

KIST

KISTI TECHNOLOGY OPPORTUNITY DISCOVERY

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KISTI

KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY INFORMATION

▶ Our mission

- ▶ Advancement of Science & Technology Information Portal Service
 - ▶ Information services for creating customer values
- ▶ Promotion of Technology Commercialization
 - ▶ Tailored S&T Information Analysis and Consultation Services for Technology Commercialization
- ▶ Advancement of Supercomputing Infrastructure

▶ Since 1962

▶ 590 Employees



QUESTIONS

- ▶ How to find out new items / opportunities for a new project, a new business?

Does **Google** give answers?

But, how to read



and recognize the necessary information?

INTRODUCTION OF THE TOD PROJECT

▶ Technology Opportunity Discovery is...

- ▶ Service to detect and provide opportunities for the new technologies.
- ▶ TOD uses the patterns of recombination in the knowledge space.

“Analysts of innovation and technological progress have long argued that the process of **innovation** is one that critically relies on the **recombination of existing ideas and artifacts**.”

Dr. Lee Fleming (Harvard University)
Recombinant Uncertainty in Technological Search, 2001

“The broadening availability of vast amounts of data in general and research data in particular are creating new challenges for research organizations in the areas of research data management, curation, long-term preservation, discovery, and access.”

Dr. Alex D. Wade (Microsoft Research)
ICSTI Odaiba, 2014

TOD ARCHITECTURE

Industrial Trend
Analysis

Business Partners
or Competitors
Analysis

Opportunity
Suggestion

Attractiveness
Mapping

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INTRODUCTION OF THE TOD PROJECT

- ▶ Assumptions
 - ▶ Target technologies would be related with such products and they would be appeared in the same documents frequently.
 - ▶ All the products aim to trade, so they need to assign trademarks.
 - ▶ Patent is the best resources than others.

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WHY PATENTS?

“Over 6,000,000 patents have been recorded in the United States Patent and Trademark Office (USPTO) since 1976, and an average of 150,000 patents are steadily being issued every year. Almost 80% of technological information can be found in patent publications.”

“Patents are also applied across various fields, covering inventors and applicants from a wide scope such as ...”

Dr. Changyong Lee (UNIST)
Technological Forecasting & Social Change 2011

WHAT INFORMATION?

▶ US 20090277702 A1: Claim

A **hybrid vehicle** having an internal combustion engine and an electric motor mounted as power sources, comprising:

a **rechargeable electric storage** supplying electric power to said electric motor;

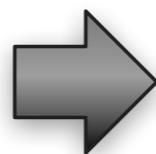
an **electric power generating device** generating electric power using an output of said internal combustion engine and supplying the generated electric power to said electric storage;

an **electric power input unit** receiving electric power applied from the outside of the vehicle for charging said electric storage;

...



hybrid vehicle



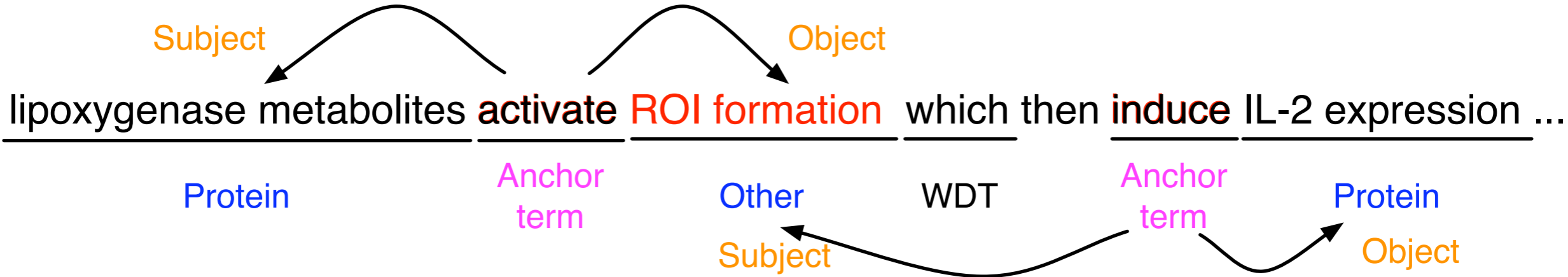
rechargeable electric storage

electric power generating device

electric power input unit

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HOW TO EXTRACT INFORMATIONS? NATURAL LANGUAGE PROCESSING



Candidate Relation 1		Metadata
Effect	Activate	
Entity 1	Lipoxygenase metabolites	UNIPROT: O75342
Entity 2	ROI formation	Reactive Oxygen Intermediates
Candidate Relation 2		Metadata
Effect	Induce	
Entity 1	ROI formation	Reactive Oxygen Intermediates
Entity 2	IL-2 expression	UNIPROT: P60568



TOD ARCHITECTURE



TARGET SOURCES

- ▶ United State Patent and Trademark Office (USPTO)
 - ▶ 1993 ~ 2014 (3,799,190 Patents)
 - ▶ IPC code : A, B, C, D, E, F, G, H
 - ▶ Title, Abstract, Background, Summary, Description of drawing, Claims

Code	Description	#Patents
A	Human Necessities	626,402
B	Performing Operations;Transporting	655,772
C	Chemistry; Metallurgy	339,189
D	Textiles; Paper	28,888
E	Fixed Constructions	82,498
F	Mechanical Engineering; Lighting; Heating; Weapons; Blasting	244,917
G	Physics	1,034,492
H	Electricity	787,032

STATISTICS

# Patents	3,799,190
# Sentences	120,325,653
# Products	101,338,539
# Unique Products	231,438
# Supply chains between Products	1,700,228

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1. Technology-based Opportunity Products Navigation
2. Competitors Benchmarking
3. Product-Technology Relation Analysis

PRODUCT SEARCH

▶ Indexes

- ▶ Number of Patents
- ▶ Korean's Market Share in the world
- ▶ Firm Monopolization (Herfindahl-Hirschman index) : How many competitors
- ▶ Ripple index : How many products use the selected product as a part
- ▶ Complexity index : How many products do the selected product uses
- ▶ Emerging index based on Patent statistics
- ▶ K-index (KISTI index) : Combination of the above indexes

▶ Advanced information

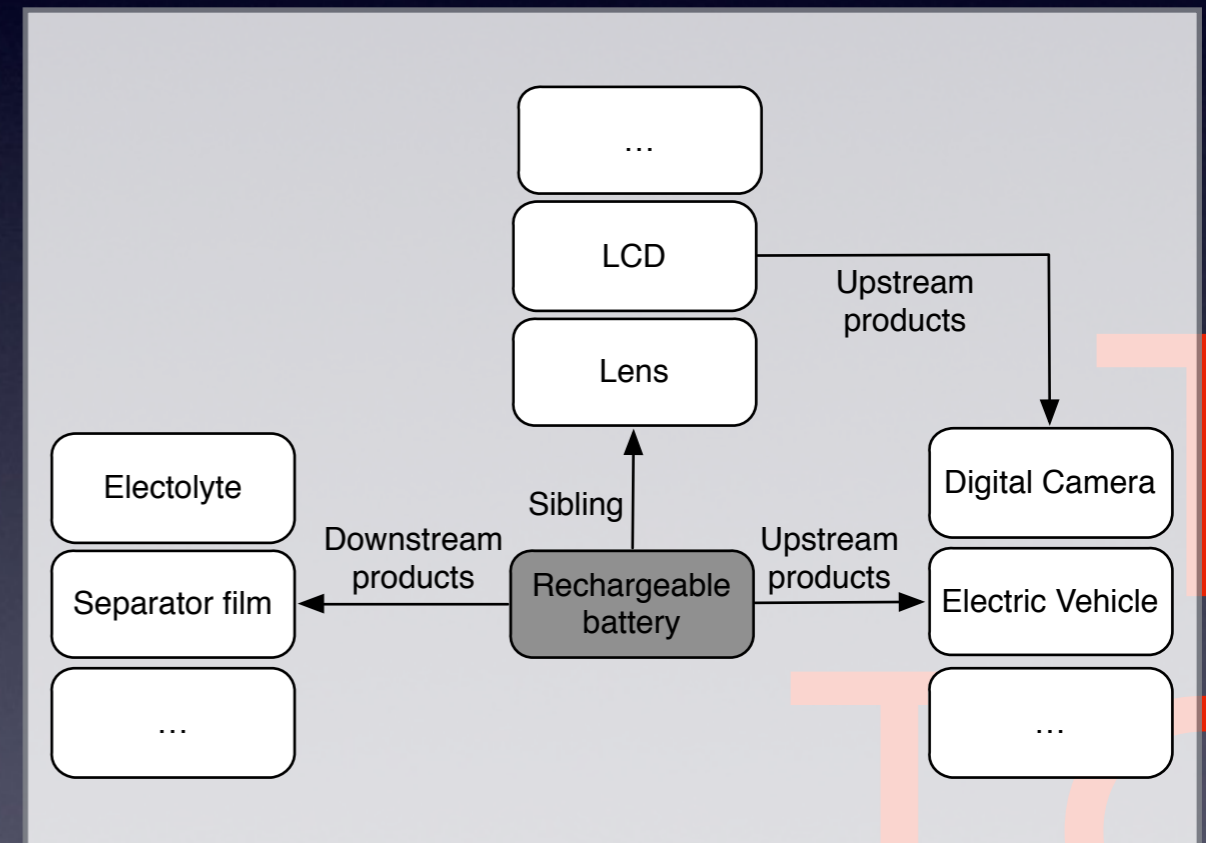
- ▶ Product overview
- ▶ Related patents
- ▶ Morphological similar products

No.	Products	K-Index	특허수	국내특허수
1	RECHARGEABLE BATTERY	88.25	1,983	9.
2	BATTERY	86.84	20,177	4.
3	BATTERY CELL	74.36	1,186	15.
4	LITHIUM SECONDARY BATTERY	64.83	787	34.
5	RECHARGEABLE LITHIUM BATTERY	64.51	268	52.
6	LITHIUM BATTERY	62.99	505	28.
7	ALKALINE BATTERY	61.90	134	0.
8	LITHIUM ION BATTERY	58.67	272	5.
9	STORAGE BATTERY	55.28	565	1.
10	FUEL BATTERY	54.02	41	2.

OPPORTUNITY SEARCH

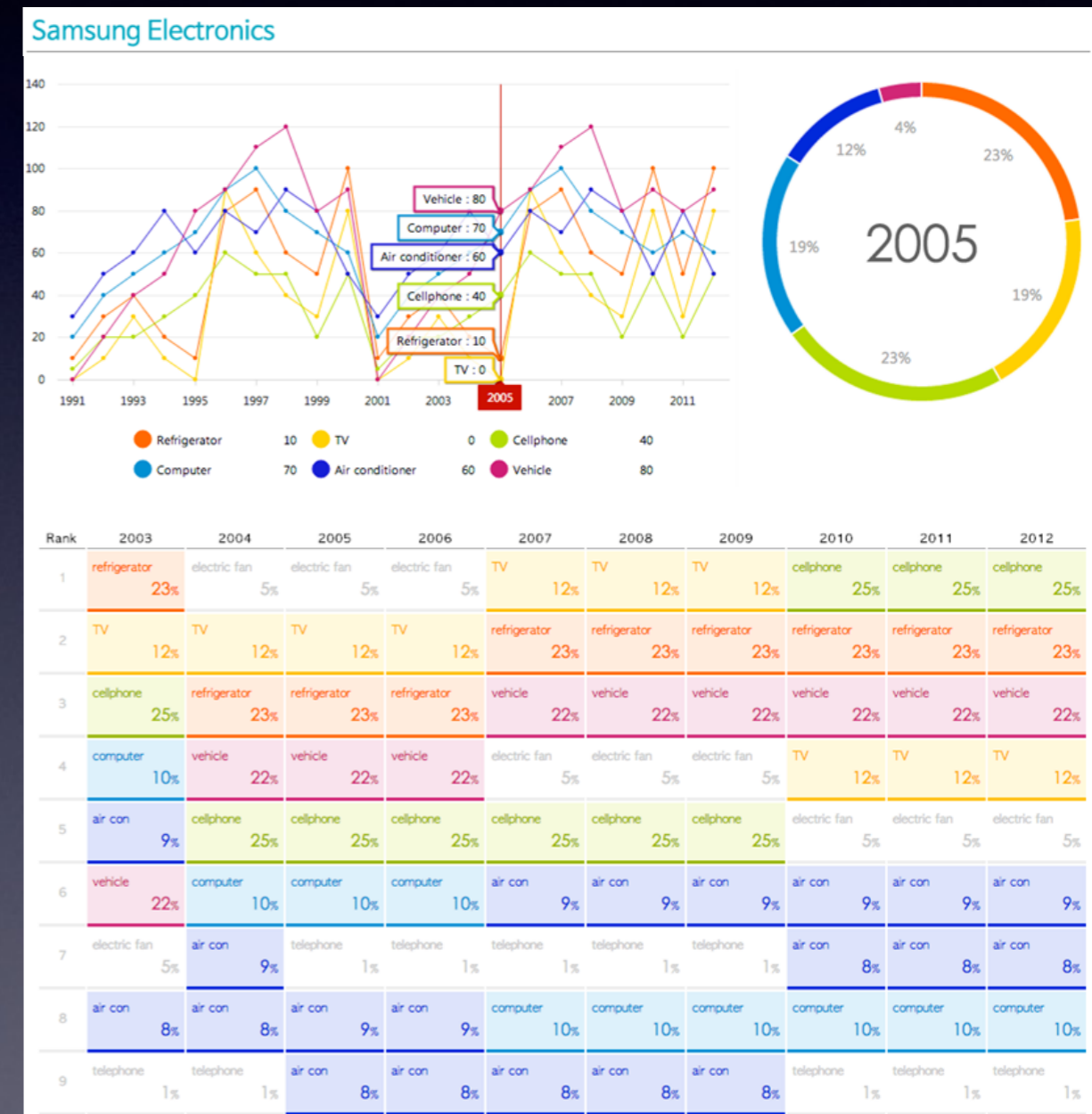
▶ Opportunities (in)

- ▶ Co-occurring product search
- ▶ Patents that refer patents of the selected product
- ▶ Upstream Search (Result products use the selected product as a part)
- ▶ Downstream search (Result products are parts of the selected product)
- ▶ Siblings search that have the same upstream products
- ▶ Siblings search that have the same downstream products
- ▶ Whose assignee distribution is similar to those of the selected product
- ▶ Assignees' next item search



PORTFOLIO ANALYSIS

- ▶ Portfolio setting using products in “My technologies”
- ▶ Selection of similar assignees based on their patents and products probability
- ▶ Navigation of holding products and portfolios of the selected assignees



ATTRACTIVENESS MAPPING

▶ Similarities

▶ Assignees

▶ IPC

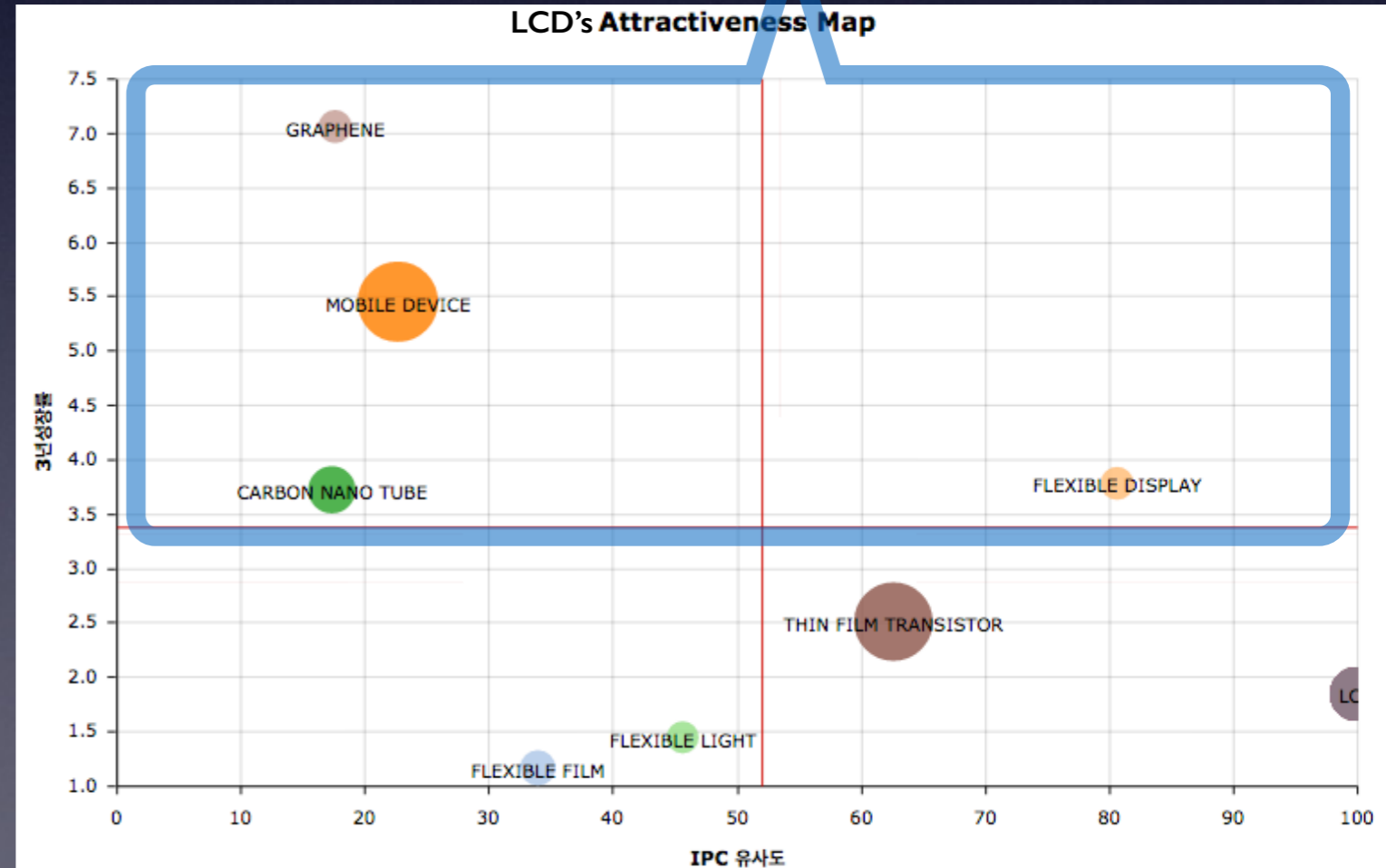
▶ Upstream and downstream products

▶ Promisingness

▶ Growth rate

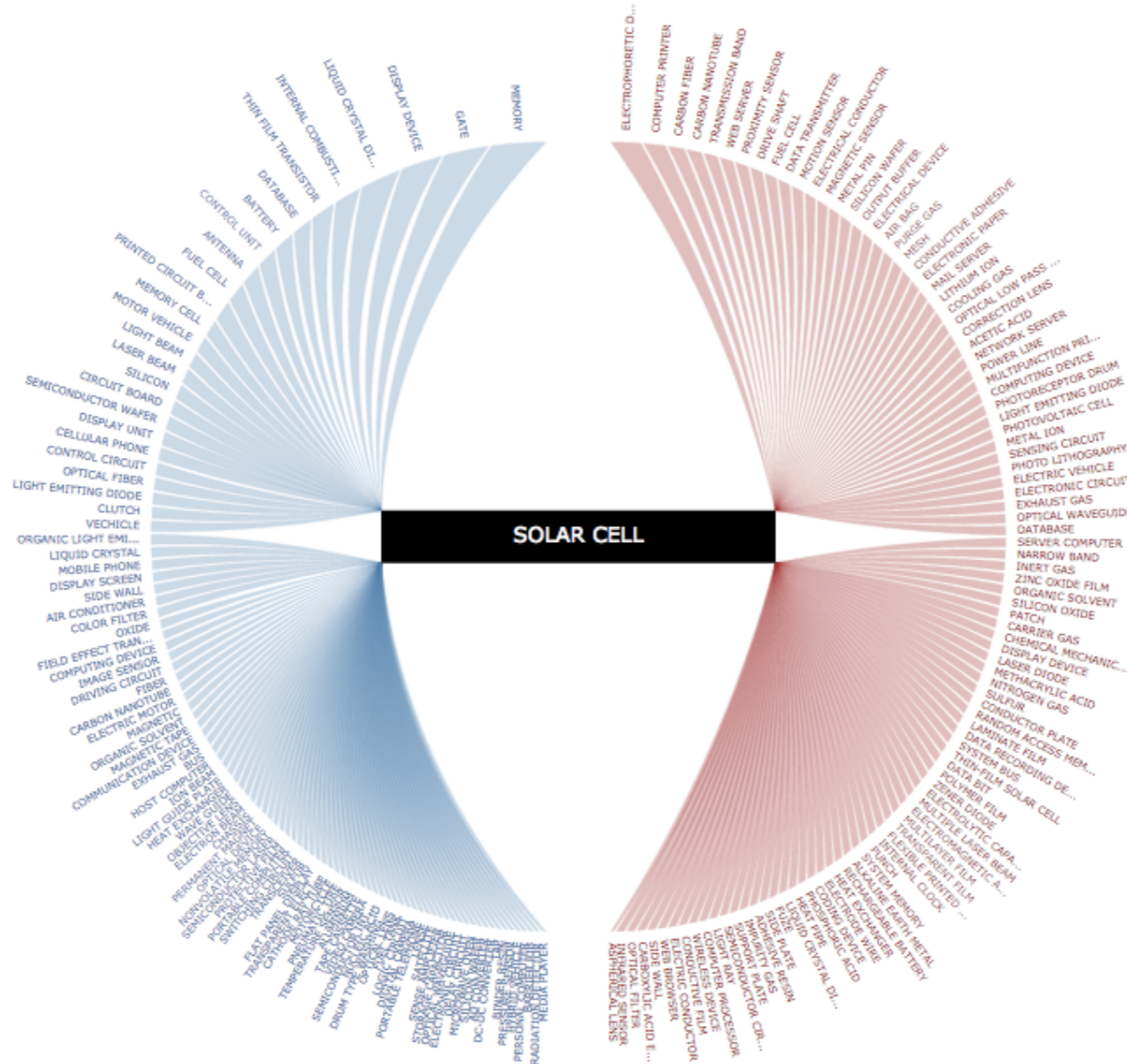
▶ Mean year value

How about these items for your next items???



DEMO

SOLAR CELL 제품의 제품천이관계에 대한 상세정보입니다.



관련 기업	SOLAR CELL 최초 출원 연도	LIQUID CRYSTAL DISPLAY 최초출원연도
APPLE	2011	2012
BAYER AKTIEN GESELLSCHAFT	1994	2002
COMMISSARIA T A L'ENERGIE ATOMIQUE	2008	2014
DONGJIN SEMIHEM CO.,	2012	2013
DUKE UNIVERSITY	2000	2001
E.I. DU PONT DE NEMOURS AND	2009	2013
KANEKA	2001	2002
KOLON INDUSTRIES,	2011	2012
MITSUBISHI DENKI	1993	1994
MURATA MANUFACTURING CO	1997	2001
OKI ELECTRIC INDUSTRY CO.,	2002	2003
SHOWA DENKO K.K.	2007	2010
TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY,	2011	2012
TEXAS INSTRUMENTS INCORPORATED	1993	1998
ULVAC,	2012	2013

CONCLUSION

- ▶ To find out new items / opportunities for a new project or business,

A **KISTI's Technology Opportunity Discovery**
can help to obtain answers.

QUESTIONS AND ANSWERS



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