



The

# **PatentMatrix**

## Dashboard

Simplify Patent Analysis with  
This Innovative Tool



InQuartik

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## Patent Analysis: Then and Now

Whether it is to have the right product development strategy, to deploy the patent portfolio worldwide, or to monetize the patent assets, people who work in this field have developed all kinds of analysis and management methodologies such as patent landscape, state-of-the-art analysis, competitive intelligence, freedom-to-operate, patent due diligence, as well as patent portfolio management.

While conducting these analyses, people usually use the pivot table in Microsoft Excel. We cannot deny that Microsoft Excel is one of the most popular software globally, but when it comes to the patent world, not everyone is satisfied with the operation or usability.

The most common issue is that multiple tools are often required for the complete analysis. Besides, you may need to organize multiple data fields in a spreadsheet, and spend a lot of time managing data integrity and accuracy; once all of these menial tasks have been completed, you may no longer have enough time for the actual data analysis.

To speak plainly, Excel may be considered an all-purpose general tool; however, in the patent world, it is necessary to have a more purpose-oriented tool for all scenarios. InQuartik's [Patent Vault](#), along with the **PatentMatrix Dashboards**, is the right tool for every patent professional in every scenario. It reduces the use of multiple tools and increases the speed of your analysis, allowing you more time to reflect and plan your next steps.

### **These tedious processes made patent work even more complicated:**

- Emails needed to communicate
- Cloud storage services needed to share patent list files and analysis with colleagues
- Excel needed to organize the data and conduct analysis

## What is the PatentMatrix Dashboard?

When it comes to patent data, basic statistical charts do have their place, especially when it comes to calculating one dimension of the data.

However, when it comes to categorizing by industry, product, or technology, basic charts often fall short of the task. This is where a pivot table comes into play.



Not just any pivot table will do. What is needed is a **PatentMatrix Dashboard**, with the robust capabilities required to handle a wide range of data and several types of categories.

# More Powerful Than a Pivot Table

## Completely Customizable Patent Analysis Data

**“ To make effective patent analysis a reality, a PatentMatrix Dashboard is needed. ”**

This Matrix allows certain data aspects—such as the product or technology—to be visualized clearly by integrating them into a pivot table, representing patent data in a hierarchical way.

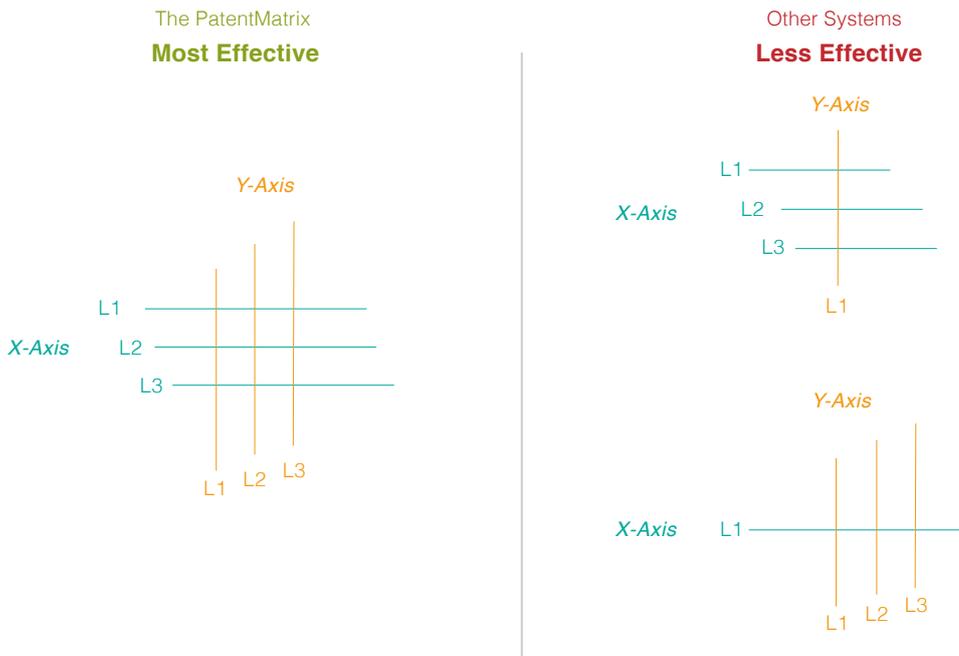
**“ The key is to make the data or fields in the PatentMatrix Dashboard entirely customizable for the user. ”**

Ease of use is essential. Instead of forcing users to attempt to do this on their own—as was necessary in the past—the customization of the data must be incorporated right into the Matrix and should be achievable in just a few clicks.

## Combined Hierarchical Processing

By utilizing hierarchical processing—such as a tree structure—patent data can be organized by product, technology, or field of application, for example.

This information on its own, however, does not provide much meaning. It is only when this data is combined with other data sets that it starts to provide insights through patent analysis.



Hierarchical processing vs. other systems



## Effective in Every Aspect of Patent Work

The **PatentMatrix Dashboard** can be an effective tool in just about every type of patent search activity, including (but not limited to):

- Freedom-to-Operate (Patent Clearance) Search
- State-of-the-Art (Patent Landscape) Search
- Competitive Intelligence and Patent Portfolio Management
- Patent Due Diligence

### Freedom-to-Operate (Patent Clearance) Search

*A Freedom-to-Operate Search, also known as a Patent Clearance Search, is used to discover whether it is safe to sell your products or services in a country that may already have patents owned by a third-party, and that may have claims that contain your product or service.*



By searching related patents in that country, you are able to lower the infringement risks and prevent wrongful investments.

The **PatentMatrix Dashboards** help applicants manage their risk by offering an overview of the technologies vs. global deployment. It gives patent professionals a better understanding of what kind of products and technologies have been applied for in specific countries.

Additionally, the **PatentMatrix Dashboards** allow you to examine filing years, patent quality, patent value, or other data in the second axis of the same dashboard, thus offering more insights at the same time. By means of this, applicants can have a bigger picture of their patent application strategy than merely a freedom-to-operate search.

### State-of-the-Art (Patent Landscape) Search

*A State-of-the-Art Search, or Patent Landscape Search, aims to uncover every known publication or patent to identify business opportunities for products or services. It helps to minimize investment errors and helps with the development of the most feasible product or technology roadmap.*

The **PatentMatrix Dashboards** also help to solve these questions: *What is the most up-to-date progress of certain technologies? Who developed the state-of-the-art? How can we develop our business blueprint based on the search results?*

Nowadays, a technology may evolve and comprise more and more sub-domain

technologies. How can we accurately analyze technology fusion?



With competitive intelligence and our proprietary analysis structure, we can tear down technology fusion into subdomain technologies and analyze them by technologies to realize the trend and the future applications of these technologies.

## Competitive Intelligence and Patent Portfolio Management

*Competitive intelligence focuses on the dynamics of the major competitors in the same target market. The purpose of conducting this type of research may help you to know more about the competitor's patent deployment strategy. Most importantly of all, you can figure out your own patent deployment roadmap based on the status of the competition.*

The **PatentMatrix Dashboards** help patent professionals to easily categorize, examine, and compare their competitors' patent portfolios by different aspects such as the countries, filing years, patent quality, patent value, technologies, fields of application, and products, to name but a few.

It is also important to mention that competitive intelligence is often combined with patent

portfolio management. Since the ultimate goal of conducting competitor intelligence is to develop your own patent deployment roadmap, effectively developing and managing the patent portfolio at every stage of the patent lifecycle becomes an issue.



In our other two white papers: ["Patent Portfolio Management: Then and Now"](#) and ["Patent Lifecycle Management: What, Why and How?"](#) we offer detailed explanations about these initiatives and use practical case studies to reflect their usage and benefits.

## Patent Due Diligence

*The most common issue that people are faced with when buying, licensing or pledging patents is not knowing the true patent quality and value. Furthermore, they can not plan an advantageous strategy to negotiate with the sellers, licensors or pledgers, eventually being unable to reach a fair deal.*

Patent due diligence is a must for every patent transaction activity to realize the real

strengths and weaknesses of a patent portfolio used for buying, licensing, or pledging. The **PatentMatrix Dashboards** help evaluate the patent portfolio's strengths and weaknesses by utilizing the two-level axis to customize the data you want to analyze. On the other hand, the **PatentMatrix Dashboards** also help patent sellers, licensors and pledgers to have a better way of analyzing their patent portfolios, and, in the long run, to know how to monetize their patent portfolios more effectively.



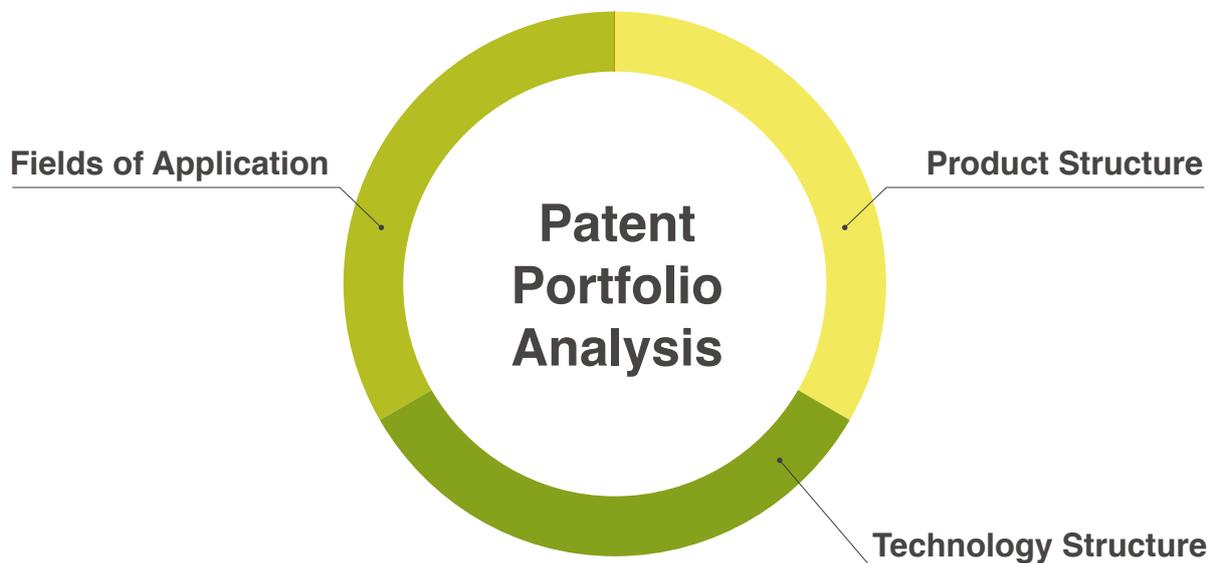
Because the **PatentMatrix Dashboards** present meaningful information in clear, easy-to-read tables, it is easy for both IP professionals and business leaders alike to grasp the patent analysis insights it provides.

# How to Perform a PatentMatrix Dashboard Analysis

## The Analysis Structure

In our [“Patent Portfolio Management: Then and Now”](#) white paper, we defined what "patent portfolio management" really is, and highlighted that patent analysis is at the core of any well-managed patent portfolio. Analyzing patents requires a thorough understanding of the structure of the portfolio — let's see how to do it with the **PatentMatrix Dashboard**.

Firstly, "technology structure," "product structure," and "fields of application," form the core of patent portfolio management analysis. Specifically, any analytics should be based on these three dimensions in order to obtain comprehensive results.



Generally speaking, when a technology is developed, it aims to cover several target fields of application. As a result, when a patent application is filed, it is necessary to consider how to protect the invention and its fields of application through the patent's specification and claims.

A patent is a combination of claims—so, when conducting any analysis, we should take a closer look at each independent claim. Since an independent claim itself represents a target field of application, this type of examination can assist in finding out the technical solutions of each invention and how to discover the most significant benefits they bring.

**“ Is it the most cost-effective solution? Is it the best performing method?  
Will it result in a higher yield rate? ”**

By understanding the essentials of the patent via a thorough [claims analysis](#), we can start to see patent portfolio management from a broader perspective.

## Other Metrics for the Analysis

In addition to the above metrics, tens of data fields enable you to conduct the analysis, including the Party (applicant, inventor, agency, etc.), Date, Classification, Quality Ranking, Value Ranking, Patent Office, Legal Status, and Assignment Records, to name but a few.

With the primary analysis structure, further metrics, and the two-level axis structure that can contain four metrics on the same chart, analysts can access all kinds of patent intelligence from the **PatentMatrix Dashboard**.

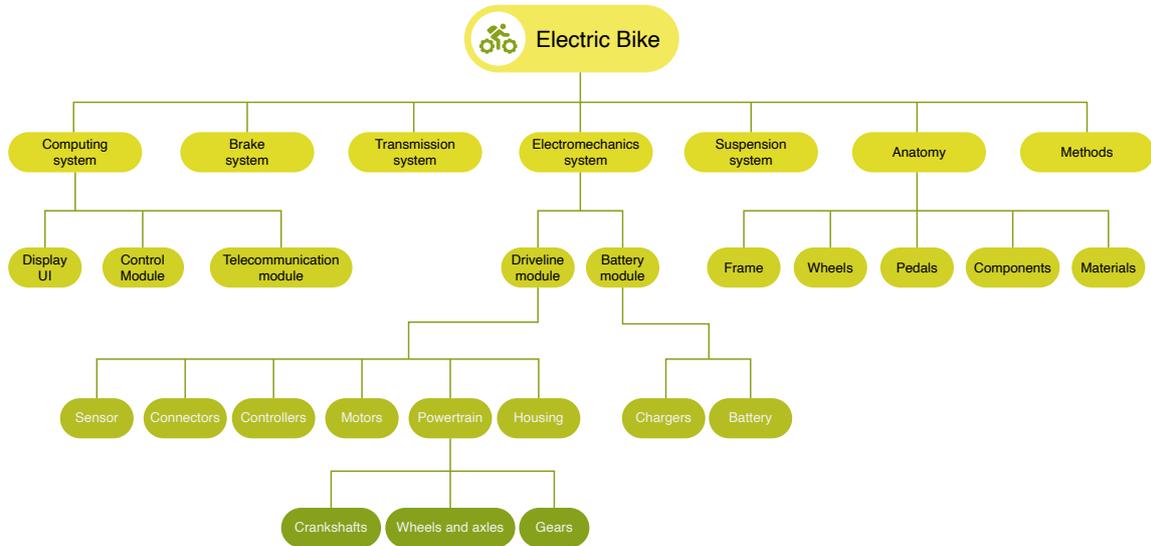
## Data Grouping

To expand a patent portfolio analysis based on the three-pillar structure as seen above, we need to categorize the patents into different technologies, products, or fields of application.

To illustrate this point, we can examine a few of the analyses that have been conducted by our partners at [WISPRO](#). The first focuses on electric bicycle patents filed at the EPO.

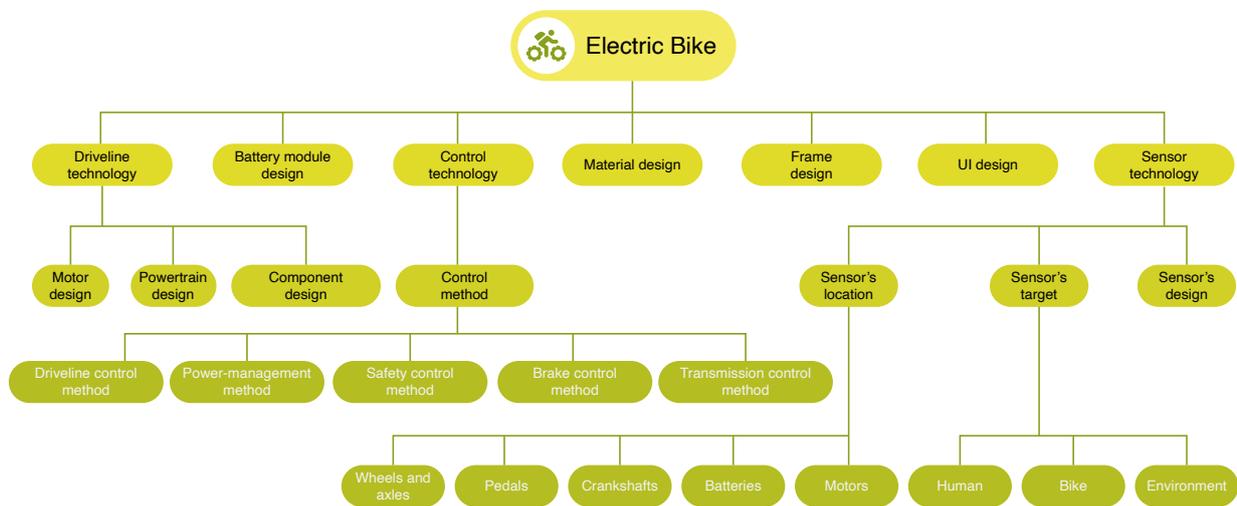


In this specific analysis, the patents are grouped by both the product structure and the technology structure. From a product perspective, WISPRO's experts virtually tore down this product and divided it into smaller subsystems, such as the electric system, the computing system, the brake system, the suspension system, and so on.



*The product structure of the electric bike*

As for the technology structure, the patents were categorized according to the technologies that they presented or disclosed, such as the technologies behind the batteries, motors, sensors, materials, and interfaces, among many others. By analyzing these patents through different perspectives, the overall evaluation process of the patent portfolio can become much easier.



*The technology structure of the electric bike*

As mentioned earlier, analyzing the patents by taking a thorough look at their independent claims is highly suggested. In fact, while doing so, we may discover that a claim contributes to more than one category in the product structure or technology structure—which is quite common in this type of analysis.

Another important aspect that should be mentioned is that by operating in this way, it will be easier to confirm the patent's subject matter, which could be a method of manufacture or an object.

## Combining the Data Sets

After the categorization has been completed, it can be visualized by utilizing the **PatentMatrix Dashboard**. The visualization options available for this specific case are as follows:

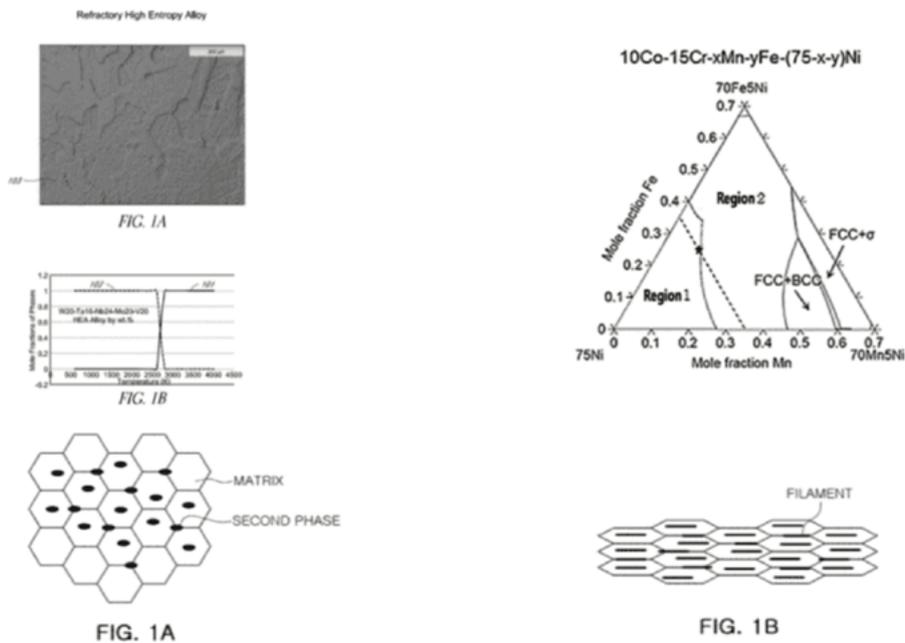
Product vs. Technology—By reviewing the **Product vs. Technology PatentMatrix Dashboard**, we can observe the patents' distribution in this industry. We can also see what kind of product is protected with the largest amount of patents.

	▶TECHNOLOGY STRUCTURE	▶Driveline technology	▶Motor design	▶Powertrain design	▶Component design	▶Battery module design	▶Sensor technology	▶Sensor's location	▶Sensor's target	▶Human	▶Bike	▶Environment	▶Sensor design	▶Control technology	▶Control method	▶Drive control method	▶Motor control method	▶Driveline control method	▶Power-management method	▶Safety control method	▶Brake control method	▶Transmission control method	▶Frame design	▶UI design	▶Material design	▶Others
▼PRODUCT STRUCTURE																										
▼Electric bike		3	16	48	18	22	2	24		61	66	10	4		7	41	50	3	8		2	7	25	5		4
▼Electromechanics system			1	4	3	4		2		4	12	2				3	6		6			3				
▼Driveline module		12	25	39	9	1		10		16	29	1			2	10	19	3	1	2		5			1	
▶Sensors		1		2			1	11		7	9		34			2	4							1	1	
Connectors					3															1						
Controllers		1		3			2	6		21	36	2			3	11	24	5	2			3		1		
Motors			28	1				1			2					1	1	1	1							
▶Powertrain			4	63	6			6		3	5		1		1			4				3	1	1	1	
Housing			1		1																					
▶Battery module					4	31		3			5								8						1	1
▶Electric control unit								2	1	1	14	5	2		8	3	2		6	1	1	4		15		2
Transmission system		2		7	4	1		1		5	10	1										34	1	1		
Brake system				1	1						3						1		2		7	1				
Suspension system				1	9		1	2			5		1	9								1	2			4
▶Anatomy		2	10	11	36	3	2	3			6		1	1	2	1	1			1			35	1	3	5
Methods			1	4	9	2		13		27	63	6	2	1	7	15	27	3	10	2	3	18	5	1		1

Technology vs. Technology—By reviewing the **Technology vs. Technology PatentMatrix Dashboard**, we can identify which technology is more relevant to another technology, which may be the core competence in this field.

	▶Sensor technology	▶Sensor's location	Axles	Pedals	Crankshafts	Batteries	Motors	▶Sensor's target	▶Human	Torque	Cadence	▶Bike	Speed	Angles and directions	Brake	Temperature	Pressure	Number of teeth	▶RPM	Wheel RPM	Engine RPM	Crankshaft RPM	▶Torque	Chain force	Crankshaft force	Engine force	▶Energy	Output power	Electric energy	▶Environment	Slope	Slip	Distance	Wind resistance	Sensor design
▼Control technology												1																							
▼Control method	2	3		1					1	1		4	3	1	1					1									2			1			
▼Driveline control method	1		3	4	3		3		2	32	4	5	9	11	1	1	2			3	4	2			3	3	1	1	3	4	1	1		2	
Motor control	1	1	1	4	2	2	7		7	41	7	9	21	10	4	2	4	1		5	10	7			4	5	5	3						1	
Driveline control										3		2	1	1						1															
Power-management method				1	3				1	1		1	1	1	2					1					1		1	11	2			1	1		
Safety control method				1									1	2										1									1		
Brake control method													1		2										1										
Transmission control method			2	1					2	5	5	5	8	7				1		5		2			1		3			3				1	

The second report features patents related to high-entropy alloys (HEAs), which are a type of alloy formed by mixing equal or relatively large proportions of (usually) five or more elements. As a side note, even though they have been studied since the 1980s, they only began to be developed substantially over the last decade.



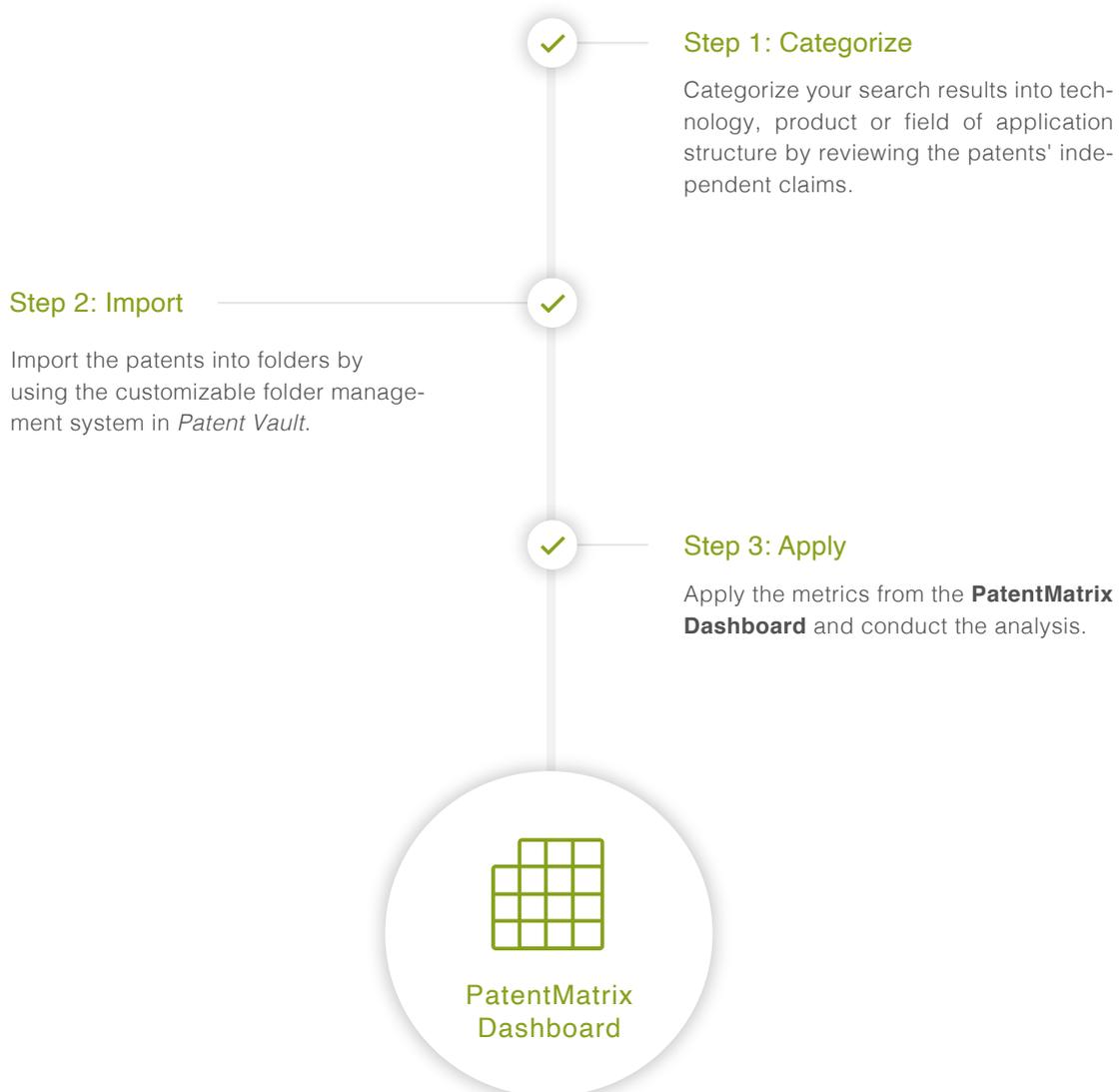
After making a categorization in a similar manner as above for the technologies involved in this field and the possible field of application of the final products, we can transfer this data into a **Technology vs. Field of Application PatentMatrix Dashboard**.

	Processing technology	Casting	Molding	Mold	Mold	Traditional processing	Sand-mold manufacturing	Modern processing	Metallic mold manufacturing	Diecasting	Centrifugal molding	Continuous-casting molding	Vacuum-casting molding	Investment casting	Semi-solid forming	Squeeze casting	Smelting	Vacuum arc remelting	Vacuum induction melting	Directional solidification	Pouring	Cooling and solidifying	Stirring	Segregation	Fluidity	Mechanical alloying	High-energy ball milling	Coating	Magnetron sputtering	Laser cladding	Spraying	Others	3DP
▼Sandblaster blades; engines																																	
Sand-blasting machine blade, engine								1	1			1		1	1	1	1				1	1			1		1	1	1				
Heat processing machine rollers and furnace tubes; sintering furnace heating coils; airplane engine blades								1				4				4	4				1	1			5	2		1	2				4
Acid pickling tanks; pumps; chemistry pipelines and valve bodies																		1								2		2		1			
Tooling, tools, and cutters							2					3				5	6	3			1	3	1			9	5	2	1	4			
Turbine blades; welding materials, heat exchange, and muffler furnace materials												2				5	4					2				6	2	2	4			4	
Refractory materials for skyscrapers							1					3				3	1				1	1										2	
Nuclear power plants																									1								
Thin films for chip-manufacturing processing																												1					
Thin films for electric battery, photoelectric, or solar power																		1			1	1				1		1				1	
High voltage inverters; motor cores; magnetic shielding; high-frequency, soft magnetic thin films																1																1	
Liquefied petroleum gas; low-temperature, high-performance gas, like hydrogen and oxygen																										1							
Coating and alloy coating						3	1					1				3	3	4			2	1	2	2		4	7	5	16	13	4	1	
Biomedical devices							1					2					2				1												
Alloy materials																		1				2											
Other industrial purposes (sewage treatment, conductors, macromolecule)																		1															

This data visualization type enables us to identify which applications might have been overlooked for a given technology, thereby highlighting and opening up potentially profitable opportunities.

Let us recap on how to conduct and generate a **PatentMatrix Dashboard**:

- Firstly, organize and categorize your search results into technology, product or field of application structure by reviewing the patents' independent claim.
- Secondly, after the categorization is complete, use the customizable folders in *Patent Vault* to place the patents into different folders.
- Thirdly, generate the **PatentMatrix Dashboard** by applying the application year as the X-axis and the technology structure and patent office as the Y-axis. You can also use other metrics for the analysis.



*The 3 steps involved in generating a PatentMatrix Dashboard*

# Examples of the PatentMatrix Dashboard

## Case 1: Freedom-to-Operate Search

The **PatentMatrix Dashboard** is a great tool for analyzing the patent portfolio collected after conducting a Freedom-to-Operate Search.

In the report entitled *“Industry and Patent Intelligence Analysis on Vision-based Sensor Fusion for ADAS\*1”* that was conducted by our partners WISPRO, the many kinds of sensors that are used to detect the motions of the driver and surroundings in a driving scenario from major manufacturers or design houses are analyzed through technology structure, product structure and field of application structure.

The major applicants of these patents have been categorized into different industrial chain positions—upstream, midstream, and downstream—according to WISPRO’s study. The patents collected and analyzed in this report are all U.S. patent applications.

From a company vs. application structure perspective, we can clearly understand the focused applications of these major patent applicants in the **PatentMatrix Dashboard**, which helps us answer these questions: *What kinds of scenarios do they focus on? How do they allocate their R&D resources?*

Industrial Chain		Application Structure																												
		Total	Vision/Display	Night Vision	Indication/Warning	Surround View Camera	Parking	Parking Steering Assistance	Key/Remote Parking	Autonomous Valet Parking	Driving	Longitudinal	Adaptive Cruise Control	Autonomous Emergency Brake	Lateral	Lane Departure Warning	Lane Keep Assistance	Lane Change Assistance	360 ° Control	Collision	Warning	Rear Collision Warning	Forward Collision warning	Blindspot Detection	Impact Reduction	Recongnition	Pedestrian Detection System	Sign Recognition	Other Controls	General
<b>Up-stream</b>																														
	Hitachi	11								3	2										1	1				3			2	
	Fujitsu	4		1																	1		1						2	
<b>Mid-stream</b>																														
	Google	8																2							6				3	
	Continental	20		3						2	2	8	3		1		1	1				6			7		3	3		
	Denso	23						2		2	4	1		2	4	2			6	3	1	1	3	1	15	4		3		
	Robert Bosch	33	1			1	1		1	1	1	11	3		2	2			2	3		3	2		2		3	3		
	Magna	48		3	18	7	15						17	3	1	14	3	7		1	3	12	8	9	1	5	7	4	17	4
<b>Down-stream</b>																														
	Honda	10											1	2	1						1			1	1			8		
	Toyota	29								1	1	4		1				2	10	3				3	25	1				
	Ford	25				2				1		1						11	9	3		1	1			19	1			
	GM	29		2		1					1	1		1	2			1		2	1				18	1	2	1	1	
	Nissan	5												1	1			1							4					
<b>Others</b>																														
	American Vehicular	2																							2					

Company vs. application structure perspective dashboard

\*1 Advanced Driver Assistance System

By replacing the application structure with the application year, the **PatentMatrix Dashboard** allows you to see the patent filing trends of these major applicants in chronological order, helping to answer: *What kind of applications are emerging? What about the remaining life of these technologies?*

Industrial Chain	Total	Application Year																								
		1989	1993	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
<b>Up-stream</b>																										
Hitachi	11			1	1	1				1				1			1	2	1					1	1	
Fujitsu	4								1		1								1				1			
<b>Mid-stream</b>																										
Google	8																				1	5	1		1	
Continental	20									1				1	1			2		1	7	3	1	3		
Denso	23											1			1	2	1					4	10	3	1	
Robert Bosch	33								2	2	5	3	1	2	2	1	1	1	1	4	3	2	2	1		
Magna	48					2		1		1	1	1		2		2	3	2	2	4	4	6	4	9	5	
<b>Down-stream</b>																										
Honda	10						1		1						1					2			1		4	
Toyota	29											1	3	2	1	4			3	1	2	5	2	3	1	1
Ford	25								1	10	3	3	1					1	1			2		3		
GM	29													1	3	2	2	10	3		3	3		1	1	
Nissan	5	1							1			1						2								
<b>Others</b>																										
American Vehicular	2										1							1								

Company vs. application year perspective dashboard

If your company or client is in the same position as—or is acting as a competitor against one of the applicants in this chart—you can dive deeper into that applicant’s patent application plan by replacing the Y-axis metrics. Take [Magna](#), for example, from a technology structure vs. application year perspective; we can see some major applications in sensing, computing, and controlling technologies.

Technology Overall	Application Year																			
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Sensing</b>																				
<b>Additional Sensor</b>																				
Infrared	2		1		1						2			2	1		1		4	
Radar	2		1		1	1			1		2	2	1	2	4	3	5	2	9	5
Ultrasonic	2		1		1	1					2		1	2	2	2	2	3	7	
LiDAR									1		1	1			2	1	2	1	2	1
Camera	1		1		1	1			2		2	3	2	2	4	4	6	4	6	5
<b>Computing</b>																				
<b>Measuring</b>																				
Proprioceptive			1		1						1	1	1	2	1	1	3	3	5	2
Exteroceptive	2		1		1				1		2	1	2		3	1	2	3	4	2
Road curvature																			1	1
Slope/Road Height																				
Parking Area/Space																				
<b>Recognizing (Presence)</b>																				
Object												1			1		1		3	
Obstacle	1					1			1		2	2	1	2	3	4	3	3	6	5
Traffic information						1			1		1	1	1	2	1	1	1		1	3
Environment	1								1							1	1		1	2
Processing/Algorithm	2		1			1			1		2	1		1	1	3	1	1	8	1
<b>Controlling</b>																				
<b>Driving</b>																				
Steering																			2	2
Pedals																			3	1
Warning/Indication	1		1						1		2	1	1	2	1	2	2	2	6	2
Others					1							1		2		1				
Control Degree																1				
Priority												1	1						1	1
<b>Self Diagnosis</b>																				

Technology structure vs. application year perspective dashboard of Magna

To go deeper, you can further examine the technology roadmap via a technology structure vs. technology structure dashboard to find out the cross-relationships between different technologies, or via a technology structure vs. application structure to find out the most applied scenarios of these technologies.

 All of the above help you figure out the general patent filing trends of the entire industry and understand the technology roadmap of your competitors. Based on this, you can leverage the existing technology that the first-movers have developed, and adjust your own product roadmap and commercialization plan in the U.S. automotive market.

## Case 2: Patent Landscape Analysis – Patent Owners and Focused Technologies

The **PatentMatrix Dashboard** can also be used to better understand a specific market, in this case, “*Patent Intelligence Analysis of Non-Invasive Optical Sensors in Medicine,*” conducted by WISPRO.

When conducting this type of analysis, taking a look at the technology structure vs. application year dashboard can help us understand the trend of patent activity. By applying the application year to the X-axis and the technology structure to the Y-axis, we can clearly see what technology has emerged over the past few years.

	Application Year									
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Sensor design</b>										
<b>Hardware design</b>										
<b>Module intergration and package</b>	6	4	2	5	11	8	6	6	6	4
<b>Electronic structure design</b>	22	25	20	26	22	26	21	34	14	6
<b>Circuit structure design</b>	8	15	8	8	12	23	17	15	13	5
<b>Special function design</b>										
Spectrum sensor					4	3	1	1	2	3
Depth sensor				1	2	1	1	1		1
Analyte junction	1		1		1		1	3	4	1
Flexible substrate		2			2	3	1	2	2	
<b>Optical design</b>										
Optical unit design	4	2	6	5	5	8	6	10	6	
Waveguide	1	1	3	2	8	4	1	17	7	2
Lens	2	1	3	6	5	12	3	10	11	4
Filter	2	1	3	6	5	12	3	10	11	4
Dispersion unit										
<b>Manufacture process</b>	11	10	7	8	2	10	8	8	5	3
<b>Controlling method</b>	1	7	6	12	5	12	4	8	2	2
<b>Photo-electric conversion technology</b>										
<b>Wavelength conversion</b>	9	1	6	11	12	14	7	8	8	2
<b>Photoelectric converter</b>										
Photodiode	4	6	7	4	11	11	11	10	7	
Avalanche diode	3	2	3		4	1	3	2	2	1
Phototransistor			2	2		2	1	1	1	1
Quantum dots sensor			1		1		2		1	1

Matching the technology structure and the application year shows the trending technologies of the past

By plugging the market’s major players into one axis and the technology structure into the other axis, patent landscape analysis can be easily created to analyze multiple subjects: *What kind of technology is under development? How do patent owners plan their patent filing activities? Who are the major players? Who are the potential partners?*

Monitor	Fitbit	Masimo	Medtronic	Cercacor Lab	Covidien	Arc Devices	Geelux Holdings	Welch Allyn
<b>POCT</b>								
<b>Non-invasive glucose meter</b>								
<b>Non-invasive central venous manometer</b>	50	52	25	3				
<b>Oximeter</b>				1	3			
<b>Pneumotachometer</b>		3	19	11	9			
<b>Thermometer</b>								
<b>Laboratory</b>			2		3	30	19	15
<b>Cell Counter</b>								
<b>Specialty</b>					2			
<b>Blood flow meter for body parts</b>								
<b>Cranial orthosis scanner</b>								
<b>Embryo image assessment system</b>					81		3	
<b>Endoscope</b>			1					
Endoscope								
Arthroscope								
Bronchoscope			3		11			3
Capsule endoscope			23		5			
Choledochoscope					9			
Colonoscope								
Colposcope								
Cystoscope					1			5
Enteroscope								2
Esophagogastroduodenoscope								5
Gastroscope								5
Hysteroscope								5
Laparoscope					2			
Laryngoscope								5
Nasopharyngoscope					60			
Nephroscope					9			2
Neuroendoscope								
Proctoscope								
Resectoscope								
Sigmoidoscope								2
Ureteroscope								
<b>Ophthalmological devices</b>								
Eye movement monitor								
Ophthalmoscope								
Photorefractor								
Strabismus detection device								5
<b>Transilluminator</b>								
<b>Surgery assisting</b>								
<b>Computer-assisted surgery</b>								
Optical teeth impression system								
Orthopedic stereotaxic instrument			16					
Liver navigation system								
Computer-assisted hair harvesting system								
<b>Blood loss image processing device</b>								
<b>Pathological analyzer</b>								
Caries detector								
Cervical cancer detector								
Dental plaque detector								
Hematoma detector								
Intraoral abnormal soft tissue detector								
Melanoma detector					6			
<b>In-device monitoring</b>								
Flowmeter								
Blood leak detector								
Blood level monitor		7	15		11			

Conducting tech. structure vs. major players (patent owners) from the Y-axis and the X-axis

From the **PatentMatrix Dashboard**, it is clear that some of the patent owners focus only on specific technologies, and some of them invest in multiple technologies. For instance, [Fitbit](#) solely

focuses on non-invasive glucose meters; [Arc Medical Devices](#) focuses solely on thermometers. On the other hand, [Masimo](#), [Medtronic](#), [Covidien](#) (now part of Medtronic Minimally Invasive Therapies), and [Welch Allyn](#) develop multiple technologies like non-invasive glucose meters, oximeters, thermometers, and different kinds of endoscopes.

We can also plug in the application structure into one axis and the efficacy structure into the other axis to see how these technologies produce the desired results in terms of radio frequency and sensor type. In this case, ionizing radiation frequency and image sensors have the greatest patent filing activity.

		Hardware design										
		Module integration and package			Semiconductor structure design							
		Sensor module package	Device package		Special semiconductor structure				electric characteristics design			
					TFT	Optical structure with the same substrate	Illumination direction	Transparent film structure	Charge carrier channel structure design	Electric circuit device structure design		
Wavelength								2				
	Infrared								2	2	1	
	Ultraviolet								2			
	Ionizing radiation								3		21	
Sensor type											1	
	Image sensor	10	1	11	8	3	10	7	33	28	45	65
	Chemical sensor	1				1	1		1		1	
	Spectrum sensor					2			3			

Conducting efficacy structure vs. tech. structure from the Y-Axis and the X-Axis

### Case 3: Competitive Patent Analysis – An Overview of a Company’s Technology and Patenting Activity

The **PatentMatrix Dashboard** can be used to better understand the total patenting activity and technology structure of a company, whether it be your own company, a client, or a competitor.

Taking a closer look at the report *“The Patent Analysis of Wearable Devices for Monitoring Biological Data”* conducted by WISPRO, we can see the patent intelligence of key players in the wearable devices market. Take [Apple Inc.](#), for example, by conducting a product structure vs. technology structure analysis; we can discover the major protected subject matter (products), e.g., general devices, storage medium, and method are the most protected subject matter of signal processing technology.

	Technology Structure	Algorithm	Alert/Notification	Analysis	Lead inversion	Measuring	Signal Processing	Motion artifact	Sensor	Placement	Design	Dynamic aperture	Reflective surface	Light path	Scan rate	Watch related	Fit adjustment
Product Structure																	
General Device			3	1	1	4	1	8		2		2	3	1	1		1
Processor																	
Storage medium			1		1			3							1		1
Sensor module																	
Display																	
Housing/bezel										1							
Electronic Watch										1							2
Earbud										3							
Method			2	1	1	4	1	8		2		1	2	1	1		2

Conducting a product structure vs. technology structure analysis

In another report, “AI in Medical Image Recognition,” conducted by WISPRO, we analyzed the patent portfolio of [Heartflow](#), a health-tech startup based in the U.S. The PatentMatrix Dashboard assesses the total patent quality and value by applying Patentcloud’s [Patent Quality and Value Rankings](#) to each axis.

As the graph shows, the high-quality patents account for 51% of the total patents, and the high-value patents account for 73%, and the high-quality and high-value patents account for 36% of the total patents. This may suggest that Heartflow has a strong patent portfolio.

Patent Quality	Patent Value				
	AAA	AA	A	B	C
AAA	1	11	5	9	6
AA	6	32	20	21	3
A	10	39	46	28	5
B	12	29	39	28	
C	14	22	22	9	
D	3	9	16	6	

Applying Patentcloud’s Patent Quality and Value Rankings to the PatentMatrix Dashboard

In addition to the previously introduced dashboards, we can also view the patent filing trends and the transformation of Heartflow by examining the product structure, technology structure, and different periods of application year at the same time.

In the graph below, WISPRO analyzed the patent filing trends between 2010-2013 and 2014-2018 in a product structure vs. technology structure dashboard to see the transformation; we observed that the protected subject matter became more diverse between 2014-2018.

		Technology structure															
		Coronary circulation disease detection										Machine learning technolog		Data transmission protocol			
		Cardiac model establishment					Pathological changes detection	Treatment planning	User interface	Training technology	Establishing features model						
		Model type			Establishment technology												
		Dissection model		Physiological model	Hemadynamics model	Rebuild 3D image						Image model segmentation	Image model labeling	Define model accuracy			
		Cardiac muscle model	Coronary circulation model				Digestive organs model										
2010-2013	Product structure																
	Coronary circulation disease detection system																
	Cardiac model module		37			39				2				2	2		
	Pathological changes detection module	1	1		2	1					2			2	2		
	Treatment planning module										1	5		1	1		
	User interface											3					
2014-2018	Product structure																
	Coronary circulation disease detection system	11	110		47	107	14	6	4	28	18		5	23	22		
	Pathological changes detection module	17	17		23	20					23			6	6		
	Treatment planning module		3		3	5					8	31		5	5		
	User interface	1	1						4	3			28				

Using the PatentMatrix to compare patent filing trends between 2010-2013 and 2014-2018



Most importantly, after conducting so much competitive analysis, you must also reflect on your own product or technology roadmap, patent application strategy, and monetization possibilities in order to have a more prosperous future in the long run.



**Preparation**

- Product/technology planning
- Resource allocation



**Prosecution**

- Patent analytics
- Patent deployment planning
  - Patent filing
- Patent maintenance



**Monetization**

- Patent transaction
- Patent litigation

### Case 4: Patent Due Diligence – Access the Monetization Potential of the Patent Portfolio

Whether it's a patent transaction, evaluation of a licensing program, or the assessment of a pledging request, patent due diligence is a must when it comes to the decision-making process.

Let us take a look at how the **PatentMatrix Dashboard** can conduct patent due diligence by comparing and contrasting the patent portfolios of two imaginary companies—Company A and B.

In this case, the **PatentMatrix Dashboard** was used to visualize, in particular, the U.S. patent quality and value distribution of each company.

Value Quality	AAA	AA	A	B	C	D
AAA					1	3
AA					4	6
A					7	10
B				1	12	11
C			2	4	14	7
D		1	3	14	15	6

← Higher value

↑ Better quality

*The patent quality and value distribution of company over 100 patents*

Value Quality	AAA	AA	A	B	C	D
AAA	1	1	4		1	
AA	1	1	1	1		
A		2	8	4		3
B		2	7	6	3	3
C	1	4	10		2	
D	2	5	2	3		

← Higher value

↑ Better quality

*The patent quality and value distribution of company less than 100 patents*

As we can see, even though Company A has an overall greater number of U.S. patents compared to Company B, the **PatentMatrix Dashboard** clearly shows that many, if not most of these patents are low-quality and low-value.

At the same time, even though Company B has a smaller patent portfolio overall, it is clear from the **PatentMatrix Dashboard** that Company B has more high-quality and high-value patents than Company A.

With this patent landscape analysis, it is easy to understand which of these companies might be the best candidate to receive investment.

The **PatentMatrix Dashboard** also enables us to examine the state-of-the-art technology of the target patent portfolio, in the form of countries, companies, and technologies. We take a few examples from “*Patent Intelligence Analysis of Image Recognition Technologies Trained by AI in Autonomous Cars*” by WISPRO.

	Data	Label	Labelled	Unlabelled	Object	Static Object	Roadmark	Traffic light	Buildings	Others	Dynamic Object	Human	Vehicles	Animals	Others	Object Properties	Shape	Pose	Behavior	Distance	Others	Environment	Image property	Color	Depth	Temporal	Resolutions	Others	Data property	Dimension	Virtual/Reak	Other sensor type
Vehicle					1	1						3	2	1						1		1				1		1			2	
Self-Driving System			2		1		2	1			1	3	2						3	3	1	2			2	2	1	1			4	
Image Recognition system			4	1	6	7		1	2	5	5	4					3		3	2		8	1	1	2	14	1	3	2		3	
SOC			14		9	3					4	2	2					1	1	3		3		6	1	10	4	4	1		4	
Interference chipset			4		4	1	2				1	1					1			3	2	4	2	2		4		1				
Software			19	1	17	11	2	1	2	7	13	11	1	1			3	1	8	7	2	13	2	7	3	25	5	7	2	1	8	
Medium			9		6	4	1				5	4								4		3	1	3		9	2	5	1		4	
Others																																
Sensors																																
Controlling system																																
Method			1				3				1	2	2						1	2		1			1	2		1			2	
Other system																																
Platform Infrastructure			21	3	7	2						1	3							2	1	3		1		1	3	2	1		4	
Training Chipset			2	1																1		1				1						
Software			25	5	6	1	2				1	4	3					1	1	5	2	6	1	5	1	4	3	3	1		4	
Medium			12	1	1	1						1								2	1			1		1		1				
Others																																

Product vs. tech. structure analysis

The autonomous car industry is emerging and has attracted a lot of attention worldwide. While this industry contains many players that originally came from other industries, it is crucial that carmakers, for example, have a better way of knowing more about the state-of-the-art technology that they are unfamiliar with.

From the **PatentMatrix Dashboard** above, we illustrated the product vs. technology structure of the U.S. patents relating to image recognition technologies trained by AI. There were a total of 191 U.S. patents in this report.

The experts at WISPRO categorized these patents into different products and technologies according to their independent and dependent claims, to create a dashboard that is easy to analyze.

For these U.S. patents, it's clear that software is the primary protected subject matter, it's highly associated with labeled data, recognition of dynamic and static object data, and temporal data.

This information enables us to know what kind of subject of protection, and what kind of technologies are mostly invested in by the leading companies. If you are a carmaker, it gives you insights into the patent landscape and which technologies or products are worth investing in—according to these first-movers and trailblazers.



*You can also dive even deeper and examine a single patent owner's patent portfolio to see—by using the techniques mentioned above—whether it is worth investing in or receiving the license from it.*

## Conclusion: A Powerful Tool for Patent Analysis and Insights

The above are just a few examples of how the **PatentMatrix Dashboard** has already been utilized effectively to conduct patent analysis in real-life cases.

Again, the **PatentMatrix Dashboard** is the only patent analysis tool available today with completely customizable, two-level hierarchical data on both the X-axis and the Y-axis, combined in one pivot table.

For patent professionals, the **PatentMatrix Dashboard** can be used not only to optimize workflows but also to perform data analysis that delivers real insights from various perspectives, all in clearly visualized tables.

The **PatentMatrix Dashboard** puts the power of data analysis in the palm of your hand.

### About Patentcloud

The PatentMatrix Dashboard is an exclusive of Patentcloud. Patentcloud is a cloud-based patent intelligence platform for all the stages of the patent lifecycle. Businesses and professionals alike can utilize this intuitive platform to uncover the full potential and true value of patents. Patentcloud currently consists of six core products — covering a wide range of scenarios.

*Patent work, one step ahead. Get started with [Patentcloud](#)*

## About InQuartik



InQuartik is an IP intelligence company dedicated to converting patent data into actionable insights and delivering AI-driven solutions. From first-tier companies and law firms to SMEs, InQuartik supports IP professionals throughout the entire patent lifecycle so that they can work smarter, live better, and gain more success.

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