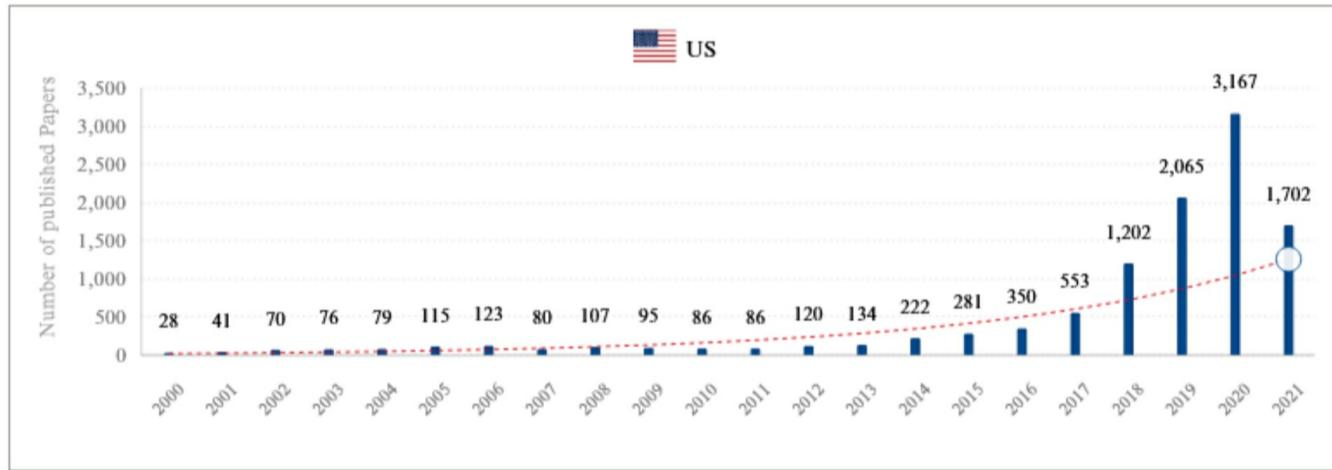


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of China in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 18,725 patent data have been published by China. There are about 4 cases documented for Learning Intelligence technology in 2000 and 3,845 cases in 2021. These numbers are growing at an annual average of 44.5%. Given this trend, China seems to be active in research and development investment on Learning Intelligence technology.

United States

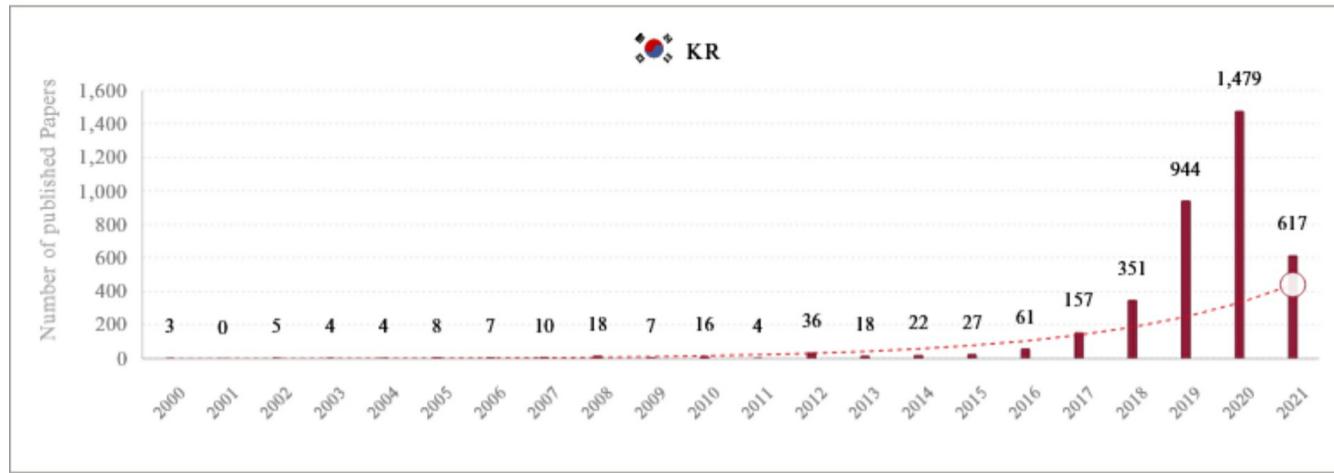


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of U.S.A in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 10,782 patent data have been published by U.S.A. There are about 28 cases documented for Learning Intelligence technology in 2000 and 1,702 cases in 2021. These numbers are growing at an annual average of 26.7%. Given this trend, U.S.A seems to be active in research and development investment on Learning Intelligence technology.

Korea

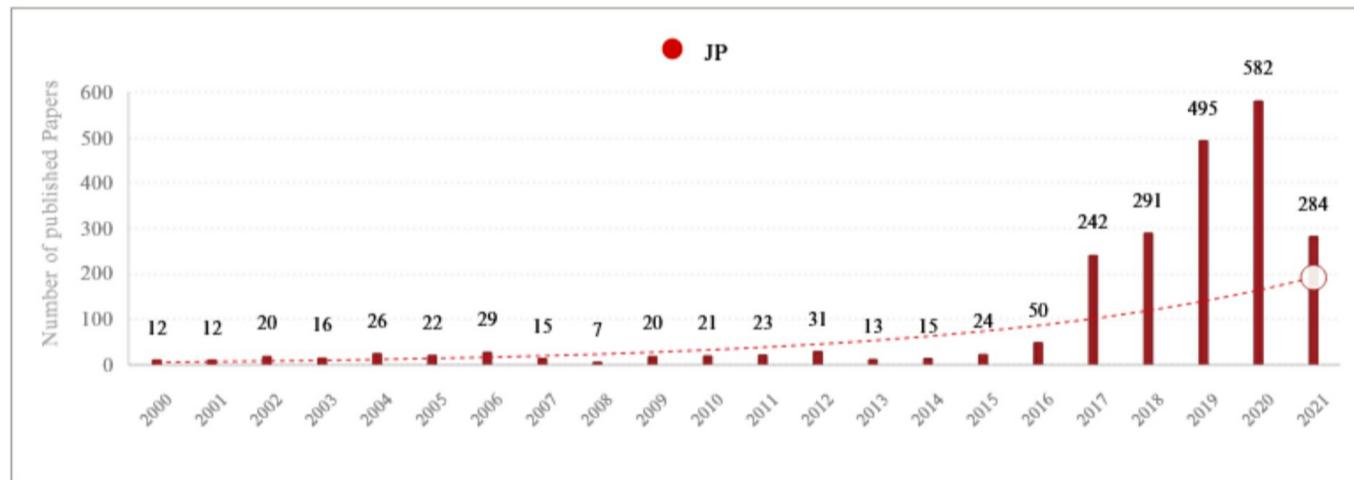


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Korea in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 3,798 patent data have been published by Korea. There are about 3 cases documented for Learning Intelligence technology in 2000 and 617 cases in 2021. These numbers are growing at an annual average of 36.3%. Given this trend, Korea seems to be active in research and development investment on Learning Intelligence technology.

Japan

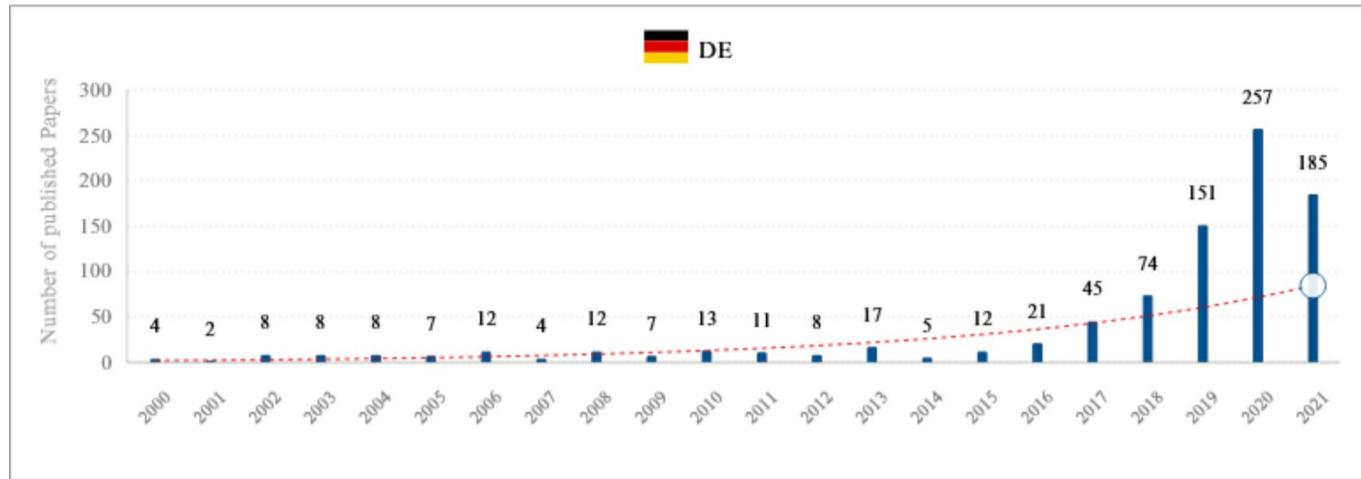


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Japan in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 2,250 patent data have been published by Japan. There are about 12 cases documented for Learning Intelligence technology in 2000 and 284 cases in 2021. These numbers are growing at an annual average of 21.4%. Given this trend, Japan seems to be active in research and development investment on Learning Intelligence technology.

Germany

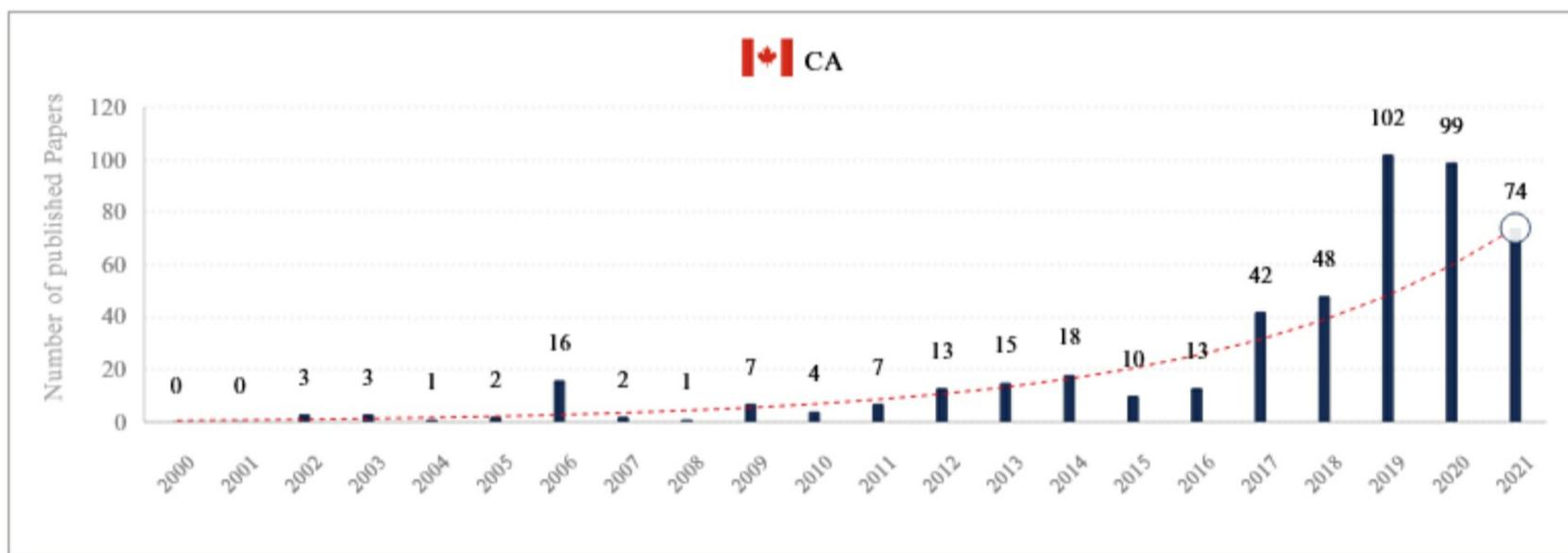


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Germany in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 871 patent data have been published by Germany. There are about 4 cases documented for Learning Intelligence technology in 2000 and 185 cases in 2021. These numbers are growing at an annual average of 23.1%. Given this trend, Germany seems to be active in research and development investment on Learning Intelligence technology.

Canada

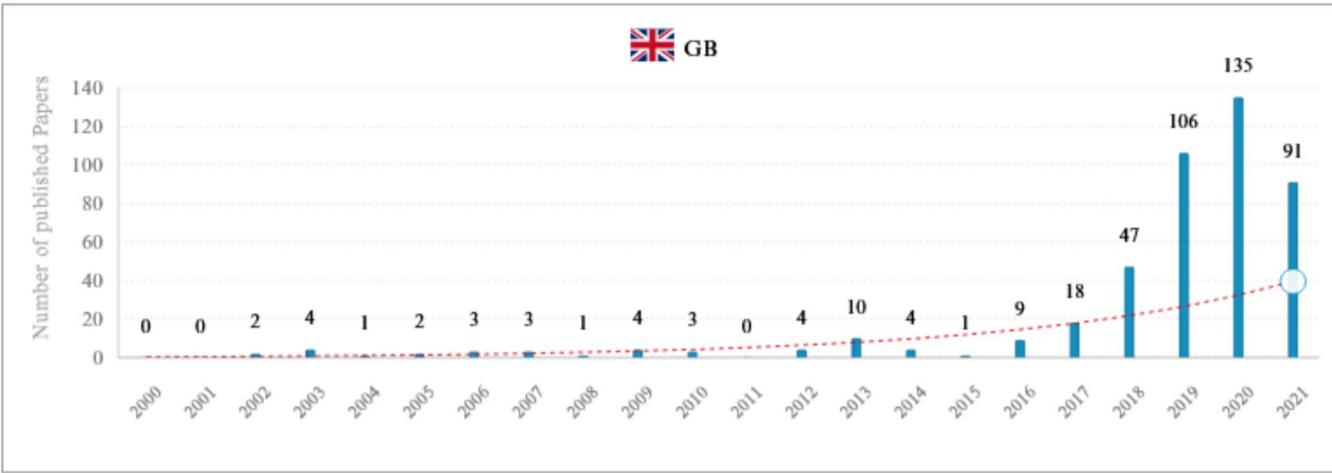


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Canada in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 480 patent data have been published by Canada. There are about 0 cases documented for Learning Intelligence technology in 2000 and 74 cases in 2021. These numbers are growing at an annual average of 25.8%. Given this trend, Canada seems to be active in research and development investment on Learning Intelligence technology.

Britain

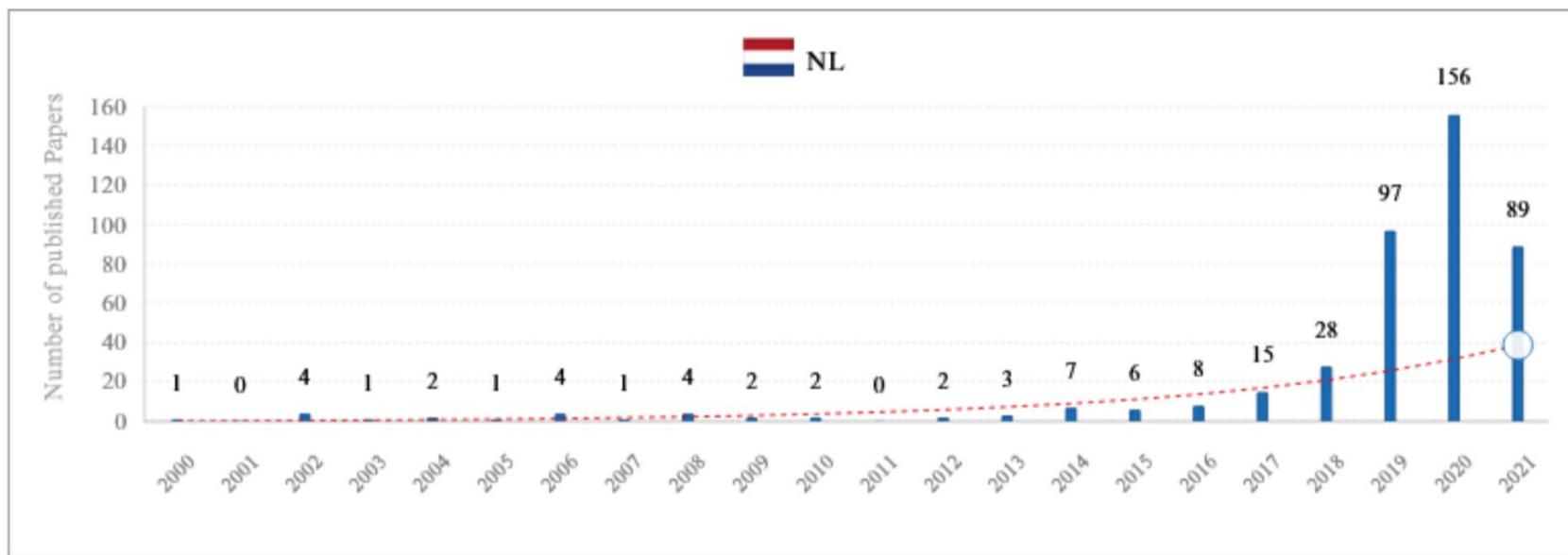


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Britain in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 448 patent data have been published by Britain. There are about 0 cases documented for Learning Intelligence technology in 2000 and 91 cases in 2021. These numbers are growing at an annual average of 27.8%. Given this trend, Britain seems to be active in research and development investment on Learning Intelligence technology.

Netherlands

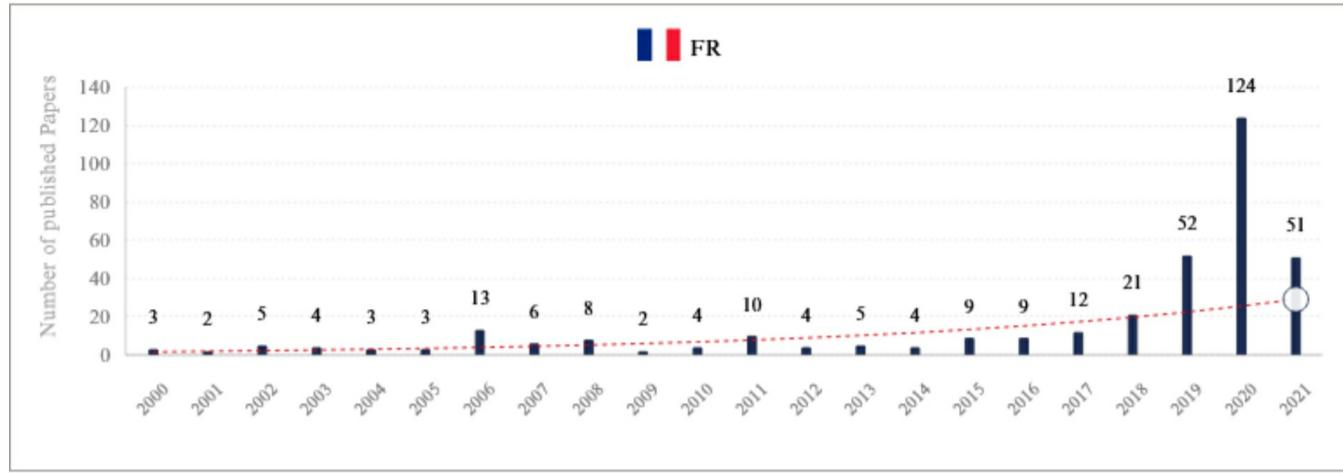


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Netherlands in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 433 patent data have been published by Netherlands. There are about 1 cases documented for Learning Intelligence technology in 2000 and 89 cases in 2021. These numbers are growing at an annual average of 28.7%. Given this trend, Netherlands seems to be active in research and development investment on Learning Intelligence technology.

France

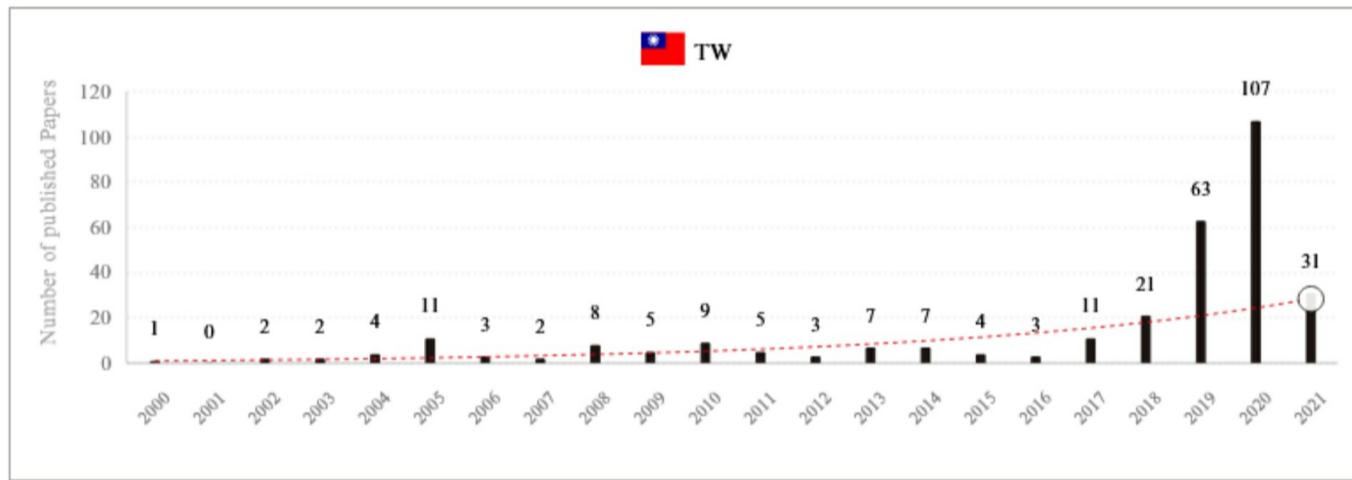


* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of France in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 354 patent data have been published by France. There are about 3 cases documented for Learning Intelligence technology in 2000 and 51 cases in 2021. These numbers are growing at an annual average of 20.5%. Given this trend, France seems to be active in research and development investment on Learning Intelligence technology.

Taiwan



* This score represents the number of the published patents during the analysis period (2000~2021).

The figure above shows the trend of Taiwan in Learning Intelligence technology based on comprehensive patent data.

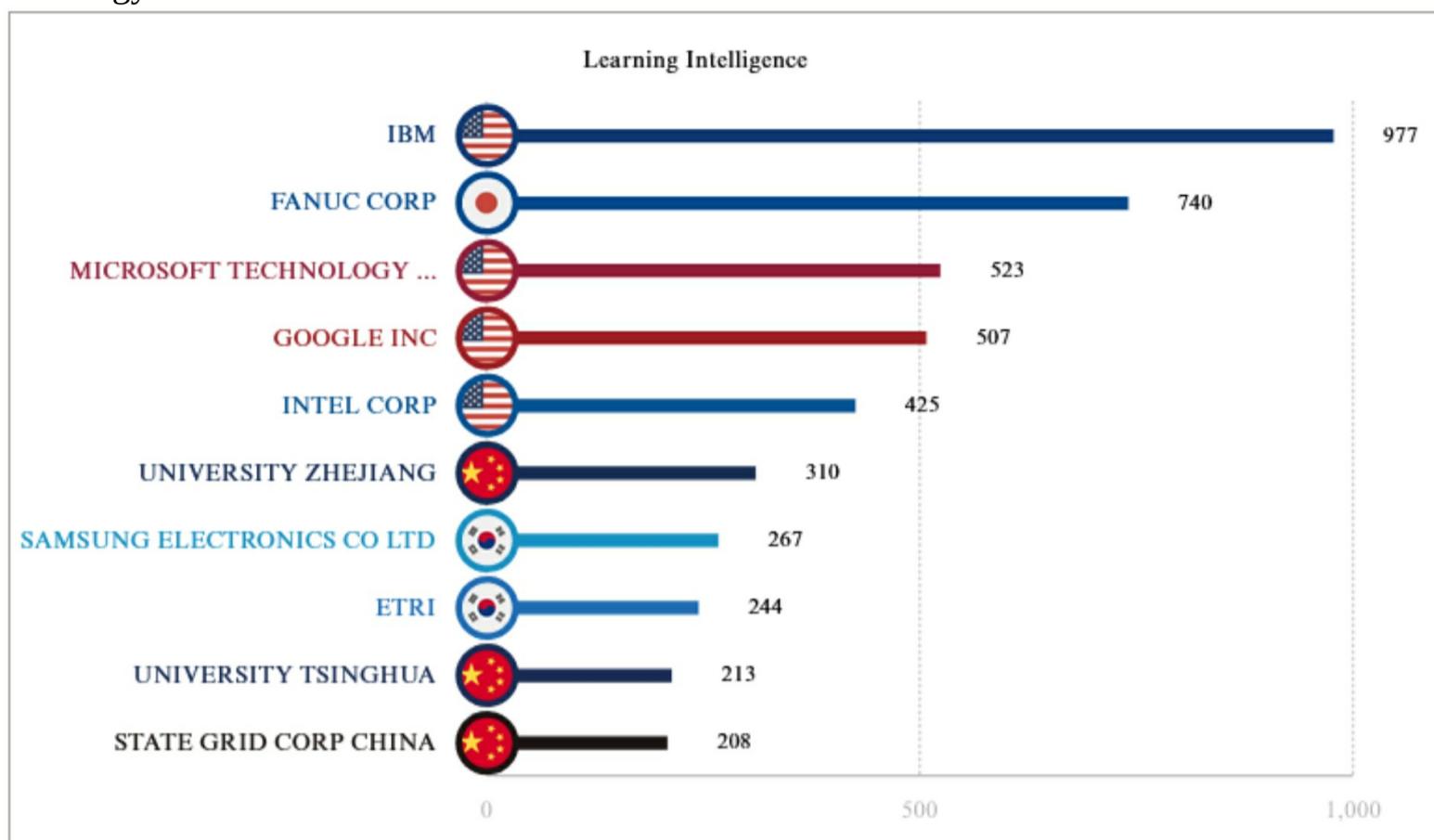
Over the past 21 years, from 2000 to 2021, about 309 patent data have been published by Taiwan. There are about 1 cases documented for Learning Intelligence technology in 2000 and 31 cases in 2021. These numbers are growing at an annual average of 26.3%. Given this trend, Taiwan seems to be active in research and development investment on Learning Intelligence technology.

4. Companies Trend

1) Statistical data

The figure below shows the global companies' trends of Learning Intelligence technology based on comprehensive patent data.

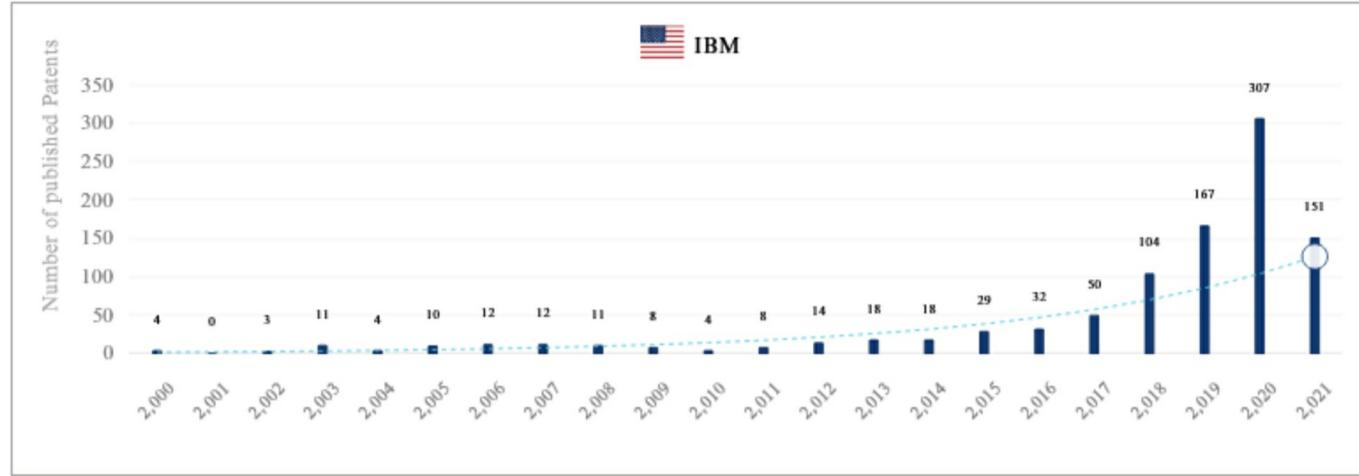
The number of published patents in the Learning Intelligence technology is ranked in IBM (1st), FANUC CORP (2nd), MICROSOFT TECHNOLOGY LICENSING LLC (3rd), GOOGLE INC (4th), INTEL CORP (5th), UNIVERSITY ZHEJIANG (6th), SAMSUNG ELECTRONICS CO LTD (7th), ETRI (8th), UNIVERSITY TSINGHUA (9th), and STATE GRID CORP CHINA (10th). Based on the global rankings, we can see that IBM and FANUC CORP play the leading roles in research and development of Learning Intelligence technology.



* This score represents total number of the published patents during the analysis period (2000~2021).

2) Trends by company

IBM

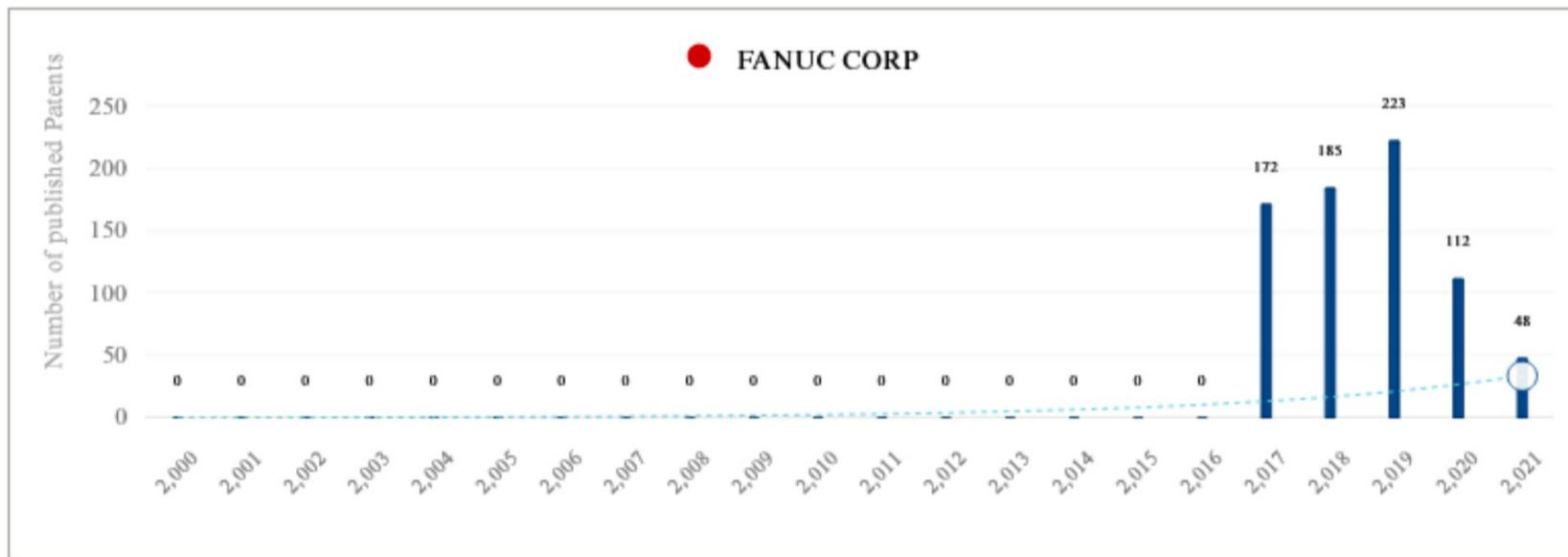


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of IBM in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 977 patent data have been published by IBM. There are about 4 cases documented for Learning Intelligence technology in 2000 and 151 cases in 2021. These numbers are growing at an annual average of 24.2%. Given this trend, IBM seems to be active in research and development investment on Learning Intelligence technology.

FANUC CORP

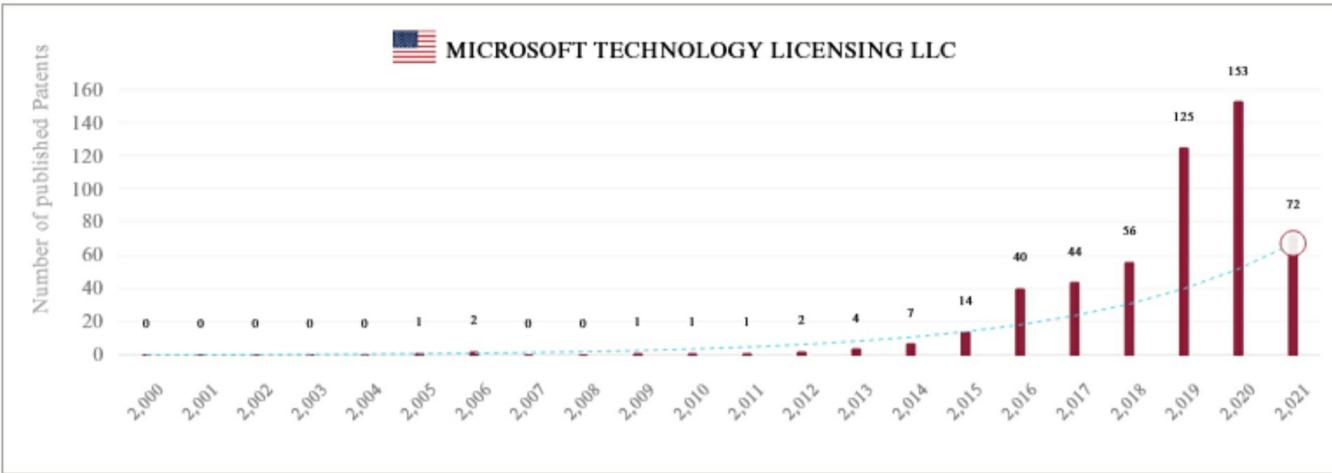


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of FANUC CORP in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 740 patent data have been published by FANUC CORP. There are about 0 cases documented for Learning Intelligence technology in 2000 and 48 cases in 2021. These numbers are growing at an annual average of 26.6%. Given this trend, FANUC CORP seems to be active in research and development investment on Learning Intelligence technology.

MICROSOFT TECHNOLOGY LICENSING LLC



* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of MICROSOFT TECHNOLOGY LICENSING LLC in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 523 patent data have been published by MICROSOFT TECHNOLOGY LICENSING LLC. There are about 0 cases documented for Learning Intelligence technology in 2000 and 72 cases in 2021. These numbers are growing at an annual average of 28.6%. Given this trend, MICROSOFT TECHNOLOGY LICENSING LLC seems to be active in research and development investment on Learning Intelligence technology.

GOOGLE INC

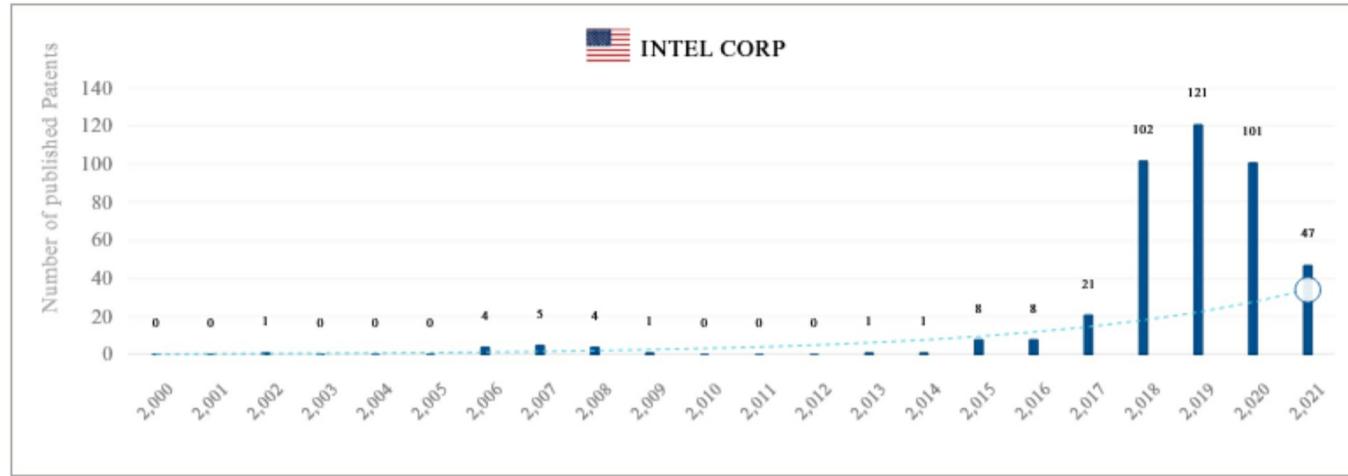


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of GOOGLE INC in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 507 patent data have been published by GOOGLE INC. There are about 0 cases documented for Learning Intelligence technology in 2000 and 85 cases in 2021. These numbers are growing at an annual average of 28.4%. Given this trend, GOOGLE INC seems to be active in research and development investment on Learning Intelligence technology.

INTEL CORP

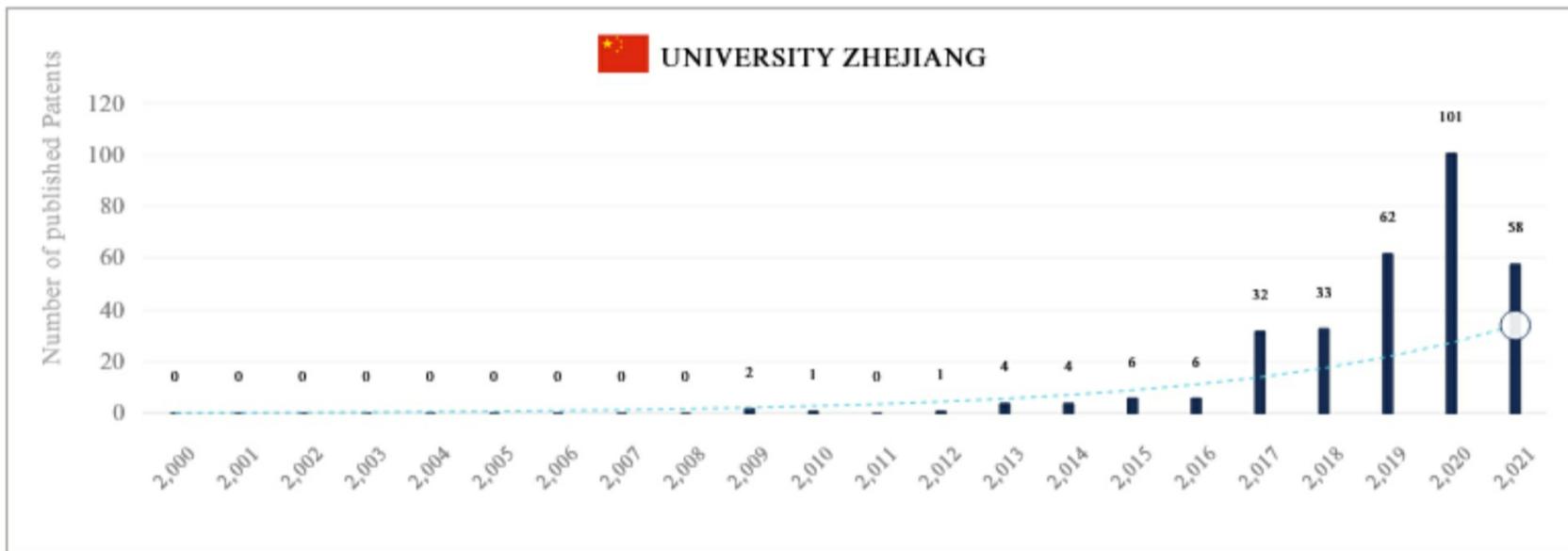


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of INTEL CORP in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 425 patent data have been published by INTEL CORP. There are about 0 cases documented for Learning Intelligence technology in 2000 and 47 cases in 2021. These numbers are growing at an annual average of 26.0%. Given this trend, INTEL CORP seems to be active in research and development investment on Learning Intelligence technology.

UNIVERSITY ZHEJIANG

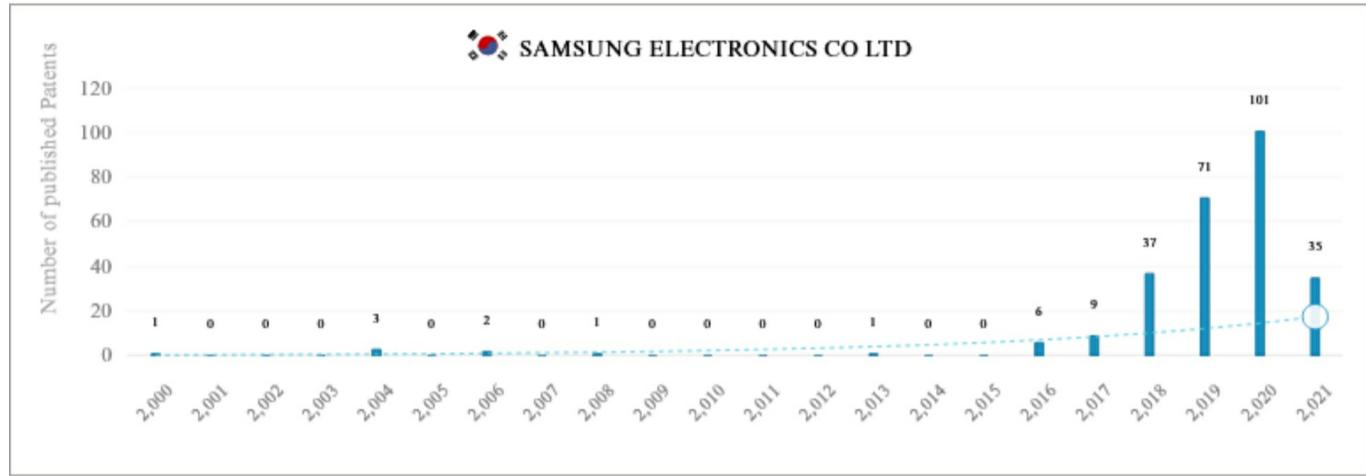


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of UNIVERSITY ZHEJIANG in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 310 patent data have been published by UNIVERSITY ZHEJIANG. There are about 0 cases documented for Learning Intelligence technology in 2000 and 58 cases in 2021. These numbers are growing at an annual average of 26.0%. Given this trend, UNIVERSITY ZHEJIANG seems to be active in research and development investment on Learning Intelligence technology.

SAMSUNG ELECTRONICS CO LTD

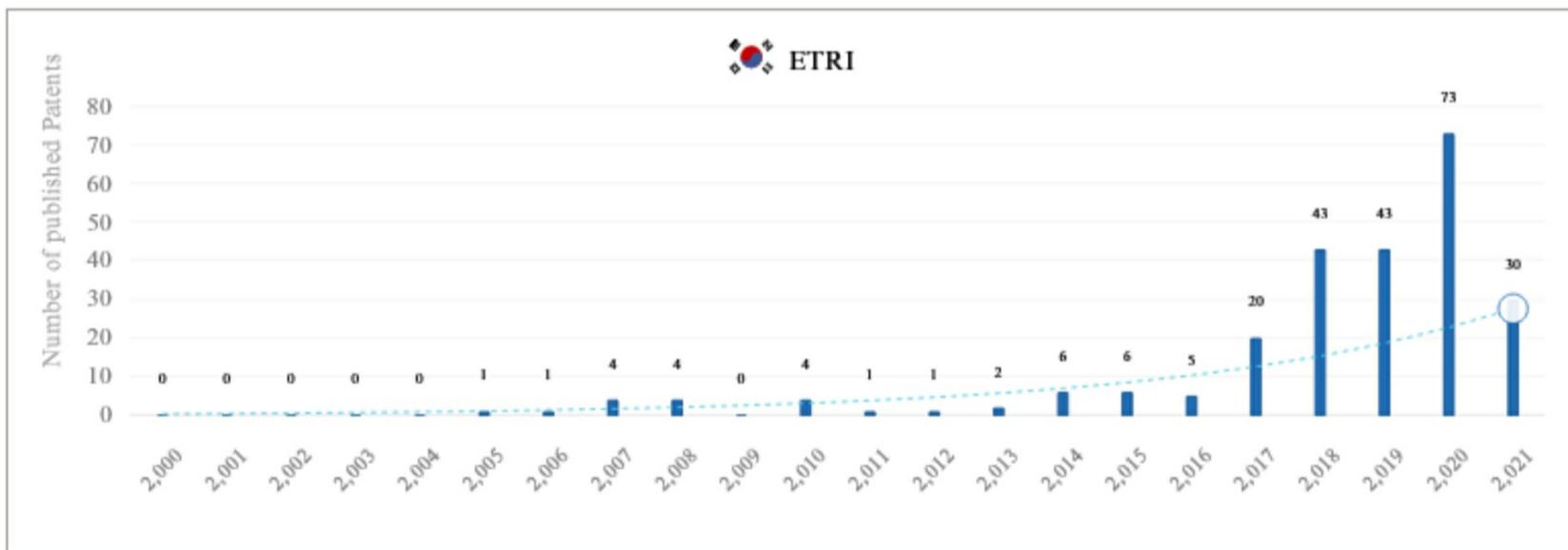


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of SAMSUNG ELECTRONICS CO LTD in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 267 patent data have been published by SAMSUNG ELECTRONICS CO LTD. There are about 1 cases documented for Learning Intelligence technology in 2000 and 35 cases in 2021. These numbers are growing at an annual average of 26.0%. Given this trend, SAMSUNG ELECTRONICS CO LTD seems to be active in research and development investment on Learning Intelligence technology.

ETRI

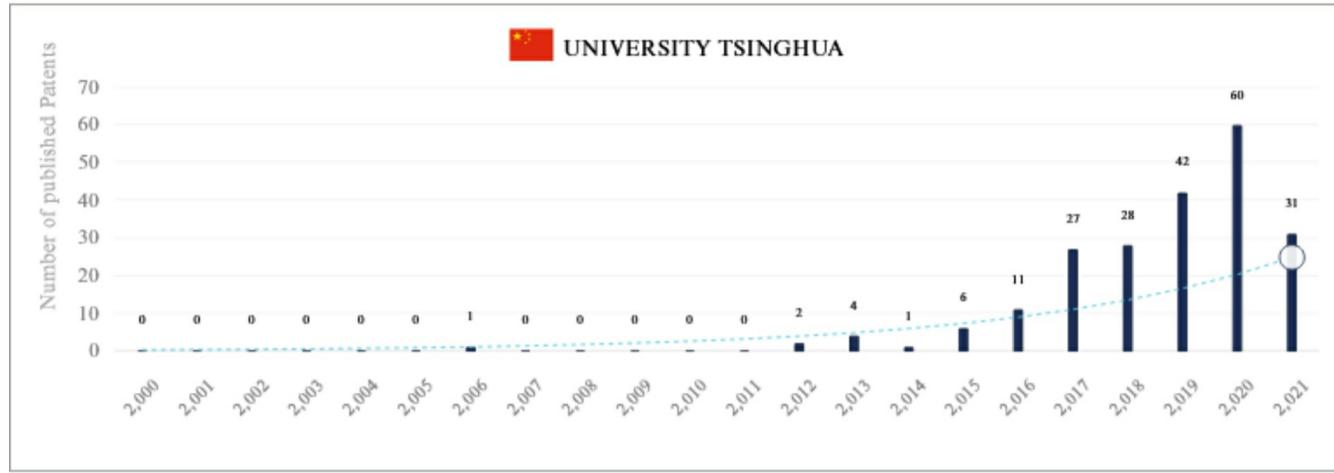


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of ETRI in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 244 patent data have been published by ETRI. There are about 0 cases documented for Learning Intelligence technology in 2000 and 30 cases in 2021. These numbers are growing at an annual average of 23.9%. Given this trend, ETRI seems to be active in research and development investment on Learning Intelligence technology.

UNIVERSITY TSINGHUA

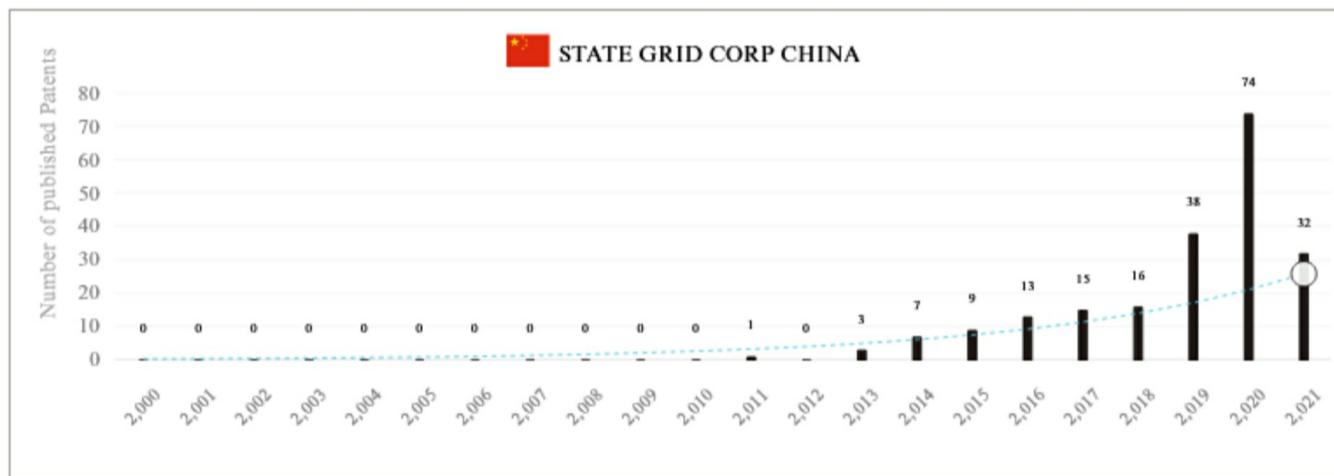


* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of UNIVERSITY TSINGHUA in Learning Intelligence technology based on comprehensive patent data.

Over the past 21 years, from 2000 to 2021, about 213 patent data have been published by UNIVERSITY TSINGHUA. There are about 0 cases documented for Learning Intelligence technology in 2000 and 31 cases in 2021. These numbers are growing at an annual average of 22.7%. Given this trend, UNIVERSITY TSINGHUA seems to be active in research and development investment on Learning Intelligence technology.

STATE GRID CORP CHINA



* This score represents the number of the published patents within the analysis period (2000~2021).

The figure above shows the trend of STATE GRID CORP CHINA in Learning Intelligence technology based on comprehensive patent data.

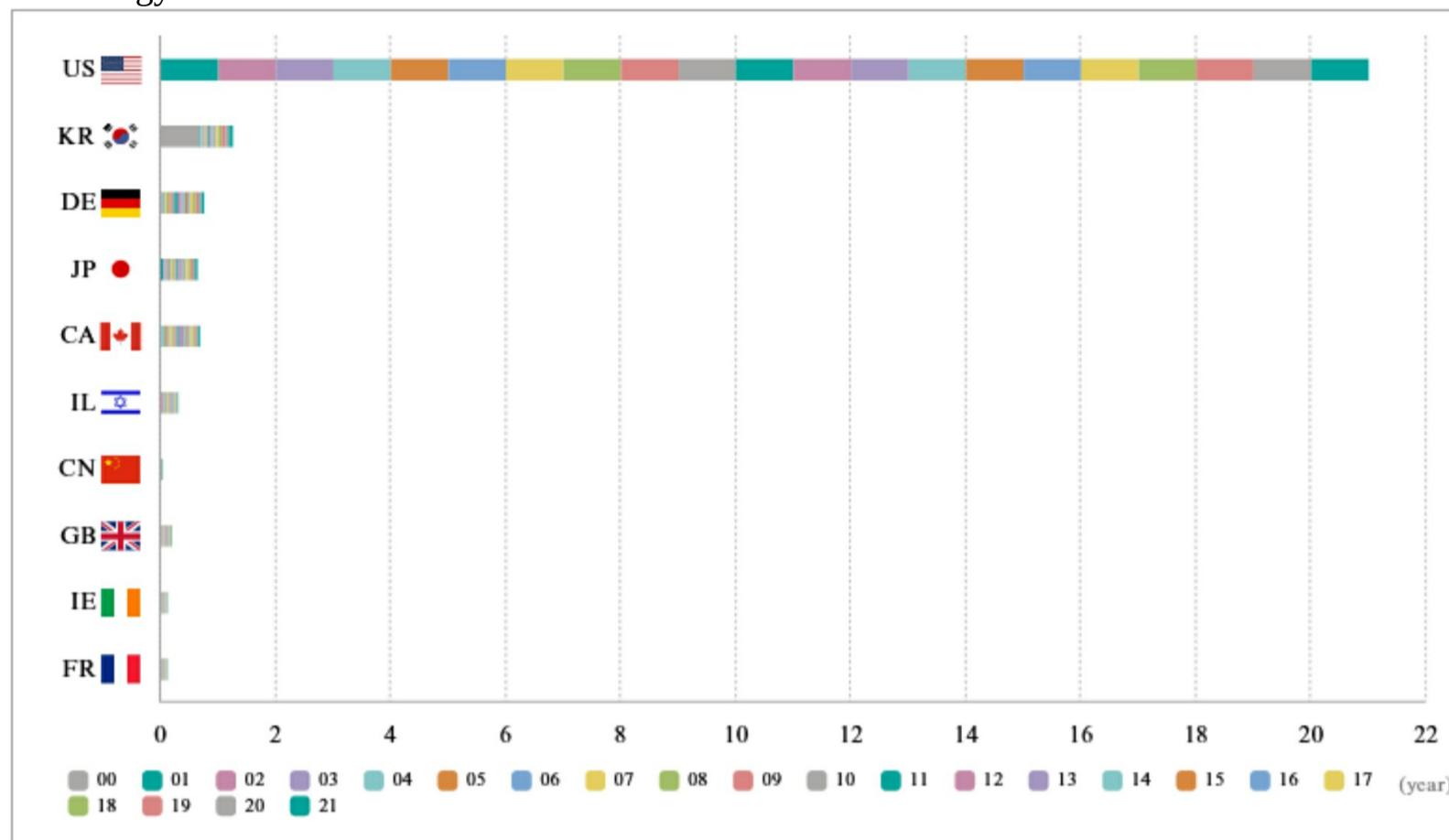
Over the past 21 years, from 2000 to 2021, about 208 patent data have been published by STATE GRID CORP CHINA. There are about 0 cases documented for Learning Intelligence technology in 2000 and 32 cases in 2021. These numbers are growing at an annual average of 24.0%. Given this trend, STATE GRID CORP CHINA seems to be active in research and development investment on Learning Intelligence technology.

5. Technology Influence

1) Global country Ranking

The figure below shows the total of the citation index of each country in Learning Intelligence technology. The total of the citation indexes of Learning Intelligence technology is ranked in U.S.A (1), Korea (2), Germany

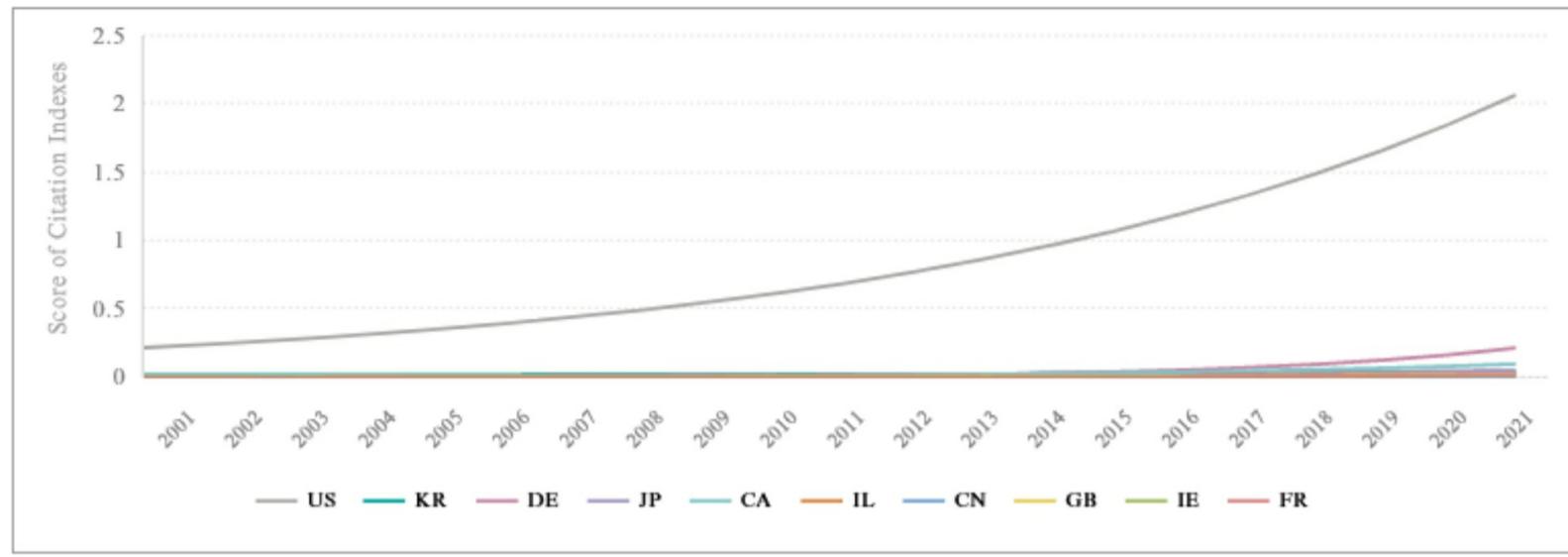
(3), Japan (4), Canada (5), Israel (6), China (7), Britain (8), Ireland (9), and France (10). Given these rankings, U.S.A and Korea seem to have significant technological impact on other countries to Learning Intelligence technology.



* This score represents accumulation of the citation index during the analysis period (2000~2021).

2) Citation Index

The figure below shows the citation index trend of each country in Learning Intelligence technology.



* This score represents the value of the citation index during the analysis period (2000~2021).

- U.S.A is on an upward trend. Given this trend, technological impact on other countries in U.S.A is increasing.
- Korea is on an upward trend. Given this trend, technological impact on other countries in Korea is increasing.
- Germany is on an upward trend. Given this trend, technological impact on other countries in Germany is increasing.
- Japan is on an upward trend. Given this trend, technological impact on other countries in Japan is increasing.
- Canada is on an upward trend. Given this trend, technological impact on other countries in Canada is increasing.
- Israel is on an upward trend. Given this trend, technological impact on other countries in Israel is increasing.
- China is on an upward trend. Given this trend, technological impact on other countries in China is increasing.
- Britain is on an upward trend. Given this trend, technological impact on other countries in Britain is increasing.
- Ireland is on an upward trend. Given this trend, technological impact on other countries in Ireland is increasing.
- France is on an upward trend. Given this trend, technological impact on other countries in France is increasing.

3) Detailed Analysis

The table below shows the citation index of Learning Intelligence technology by the year.

Rank	Country	Citation Index									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	US	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	KR	0.667	0.017	0.013	0.009	0.017	0.013	0.015	0.015	0.016	0.018
3	DE	0.000	0.000	0.000	0.000	0.029	0.019	0.024	0.021	0.052	0.046
4	JP	0.000	0.039	0.014	0.037	0.023	0.024	0.031	0.029	0.026	0.025
5	CA	0.000	0.000	0.005	0.002	0.067	0.043	0.034	0.038	0.032	0.033
6	IL	0.000	0.000	0.030	0.013	0.020	0.021	0.016	0.019	0.017	0.014
7	CN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	GB	0.000	0.000	0.000	0.016	0.010	0.007	0.005	0.009	0.007	0.008
9	IE	0.000	0.000	0.000	0.000	0.004	0.003	0.006	0.005	0.004	0.005
10	FR	0.000	0.000	0.000	0.003	0.002	0.001	0.003	0.003	0.003	0.002

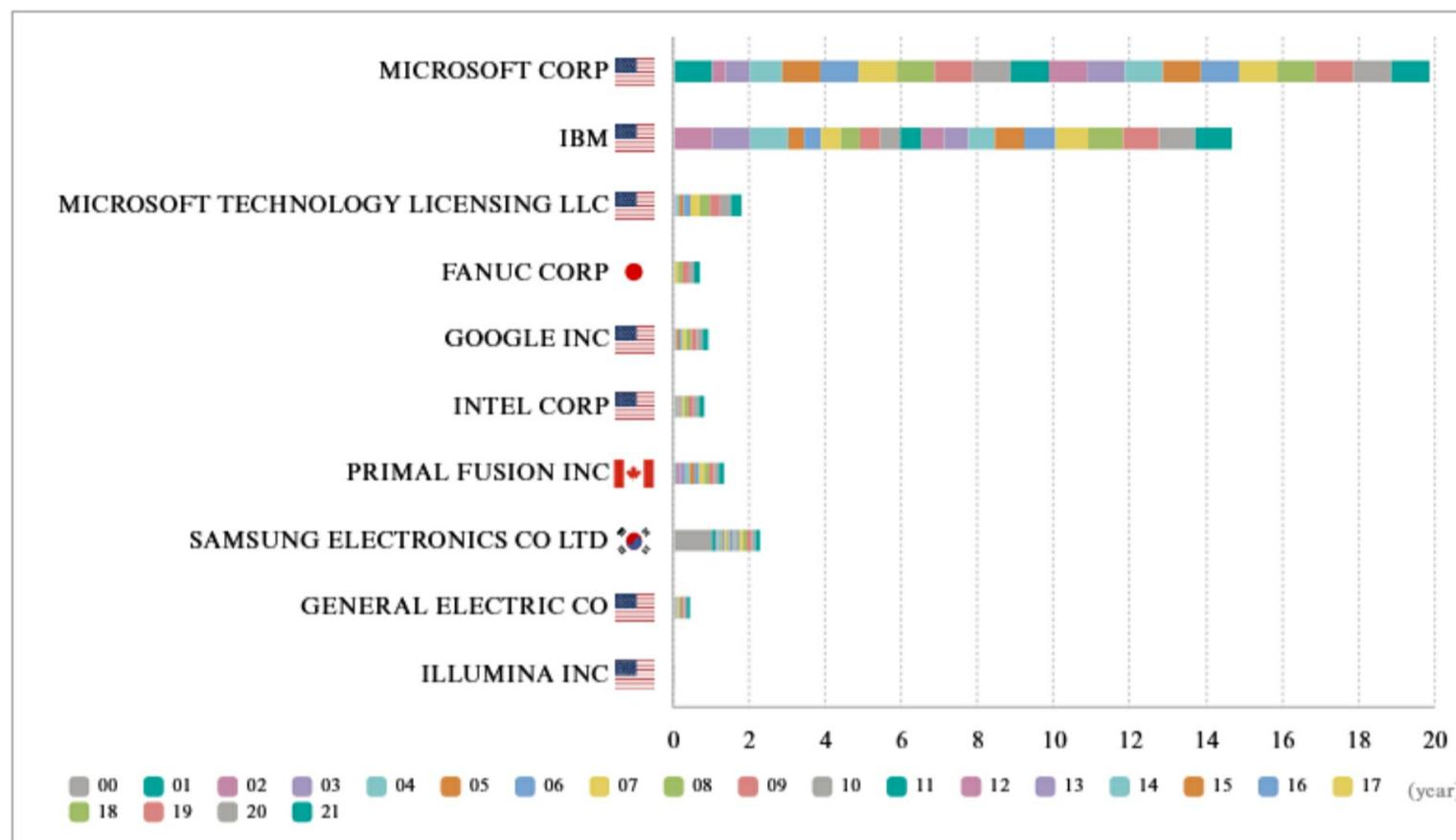
Rank	Country	Citation Index									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	US	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	KR	0.020	0.026	0.024	0.023	0.023	0.021	0.027	0.040	0.053	0.064
3	DE	0.049	0.052	0.047	0.043	0.042	0.043	0.043	0.048	0.049	0.049
4	JP	0.028	0.029	0.028	0.026	0.025	0.023	0.027	0.040	0.040	0.041
5	CA	0.032	0.033	0.041	0.040	0.037	0.037	0.037	0.036	0.034	0.034
6	IL	0.013	0.013	0.012	0.010	0.011	0.010	0.012	0.012	0.014	0.015
7	CN	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.003	0.006
8	GB	0.008	0.007	0.011	0.012	0.013	0.012	0.011	0.012	0.011	0.012
9	IE	0.005	0.006	0.005	0.007	0.007	0.006	0.008	0.008	0.008	0.009
10	FR	0.006	0.006	0.007	0.007	0.007	0.011	0.010	0.009	0.009	0.009

Rank	Country	Citation Index	
		2020	2021
1	US	1.000	1.000
2	KR	0.067	0.067
3	DE	0.049	0.049
4	JP	0.041	0.041
5	CA	0.033	0.033
6	IL	0.015	0.015
7	CN	0.010	0.012
8	GB	0.012	0.012
9	IE	0.010	0.010
10	FR	0.009	0.009

- The citation index of U.S.A is increasing at an annual average of 11.5 % from 0.209 in 2000 to 2.071 in 2021.
- The citation index of Korea is increasing at an annual average of 3.5 % from 0.019 in 2000 to 0.039 in 2021.
- The citation index of Germany is increasing at an annual average of 30.5 % from 0.001 in 2000 to 0.220 in 2021.
- The citation index of Japan is increasing at an annual average of 9.0 % from 0.009 in 2000 to 0.056 in 2021.
- The citation index of Canada is increasing at an annual average of 18.5 % from 0.003 in 2000 to 0.102 in 2021.
- The citation index of Israel is increasing at an annual average of 9.8 % from 0.003 in 2000 to 0.025 in 2021.
- The citation index of China is increasing at an annual average of 27.2 % from 0.000 in 2000 to 0.005 in 2021.
- The citation index of Britain is increasing at an annual average of 17.7 % from 0.001 in 2000 to 0.029 in 2021.
- The citation index of Ireland is increasing at an annual average of 22.2 % from 0.000 in 2000 to 0.024 in 2021.
- The citation index of France is increasing at an annual average of 21.4 % from 0.000 in 2000 to 0.023 in 2021.

4) Global company Ranking

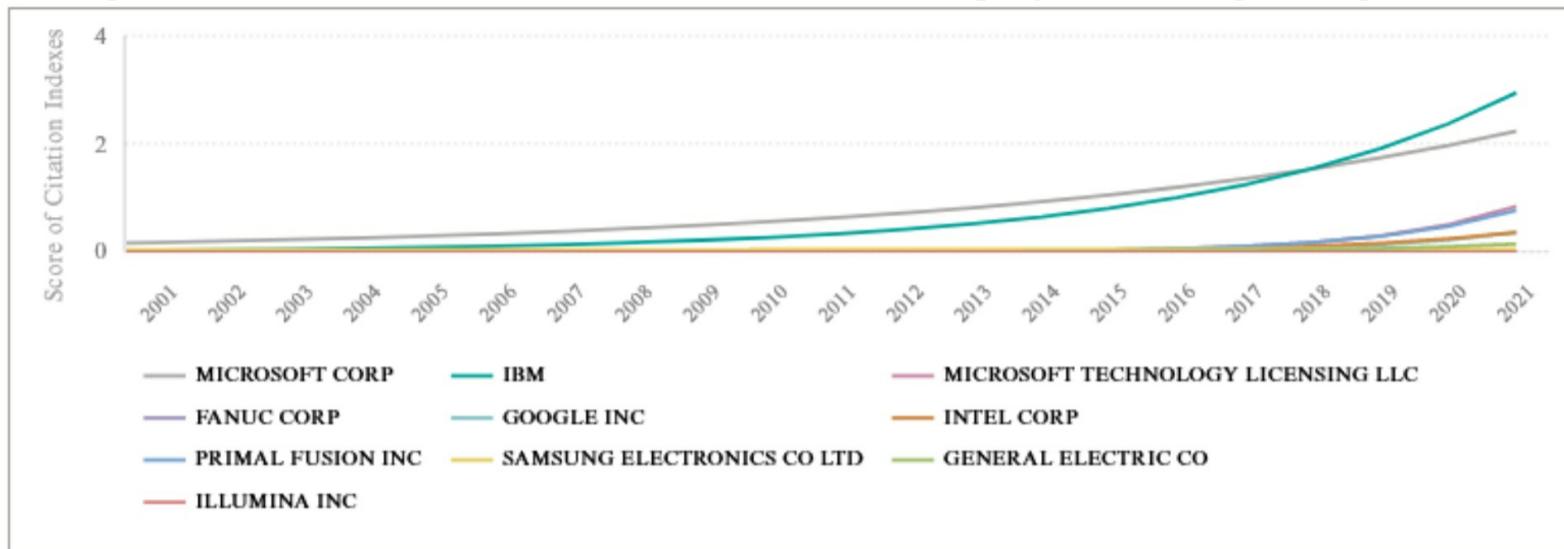
The figure below shows the total of the citation index of each company in Learning Intelligence technology. The total of the citation indexes of Learning Intelligence technology is ranked in MICROSOFT CORP (1), IBM (2), MICROSOFT TECHNOLOGY LICENSING LLC (3), FANUC CORP (4), GOOGLE INC (5), INTEL CORP (6), PRIMAL FUSION INC (7), SAMSUNG ELECTRONICS CO LTD (8), GENERAL ELECTRIC CO (9), and ILLUMINA INC (10). Given these rankings, MICROSOFT CORP and IBM seem to have significant technological impact on other countries to Learning Intelligence technology.



* This score represents accumulation of the citation index during the analysis period (2000~2021).

5) Citation Index

The figure below shows the citation index trend of each company in Learning Intelligence technology.



* This score represents the value of the citation index during the analysis period (2000~2021).

- MICROSOFT CORP is on an upward trend. Given this trend, technological impact on other countries in MICROSOFT CORP is increasing.
- IBM is on an upward trend. Given this trend, technological impact on other countries in IBM is increasing.
- MICROSOFT TECHNOLOGY LICENSING LLC is on an upward trend. Given this trend, technological impact on other countries in MICROSOFT TECHNOLOGY LICENSING LLC is increasing.
- FANUC CORP is on an upward trend. Given this trend, technological impact on other countries in FANUC CORP is increasing.
- GOOGLE INC is on an upward trend. Given this trend, technological impact on other countries in GOOGLE INC is increasing.
- INTEL CORP is on an upward trend. Given this trend, technological impact on other countries in INTEL CORP is increasing.
- PRIMAL FUSION INC is on an upward trend. Given this trend, technological impact on other countries in PRIMAL FUSION INC is increasing.
- SAMSUNG ELECTRONICS CO LTD is on an upward trend. Given this trend, technological impact on other countries in SAMSUNG ELECTRONICS CO LTD is increasing.
- GENERAL ELECTRIC CO is on an upward trend. Given this trend, technological impact on other countries in GENERAL ELECTRIC CO is increasing.
- ILLUMINA INC is on an upward trend. Given this trend, technological impact on other countries in ILLUMINA INC is increasing.

6) Detailed Analysis

The table below shows the citation index of Learning Intelligence technology by the year.

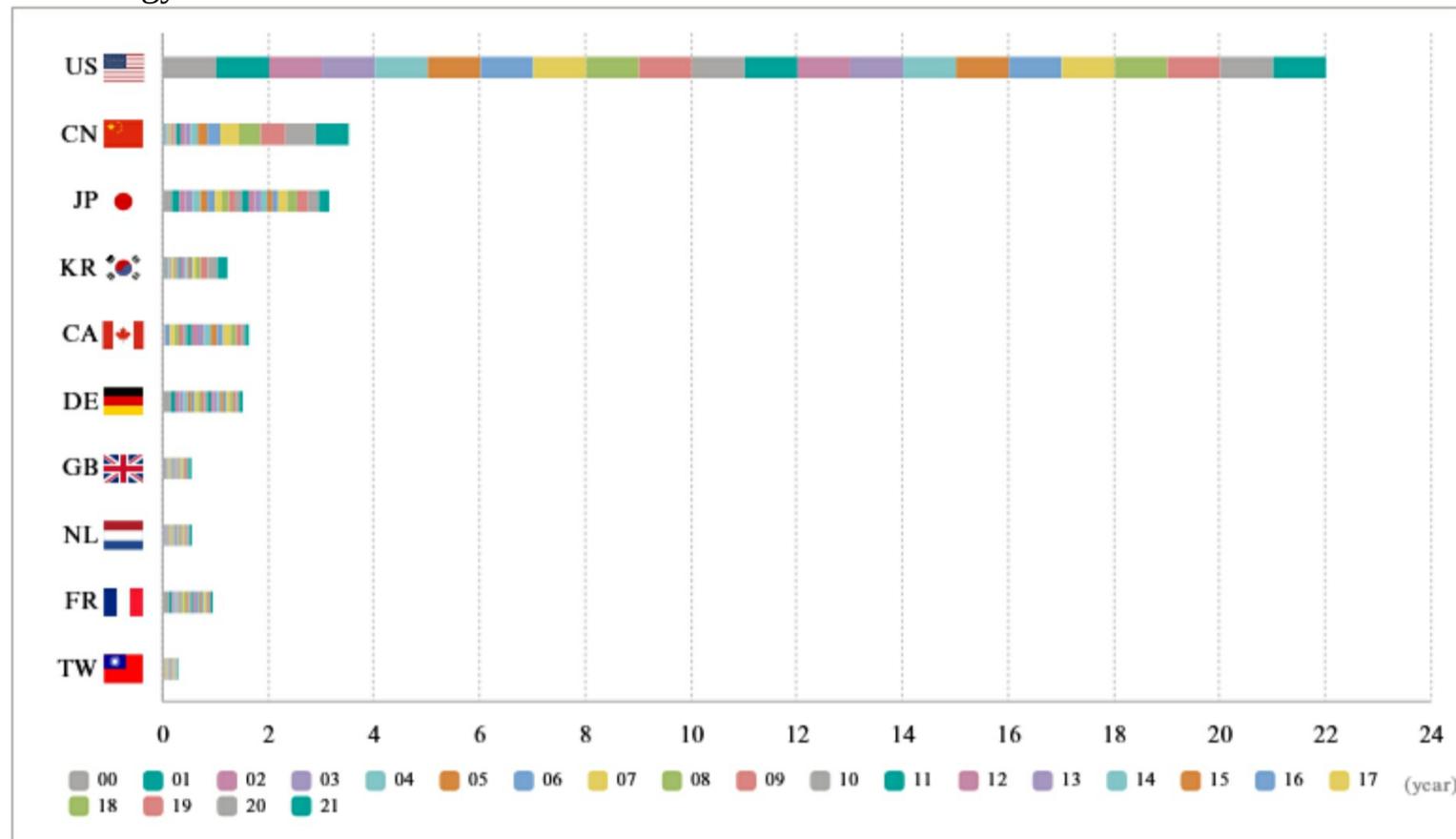
Rank	Country	Company	Citation Index	
			2020	2021
1	US	MICROSOFT CORP	1.000	1.000
2	US	IBM	0.953	0.953
3	US	MICROSOFT TECHNOLOGY	0.280	0.280
4	JP	FANUC CORP	0.152	0.152
5	US	GOOGLE INC	0.151	0.151
6	US	INTEL CORP	0.138	0.138
7	CA	PRIMAL FUSION INC	0.130	0.130
8	KR	SAMSUNG ELECTRONICS CO LTD	0.115	0.115
9	US	GENERAL ELECTRIC CO	0.080	0.080
10	US	ILLUMINA INC	0.006	0.006

- The citation index of MICROSOFT CORP is increasing at an annual average of 13.2 % from 0.166 in 2000 to 2.249 in 2021.
- The citation index of IBM is increasing at an annual average of 23.8 % from 0.033 in 2000 to 2.958 in 2021.
- The citation index of MICROSOFT TECHNOLOGY LICENSING LLC is increasing at an annual average of 66.1 % from 0.000 in 2000 to 0.855 in 2021.
- The citation index of FANUC CORP is increasing at an annual average of 41.5 % from 0.000 in 2000 to 0.020 in 2021.
- The citation index of GOOGLE INC is increasing at an annual average of 59.1 % from 0.000 in 2000 to 0.370 in 2021.
- The citation index of INTEL CORP is increasing at an annual average of 46.7 % from 0.000 in 2000 to 0.374 in 2021.
- The citation index of PRIMAL FUSION INC is increasing at an annual average of 61.1 % from 0.000 in 2000 to 0.781 in 2021.
- The citation index of SAMSUNG ELECTRONICS CO LTD is increasing at an annual average of 1.0 % from 0.051 in 2000 to 0.063 in 2021.
- The citation index of GENERAL ELECTRIC CO is increasing at an annual average of 45.4 % from 0.000 in 2000 to 0.159 in 2021.
- The citation index of ILLUMINA INC is increasing at an annual average of 13.6 % from 0.000 in 2000 to 0.001 in 2021.

6. Market Outlook

1) Global country Ranking

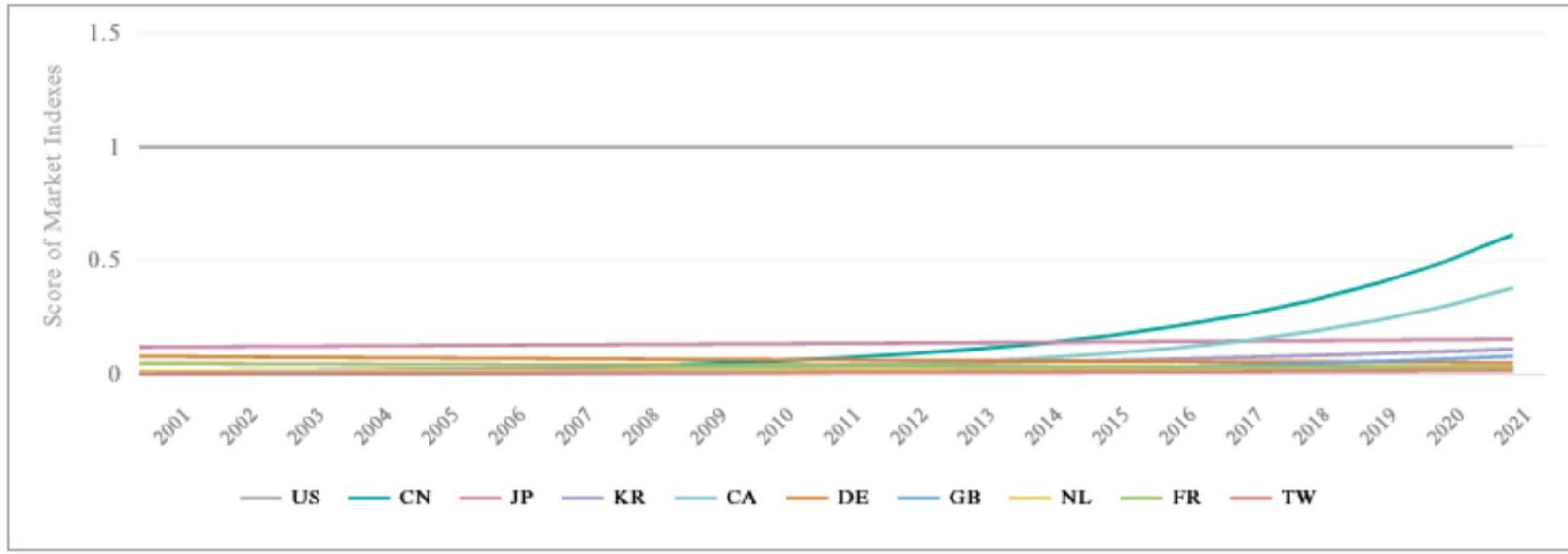
The figure below shows the total of the market index of each country in Learning Intelligence technology. The total of the market indexes of Learning Intelligence technology is ranked in U.S.A (1), China (2), Japan (3), Korea (4), Canada (5), Germany (6), Britain (7), Netherlands (8), France (9), and Taiwan (10). Given these rankings, U.S.A and China seem to have positive view on future market prospect for Learning Intelligence technology.



* This score represents accumulation of the market index during the analysis period (2000~2021).

2) Market Index

The figure below shows the market index trend of each country in Learning Intelligence technology.



* This score represents the value of the market index during the analysis period (2000~2021).

- U.S.A is almost unchanged in trends. Given this trend, it is analyzed that U.S.A has positive view on future market prospect of Learning Intelligence technology.
- China is on an upward trend. Given this trend, it is analyzed that China has positive view on future market prospect of Learning Intelligence technology.
- Japan is on an upward trend. Given this trend, it is analyzed that Japan has positive view on future market prospect of Learning Intelligence technology.
- Korea is on an upward trend. Given this trend, it is analyzed that Korea has positive view on future market prospect of Learning Intelligence technology.
- Canada is on an upward trend. Given this trend, it is analyzed that Canada has positive view on future market prospect of Learning Intelligence technology.
- Germany is on a downward trend. Given this trend, it is analyzed that Germany has negative view on future market prospect of Learning Intelligence technology.
- Britain is on an upward trend. Given this trend, it is analyzed that Britain has positive view on future market prospect of Learning Intelligence technology.
- Netherlands is on an upward trend. Given this trend, it is analyzed that Netherlands has positive view on future market prospect of Learning Intelligence technology.
- France is on a downward trend. Given this trend, it is analyzed that France has negative view on future market prospect of Learning Intelligence technology.
- Taiwan is on an upward trend. Given this trend, it is analyzed that Taiwan has positive view on future market prospect of Learning Intelligence technology.

3) Detailed Analysis

The table below shows the market index of Learning Intelligence technology by the year.

Rank	Country	Market Index									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	US	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	CN	0.024	0.014	0.008	0.016	0.016	0.015	0.015	0.022	0.028	0.040
3	JP	0.162	0.136	0.117	0.137	0.148	0.132	0.140	0.135	0.127	0.124
4	KR	0.042	0.019	0.018	0.019	0.020	0.021	0.021	0.025	0.032	0.032
5	CA	0.000	0.000	0.010	0.012	0.009	0.007	0.087	0.086	0.078	0.080
6	DE	0.144	0.075	0.081	0.085	0.081	0.066	0.063	0.061	0.060	0.059
7	GB	0.000	0.000	0.010	0.033	0.023	0.019	0.018	0.018	0.018	0.018
8	NL	0.024	0.011	0.022	0.020	0.021	0.017	0.020	0.019	0.022	0.022
9	FR	0.108	0.055	0.040	0.038	0.042	0.032	0.041	0.040	0.044	0.041
10	TW	0.006	0.003	0.006	0.008	0.008	0.014	0.012	0.012	0.014	0.014

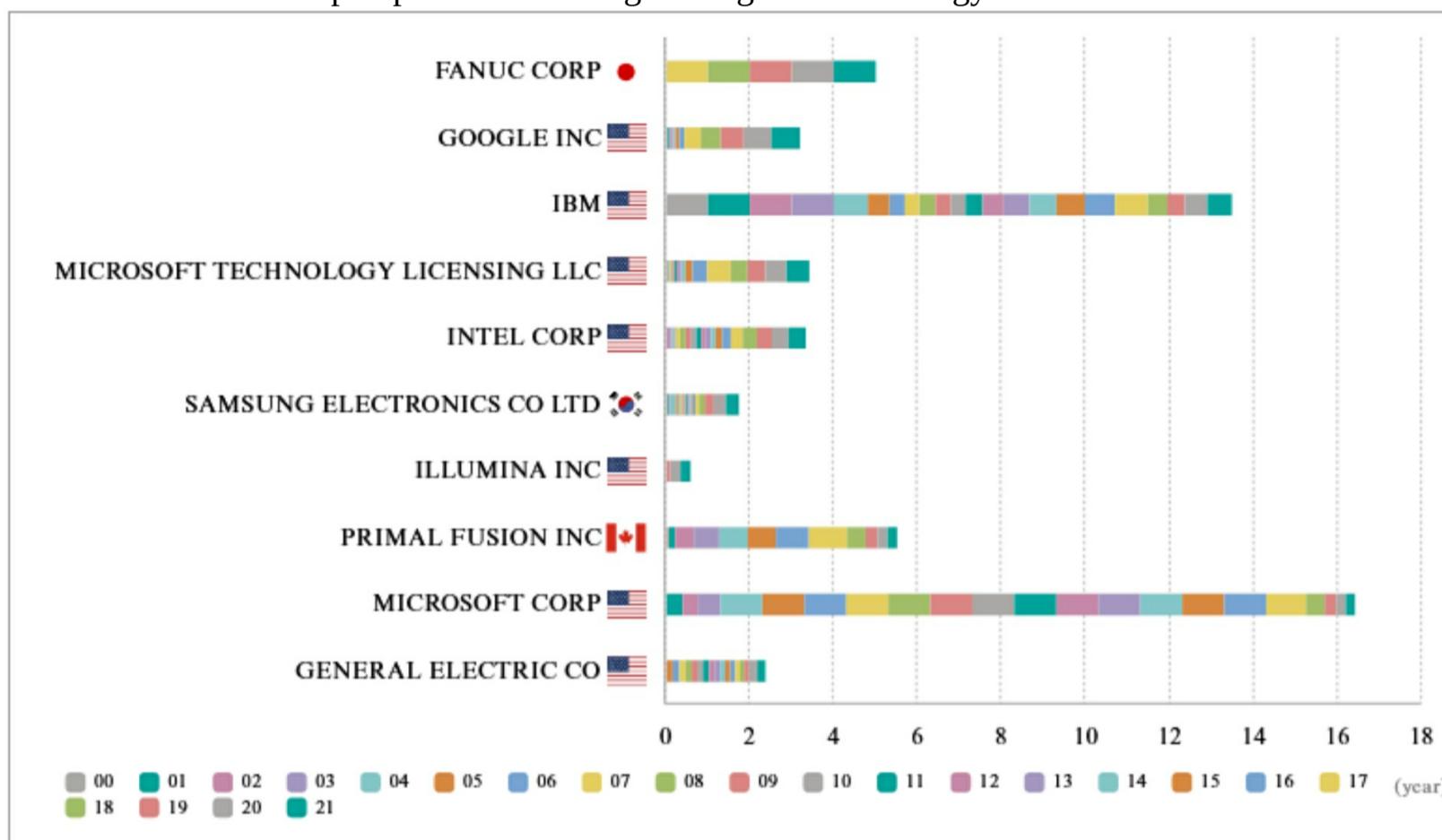
Rank	Country	Market Index									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	US	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	CN	0.056	0.069	0.089	0.106	0.136	0.181	0.243	0.353	0.408	0.475
3	JP	0.126	0.125	0.128	0.118	0.110	0.101	0.105	0.169	0.193	0.208
4	KR	0.036	0.035	0.045	0.048	0.046	0.044	0.049	0.062	0.088	0.137
5	CA	0.078	0.087	0.115	0.127	0.128	0.116	0.114	0.136	0.111	0.093
6	DE	0.060	0.062	0.061	0.065	0.058	0.058	0.058	0.062	0.060	0.058
7	GB	0.020	0.018	0.021	0.026	0.028	0.025	0.025	0.029	0.036	0.046
8	NL	0.022	0.020	0.018	0.019	0.024	0.026	0.026	0.027	0.027	0.038
9	FR	0.042	0.044	0.041	0.040	0.038	0.038	0.038	0.036	0.032	0.030
10	TW	0.016	0.016	0.015	0.016	0.016	0.014	0.013	0.012	0.013	0.015

Rank	Country	Market Index	
		2020	2021
1	US	1.000	1.000
2	CN	0.569	0.627
3	JP	0.200	0.199
4	KR	0.183	0.188
5	CA	0.074	0.071
6	DE	0.060	0.065
7	GB	0.048	0.050
8	NL	0.045	0.048
9	FR	0.036	0.036
10	TW	0.019	0.018

- The market index of U.S.A is more or less unchanged at an annual average of 0.0 % from 1.000 in 2000 to 1.000 in 2021.
- The market index of China is increasing at an annual average of 23.4 % from 0.007 in 2000 to 0.617 in 2021.
- The market index of Japan is increasing at an annual average of 1.2 % from 0.123 in 2000 to 0.158 in 2021.
- The market index of Korea is increasing at an annual average of 10.1 % from 0.015 in 2000 to 0.114 in 2021.
- The market index of Canada is increasing at an annual average of 26.1 % from 0.003 in 2000 to 0.384 in 2021.
- The market index of Germany is decreasing at an annual average of -2.1 % from 0.083 in 2000 to 0.053 in 2021.
- The market index of Britain is increasing at an annual average of 17.8 % from 0.003 in 2000 to 0.083 in 2021.
- The market index of Netherlands is increasing at an annual average of 3.8 % from 0.016 in 2000 to 0.034 in 2021.
- The market index of France is decreasing at an annual average of -2.2 % from 0.052 in 2000 to 0.032 in 2021.
- The market index of Taiwan is increasing at an annual average of 5.3 % from 0.007 in 2000 to 0.020 in 2021.

4) Global company Ranking

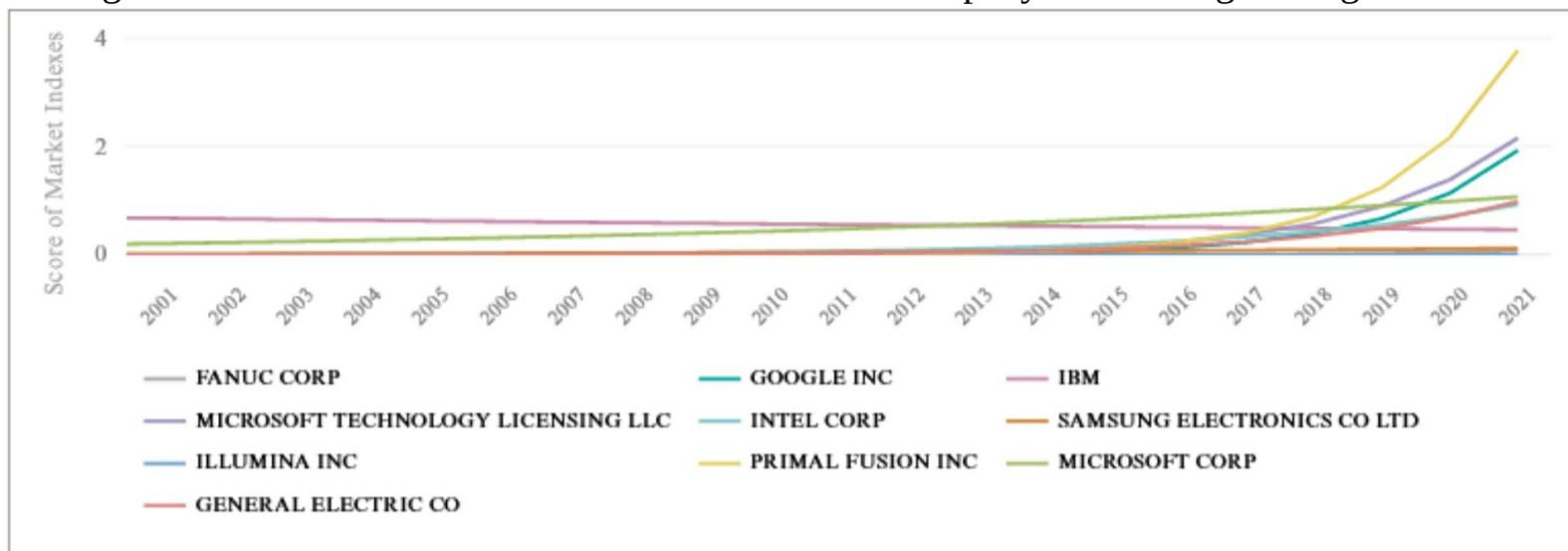
The figure below shows the total of the market index of each company in Learning Intelligence technology. The total of the market indexes of Learning Intelligence technology is ranked in FANUC CORP (1), GOOGLE INC (2), IBM (3), MICROSOFT TECHNOLOGY LICENSING LLC (4), INTEL CORP (5), SAMSUNG ELECTRONICS CO LTD (6), ILLUMINA INC (7), PRIMAL FUSION INC (8), MICROSOFT CORP (9), and GENERAL ELECTRIC CO (10). Given these rankings, FANUC CORP and GOOGLE INC seem to have positive view on future market prospect for Learning Intelligence technology.



* This score represents accumulation of the market index during the analysis period (2000~2021).

5) Market Index

The figure below shows the market index trend of each company in Learning Intelligence technology.



* This score represents the value of the market index during the analysis period (2000~2021).

- FANUC CORP is on an upward trend. Given this trend, it is analyzed that FANUC CORP has positive view on future market prospect of Learning Intelligence technology.
- GOOGLE INC is on an upward trend. Given this trend, it is analyzed that GOOGLE INC has positive view on future market prospect of Learning Intelligence technology.
- IBM is on a downward trend. Given this trend, it is analyzed that IBM has negative view on future market prospect of Learning Intelligence technology.
- MICROSOFT TECHNOLOGY LICENSING LLC is on an upward trend. Given this trend, it is analyzed that MICROSOFT TECHNOLOGY LICENSING LLC has positive view on future market prospect of Learning Intelligence technology.
- INTEL CORP is on an upward trend. Given this trend, it is analyzed that INTEL CORP has positive view on future market prospect of Learning Intelligence technology.
- SAMSUNG ELECTRONICS CO LTD is on an upward trend. Given this trend, it is analyzed that SAMSUNG ELECTRONICS CO LTD has positive view on future market prospect of Learning Intelligence technology.
- ILLUMINA INC is on an upward trend. Given this trend, it is analyzed that ILLUMINA INC has positive view on future market prospect of Learning Intelligence technology.
- PRIMAL FUSION INC is on an upward trend. Given this trend, it is analyzed that PRIMAL FUSION INC has positive view on future market prospect of Learning Intelligence technology.
- MICROSOFT CORP is on an upward trend. Given this trend, it is analyzed that MICROSOFT CORP has positive view on future market prospect of Learning Intelligence technology.
- GENERAL ELECTRIC CO is on an upward trend. Given this trend, it is analyzed that GENERAL ELECTRIC CO has positive view on future market prospect of Learning Intelligence technology.

6) Detailed Analysis

The table below shows the market index of Learning Intelligence technology by the year.

Rank	Country	Company	Market Index									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	JP	FANUC CORP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	US	GOOGLE INC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.011
3	US	IBM	1.000	1.000	1.000	1.000	0.813	0.515	0.365	0.350	0.380	0.364
4	US	MICROSOFT TECHNOLOGY	0.000	0.000	0.000	0.000	0.000	0.025	0.044	0.036	0.035	0.034
5	US	INTEL CORP	0.000	0.000	0.088	0.057	0.038	0.015	0.041	0.098	0.134	0.133
6	KR	SAMSUNG ELECTRONICS CO LTD	0.033	0.033	0.029	0.019	0.125	0.051	0.041	0.034	0.042	0.038
7	US	ILLUMINA INC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	CA	PRIMAL FUSION INC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040
9	US	MICROSOFT CORP	0.000	0.400	0.353	0.547	1.000	1.000	1.000	1.000	1.000	1.000
10	US	GENERAL ELECTRIC CO	0.000	0.000	0.000	0.000	0.000	0.162	0.164	0.146	0.146	0.131

Rank	Country	Company	Market Index									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	JP	FANUC CORP	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
2	US	GOOGLE INC	0.030	0.047	0.045	0.046	0.044	0.088	0.122	0.398	0.465	0.548
3	US	IBM	0.349	0.409	0.506	0.611	0.640	0.672	0.724	0.781	0.460	0.423
4	US	MICROSOFT TECHNOLOGY	0.041	0.043	0.047	0.068	0.093	0.167	0.349	0.562	0.398	0.426
5	US	INTEL CORP	0.124	0.119	0.114	0.114	0.112	0.153	0.208	0.281	0.346	0.357
6	KR	SAMSUNG ELECTRONICS CO LTD	0.036	0.034	0.032	0.036	0.034	0.032	0.057	0.090	0.137	0.210
7	US	ILLUMINA INC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.105
8	CA	PRIMAL FUSION INC	0.037	0.143	0.445	0.610	0.677	0.672	0.783	0.913	0.437	0.282
9	US	MICROSOFT CORP	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.947	0.445	0.274
10	US	GENERAL ELECTRIC CO	0.142	0.136	0.133	0.132	0.126	0.119	0.117	0.114	0.102	0.115

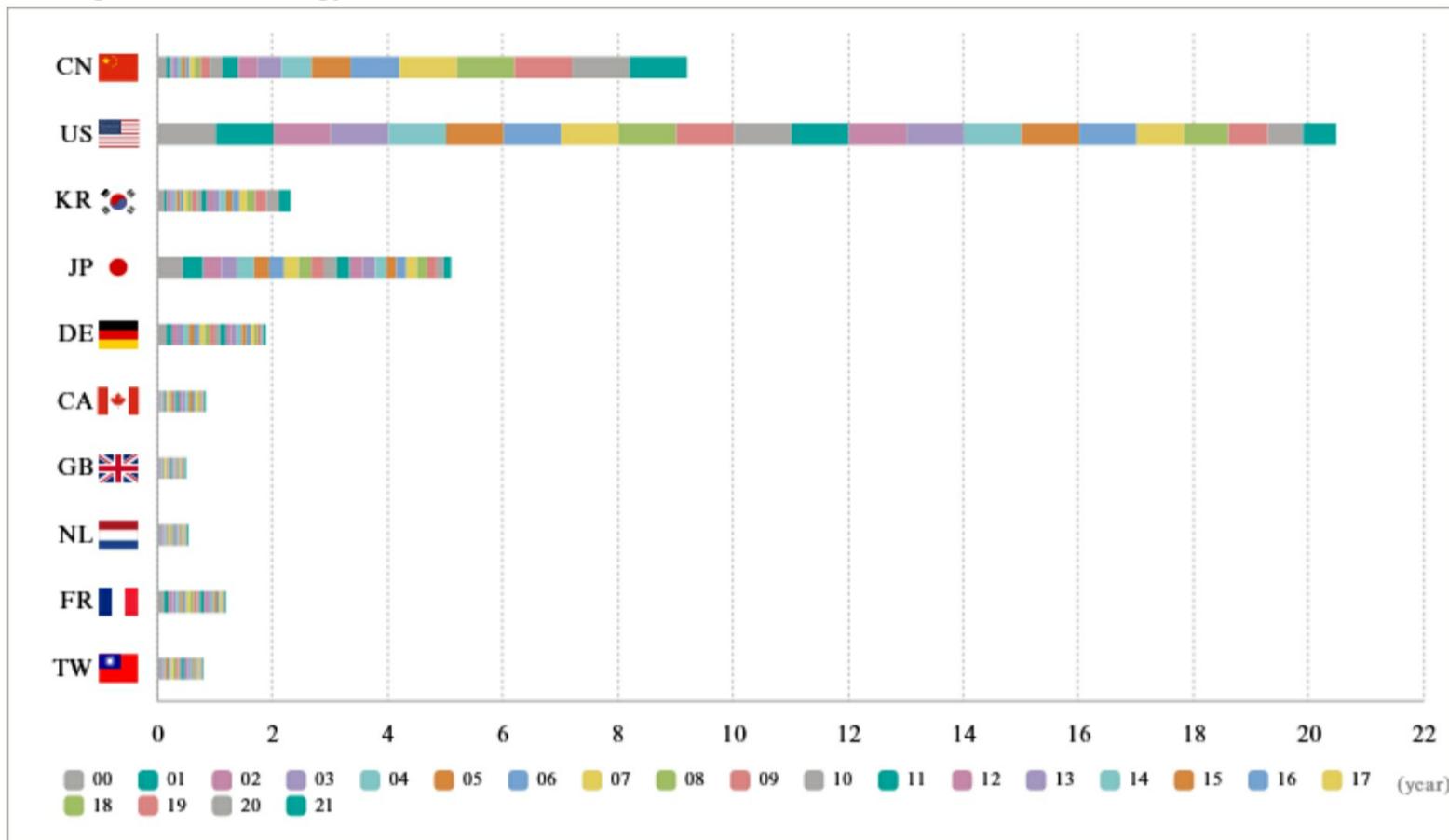
Rank	Country	Company	Market Index	
			2020	2021
1	JP	FANUC CORP	1.000	1.000
2	US	GOOGLE INC	0.661	0.684
3	US	IBM	0.534	0.584
4	US	MICROSOFT TECHNOLOGY	0.511	0.539
5	US	INTEL CORP	0.397	0.409
6	KR	SAMSUNG ELECTRONICS CO LTD	0.290	0.308
7	US	ILLUMINA INC	0.247	0.235
8	CA	PRIMAL FUSION INC	0.244	0.228
9	US	MICROSOFT CORP	0.230	0.215
10	US	GENERAL ELECTRIC CO	0.196	0.193

- The market index of FANUC CORP is increasing at an annual average of 55.6 % from 0.000 in 2000 to 0.084 in 2021.
- The market index of GOOGLE INC is increasing at an annual average of 69.0 % from 0.000 in 2000 to 1.939 in 2021.
- The market index of IBM is decreasing at an annual average of -1.8 % from 0.697 in 2000 to 0.471 in 2021.
- The market index of MICROSOFT TECHNOLOGY LICENSING LLC is increasing at an annual average of 54.7 % from 0.000 in 2000 to 2.166 in 2021.
- The market index of INTEL CORP is increasing at an annual average of 28.9 % from 0.005 in 2000 to 0.934 in 2021.
- The market index of SAMSUNG ELECTRONICS CO LTD is increasing at an annual average of 8.5 % from 0.023 in 2000 to 0.129 in 2021.
- The market index of ILLUMINA INC is increasing at an annual average of 27.5 % from 0.000 in 2000 to 0.004 in 2021.
- The market index of PRIMAL FUSION INC is increasing at an annual average of 74.1 % from 0.000 in 2000 to 3.787 in 2021.
- The market index of MICROSOFT CORP is increasing at an annual average of 8.4 % from 0.199 in 2000 to 1.078 in 2021.
- The market index of GENERAL ELECTRIC CO is increasing at an annual average of 41.1 % from 0.001 in 2000 to 0.990 in 2021.

7. R&D Activity

1) Global country Ranking

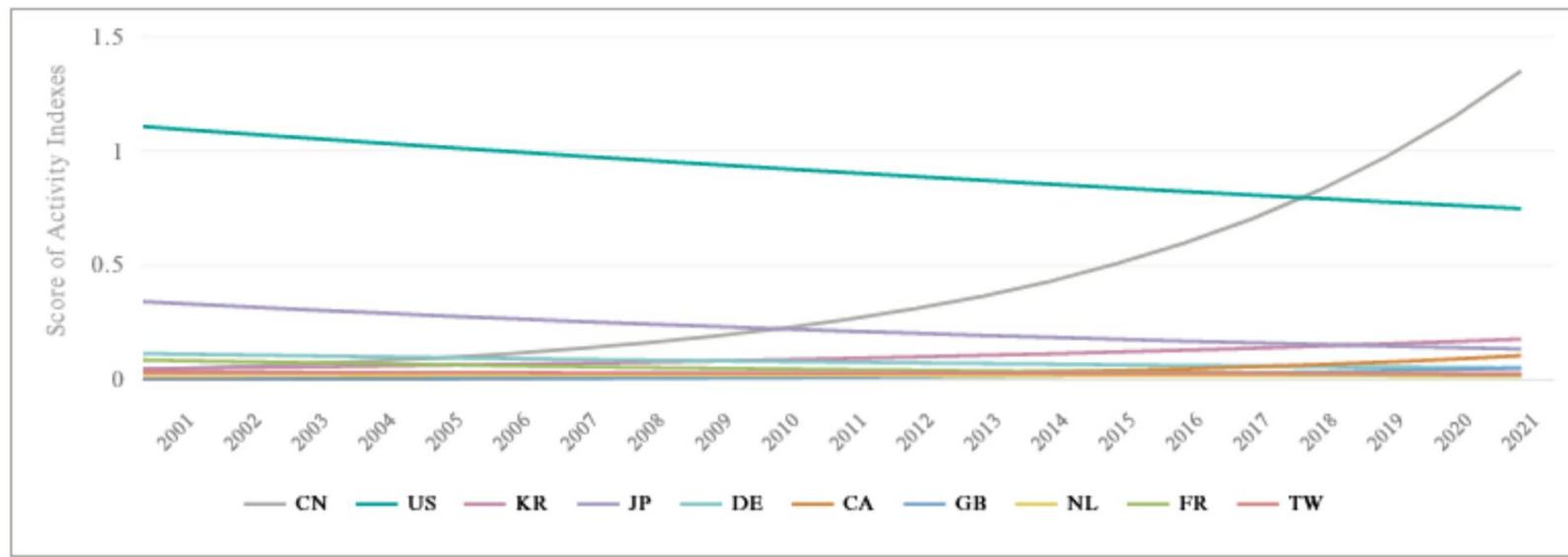
The figure below shows the total of the activity index of each country in Learning Intelligence technology. The total of the activity indexes of Learning Intelligence technology is ranked in China (1), U.S.A (2), Korea (3), Japan (4), Germany (5), Canada (6), Britain (7), Netherlands (8), France (9), and Taiwan (10). Given these rankings, China and U.S.A seem to be quite active in research and development investment on Learning Intelligence technology.



* This score represents accumulation of the activity index during the analysis period (2000~2021).

2) Activity Index

The figure below shows the activity index trend of each country in Learning Intelligence technology.



* This score represents the value of the activity index during the analysis period (2000~2021).

- China is on an upward trend. Given this trend, it is analyzed that China is active in research and development investment on Learning Intelligence technology.
- U.S.A is on a downward trend. Given this trend, it is analyzed that U.S.A is passive in research and development investment on Learning Intelligence technology.
- Korea is on an upward trend. Given this trend, it is analyzed that Korea is active in research and development investment on Learning Intelligence technology.
- Japan is on a downward trend. Given this trend, it is analyzed that Japan is passive in research and development investment on Learning Intelligence technology.
- Germany is on a downward trend. Given this trend, it is analyzed that Germany is passive in research and development investment on Learning Intelligence technology.
- Canada is on an upward trend. Given this trend, it is analyzed that Canada is active in research and development investment on Learning Intelligence technology.
- Britain is on an upward trend. Given this trend, it is analyzed that Britain is active in research and development investment on Learning Intelligence technology.
- Netherlands is on a downward trend. Given this trend, it is analyzed that Netherlands is passive in research and development investment on Learning Intelligence technology.
- France is on a downward trend. Given this trend, it is analyzed that France is passive in research and development investment on Learning Intelligence technology.
- Taiwan is on a downward trend. Given this trend, it is analyzed that Taiwan is passive in research and development investment on Learning Intelligence technology.

3) Detailed Analysis

The table below shows the activity index of Learning Intelligence technology by the year.

Rank	Country	Activity Index									
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	🇨🇳 CN	0.143	0.072	0.043	0.074	0.071	0.071	0.070	0.087	0.103	0.157
2	🇺🇸 US	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3	🇰🇷 KR	0.107	0.043	0.058	0.056	0.054	0.059	0.058	0.067	0.082	0.081
4	🇯🇵 JP	0.429	0.348	0.317	0.279	0.293	0.264	0.258	0.248	0.221	0.220
5	🇩🇪 DE	0.143	0.087	0.101	0.102	0.102	0.090	0.092	0.087	0.090	0.088
6	🇨🇦 CA	0.000	0.000	0.022	0.028	0.024	0.022	0.047	0.044	0.039	0.043
7	🇬🇧 GB	0.000	0.000	0.014	0.028	0.024	0.022	0.023	0.025	0.022	0.025
8	🇳🇱 NL	0.036	0.014	0.036	0.028	0.027	0.022	0.024	0.023	0.025	0.025
9	🇫🇷 FR	0.107	0.072	0.072	0.065	0.058	0.049	0.062	0.064	0.065	0.060
10	🇹🇼 TW	0.036	0.014	0.022	0.023	0.031	0.049	0.043	0.041	0.046	0.047

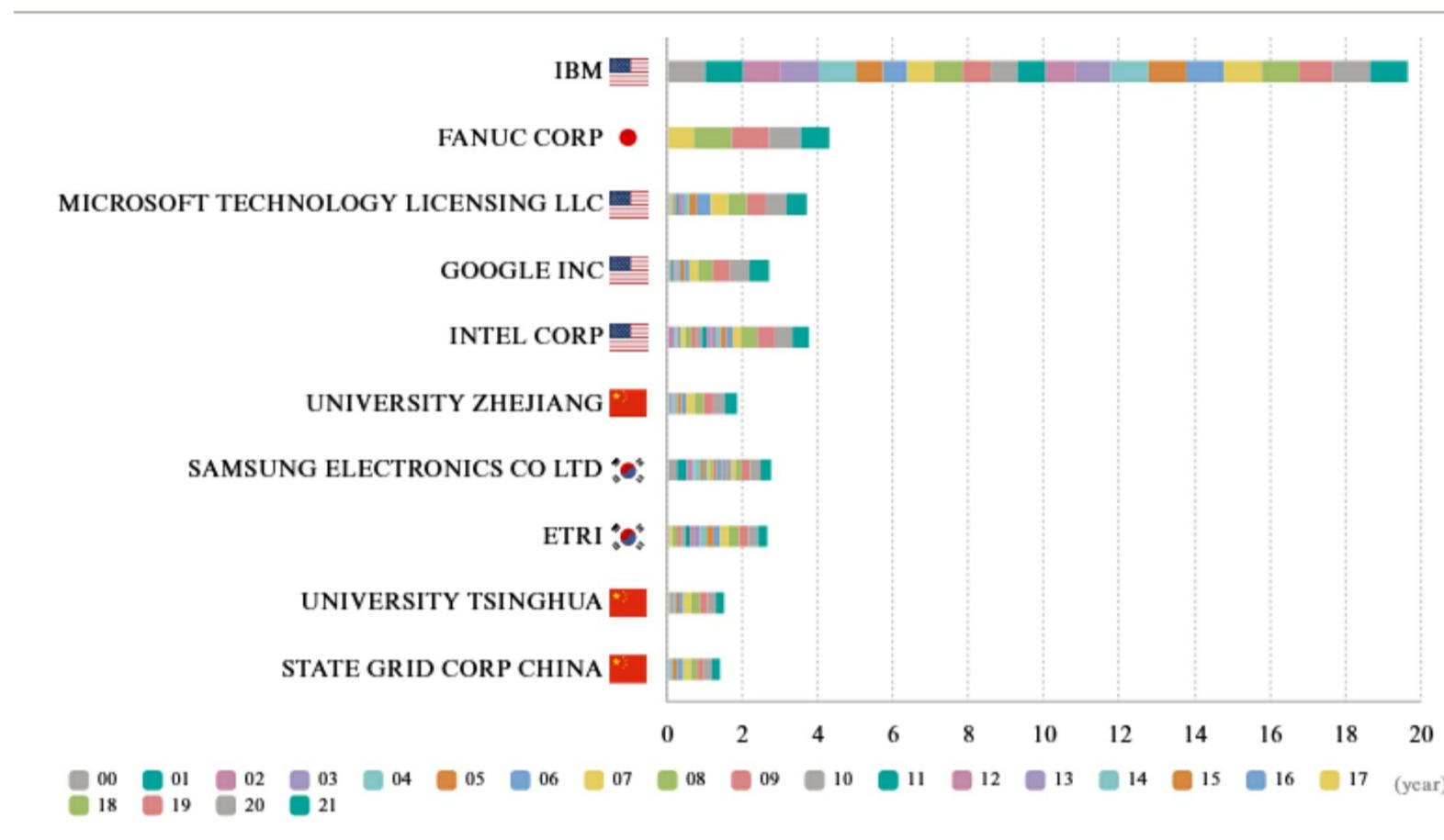
Rank	Country	Activity Index									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	🇨🇳 CN	0.226	0.268	0.343	0.419	0.516	0.674	0.850	1.000	1.000	1.000
2	🇺🇸 US	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.819	0.773	0.689
3	🇰🇷 KR	0.091	0.087	0.110	0.113	0.111	0.108	0.119	0.126	0.152	0.198
4	🇯🇵 JP	0.222	0.226	0.230	0.215	0.193	0.176	0.170	0.185	0.179	0.161
5	🇩🇪 DE	0.094	0.097	0.094	0.098	0.086	0.079	0.076	0.063	0.056	0.050
6	🇨🇦 CA	0.043	0.047	0.053	0.060	0.063	0.059	0.055	0.049	0.041	0.036
7	🇬🇧 GB	0.026	0.023	0.024	0.030	0.028	0.024	0.024	0.021	0.023	0.026
8	🇳🇱 NL	0.024	0.022	0.022	0.022	0.023	0.023	0.023	0.020	0.018	0.022
9	🇫🇷 FR	0.059	0.064	0.061	0.058	0.052	0.049	0.045	0.033	0.026	0.021
10	🇹🇼 TW	0.052	0.053	0.050	0.050	0.047	0.042	0.036	0.027	0.022	0.020

Rank	Country	Activity Index	
		2020	2021
1	 CN	1.000	1.000
2	 US	0.610	0.576
3	 KR	0.214	0.203
4	 JP	0.132	0.120
5	 DE	0.046	0.047
6	 CA	0.027	0.026
7	 GB	0.024	0.024
8	 NL	0.023	0.023
9	 FR	0.020	0.019
10	 TW	0.019	0.017

- The activity index of China is increasing at an annual average of 17.6 % from 0.045 in 2000 to 1.354 in 2021.
- The activity index of U.S.A is decreasing at an annual average of -1.9 % from 1.122 in 2000 to 0.752 in 2021.
- The activity index of Korea is increasing at an annual average of 6.4 % from 0.049 in 2000 to 0.182 in 2021.
- The activity index of Japan is decreasing at an annual average of -4.4 % from 0.354 in 2000 to 0.138 in 2021.
- The activity index of Germany is decreasing at an annual average of -3.6 % from 0.121 in 2000 to 0.056 in 2021.
- The activity index of Canada is increasing at an annual average of 16.1 % from 0.005 in 2000 to 0.109 in 2021.
- The activity index of Britain is increasing at an annual average of 13.8 % from 0.004 in 2000 to 0.056 in 2021.
- The activity index of Netherlands is decreasing at an annual average of -1.2 % from 0.026 in 2000 to 0.021 in 2021.
- The activity index of France is decreasing at an annual average of -5.9 % from 0.093 in 2000 to 0.026 in 2021.
- The activity index of Taiwan is decreasing at an annual average of -1.0 % from 0.037 in 2000 to 0.030 in 2021.

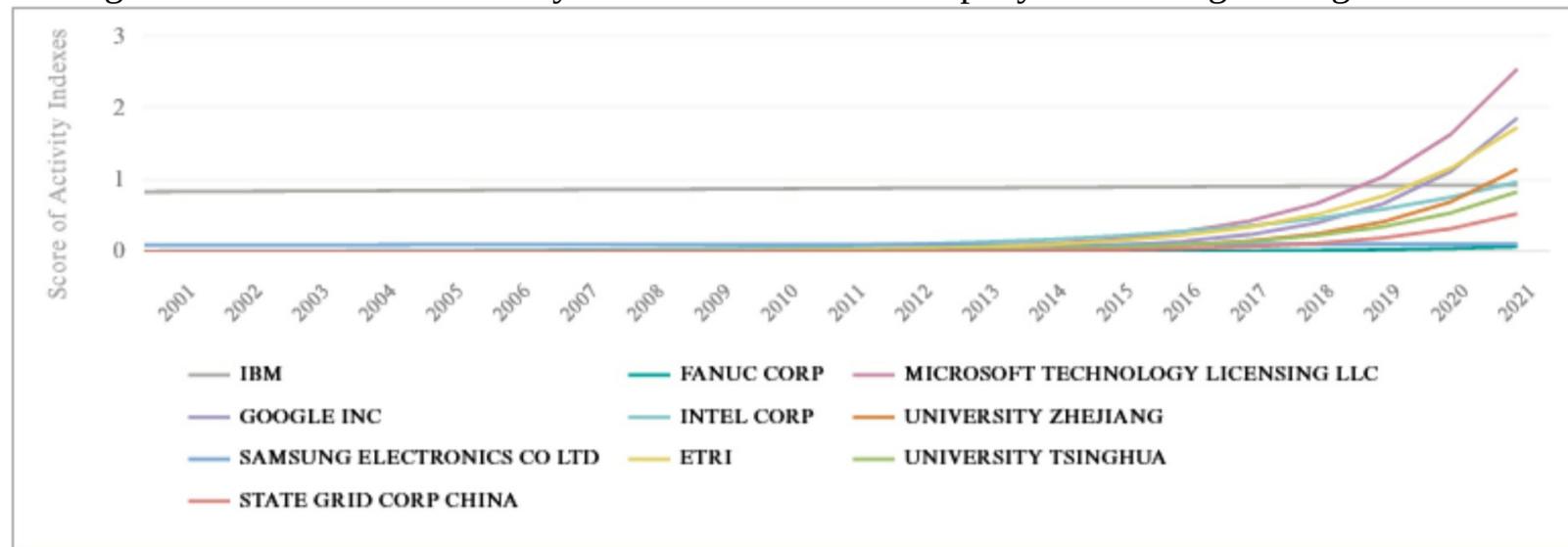
4) Global company Ranking

The figure below shows the total of the activity index of each company in Learning Intelligence technology. The total of the activity indexes of Learning Intelligence technology is ranked in IBM (1), FANUC CORP (2), MICROSOFT TECHNOLOGY LICENSING LLC (3), GOOGLE INC (4), INTEL CORP (5), UNIVERSITY ZHEJIANG (6), SAMSUNG ELECTRONICS CO LTD (7), ETRI (8), UNIVERSITY TSINGHUA (9), and STATE GRID CORP CHINA (10). Given these rankings, IBM and FANUC CORP seem to be quite active in research and development investment on Learning Intelligence technology.



5) Activity Index

The figure below shows the activity index trend of each company in Learning Intelligence technology.



* This score represents the value of the activity index during the analysis period (2000~2021).

- IBM is almost unchanged in trends. Given this trend, it is analyzed that IBM is active in research and development investment on Learning Intelligence technology.
- FANUC CORP is on an upward trend. Given this trend, it is analyzed that FANUC CORP is active in research and development investment on Learning Intelligence technology.
- MICROSOFT TECHNOLOGY LICENSING LLC is on an upward trend. Given this trend, it is analyzed that MICROSOFT TECHNOLOGY LICENSING LLC is active in research and development investment on Learning Intelligence technology.
- GOOGLE INC is on an upward trend. Given this trend, it is analyzed that GOOGLE INC is active in research and development investment on Learning Intelligence technology.
- INTEL CORP is on an upward trend. Given this trend, it is analyzed that INTEL CORP is active in research and development investment on Learning Intelligence technology.
- UNIVERSITY ZHEJIANG is on an upward trend. Given this trend, it is analyzed that UNIVERSITY ZHEJIANG is active in research and development investment on Learning Intelligence technology.
- SAMSUNG ELECTRONICS CO LTD is almost unchanged in trends. Given this trend, it is analyzed that SAMSUNG ELECTRONICS CO LTD is active in research and development investment on Learning Intelligence technology.
- ETRI is on an upward trend. Given this trend, it is analyzed that ETRI is active in research and development investment on Learning Intelligence technology.
- UNIVERSITY TSINGHUA is on an upward trend. Given this trend, it is analyzed that UNIVERSITY TSINGHUA is active in research and development investment on Learning Intelligence technology.

- STATE GRID CORP CHINA is on an upward trend. Given this trend, it is analyzed that STATE GRID CORP CHINA is active in research and development investment on Learning Intelligence technology.

6) Detailed Analysis

The table below shows the activity index of Learning Intelligence technology by the year.

Rank	Country	Company	Activity Index									
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	US	IBM	0.718	0.744	0.802	0.930	1.000	1.000	1.000	1.000	0.986	0.895
2	JP	FANUC CORP	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.694	1.000	1.000
3	US	MICROSOFT TECHNOLOGY	0.045	0.051	0.063	0.094	0.139	0.199	0.369	0.472	0.485	0.514
4	US	GOOGLE INC	0.045	0.060	0.056	0.063	0.058	0.114	0.126	0.226	0.387	0.472
5	US	INTEL CORP	0.136	0.128	0.119	0.125	0.124	0.151	0.167	0.218	0.437	0.478
6	CN	UNIVERSITY ZHEJIANG	0.027	0.026	0.032	0.063	0.088	0.108	0.121	0.226	0.249	0.260
7	KR	SAMSUNG ELECTRONICS CO LTD	0.064	0.060	0.056	0.063	0.058	0.048	0.071	0.093	0.168	0.226
8	KR	ETRI	0.127	0.128	0.127	0.141	0.175	0.181	0.177	0.222	0.275	0.243
9	CN	UNIVERSITY TSINGHUA	0.009	0.009	0.024	0.055	0.058	0.084	0.126	0.210	0.224	0.210
10	CN	STATE GRID CORP CHINA	0.000	0.009	0.008	0.031	0.080	0.120	0.167	0.194	0.179	0.176

Rank	Country	Company	Activity Index	
			2020	2021
1	US	IBM	1.000	1.000
2	JP	FANUC CORP	0.838	0.757
3	US	MICROSOFT TECHNOLOGY	0.546	0.535
4	US	GOOGLE INC	0.511	0.519
5	US	INTEL CORP	0.458	0.435
6	CN	UNIVERSITY ZHEJIANG	0.305	0.317
7	KR	SAMSUNG ELECTRONICS CO LTD	0.281	0.273
8	KR	ETRI	0.259	0.250
9	CN	UNIVERSITY TSINGHUA	0.220	0.218
10	CN	STATE GRID CORP CHINA	0.213	0.213

- The activity index of IBM is more or less unchanged at an annual average of 0.5 % from 0.835 in 2000 to 0.932 in 2021.

- The activity index of FANUC CORP is increasing at an annual average of 54.4 % from 0.000 in 2000 to 0.075 in 2021.
- The activity index of MICROSOFT TECHNOLOGY LICENSING LLC is increasing at an annual average of 55.9 % from 0.000 in 2000 to 2.547 in 2021.
- The activity index of GOOGLE INC is increasing at an annual average of 66.6 % from 0.000 in 2000 to 1.866 in 2021.
- The activity index of INTEL CORP is increasing at an annual average of 27.8 % from 0.006 in 2000 to 0.971 in 2021.

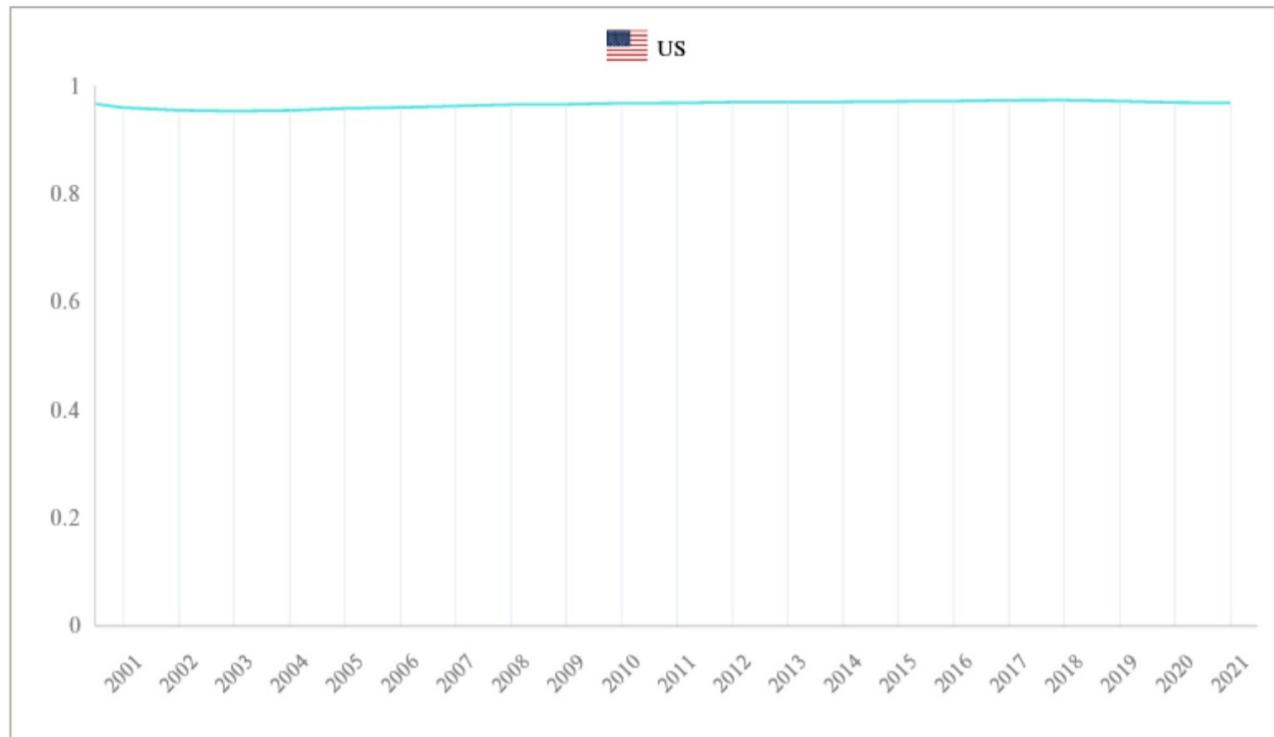
- The activity index of UNIVERSITY ZHEJIANG is increasing at an annual average of 65.8 % from 0.000 in 2000 to 1.152 in 2021.
- The activity index of SAMSUNG ELECTRONICS CO LTD is more or less unchanged at an annual average of 0.5 % from 0.099 in 2000 to 0.108 in 2021.
- The activity index of ETRI is increasing at an annual average of 49.5 % from 0.000 in 2000 to 1.735 in 2021.
- The activity index of UNIVERSITY TSINGHUA is increasing at an annual average of 54.3 % from 0.000 in 2000 to 0.838 in 2021.
- The activity index of STATE GRID CORP CHINA is increasing at an annual average of 64.6 % from 0.000 in 2000 to 0.533 in 2021.

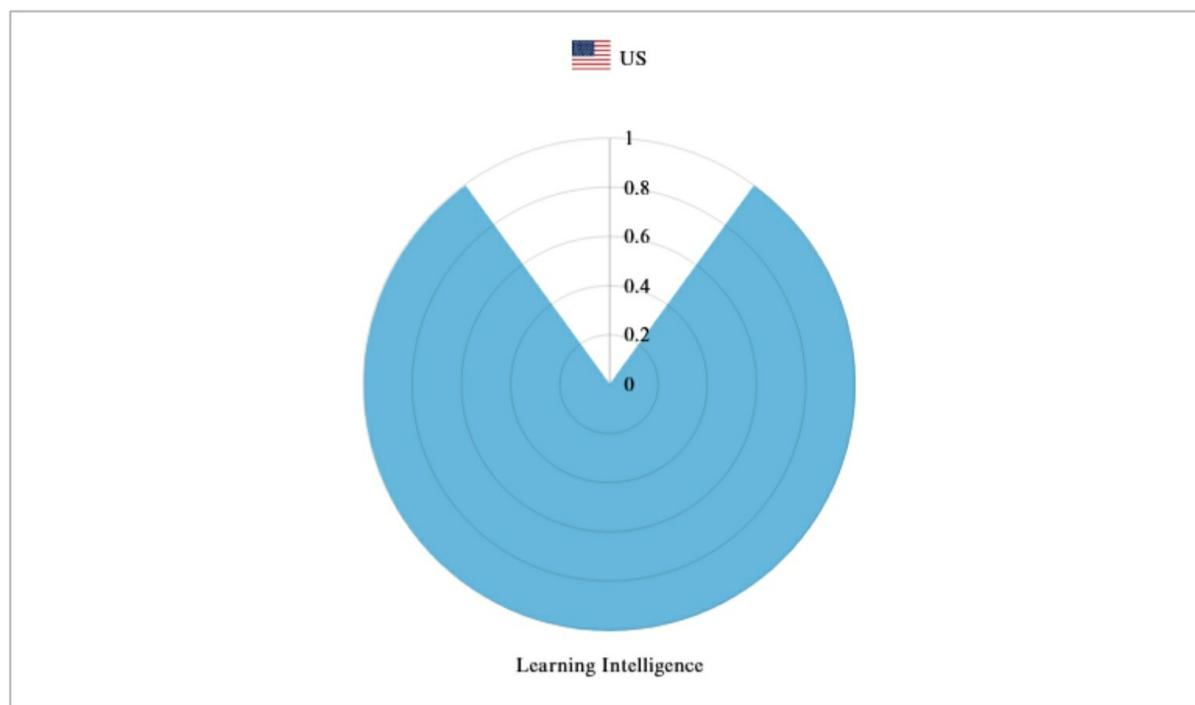
8. Diagnosis

1) Country Diagnosis

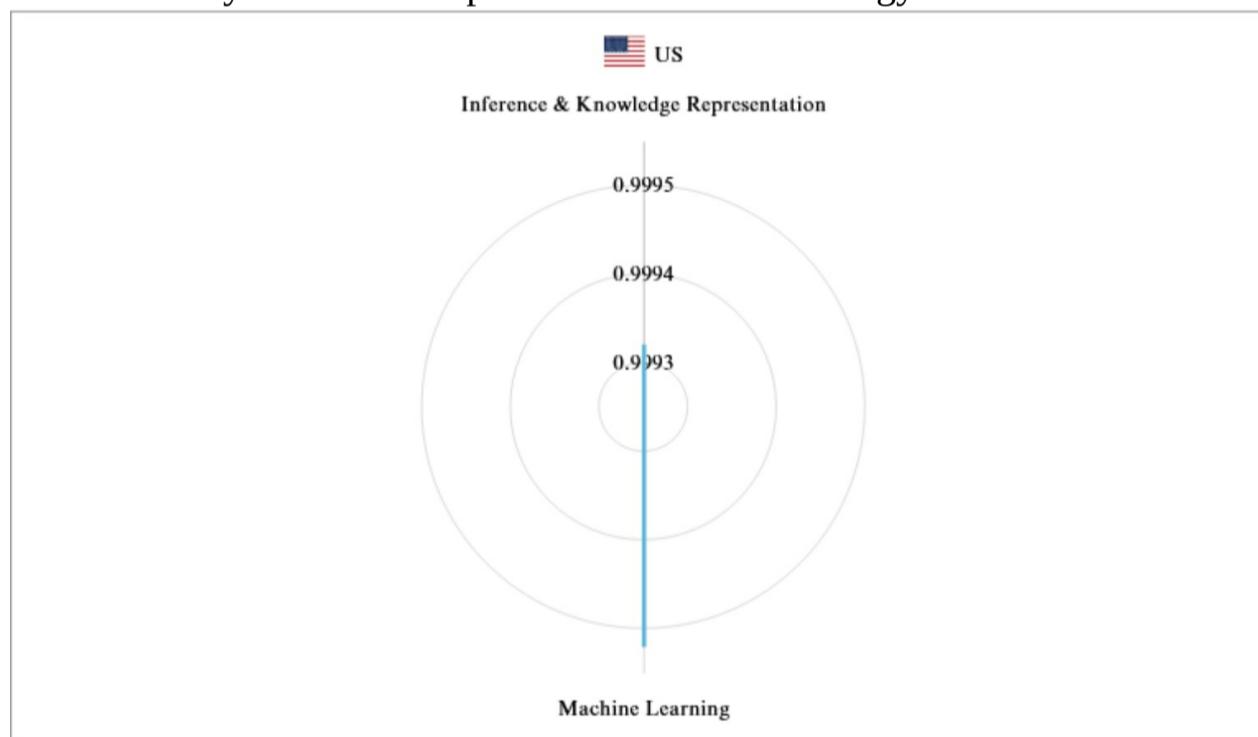
United States

According to the diagnosis results, technological competitiveness of U.S.A is globally at 1st. The diagnostic score in U.S.A is increasing at an annual average of -0.0 % from 0.974 in 2000 to 0.970 in 2021. Given this trend, it shows that technological competitiveness in U.S.A is more or less unchanged.





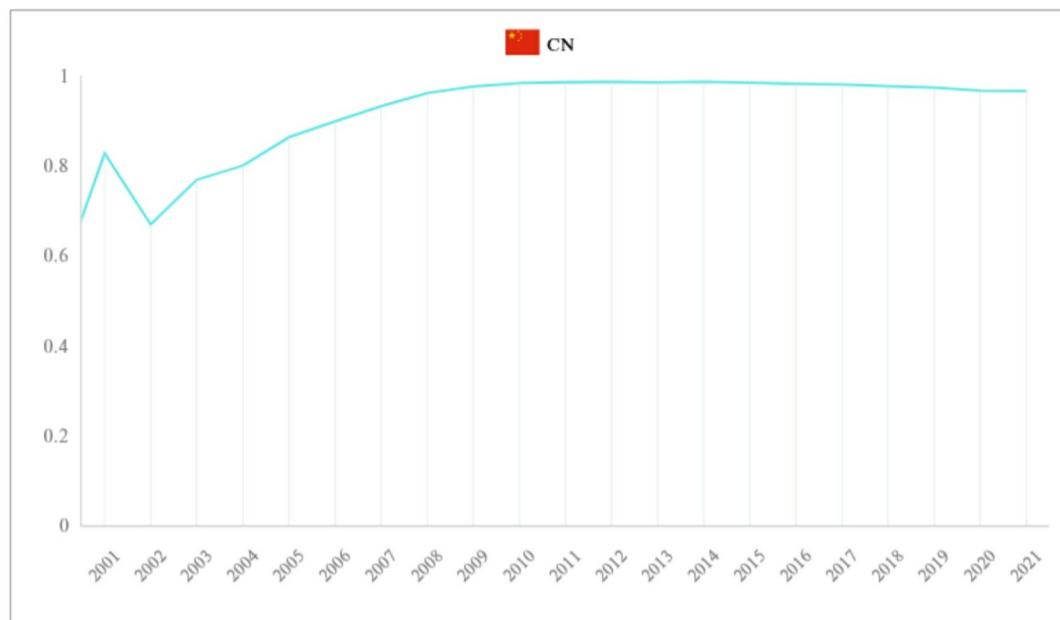
The diagnostic score of the Learning Intelligence technology is 1.00.
U.S.A is analyzed to be competitive in entire technology.



The diagnostic score of the Inference & Knowledge Representation technology is 1.00, and Machine Learning technology is 1.00.
Given this score, U.S.A is analyzed to be competitive in entire technology.

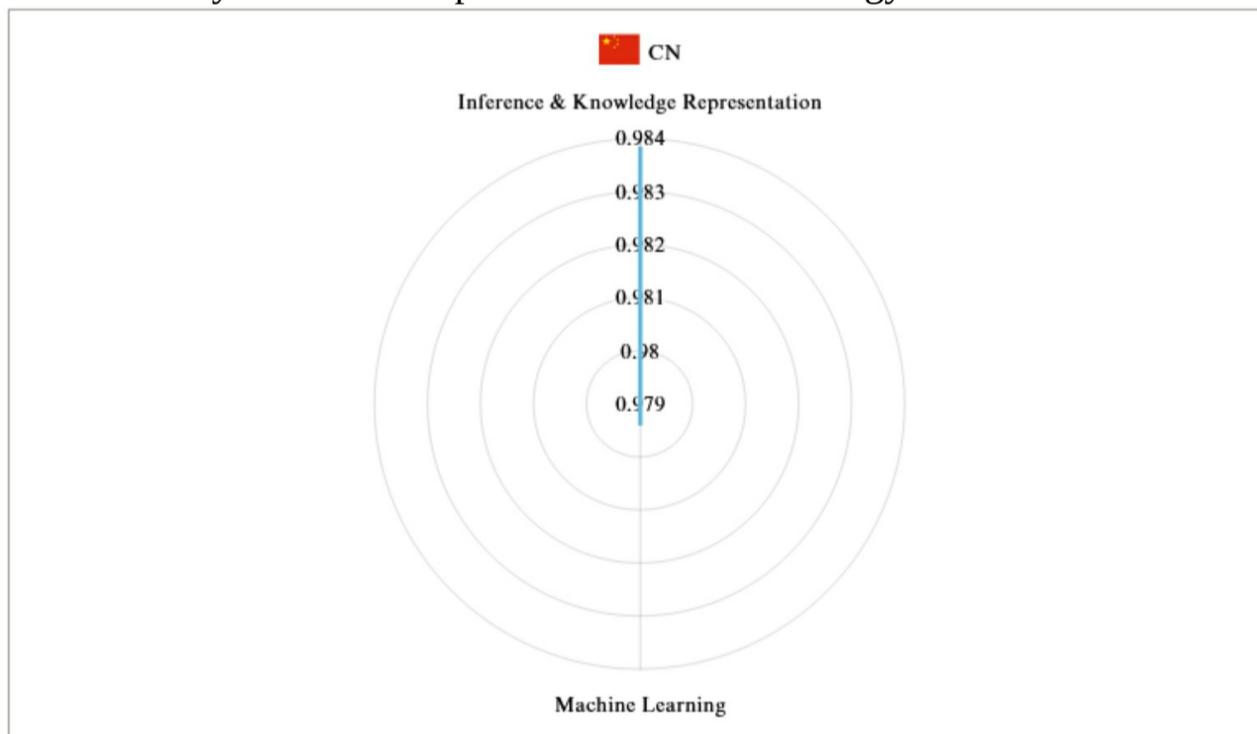
China

According to the diagnosis results, technological competitiveness of China is globally at 2nd. The diagnostic score in China is increasing at an annual average of 3.0 % from 0.539 in 2000 to 0.967 in 2021. Given this trend, it shows that technological competitiveness in China is increasing.





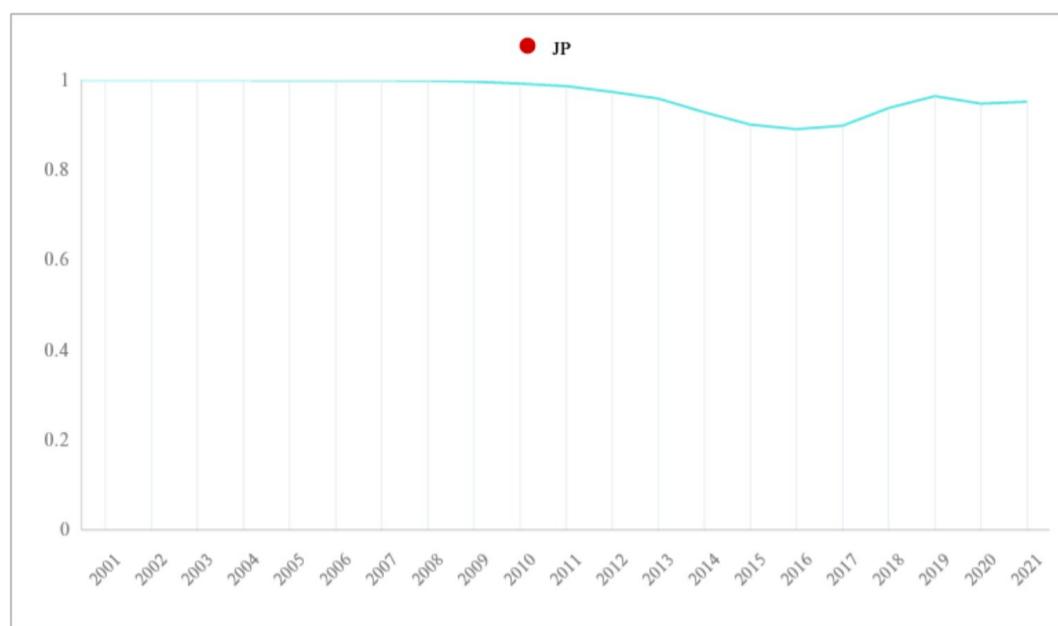
The diagnostic score of the Learning Intelligence technology is 0.92.
China is analyzed to be competitive in entire technology.

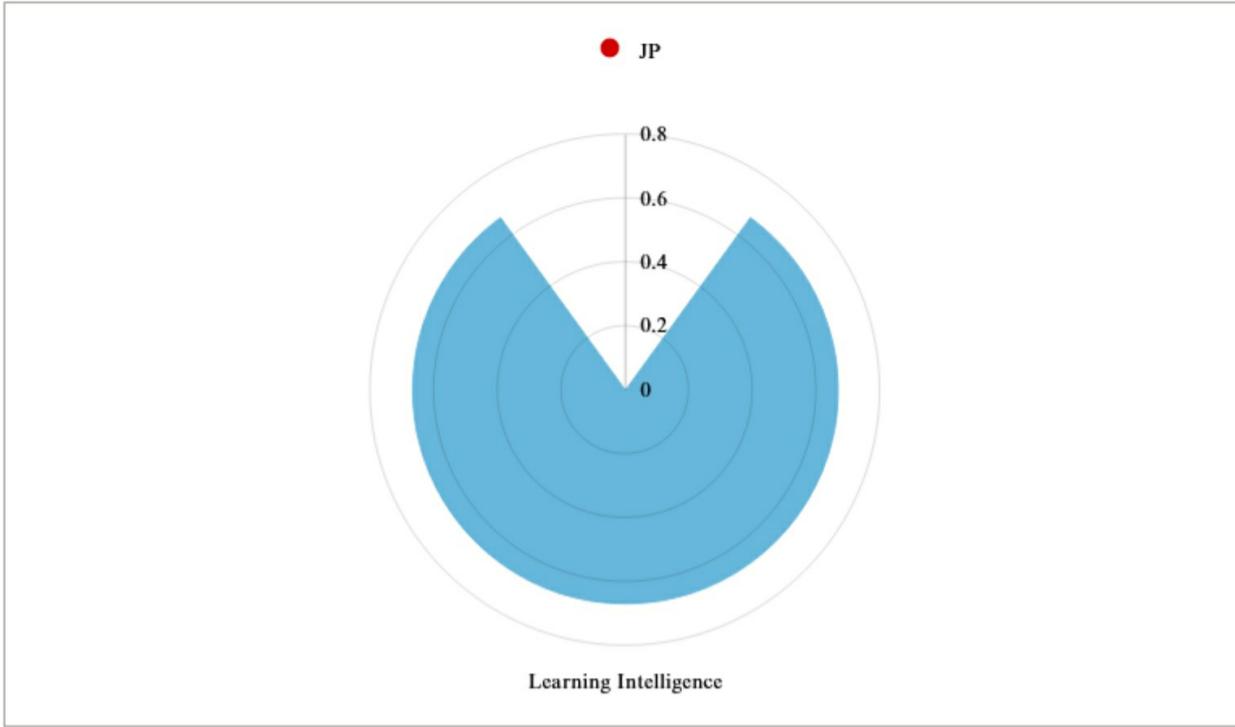


The diagnostic score of the Inference & Knowledge Representation technology is 0.98, and Machine Learning technology is 0.98.
Given this score, China is analyzed to be competitive in entire technology.

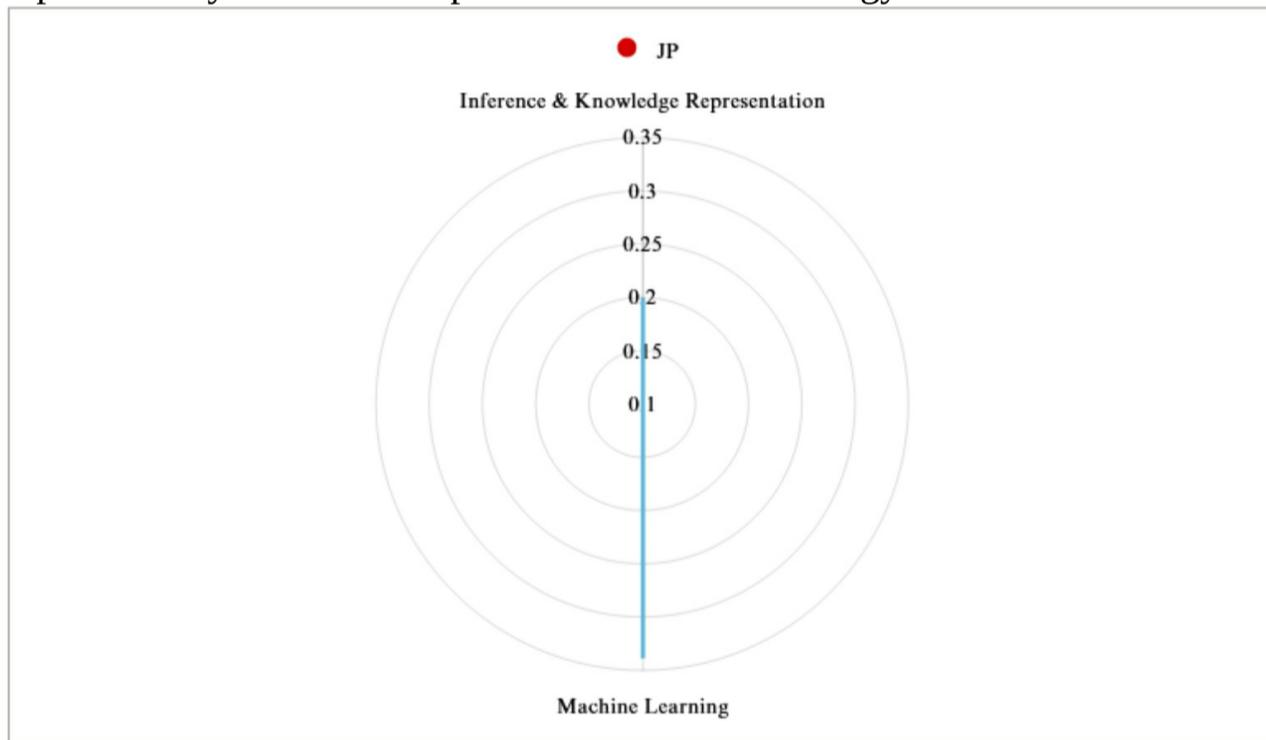
Japan

According to the diagnosis results, technological competitiveness of Japan is globally at 3rd. The diagnostic score in Japan is decreasing at an annual average of -0.3 % from 1.000 in 2000 to 0.952 in 2021. Given this trend, it shows that technological competitiveness in Japan is more or less unchanged.





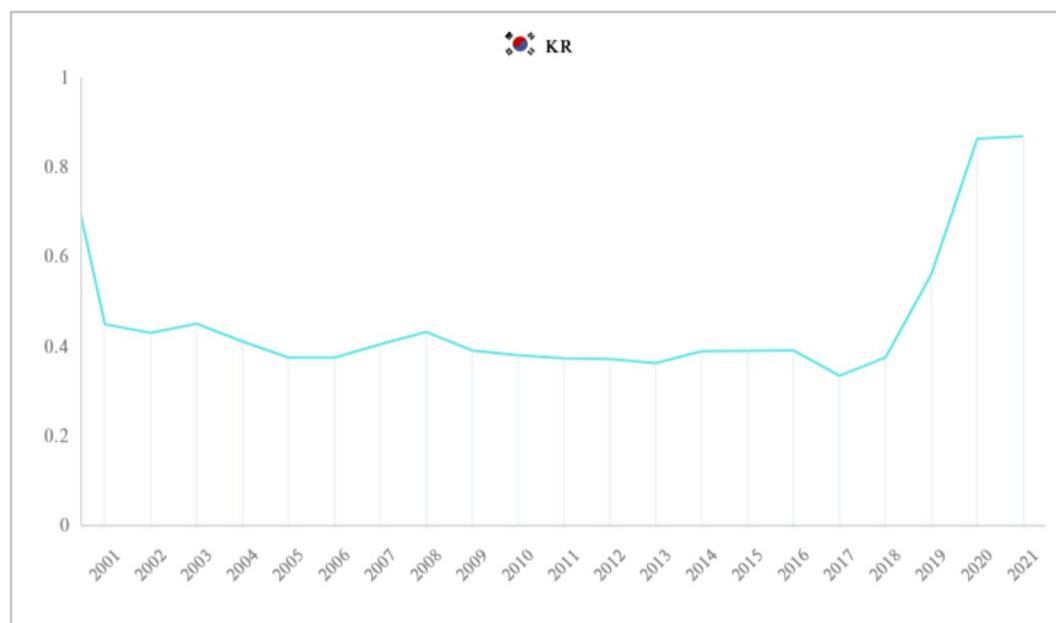
The diagnostic score of the Learning Intelligence technology is 0.67.
Japan is analyzed to be competitive in entire technology.

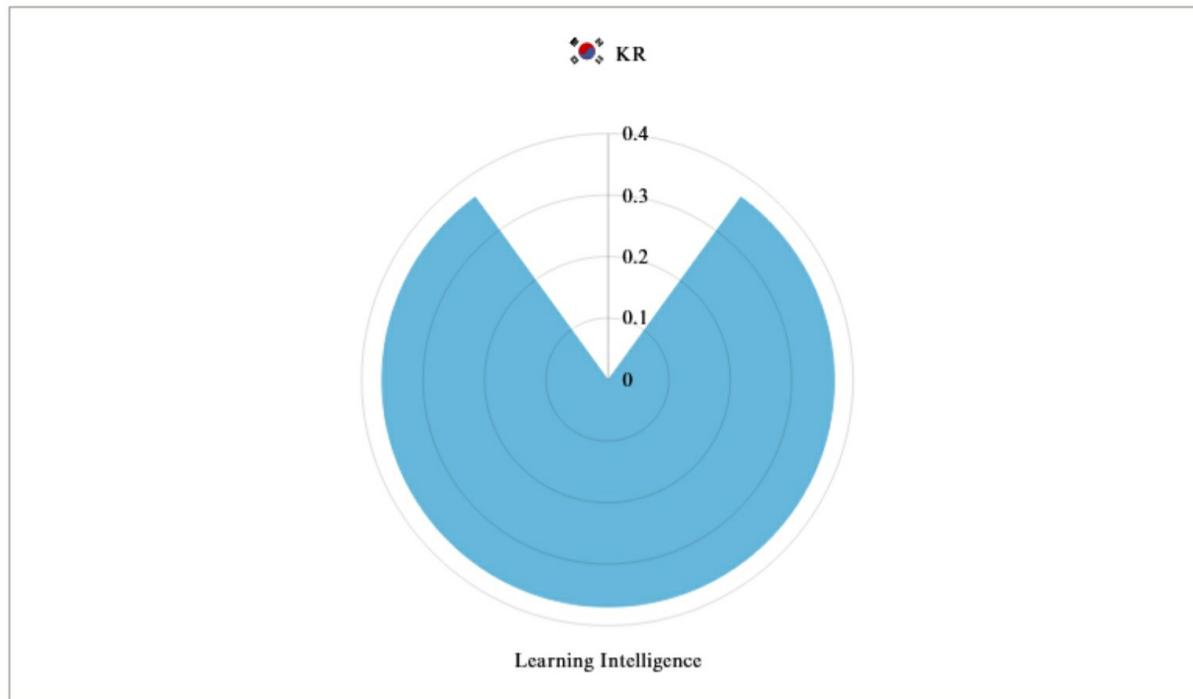


The diagnostic score of the Emotional Intelligence technology is 0.13, General Artificial Intelligence technology is 0.12, Intelligent Agent technology is 0.11, and Social Intelligence technology is 0.18. Given this score, Japan is analyzed to be non-competitive in entire technology.

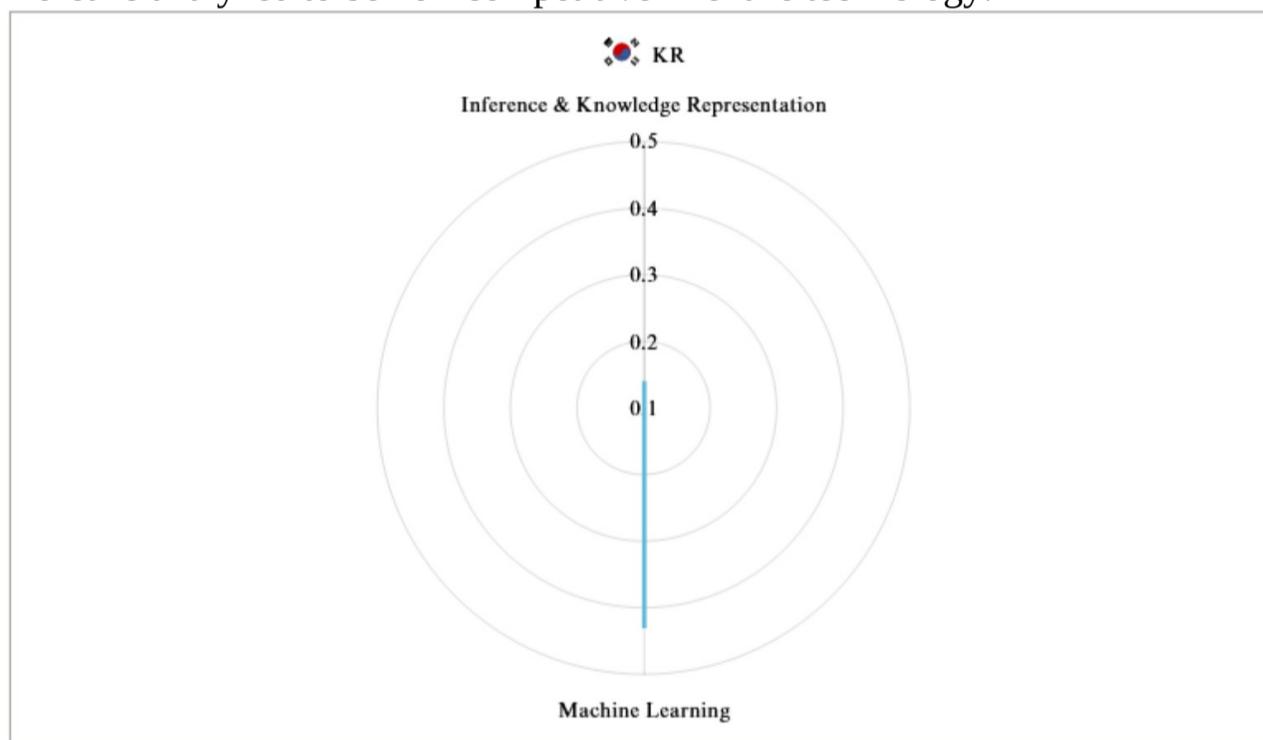
Korea

According to the diagnosis results, technological competitiveness of Korea is globally at 4th. The diagnostic score in Korea is decreasing at an annual average of -0.3 % from 0.915 in 2000 to 0.870 in 2021. Given this trend, it shows that technological competitiveness in Korea is more or less unchanged.





The diagnostic score of the Learning Intelligence technology is 0.37.
Korea is analyzed to be non-competitive in entire technology.

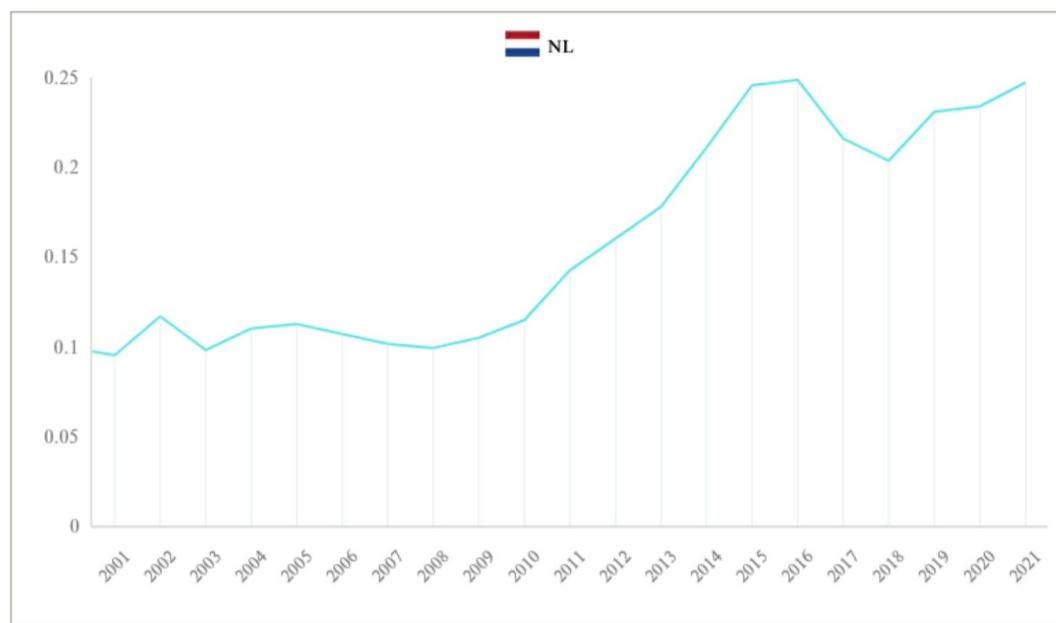


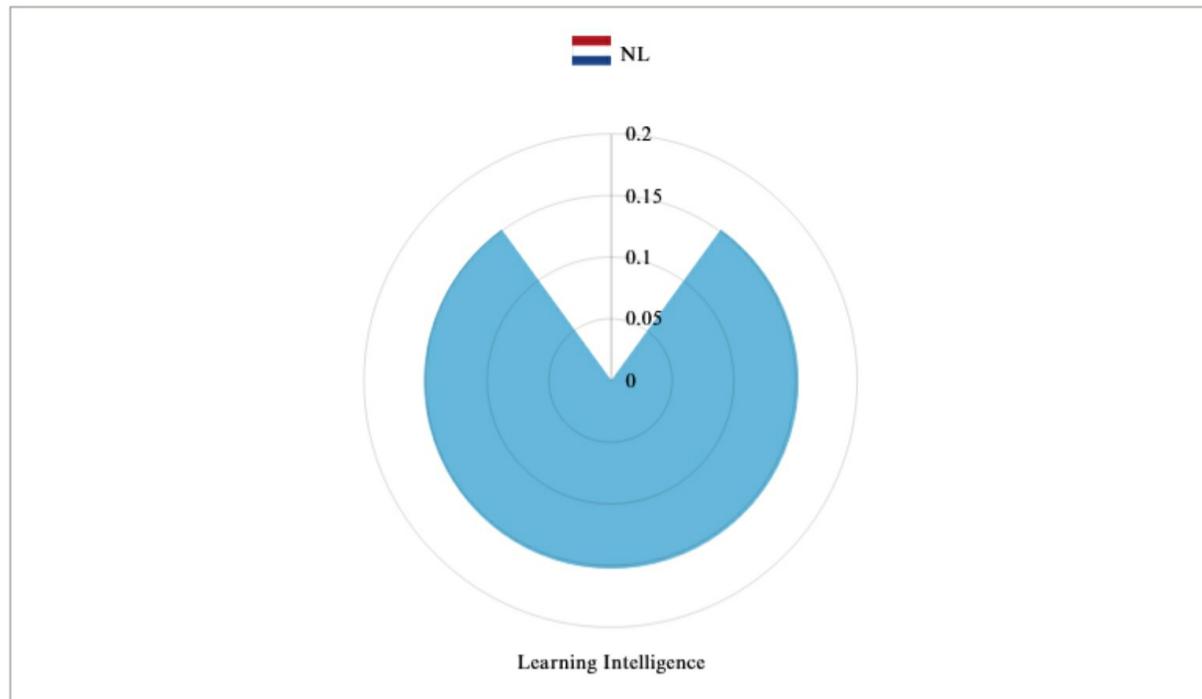
The diagnostic score of the Inference & Knowledge Representation technology is 0.14, and Machine Learning technology is 0.43.
Given this score, Korea is analyzed to be competitive in Machine Learning technology.

Given this score, Korea is analyzed to be non-competitive in Inference & Knowledge Representation technology.

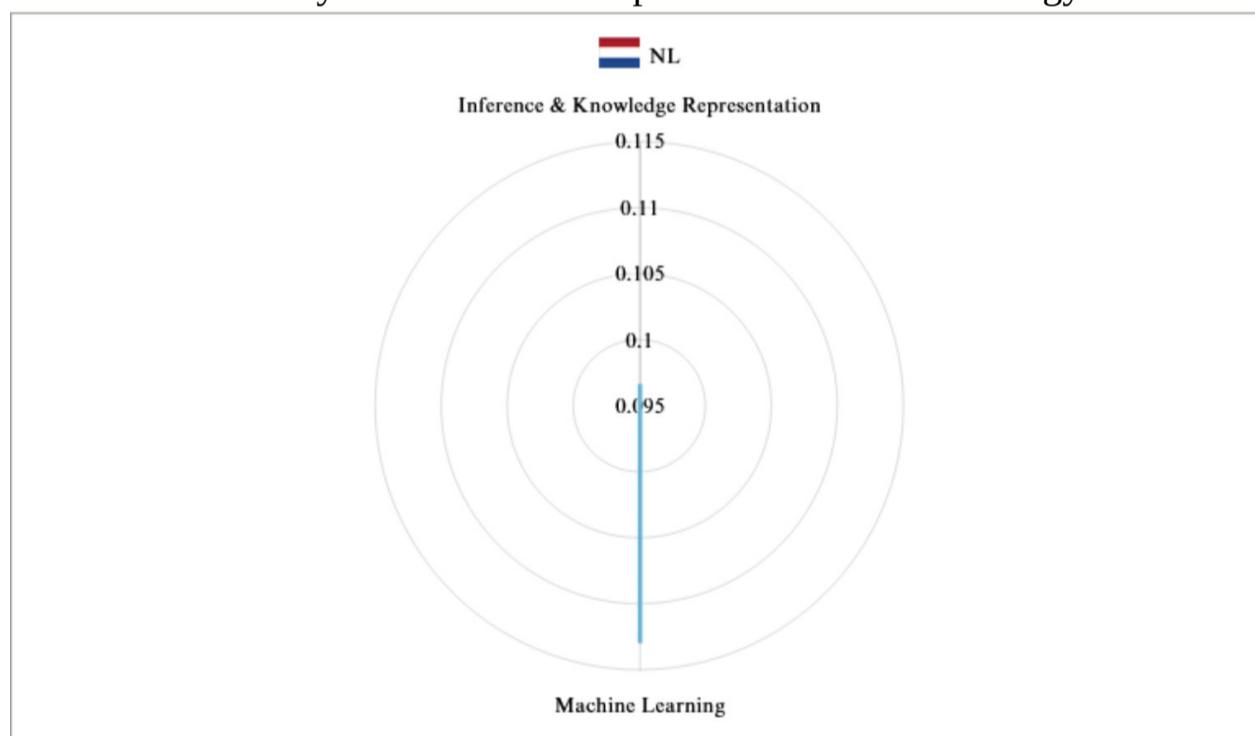
Netherlands

According to the diagnosis results, technological competitiveness of Netherlands is globally at 5th. The diagnostic score in Netherlands is increasing at an annual average of 4.3 % from 0.100 in 2000 to 0.247 in 2021. Given this trend, it shows that technological competitiveness in Netherlands is increasing.





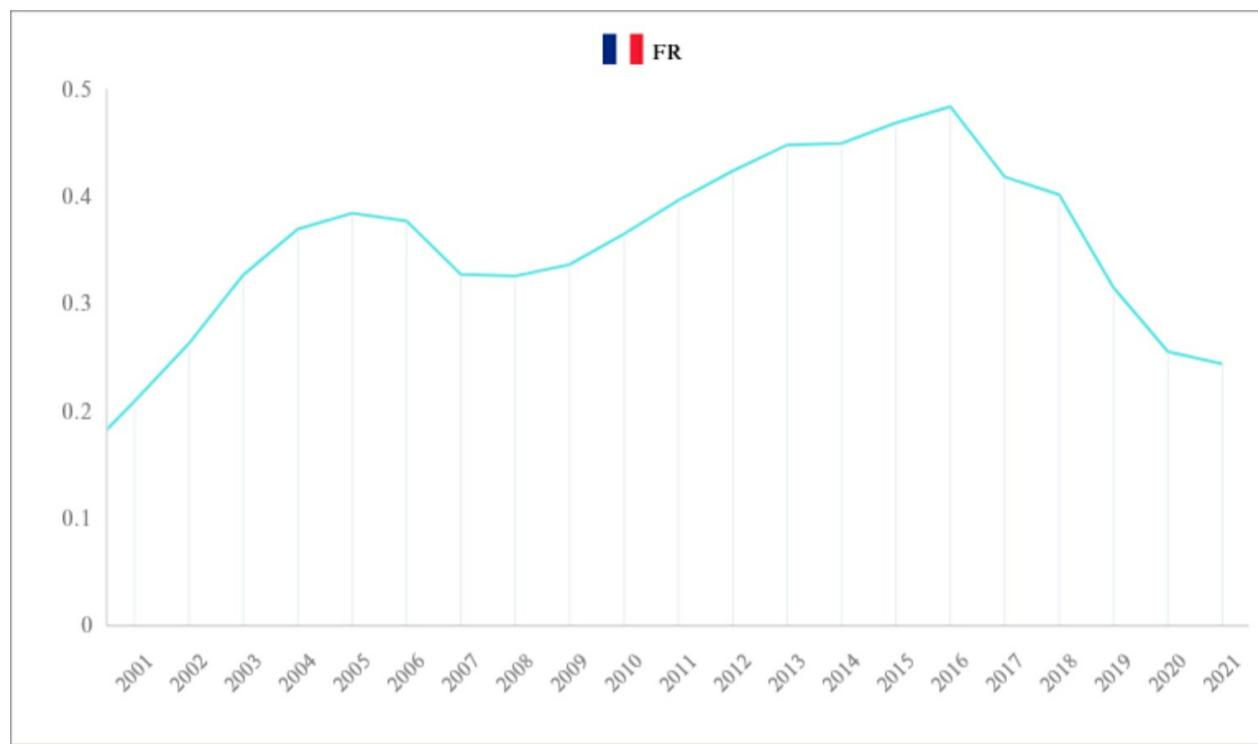
The diagnostic score of the Learning Intelligence technology is 0.15.
Netherlands is analyzed to be non-competitive in entire technology.



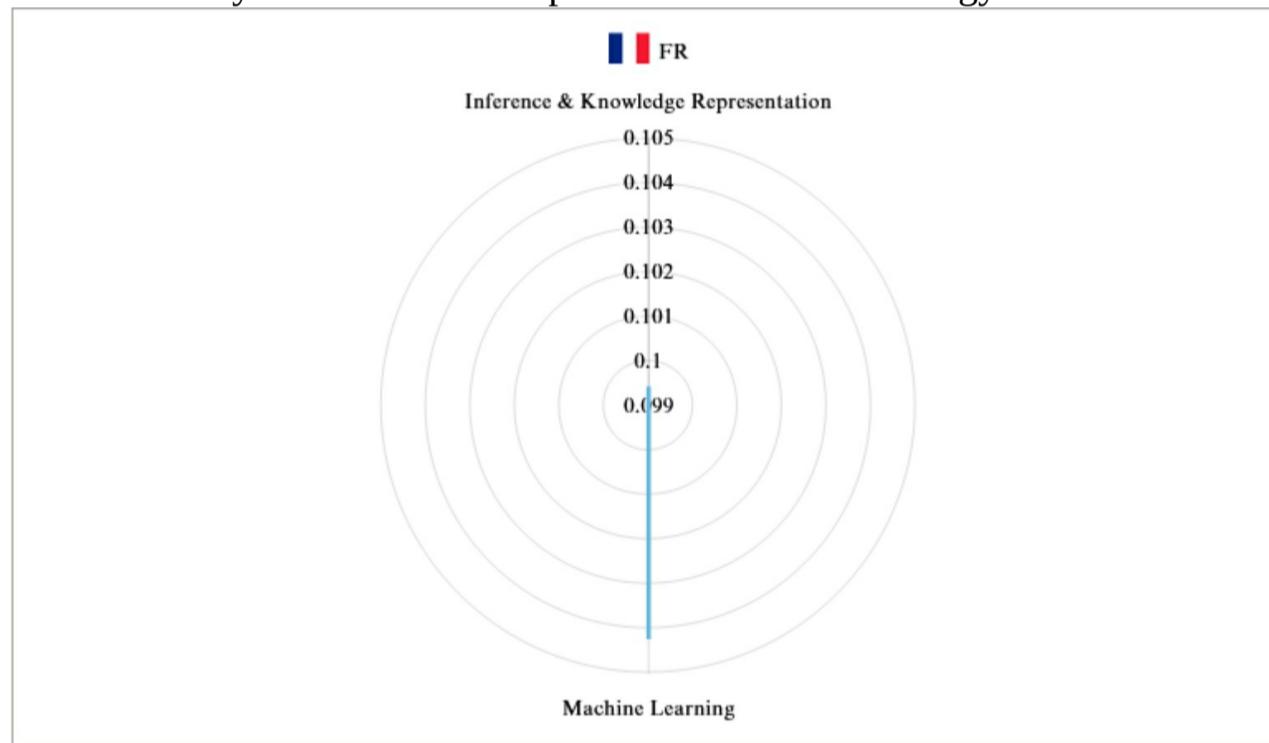
The diagnostic score of the Inference & Knowledge Representation technology is 0.10, and Machine Learning technology is 0.11.
Given this score, Netherlands is analyzed to be non-competitive in entire technology.

France

According to the diagnosis results, technological competitiveness of France is globally at 6th. The diagnostic score in France is increasing at an annual average of 2.5 % from 0.158 in 2000 to 0.245 in 2021. Given this trend, it shows that technological competitiveness in France is increasing.



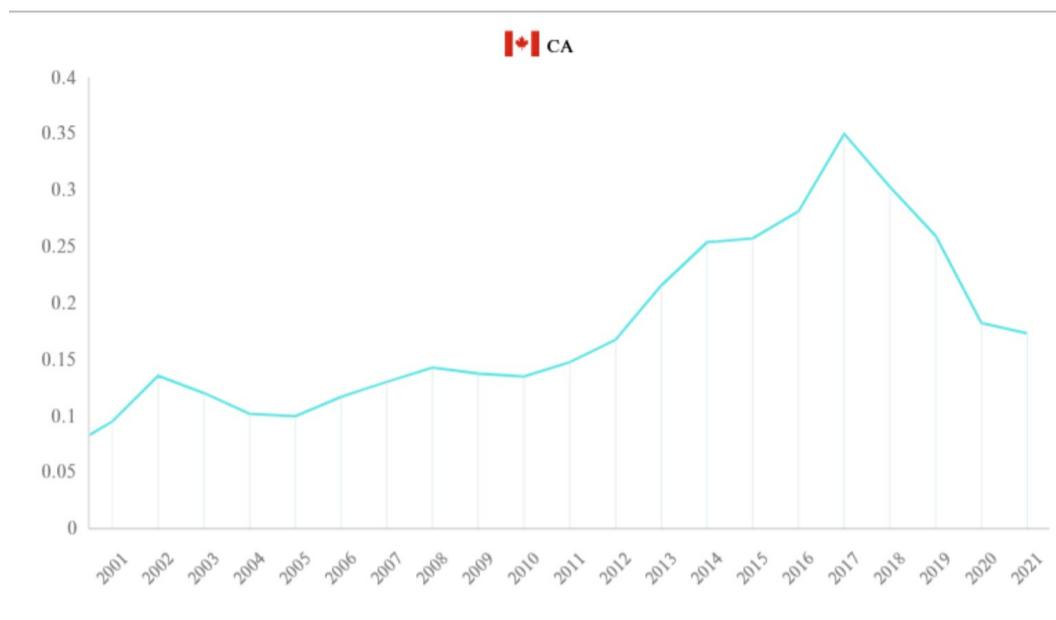
The diagnostic score of the Learning Intelligence technology is 0.12.
France is analyzed to be non-competitive in entire technology.

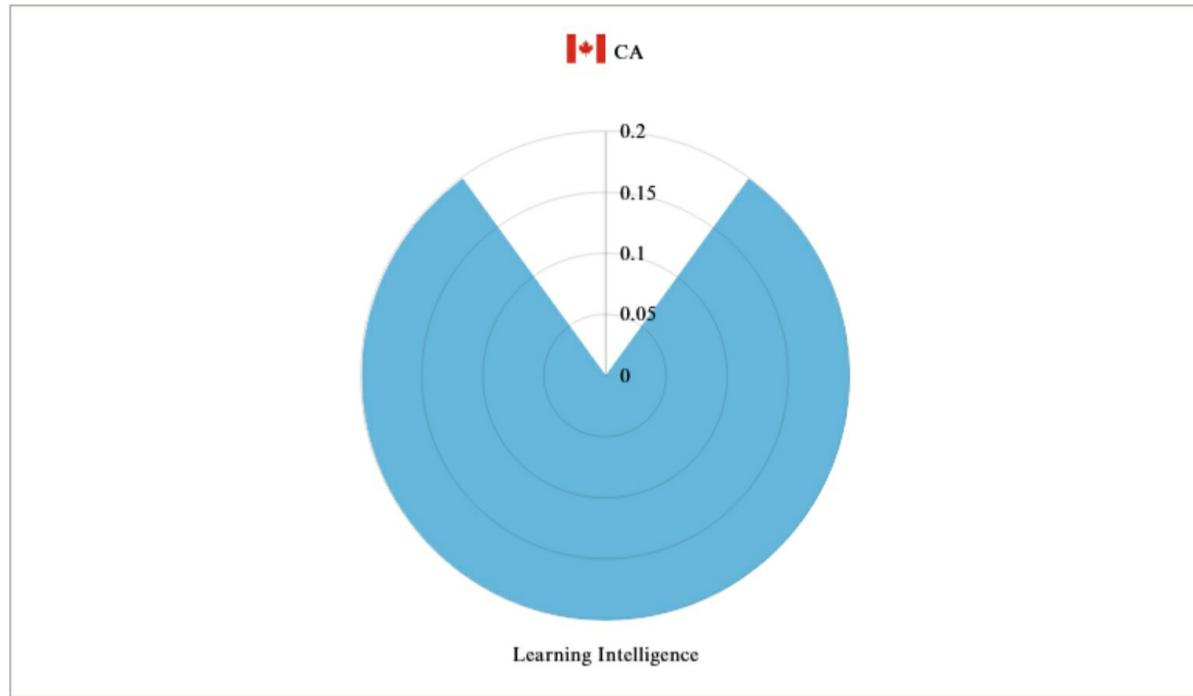


The diagnostic score of the Inference & Knowledge Representation technology is 0.10, and Machine Learning technology is 0.10.
Given this score, France is analyzed to be non-competitive in entire technology.

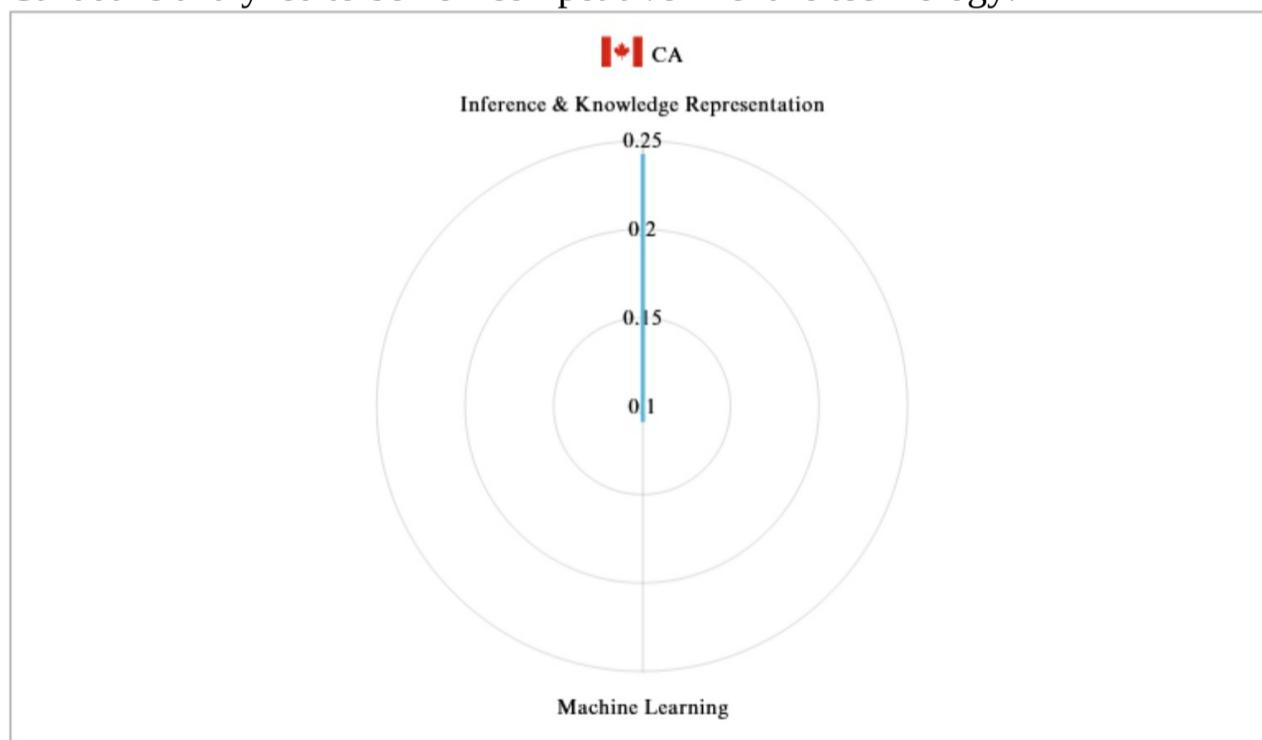
Canada

According to the diagnosis results, technological competitiveness of Canada is globally at 7th. The diagnostic score in Canada is increasing at an annual average of 4.8 % from 0.072 in 2000 to 0.173 in 2021. Given this trend, it shows that technological competitiveness in Canada is increasing.





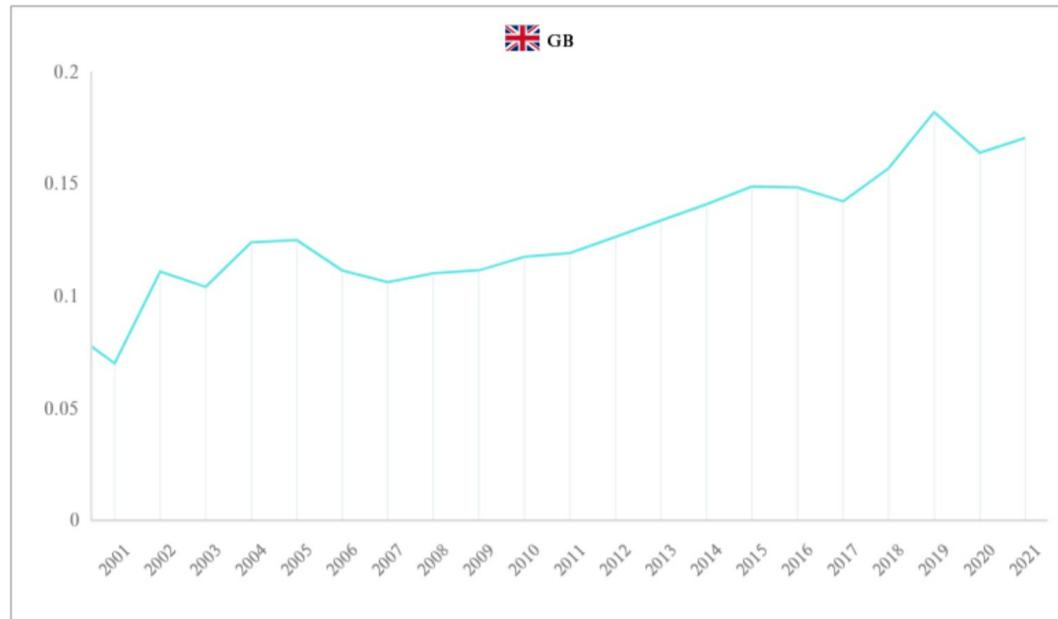
The diagnostic score of the Learning Intelligence technology is 0.20.
Canada is analyzed to be non-competitive in entire technology.

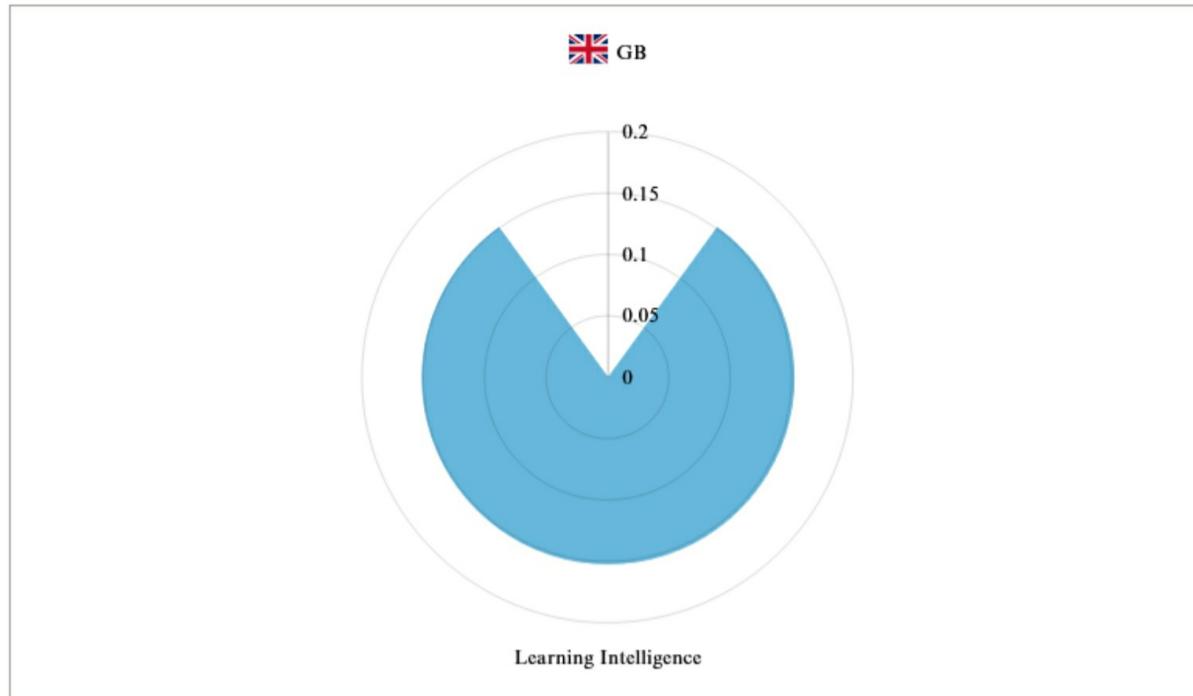


The diagnostic score of the Inference & Knowledge Representation technology is 0.24, and Machine Learning technology is 0.11.
Given this score, Canada is analyzed to be non-competitive in entire technology.

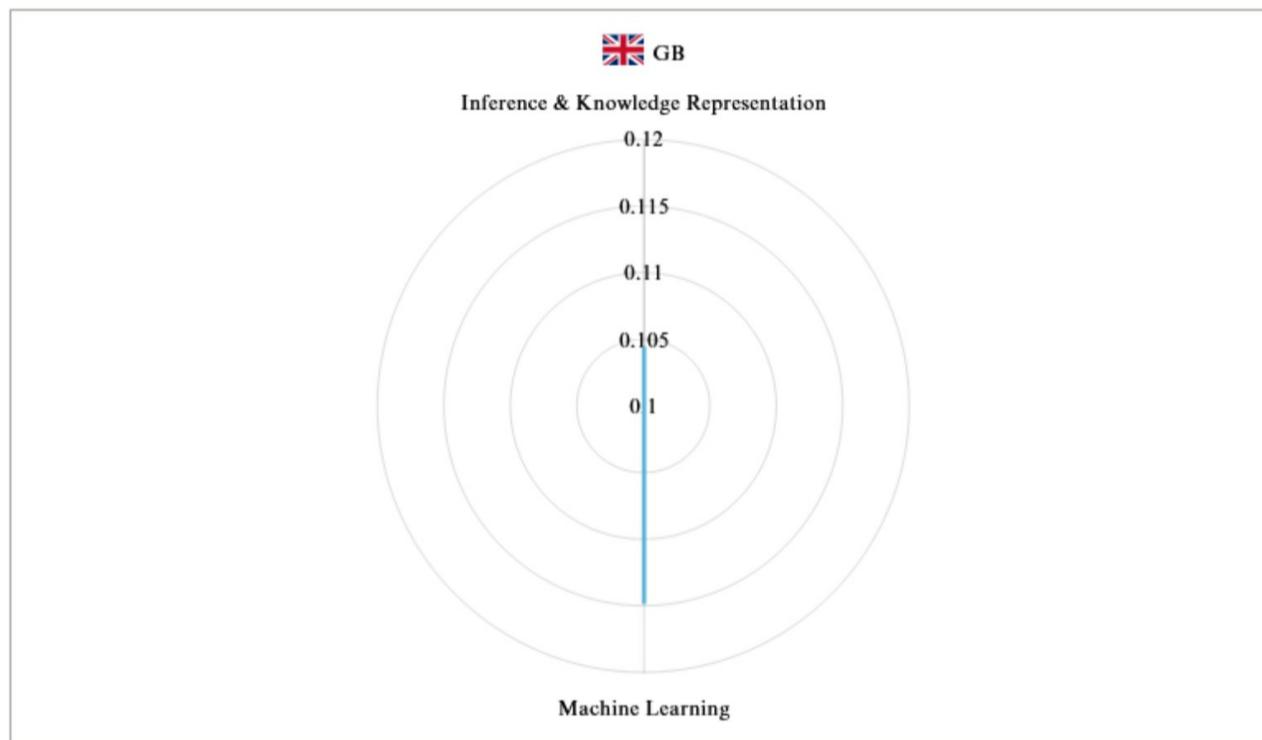
Britain

According to the diagnosis results, technological competitiveness of Britain is globally at 8th. The diagnostic score in Britain is increasing at an annual average of 3.3 % from 0.085 in 2000 to 0.171 in 2021. Given this trend, it shows that technological competitiveness in Britain is increasing.





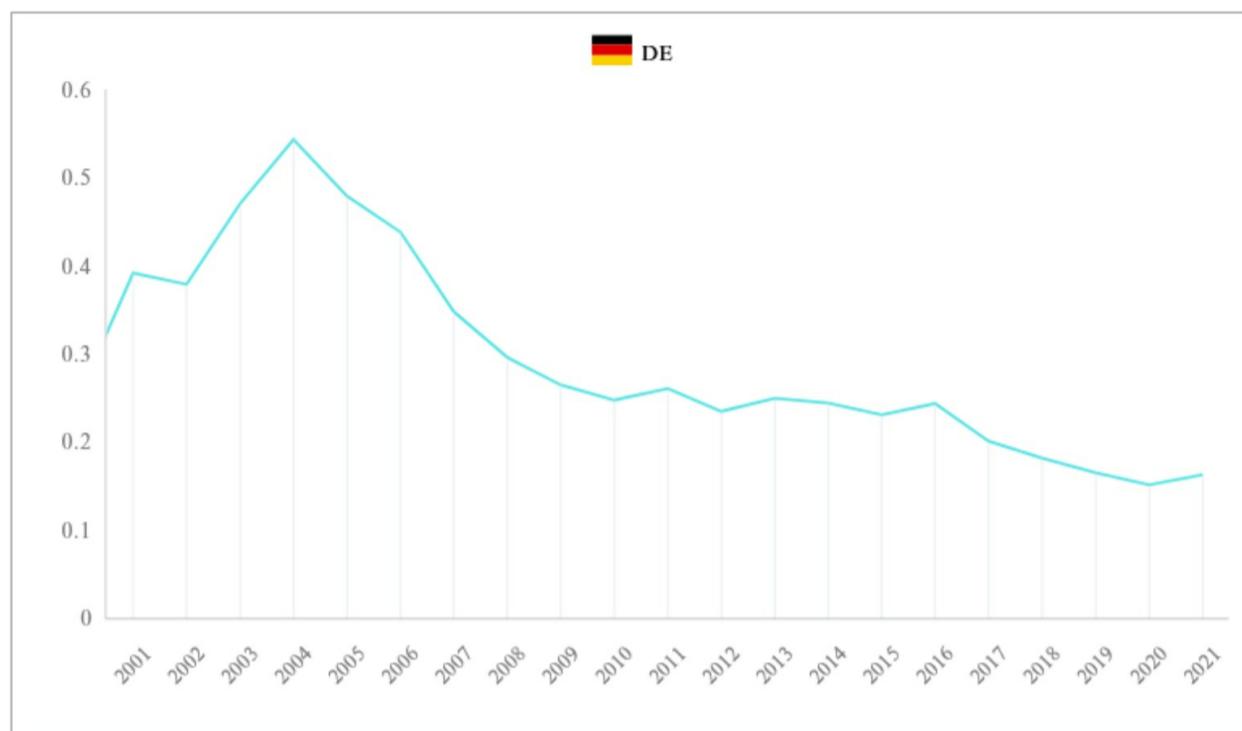
The diagnostic score of the Learning Intelligence technology is 0.15.
Britain is analyzed to be non-competitive in entire technology.

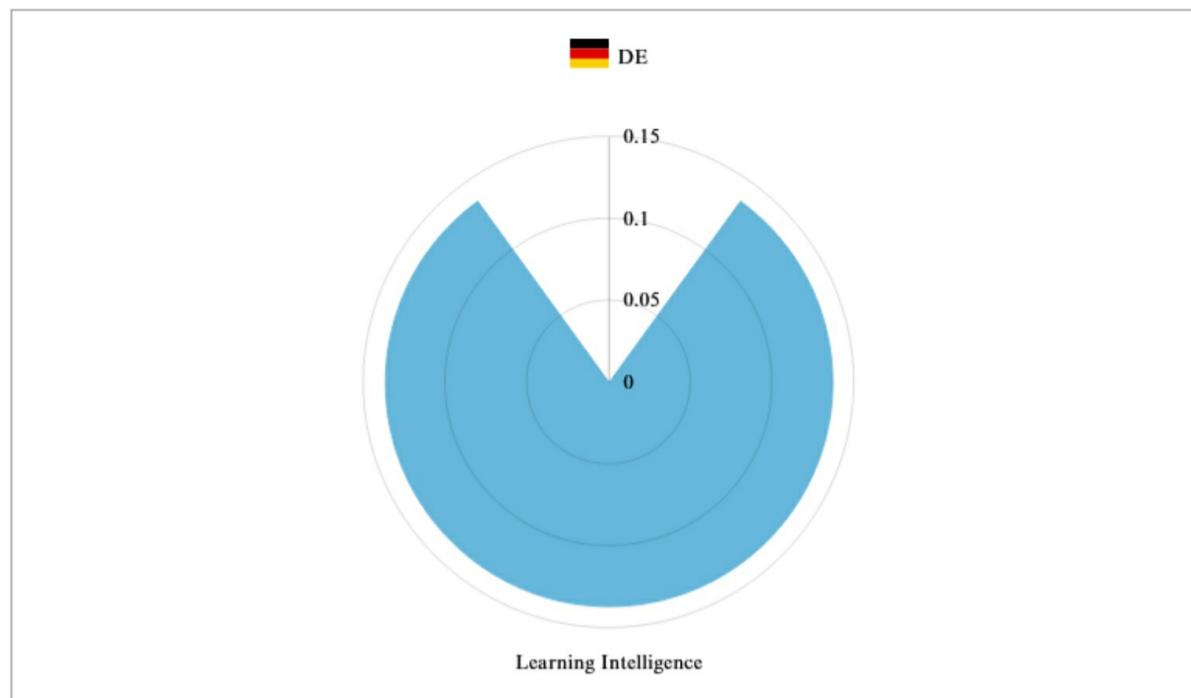


The diagnostic score of the Inference & Knowledge Representation technology is 0.10, and Machine Learning technology is 0.11.
Given this score, Britain is analyzed to be non-competitive in entire technology.

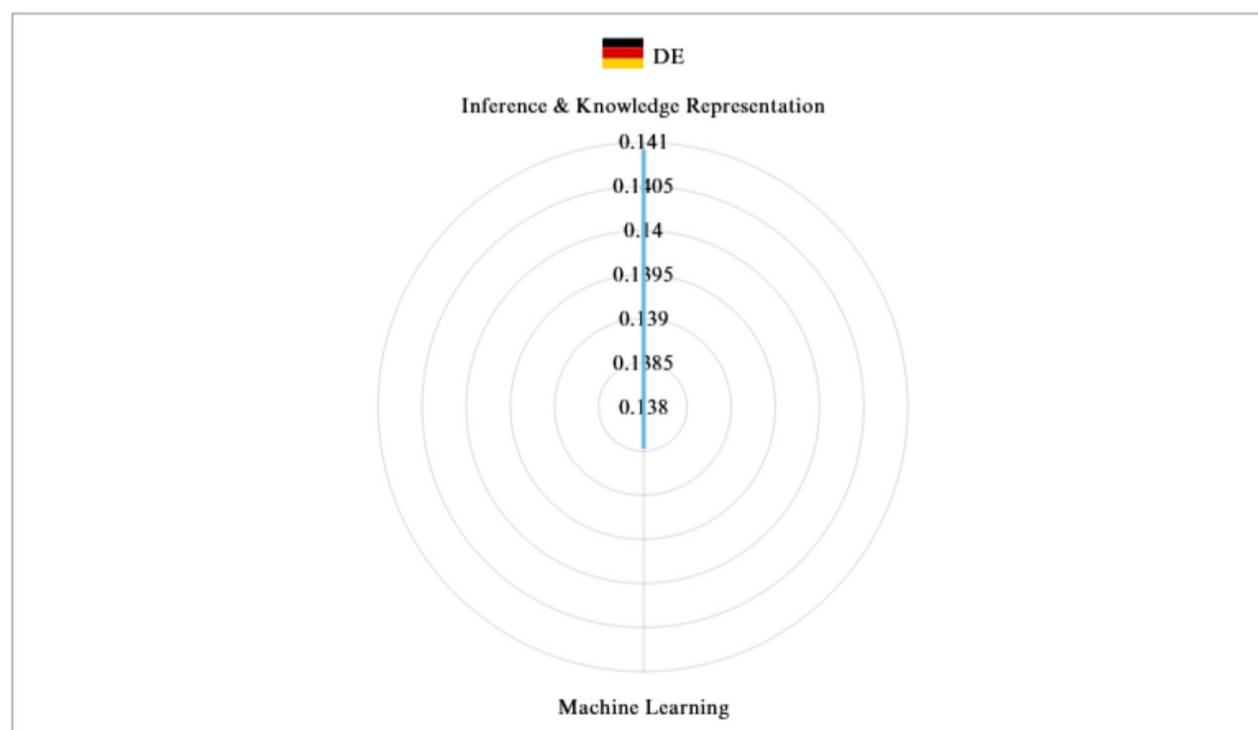
Germany

According to the diagnosis results, technological competitiveness of Germany is globally at 9th. The diagnostic score in Germany is decreasing at an annual average of -2.5 % from 0.254 in 2000 to 0.164 in 2021. Given this trend, it shows that technological competitiveness in Germany is decreasing.





The diagnostic score of the Learning Intelligence technology is 0.14.
Germany is analyzed to be non-competitive in entire technology.

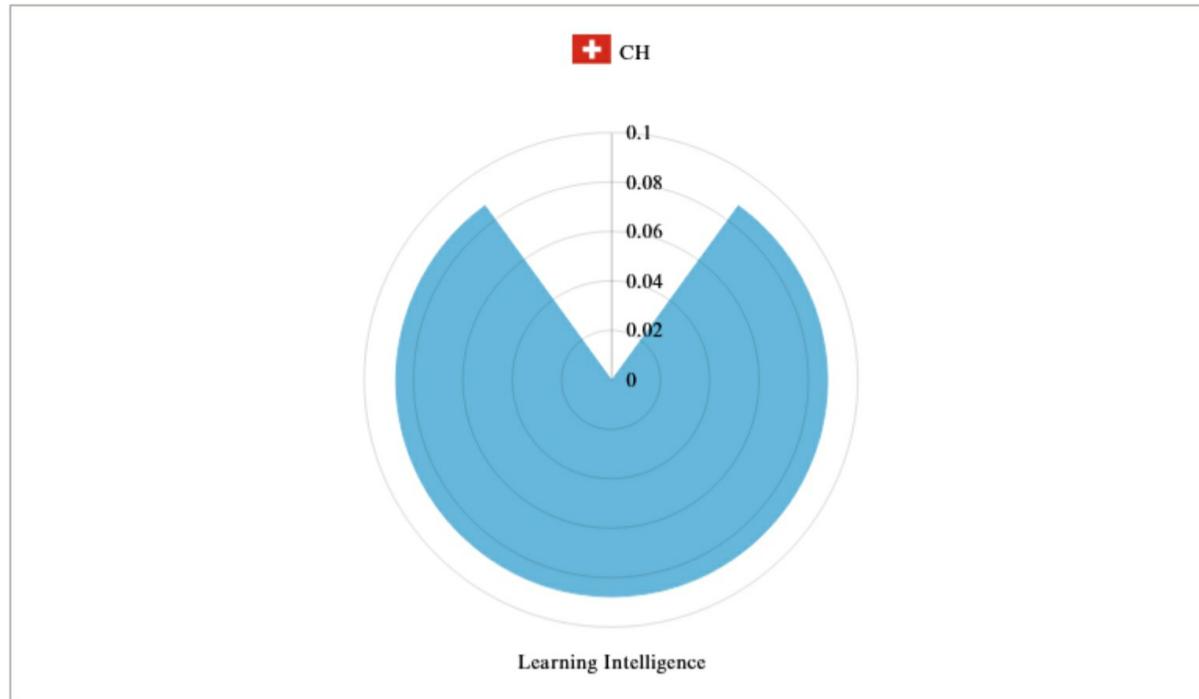


The diagnostic score of the Inference & Knowledge Representation technology is 0.14, and Machine Learning technology is 0.14.
Given this score, Germany is analyzed to be non-competitive in entire technology.

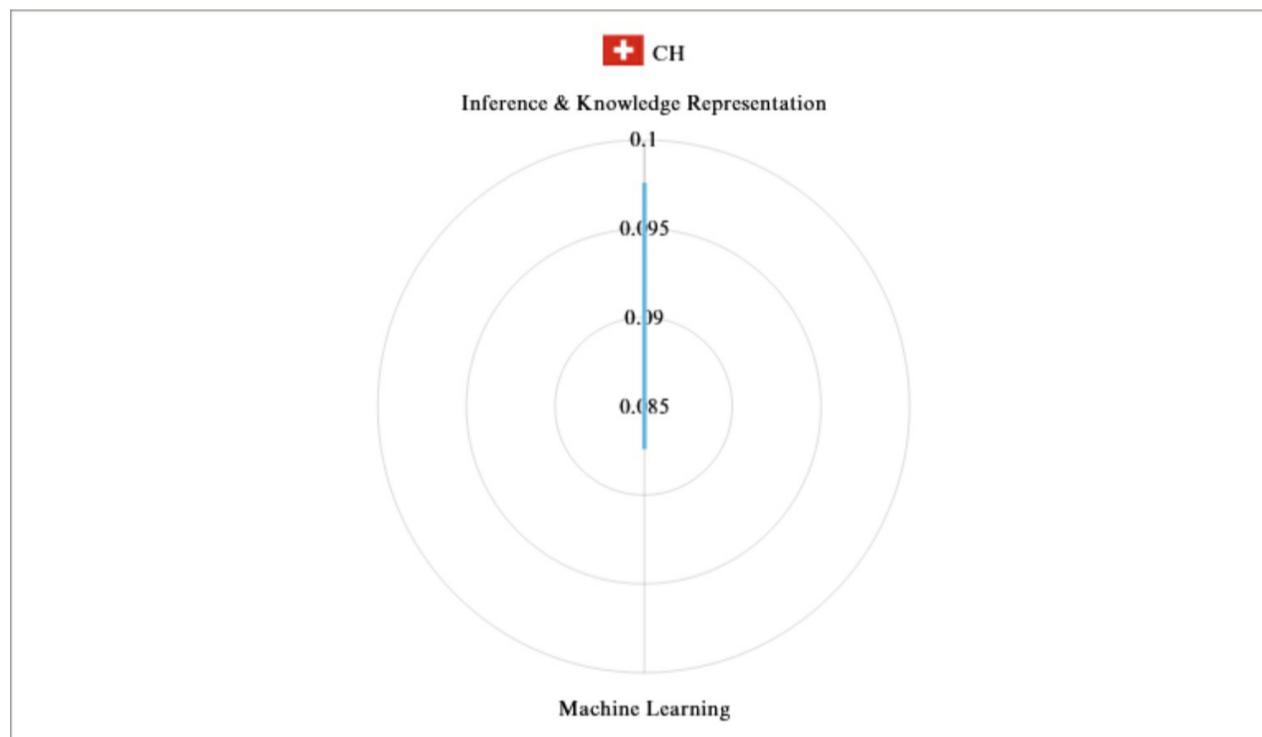
Switzerland

According to the diagnosis results, technological competitiveness of Switzerland is globally at 10th. The diagnostic score in Switzerland is increasing at an annual average of 1.3 % from 0.054 in 2000 to 0.071 in 2021. Given this trend, it shows that technological competitiveness in Switzerland is increasing.



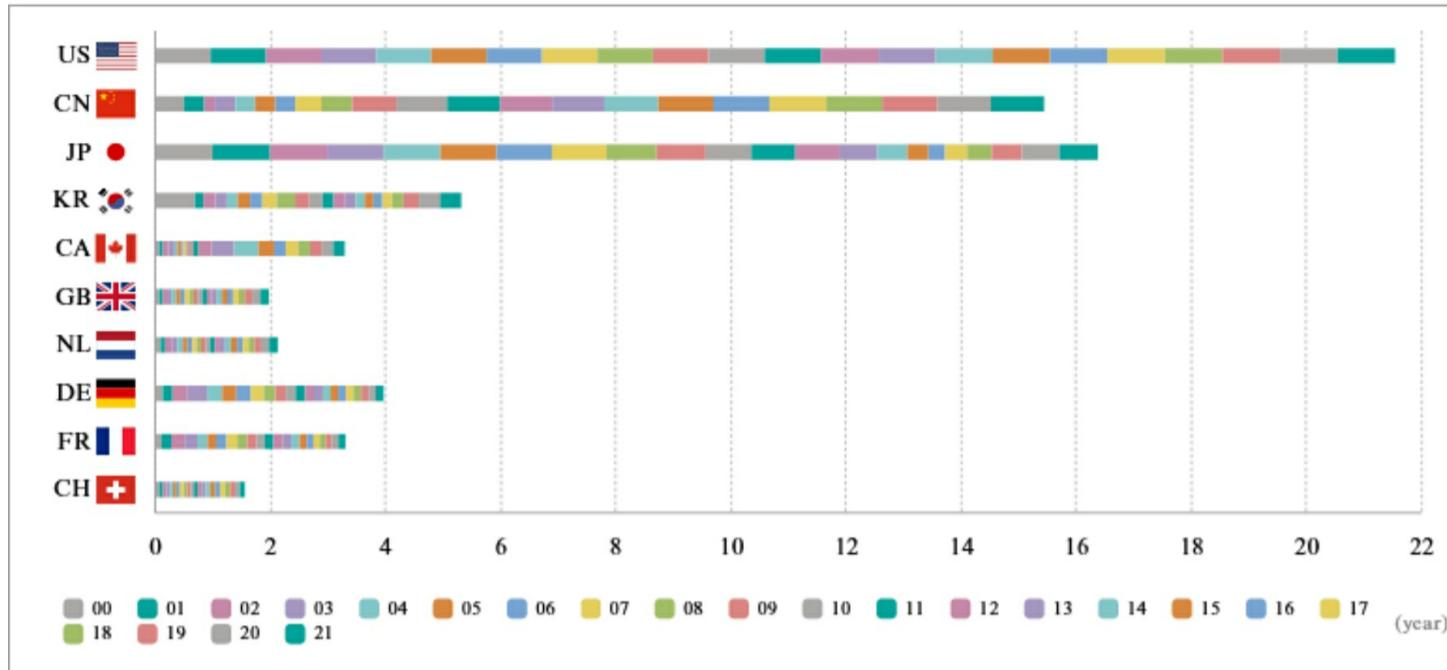


The diagnostic score of the Learning Intelligence technology is 0.09.
Switzerland is analyzed to be non-competitive in entire technology.



The diagnostic score of the Inference & Knowledge Representation technology is 0.10, and Machine Learning technology is 0.09.
Given this score, Switzerland is analyzed to be non-competitive in entire technology.

2) Technology competitiveness by Country



* his score represents total diagnostic score during the analysis period (2000~2021).

The total diagnostic scores in Learning Intelligence technology is ranked in U.S.A (1st), China (2nd), Japan (3rd), Korea (4th), Canada (5th), Britain (6th), Netherlands (7th), Germany (8th), France (9th), and Switzerland (10th). Given these ranking, it is analyzed that U.S.A and China are competitive in Learning Intelligence technology.

3) Strength and weakness of technological competitiveness by country

Technology	US	CN	JP	KR	NL	FR	CA	GB	DE	CH
Inference & Knowledge Representation	0.9993	0.9839	0.2006	0.1417	0.0967	0.0994	0.2430	0.1045	0.1409	0.0976
Machine Learning	0.9995	0.9794	0.3379	0.4296	0.1129	0.1042	0.1087	0.1148	0.1385	0.0874

* This score represents diagnostic scores of each country regarding Small Category technology.

- U.S.A is analyzed to have competitiveness in entire technology.
- China is analyzed to have competitiveness in entire technology.
- Japan is analyzed not to have competitiveness in entire technology.
- Korea is analyzed to have competitiveness in machine learning (0.43) technology.

Korea is analyzed not to have competitiveness in inference & knowledge representation (0.14) technology.

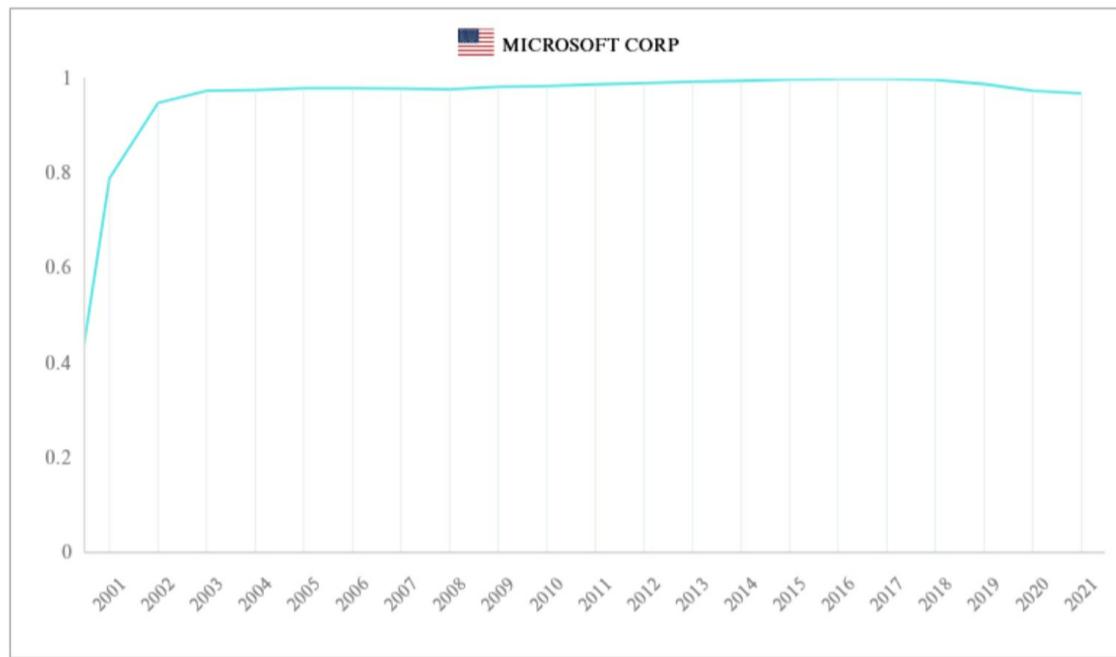
- Netherlands is analyzed not to have competitiveness in entire technology.
- France is analyzed not to have competitiveness in entire technology.
- Canada is analyzed not to have competitiveness in entire technology.
- Britain is analyzed not to have competitiveness in entire technology.

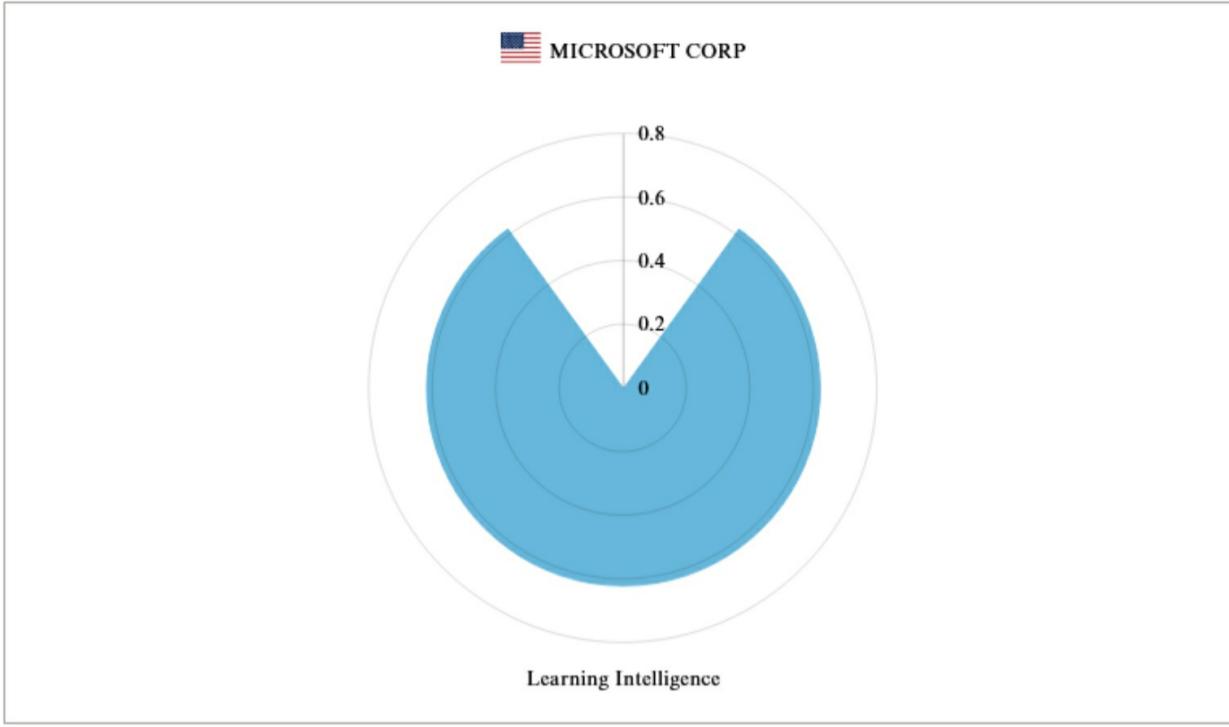
- Germany is analyzed not to have competitiveness in entire technology.
- Switzerland is analyzed not to have competitiveness in entire technology.

4) Company Diagnosis

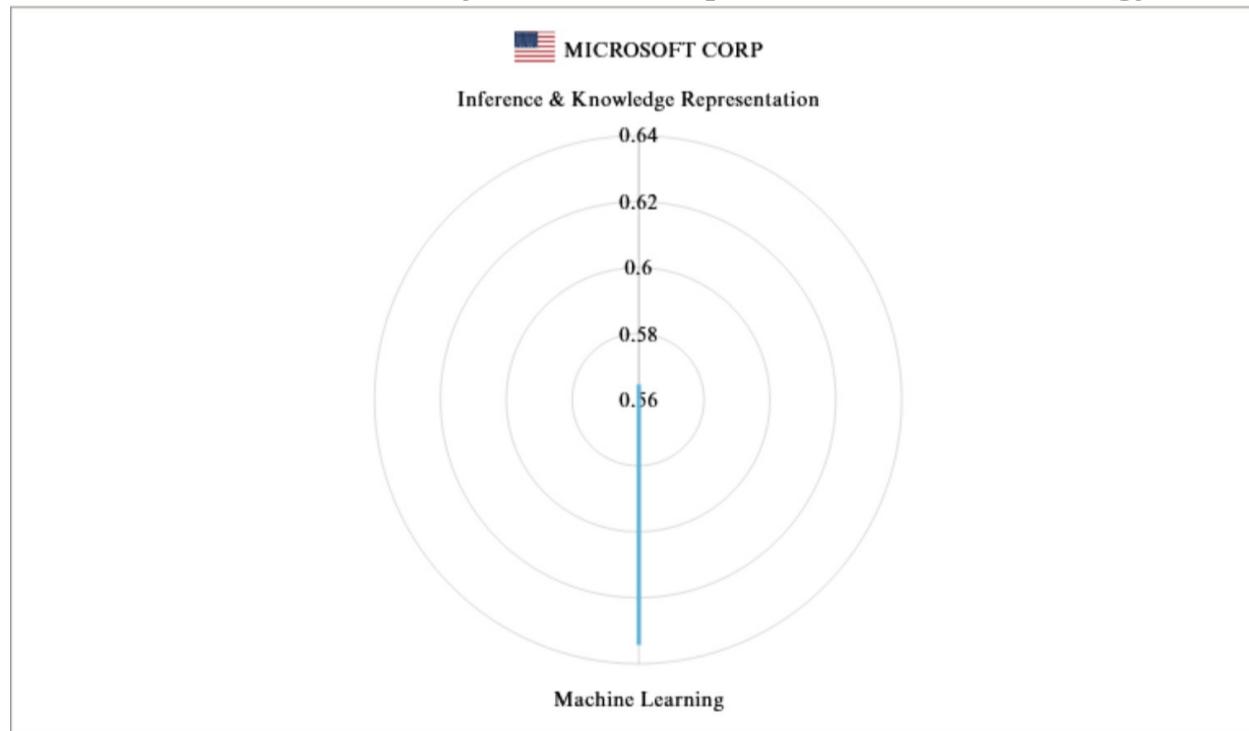
Microsoft Corp

According to the diagnosis results, technological competitiveness of MICROSOFT CORP is globally at 1st. The diagnostic score in MICROSOFT CORP is increasing at an annual average of 11.0 % from 0.120 in 2000 to 0.968 in 2021. Given this trend, it shows that technological competitiveness in MICROSOFT CORP is increasing.





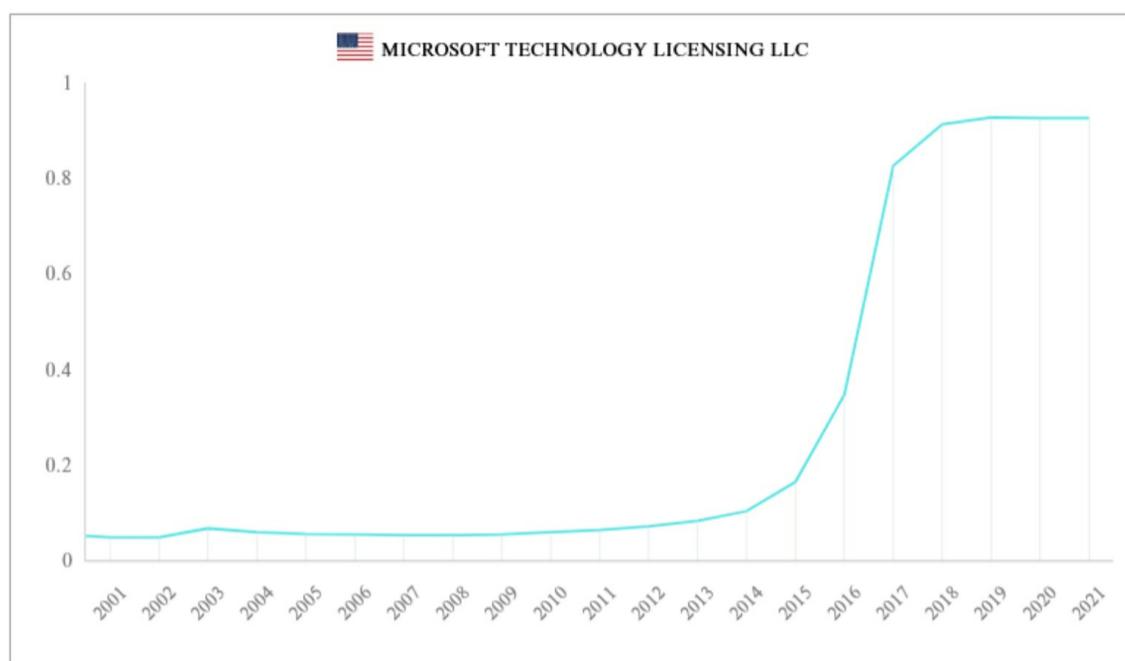
The diagnostic score of the Learning Intelligence technology is 0.62.
MICROSOFT CORP is analyzed to be competitive in entire technology.

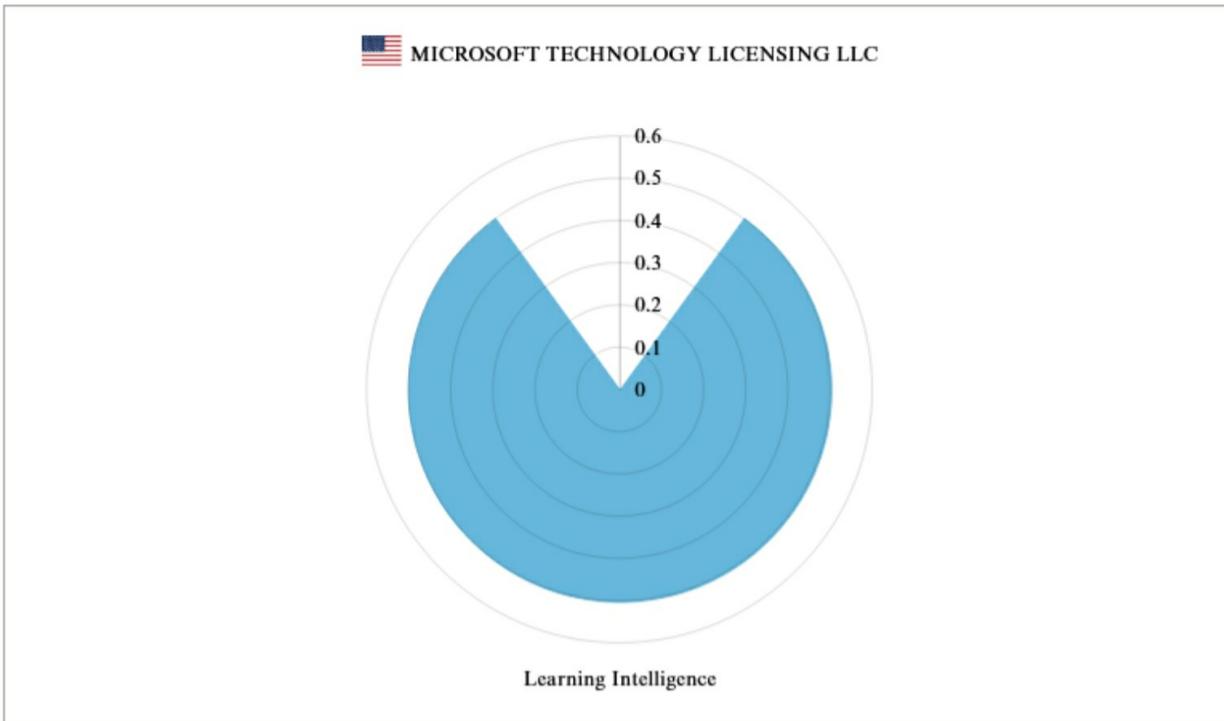


The diagnostic score of the Inference & Knowledge Representation technology is 0.56, and Machine Learning technology is 0.63.
Given this score, MICROSOFT CORP is analyzed to be competitive in entire technology.

Microsoft Technology Licensing LLC

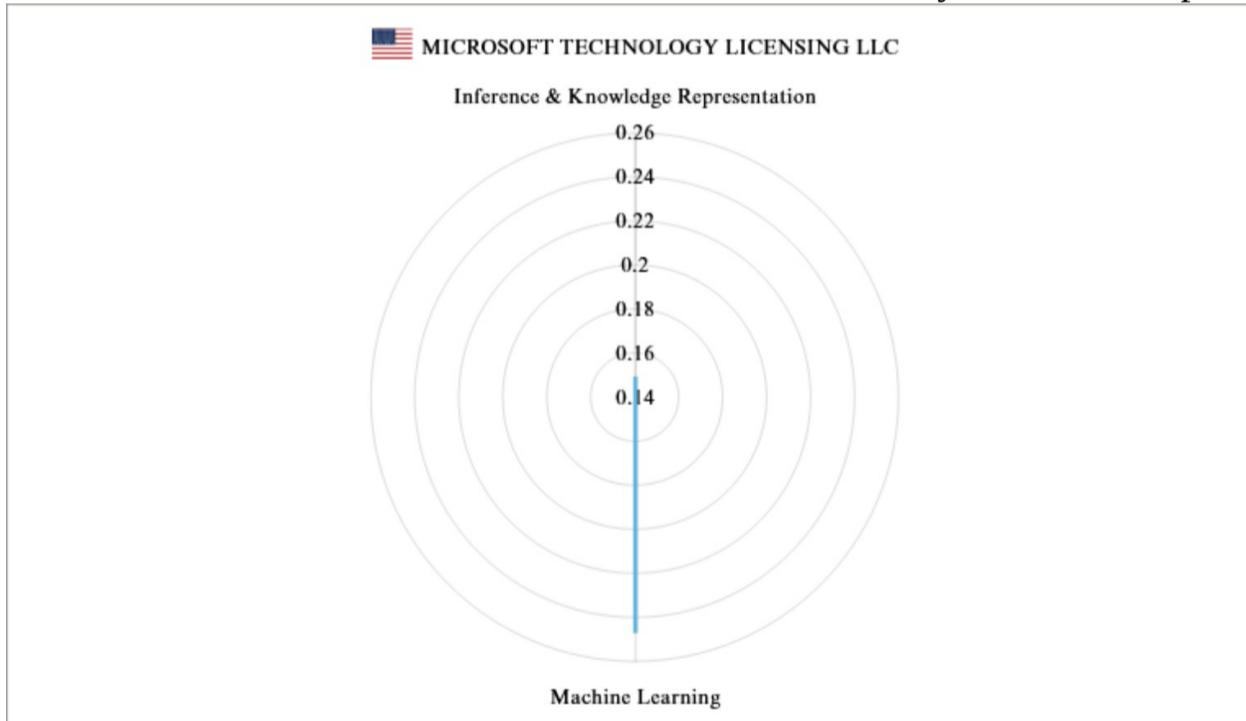
According to the diagnosis results, technological competitiveness of MICROSOFT TECHNOLOGY LICENSING LLC is globally at 2nd. The diagnostic score in MICROSOFT TECHNOLOGY LICENSING LLC is increasing at an annual average of 14.9 % from 0.057 in 2000 to 0.927 in 2021. Given this trend, it shows that technological competitiveness in MICROSOFT TECHNOLOGY LICENSING LLC is increasing.





The diagnostic score of the Learning Intelligence technology is 0.50.

MICROSOFT TECHNOLOGY LICENSING LLC is analyzed to be competitive in entire technology.

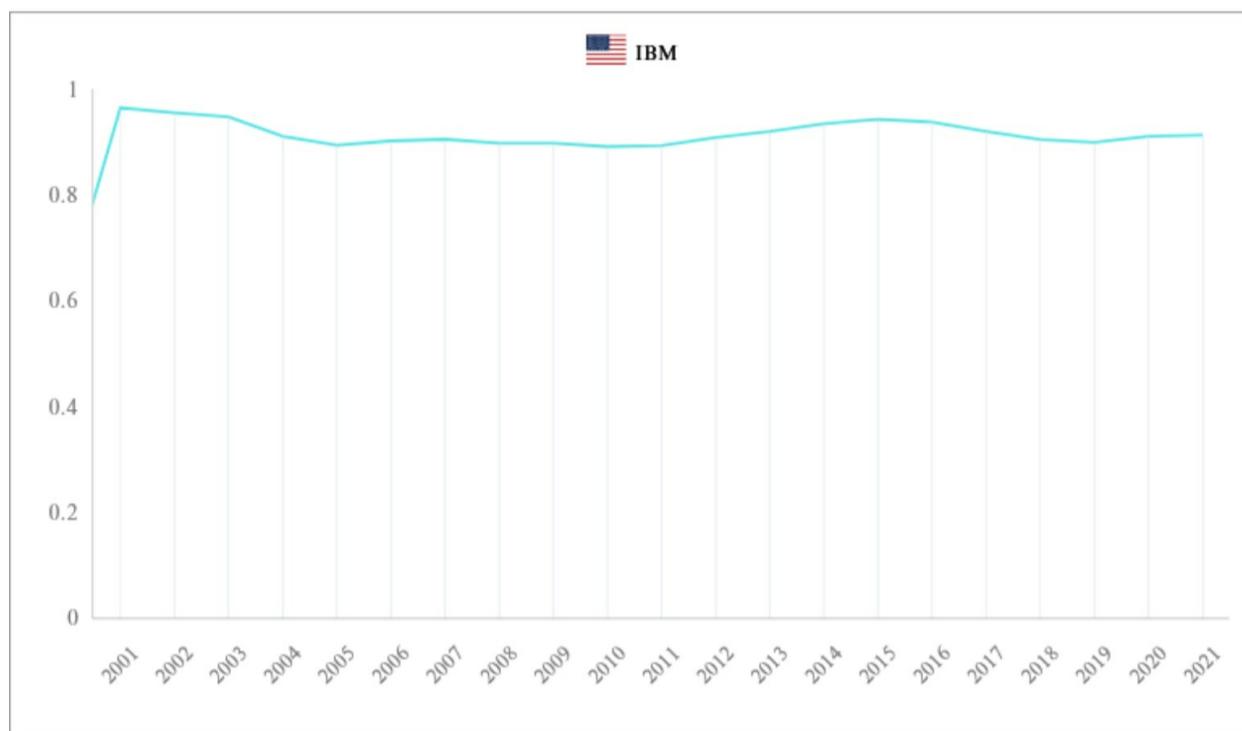


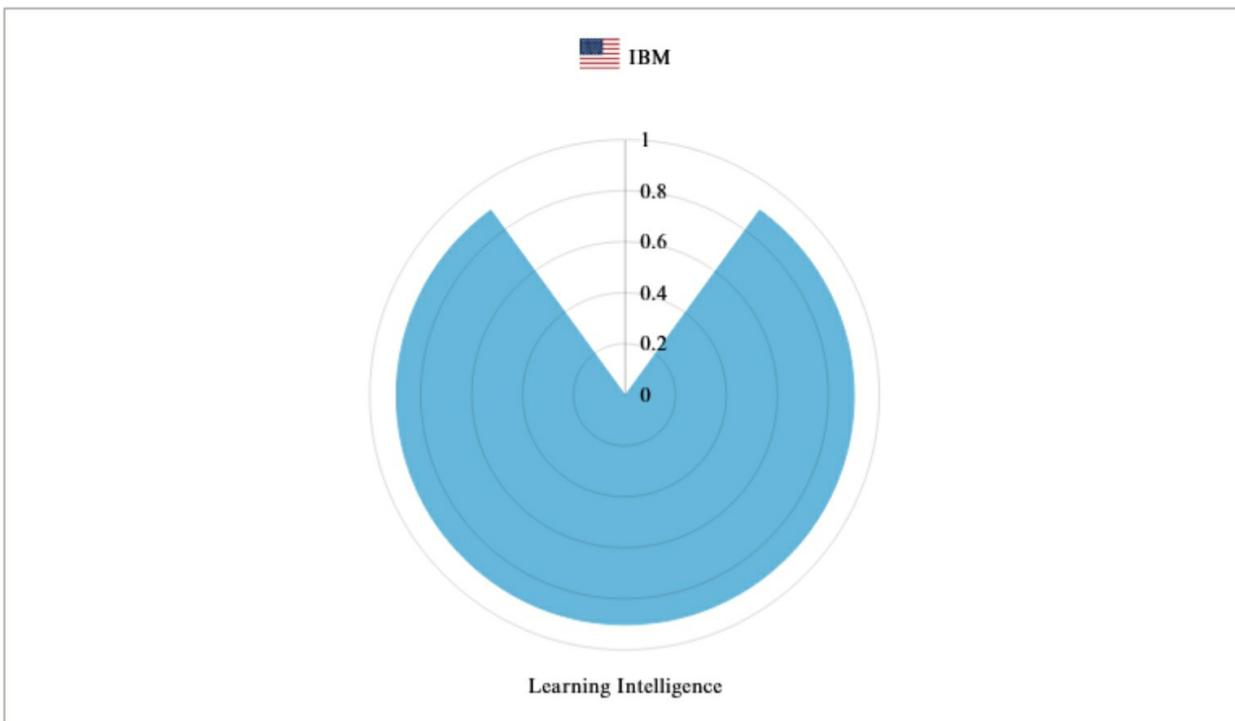
The diagnostic score of the Inference & Knowledge Representation technology is 0.15, and Machine Learning technology is 0.25.

Given this score, MICROSOFT TECHNOLOGY LICENSING LLC is analyzed to be non-competitive in entire technology.

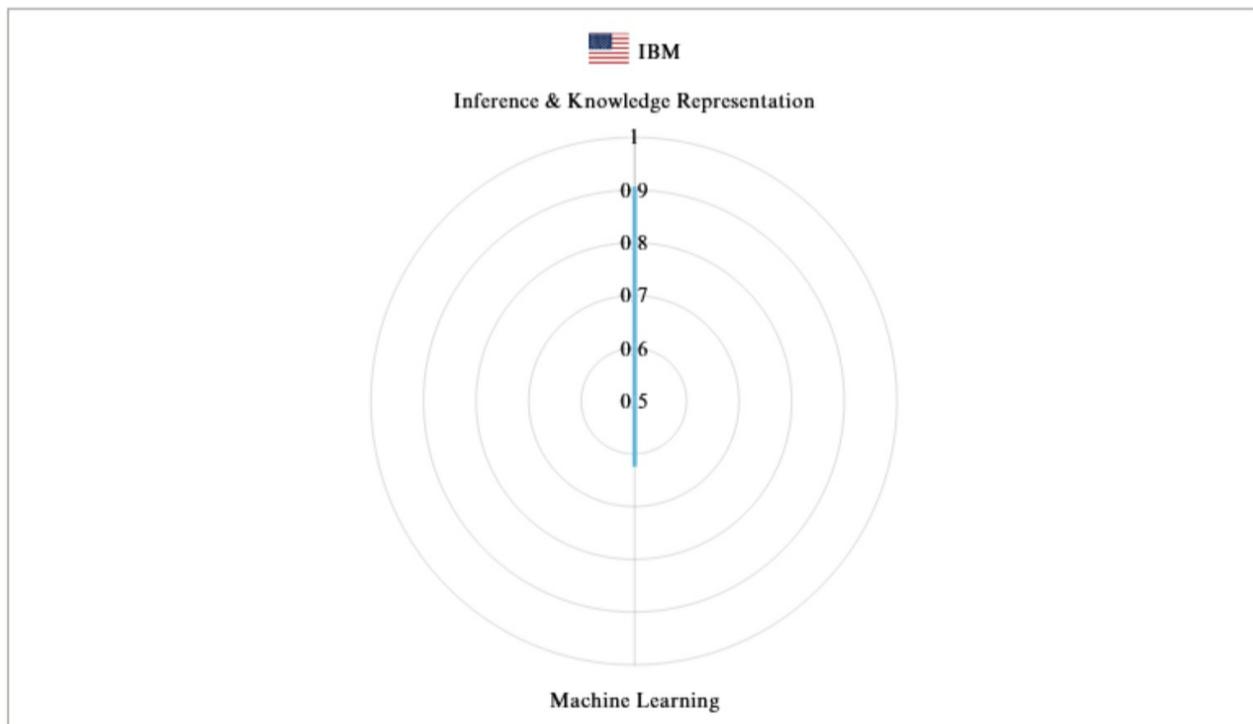
IBM

According to the diagnosis results, technological competitiveness of IBM is globally at 3rd. The diagnostic score in IBM is increasing at an annual average of 2.0 % from 0.614 in 2000 to 0.915 in 2021. Given this trend, it shows that technological competitiveness in IBM is increasing.





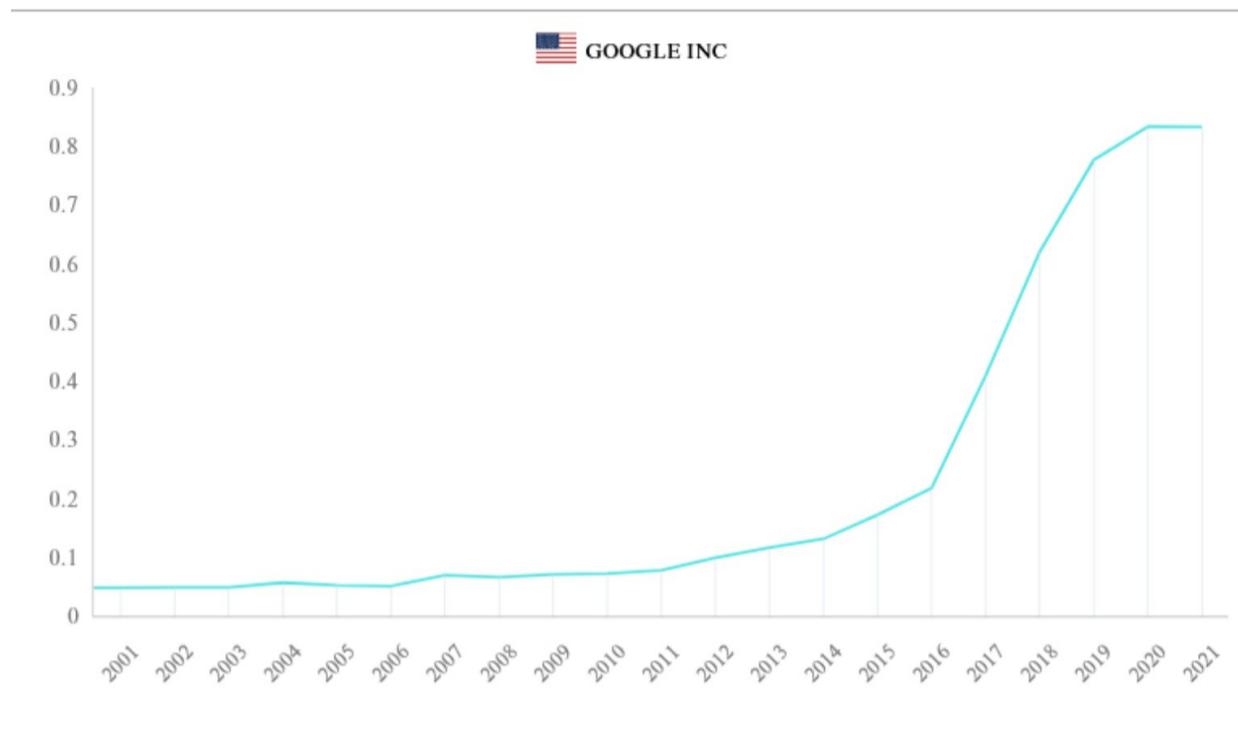
The diagnostic score of the Learning Intelligence technology is 0.90.
IBM is analyzed to be competitive in entire technology.

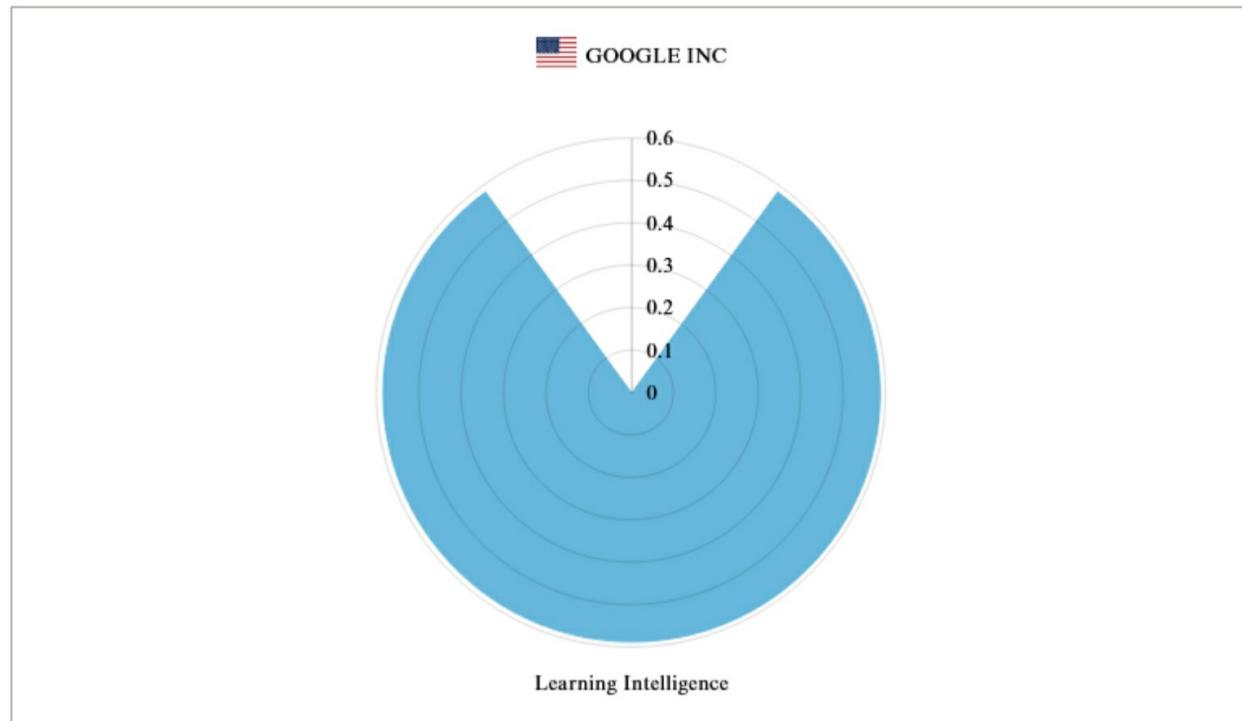


The diagnostic score of the Inference & Knowledge Representation technology is 0.91, and Machine Learning technology is 0.62.
Given this score, IBM is analyzed to be competitive in entire technology.

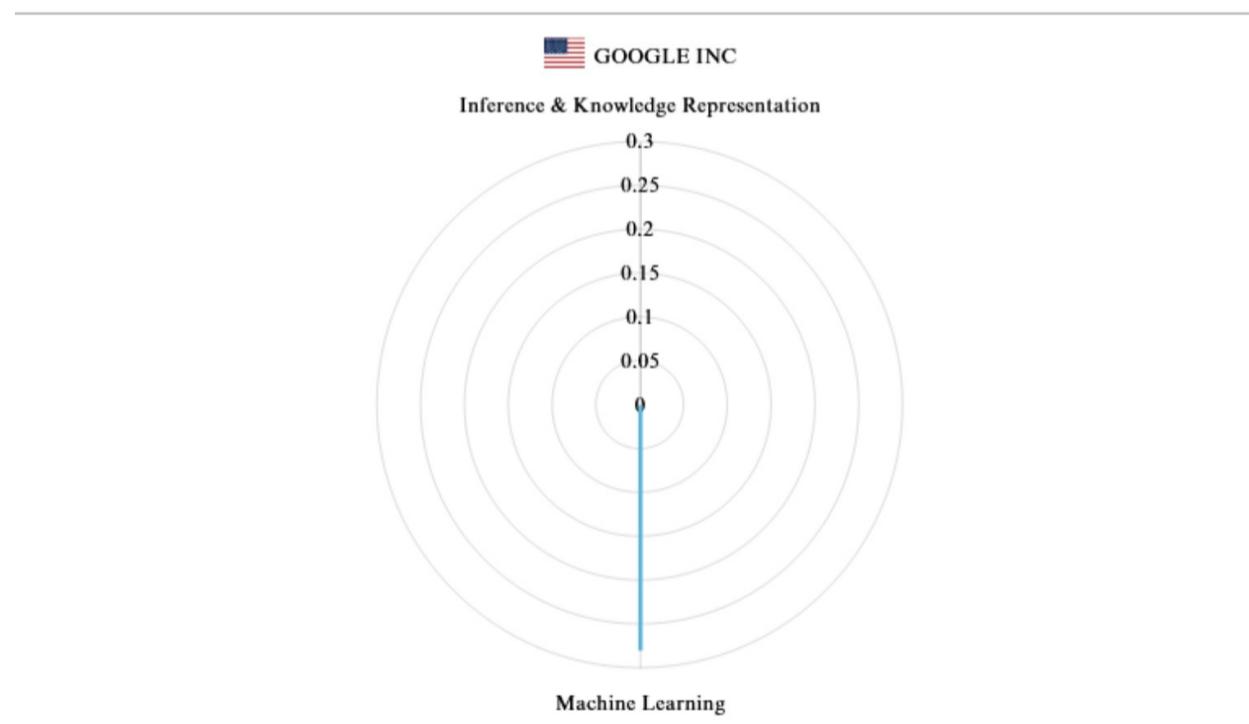
Google Inc

According to the diagnosis results, technological competitiveness of GOOGLE INC is globally at 4th. The diagnostic score in GOOGLE INC is increasing at an annual average of 15.0 % from 0.051 in 2000 to 0.834 in 2021. Given this trend, it shows that technological competitiveness in GOOGLE INC is increasing.





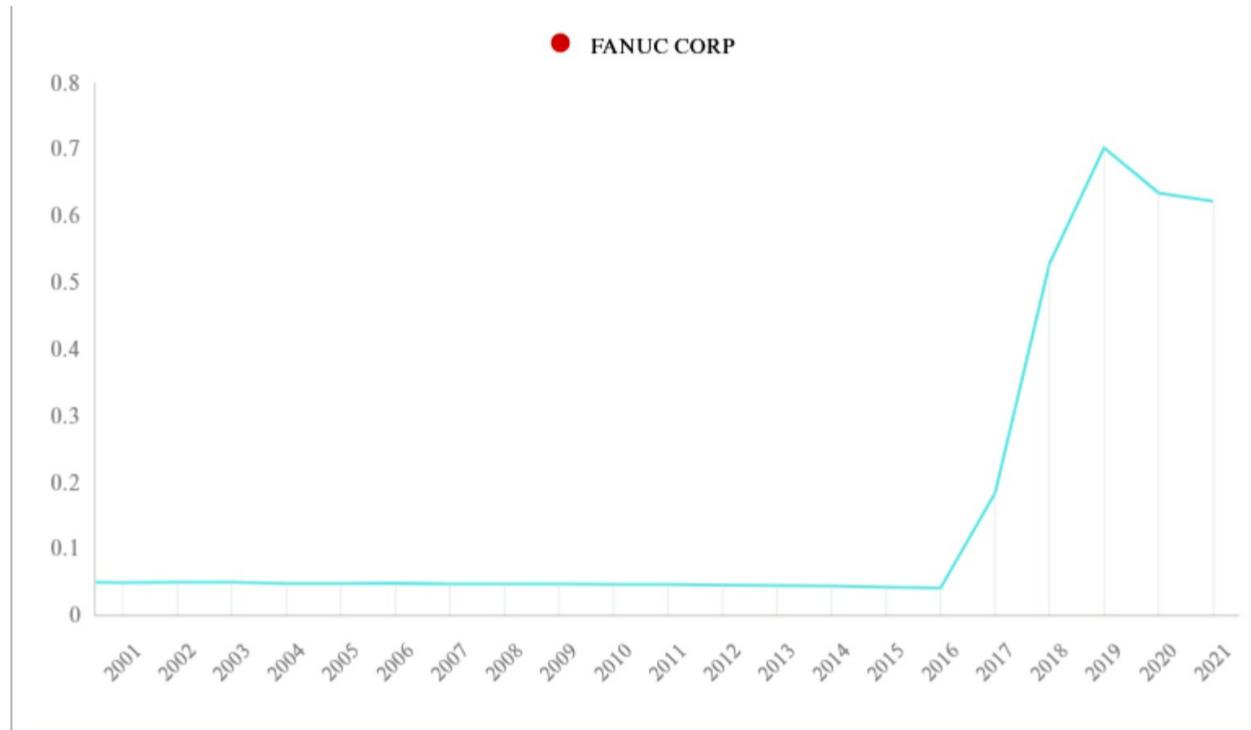
The diagnostic score of the Learning Intelligence technology is 0.59.
GOOGLE INC is analyzed to be competitive in entire technology.

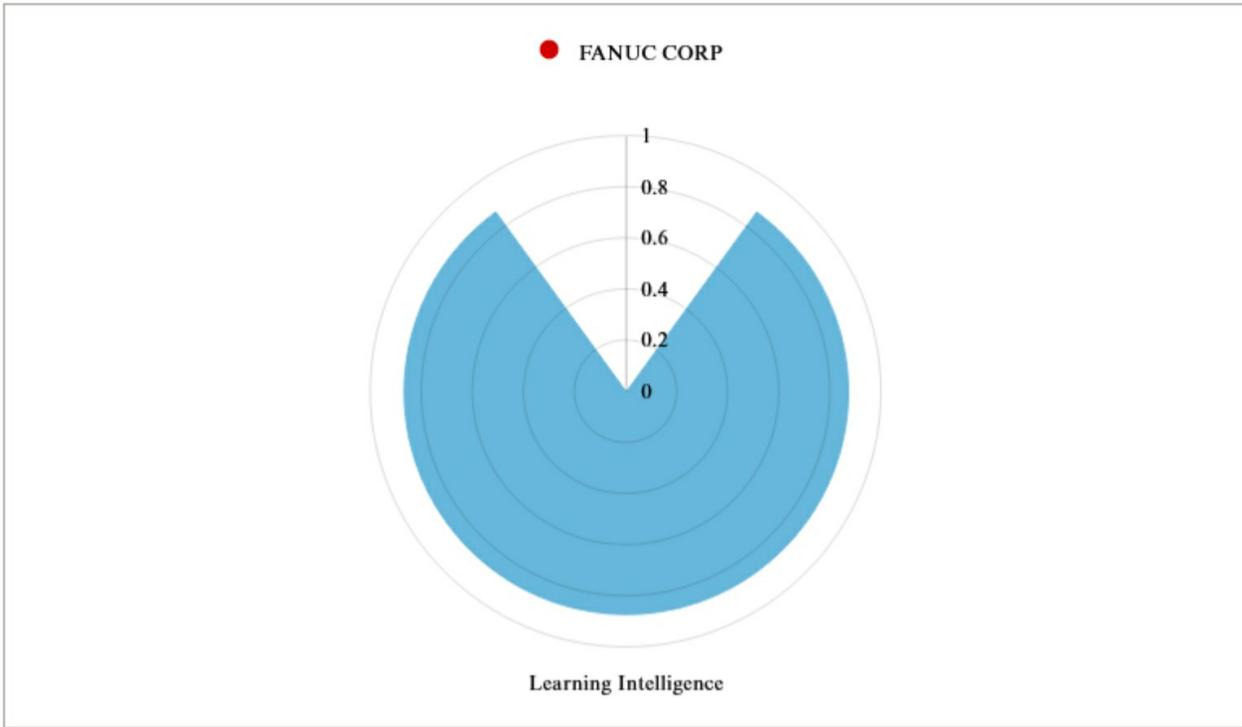


The diagnostic score of the Inference & Knowledge Representation technology is 0.00, and Machine Learning technology is 0.28.
Given this score, GOOGLE INC is analyzed to be non-competitive in entire technology.

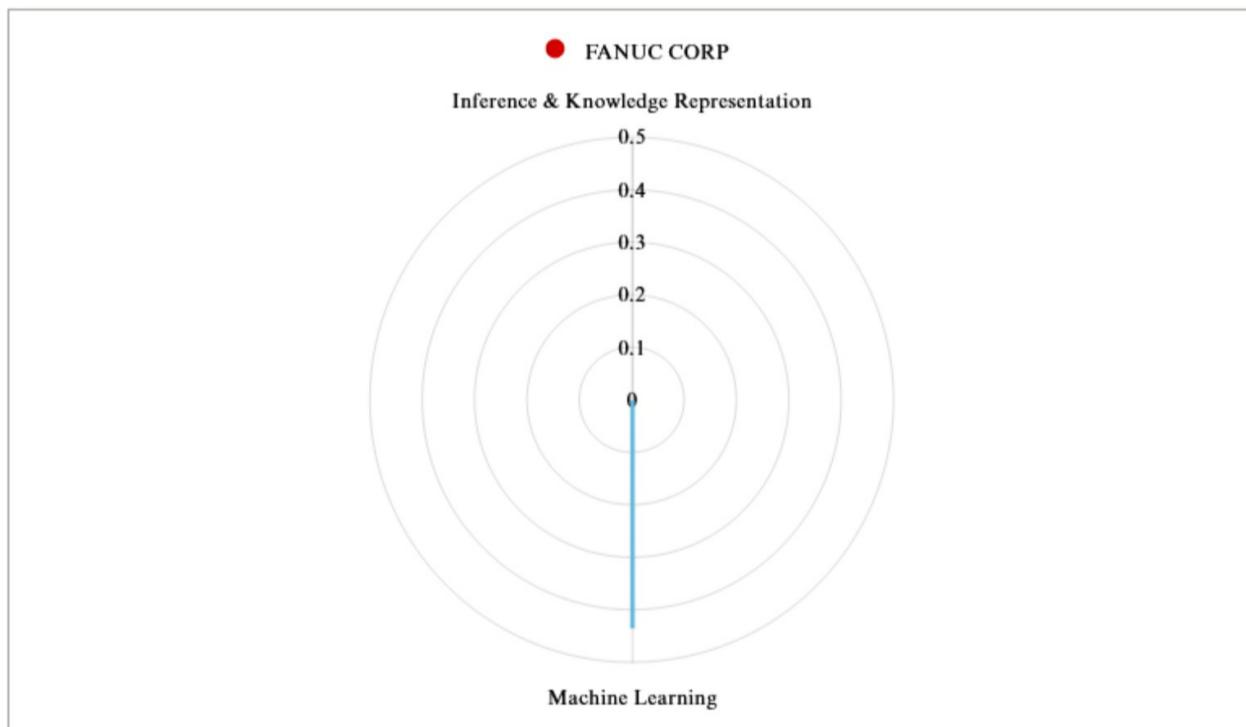
Fanuc Corp

According to the diagnosis results, technological competitiveness of FANUC CORP is globally at 5th. The diagnostic score in FANUC CORP is increasing at an annual average of 13.4 % from 0.051 in 2000 to 0.623 in 2021. Given this trend, it shows that technological competitiveness in FANUC CORP is increasing.





The diagnostic score of the Learning Intelligence technology is 0.87.
FANUC CORP is analyzed to be competitive in entire technology.

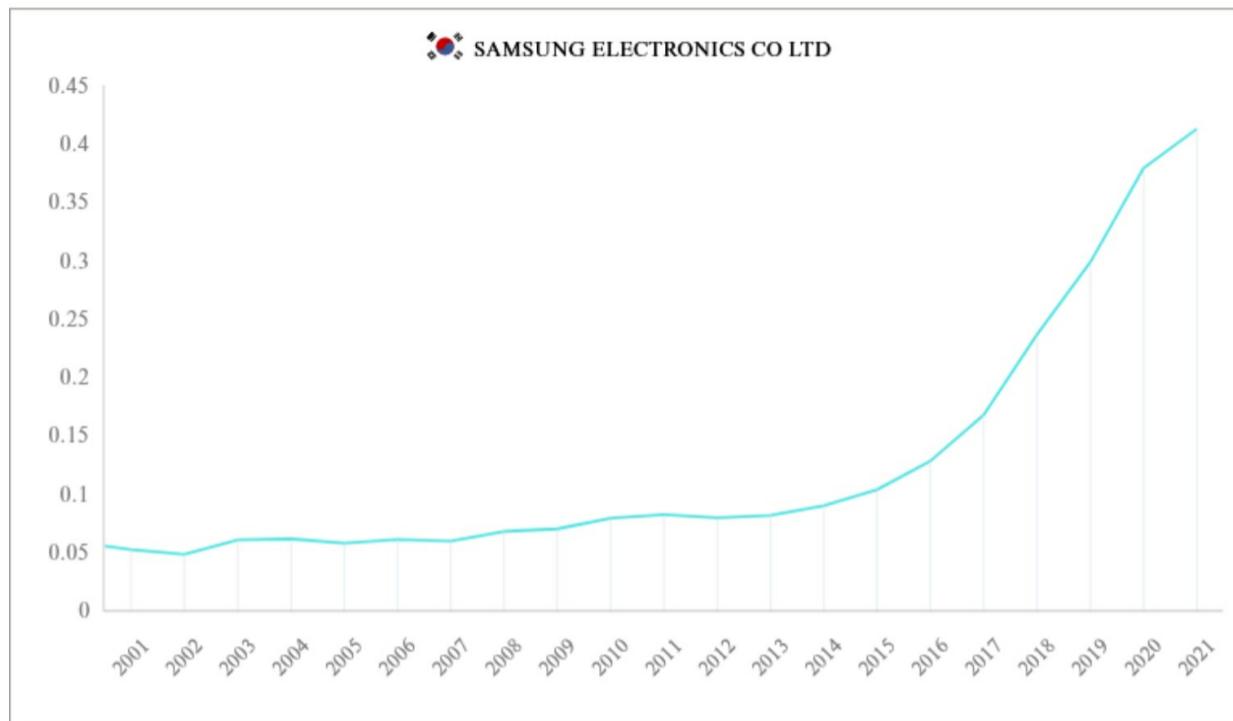


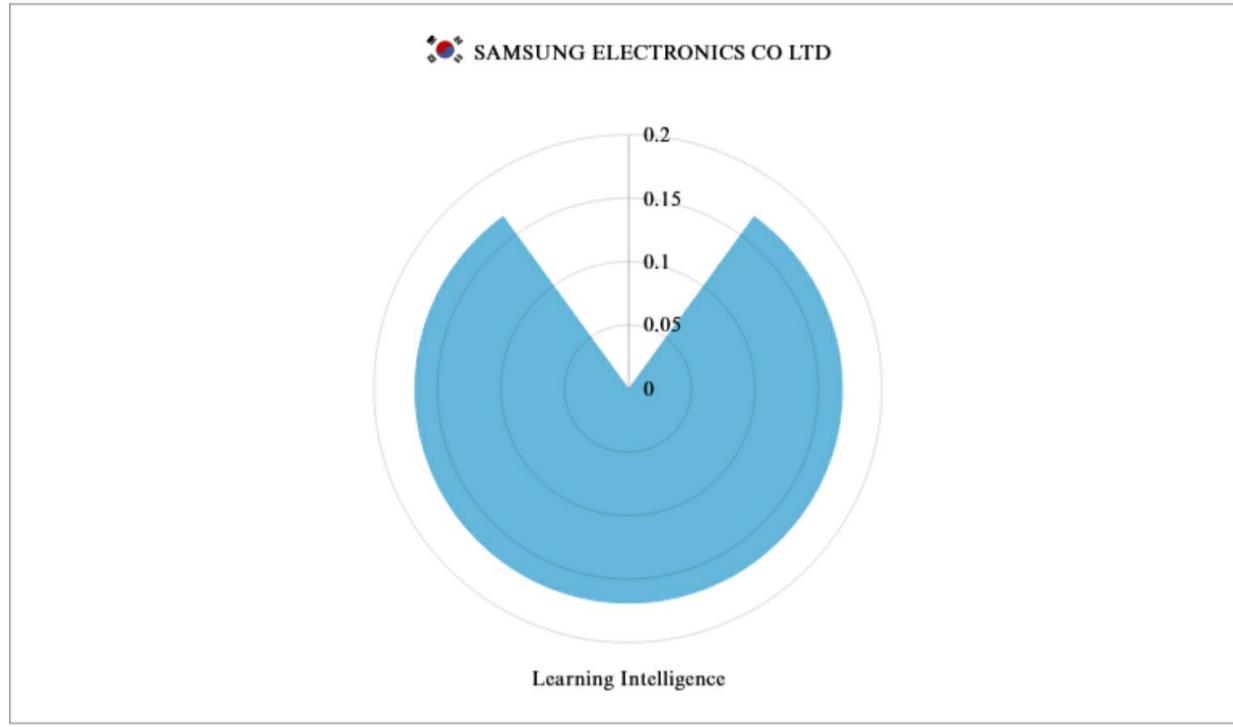
The diagnostic score of the Inference & Knowledge Representation technology is 0.00, and Machine Learning technology is 0.43.
Given this score, FANUC CORP is analyzed to be competitive in Machine Learning technology.

Given this score, FANUC CORP is analyzed to be non-competitive in Inference & Knowledge Representation technology.

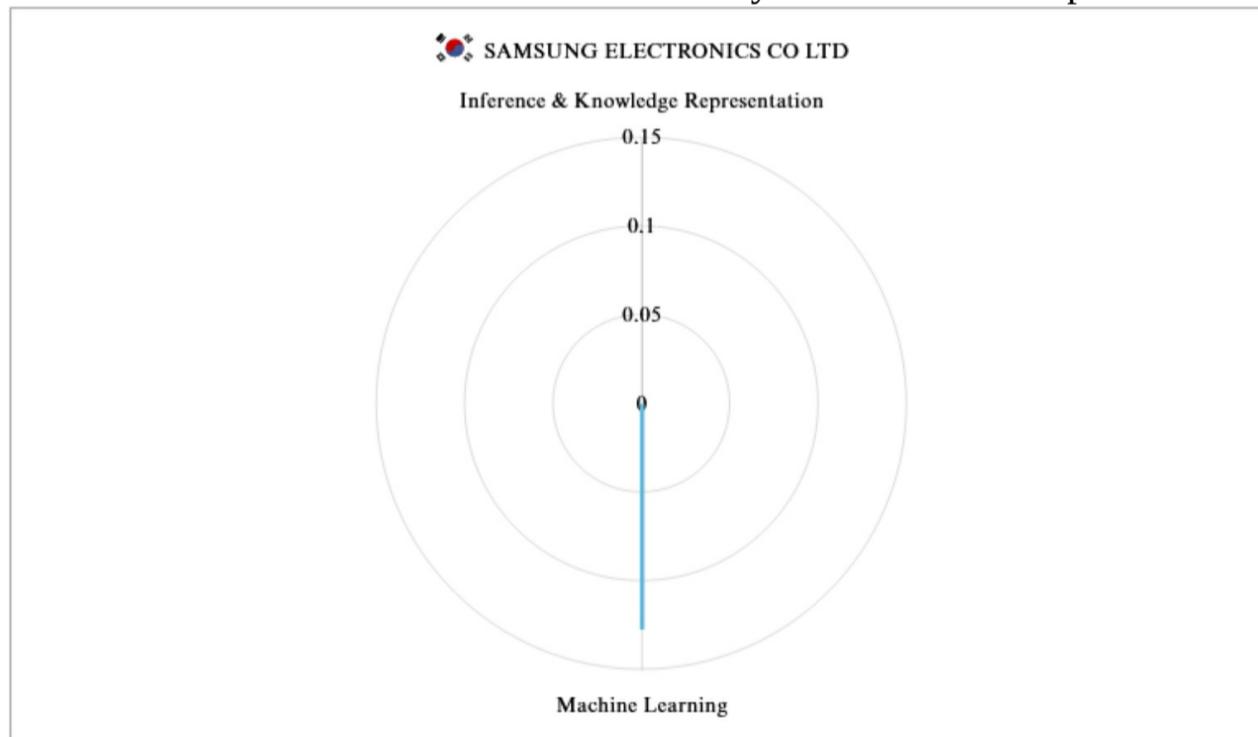
Samsung Electronics Co Ltd

According to the diagnosis results, technological competitiveness of SAMSUNG ELECTRONICS CO LTD is globally at 6th. The diagnostic score in SAMSUNG ELECTRONICS CO LTD is increasing at an annual average of 9.8 % from 0.059 in 2000 to 0.413 in 2021. Given this trend, it shows that technological competitiveness in SAMSUNG ELECTRONICS CO LTD is increasing.





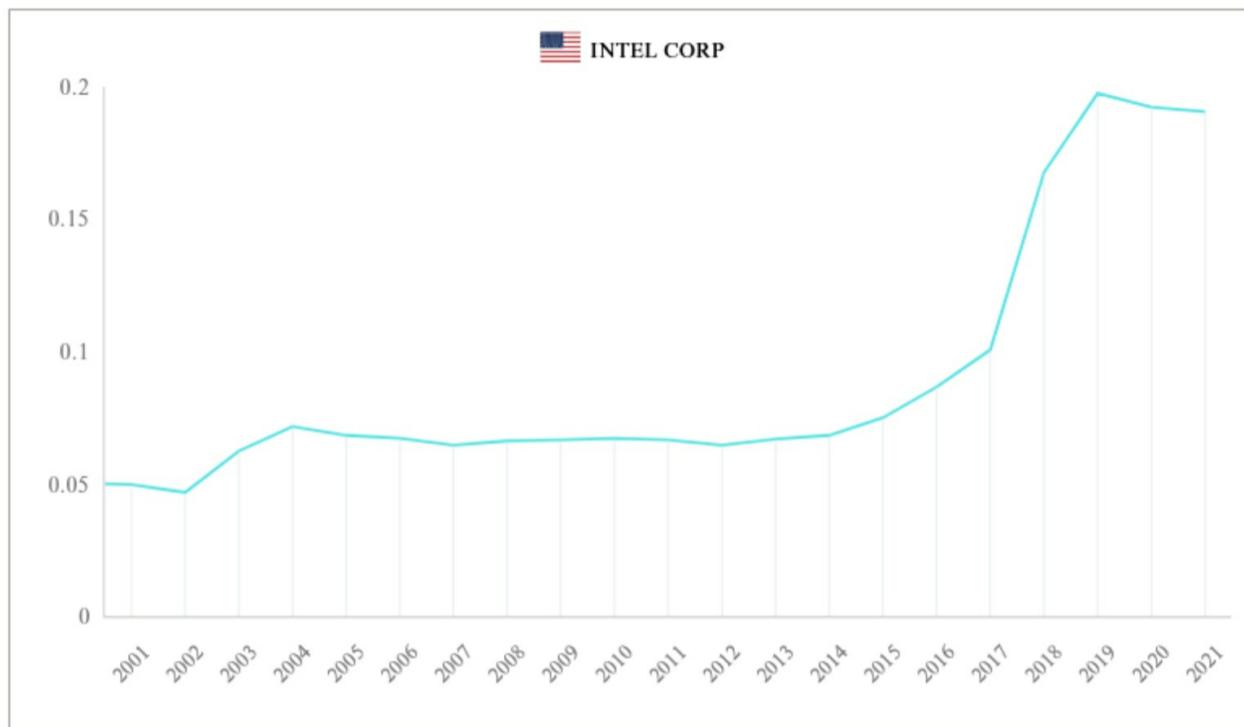
The diagnostic score of the Learning Intelligence technology is 0.17.
 SAMSUNG ELECTRONICS CO LTD is analyzed to be non-competitive in entire technology.

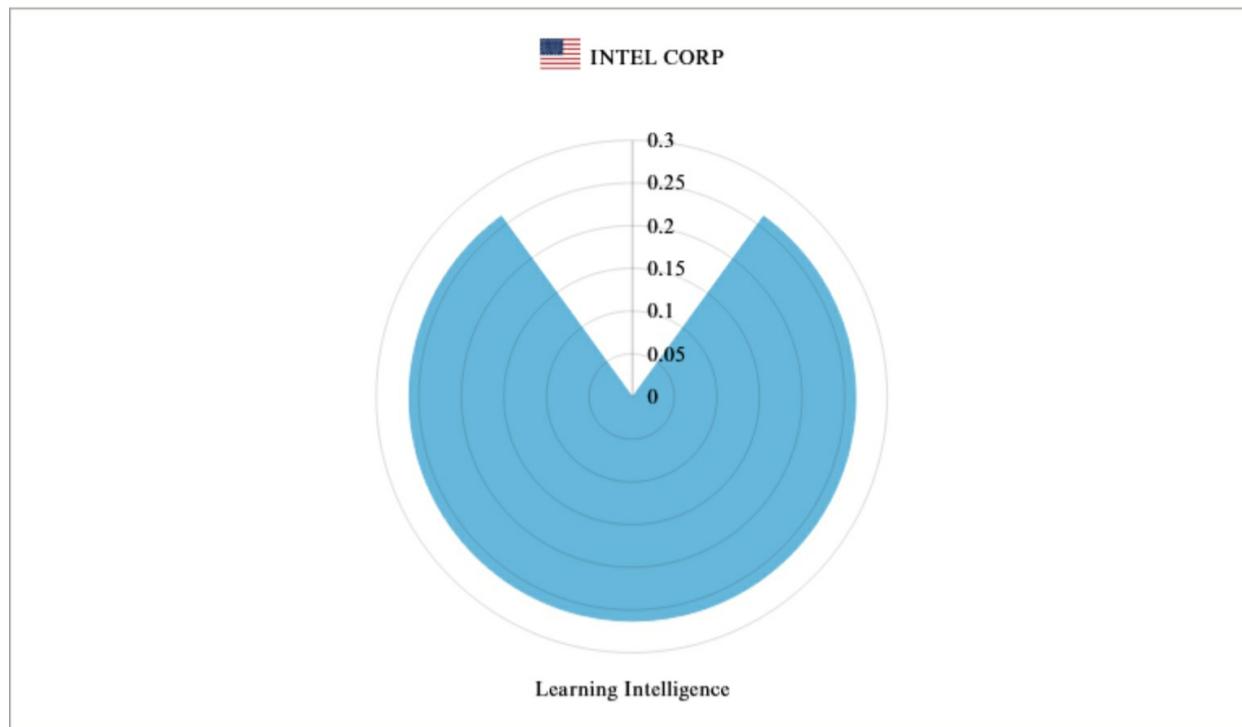


The diagnostic score of the Inference & Knowledge Representation technology is 0.00, and Machine Learning technology is 0.13.
 Given this score, SAMSUNG ELECTRONICS CO LTD is analyzed to be non-competitive in entire technology.

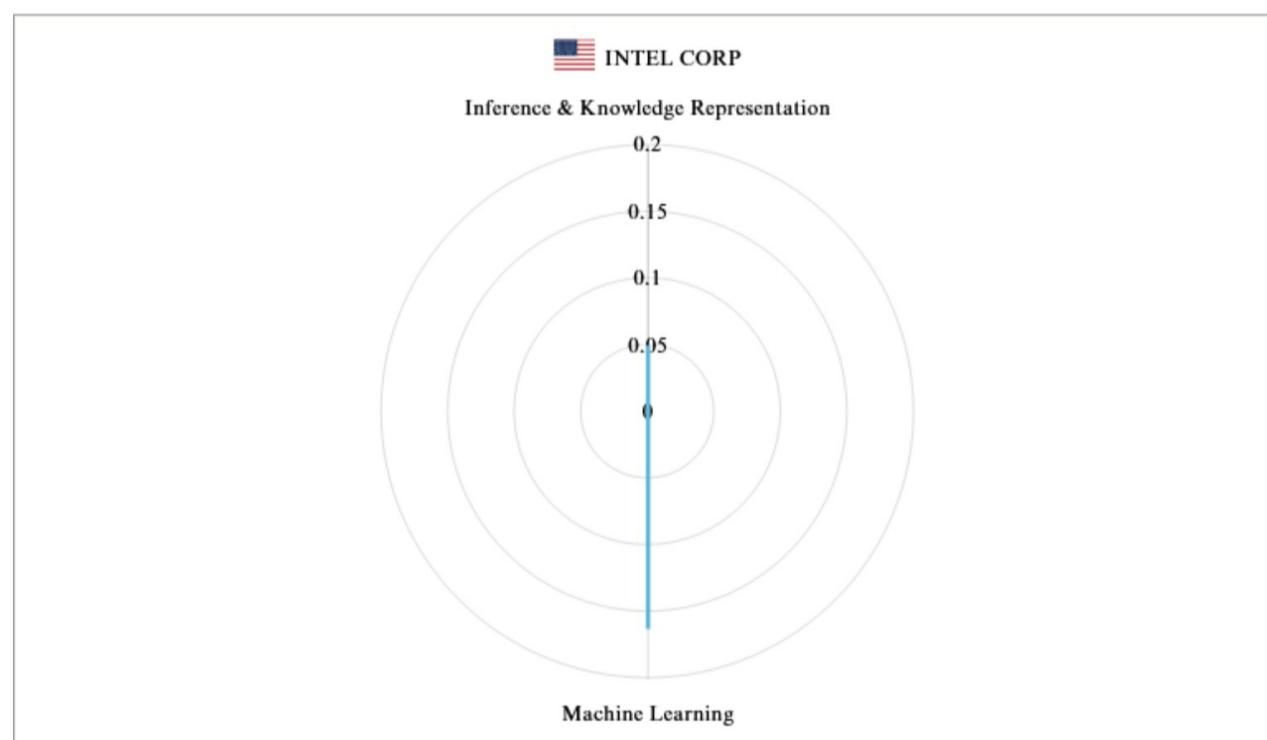
Intel Corp

According to the diagnosis results, technological competitiveness of INTEL CORP is globally at 7th. The diagnostic score in INTEL CORP is increasing at an annual average of 6.9 % from 0.051 in 2000 to 0.191 in 2021. Given this trend, it shows that technological competitiveness in INTEL CORP is increasing.





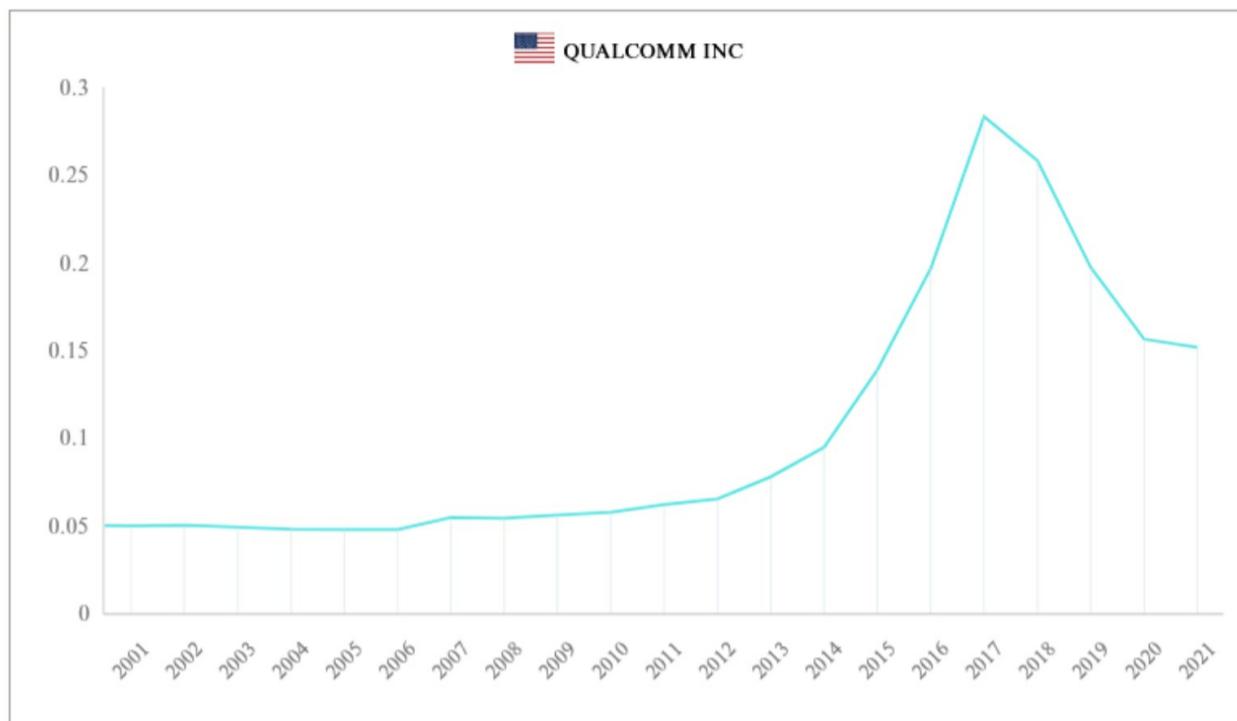
The diagnostic score of the Learning Intelligence technology is 0.26.
INTEL CORP is analyzed to be non-competitive in entire technology.

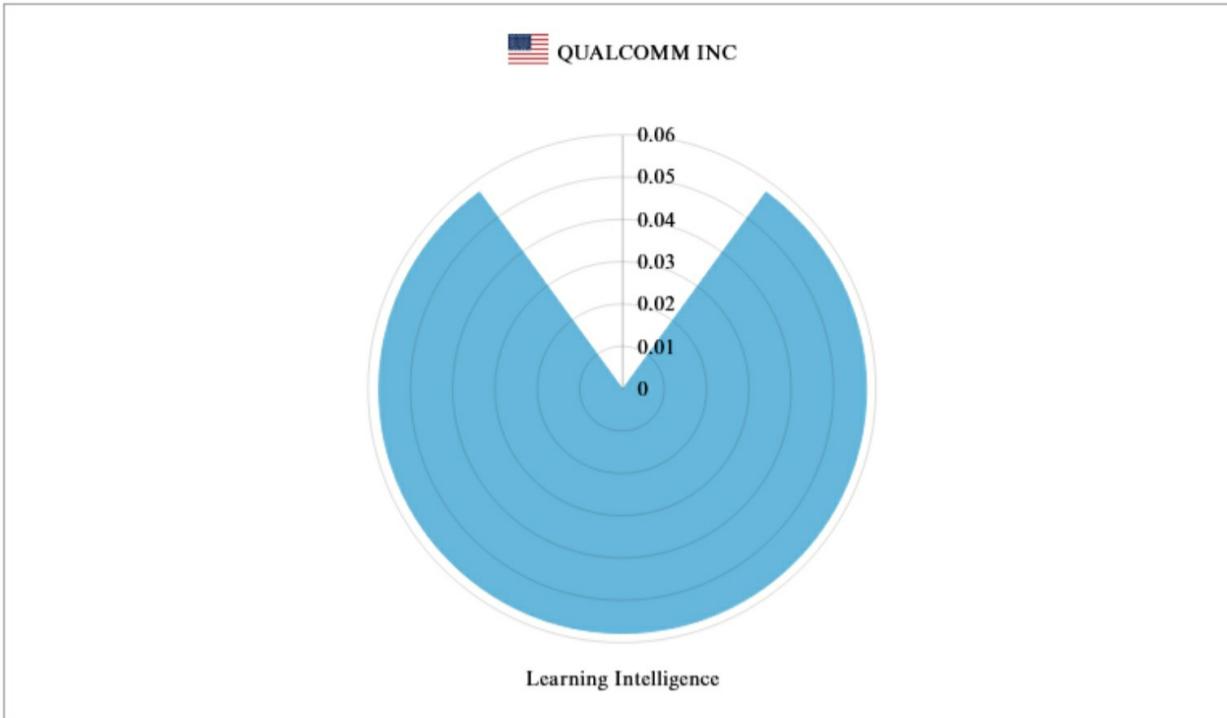


The diagnostic score of the Inference & Knowledge Representation technology is 0.05, and Machine Learning technology is 0.16.
Given this score, INTEL CORP is analyzed to be non-competitive in entire technology.

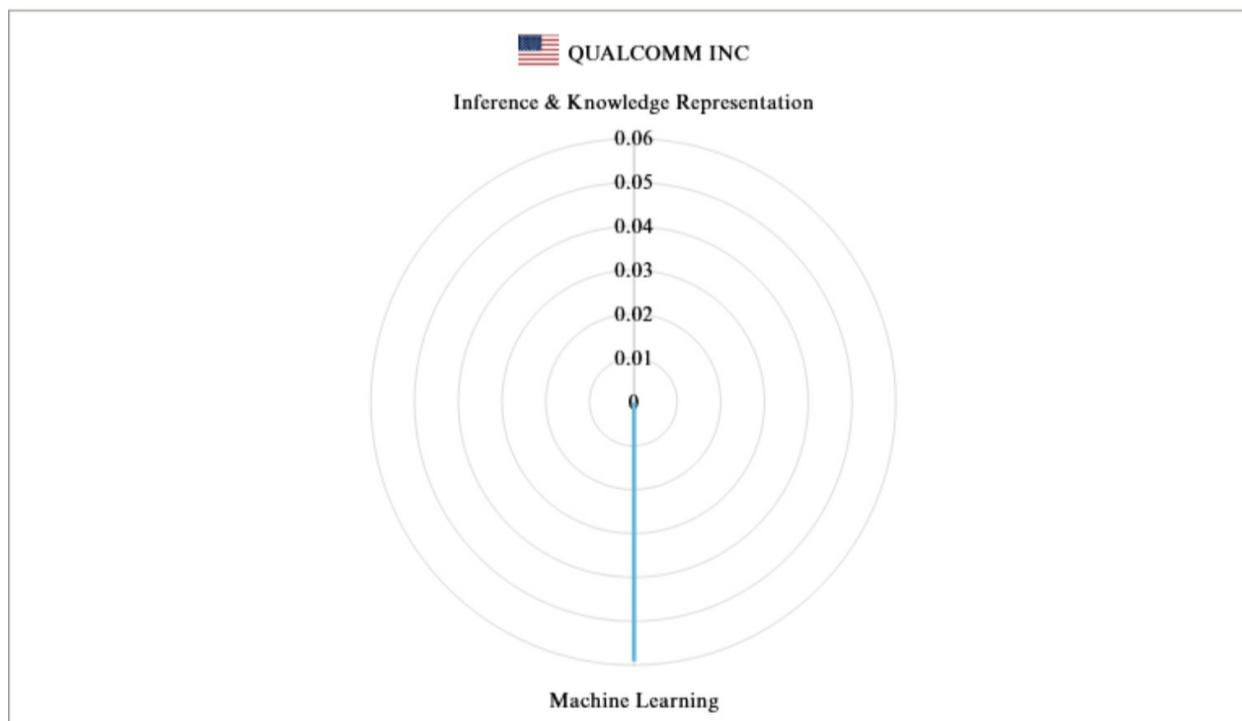
Qualcomm Inc

According to the diagnosis results, technological competitiveness of QUALCOMM INC is globally at 8th. The diagnostic score in QUALCOMM INC is increasing at an annual average of 5.8 % from 0.051 in 2000 to 0.152 in 2021. Given this trend, it shows that technological competitiveness in QUALCOMM INC is increasing.





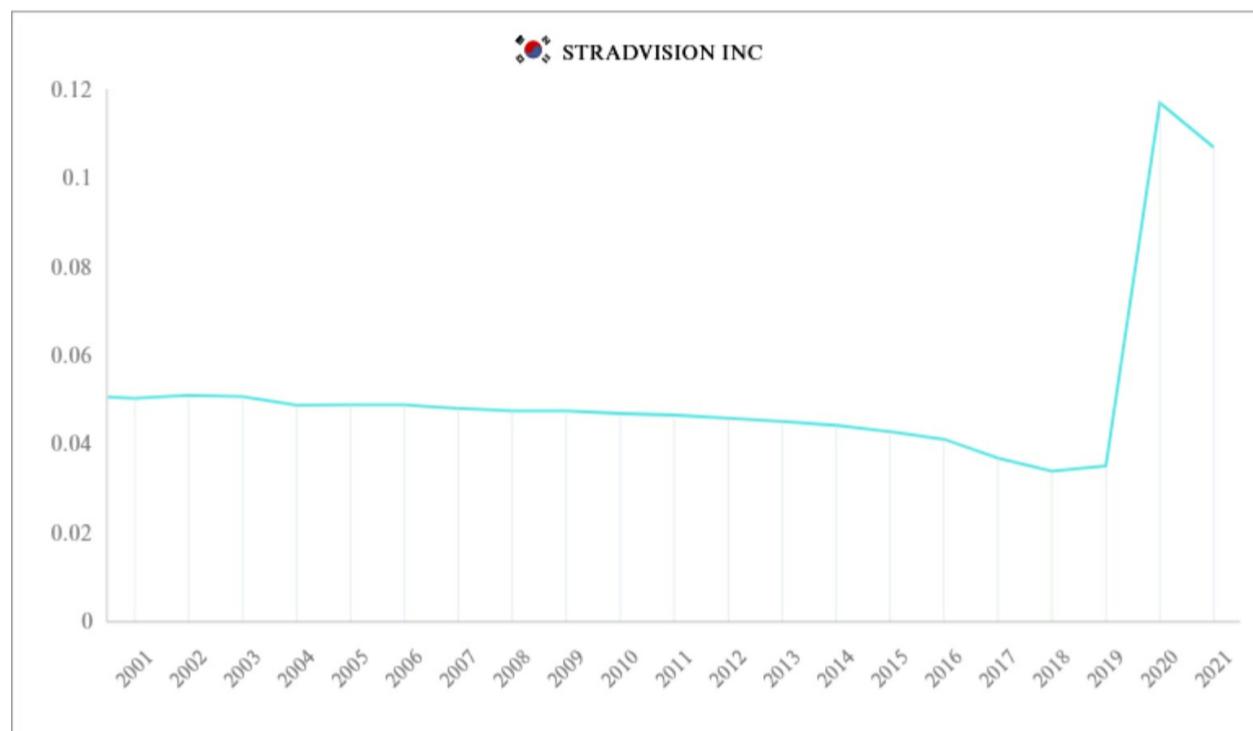
The diagnostic score of the Learning Intelligence technology is 0.06.
QUALCOMM INC is analyzed to be non-competitive in entire technology.

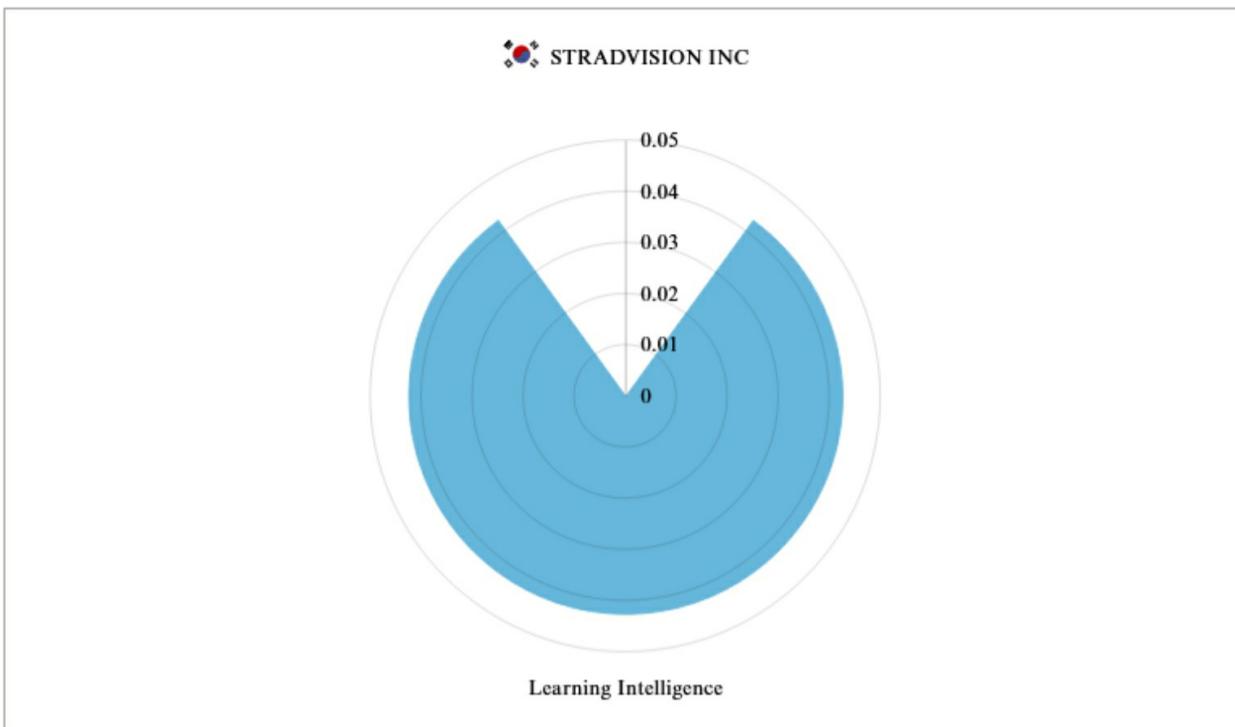


The diagnostic score of the Inference & Knowledge Representation technology is 0.00, and Machine Learning technology is 0.06.
Given this score, Qualcomm INC is analyzed to be non-competitive in entire technology.

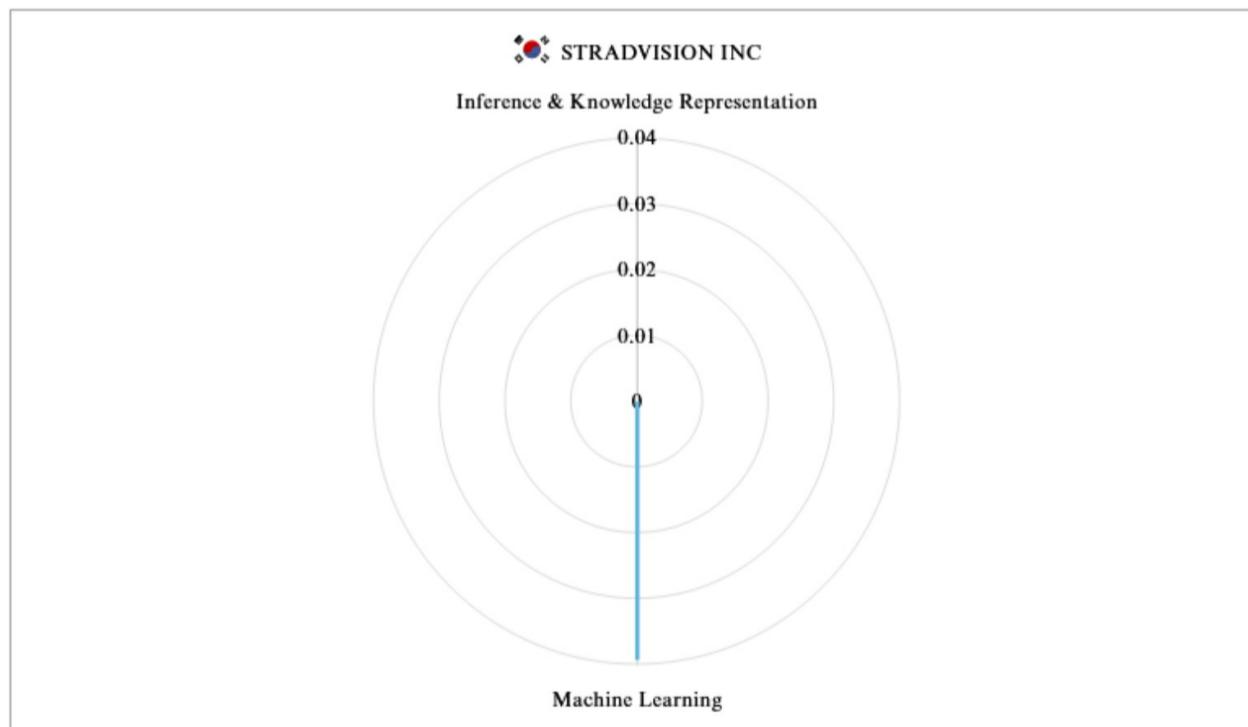
Stradvision Inc

According to the diagnosis results, technological competitiveness of STRADVISION INC is globally at 9th. The diagnostic score in STRADVISION INC is increasing at an annual average of 4.2 % from 0.051 in 2000 to 0.107 in 2021. Given this trend, it shows that technological competitiveness in STRADVISION INC is increasing.





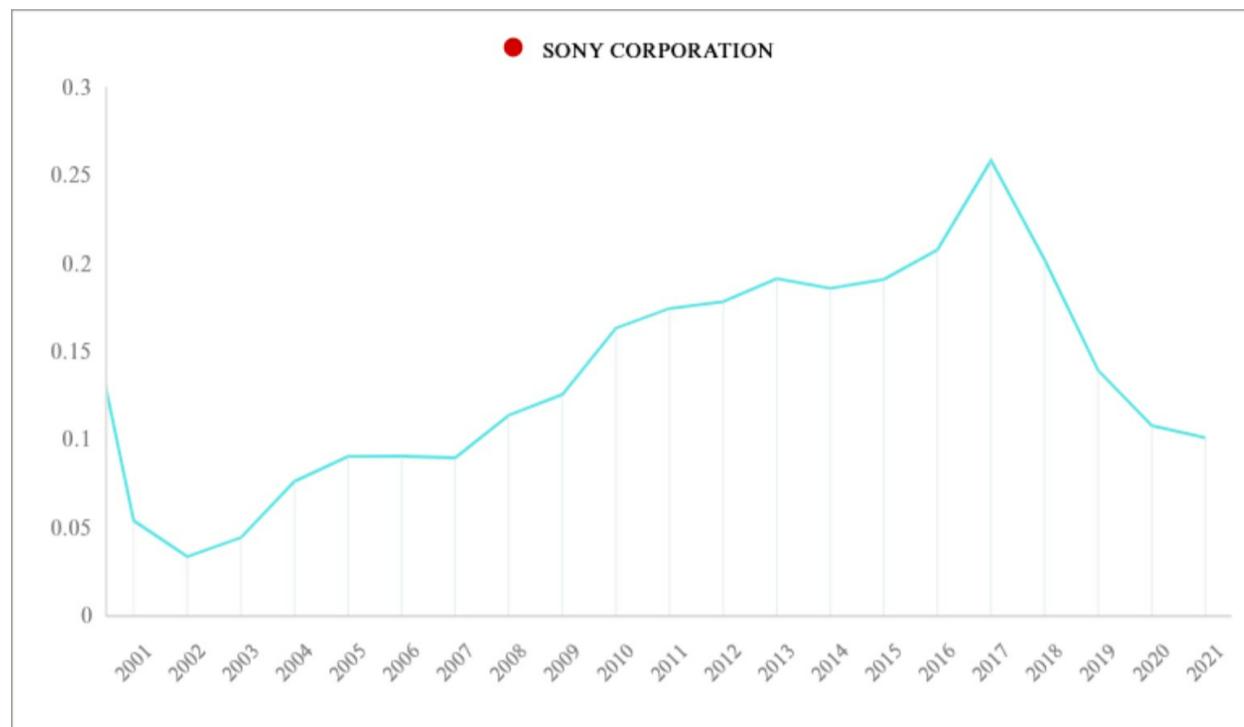
The diagnostic score of the Learning Intelligence technology is 0.04.
STRADVISION INC is analyzed to be non-competitive in entire technology.

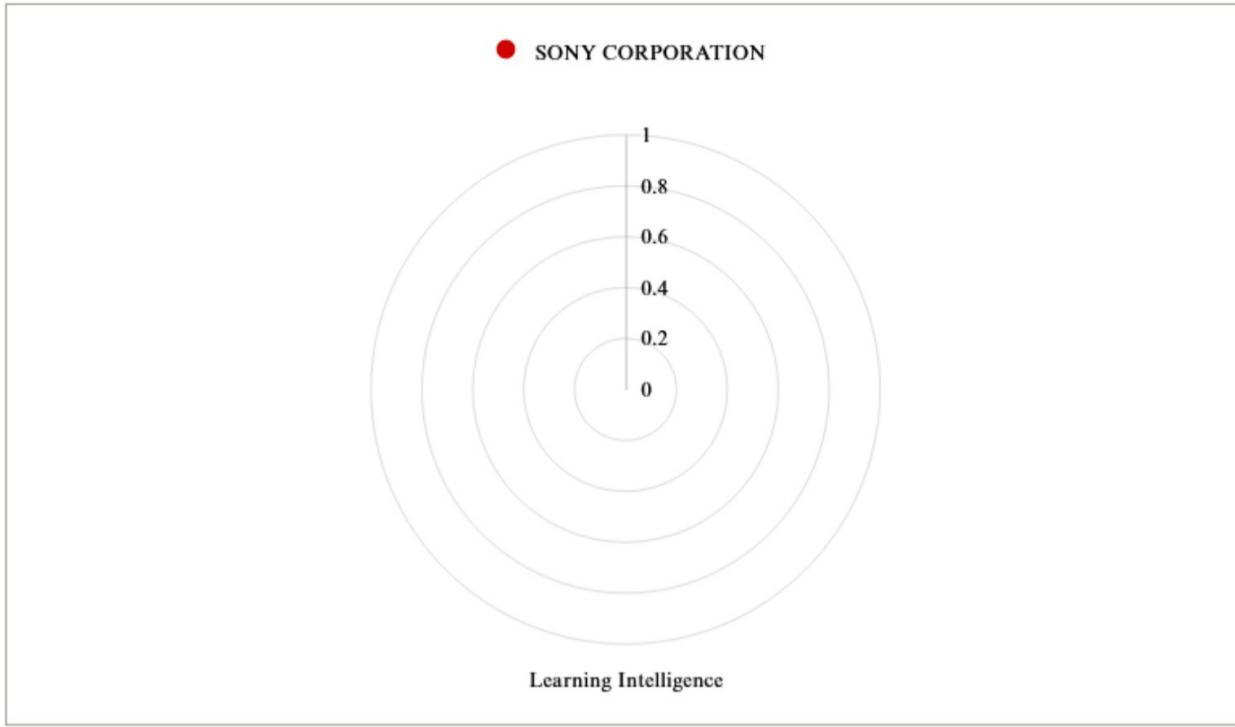


The diagnostic score of the Inference & Knowledge Representation technology is 0.00, and Machine Learning technology is 0.04.
Given this score, STRADVISION INC is analyzed to be non-competitive in entire technology.

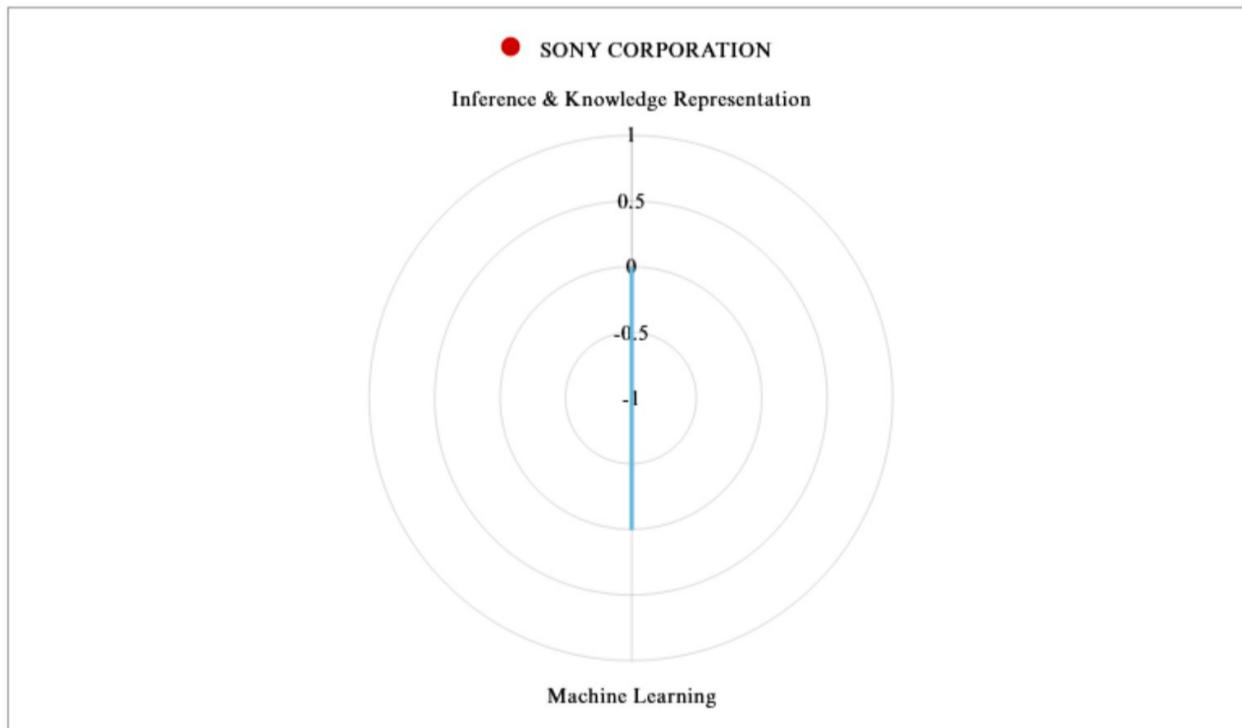
Sony Corporation

According to the diagnosis results, technological competitiveness of SONY CORPORATION is globally at 10th. The diagnostic score in SONY CORPORATION is decreasing at an annual average of -3.0 % from 0.199 in 2000 to 0.101 in 2021. Given this trend, it shows that technological competitiveness in SONY CORPORATION is decreasing.

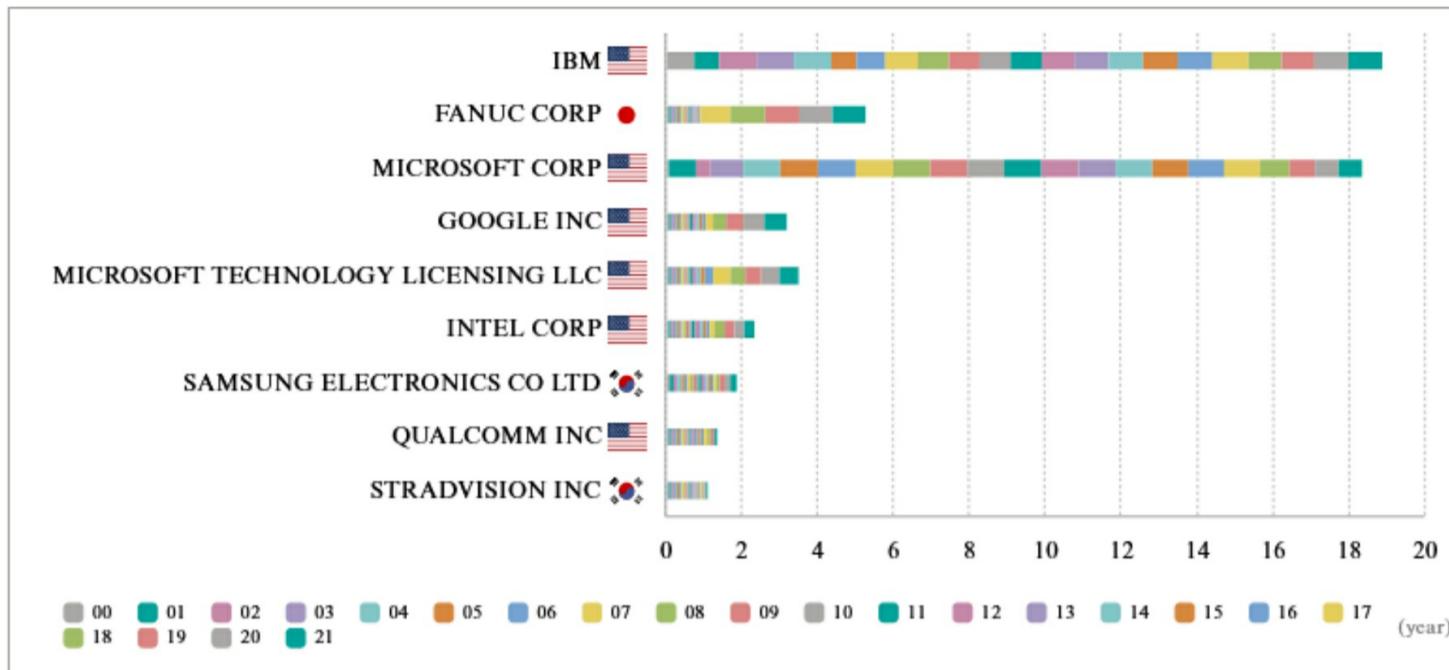




The diagnostic score of the Learning Intelligence technology is 0.00.
SONY CORPORATION is analyzed to be non-competitive in entire technology.



The diagnostic score of the Inference & Knowledge Representation technology is 0.00, and Machine Learning technology is 0.00.
Given this score, SONY CORPORATION is analyzed to be non-competitive in entire technology.



5) * his score represents total diagnostic score during the analysis period (2000~2021).

Technology

competitiveness by Company

The total diagnostic scores in Learning Intelligence technology is ranked in IBM (1st), FANUC CORP (2nd), MICROSOFT CORP (3rd), GOOGLE INC (4th), MICROSOFT TECHNOLOGY LICENSING LLC (5th), INTEL CORP (6th), SAMSUNG ELECTRONICS CO LTD (7th), QUALCOMM INC (8th), and STRADVISION INC (9th). Given these ranking, it is analyzed that IBM and FANUC CORP are competitive in Learning Intelligence technology.

6) Strength and weakness of technological competitiveness by company

Technology	MICROSOFT CORP	MICROSOFT	IBM	GOOGLE INC	FANUC CORP
Inference & Knowledge Re...	0.5649	0.1496	0.9086	0.0000	0.0000
Machine Learning	0.6340	0.2468	0.6227	0.2798	0.4341

* This score represents diagnostic scores of each company regarding Small Category technology.

Technology	SAMSUNG	INTEL CORP	QUALCOMM INC	STRADVISION INC	SONY
Inference & Knowledge Re...	0.0000	0.0502	0.0000	0.0000	0.0000
Machine Learning	0.1273	0.1627	0.0590	0.0393	0.0000

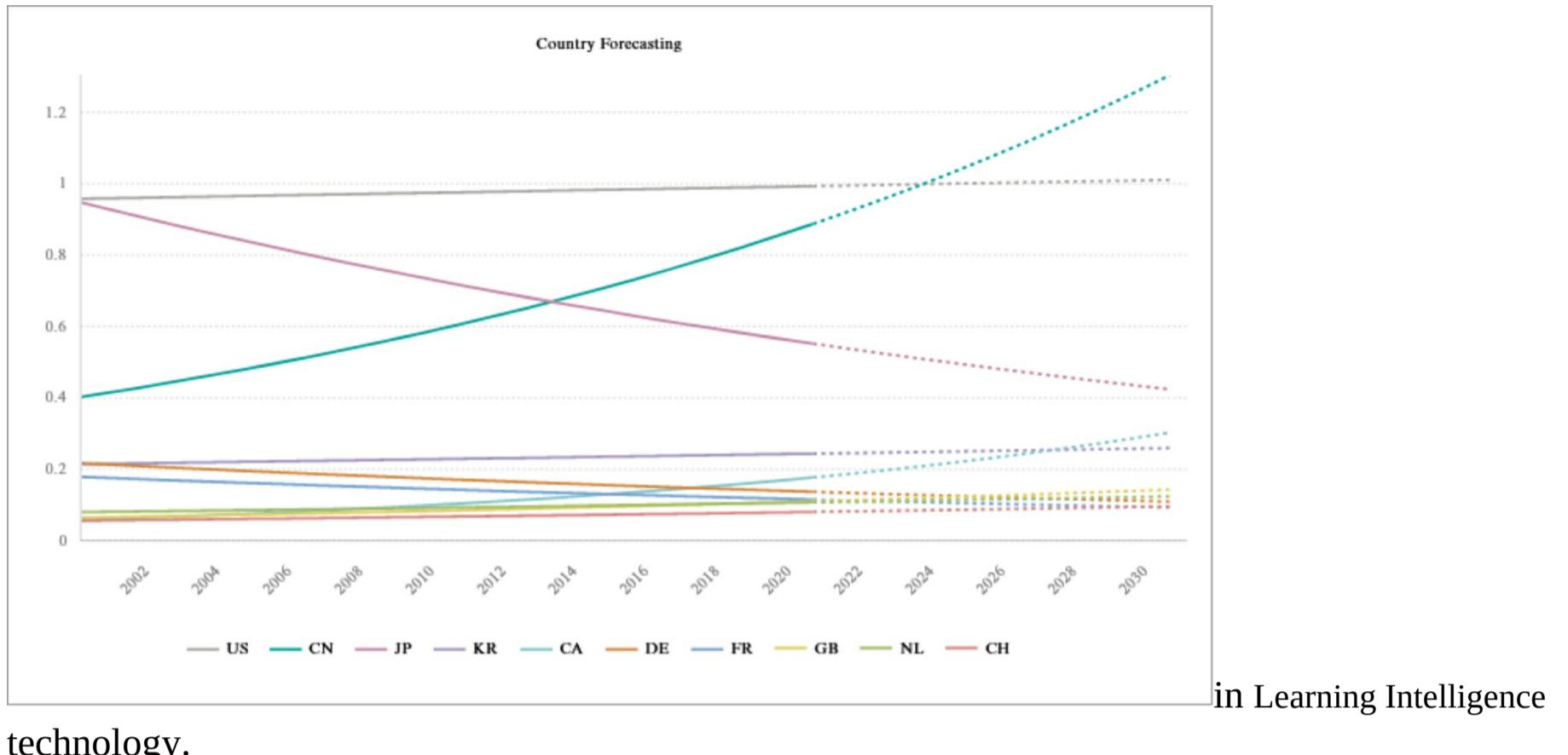
* This score represents diagnostic scores of each company regarding Small Category technology.

- MICROSOFT CORP is analyzed to have competitiveness in entire technology.
- MICROSOFT TECHNOLOGY LICENSING LLC is analyzed not to have competitiveness in entire technology.
- IBM is analyzed to have competitiveness in entire technology.
- GOOGLE INC is analyzed not to have competitiveness in entire technology.
- FANUC CORP is analyzed to have competitiveness in machine learning (0.43) technology. FANUC CORP is analyzed not to have competitiveness in inference & knowledge representation (0.00) technology.
- SAMSUNG ELECTRONICS CO LTD is analyzed not to have competitiveness in entire technology.
- INTEL CORP is analyzed not to have competitiveness in entire technology.
- QUALCOMM INC is analyzed not to have competitiveness in entire technology.
- STRADVISION INC is analyzed not to have competitiveness in entire technology.
- SONY CORPORATION is analyzed not to have competitiveness in entire technology.

8. Forecasting

1) Global countries R&D capability

The figure below shows the results of forecasting the technological competitiveness of each country



By 2033, global countries will be ranked in U.S.A (1st), China (2nd), Japan (3rd), Korea (4th), Canada (5th), Germany (6th), France (7th), Britain (8th), Netherlands (9th), and Switzerland (10th).

U.S.A will remain same its technology competitiveness.

China will increase its technology competitiveness by an annual average of around 3.9%.

Japan will decrease its technology competitiveness by an annual average of around -2.6%.

Korea will remain same its technology competitiveness.

Canada will increase its technology competitiveness by an annual average of around 5.5%.

Germany will decrease its technology competitiveness by an annual average of around -2.2%.

France will decrease its technology competitiveness by an annual average of around -2.1%.

Britain will increase its technology competitiveness by an annual average of around 2.6%.

Netherlands will increase its technology competitiveness by an annual average of around 1.4%.

Switzerland will increase its technology competitiveness by an annual average of around 1.7%.

2) Technology gap: Present

The table below shows durations for global country to reach the highest level of the Learning Intelligence technology.

Standard▼	US	CN	JP	KR	CA	DE	FR	GB	NL	CH
US	0	+1.1	+4.4	+7.5	+8.2	+8.6	+8.8	+8.8	+8.9	+9.1
CN	-1.1	0	+3.3	+6.4	+7.1	+7.5	+7.7	+7.8	+7.8	+8.1
JP	-4.4	-3.3	0	+3.1	+3.8	+4.2	+4.4	+4.4	+4.4	+4.7
KR	-7.5	-6.4	-3.1	0	+0.7	+1.1	+1.3	+1.3	+1.4	+1.6
CA	-8.2	-7.1	-3.8	-0.7	0	+0.4	+0.6	+0.7	+0.7	+1.0
DE	-8.6	-7.5	-4.2	-1.1	-0.4	0	+0.2	+0.3	+0.3	+0.6
FR	-8.8	-7.7	-4.4	-1.3	-0.6	-0.2	0	+0.1	+0.1	+0.3
GB	-8.8	-7.8	-4.4	-1.3	-0.7	-0.3	-0.1	0	+0.0	+0.3
NL	-8.9	-7.8	-4.4	-1.4	-0.7	-0.3	-0.1	-0.0	0	+0.3
CH	-9.1	-8.1	-4.7	-1.6	-1.0	-0.6	-0.3	-0.3	-0.3	0

+ Positive technology gap

- Negative technology gap

Regarding the technology level, U.S.A is more than 1.06 years ahead of China, 4.41 years ahead of Japan, 7.49 years ahead of Korea, 8.16 years ahead of Canada, and 8.56 years ahead of Germany.

Regarding the technology level, China is more than 1.06 years behind U.S.A, 3.35 years ahead of Japan, 6.43 years ahead of Korea, 7.1 years ahead of Canada, and 7.5 years ahead of Germany.

Regarding the technology level, Japan is more than 4.41 years behind U.S.A, 3.35 years behind China, 3.08 years ahead of Korea, 3.75 years ahead of Canada, and 4.15 years ahead of Germany.

Regarding the technology level, Korea is more than 7.49 years behind U.S.A, 6.43 years behind China, 3.08 years behind Japan, 0.67 years ahead of Canada, and 1.07 years ahead of Germany.

Regarding the technology level, Canada is more than 8.16 years behind U.S.A, 7.1 years behind China, 3.75 years behind Japan, 0.67 years behind Korea, and 0.4 years ahead of Germany.

3) Technology gap: Future

The table below shows durations for global country to reach the highest level of the Learning Intelligence technology.

Standard▼	CN	US	JP	CA	KR	GB	NL	DE	CH	FR
CN	0	+2.9	+8.8	+10↑	+10↑	+10↑	+10↑	+10↑	+10↑	+10↑
US	-2.9	0	+5.9	+7.1	+7.5	+8.7	+8.9	+9.0	+9.1	+9.2
JP	-8.8	-5.9	0	+1.2	+1.6	+2.8	+3.0	+3.1	+3.3	+3.3
CA	-10↓	-7.1	-1.2	0	+0.4	+1.6	+1.8	+1.9	+2.1	+2.1
KR	-10↓	-7.5	-1.6	-0.4	0	+1.2	+1.4	+1.5	+1.6	+1.7
GB	-10↓	-8.7	-2.8	-1.6	-1.2	0	+0.2	+0.3	+0.5	+0.5
NL	-10↓	-8.9	-3.0	-1.8	-1.4	-0.2	0	+0.1	+0.3	+0.3
DE	-10↓	-9.0	-3.1	-1.9	-1.5	-0.3	-0.1	0	+0.1	+0.2
CH	-10↓	-9.1	-3.3	-2.1	-1.6	-0.5	-0.3	-0.1	0	+0.0
FR	-10↓	-9.2	-3.3	-2.1	-1.7	-0.5	-0.3	-0.2	-0.0	0

+ Positive technology gap

- Negative technology gap

Regarding the technology level, China is more than 2.93 years ahead of U.S.A, 8.8 years ahead of Japan, 10 years ahead of Canada, 10 years ahead of Korea, and 10 years ahead of Britain.

Regarding the technology level, U.S.A is more than 2.93 years behind China, 5.87 years ahead of Japan, 7.08 years ahead of Canada, 7.51 years ahead of Korea, and 8.68 years ahead of Britain.

Regarding the technology level, Japan is more than 8.8 years behind China, 5.87 years behind U.S.A, 1.21 years ahead of Canada, 1.65 years ahead of Korea, and 2.81 years ahead of Britain.

Regarding the technology level, Canada is more than 10 years behind China, 7.08 years behind U.S.A, 1.21 years behind Japan, 0.43 years ahead of Korea, and 1.6 years ahead of Britain.

Regarding the technology level, Korea is more than 10 years behind China, 7.51 years behind U.S.A, 1.65 years behind Japan, 0.43 years behind Canada, and 1.16 years ahead of Britain.

4) Global companies R&D capability

The figure below shows the results of forecasting the technological competitiveness of each company in Learning Intelligence technology.

By 2033, global countries will be ranked in IBM (1st), MICROSOFT CORP (2nd), FANUC CORP (3rd), MICROSOFT TECHNOLOGY LICENSING LLC (4th), GOOGLE INC (5th), INTEL CORP (6th), CISCO TECHNOLOGY INC (7th), PRIMAL FUSION INC (8th), SAMSUNG ELECTRONICS CO LTD (9th), and AMAZON TECHNOLOGIES INC (10th).

IBM will remain same its technology competitiveness.

MICROSOFT CORP will remain same its technology competitiveness.

FANUC CORP will increase its technology competitiveness by an annual average of around 13.9%.

MICROSOFT TECHNOLOGY LICENSING LLC will increase its technology competitiveness by an annual average of around 9.8%.

GOOGLE INC will increase its technology competitiveness by an annual average of around 10.1%.

INTEL CORP will increase its technology competitiveness by an annual average of around 7.0%.

CISCO TECHNOLOGY INC will increase its technology competitiveness by an annual average of around 5.8%.

PRIMAL FUSION INC will increase its technology competitiveness by an annual average of around 4.3%.

SAMSUNG ELECTRONICS CO LTD will increase its technology competitiveness by an annual average of around 2.3%.

AMAZON TECHNOLOGIES INC will increase its technology competitiveness by an annual average of around 2.3%.

5) Technology gap: Present

The table below shows durations for global company to reach the highest level of the Learning Intelligence technology.

Standard*	IBM	MICROSOFT	FANUC CORP	MICROSOFT	GOOGLE INC	INTEL CORP	CISCO	PRIMAL	SAMSUNG	AMAZON
IBM	0	+1.3	+4.6	+6.0	+6.1	+6.9	+7.1	+7.4	+7.7	+7.9
MICROSOFT	-1.3	0	+3.4	+4.8	+4.9	+5.6	+5.8	+6.1	+6.4	+6.6
FANUC CORP	-4.6	-3.4	0	+1.4	+1.5	+2.3	+2.5	+2.8	+3.0	+3.2
MICROSOFT	-6.0	-4.8	-1.4	0	+0.1	+0.9	+1.1	+1.4	+1.6	+1.9
GOOGLE INC	-6.1	-4.9	-1.5	-0.1	0	+0.8	+1.0	+1.3	+1.5	+1.7
INTEL CORP	-6.9	-5.6	-2.3	-0.9	-0.8	0	+0.2	+0.5	+0.8	+1.0
CISCO	-7.1	-5.8	-2.5	-1.1	-1.0	-0.2	0	+0.3	+0.6	+0.8
PRIMAL	-7.4	-6.1	-2.8	-1.4	-1.3	-0.5	-0.3	0	+0.3	+0.5
SAMSUNG	-7.7	-6.4	-3.0	-1.6	-1.5	-0.8	-0.6	-0.3	0	+0.2
AMAZON	-7.9	-6.6	-3.2	-1.9	-1.7	-1.0	-0.8	-0.5	-0.2	0

+ Positive technology gap

- Negative technology gap

Regarding the technology level, IBM is more than 1.25 years ahead of MICROSOFT CORP, 4.65 years ahead of FANUC CORP, 6.03 years ahead of MICROSOFT TECHNOLOGY LICENSING LLC, 6.14 years ahead of GOOGLE INC, and 6.9 years ahead of INTEL CORP.

Regarding the technology level, MICROSOFT CORP is more than 1.25 years behind IBM, 3.39 years ahead of FANUC CORP, 4.78 years ahead of MICROSOFT TECHNOLOGY LICENSING LLC, 4.89 years ahead of GOOGLE INC, and 5.64 years ahead of INTEL CORP.

Regarding the technology level, FANUC CORP is more than 4.65 years behind IBM, 3.39 years behind MICROSOFT CORP, 1.39 years ahead of MICROSOFT TECHNOLOGY LICENSING LLC, 1.5 years ahead of GOOGLE INC, and 2.25 years ahead of INTEL CORP.

Regarding the technology level, MICROSOFT TECHNOLOGY LICENSING LLC is more than 6.03 years behind IBM, 4.78 years behind MICROSOFT CORP, 1.39 years behind FANUC CORP, 0.11 years ahead of GOOGLE INC, and 0.87 years ahead of INTEL CORP.

Regarding the technology level, GOOGLE INC is more than 6.14 years behind IBM, 4.89 years behind MICROSOFT CORP, 1.5 years behind FANUC CORP, 0.11 years behind MICROSOFT TECHNOLOGY LICENSING LLC, and 0.76 years ahead of INTEL CORP.

6) Technology gap: Future

The table below shows durations for global company to reach the highest level of the Complex Intelligence technology.

Standard*	FANUC CORP	IBM	MICROSOFT	MICROSOFT	GOOGLE INC	INTEL CORP	CISCO	PRIMAL	SAMSUNG	AMAZON
FANUC CORP	0	+6.0	+7.1	+8.1	+8.2	+10↑	+10↑	+10↑	+10↑	+10↑
IBM	-6.0	0	+1.2	+2.1	+2.3	+5.4	+6.1	+7.0	+7.6	+7.9
MICROSOFT	-7.1	-1.2	0	+1.0	+1.1	+4.2	+5.0	+5.8	+6.5	+6.8
MICROSOFT	-8.1	-2.1	-1.0	0	+0.1	+3.2	+4.0	+4.8	+5.5	+5.8
GOOGLE INC	-8.2	-2.3	-1.1	-0.1	0	+3.1	+3.9	+4.7	+5.4	+5.7
INTEL CORP	-10↓	-5.4	-4.2	-3.2	-3.1	0	+0.7	+1.6	+2.2	+2.5
CISCO	-10↓	-6.1	-5.0	-4.0	-3.9	-0.7	0	+0.8	+1.5	+1.8
PRIMAL	-10↓	-7.0	-5.8	-4.8	-4.7	-1.6	-0.8	0	+0.7	+1.0
SAMSUNG	-10↓	-7.6	-6.5	-5.5	-5.4	-2.2	-1.5	-0.7	0	+0.3
AMAZON	-10↓	-7.9	-6.8	-5.8	-5.7	-2.5	-1.8	-1.0	-0.3	0

+ Positive technology gap

- Negative technology gap

Regarding the technology level, FANUC CORP is more than 5.96 years ahead of IBM, 7.11 years ahead of MICROSOFT CORP, 8.11 years ahead of MICROSOFT TECHNOLOGY LICENSING LLC, 8.23 years ahead of GOOGLE INC, and 10 years ahead of INTEL CORP.

Regarding the technology level, IBM is more than 5.96 years behind FANUC CORP, 1.16 years ahead of MICROSOFT CORP, 2.15 years ahead of MICROSOFT TECHNOLOGY LICENSING LLC, 2.27 years ahead of GOOGLE INC, and 5.4 years ahead of INTEL CORP.

Regarding the technology level, MICROSOFT CORP is more than 7.11 years behind FANUC CORP, 1.16 years behind IBM, 0.99 years ahead of MICROSOFT TECHNOLOGY LICENSING LLC, 1.12 years ahead of GOOGLE INC, and 4.24 years ahead of INTEL CORP.

Regarding the technology level, MICROSOFT TECHNOLOGY LICENSING LLC is more than 8.11 years behind FANUC CORP, 2.15 years behind IBM, 0.99 years behind MICROSOFT CORP, 0.12 years ahead of GOOGLE INC, and 3.25 years ahead of INTEL CORP.

Regarding the technology level, GOOGLE INC is more than 8.23 years behind FANUC CORP, 2.27 years behind IBM, 1.12 years behind MICROSOFT CORP, 0.12 years behind MICROSOFT TECHNOLOGY LICENSING LLC, and 3.12 years ahead of INTEL CORP.

9. Smart Solutions

1) Country diagnostic solutions

..... United States

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of U.S.A in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	US	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★	★	★ 0.12%	High (1.00)	0.0	US
		Machine Learning	★ -0.02%	0.25%	★ 0.12%	High (1.00)	0.0	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is falling at an annual average rate of -0.02 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is at an average annual rate of 0.25%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is at an average annual rate of 0.12%, and Machine Learning technology is 0.12%.

Technological development capability

Based on the above table, the technological competitiveness of U.S.A will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

U.S.A has strong competitiveness in Inference & Knowledge Representation (1.00) , Machine Learning (1.00).

Technological gap

Based on the above table, the technological gap between U.S.A and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, U.S.A has the highest technology development capability.

In Machine Learning technology, U.S.A has the highest technology development capability.

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of China in Artificial Intelligence technology.

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	CN	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 2.97%	★ 3.26%	★ 13.38%	High (0.98)	-0.2	US
		Machine Learning			★ 0.67%	High (0.98)	-0.2	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 2.97 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 3.26%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is growing at an average annual rate of 13.38%, and Machine Learning technology is 0.67%.

Technological development capability

Based on the above table, the technological competitiveness of China will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

China has strong competitiveness in Inference & Knowledge Representation (0.98) , Machine Learning (0.98) .

Technological gap

Based on the above table, the technological gap between China and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, China is 0.2 years behind U.S.A.
In Machine Learning technology, China is 0.2 years behind U.S.A.

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of Japan in Artificial Intelligence technology.

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	JP	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ -0.27%	★ -2.04%	★ -3.58%	High (0.20)	-8.0	US
		Machine Learning			★ -4.83%	High (0.34)	-6.6	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is falling at an annual average rate of -0.27 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is falling at an average annual rate of -2.04%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is falling at an average annual rate of -4.83%, and Inference & Knowledge Representation technology is falling -3.58%.

Technological development capability

Based on the above table, the technological competitiveness of Japan will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

Japan has weak competitiveness in Machine Learning (0.34) , Inference & Knowledge Representation (0.20) .

Technological gap

Based on the above table, the technological gap between Japan and top-tier technology countries will be examined below.

In Machine Learning technology, Japan is 6.6 years behind U.S.A.

In Inference & Knowledge Representation technology, Japan is 8 years behind U.S.A.

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of Korea in Artificial Intelligence technology.

Technology Category			Trend		Diagnostic	Technical gap		
LC	MC	SC	LC	MC	SC	KR	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation			★ 2.99%	High (0.14)	-8.6	US
		Machine Learning	★ -0.29%	★ -3.01%	★ -3.14%	High (0.43)	-5.7	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is falling at an annual average rate of -0.29 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is falling at an average annual rate of -3.01%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is growing at an average annual rate of 2.99%, and Machine Learning technology is falling -3.14%.

Technological development capability

Based on the above table, the technological competitiveness of Korea will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

Korea has strong competitiveness in Machine Learning (0.43) .

Korea has weak competitiveness in Inference & Knowledge Representation (0.14) .

Technological gap

Based on the above table, the technological gap between Korea and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, Korea is 8.6 years behind U.S.A.

In Machine Learning technology, Korea is 5.7 years behind U.S.A.

Netherlands

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of Netherlands in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	NL	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 4.33%	★ 2.79%	★ -0.29%	High (0.10)	-9.0	US
		Machine Learning	★ 4.33%	★ 2.79%	★ 1.61%	High (0.11)	-8.9	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 4.33 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 2.79%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is at an average annual rate of -0.29%, and Machine Learning technology is growing 1.61%.

Technological development capability

Based on the above table, the technological competitiveness of Netherlands will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

Netherlands has weak competitiveness in General Artificial Intelligence (0.10) , Intelligent Agent (0.09) , Emotional Intelligence (0.08) , Social Intelligence (0.09) .

Technological gap

Based on the above table, the technological gap between Netherlands and top-tier technology countries will be examined below.

In General Artificial Intelligence technology, Netherlands is 9 years behind China.

In Intelligent Agent technology, Netherlands is 9.1 years behind U.S.A.

In Emotional Intelligence technology, Netherlands is 9.1 years behind China.

In Social Intelligence technology, Netherlands is 9.1 years behind China.

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of France in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	FR	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 2.45%	★ 0.84%	★ -2.50%	High (0.10)	-9.0	US
		Machine Learning						

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 2.45 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is at an average annual rate of 0.84%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is growing at an average annual rate of 1.30%, and Inference & Knowledge Representation technology is falling -2.50%.

Technological development capability

Based on the above table, the technological competitiveness of France will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

France has weak competitiveness in Machine Learning (0.10) , Inference & Knowledge Representation (0.10) .

Technological gap

Based on the above table, the technological gap between France and top-tier technology countries will be examined below.

In Machine Learning technology, France is 9 years behind U.S.A.

In Inference & Knowledge Representation technology, France is 9 years behind U.S.A.

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of Canada in Artificial Intelligence technology.

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	CA	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation		★	★ 5.66%	High (0.24)	-7.6	US
		Machine Learning	4.80%	★ 6.64%	★ 1.54%	High (0.11)	-8.9	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 4.80 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 6.64%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is growing at an average annual rate of 1.54%, and Inference & Knowledge Representation technology is growing 5.66%.

Technological development capability

Based on the above table, the technological competitiveness of Canada will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

Canada has weak competitiveness in Machine Learning (0.11) , Inference & Knowledge Representation (0.24) .

Technological gap

Based on the above table, the technological gap between Canada and top-tier technology countries will be examined below.

In Machine Learning technology, Canada is 8.9 years behind U.S.A.

In Inference & Knowledge Representation technology, Canada is 7.6 years behind U.S.A.

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of Britain in Artificial Intelligence technology.

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	GB	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation		★ 3.34%	★ 1.17%	High (0.10)	-8.9	US
		Machine Learning	★ 4.76%	★ 1.76%	High (0.11)	-8.8	US	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 3.34 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 4.76%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is growing at an average annual rate of 1.17%, and Machine Learning technology is growing 1.76%.

Technological development capability

Based on the above table, the technological competitiveness of Britain will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

Britain has weak competitiveness in Inference & Knowledge Representation (0.10) , Machine Learning (0.11) .

Technological gap

Based on the above table, the technological gap between Britain and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, Britain is 8.9 years behind U.S.A.

In Machine Learning technology, Britain is 8.8 years behind U.S.A.

Germany

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of Germany in Artificial Intelligence technology.

Technology Category			Trend			Diagnostic	Technical gap	
LC	MC	SC	LC	MC	SC	DE	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★	★	★ -2.10%	High (0.14)	-8.6	US
		Machine Learning		0.32%	★ 2.65%	High (0.14)	-8.6	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is falling at an annual average rate of -2.52 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is at an average annual rate of 0.32%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is falling at an average annual rate of -2.10%, and Machine Learning technology is growing 2.65%.

Technological development capability

Based on the above table, the technological competitiveness of Germany will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

Germany has weak competitiveness in Inference & Knowledge Representation (0.14) , Machine Learning (0.14) .

Technological gap

Based on the above table, the technological gap between Germany and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, Germany is 8.6 years behind U.S.A.
In Machine Learning technology, Germany is 8.6 years behind U.S.A.

Switzerland

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of Switzerland in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low								
Technology Category			Trend		Diagnostic	Technical gap		
LC	MC	SC	LC	MC	SC	CH	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 1.29%	★ 2.07%	★ 1.02%	High (0.10)	-9.0	US
		Machine Learning			★ 0.38%	High (0.09)	-9.1	US

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 1.29 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 2.07%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is growing at an average annual rate of 1.02%, and Machine Learning technology is 0.38%.

Technological development capability

Based on the above table, the technological competitiveness of Switzerland will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

Switzerland has weak competitiveness in Inference & Knowledge Representation (0.10) , Machine Learning (0.09) .

Technological gap

Based on the above table, the technological gap between Switzerland and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, Switzerland is 9 years behind U.S.A.
In Machine Learning technology, Switzerland is 9.1 years behind U.S.A.

2) Company diagnostic solutions

Microsoft Corp

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of MICROSOFT CORP in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	MICROSOFT ...	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 11.04%	★ 12.17%	★ 10.28%	High (0.56)	-3.4	IBM	
		Machine Learning			★ 10.88%	High (0.63)	0.0	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 11.04 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 12.17%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is growing at an average annual rate of 10.88%, and Inference & Knowledge Representation technology is growing 10.28%.

Technological development capability

Based on the above table, the technological competitiveness of MICROSOFT CORP will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

MICROSOFT CORP has strong competitiveness in Machine Learning (0.63) , Inference & Knowledge Representation (0.56) .

Technological gap

Based on the above table, the technological gap between MICROSOFT CORP and top-tier technology countries will be examined below.

In Machine Learning technology, MICROSOFT CORP has the highest technology development

capability.

In Inference & Knowledge Representation technology, MICROSOFT CORP is 3.4 years behind IBM.

Microsoft Technology Licensing LLC

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of MICROSOFT TECHNOLOGY LICENSING LLC in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	MICROSOFT ...	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★	★	★ 2.86%	High (0.15)	-7.6	IBM	
		Machine Learning	★ 14.95%	10.74%	★ 5.45%	High (0.25)	-3.9	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 14.95 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 10.74%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is growing at an average annual rate of 2.86%, and Machine Learning technology is growing 5.45%.

Technological development capability

Based on the above table, the technological competitiveness of MICROSOFT TECHNOLOGY LICENSING LLC will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

MICROSOFT TECHNOLOGY LICENSING LLC has weak competitiveness in Inference & Knowledge Representation (0.15) , Machine Learning (0.25) .

Technological gap

Based on the above table, the technological gap between MICROSOFT TECHNOLOGY LICENSING LLC and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, MICROSOFT TECHNOLOGY LICENSING LLC

is 7.6 years behind IBM.

In Machine Learning technology, MICROSOFT TECHNOLOGY LICENSING LLC is 3.9 years behind MICROSOFT CORP.

..... IBM

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of IBM in Artificial Intelligence technology.

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	IBM	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation		★ 0.95%	★ 5.33%	High (0.91)	0.0	IBM	
		Machine Learning	★ 2.00%	★ 10.38%	High (0.62)	-0.1	IBM	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 2.00 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 0.95%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is growing at an average annual rate of 5.33%, and Machine Learning technology is growing 10.38%.

Technological development capability

Based on the above table, the technological competitiveness of IBM will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness.

The number in parentheses represents the diagnostic score.

IBM has strong competitiveness in Inference & Knowledge Representation (0.91) , Machine Learning (0.62) .

Technological gap

Based on the above table, the technological gap between IBM and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, IBM has the highest technology development capability.

In Machine Learning technology, IBM is 0.1 years behind MICROSOFT CORP.

Google Inc

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of GOOGLE INC in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score	Technical gap	
LC	MC	SC	LC	MC	SC	GOOGLE INC	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★	★	★ 0.00%	Low (0.00)	-10 ↓	IBM
		Machine Learning	15.00%	11.57%	★ 6.01%	High (0.28)	-3.5	MICROSOFT ...

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 15.00 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 11.57%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is growing at an average annual rate of 6.01%.

Technological development capability

Based on the above table, the technological competitiveness of GOOGLE INC will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

GOOGLE INC has weak competitiveness in Machine Learning (0.28) .

Technological gap

Based on the above table, the technological gap between GOOGLE INC and top-tier technology countries will be examined below.

In Machine Learning technology, GOOGLE INC is 3.5 years behind MICROSOFT CORP.

Fanuc Corp

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of FANUC CORP in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	FANUC CORP	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★	★	★ 0.00%	Low (0.00)	-10↓	IBM	
		Machine Learning	13.44%	14.08%	★ 8.69%	High (0.43)	-2.0	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 13.44 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 14.08%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is growing at an average annual rate of 8.69%.

Technological development capability

Based on the above table, the technological competitiveness of FANUC CORP will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

FANUC CORP has strong competitiveness in Machine Learning (0.43) .

Technological gap

Based on the above table, the technological gap between FANUC CORP and top-tier technology countries will be examined below.

In Machine Learning technology, FANUC CORP is 2 years behind MICROSOFT CORP.

Samsung Electronics Co Ltd

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of SAMSUNG ELECTRONICS CO LTD in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	SAMSUNG	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 9.76%	★ 2.65%	★ 0.00%	Low (0.00)	-10↓	IBM	
		Machine Learning			★ -8.20%	High (0.13)	-5.1	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 9.76 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 2.65%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is falling at an average annual rate of -8.20%.

Technological development capability

Based on the above table, the technological competitiveness of SAMSUNG ELECTRONICS CO LTD will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

SAMSUNG ELECTRONICS CO LTD has weak competitiveness in Machine Learning (0.13) .

Technological gap

Based on the above table, the technological gap between SAMSUNG ELECTRONICS CO LTD and top-tier technology countries will be examined below.

In Machine Learning technology, SAMSUNG ELECTRONICS CO LTD is 5.1 years behind MICROSOFT CORP.

Corp

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of INTEL CORP in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	INTEL CORP	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★	★	★	High (0.05)	-8.6	IBM	
		Machine Learning	6.87%	7.42%	-2.46% 3.43%	High (0.16)	-4.7	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 6.87 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is growing at an average annual rate of 7.42%.

Regarding Small Category (SC) technologies, R & D activity of Inference & Knowledge Representation technology is falling at an average annual rate of -2.46%, and Machine Learning technology is growing 3.43%.

Technological development capability

Based on the above table, the technological competitiveness of INTEL CORP will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

INTEL CORP has weak competitiveness in Inference & Knowledge Representation (0.05) , Machine Learning (0.16) .

Technological gap

Based on the above table, the technological gap between INTEL CORP and top-tier technology countries will be examined below.

In Inference & Knowledge Representation technology, INTEL CORP is 8.6 years behind IBM.
In Machine Learning technology, INTEL CORP is 4.7 years behind MICROSOFT CORP.

Qualcomm Inc

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of QUALCOMM INC in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score	Technical gap	
LC	MC	SC	LC	MC	SC	QUALCOMM	Year	Top
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 5.78%	★ -0.50%	★ 0.00% -1.59%	Low (0.00) High (0.06)	-10 ↓	IBM MICROSOFT ...
		Machine Learning						

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 5.78 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is at an average annual rate of -0.50%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is falling at an average annual rate of -1.59%.

Technological development capability

Based on the above table, the technological competitiveness of QUALCOMM INC will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

QUALCOMM INC has weak competitiveness in Machine Learning (0.06) .

Technological gap

Based on the above table, the technological gap between QUALCOMM INC and top-tier technology countries will be examined below.

In Machine Learning technology, QUALCOMM INC is 5.8 years behind MICROSOFT CORP.

Stradvision Inc

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of STRADVISION INC in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	STRADVISION	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★ 4.24%	★ -1.79%	★ 0.00%	Low (0.00)	-10 ↓	IBM	
		Machine Learning	★ 4.24%	★ -1.79%	★ -3.43%	High (0.04)	-5.9	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is growing at an annual average rate of 4.24 %.

Regarding Middle Category (MC) technologies, R & D activity of Learning Intelligence technology is falling at an average annual rate of -1.79%.

Regarding Small Category (SC) technologies, R & D activity of Machine Learning technology is falling at an average annual rate of -3.43%.

Technological development capability

Based on the above table, the technological competitiveness of STRADVISION INC will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

STRADVISION INC has weak competitiveness in Machine Learning (0.04) .

Technological gap

Based on the above table, the technological gap between STRADVISION INC and top-tier technology countries will be examined below.

In Machine Learning technology, STRADVISION INC is 5.9 years behind MICROSOFT CORP.

Sony Corporation

Diagnostic solution diagnoses global using technology trends, technology diagnosis, and technology prediction results. The table below shows the results of a comprehensive diagnosis of SONY CORPORATION in Artificial Intelligence technology.

★ Annual average growth rate(+) / ★ Annual average growth rate(-) / Competitiveness High / Competitiveness Low

Technology Category			Trend			Diagnostic Score		Technical gap	
LC	MC	SC	LC	MC	SC	SONY	Year	Top	
Artificial Intelligence	Learning Intelligence	Inference & Knowledge Representation	★	★	★ 0.00%	Low (0.00)	-10↓	IBM	
		Machine Learning	★ -3.00%	★ 0.00%	★ 0.00%	Low (0.00)	-10↓	MICROSOFT ...	

Technological Trend

Mega Trends of Artificial Intelligence technology will be examined based on table above.

Regarding Large Category (LC) technology, research and development activity of Artificial Intelligence technology is falling at an annual average rate of -3.00 %.

Technological development capability

Based on the above table, the technological competitiveness of SONY CORPORATION will be examined through the diagnostic score. If the diagnostic score is 0.4 or higher, it considers that global have strong technical competitiveness. The number in parentheses represents the diagnostic score.

Technological gap

Based on the above table, the technological gap between SONY CORPORATION and top-tier technology countries will be examined below.



Web : <http://amur.zone>

E-mail : amur@amur.zone

