Patent Visualization

— Strategies in Electronics and Software Fields —
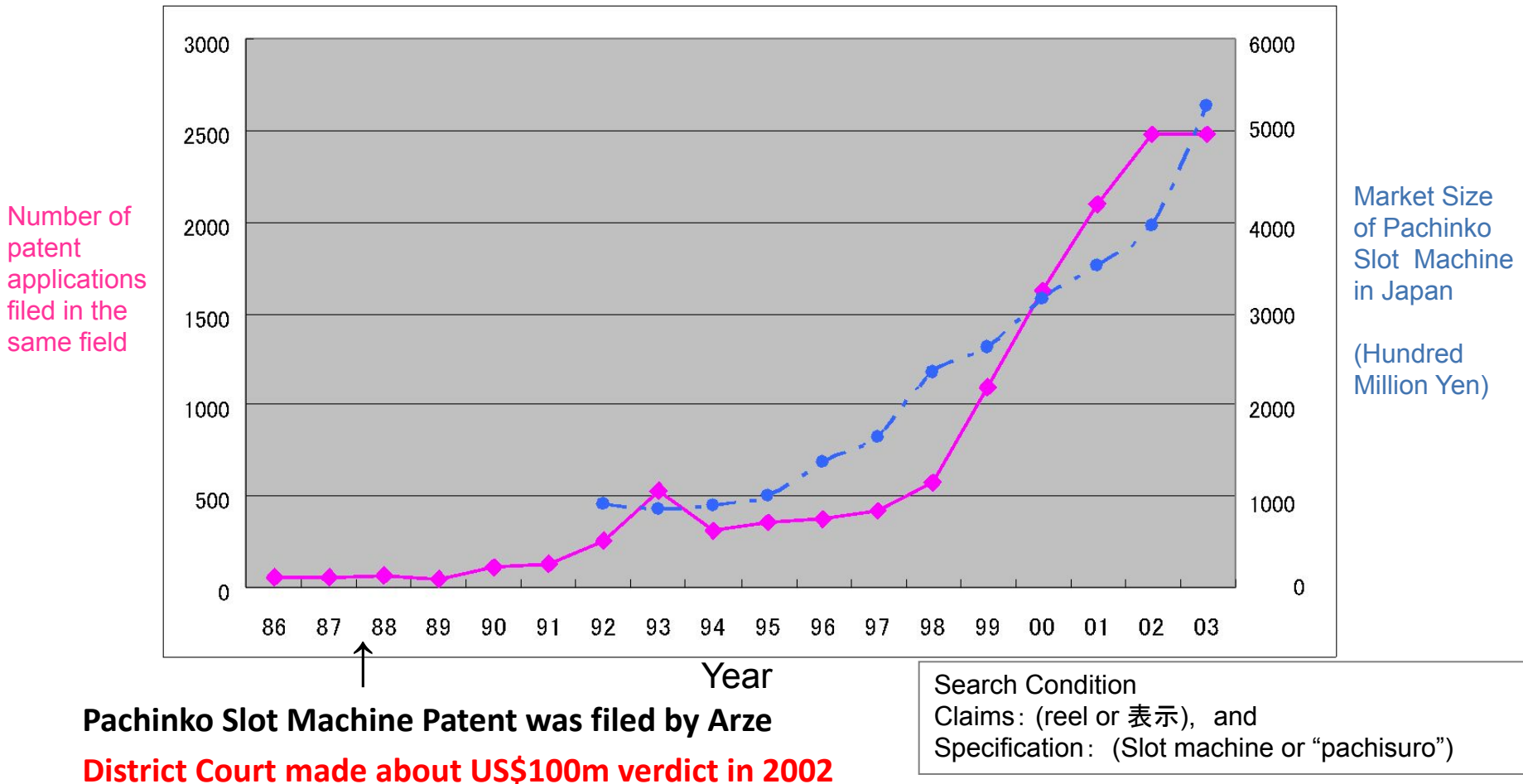
·RYUKA·
with Free Vision

Feb. 7, 2024

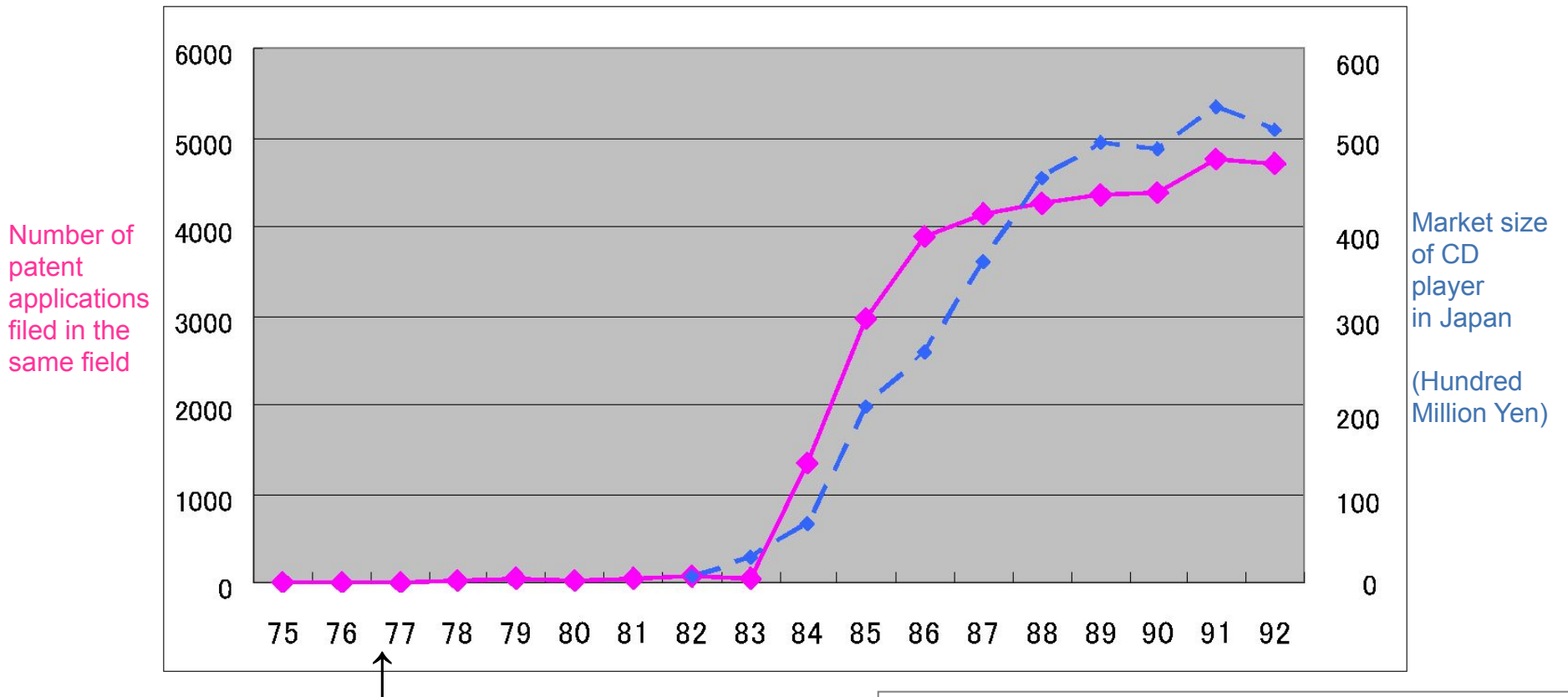# Agenda：Patent Visualization

1. Filing dates of the inventions that later became top-value

2. Overview of Patent Visualization

3. Filing dates of top-value US Patents

4. Overall processes of Patent Visualization

Filing dates of the patents that later became top-value

Inventions Ahead of Market Bring Large Profit

Number of patent applications filed in the same field

Market Size of Pachinko Slot Machine in Japan

(Hundred Million Yen)

Year

Pachinko Slot Machine Patent was filed by Arze

District Court made about US$100m verdict in 2002

Search Condition
Claims： (reel or 表示)， and
Specification： (Slot machine or "pachisuro")

Inventions Ahead of Market
Bring Large Profit

Number of patent applications filed in the same field

Market size of CD player in Japan

(Hundred Million Yen)

Optical Pickup Patent of Hitachi was filed
District Court made about US$2m verdict in 2006

Search condition:
Claims： (beam or laser or light) and (medium or disk) and
Specification： (CD or disk)

Patent Visualization
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JP patents in the electronics and software fields for which a verdict of >JPY100 million was reached by a Court

	Plantiff	Defendant	Invention	District Court	High Court
1	Shuji Nakamura	Nichia	Blue Diode	JPY20,000m	JPY840m (Arbitrated)
2	Arze	Sammy & Net	Slot Machine	JPY7,400m	Found invalid
3	Toshiba Tech.	Family Inc.	Massage Chair	JPY1,500m	JPY 11m
4	Hitachi	IHI	Steel Plate Winding System	JPY430m	－－
5	Seiji Yonezawa (Compensation)	Hitachi	Optical Pickup	JPY 35m	JPY160m
6	Nichia	Toyoda Gosei	Blue Diode Patent	JPY 100m	－－
7	Nichia	Toyoda Gosei	Blue Diode Utility Model	JPY 100m	－－
8	Fujitsu	Japan Nanya Technologies	DDR SDRAM	JPY 100m	－－

Blue Diode of Nichia

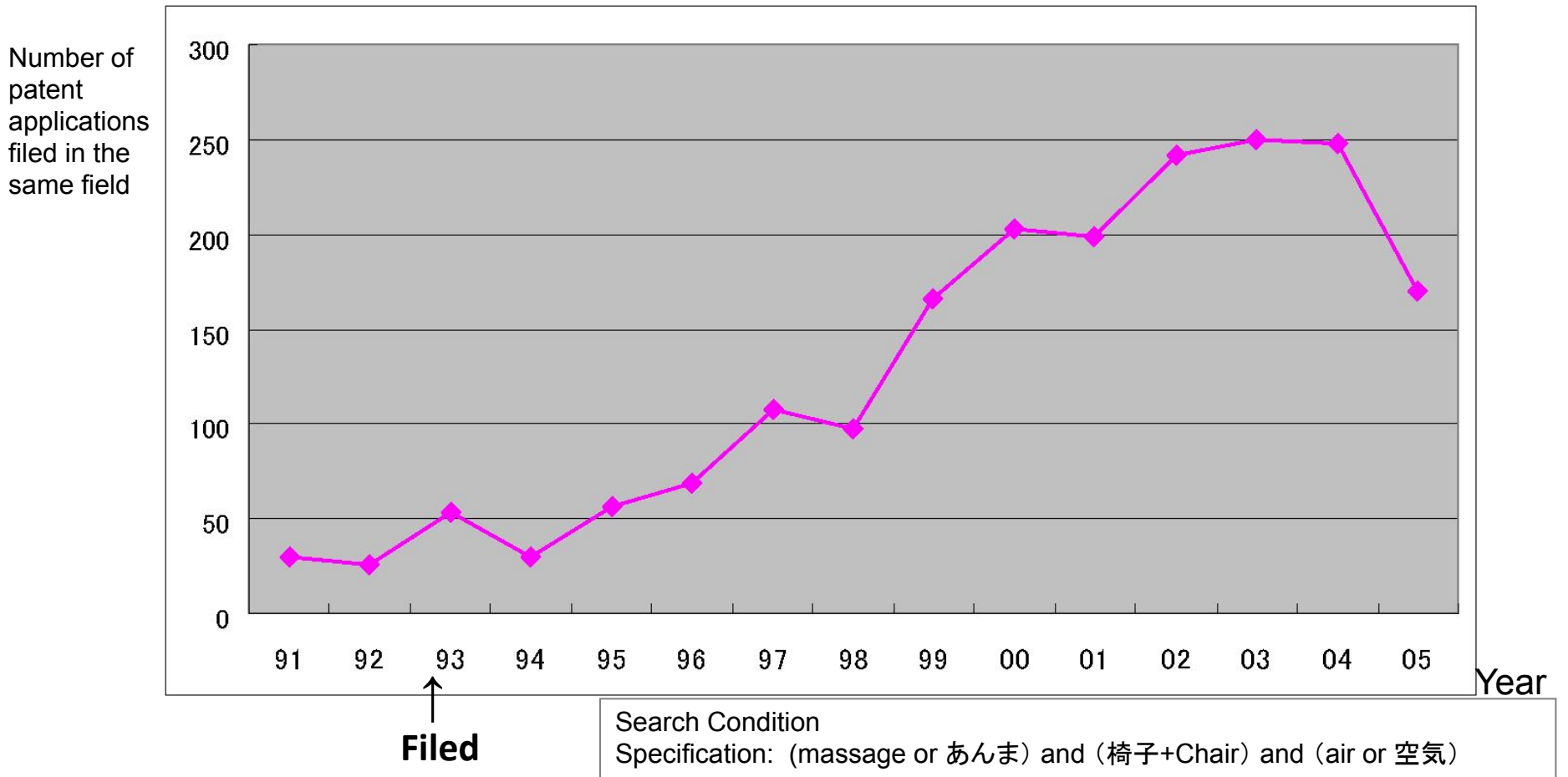Number of patent applications filed in the same field
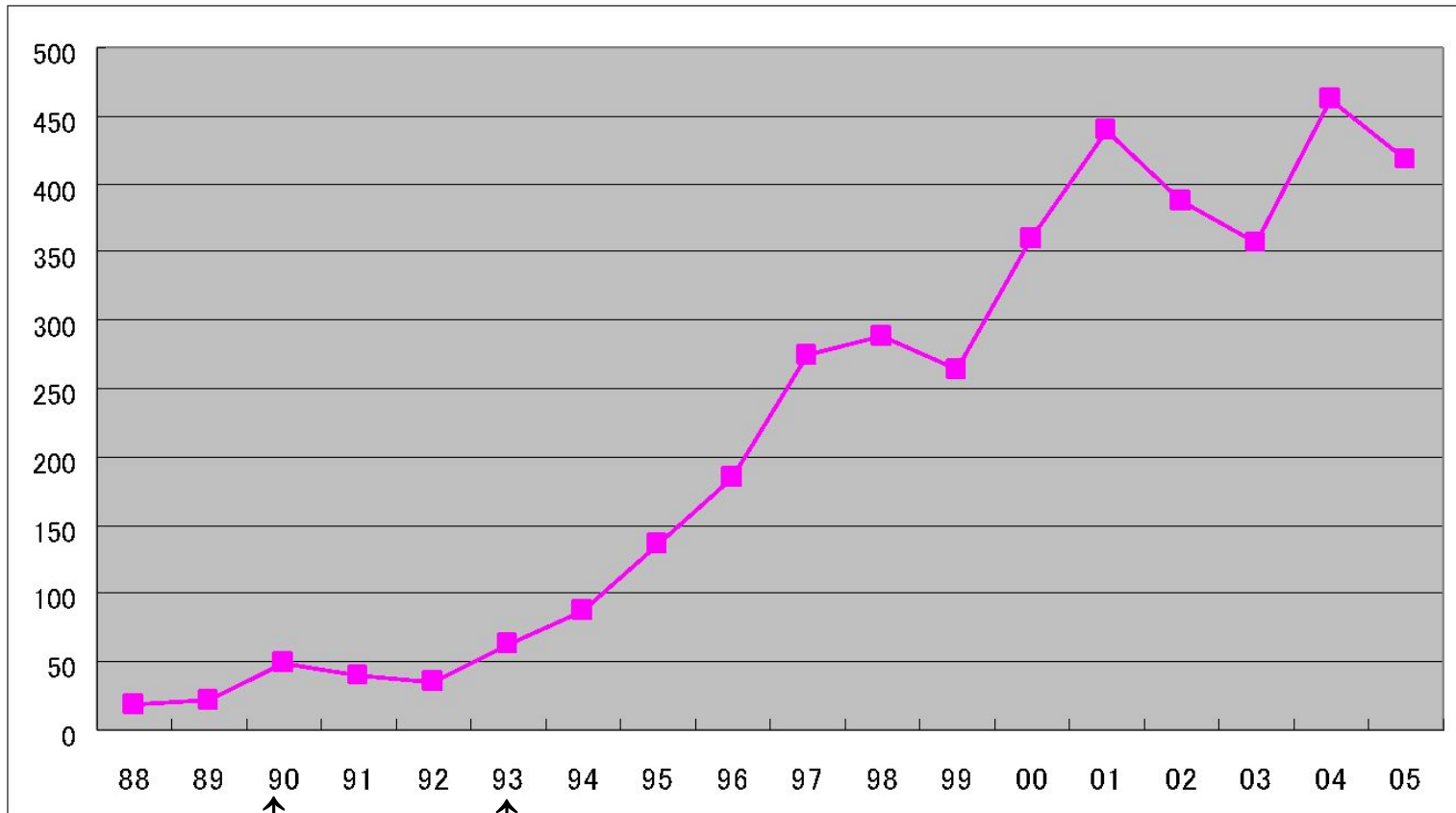
Year

Patent Filed

Utility Model Filed

Search Condition
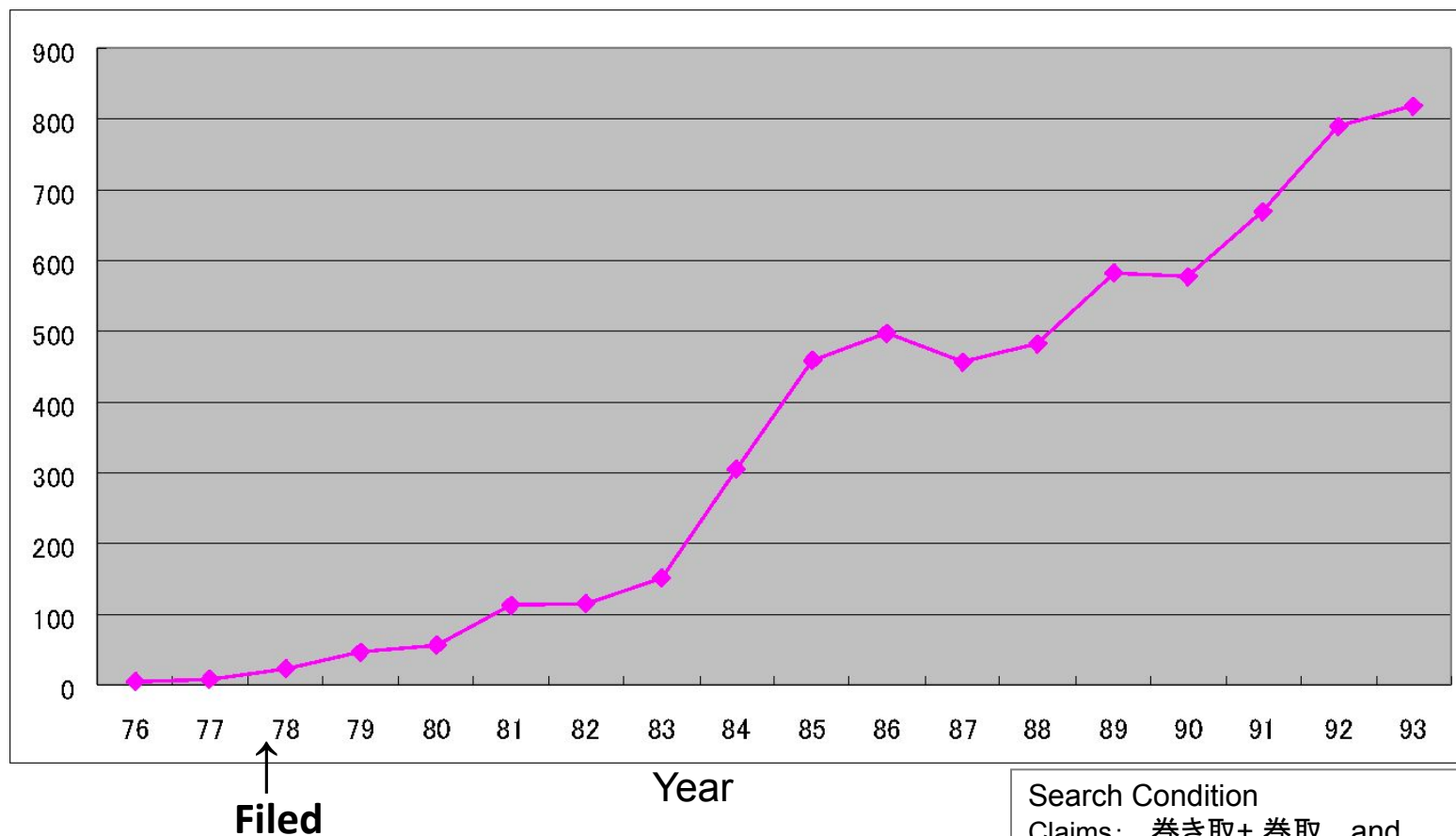Claims： (窒 or GaN) and （ガリウム or GaN）and
（Lazar and diode or LD and LED and 発光）

Massage Chair of Toshiba Tech.

Number of patent applications filed in the same field

Filed

Year

Search Condition
Specification: （massage or あんま）and （椅子+Chair）and （air or 空気）

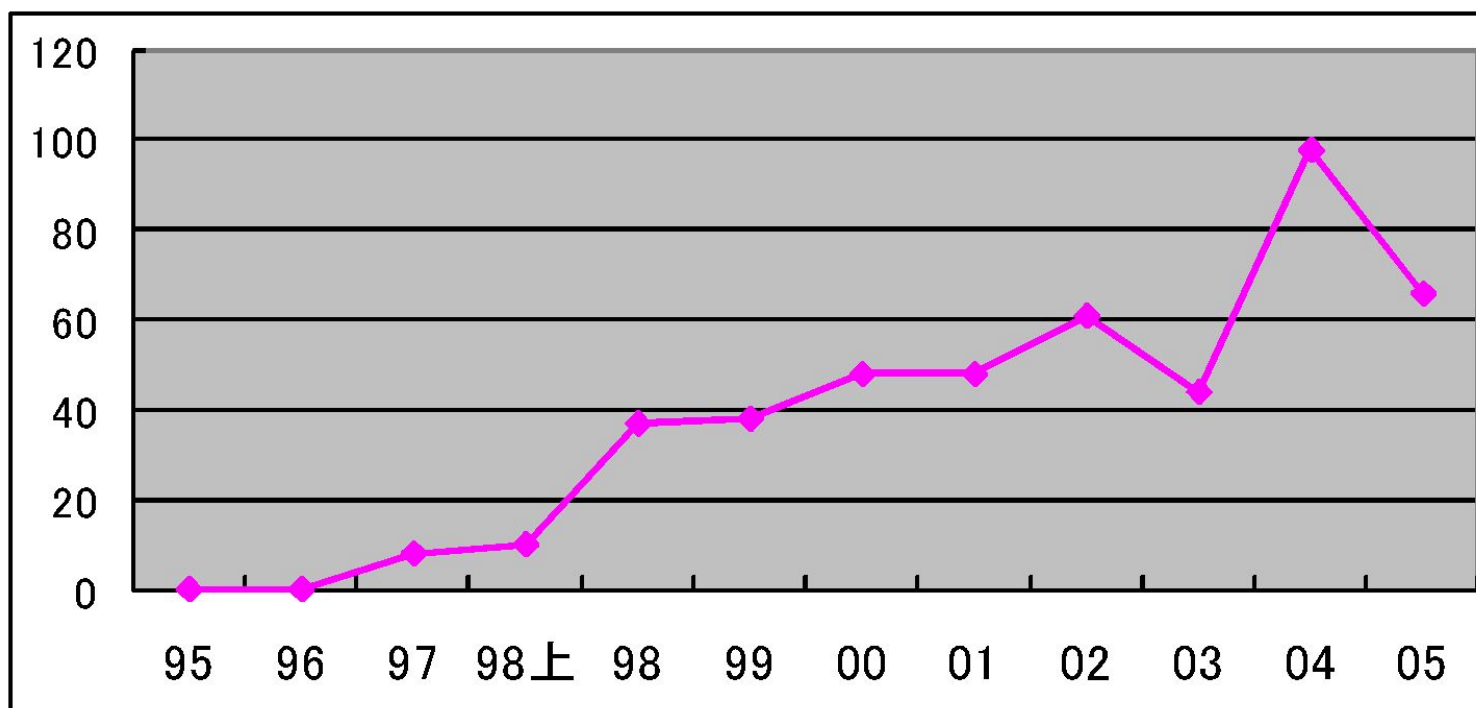# Steel Plate Winding System of Hitachi

Number of patent applications filed in the same field

Year

Filed

Search Condition
Claims： 巻き取+ 巻取　and
Specification： 鋼+ 板厚+ 厚物

DDR SDRAM Patent of Fujitsu

Number of patent applications filed in the same field

Filed

Year

Search Condition
Claims：（メモリ＋半導体＋記憶）＊（アドレス＋データ）and
Specification：　ダブルデータレート＋'double data rate '
「98上」shows double the number of applications filed in the first half of the year.
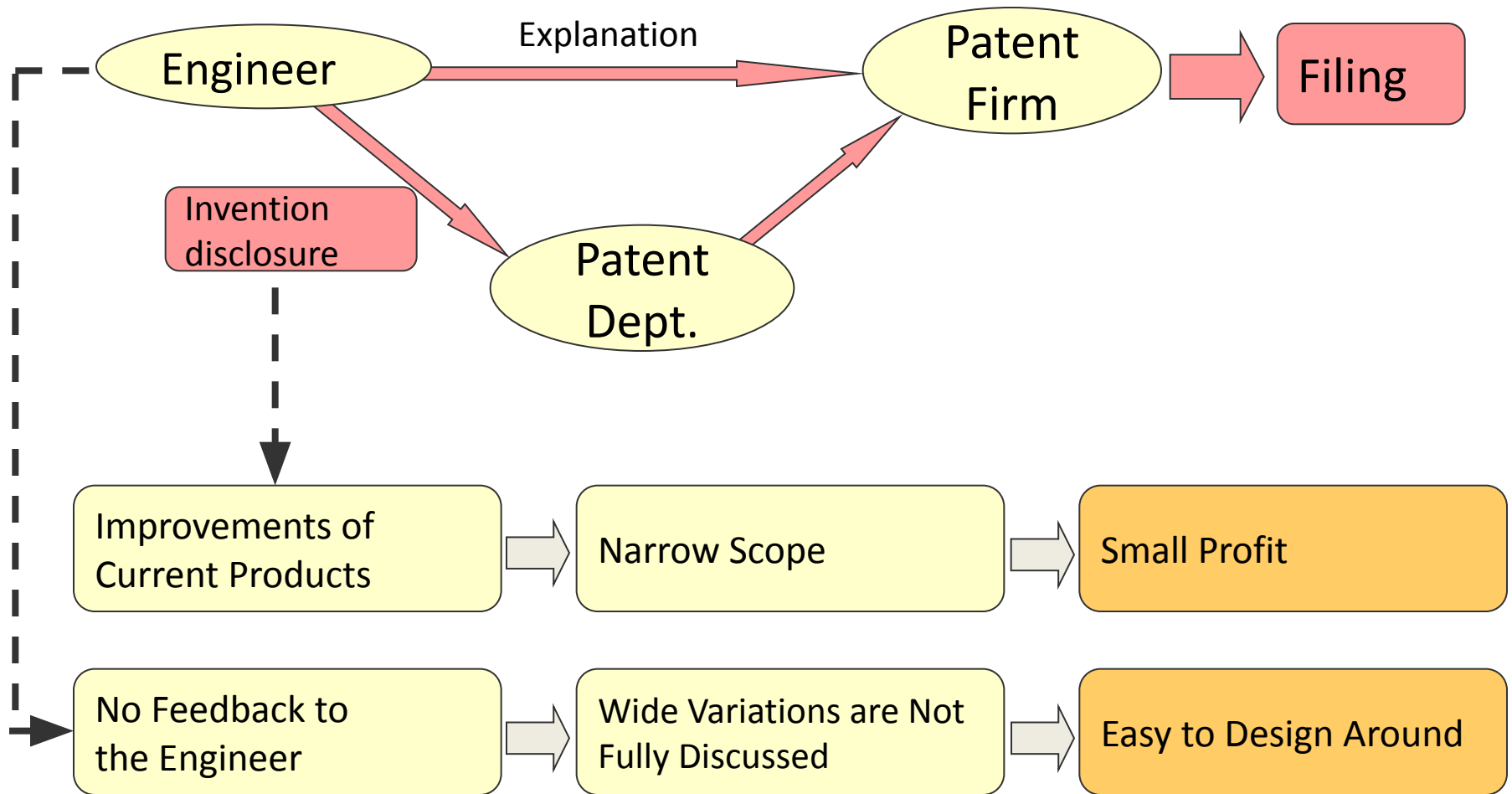
All JP patents in electronics and software fields with a verdict of >JPY100 million were filed in early stage.

	Plaintiff	Defendant	Invention	District Court	High Court
1	Shuji Nakamura	Nichia	Blue Diode	JPY20,000m	JPY840m （Arbitrated）
2	Arze	Sammy & Net	Slot Machine	JPY7,400m	Found invalid
3	Toshiba Tech.	Family	Massage Chair	JPY1,500m	JPY 11m
4	Hitachi	IHI	Steel Plate Winding System	JPY430m	――
5	Seiji Yonezawa （Compensation）	Hitachi	Optical Pickup	JPY 35m	JPY160m
6	Nichia	Toyoda Gosei	Blue Diode Patent	JPY 100m	――
7	Nichia	Toyoda Gosei	Blue Diode Utility Model	JPY 100m	――
8	Fujitsu	Japan Nanya Technologies	DDR SDRAM	JPY 100m	――

Overview of Patent Visualization
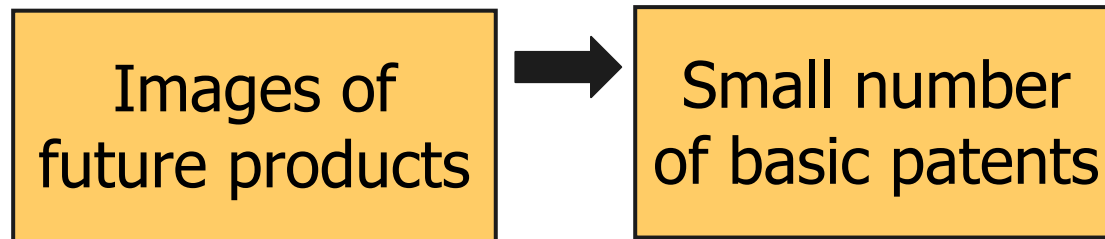
Issues of Traditional Filing Procedures

Engineer

Explanation

Patent Firm

Filing

Invention disclosure

Patent Dept.

Improvements of Current Products → Narrow Scope → Small Profit

No Feedback to the Engineer → Wide Variations are Not Fully Discussed → Easy to Design Around

To Obtain Basic Patents,
New Strategies are Necessary

Applications from research and developments (R&D)

| R&D results | → | Large number of R&D patents |

Patent Visualization

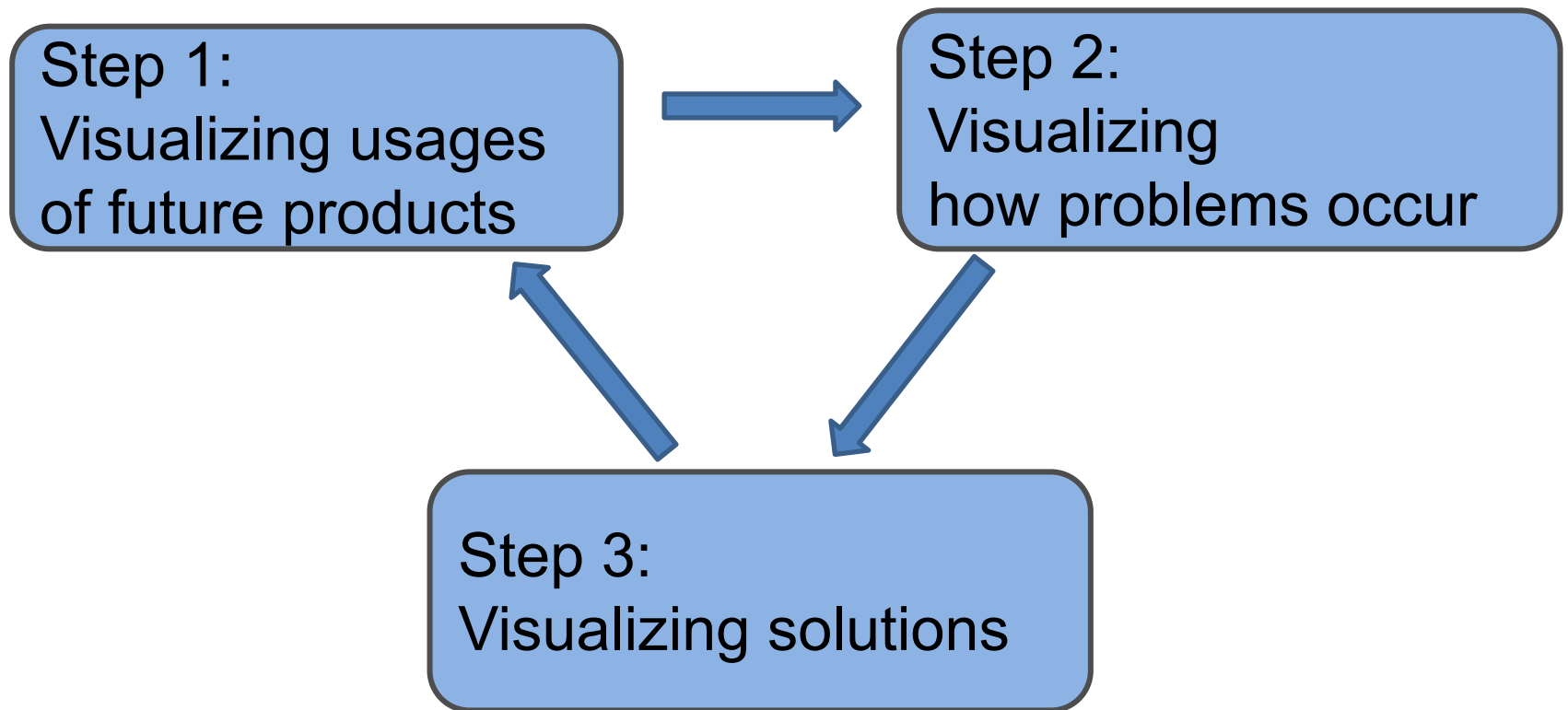| Images of future products | → | Small number of basic patents |
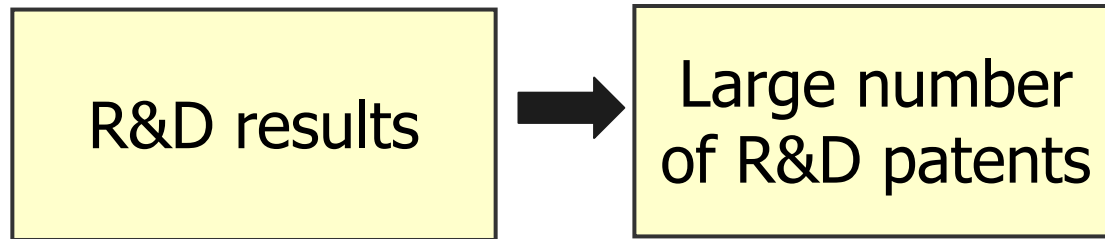
A new filing procedure, Patent Visualization, is based on knowledge management
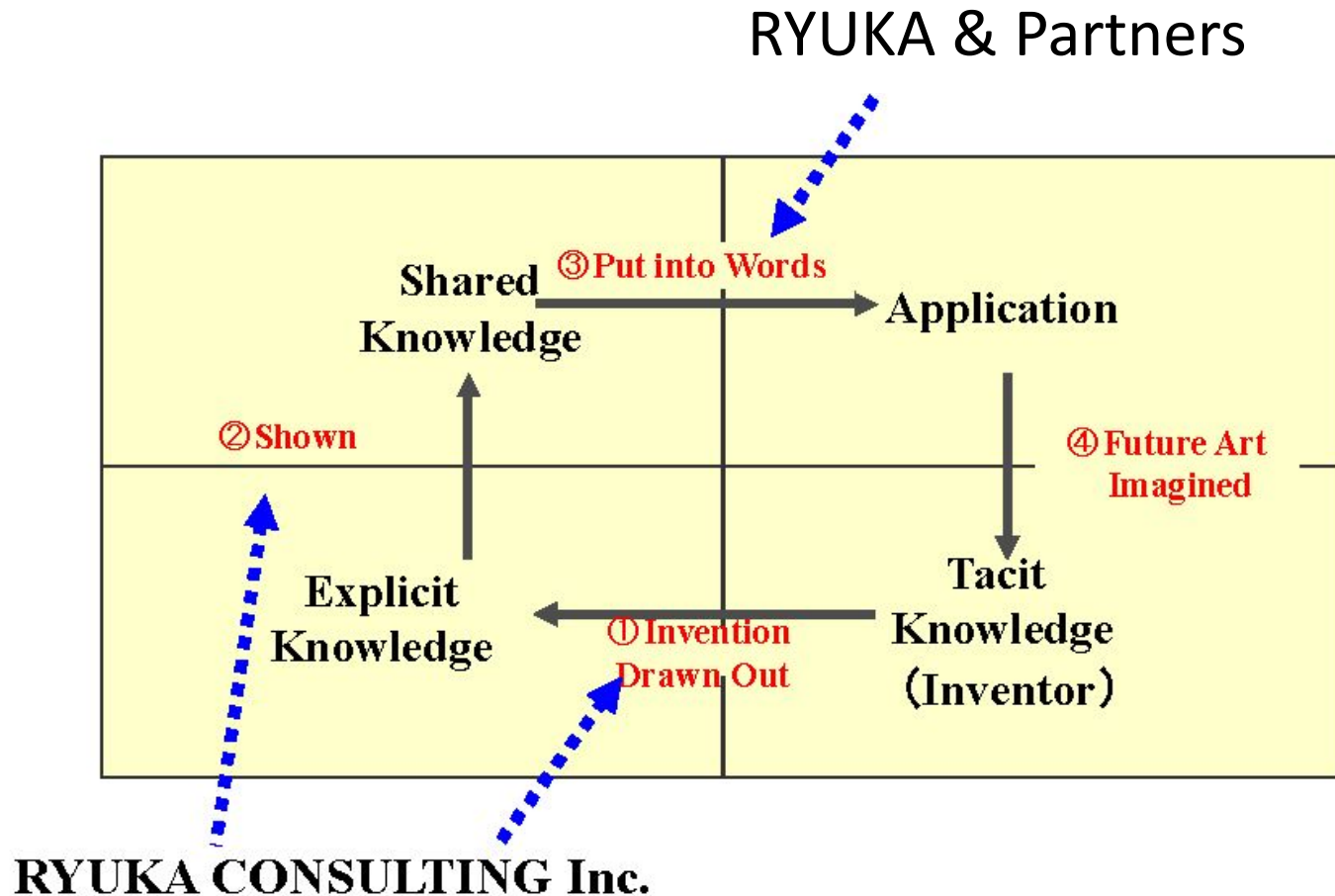
# Three Steps for Patent Visualization to utilize implicit knowledge of the inventors

Step 1:
Visualizing usages
of future products

Step 2:
Visualizing
how problems occur

Step 3:
Visualizing solutions

Visualizing a Product Usages
- Home solar cell -

Solar Cells

Visualizing Problem States
The sun is blocked by clouds while the AC is active.

Insufficient Power

Solar Cells
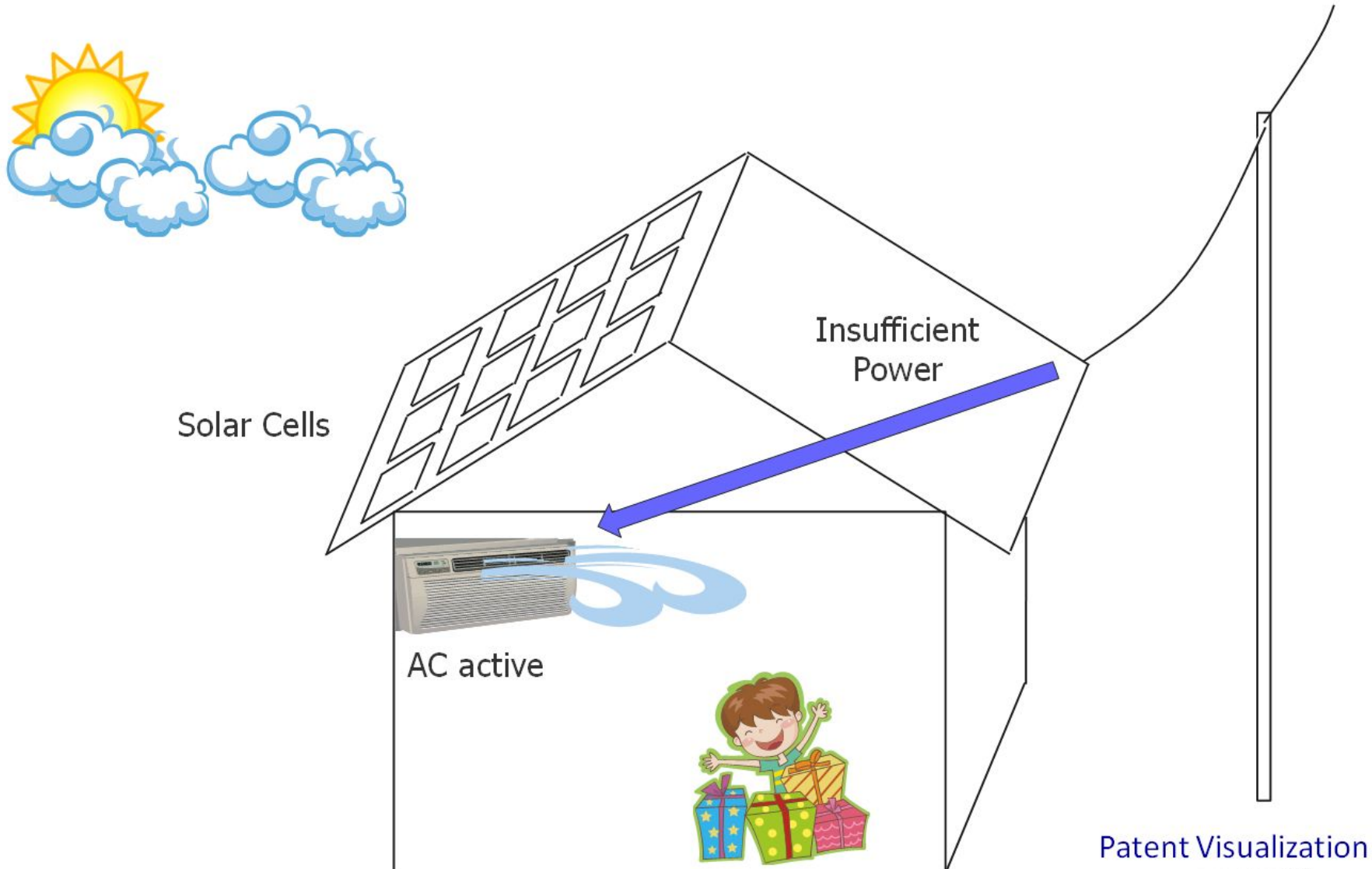
AC active

Visualizing Problem States –
The sun is not blocked by clouds, but the AC is inactive.

Solar Cells

Unused Power

AC Inactive
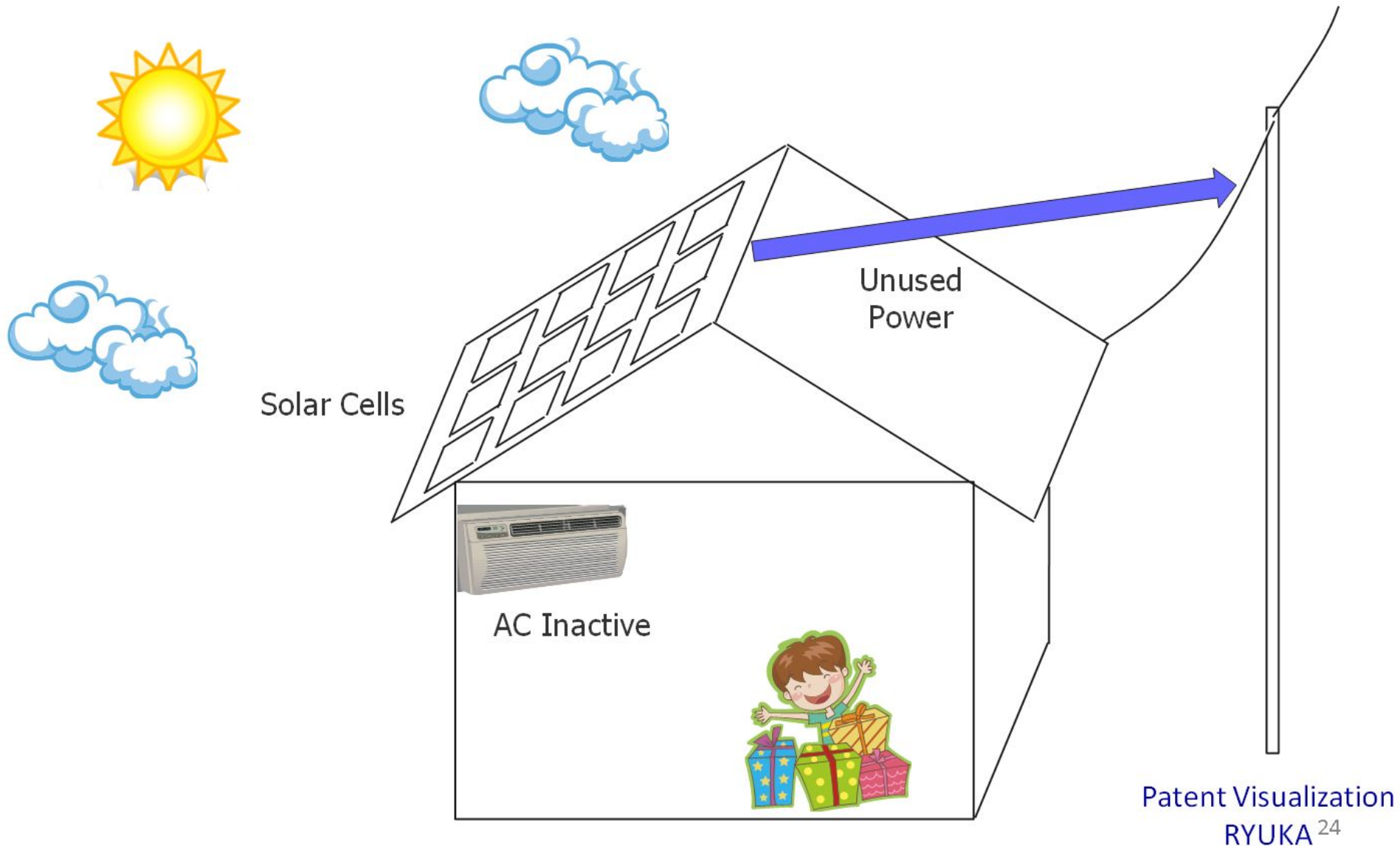
Three Steps Achieve Valuable Inventions

Step 1:
Visualizing
a future product

Step 2:
Visualizing
how problems occur

Step 3:
Visualizing solutions
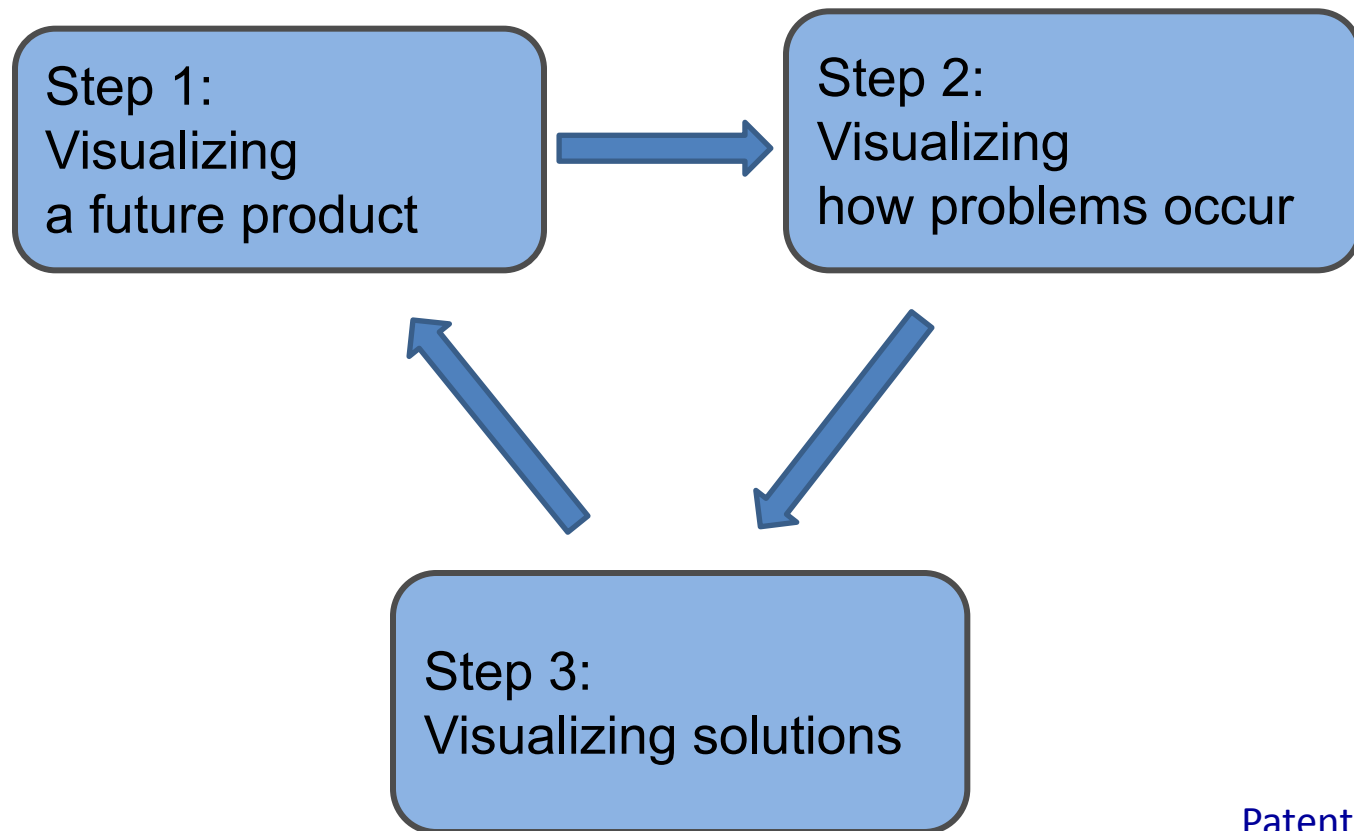
Examples of Thought Processes in Each Visualization Step

Step 1:
Visualizing a future product

Step 2:
Visualizing problem states

Step 3:
Visualizing solutions

- Expanding spatially

- Expanding temporally

- Making concrete approximations of relevant figures
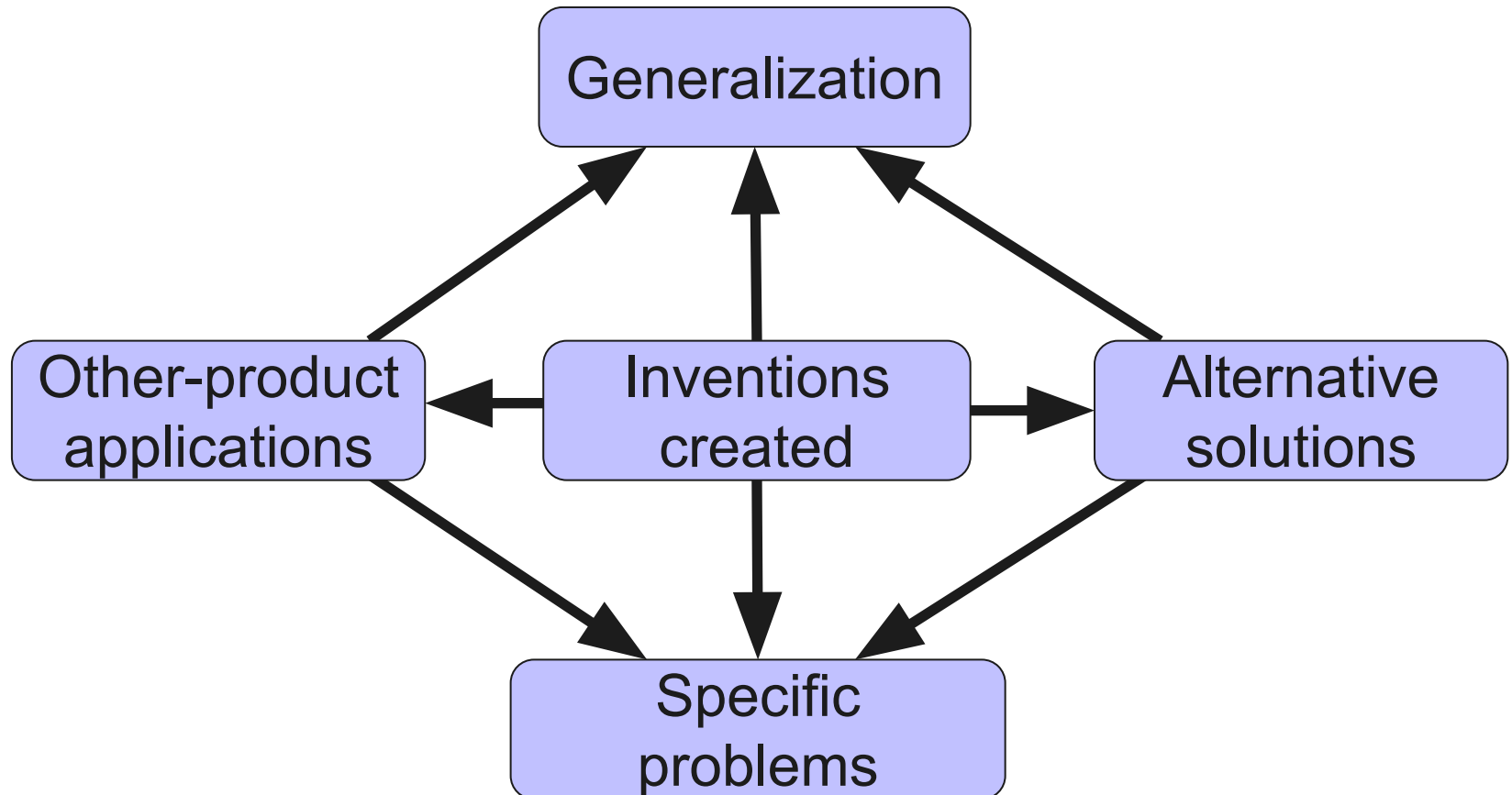
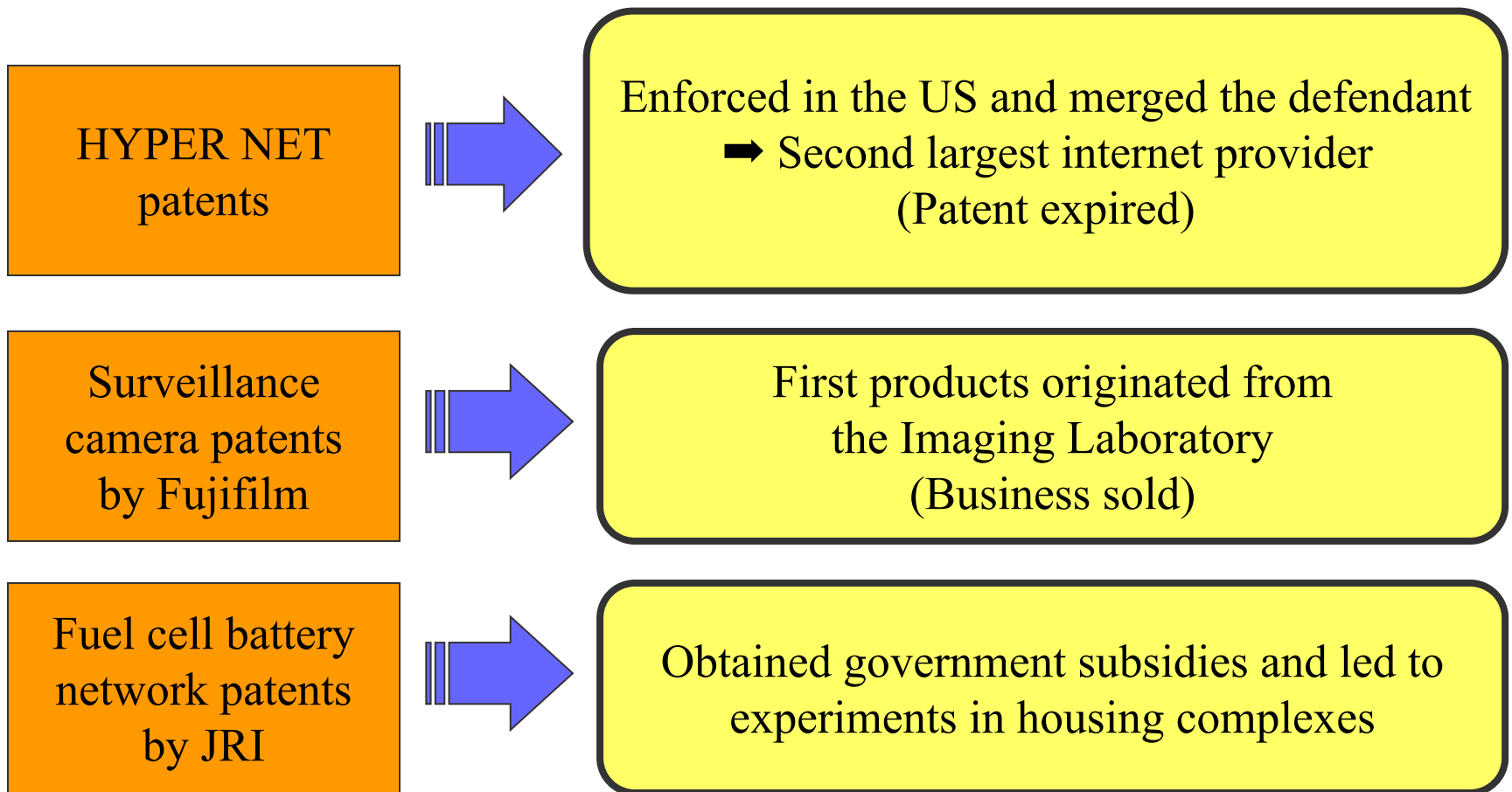- Searching for irregular occurrences

- Considering updates

- Evaluating real-time processes

- Separately considering alternate input and output

- Switching component pairs

Eight Directions to Expand Inventions

Generalization

Other-product applications

Inventions created

Alternative solutions

Specific problems

Successful Cases of Patent Visualizations (Expired Patents/Completed Projects)

HYPER NET patents	Enforced in the US and merged the defendant ➡ Second largest internet provider (Patent expired)
Surveillance camera patents by Fujifilm	First products originated from the Imaging Laboratory (Business sold)
Fuel cell battery network patents by JRI	Obtained government subsidies and led to experiments in housing complexes

Filing dates of top-value US Patents

US patents in electronics and software fields with a verdict of >$150 million damages by a District Court

	Plaintiff	Defendant	Invention	Damages Amount at District Court
1	Alcatel-Lucent	Microsoft	Perceptual coding of audio signals	$1,500 million
2	Uniloc USA Inc.	Microsoft et al.	System for software registration	$388 million
3	Alcatel-Lucent	Microsoft	Touch screen form entry system	$368 million
4	i4i LP	Microsoft	Manipulating the architecture and the content of a document separately	$200 million
5	Cornell	Hewlett-Packard Co.	Instruction issuing mechanism for processors with multiple functional units	$184 million
6	TGIP	AT&T	Telephone pre-paid calling card system and method	$156 million

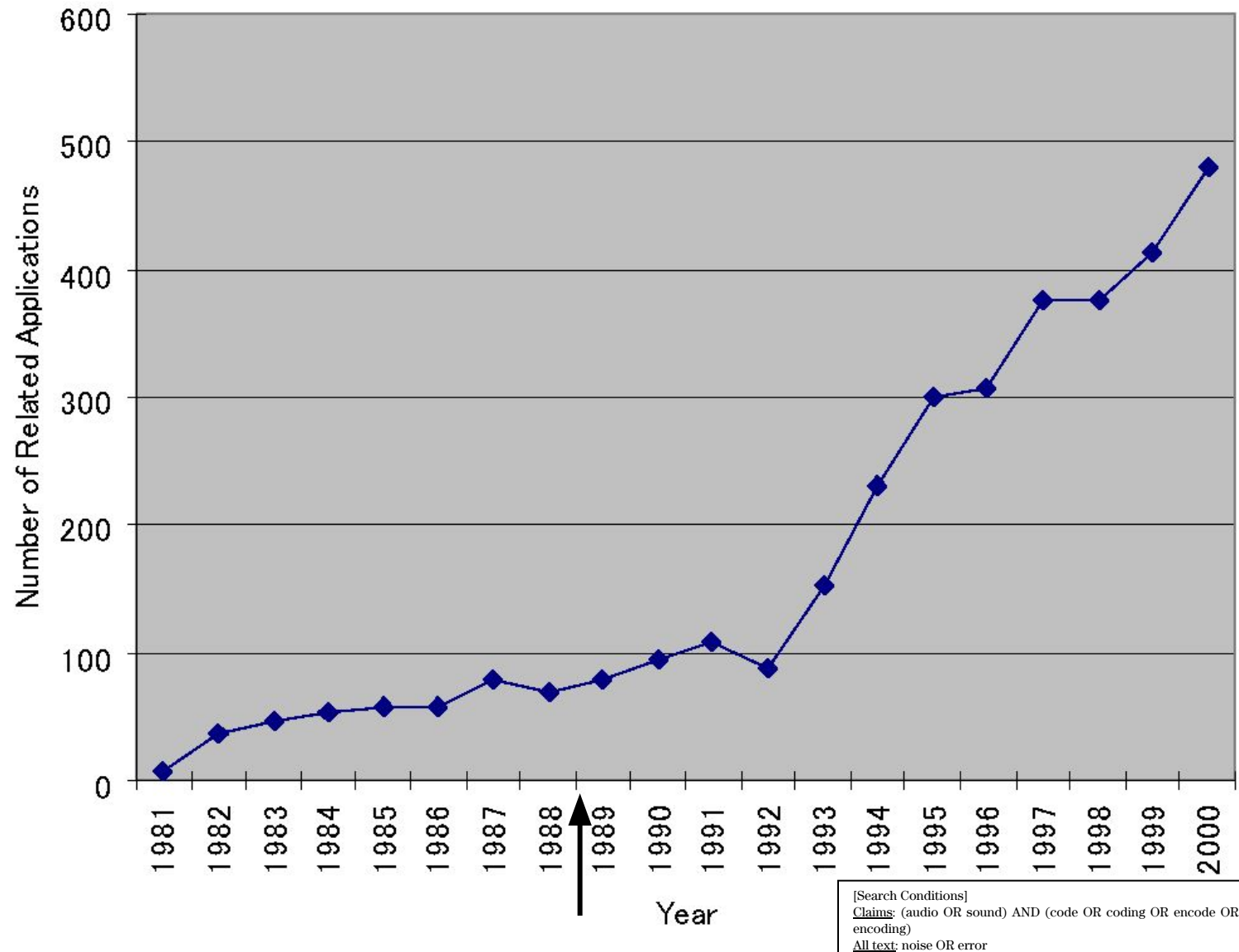**Fig. 1** Alcatel-Lucent's "Perceptual coding of audio signals" patent: Number of related applications per year

[Search Conditions]
Claims: (audio OR sound) AND (code OR coding OR encode OR encoding)
All text: noise OR error

Fig. 2 Uniloc USA's "System of software registration" patent: Number of related applications per year

[Search Conditions]
All text: (license OR licensing) AND (register OR registration) AND (software OR program)

27
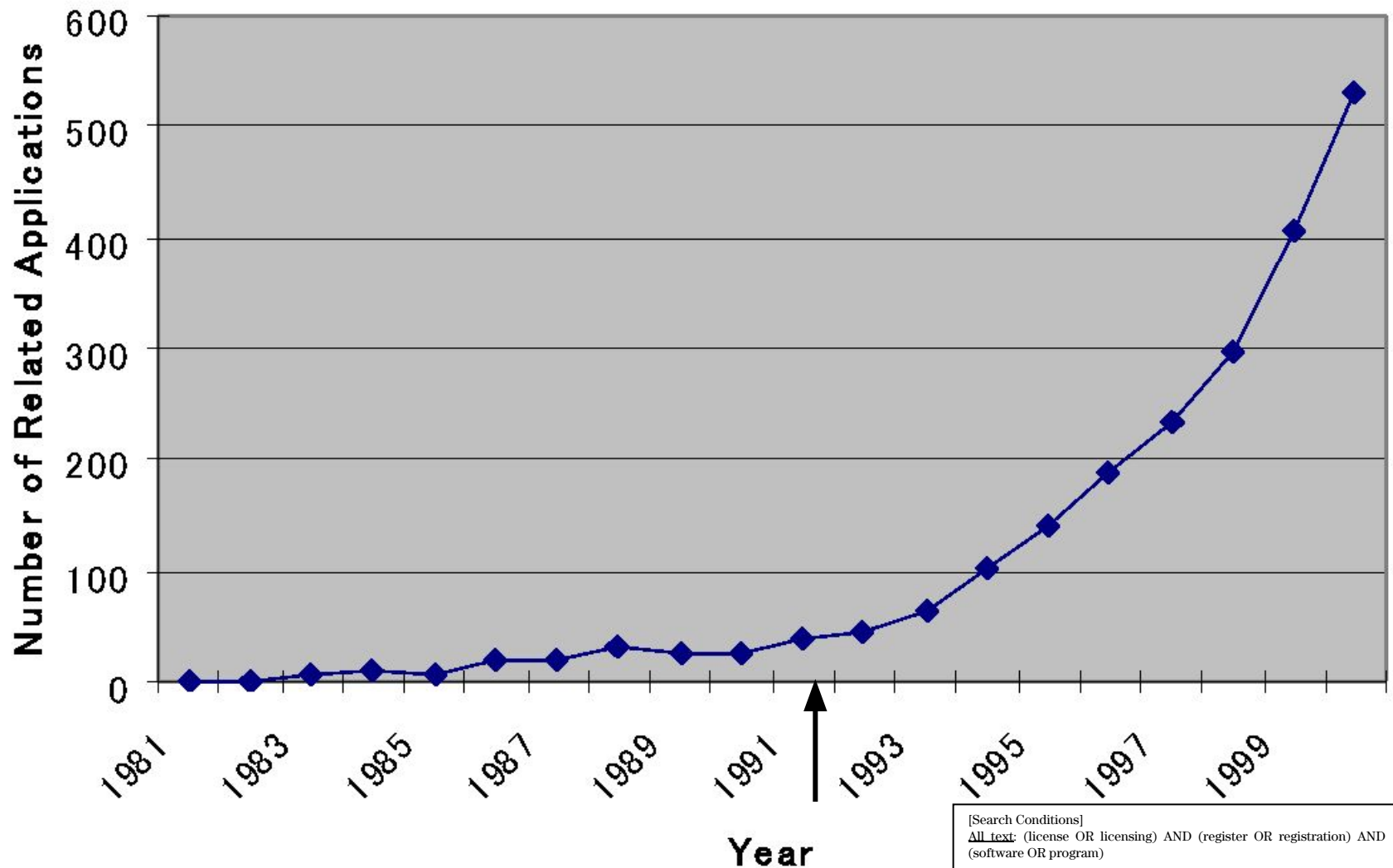
Fig. 3 Alcatel-Lucent's "Touch screen form entry system" patent: Number of related applications per year

[Search Conditions]
Claims: touch AND (panel OR screen OR display)
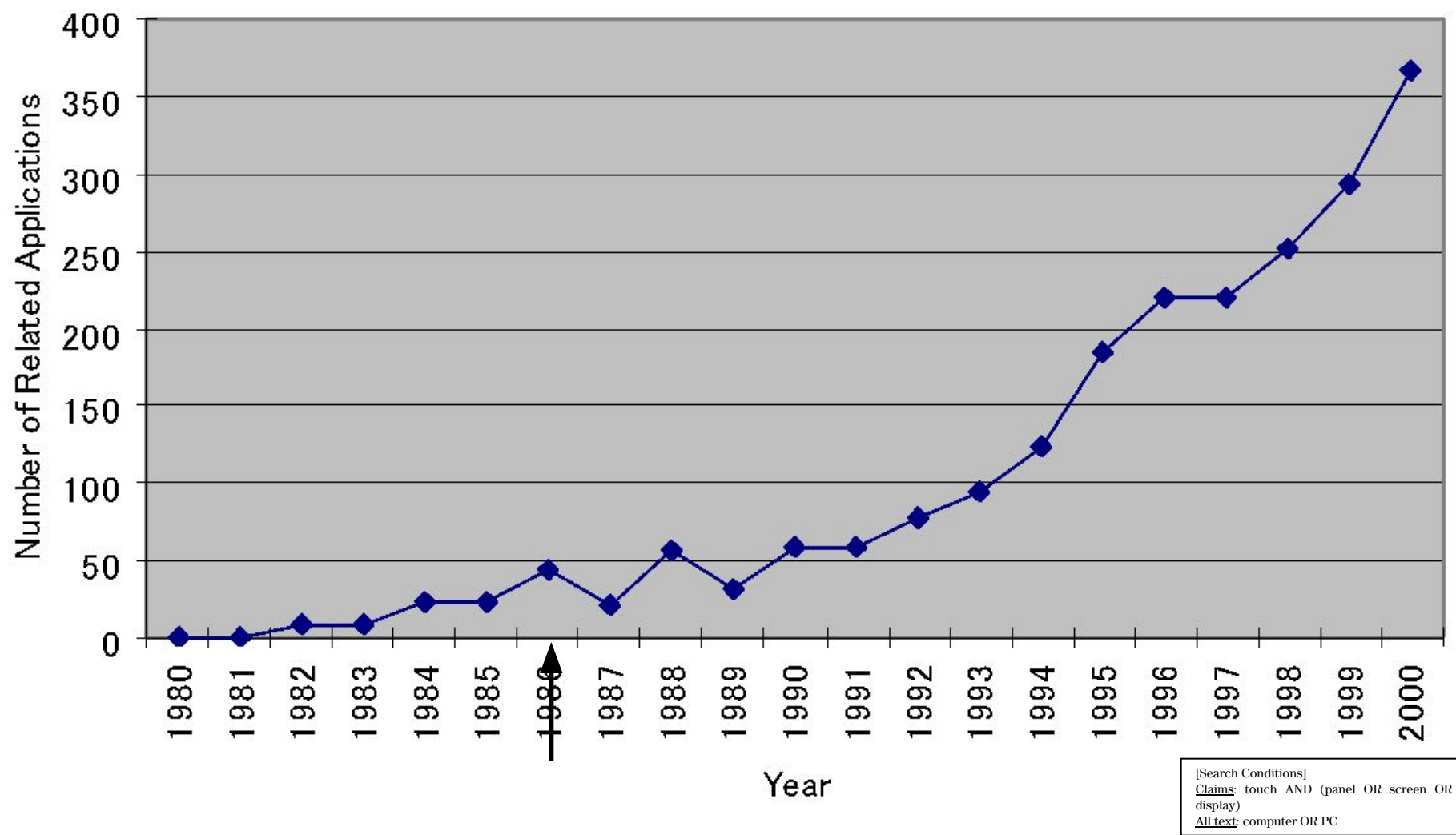All text: computer OR PC

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Fig. 4 i4i LP's Method and system for manipulating the architecture and the content of a document separately from each other: Number of related applications per year
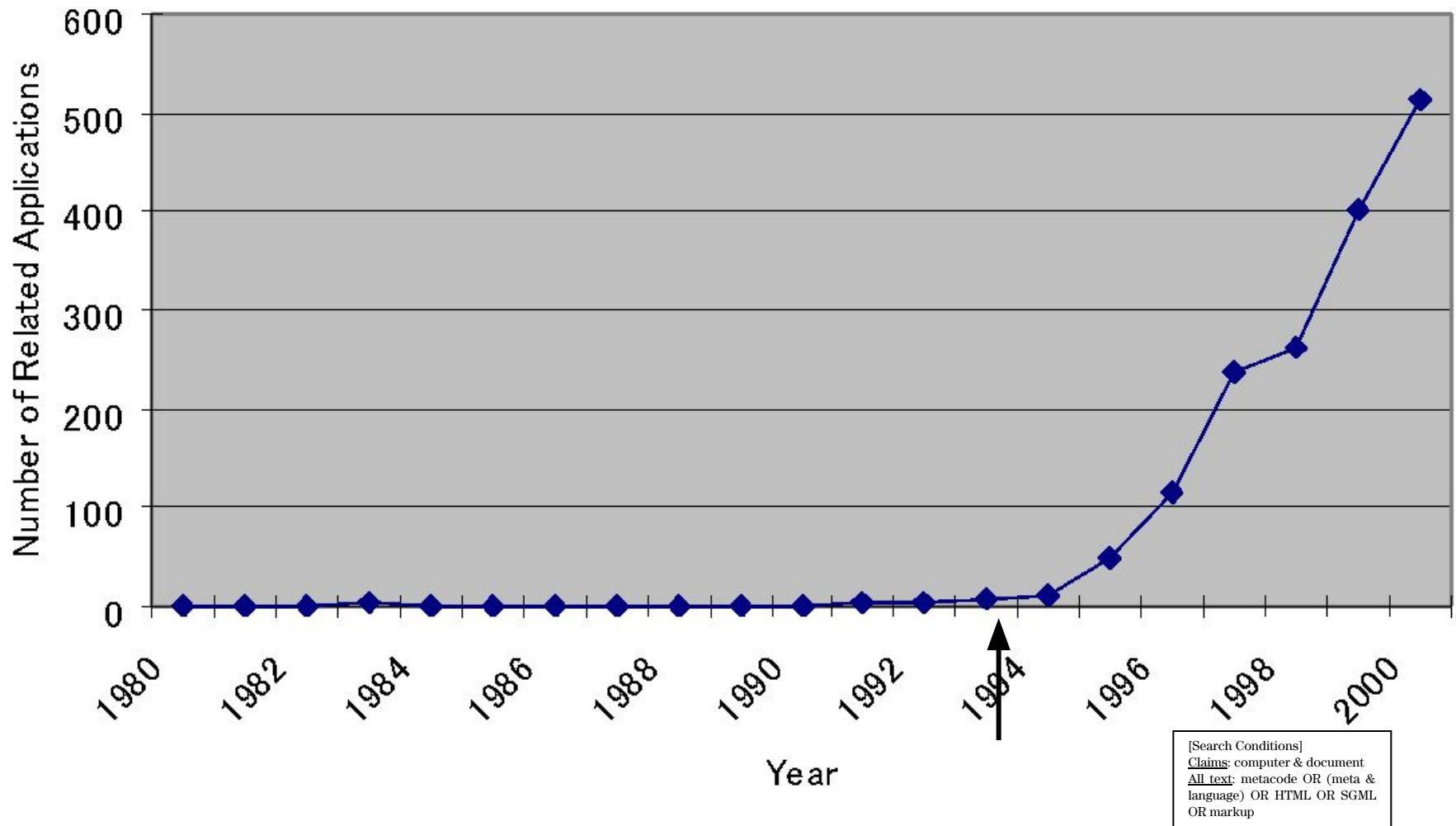
[Search Conditions]
Claims: computer & document
All text: metacode OR (meta & language) OR HTML OR SGML OR markup

Fig. 5 Cornell's "Instruction issuing mechanism for processors with multiple funtional units" patent: Number of related applications per year

[Search Conditions]
Claims: (instruction OR command) AND (processor OR CPU) AND (parallel OR multi OR multiple OR concurrent)
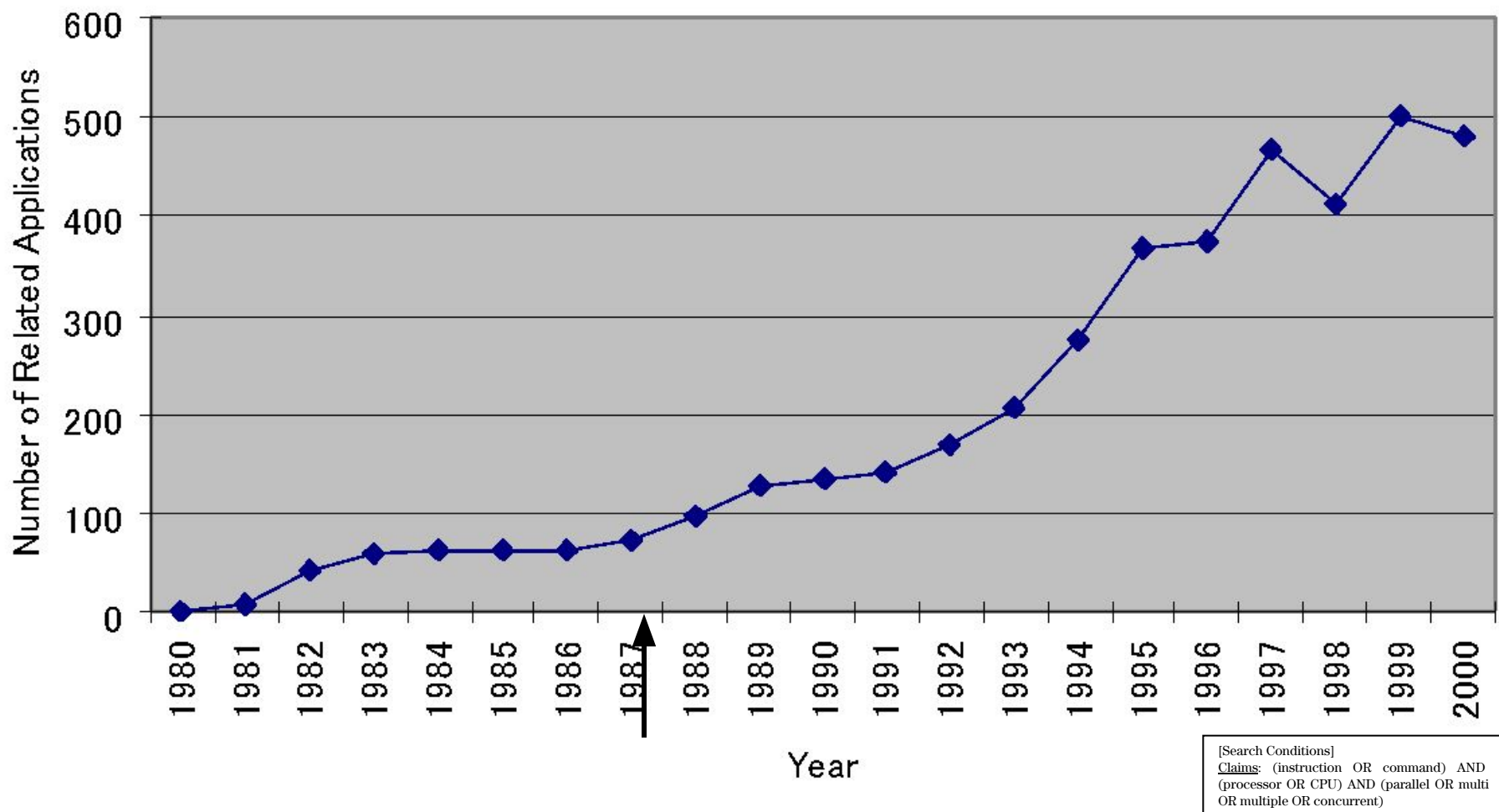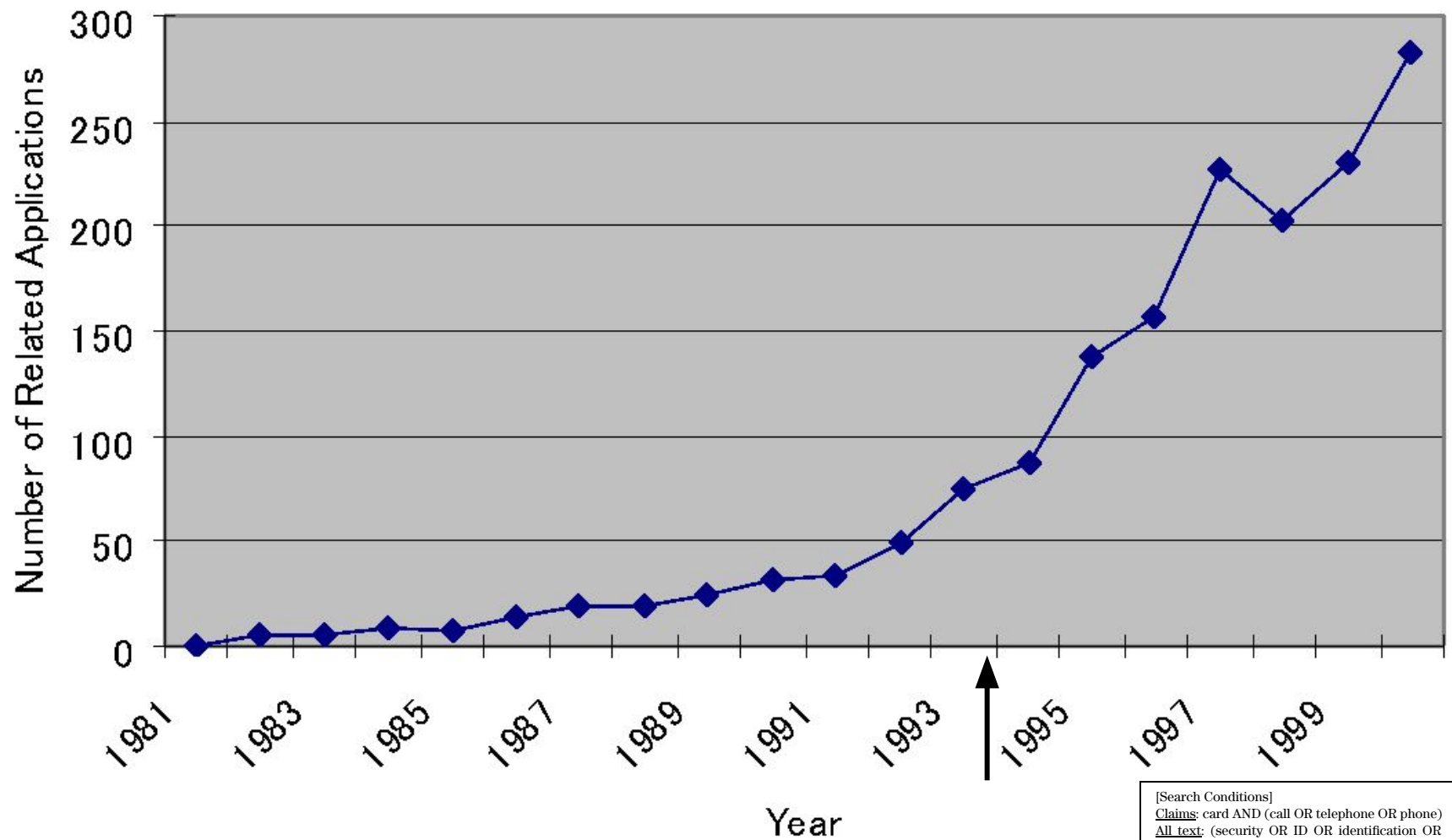
Fig. 6 TGIP's "Telephone pre-paid calling card system and method" patent: Number of related applications per year

US patents in electronics and software fields with a verdict of >$150 million damages were filed in an early stage.
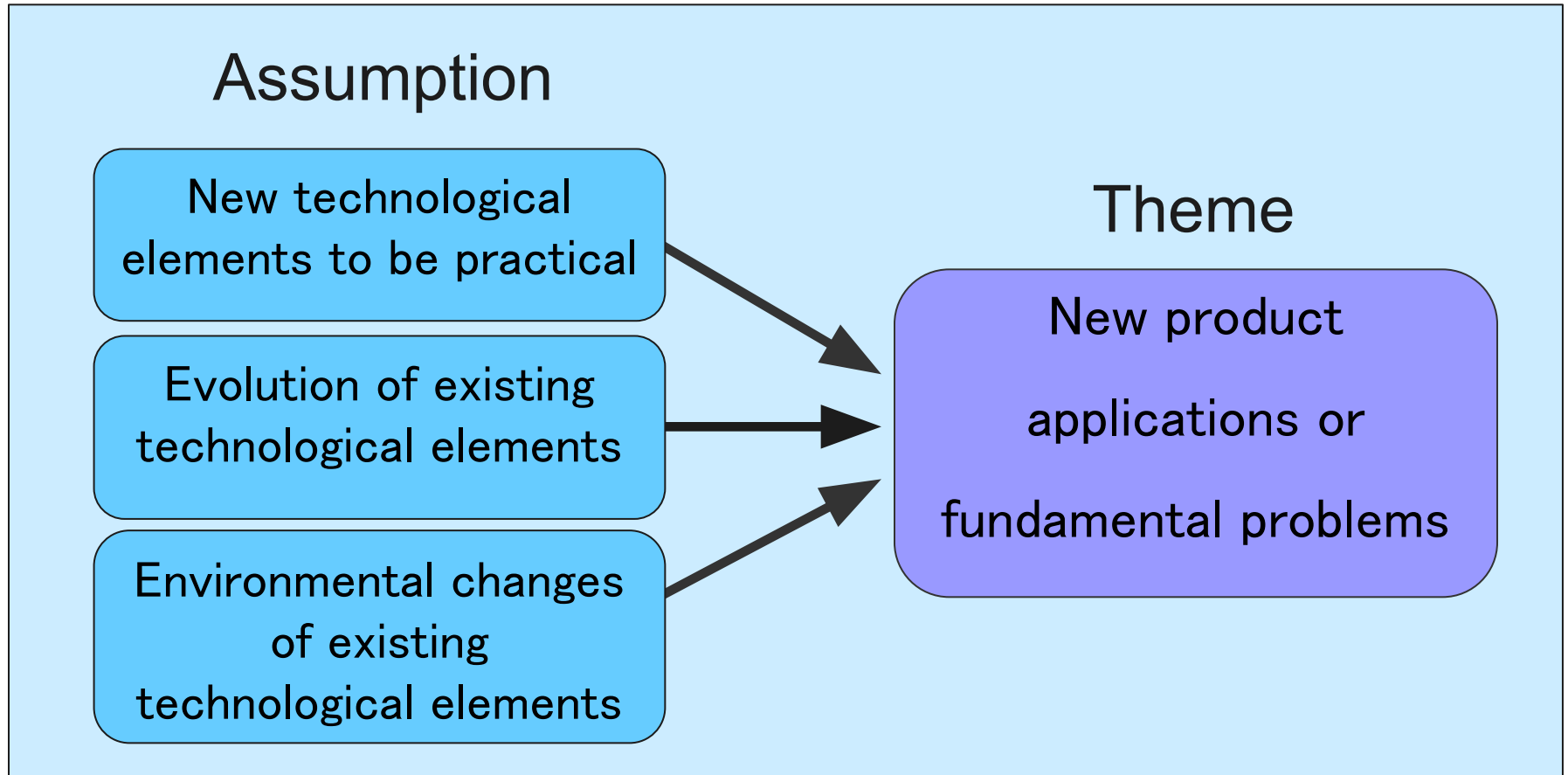
	Plaintiff	Defendant	Invention	Damages Amount at District Court
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2	Uniloc USA Inc.	Microsoft Corp. et al.	System for software registration	$388 million
3	Alcatel-Lucent	Microsoft	Touch screen form entry system	$368 million
4	i4i LP	Microsoft Corp.	Manipulating the architecture and the content of a document separately	$200 million
5	Cornell	Hewlett-Packard Co.	Instruction issuing mechanism for processors with multiple functional units	$184 million
6	TGIP	AT&T	Telephone pre-paid calling card system and method	$156 million

Overall Processes of Patent Visualization
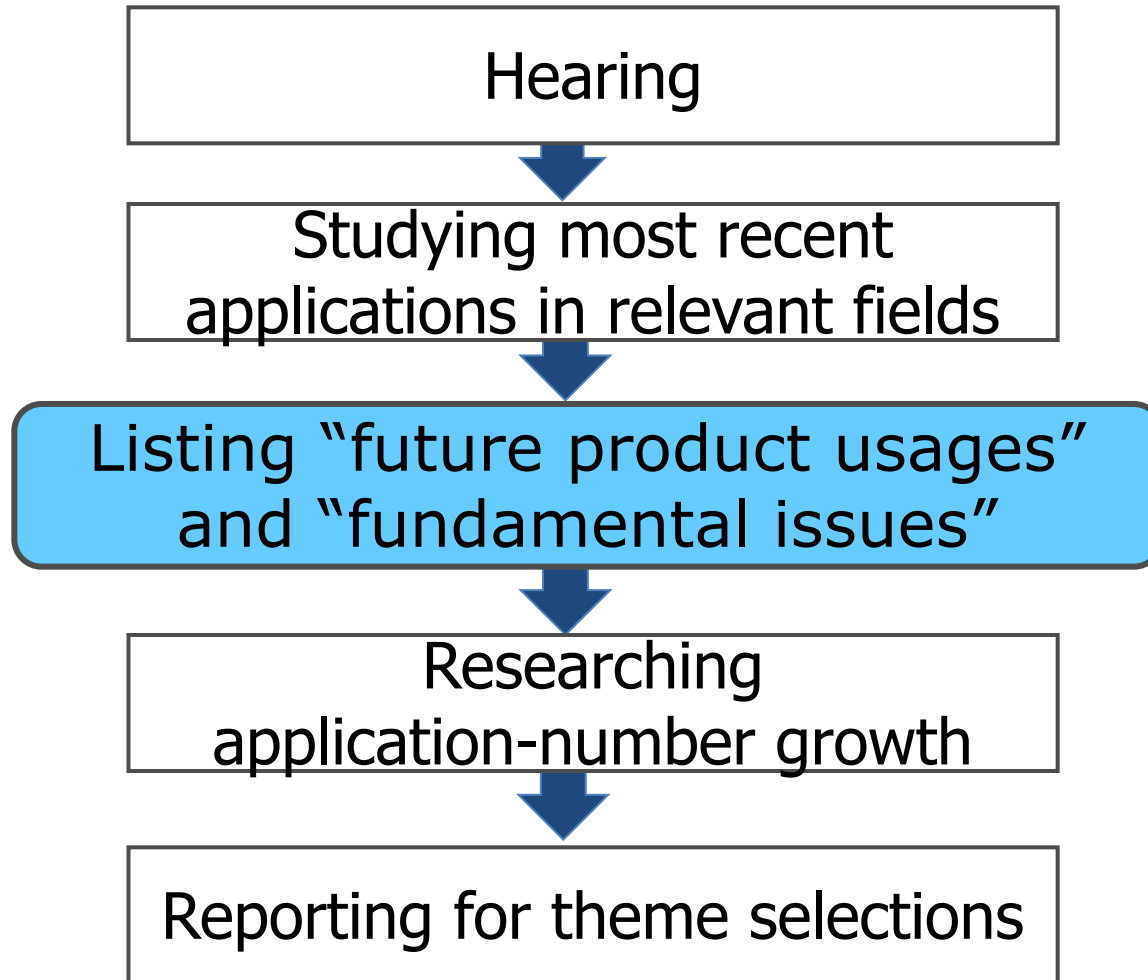
Overall Processes of Patent Visualization

Patent Visualization
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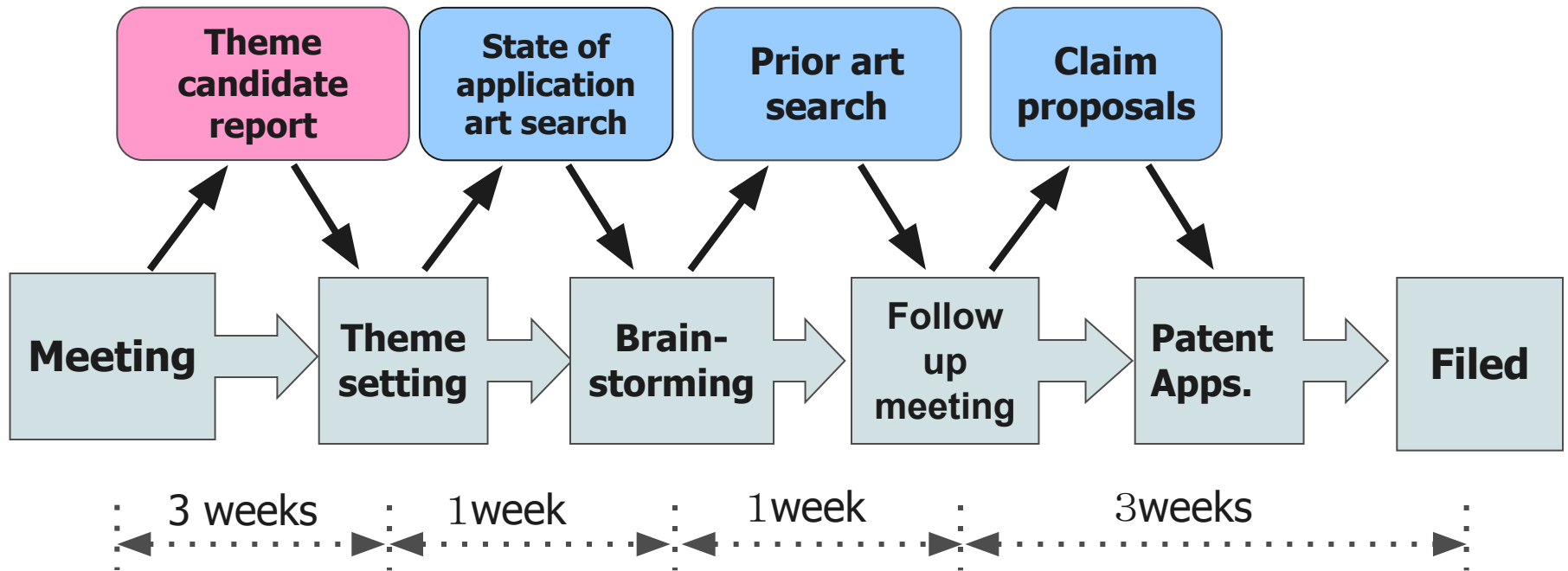
Look for themes in which
the application numbers will surge

Selecting Themes for Patent Visualization

Hearing

Studying most recent
applications in relevant fields

Listing "future product usages"
and "fundamental issues"

Researching
application-number growth
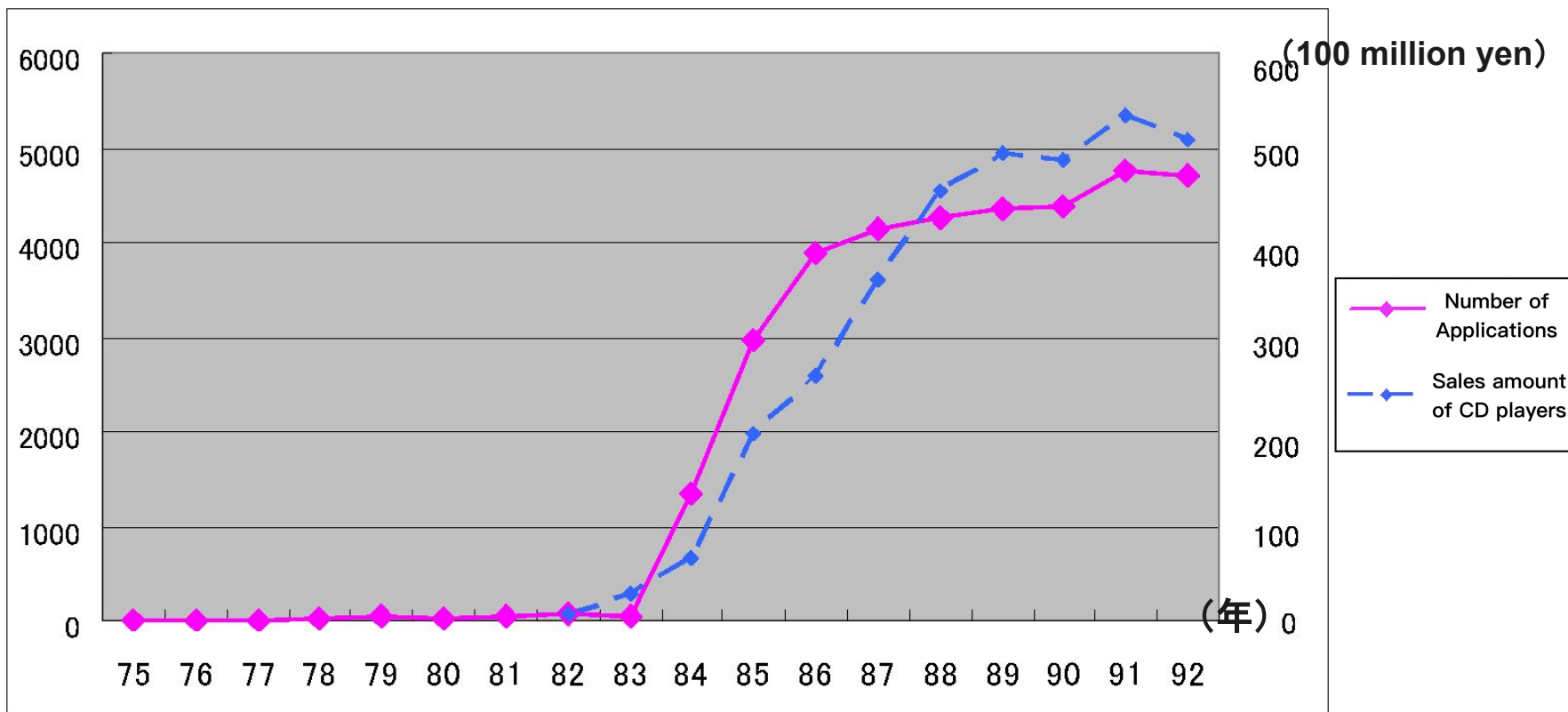
Reporting for theme selections

Deciding the application number for each theme per expected profits from patents

Often: deciding the application numbers per the number of 'invention proposals'.

→ Fewer developers = Fewer applications

Applications increase in proportion to market size

Applications for optical pick-up

（**100 million yen**）

Legend:
- Number of Applications
- Sales amount of CD players

X-axis (年): 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92

Left axis: 0 1000 2000 3000 4000 5000 6000
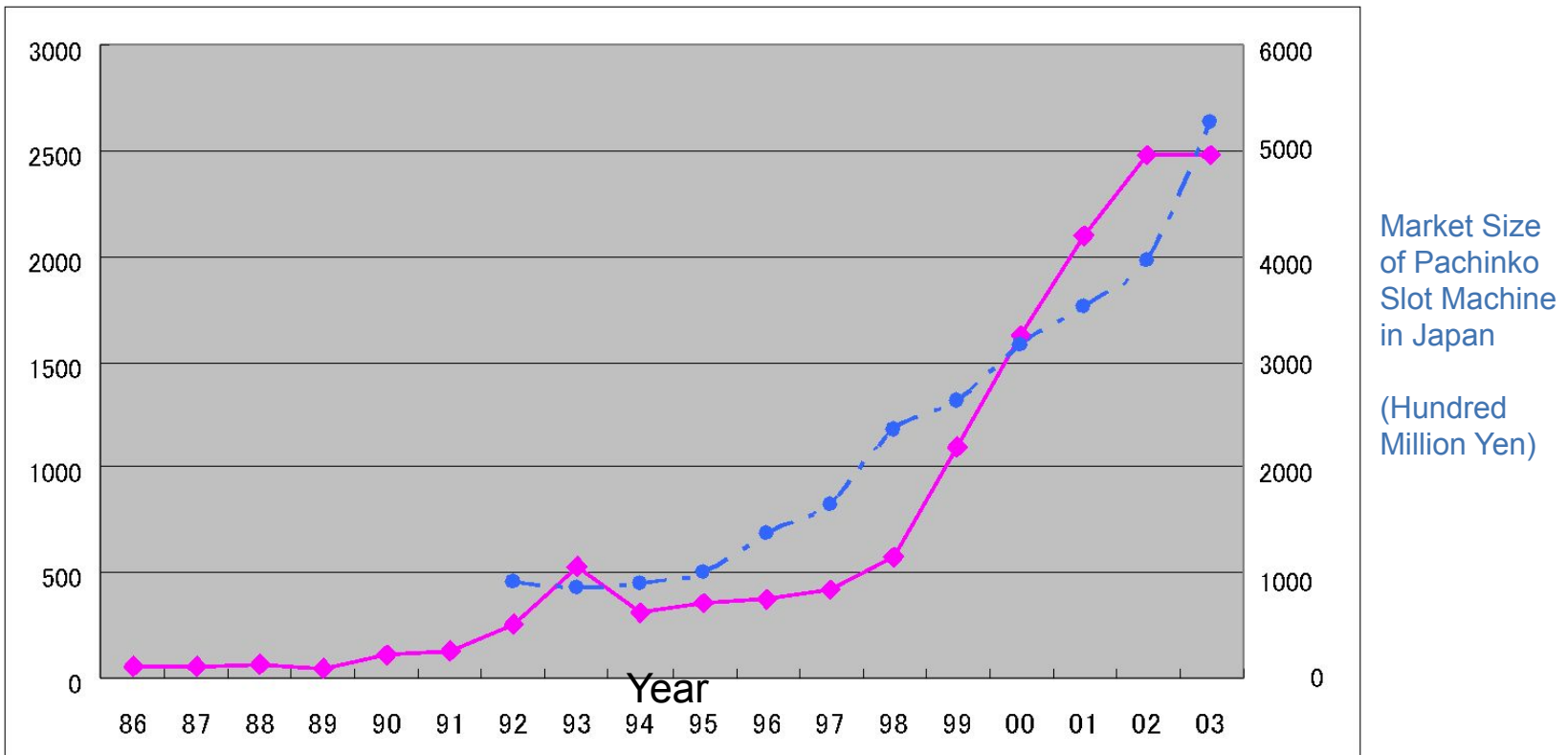Right axis: 0 100 200 300 400 500 600

Search condition:
Claims： (beam or laser or light) and (medium or disk) and
Specification： (CD or disk)

Applications increase
in proportion to market size

Applications for pachinko slot machines

Market Size of Pachinko Slot Machine in Japan

(Hundred Million Yen)

Year

Search Condition
Claims: (reel or 表示), and
Specification: (Slot machine or "pachisuro")

Deciding the application number for each theme per expected profits from patents

Currently, Fewer developers = Fewer applications

Strategic budget is required

Investment Characteristics of Patent Visualization

Patent applications
from R&D

Patent Visualization

Short term
investment

Low risk
Low return

Long term
investment
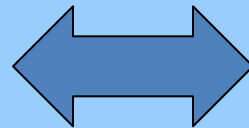
High risk
High return

Budget Control for Patent Filings

Filings from R&D (Short Term Investment) 70%

   Department ○○ 25%

     :   :

   Department ○○ 15%
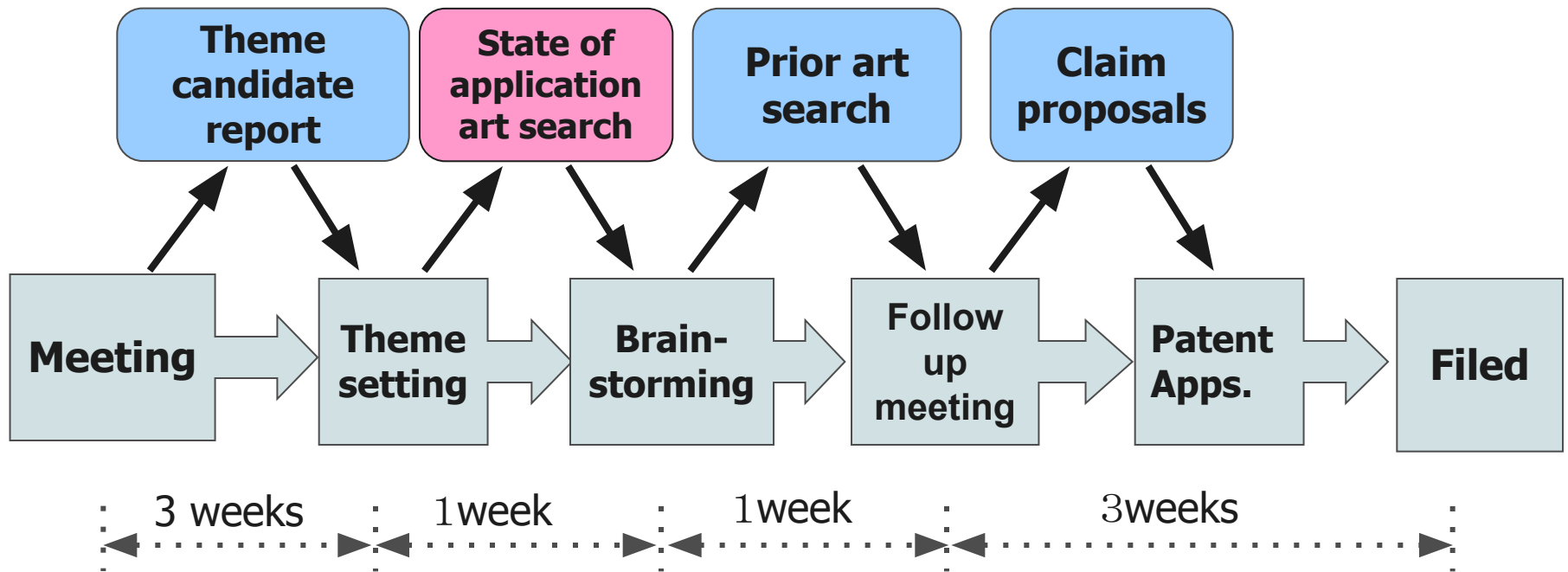

Filings from Patent Visualization (Long Term Investment) 30%

   Theme ○○   10%

     :   :

   Theme ○○   5%

Understand the state of published applications before brainstorming

Theme candidate report

State of application art search

Prior art search

Claim proposals

Meeting → Theme setting → Brain-storming → Follow up meeting → Patent Apps. → Filed

3 weeks | 1week | 1week | 3weeks

Brainstorming after knowing the states of published applications

Hearing

Search for states of published applications and examples

Know the states of the published applications

Assemble the examples for introductions and state explanations

Brainstorming
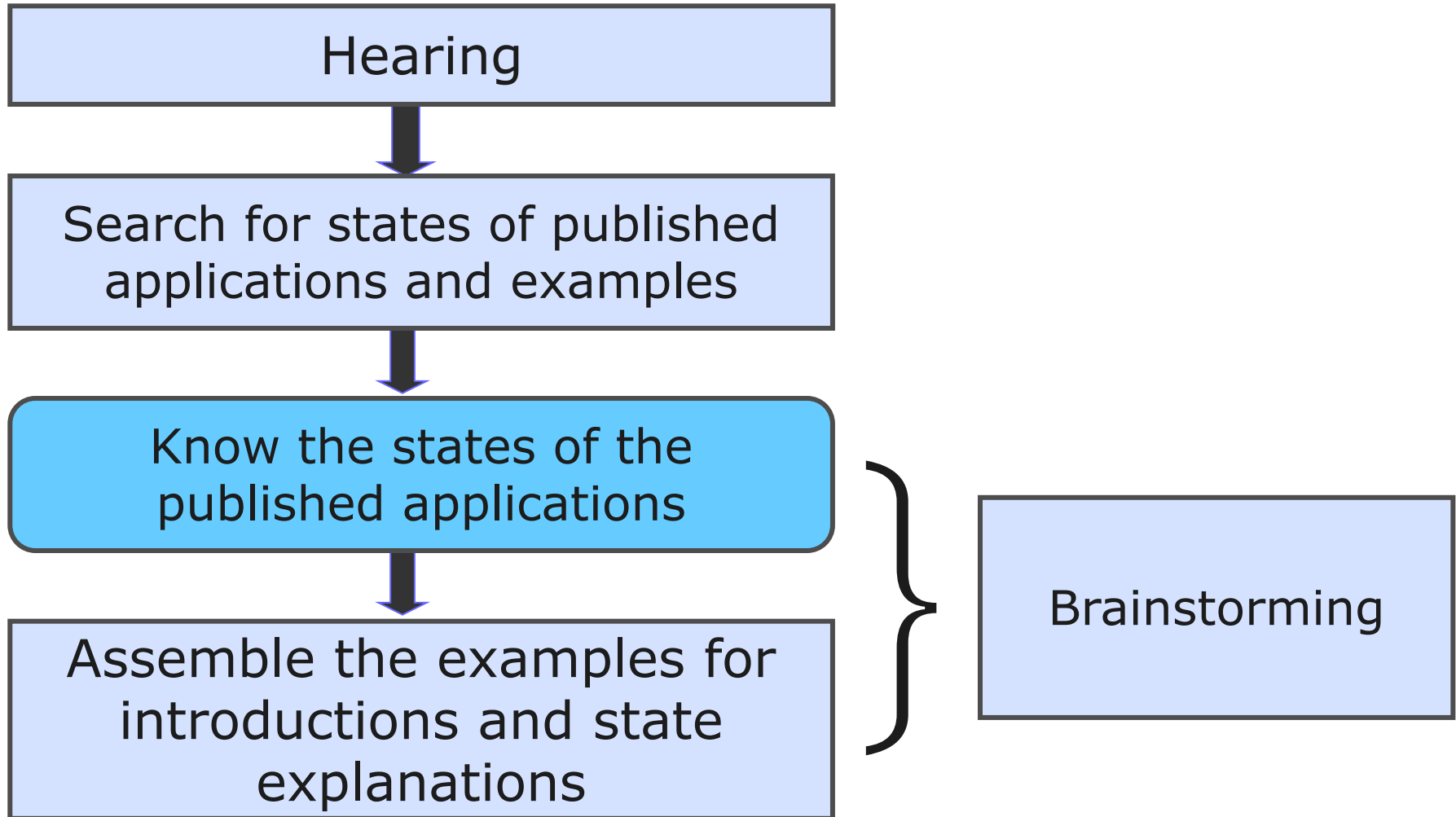
Drafting claim proposals after searching prior art of each invention

| Theme candidate report | State of application art search | Prior art search | Claim proposals |

| Meeting | Theme setting | Brain-storming | Follow up meeting | Patent Apps. | Filed |

3 weeks 1week 1week 3weeks
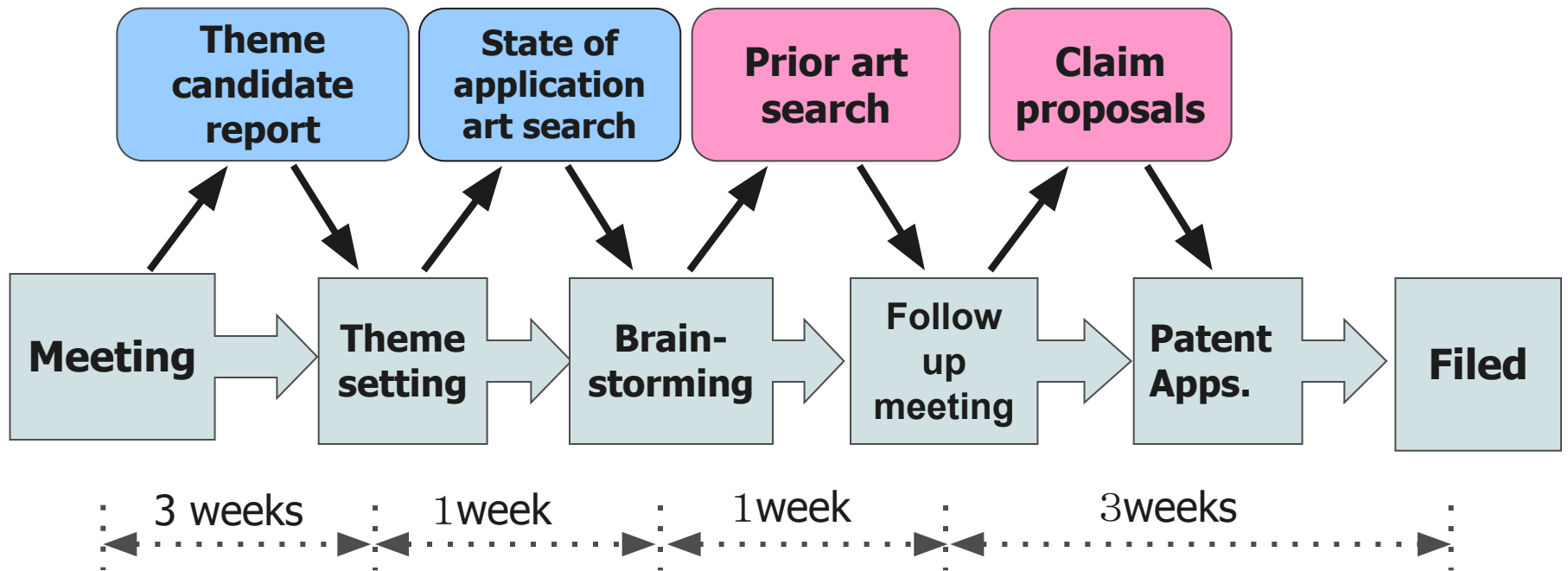
Resources and achievements of Patent Visualization

Strategic Theme Determination

Implicit Knowledge of Engineers

Brainstorming, Search, and Development

CREATING FUNDAMENTAL INVENTIONS

Building a Patent Portfolio

Accelerating New Product Development

Improving Engineers' Abilities
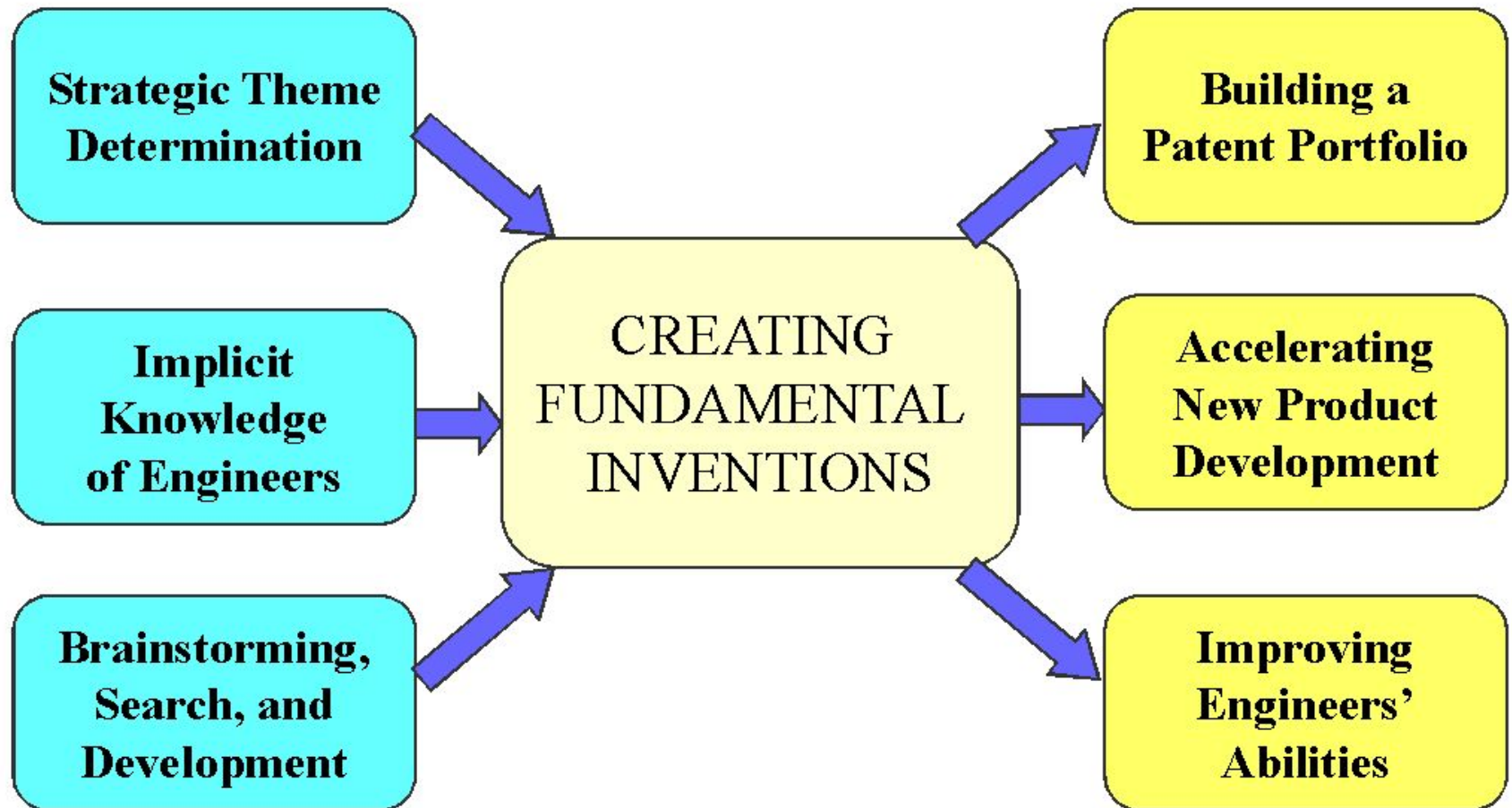
The future of industry,

begins with the invention of engineers.

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