



Hochschule Ulm

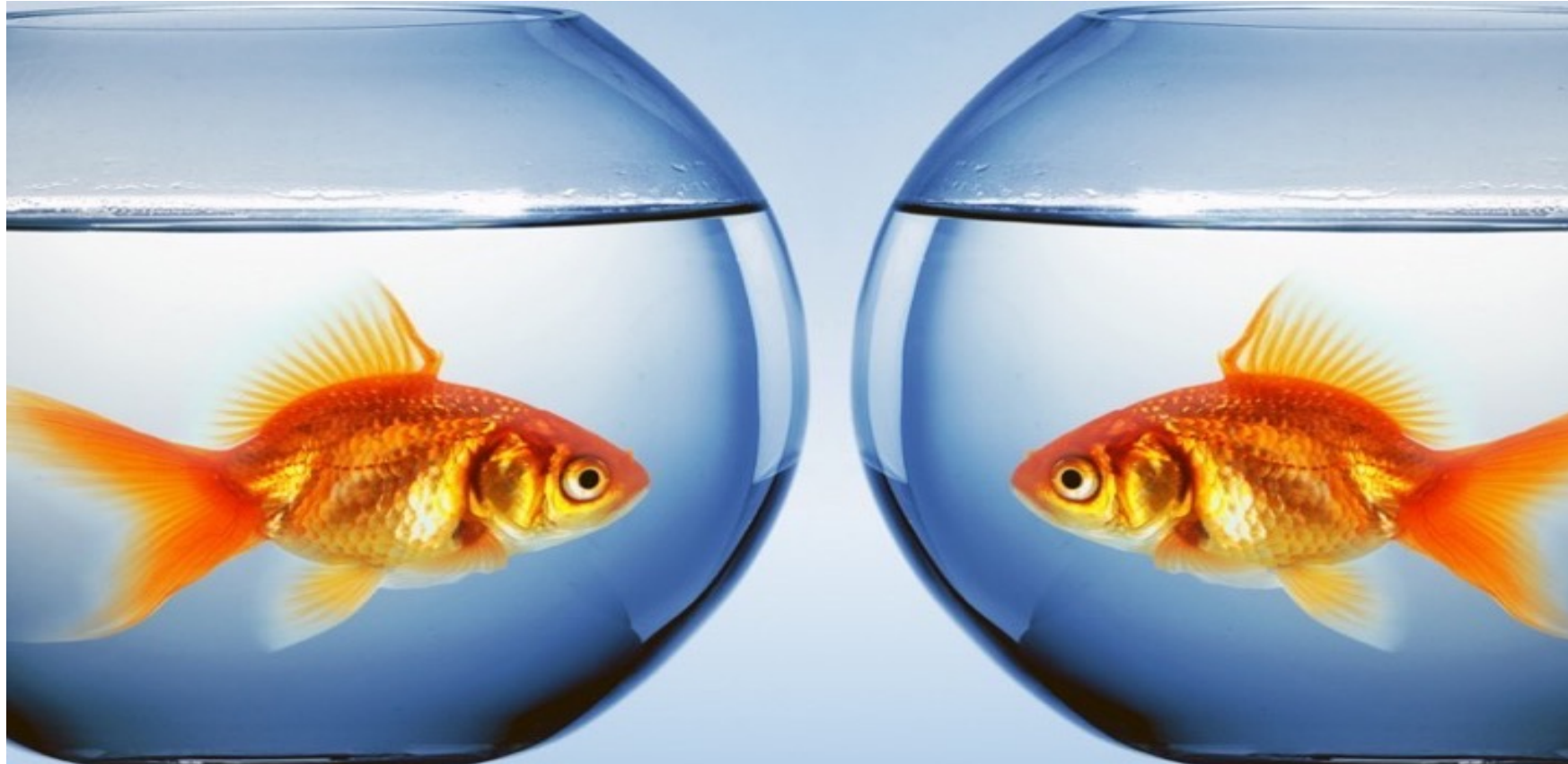


Germany

Spain

Austria

France



International Innovation Engineering  
TRIZ & Patentinspiration  
September 2021

**INNOVATIVE  
PARTNERS TRAINING**

## Introduction

Innovative Partners helps organisations solve complex problems, by a fast and structured delivery of innovative insights and relevant solution directions.

## Presentation

TRIZ

TRIZ Process

Functions & Contradictions

TRIZ tools

Patentinspiration

More video's and questions

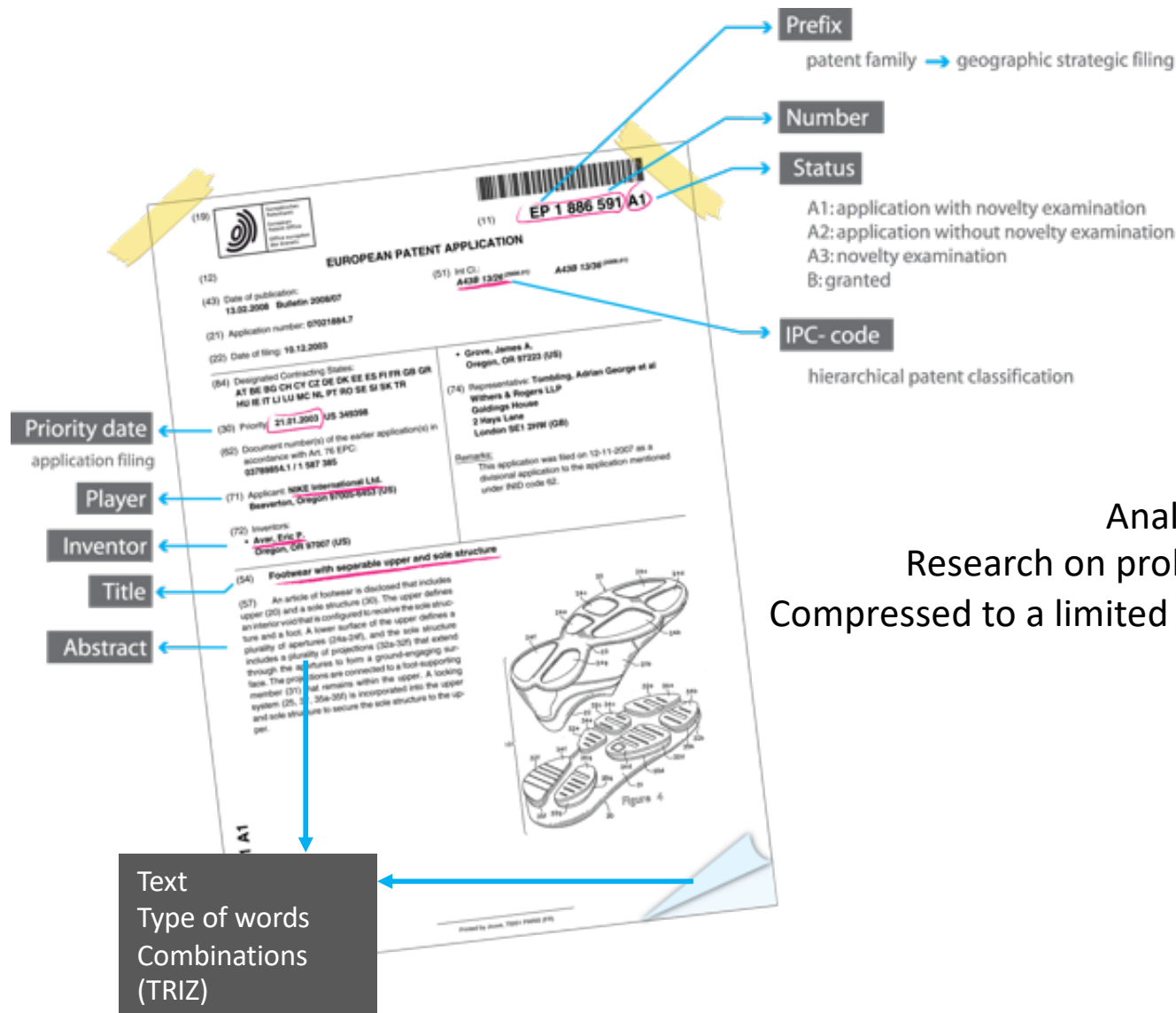


# TRIZ Theory of inventive problem solving

## Теория Решения Изобретательских Задач



Altshuller, Genrich (1984).  
Creativity as an Exact Science.  
New York, NY: Gordon & Breach.  
[ISBN 0-677-21230-5.](https://www.gordonandbreach.com/books/9780677212305)



### TRIZ

Analysis of 2,5 million patents (1947-1985)  
Research on problems and solutions from all industries  
Compressed to a limited amount of abstract solution directions  
Update to 3,5 million patents (2010)

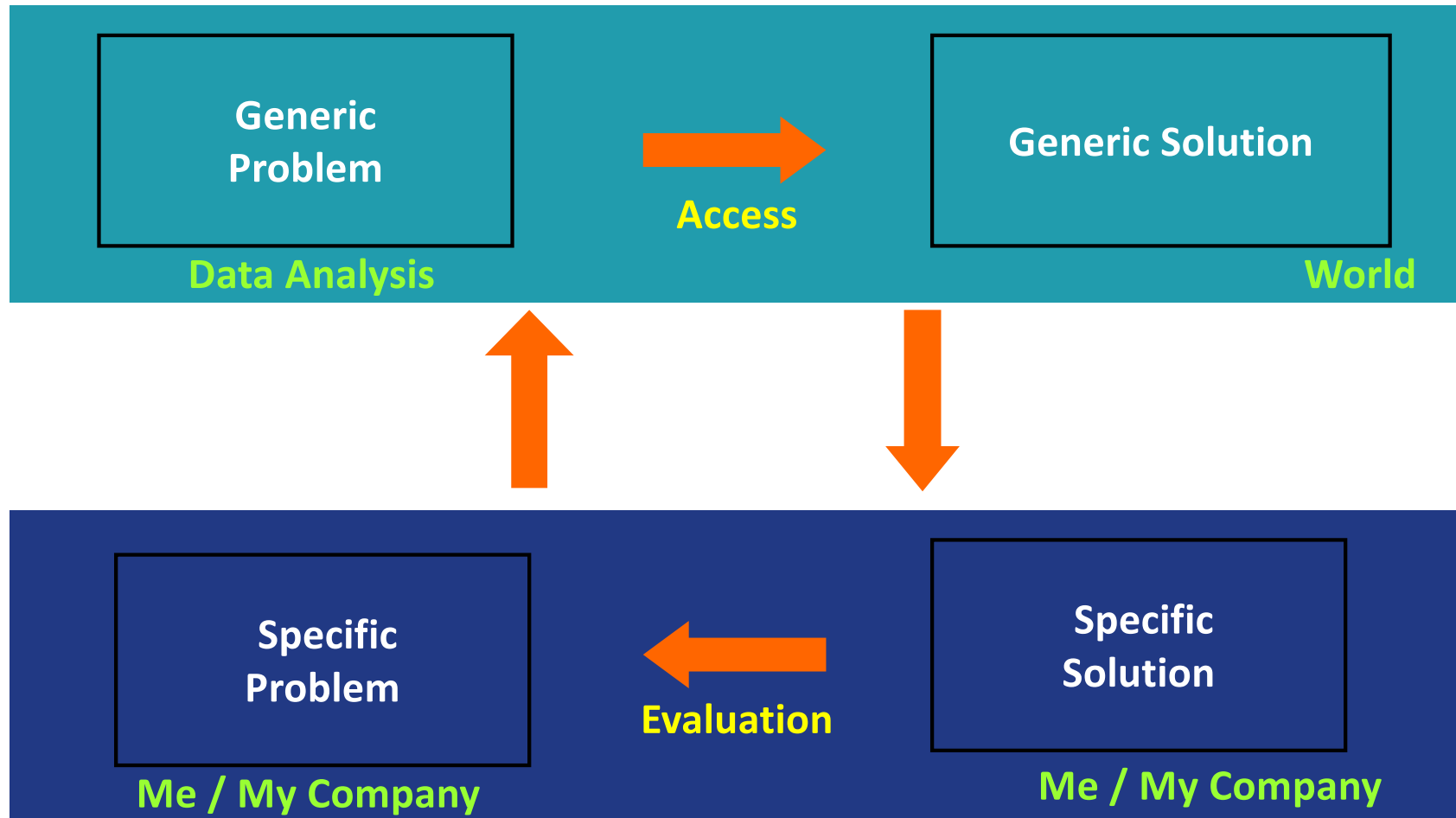
### Patentinspiration

90 million patents (2016)  
100 million patents (2020)  
Respect a structured process!

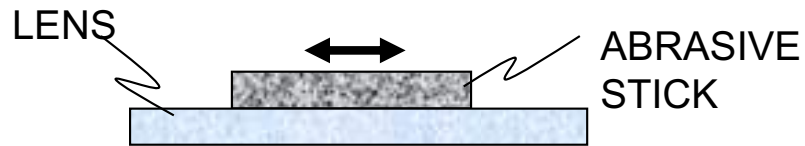
<https://the-trizjournal.com/what-is-triz/>

**INNOVATIVE  
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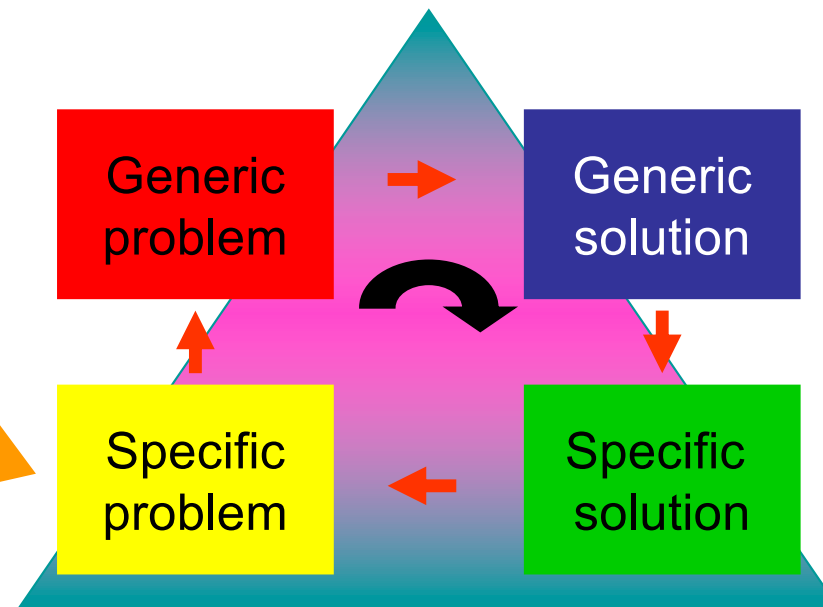
# TRIZ PROCESS



Objective: faster polishing a lens  
(production process)



Can the function be performed in another way?





# TRIZ – Function & effect database

<https://www.triz.co.uk>



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# TRIZ – Function & effect database

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CREATIVITY**

## FUNCTION QUERY

Select an Action and an Object on which the Action is to be performed.  
Then click on the Submit Query button.

ACTION				OBJECT	RESULTS TYPE
<input type="radio"/> Absorb	<input type="radio"/> Constrain	<input type="radio"/> Extract	<input type="radio"/> Produce	<input type="radio"/> Divided Solid	<input type="radio"/> Effect
<input type="radio"/> Accumulate	<input type="radio"/> Cool	<input type="radio"/> Freeze	<input type="radio"/> Protect	<input type="radio"/> Field	<input type="radio"/> Application
<input type="radio"/> Bend	<input type="radio"/> Deposit	<input type="radio"/> Heat	<input type="radio"/> Purify	<input type="radio"/> Gas	<input checked="" type="radio"/> Both
<input type="radio"/> Break Down	<input type="radio"/> Destroy	<input type="radio"/> Hold	<input checked="" type="radio"/> Remove	<input type="radio"/> Liquid	
<input type="radio"/> Change Phase	<input type="radio"/> Detect	<input type="radio"/> Join	<input type="radio"/> Resist	<input checked="" type="radio"/> Solid	
<input type="radio"/> Clean	<input type="radio"/> Dilute	<input type="radio"/> Melt	<input type="radio"/> Rotate		
<input type="radio"/> Compress	<input type="radio"/> Dry	<input type="radio"/> Mix	<input type="radio"/> Separate		
<input type="radio"/> Concentrate	<input type="radio"/> Evaporate	<input type="radio"/> Move	<input type="radio"/> Vibrate		
<input type="radio"/> Condense	<input type="radio"/> Expand	<input type="radio"/> Orient			

Submit Query



# TRIZ – Function & effect database

Effects Database

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## 106 SUGGESTIONS FOR REMOVE SOLID

3D Printing	Conduction (electrical)	Electron Impact Desorption	Holes	Magnetic Field	Redox Reactions	Tidal Force
Ablation	Conservation of Momentum	Electropermanent Magnet	Hydrodynamic Cavitation	Magnetism	Reduction	Tribocorrosion
Abrasion	Corona Discharge	Electrophoresis	Hydrogen Peroxide	Melting	Resonance	Turbulence
Acoustic Cavitation	Crevice Corrosion	Electrostatic Discharge	Hydrogenation	Molecular Sieve	Reuleaux Triangle	Ultrasonic Vibration
Adsorption	Cryolysis	Electrostatics	Hydrophile	Ostwald Ripening	Smoke	Ultrasound
Aerobic Digestion	Cyclone Separation	Enzyme	Inertia	Oxidation	Solenoid	Vacuum
Anaerobic Digestion	Decomposition (biological)	Erosion	Ion Beam	Ozone	Solvation	Vibration
Arc Discharge	Desorption	Exothermic Reaction	Ion Exchange	Photo-oxidation	Sonochemistry	Weak Point
Briquetting	Detonation	Explosion	Ionisation	Photodissociation	Sorption	Wear
Brine Crystallization	Electret	Fermentation	Iontophoresis	Physisorption	Sound	Weathering
Catalysis	Electric Arc	Filter (physical)	Jet	Plasma	Sputtering	
Cavitation	Electric Glow Discharge	Friction	Jet Erosion	Pump	Sublimation	
Centrifugal Separation	Electrical Discharge Machining	Froth Floatation	Lamella	Pyrolysis	Suction	
Combustion	Electrohydrogenesis	Gettering	Laser	Pyrophoricity	Supercritical Fluid	
Condensation	Electrolysis	Gravitation	Laser Ablation	Radiation	Surfactant	
	Electron Beam	Heating	Liquid-Liquid Extraction	Radioactive Decay	Thermolysis	

### 3D Printing

The process of creating three dimensional objects from digital data using a materials printer, in a manner similar to printing images on paper. The term is most closely associated with additive manufacturing technology, where an object is created by laying down successive layers of material.

In the case of subtractive 3D Printing.

### Ablation

The removal of material from the surface of an object by vaporisation, chipping, or other erosive processes. The term occurs in space physics associated with atmospheric reentry, in glaciology, medicine and passive fire protection. In space vehicle design, ablation is used to both cool and protect mechanical parts and/or payloads that would otherwise be adversely affected by extremely high temperatures.

Through vapourisation of the ablated material.

### Abrasion

The process of scuffing, scratching, wearing down, marring, or rubbing away. It can be intentionally imposed in a controlled process using an abrasive.

### Acoustic Cavitation

Cavitation induced by an acoustic field. Microscopic gas bubbles which are generally present in a liquid will be forced to oscillate due to an applied acoustic field. If the acoustic intensity is sufficiently high, the bubbles will first grow in size, and then rapidly collapse. High power ultrasonics usually use the inertial cavitation of microscopic vacuum bubbles for treatment of surfaces, liquids and slurries.

### Adsorption

A process that occurs when a gas or liquid solute accumulates on the surface of a solid or a liquid (adsorbent), forming a film of molecules or atoms (the adsorbate). Most industrial adsorbents fall into one of three classes: 1. Oxygen-containing compounds (e.g. silica gel and zeolites) 2. Carbon-based compounds (e.g. activated carbon and graphite) 3. Polymer-based compounds


By adsorbing surface contaminants onto an adsorbent material. For example, wiping a surface with a cloth or sponge to remove moisture and/or dirt.

### Aerobic Digestion

A series of processes in which microorganisms break down biodegradable material in the presence of oxygen



# TRIZ – Function & effect database



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## 3D printing

From Wikipedia, the free encyclopedia  
(Redirected from 3d printing)

For methods of transferring an image onto a 3D surface, see *pad printing*. For methods of generating autostereoscopic lenticular images, see *lenticular printing and holography*.

**3D printing**, or **additive manufacturing**, is the construction of a three-dimensional object from a *CAD* model or a digital *3D model*.<sup>[1]</sup> The term "3D printing" can refer to a variety of processes in which material is deposited, joined or solidified under *computer control* to create a *three-dimensional object*,<sup>[2]</sup> with material being added together (such as plastics, liquids or powder grains being fused together), typically layer by layer.

In the 1980s, 3D printing techniques were considered suitable only for the production of functional or aesthetic prototypes, and a more appropriate term for it at the time was *rapid prototyping*.<sup>[3]</sup> As of 2019, the precision, repeatability, and material range of 3D printing have increased to the point that some 3D printing processes are considered viable as an industrial-production technology, whereby the term *additive manufacturing* can be used synonymously with *3D printing*.<sup>[4]</sup> One of the key advantages of 3D printing is the ability to produce very complex shapes or geometries that would be otherwise impossible to construct by hand, including hollow parts or parts with internal truss structures to reduce weight.

*Fused deposition modeling* (FDM), which uses a continuous filament of a *thermoplastic* material, is the most common 3D printing process in use as of 2020.<sup>[5]</sup>

Contents [hide]

1 Terminology

2 History

2.1 1940s and 1950s


2.2 1970s

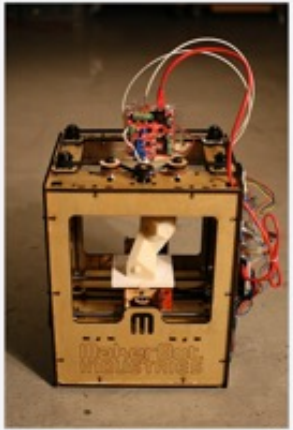
2.3 1980s

2.4 1990s

2.5 2000s

2.6 2010s





A three-dimensional printer

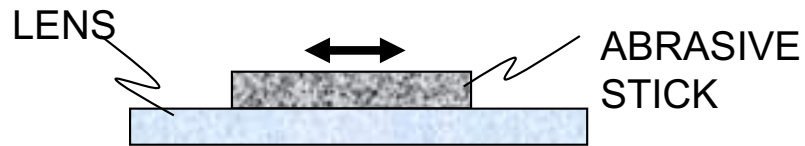
## See also

- 3D modeling
- 3D scanning
- 3D printing marketplace
- 3D bioprinting
- 3D food printing
- 3D Manufacturing Format
- 3D printing speed
- 3D Systems
- Additive Manufacturing File Format
- Actuator
- AstroPrint
- Cloud manufacturing
- Computer numeric control
- Delta robot
- Fusion3
- Laser cutting
- Limitless Solutions
- List of 3D printer manufacturers
- List of common 3D test models
- List of emerging technologies
- List of notable 3D printed weapons and parts
- Magnetically assisted slip casting
- MakerBot Industries
- Milling center
- Organ-on-a-chip
- Robocasting
- Self-replicating machine
- Ultimaker
- Volumetric printing

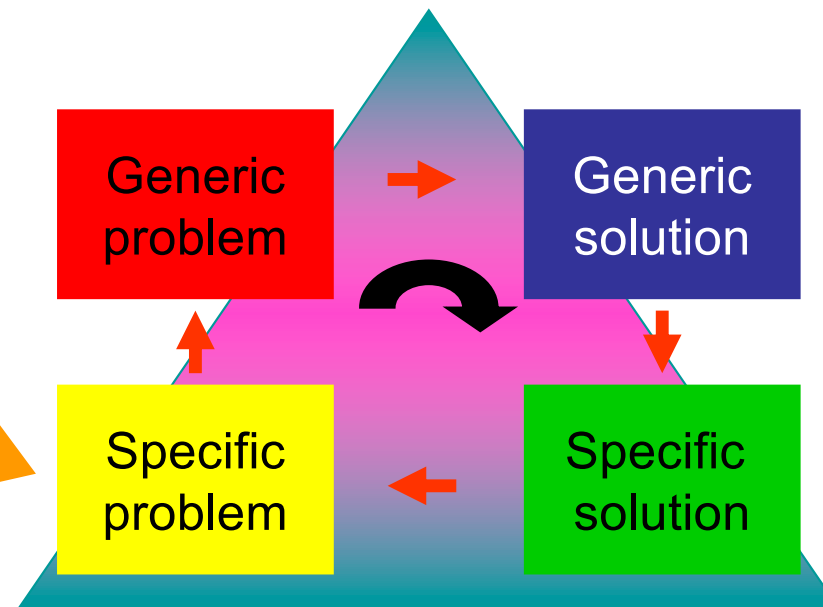
## References

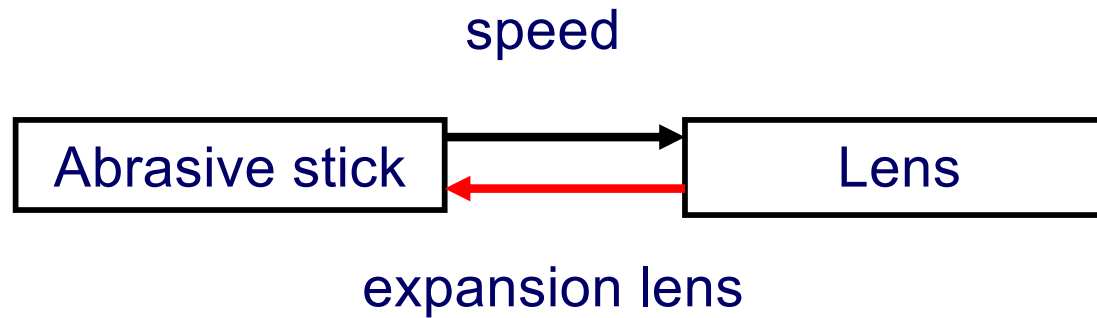
- <sup>1</sup> "3D printing scales up". *The Economist*. 5 September 2013.
- <sup>2</sup> Excell, Jon (23 May 2010). "The rise of additive manufacturing". *The Engineer*. Retrieved 30 October 2013.
- <sup>3</sup> "Learning Course: Additive Manufacturing – Additive Fertigung". *tmg-muenchen.de*.
- <sup>4</sup> "How Selective Heat Sintering Works". *THRE3D.com*. Archived from the original on 3 February 2014. Retrieved 3 February 2014.
- <sup>5</sup> Woern, Aubrey; Byard, Dennis; Oakley, Robert; Fiedler, Matthew; Snabes, Samantha (12 August 2018). "Fused Particle Fabrication 3-D Printing: Recycled Materials' Optimization and Mechanical
- <sup>6</sup> Belgrano, Fabricio dos Santos; Diegel, Olaf; Pereira, Nei; Hatt-Kaul, Rajni (2018). "Cell immobilization on 3D-printed matrices: A model study on propionic acid fermentation". *Bioresource Technology*. **249**: 777–782. doi:10.1016/j.biortech.2017.10.087. PMID 29136932.
- <sup>7</sup> Séquin, Carlo H. (2005). "Rapid prototyping". *Communications of the*

Objective: faster polishing a lens  
(production process)



What is the limited contradiction?





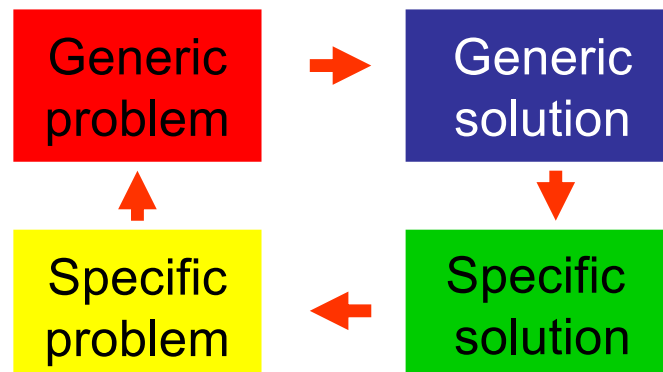
Improve?

SPEED

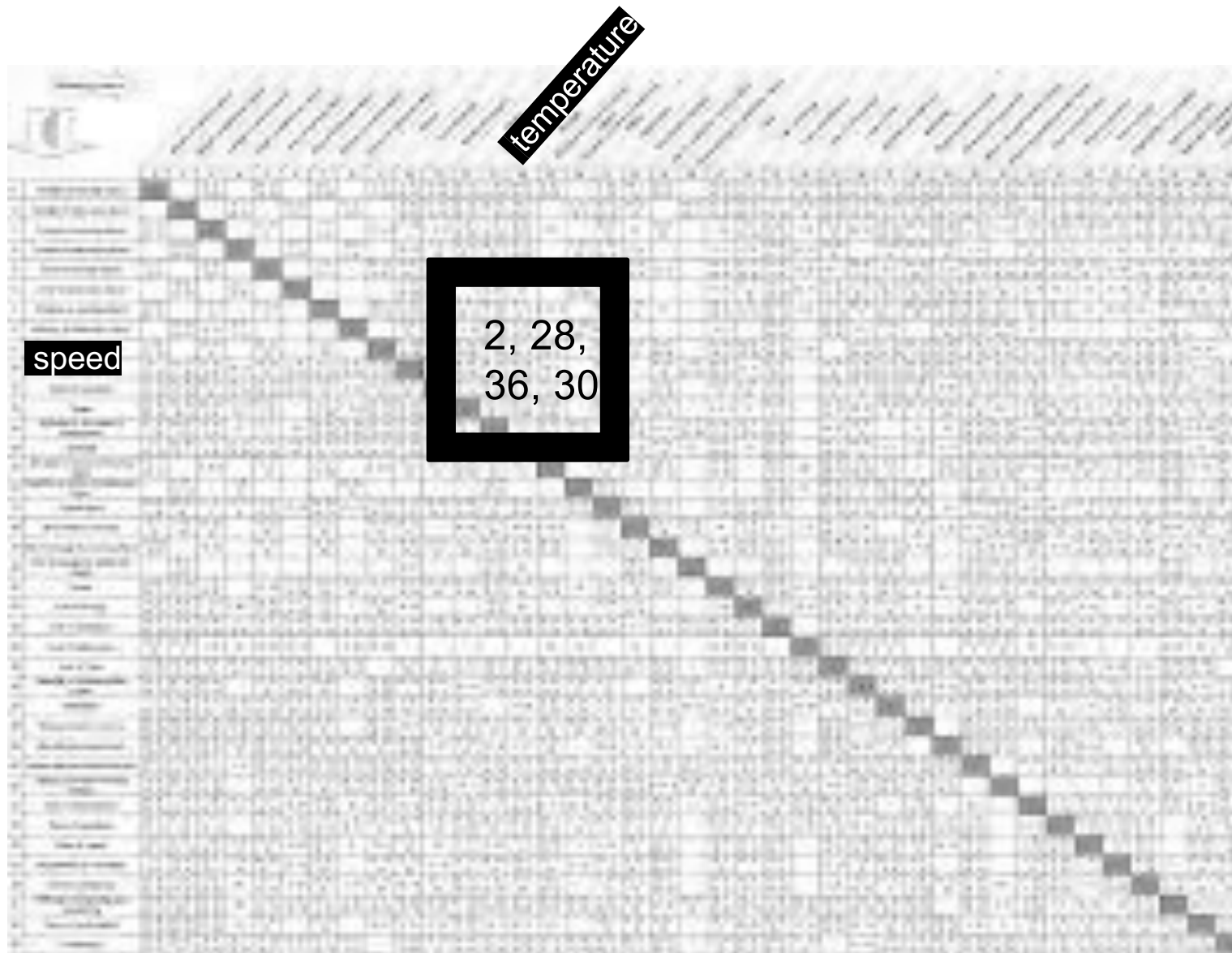
Worsening?

TEMPERATURE

The limiting contradiction is *speed* versus *temperature*.



# TRIZ – Contradiction matrix



# TRIZ - 40 Inventive Principles

- |                                 |                                |
|---------------------------------|--------------------------------|
| 1. Segmentation                 | 21. Skipping                   |
| 2. Take out                     | 22. 'Blessing in Disguise'     |
| 3. Local Quality                | 23. Feedback                   |
| 4. Asymmetry                    | 24. Intermediary               |
| 5. Combination                  | 25. Self-Service               |
| 6. Universality                 | 26. Copying                    |
| 7. 'Nested Doll'                | 27. Cheap/Short Living         |
| 8. Counterweight                | 28. Mechanics Substitution     |
| 9. Prior Counter-Action         | 29. Pneumatics and Hydraulics  |
| 10. Prior Action                | 30. Flexible Shells/Thin Films |
| 11. Prior Cushioning            | 31. Porous Materials           |
| 12. Equi-potentiality           | 32. Colour Changes             |
| 13. 'The Other Way Round'       | 33. Homogeneity                |
| 14. Spheroidality               | 34. Discarding and Recovering  |
| 15. Dynamics                    | 35. Parameter Changes          |
| 16. Partial or Excessive Action | 36. Phase Transitions          |
| 17. Another Dimension           | 37. Thermal Expansion          |
| 18. Mechanical Vibration        | 38. Strong Oxidants            |
| 19. Periodic Action             | 39. Inert Atmosphere           |
| 20. Continuity of Useful Action | 40. Composite Materials        |

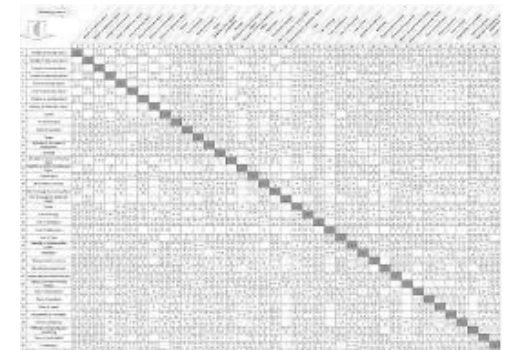


# Recommend principles to solve the problem

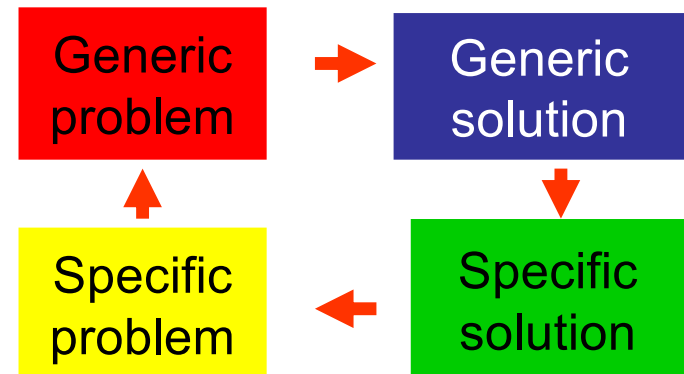
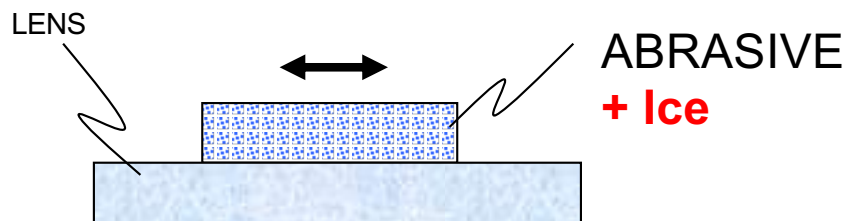
2.Taking Out  
28.Mechanics Substitution  
36.Phase Transition  
30.Flexible Shells & Thin Films



Abrasive + Ice



contradictionmatrix

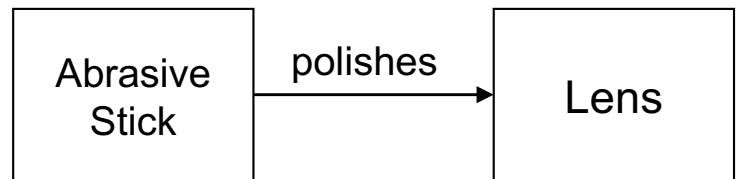


A useful solution for this process-problem

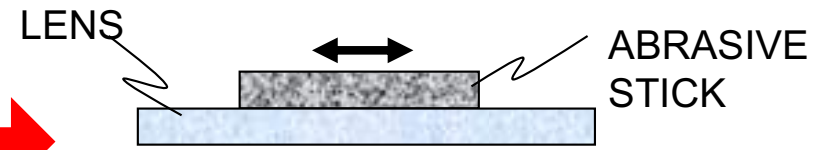
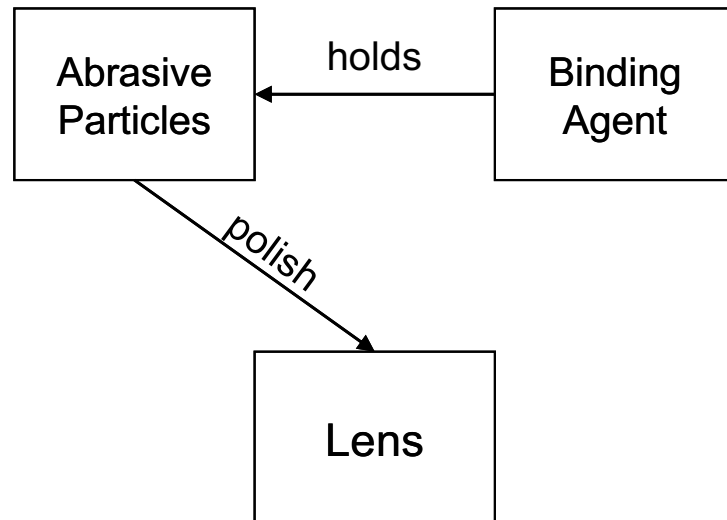


# Function / parameter Analysis - polishing lens

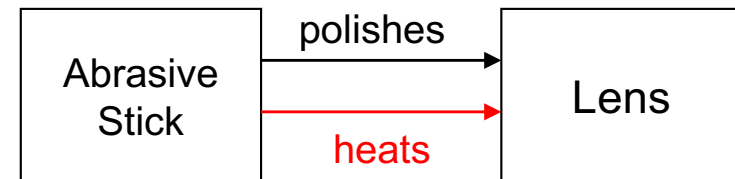
## Traditional View



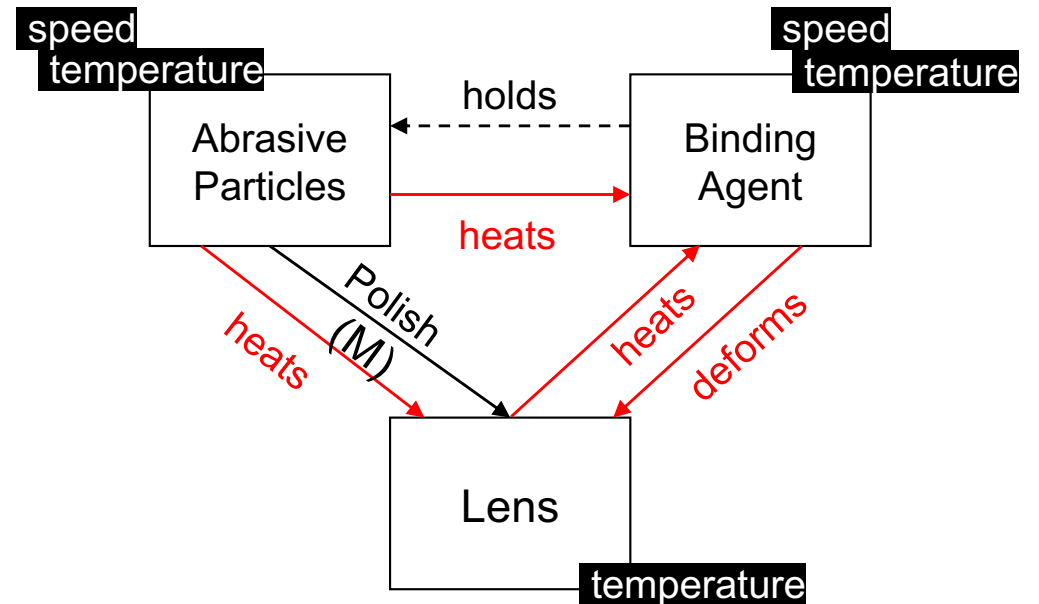
OR:



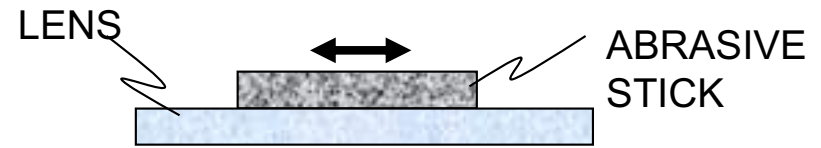
## TRIZ View



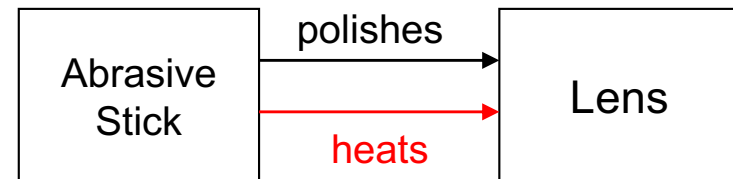
OR:



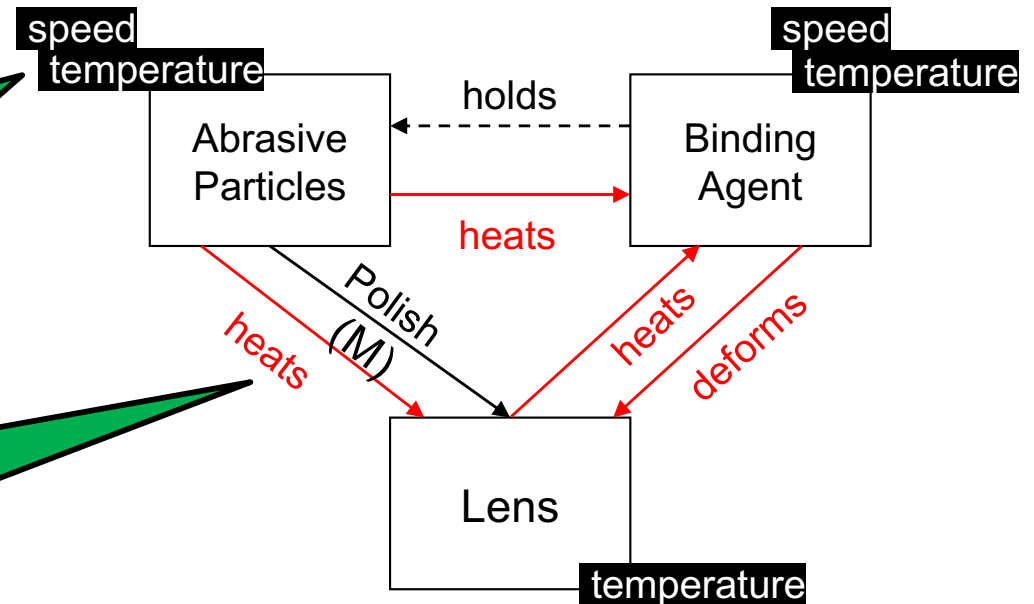
# Function / parameter Analysis - polishing lens



TRIZ View



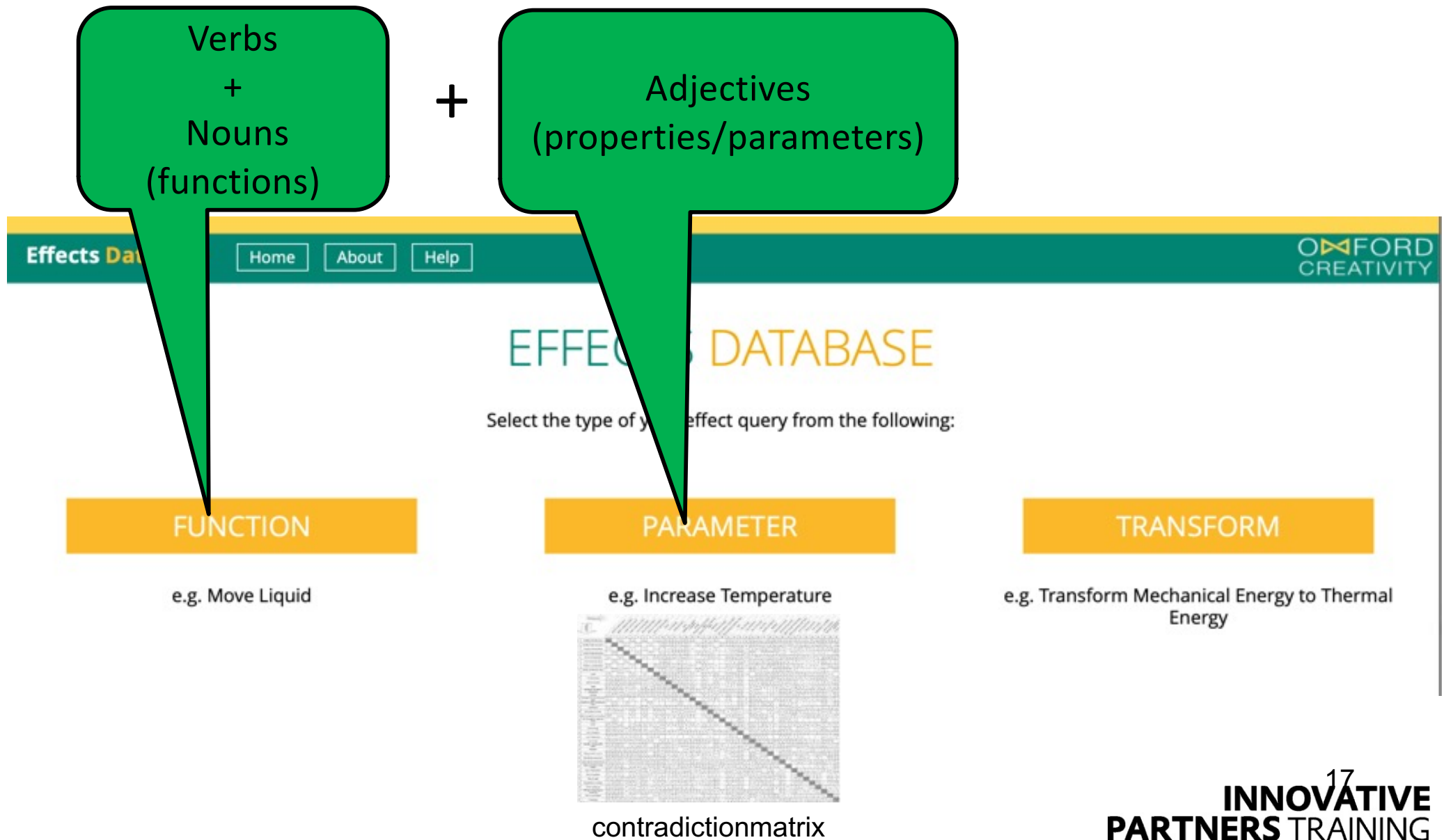
OR:



Adjectives  
(properties/parameters)

Verbs  
+  
Nouns  
(functions)

# TRIZ Tools



[PatentInspiration.com](http://PatentInspiration.com)

TRIZ based Tool



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DSM EVONIK TATA Unilever SIEMENS

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INNOVATIVE PARTNERS TRAINING



# Defining related key words acc. example "last mile"

The screenshot displays a patent search interface. At the top, a search bar contains the text "Patents with 'last mile' in Title, Abstract, Claims or Description". Below the search bar, there are filters for narrowing results. A button labeled "View 7525 patents" is highlighted with a red circle. The "Visual filter assistant" section shows four visualizations: a bar chart for "Publication date", a list of applicants including "CISCO TECH INC", "FUTUREWEI TECHN", "AT & T IP I LP", "HUAWEI TECH CO LT", and "ALCATEL LUCENT"; a world map for "Applicant country"; and a donut chart for "CPC Code".

AND OR NOT Patents with "last mile" in Title, Abstract, Claims or Description

Undo Redo History

Disable Edit Delete

Enter a keyword, applicant, inventor, code or number

**Narrow results:** ?

- ☐ Show only one patent per family: Select by text content
- ☐ Hide patents with empty title or abstract
- ☐ Show only patents that are granted
- ☐ Show only patents with images
- ☐ Show only patents with publication date between: 01/01/1900 - 01/01/2100

**View 7525 patents** Clear

Visual filter assistant

Publication date

Applicant

Applicant country

CPC Code

# Different views: list, detail & thumbnail

The image displays a patent database interface with three main views: list, detail, and thumbnail.

**List View (Top):** Shows a table of 7318 patents. The table has columns for Publication, Title, Publication Date, and Standardized Applicant. Red circles highlight the view toggle icons (list, detail, thumbnail) and the 'last mile' text in the title of the patent US2021150152A1.

**Detail View (Middle):** Shows the details of the patent US2021150152A1, titled "Controlling network access of customer-premises equipment". The abstract describes a system and computer-implemented method for controlling network access of customer-premises equipment. Red circles highlight the view toggle icons and the 'last mile' text in the abstract.

**Thumbnail View (Bottom):** Shows a grid of patent thumbnails, each with a title and a small image. Red circles highlight the view toggle icons and the 'last mile' text in the title of the patent US2021150152A1.

**Left Sidebar:** Contains filters for PUBLISHED, APPLICANT, INVENTOR, and CPC CODE. The PUBLISHED filter shows years from 2017 to 2021. The APPLICANT filter shows companies like CISCO TECH INC, FUTUREWEI TECHNOLOGIES, and AT & T IP LLP. The INVENTOR filter shows names like FORBES JR JOSEPH W, LUO YUANQIU, and EFFENBERGER FRANK J. The CPC CODE filter shows codes like H04L65/80, H04Q11/0067, and H04L67/02.

**Right Sidebar:** Contains filters for Claims, Description, Citations, and Family. The Claims filter shows a count of 2. The Description filter shows a count of 0. The Citations filter shows a count of 0. The Family filter shows a count of 0.

# Filter: Advanced search example

The screenshot displays a patent search interface with the following elements:

- Search Bar:** Contains the text "Patents with 'last mile' in Title, Abstract, Claims or Description".
- Buttons:** "Add filter" (circled in red), "Cancel", "CPC Lookup" (circled in red), and "Add selection" (circled in red).
- Filters:** "Keyword", "Applicant", "Inventor", and "CPC".
- Modal Window:** Titled "Cooperative Patent Classification", it lists various CPC codes with checkboxes. The following codes are selected:
  - ☒ B60 VEHICLES IN GENERAL
  - ☒ B62 LAND VEHICLES FOR TRAVELLING OTHERWISE THAN ON RAILS
- Visual Filter Assistant:** A bar chart showing the distribution of patents by publication date.
- Visual Filter Assistant:** A list of applicants: CISCO, FUTUREW, AT & T, HUAWEI, and ALCATEL LUCENT.
- Visual Filter Assistant:** A map showing the distribution of patents by applicant country.
- Visual Filter Assistant:** A pie chart showing the distribution of patents by CPC code.

# Filter: Advanced search example

The screenshot displays a patent search interface with the following elements:

- Search Bar:** Contains the text "Patents with 'last mile' in Title, Abstract, Claims or Description".
- Buttons:** "Add filter" (circled in red), "Cancel", "Undo", "Redo", and "History".
- Filters:** A list of filters including "B60 VEHICLES IN GENERAL" and "B62 LAND VEHICLES FOR TRAVELLING OTHERWISE THAN ON RAILS".
- CPC Lookup:** A section for looking up CPC codes.
- Keyword Search:** Tabs for "Keyword", "Applicant", "Inventor", "CPC Code", "IPC Code", "Number", and "All".
- Narrow results by filtering...:** A section with checkboxes for "show only one per family", "patents without empty title or abstract", "only applications that are granted", "only with images", and "Publication date".
- Results:** A button "View 7318 patents" and a "Clear" button.
- Visual filter assistant:** A section with four visualizations: "Publication date" (bar chart), "Applicant" (text list including CISCO TECH INC, FUTUREWEI TECHN, AT & T IP I LP, HUAWEI TECH CO LT, and ALCATEL LUCENT), "Applicant country" (world map), and "CPC Code" (donut chart).

# Analyze: Filter results

Undo Redo History

AND OR NOT Patents with "last mile" in Title, Abstract, Claims or Description Disable Edit Delete

AND OR NOT Patents with B60 children included OR B62 children included in CPC Codes Disable Edit Delete

Enter a keyword, applicant, inventor, code or number

Narrow results by filtering...

☐ show only one per family Order by text content

☐ patents without empty title or abstract

☐ only applications that are granted

☐ only with images

☐ Publication date Last 20 years, 10 years, 5 years

01-01-1900 - 01-01-2100

View 221 patents Clear

Visual filter assistant

Publication date

V2GREEN INC  
FORD GLOBAL TEC  
GRIDPOINT INC  
BRIDGES SETH W  
POLLACK SETH B  
KARLAN DAVID L

Applicant

Applicant country

CPC Code



# Refine: Filter results

**Edit filter** **Analyze patents**

**221 patents**

**PUBLISHED**

- ☐ 2021 (3)
- ☐ 2020 (36)
- ☐ 2019 (31)
- ☐ 2018 (24)
- ☐ 2017 (10)

**APPLICANT**

- ☐ V2GREEN INC (30)
- ☐ FORD GLOBAL TECH ... (29)
- ☐ GRIDPOINT INC (22)
- ☐ BRIDGES SETH W (14)
- ☐ POLLACK SETH B (13)

**INVENTOR**

- ☐ BRIDGES SETH W (43)
- ☐ POLLACK SETH B (42)
- ☐ KAPLAN DAVID L (31)
- ☐ GERHARDT TORSTEN (21)
- ☐ NEUGEBAUER JAMES (18)

**CPC CODE**

- ☐ Y02T10/7072 (70)
- ☐ Y02T90/14 (68)
- ☐ Y02T90/16 (67)
- ☐ Y02T10/70 (59)
- ☐ Y04S10/126 (57)

**IPC CODE**

- ☐ B62K15/00 (30)
- ☐ G05D1/02 (27)
- ☐ G06Q10/08 (26)
- ☐ B60L11/18 (20)
- ☐ G05D1/00 (15)

**FIG. 1**

**FIG. 1A**

**FIG. 1B**

**FIG. 1C**

**FIG. 1D**

**FIG. 1E**

**FIG. 1F**

**FIG. 1G**

**FIG. 1H**

**FIG. 1I**

**FIG. 1J**

**FIG. 1K**

**FIG. 1L**

**FIG. 1M**

**FIG. 1N**

# Narrow/broaden Filter results

The screenshot shows a patent search interface with several annotations. Red circles highlight the 'Add filter' button, the search input field containing '\*package delivery\*', and the 'Publication date' filter range '01-01-1900 - 01-01-2100'. Green callout boxes point to the search input and the date filter, containing the text 'Verbs + Nouns (functions)' and 'Adjectives (properties/parameters)' respectively. The interface includes a sidebar with navigation icons, a top bar with 'Undo', 'Redo', and 'History' buttons, and a main area with search filters and a 'Visual filter assistant' section.

AND OR NOT Patents with "last mile" in Title, Abstract, Claims or Description

AND OR NOT Patents with B60 children included OR B62 children included in CPC Codes

Add filter Cancel Find related terms

\*package delivery\*

Keyword Applicant Inventor CPC Code IPC Code Number All

Narrow results by filtering...

☐ show only one per family ☐ Order by text content

☐ patents without empty title or abstract

☐ only applications that are granted

☐ only with images

☐ Publication date

01-01-1900 - 01-01-2100

View 221 patents Clear

Visual filter assistant

Publication date

V2GREEN INC  
FORD GLOBAL TEC  
GRIDPOINT INC  
BRIDGES SETH W  
POLLACK SETH B  
KARLAN DAVID L

Applicant

Applicant country

CPC Code

Verbs  
+  
Nouns  
(functions)

Adjectives  
(properties/parameters)

# Narrow/broaden Filter results

The screenshot shows a patent search interface with several filter options highlighted by red circles:

- Filter 1:** Patents with "last mile" in Title, Abstract, Claims or Description. Operators: AND, OR, NOT.
- Filter 2:** Patents with B60 children included OR B62 children included in CPC Codes. Operators: AND, OR, NOT.
- Filter 3:** Patents with "package delivery" in Title or Abstract. Operators: AND, OR, NOT.
- Search Bar:** Enter a keyword, applicant, inventor, code or number.
- Narrow results by filtering...**
  - ☐ show only one per family
  - ☐ patents without empty title or abstract
  - ☐ only applications that are granted
  - ☐ only with images
  - Publication date: Last 20 years, 10 years, 5 years
  - 01-01-1900 - 01-01-2100
- View 1210 patents** (button)
- Visual filter assistant**
  - Publication date: Bar chart showing a peak in recent years.
  - Applicant: List of companies including UNITED PARCEL SERVICE OF AMERICA, INC., FORD GLOBAL TECHNOLOGIES, INC., GOOGLE INC, V2GREEN INC, GRIDPOINT INC, and IBM.
  - Applicant country: World map showing high concentrations in North America and Europe.
  - CPC Code: Donut chart showing a distribution of patent classes.

A warning message is displayed at the bottom:

**Warning**  
You can only analyze on a filter with maximum 100 000 patents. Please check your filter.  
[Go to filter](#)

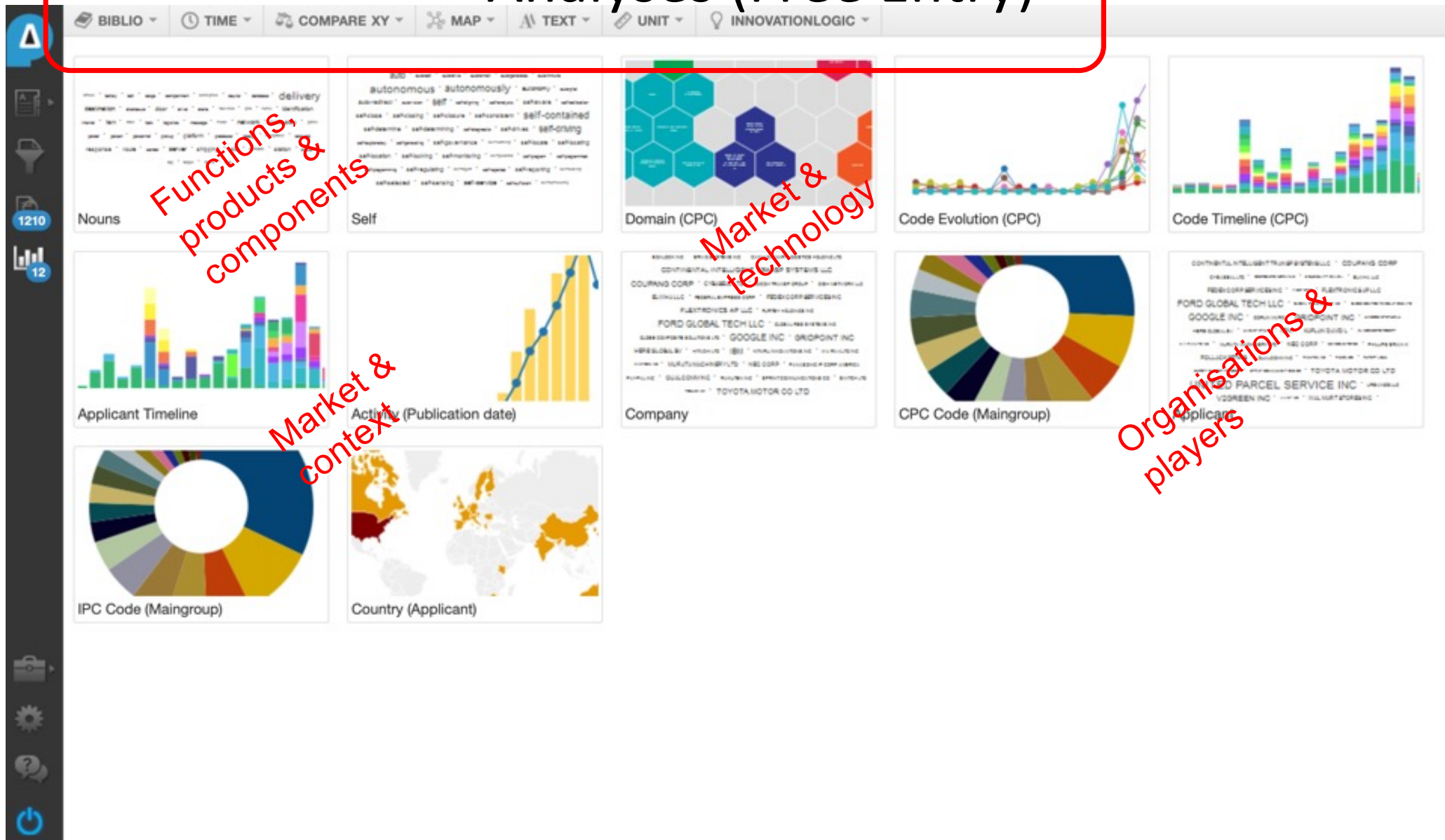
**Ok** (button)

# Process information: use the default analysis

1210 patents			
Publication	Title	Publication Date	Standardized Applicant
WO2021106045A1	Package delivery method, package delivery system, and delivery management device	3 Jun 2021	RAKUTEN INC
US2021134094A1	Automated physical package delivery with end-to-end package security	6 May 2021	DISH NETWORK LLC
US2021130114A1	Vehicle-Based Package Delivery And Alignment Systems And Methods	6 May 2021	FORD GLOBAL TECH LLC
US2021114729A1	Autonomous package storage and retrieval system using a drone	22 Apr 2021	LAITRAM LLC
US2021116936A1	Repurposing autonomous vehicles for package delivery	22 Apr 2021	MICRON TECHNOLOGY INC
AU2021100171A4	Biodegradable single use, temperature controlled esky type container for the delivery of cold chain temperatu...	15 Apr 2021	PAGDEN KENNETH LINDSA...
SG11202011953RA	Computerized systems and methods for facilitating package delivery	30 Mar 2021	COUPANG CORP
RO202000002U2	Logistic terminal for automated package delivery	30 Mar 2021	IMOBILIARE SOLUTIONS S...
US2021090020A1	In-transit package delivery	25 Mar 2021	IBM
US2021074107A1	Systems and methods for facilitating package delivery or pickup	11 Mar 2021	EICHENBLATT DAVID L
AU2020260497A1	Computerized systems and methods for facilitating package delivery	4 Mar 2021	COUPANG CORP
TW202109400A	Package distribution system and method thereof	1 Mar 2021	UNIV NAN KAI TECHNOLOGY
US2021056495A1	Systems and methods for providing proactive regulatory compliance services for packages potentially contai...	25 Feb 2021	UNITED PARCEL SERVICE ...
US2021056494A1	Online system for facilitating delivery of packages via drone delivery	25 Feb 2021	YANGOURAZOV ALBERT D...
KR20210020716A	Computerized systems and methods for facilitating package delivery	24 Feb 2021	COUPANG CORP
WO2021028742A1	Computerized systems and methods for facilitating package delivery	18 Feb 2021	COUPANG CORP
US2021049549A1	Computerized systems and methods for facilitating package delivery	18 Feb 2021	COUPANG CORP
US2021042697A1	Systems and methods for providing personalized delivery services	11 Feb 2021	UNITED PARCEL SERVICE ...
US2021031370A1	Shipping system and control system for secure package delivery	4 Feb 2021	SPURGEON DANIEL A
US2021034847A1	Autonomous Delivery Vehicle	4 Feb 2021	ROBOTIC RES LLC
US2021031860A1	Chassis for Electric Cargo Vehicles and Electric Vehicle Comprising Said Chassis	4 Feb 2021	PASSION MOTORBIKE FAC...
US2021033131A1	Rotating tension latch	4 Feb 2021	OLIVER JAVIER E
WO2021022122A1	Shipping system and control system for secure package delivery	4 Feb 2021	SPURGEON DANIEL A
CN112278457A	Full-automatic express package delivery assembly line	29 Jan 2021	ZHEJIANG KECANG INTEL...
US2021025728A1	Decentralized lmv charging infrastructure	28 Jan 2021	VOLKSWAGEN AG
US2021026378A1	System and method of last mile delivery	28 Jan 2021	MOTOGO LLC
US2021022536A1	Systems and methods for secure package delivery and retrieval	28 Jan 2021	ANDERSON JERRY
CN112258289A	Full-automatic intelligent packaging, delivering and sorting system and method thereof	22 Jan 2021	ZHEJIANG KECANG INTEL...
US10881233B1	Through-hole package delivery assembly and related methods	5 Jan 2021	WAI SH PATRICK R



# Analyses (Free Entry)





# Analysis

**Nouns**

99.83%

absence • accessory • accident • acquisition • addressee • adhesive • administration • advertising • agc

agency • aircraft • alarm • algorithms • analysis • animals • antenna • aperture • app • apparatuses

arm • article • aspect • attention • audio • authorization • autonomy • availability • axle • background

bag • bar • barcode • barrier • basis • battery • beacon • behavior • belt • bench • benefit

bicycle • bidding • bill • bins • blade • bobbin • bolt • bot • bracket • bulk • bus • business • buyer

buying • cabin • cabinet • cable • cam • camera • candidates • capacity • car • carbohydrates

carbon • card • care • cargo • carriage • cash • catalysts • categories • cavity • chain • chassis

circuitry • city • class • classification • client • closure • cloud • cluster • coin • commerce • commodity

company • comparison • compartment • compliance • conjunction • consideration

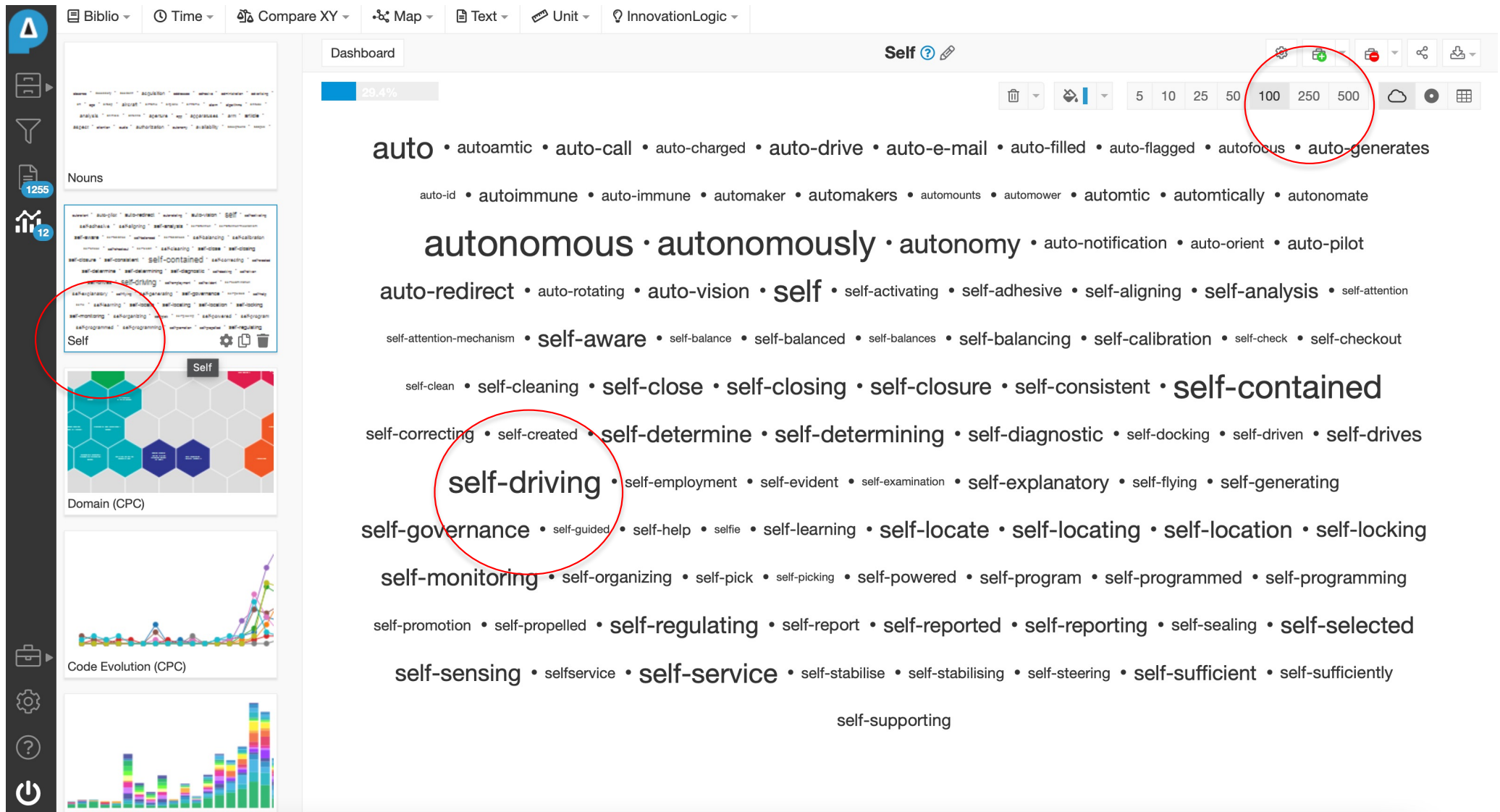
consignee • consignor • conspicuousness • consumption • context • conversion • conveyer

conveyor • cord • corner • counter • counterweight • courier • course • coverage • crane • creation

credential • credit • criteria • cross-docking • curbside • custody • cycle • database • date • day

decisions • deck • decrvotion • deliverability • deliverer • deliverman • deliver-man • department

# Analysis



# Analysis

Navigation: Biblio | Time | Compare XY | Map | Text | Unit | InnovationLogic

self-driving (49 patents)

HIGHLIGHTING ?

- Filter terms
- Analysis terms
- + Add

Publication	Title	Publication Date	Company
US2021205982A1	Modular autonomous bot apparatus assembly for transporting an item being shipped	8 Jul 2021	FEDEX CORP SERVICES INC
US2021201052A1	Method and apparatus for predicting intent of vulnerable road users	1 Jul 2021	FEDEX CORP SERVICES INC
US2021122033A1	Modular autonomous bot apparatus assembly for transporting an item being shipped	29 Apr 2021	FEDEX CORP SERVICES INC
US2021116907A1	Device, System, and Method of Autonomous Driving and Tele-Operated Vehicles	22 Apr 2021	DRIVEU TECH LTD
US2021086577A1	Vehicle	25 Mar 2021	INNOVATIVE DRAGON LTD
US2021080953A1	Micro autonomous vehicle with exchangeable utility pods	18 Mar 2021	FORD GLOBAL TECH LLC
US2021061124A1	Mobile modular battery charging and exchange system	4 Mar 2021	HONDA MOTOR CO LTD
US2021046829A1	Systems and methods for mobile charging of electric vehicles	18 Feb 2021	TOYOTA ENG & MFG NORT...
US2021022536A1	Systems and methods for secure package delivery and retrieval	28 Jan 2021	ANDERSON JERRY
US2020364953A1	Systems and methods for managing vehicle data	19 Nov 2020	SIMOUDIS EVANGELOS
US10834523B1	Identification of delivery zones for autonomous vehicles, rovers, and drones	10 Nov 2020	RAO SANJAY K
US2020338624A1	Bend-formed load-bearing structure of a passenger car	29 Oct 2020	OUTOKUMPU OY
US10783559B1	Mobile information display platforms	22 Sep 2020	TRAN HA
US2020276990A1	Integrated urban mobility system	3 Sep 2020	ITALDESIGN GIUGIARO SPA
US2020230822A1	Multi-use mobile robot and methods of use	23 Jul 2020	FORD GLOBAL TECH LLC
US10694078B1	Motion sickness reduction for in-vehicle displays	23 Jun 2020	VOLVO CAR CORP
US2020193371A1	Method and System for Providing an On-Demand Package Delivery Service by Generating an Indicator betwe...	18 Jun 2020	JEAN CHARLES OLDINE
US2020183414A1	Automated vehicle for autonomous last-mile deliveries	11 Jun 2020	DOORDASH INC
US2020101981A1	Method and system for impaired driving detection, monitoring and accident prevention with driving habits	2 Apr 2020	PHILLIPS BRIAN K
US2020070717A1	Vehicle with context sensitive information presentation	5 Mar 2020	ZUME INC
US2019342702A1	System, Device, and Method of Secure Location-Aware Garage Door Actuation for Efficient Delivery of Packages	7 Nov 2019	OLIBRA LLC
US2019283648A1	Modular Auxiliary Power Module for a Modular Autonomous Bot Apparatus that Transports an Item Being Ship...	19 Sep 2019	FEDEX CORP SERVICES INC
US2019283252A1	Methods of Performing an Inventory Management Related Dispatched Logistics Operation for an Inventory It...	19 Sep 2019	FEDEX CORP SERVICES INC
US2019283240A1	Detachable Modular Mobile Autonomy Control Module for a Modular Autonomous Bot Apparatus that Transpo...	19 Sep 2019	FEDEX CORP SERVICES INC
US2019283230A1	Modular Mobility Base for a Modular Autonomous Logistics Vehicle Transport Apparatus	18 Sep 2019	FEDEX CORP SERVICES INC

Domain (CPC)

Code Evolution (CPC)

Code Timeline (CPC)



# Analysis

The screenshot displays the InnoVision platform interface. At the top, a navigation bar includes tabs for BIBLIO, TIME, COMPARE XY, MAP, TEXT, UNIT, and INNOVATIONLOGIC. A large red arrow points down to the 'Analysis' section. The main content area is titled 'self-driving (1 of 41 patents)' and features a table with columns for Title, Abstract, Claims, and Description. The table lists two patents: 'last\* mil\*...' and 'self\*-driv\*'. To the right of the table, there are filters for 'Filter Hits' and 'User Defined Hits'. Below the table, the 'Analysis Hits' section shows a search for 'self\*-driv\*' with 1 hit. On the left sidebar, there are various tool icons and a 'Self' section with a red circle around it. Below the 'Self' section, there are visualizations for 'Domain (CPC)' and 'Code Evolution (CPC)'. The main content area also includes a section for 'Systems and methods for secure package delivery and retrieval' with an abstract and a diagram labeled 'Figure 1'.

Title	Abstract	Claims	Description
last* mil*...	1	0	4
self*-driv*	0	0	1

**Systems and methods for secure package delivery and retrieval**

**Abstract**

Systems and methods for smooth attended or unattended package delivery and retrieval may be provided through a container locker. Delivery companies and their respective delivery means may interact with the container locker wirelessly, through handheld devices, or through mechanisms provided on the container locker itself. The processes of receiving or pickup of a parcel or other item may be facilitated, regardless the user's presence or absence from the delivery/pickup location. Systems and methods may receive, secure, maintain, and temporarily house delivery or pickup items and concomitantly document, verify, confirm, and communicate data in varied forms to the parties interested or engaged in such deliveries or retrievals through a variety of connected networks, communication means and the use thereof.

**Figure 1**

1. A container locker comprising:  
a first cavity that accepts or holds one or more parcels;  
a second cavity positioned below the first cavity, the second cavity having a ceiling that provides a cushioned surface for the first cavity to receive the one or more parcels, a scale, and a scale deck to weigh the one or more parcels;  
a third cavity that houses mechanical and electrical equipment for operation of the container locker; and  
a lockable lid that removably covers the first cavity.

2. The container locker of claim 1, the second cavity further comprising:  
a drop-cushion spring system positioned below the ceiling.

3. The container locker of claim 1, wherein the mechanical and electrical equipment in the interior or exterior of the container locker comprises one or more of the following:  
refrigeration equipment, heating/warming equipment, cellular phones and related cellular technology communication and interface devices, on-board single board computers and other computers and interface devices, 4G, 5G (and future versions of these protocols) repeater(s) or relay modules to complete 4G 5G (including contemplated future versions thereof) networks and communication systems, interior and exterior cameras, scanners and optical devices, USB and other computer interface connection ports, Wi-Fi repeaters and boosters, antennas and transmitter and transceiving devices, communication and uplink modules, equipment and devices, electrical cords and plugs and related powering and charging equipment, batteries, battery wall sockets, and other power supply.





# Your own project (key words)!

The screenshot shows a patent search interface. At the top, there's a search bar with the text "Patents with **surfboard** in Title or Abstract". A red arrow points from the word "surfboard" in the search bar to the word "surfboard" in the search results table. The interface includes a sidebar with navigation icons, a top bar with "Undo", "Redo", and "History" buttons, and a main area with search filters and results.

**Search Bar:** AND OR NOT Patents with **surfboard** in Title or Abstract

**Enter a keyword, applicant, inventor, code or number**

**Narrow results:** ?

- ☐ Show only one patent per family: Select by text content
- ☐ Hide patents with empty title or abstract
- ☐ Show only patents that are granted
- ☐ Show only patents with images
- ☐ Show only patents with publication date between: 01/01/1900 - 01/01/2100

**Visual filter assistant**

- Publication date
- Applicant
- Applicant country
- CPC

**3723 patents**

Publication	Title	Publication Date	Standardized Applicant
CA3103528A1	Self-propelled hydrofoil <b>surfboard</b>	5 Jul 2021	MSLR ELECTRIC INCORP...
AU2019283772A1	A <b>surfboard</b>	1 Jul 2021	CAMPBELL, STUART DOU...
WO202111926A1	A <b>surfboard</b> and spring assembly	24 Jun 2021	CAMPBELL, STUART DOU...
US2021179236A1	Fins with improved fluid dynamic properties	17 Jun 2021	FLYING FIN SYSTEMS PTY...
US2021171160A1	Rotational leash plug system for surf boards	10 Jun 2021	DELAUDER JOHN
US11027584B1	Flying car with fore and aft tilting surfaces	8 Jun 2021	KICENIUK, JR TARAS
ES2831549A1	REMOVABLE SURF BOARD (Machine-translation by Google Translate, not legally binding)	8 Jun 2021	UNIV MADRID POLITECNICA
US2021162287A1	Surfing simulation device and surfing simulation method	3 Jun 2021	BEIJING XIAOMI MOBILE ...
EP3828689A1	Surfing simulation device and surfing simulation method	2 Jun 2021	BEIJING XIAOMI MOBILE ...
US11021218B1	Apparatus and method to aid water sport board maneuvers	1 Jun 2021	BLOCKER ROBERT RAY
AU2021202732A1	Electrically Powered, Water-Jet Propelled <b>Surfboard</b>	27 May 2021	RADINN AB
WO202109654A1	<b>Surfboard</b> propelled with a reciprocating mechanism	27 May 2021	AGUSTIN CARMONA UTR...
KR102254113B1	<b>Surfboard</b> manufacturing method and manufacturing apparatus thereof using vacuum forming	20 May 2021	VERBEX CO LTD
KR102254112B1	Water leisure <b>surfboard</b>	20 May 2021	VERBEX CO LTD
WO2021093052A1	Modular water sports device	20 May 2021	SHENZHEN WAYDOO INT...
US2021147040A1	Motorized <b>Surfboard</b> Fin and Remote Control	20 May 2021	BOOST SURF INC
US2021147041A1	<b>Surfboard</b> with handle	20 May 2021	WBV WEISENBURGER BA...
US2021147042A1	Inflatable <b>Surfboard</b> Having a Drive Unit	20 May 2021	WBV WEISENBURGER BA...
EP3822158A1	Electric <b>surfboard</b>	19 May 2021	JETWAKE CO LTD
US2021139114A1	Electric <b>surfboard</b>	13 May 2021	JETWAKE CO LTD
WO2021085719A1	Electric <b>surfboard</b>	6 May 2021	CHOI SOON GIL
AU2020104417A4	<b>Surfboard</b> carrier	6 May 2021	HOMESWOOD DANIEL
US2021129947A1	Novel Waterboard	6 May 2021	REIFSNYDER ADRIAN PE...
EP3815977A1	Roof rack structure	5 May 2021	FORMOSA SAINT JOSE G...
GB202103734D0	<b>Surfboard</b> and method of construction	26 Apr 2021	MARTINEZ SEBASTIAN DA...
US10888218B1	<b>Surfboard</b> and method of construction	27 Apr 2021	MARTINEZ SEBASTIAN DA...

More explanation/video's on Patentinspiration.com  
questions via email [gertjan@innovativepartners.nl](mailto:gertjan@innovativepartners.nl)



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