

FINTECH WAR, WHO WILL COME OUT A WINNER? (I)

FinTech industry analysis based on patents / Payment Architecture & Payment Circuits



IP Tech Trend Report iPnomics

2015 No. 17

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This is the abridgement of the report "Global IT Startup, Who's rising?" You can purchase the full version at our website, <http://www.ipnomics.co.kr>

Contact us at etrc@etnews.com/82-2-2168-9485

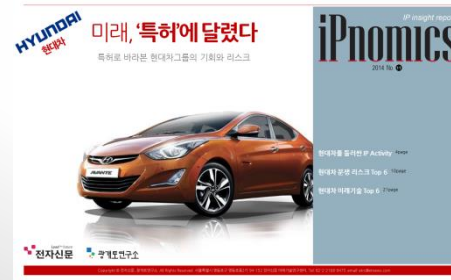
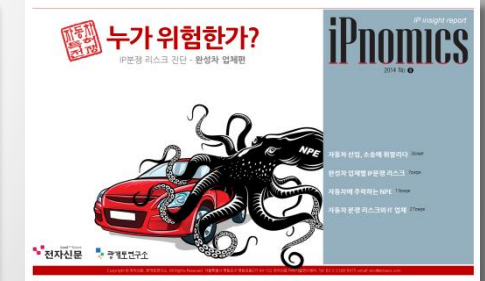
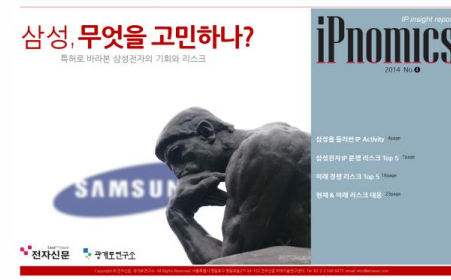
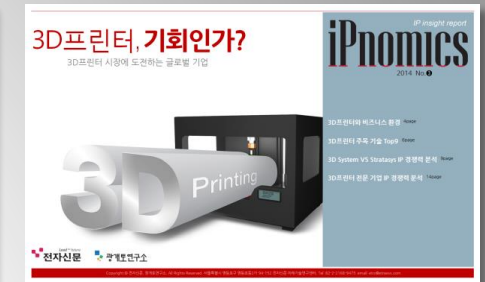
IP + Economics

Technology Trend

Industry Outlook

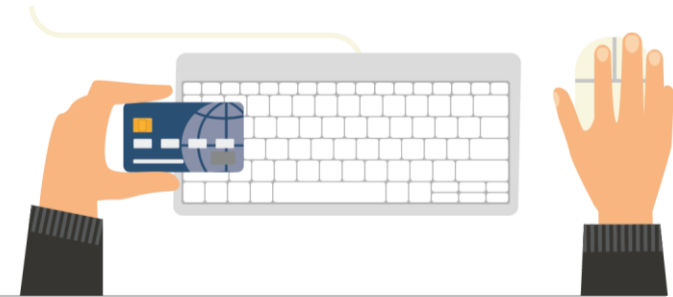
Dispute Risk Forecast

Company Analysis



As investment is quite concentrated in the FinTech industry, related patents are trending up.

Citations for FinTech payment patents by financial and IT companies are increasing sharply.



- The “FinTech” (financial payment technology) industry was analyzed centering on payment-related patents in the U.S. To do this the industry was divided into five segments with a total of 18 technological fields.

The IPnomics report analyzed the FinTech industry centering on payment-related patents (G06Q20) as defined by the CPC (Cooperative Patent Classification). To do this, the industry was divided into five segments (payment architecture, payment circuits, payment devices, payment method and payment protocols) with a total of 18 technological fields.

- As investment in the FinTech industry is quite concentrated, related patents are trending up.

During the past ten years (2006–2014) a total of 6,235 payment-related patents were registered, of which around 42% were registered in the last three years. In particular, the number of patents registered in 2014 more than doubled to 1,281 from the previous year.

- Citations for FinTech payment patents by financial and IT companies are increasing sharply.

Financial and IT companies have cited a total of 189,936 FinTech payment patents in the last ten years (2005–2015). In particular, the segment for which FinTech payment was most frequently cited was ‘payment devices.’ This was followed, in order, by ‘payment protocols,’ ‘payment architecture,’ ‘payment circuits’ and ‘payment methods.’

- The largest number of patents was registered in the Payment Architecture segment among FinTech payment patents.

Over the past ten years a total of 2,144 patents were registered in the Payment Architecture segment. The share of patent registrations in the last three years has been about 53%. These patents were owned by global ICT companies such as Intel, AT&T and global financial such as Bank of America, Jpmorgan Chase Bank.

- In the payment circuits segment, FinTech payment patents were the ones most frequently cited by global ICT companies.

In the payment circuits segment, a total of 1,408 patents were registered over the past ten years. In this segment, citation count is increasing sharply although patent registration is displaying a downward trend. The number of payment circuits patents cited by global ICT companies during the last ten years was 62,336 in total with 58% being cited within the last three years. The patents were most frequently cited by global financial companies such as JPMorgan Chase Bank, Visa and Bank of America.



Payment Architecture



Payment Circuits



Payment Devices



Payment Method



Payment Protocols

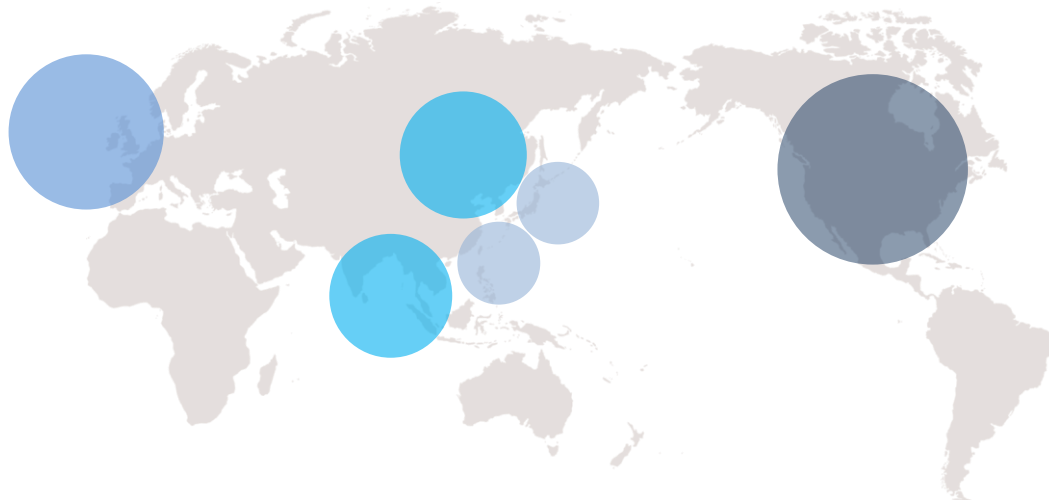


FinTech and the Business Environment

The FinTech market is developing and expanding rapidly in both size and scope.
Last year, the global FinTech frenzy attracted about \$3 billion in venture investment.

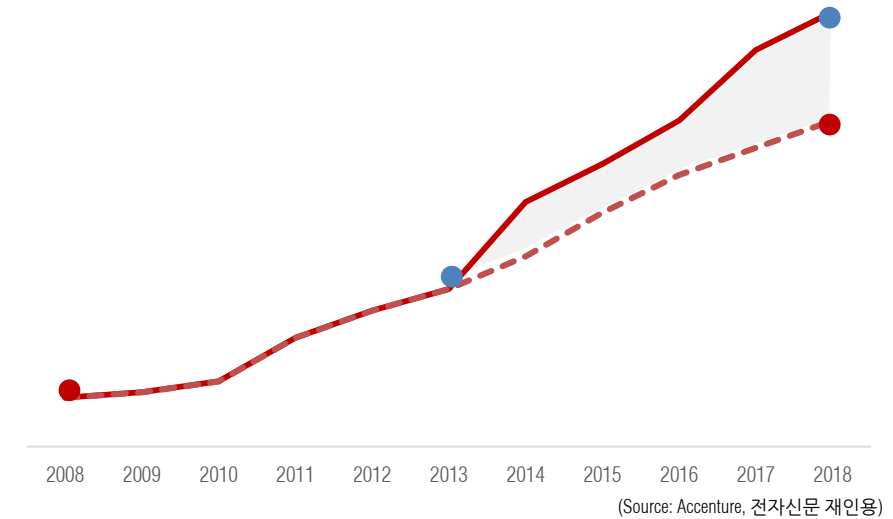


● FinTech companies across the world (Unit: Companies)

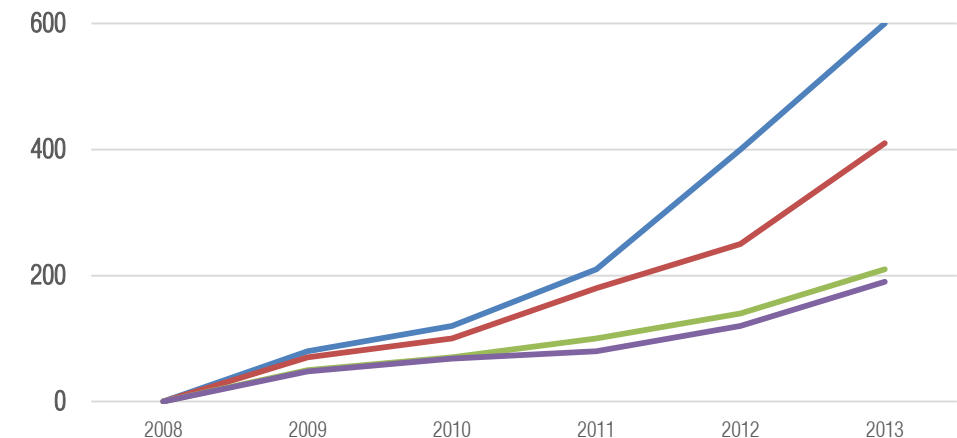


(Source: Accenture, Venture scanner, Capgemini)

● Global FinTech venture investment trend (Unit: \$100 million)



● FinTech investment increase by region (Unit: %)



(Source: Accenture, Partnership Fund analysis of CB insights data, Venture scanner)

The FinTech industry was analyzed centering on U.S patent activities in the ‘payment’ area.

FinTech business areas were divided into ‘payment,’ ‘data analysis,’ ‘remittance’ and ‘investment.’ In particular, for ‘payment,’ the profit model is simple and the transaction can be secured conveniently through payment counters. According to the report, the key FinTech business areas are, however, FinTechs defined differently. The Economics report analyzed the FinTech industry centering on payment-related patents (G06Q20) as defined by the CPC (Cooperative Patent Classification).

SAMPLE

Glossary : CPC?

CPC (Cooperative Patent Classification), an advanced patent classification system, was jointly developed by patent offices in the U.S. and Europe. Compared to the existing International Patent Classification (IPC), CPC offers more segmented categories. The strength of the CPC is efficient prior art search. Approximately 71% of patent documents across the world are categorized under the CPC.



Key Business Areas of the FinTech Industry

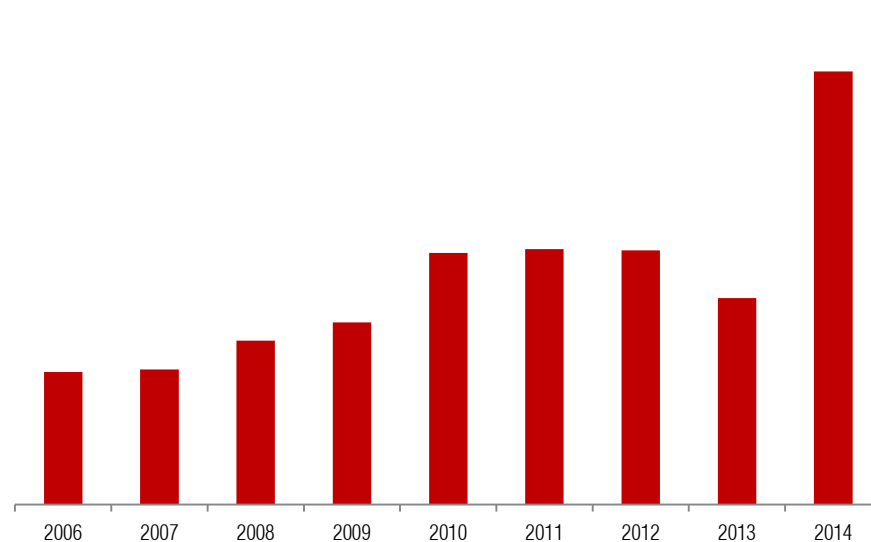
Type	Description
Payment	One-stop payment service ranging from payment architecture to payment circuits, payment devices, payment method and payment protocols
Remittance	Online banking service
Data Analysis	Personal and corporate credit analysis service
Investment	Investment-related services, such as loan and start-up assistance

(Source: Data from Venture Scanner, the South Korea's Financial Supervisory Service, Accenture and FT recited)

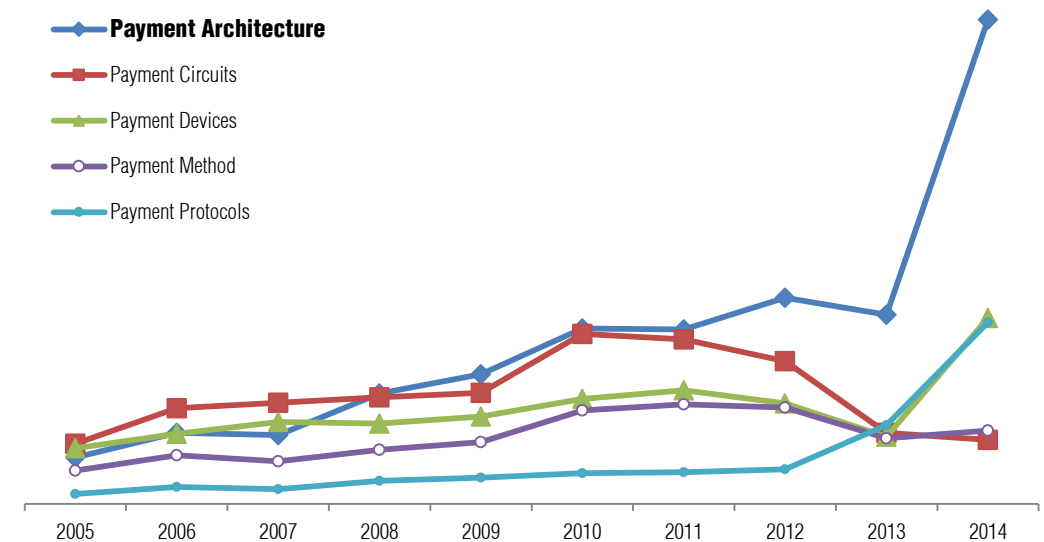
As investment is quite concentrated in the FinTech industry, related patents are trending up.



● FinTech-related patent registration (Unit: Count)



● Patent registration by FinTech technological segment (Unit: %)

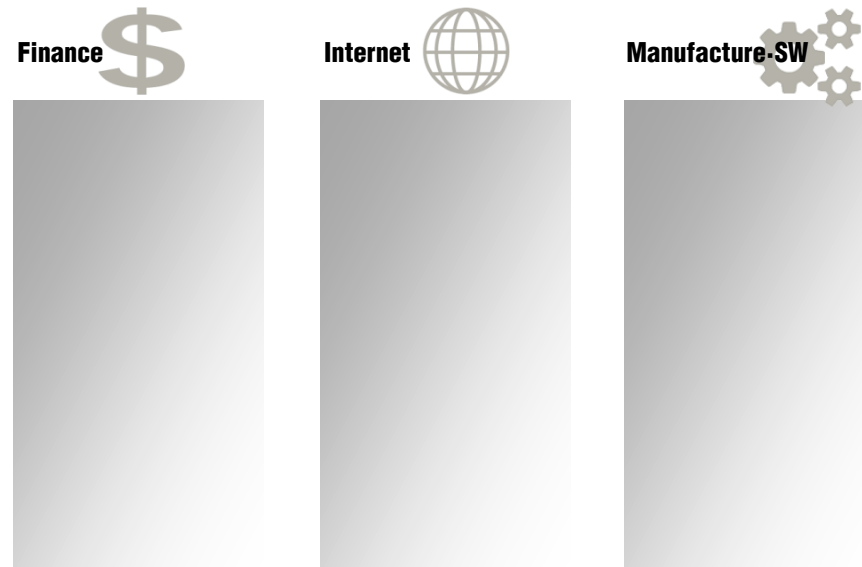


VISA, a global credit card company, owns the largest number of FinTech patents.

Global IT companies, such as IBM, Google and MS, are also focusing on acquiring FinTech patents.

The companies that own the largest number of FinTech patents are, in order, Visa followed by Mastercard, then JPMorgan, Global Payments, and PayPal. These companies pay attention in their efforts to obtain FinTech patents. Examples are given below, each of which has recently introduced an independent payment system. The patent activities of payment systems startup Square are also noteworthy.

● Companies with the largest number of FinTech patents (Unit: Count)




● **FinTech patent registration trend by company** (Unit: Count)

[illegible]


The FinTech market is expanding rapidly in both the U.S. and China. Companies in Korea are also focusing on FinTech services.



● FinTech business of global IT companies

Company	Service	Description
 Apple		

● FinTech business of Domestic IT companies

Company	Service	Description
		

(Source: Comprehensive media)



FinTech Payment

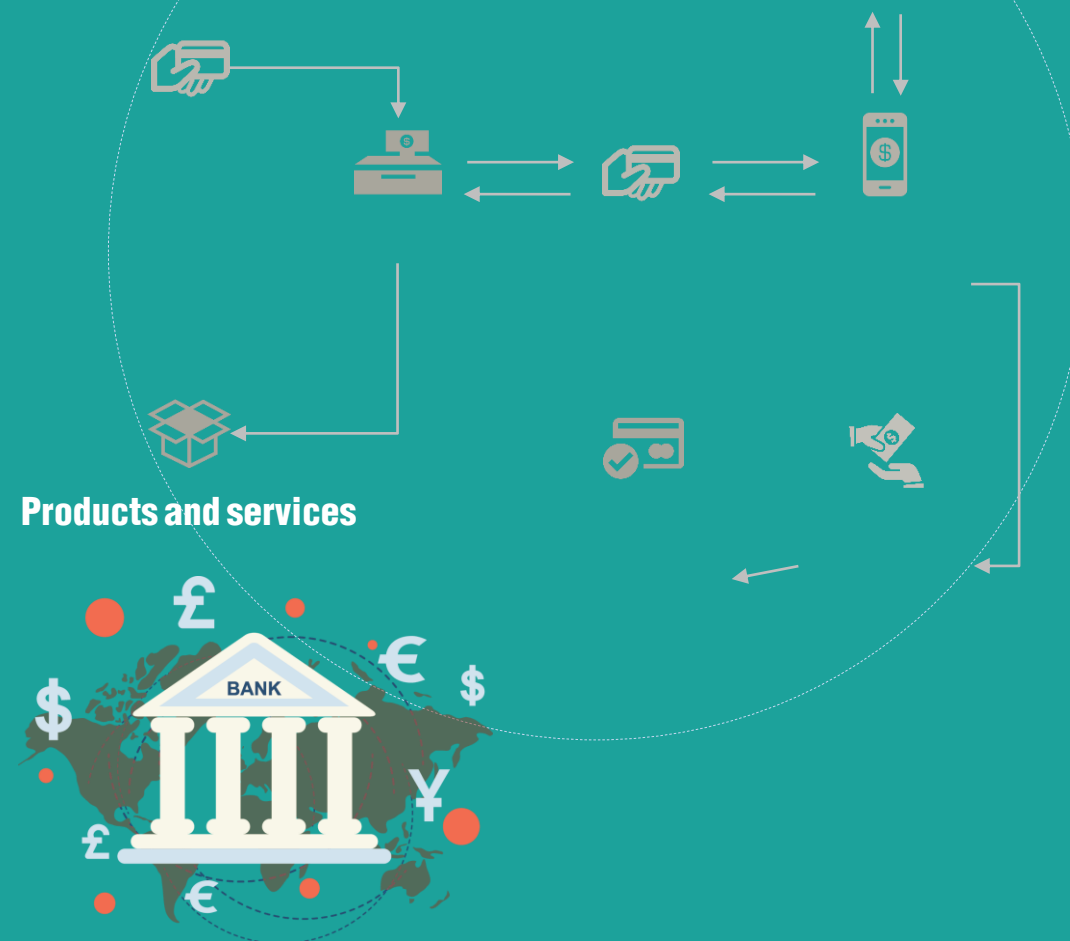
Under the CPC there are basically five segments comprising FinTech payments: payment architecture, payment circuits, payment services, payment methods and payment protocols.



● FinTech Payment Overview

Key Technologies	Technology Overview	Applied Fields
<div>1</div> <div>Payment Architecture</div> <div></div>		

The five FinTech payment processes



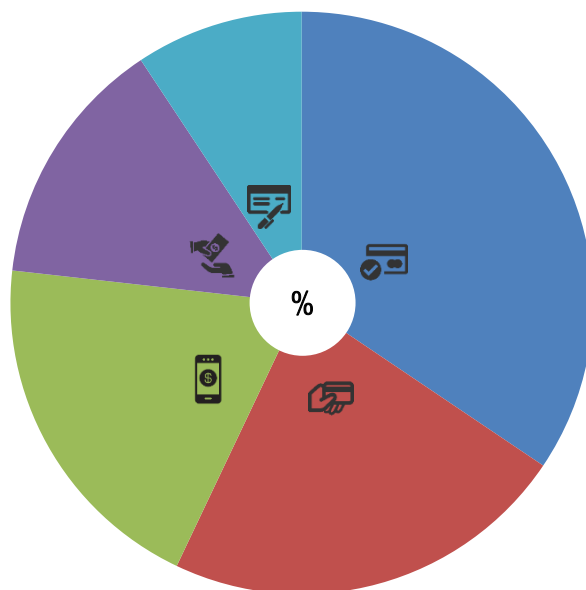
Products and services



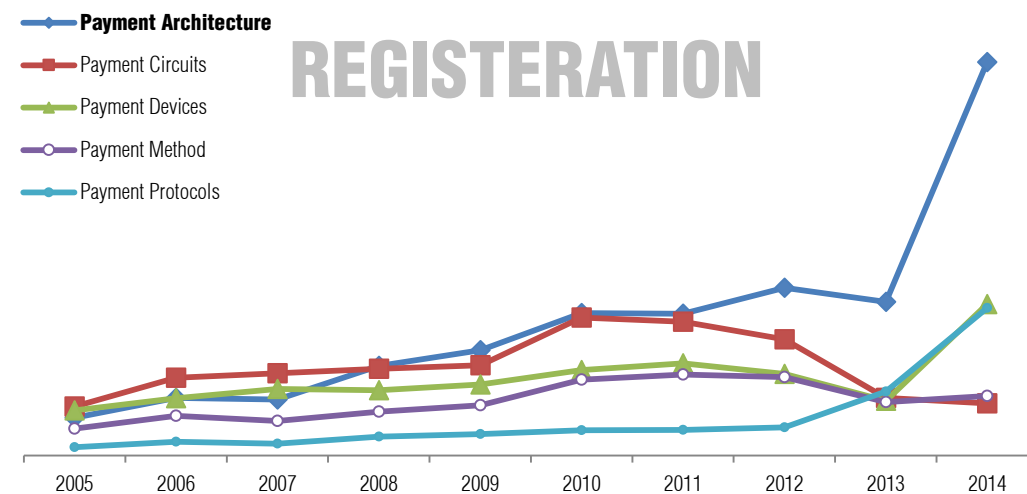
Citations for FinTech payment patents by financial and IT companies are increasing sharply.

Financial and IT companies have registered 1,936 FinTech payment patents in the last ten years (2005-2014). In particular, the segment for which FinTech payment patents were most frequently cited was 'payment devices.' This was followed, in order, by 'payment protocols,' 'payment architecture,' 'payment circuits,' and 'payment methods.'

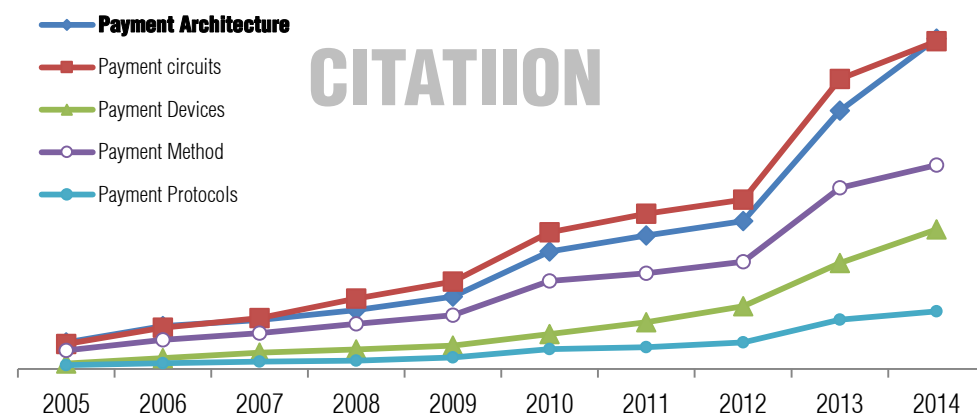
● **Registered patents for each of the five FinTech payment technologies in the last ten years** (Unit: %)



● **Patent registration by FinTech segment** (Unit: Count)



● **Patent registration by FinTech segment** (Unit: Count)



For FinTech payment, a total of 18 technologies from five patent segments were analyzed.

[illegible][illegible]

Analysis information on detail descriptions such as Payment Devices, Payment Method, Payment Protocols is included in the Fintech war, who will come out a winner (II)

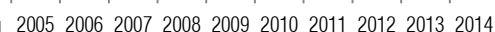
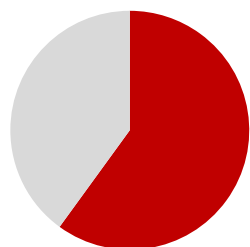
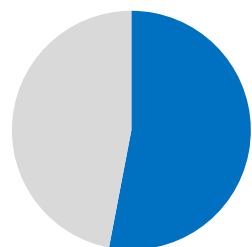


In the last ten years a total of 2,141 patents in the Payment Architecture segment. The share of patent registrations in the Payment Architecture segment has been about 53%.

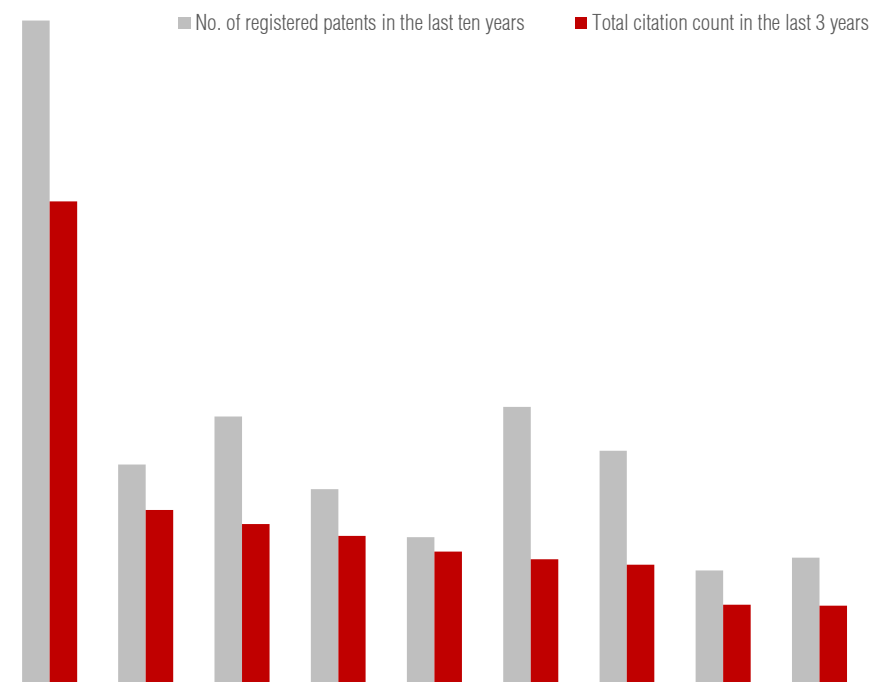
Citations of payment Architecture patents by global IT companies are increasing. These patents were cited most frequently by global IT companies such as Google, Ebay and Apple, during the last three years.

SAMPLE

● **Patent citations in the Payment Architecture segment** (Unit: Count)



● Patent citations by company in the Payment Architecture segment (Unit: Count,%)

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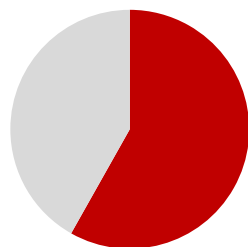
frequently cited by global ICT companies

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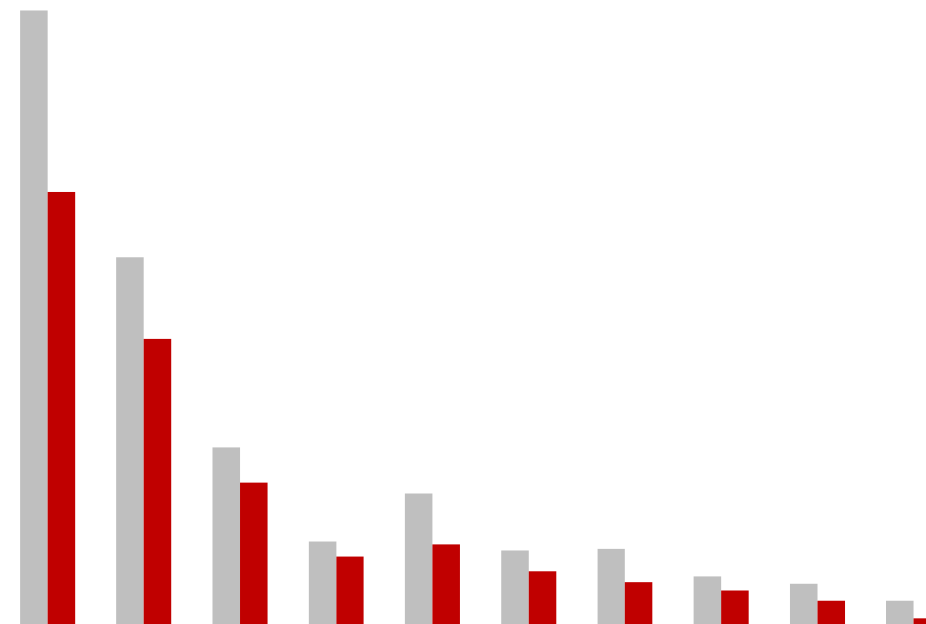
frequently cited by global ICT companies

SAMPLE

● **Patent citations in the Payment Circuits segment** (Unit: Count)



■ No. of registered patents in the last ten years ■ Total citation count in the last 3 years

[illegible]

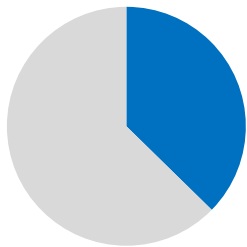


In the payment devices segment, the count of patent registrations fluctuated most severely among the top five FinTech segments during the previous year.

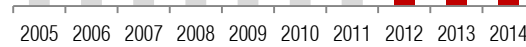
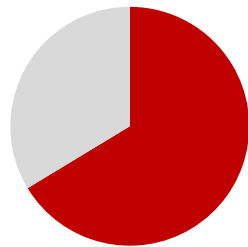
In the payment devices segment, a total of 1,239 patents were registered in the last ten years. In 2014, 241 patents were registered, which is approximately 2.7 times from the previous year. This is the largest number among all the segments.

Patents in the payment devices segment have been extensively cited by global manufacturers. Over the last three years, such patents were frequently cited by global mobile manufacturers and service providers such as Sony, Google and Qualcomm.

● **Trend of patent registration in the Payment Devices segment** (Unit: Count)

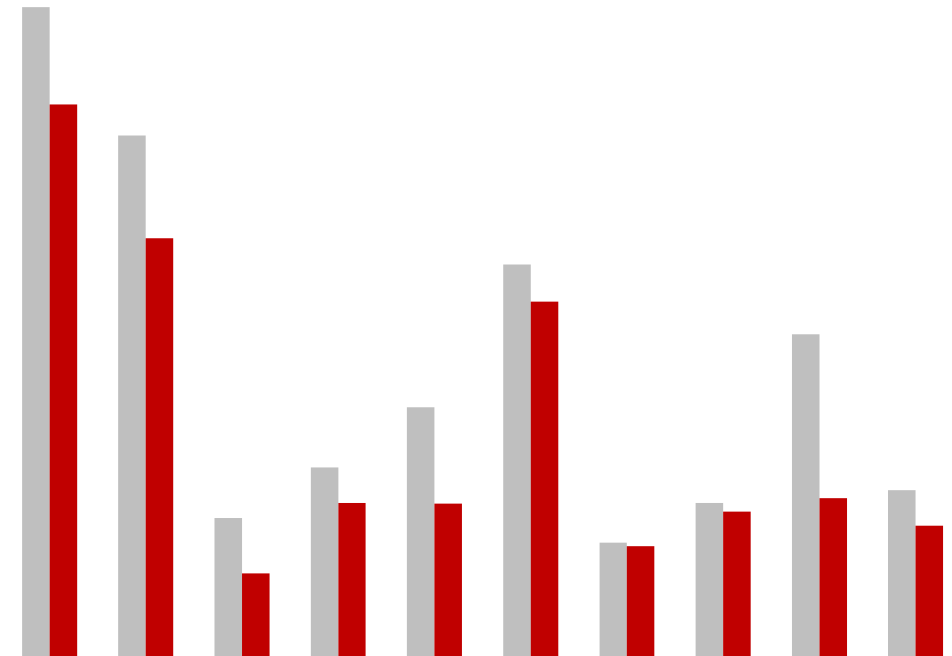


● **Patent citations in the Payment Devices segment** (Unit: Count)



● **Patent citations by company in the Payment Devices segment** (Unit: Count, %)

■ No. of registered patents in the last ten years ■ Total citation count in the last 3 years

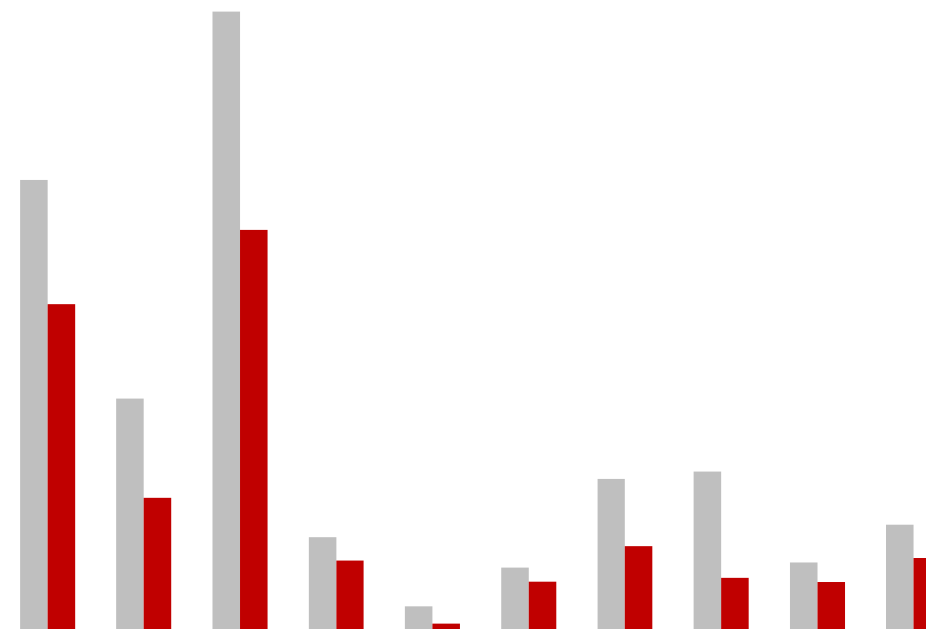
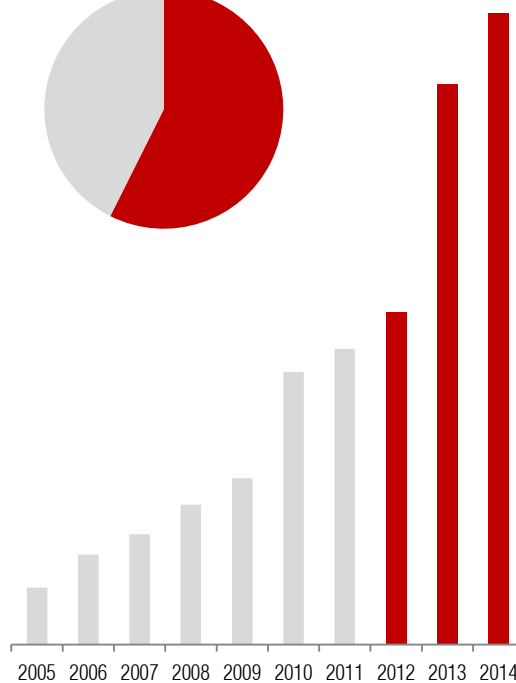
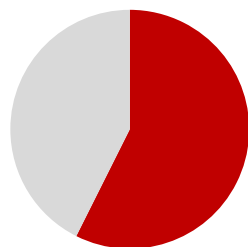
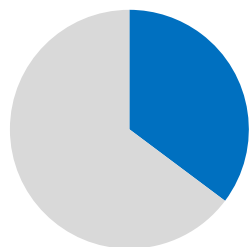
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● Patent citations by company in the Payment Method segment (Unit: Count, %)

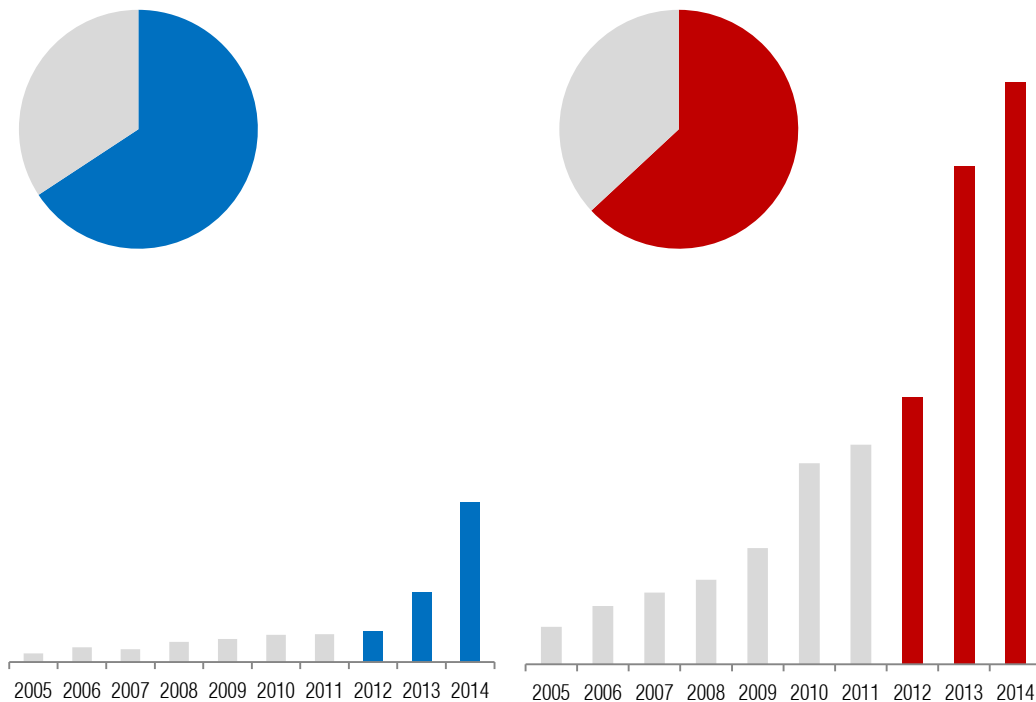
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● **Patent citations in the Payment Method segment** (Unit: Count)

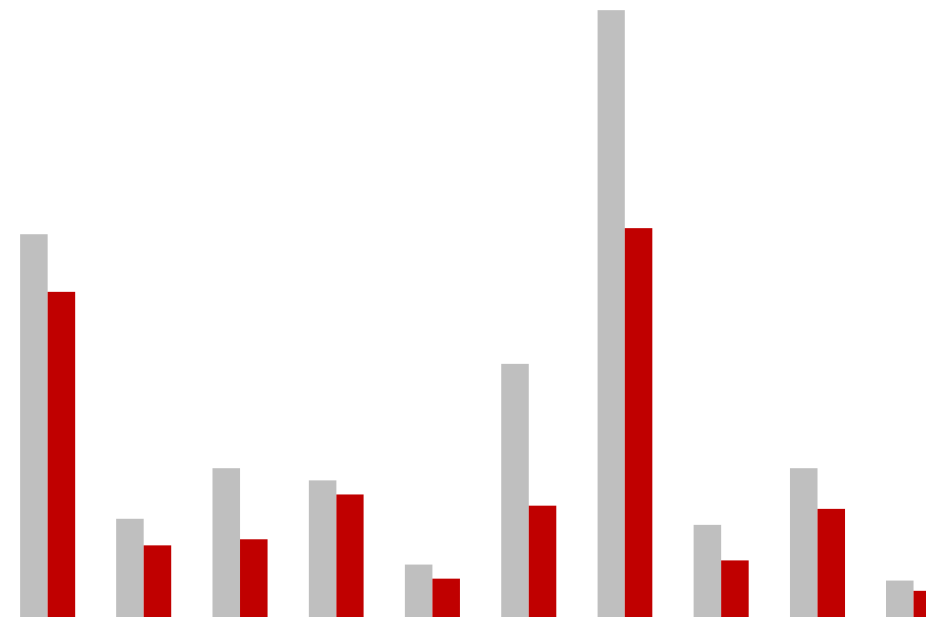
[illegible]



In the previous years a total of 581 patents in the Payment Protocols segment. The share of patent registrations in the Payment Protocols segment has been about 66%. Citation of patents in the Payment Protocols segment by global financial and IT companies is increasing. Over the last three years, these patents were most frequently cited by global financial and ICT companies such as Visa, Mastercard and IBM.



■ No. of registered patents in the last ten years ■ Total citation count in the last 3 years

[illegible]

The fields where FinTech security patents are concentrated are 'cryptography' and 'information security.'

FinTech security patents are largely divided into 'cryptography' and 'information security' patents. 'Cryptography' generally refers to a technology that makes information unreadable by a third party. 'Information security' is a technology that prevents information damage, forgery and leakage when collecting, processing, storing, transmitting or transmitting information. It is mainly utilized for e-Commerce and copyright protection.

Security patents in the FinTech industry (Unit: Count)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Cryptography											
Information Security											
Total											

Security patents for FinTech payment (Unit: Count)





Details of FinTech technologies - 1

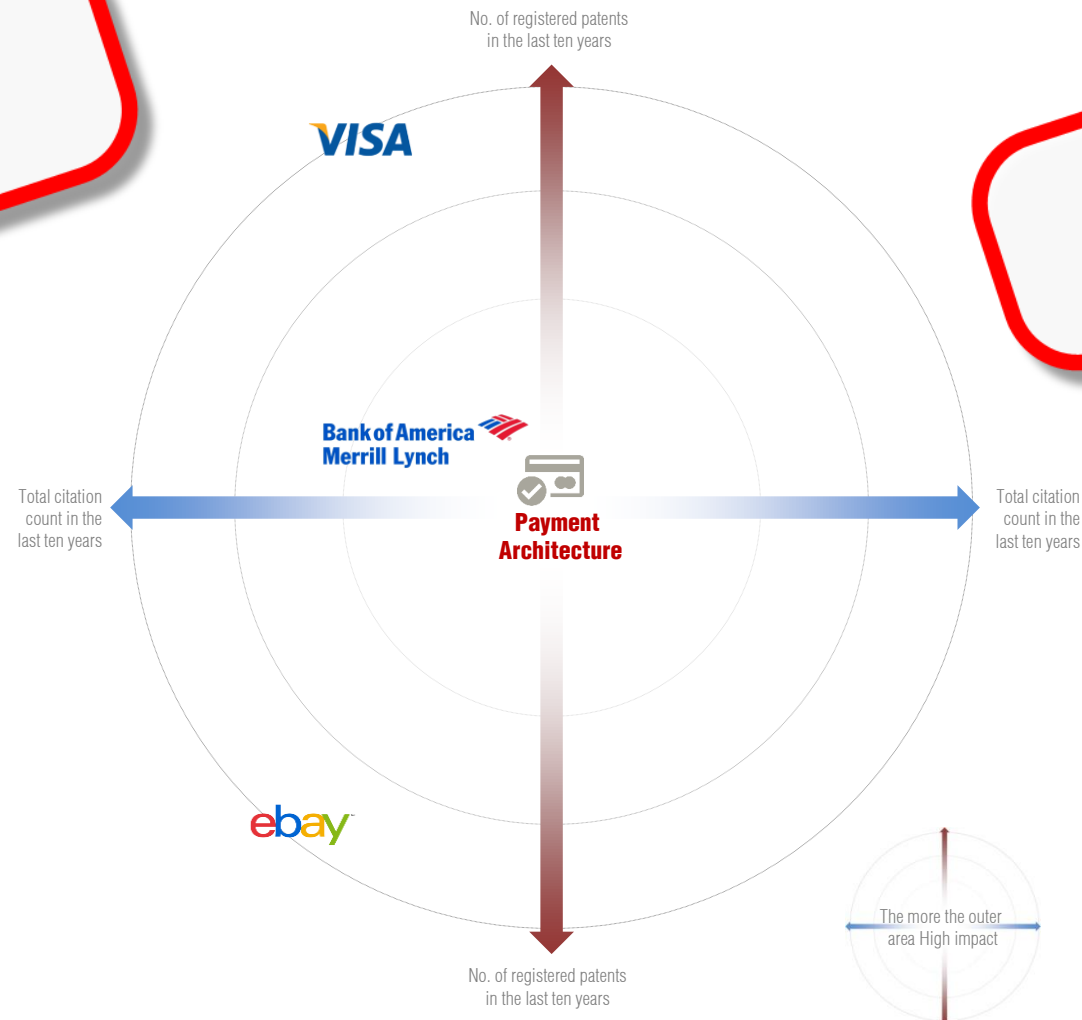
Payment Architecture



Payment Architecture

SAMPLE

Diebold, a U.S. electronic security system developer that manufactures ATMs, and First Data, a commerce and payment solution developer in the U.S., are also drawing attention as they have high citation counts are high.

[illegible]

SAMPLE

[illegible]

21



Startups and specialized companies drawing attention in the Payment Architecture segment

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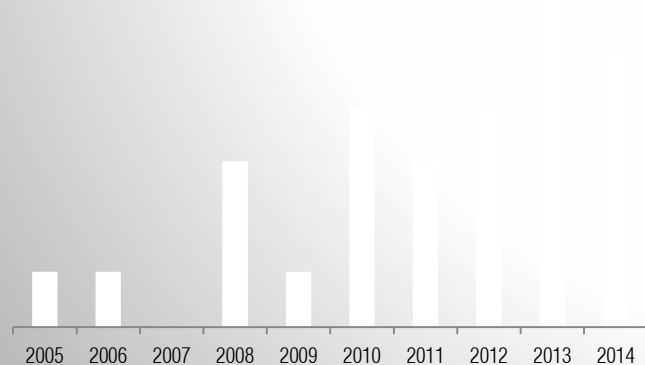
Apple is preparing to enter the FinTech market with their patent for fingerprint recognition for payment. In particular, Apple has applied for a patent on 'cloud fingerprint payment' for convenient payment. Fingerprints registered on a server can be used on other devices. This technology will bring about a revolutionary change to existing commercial transactions.



A fingerprint registered in a device is recognized in other devices through the cloud. In addition, the cryptographic formula improves security.

—Apple—

● FinTech patent registration by Apple (Unit: Count)



Payment Architecture for Electronic Fund Transfer (Home Banking)

Global companies

- Ebay is a global company that owns the largest number of patents for home banking payment architecture.
- Moneygram International is a company providing remittance services. It has drawn attention for its large 'click-to-pay' which indicates the degree of utilization of their patents.

SAMPLE



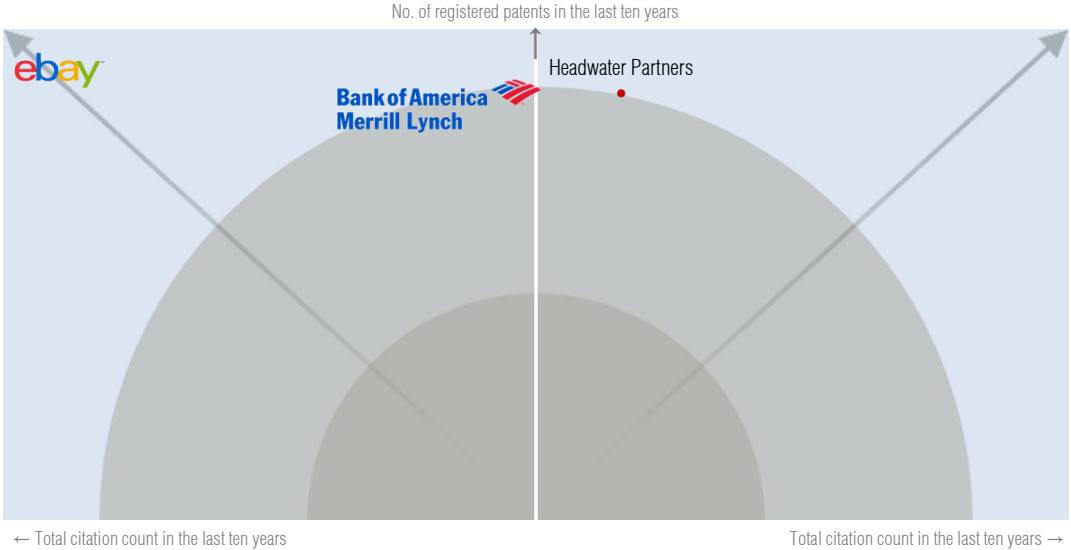
Specialized companies

- The company that owns the largest number of patents for 'home banking' payment architecture in the U.S. asset management industry is Headwater Partners.
- Patents of Paypal, a payment service provider, and e2interact, a U.S. Internet service provider, are also being used actively.

SAMPLE

Fund distribution or payment architecture through home banking including ATMs

Company	No. of registered patents	Total citation count
Ebay		



Company	No. of registered patents	Total citation count
Headwater Partners		

Payment Architecture for POS Network System

Global companies

- The global company that owns the largest number of patents for "Payment Architecture for POS Network Systems" is First Data, a payment system developer. This company has attracted attention for its large citation count, which indicates the degree of technological utilization in the field.
- The patents of Visa and MasterCard are also being utilized actively.

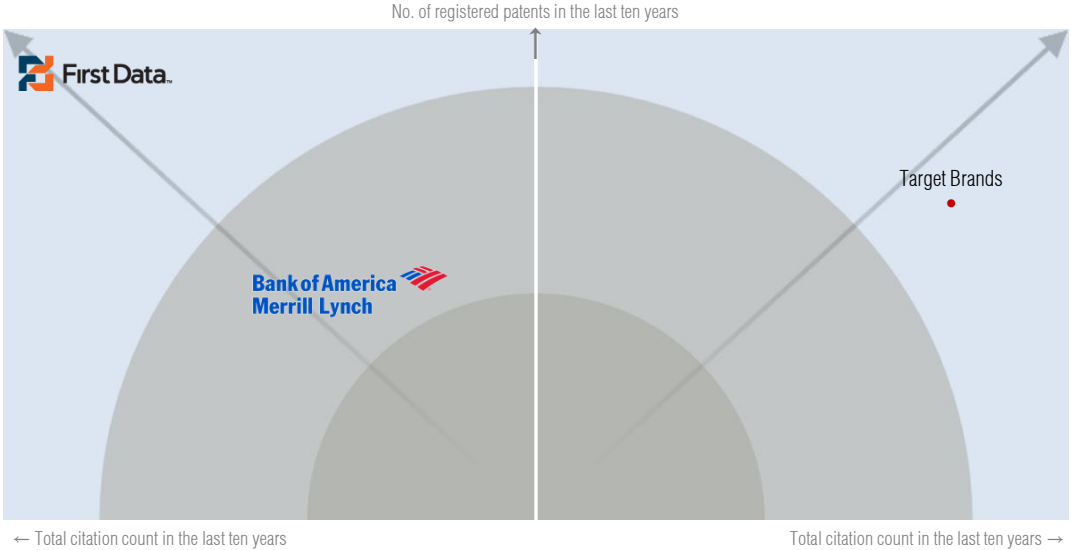


Electronic payment architecture using POS networks

Specialized companies

- Among specialized companies, Target Brands, a discount distributor in the U.S. and Canada, and Compesa, a video traffic provider, own the largest number of patents. Bank of America and Merrill Lynch are also paying attention to their patents.
- a POS solution for small businesses.

Company	No. of registered patents	Total citation count
First Data		



Company	No. of registered patents	Total citation count
Target Brands		

Payment Architecture for Electronic Shopping Systems

Global companies

- The global company that owns the largest number of patents for "Payment Architecture" is Visa Inc.
- eBay and Microsoft are ranked for their large citation count and the degree of technological advancement of patents.

SAMPLE



e-Commerce payment architecture including digital content and digital publication rights.

Specialized companies

- Cardlytics Commerce, a payment platform developer in the U.S., owns the largest patents among specialized companies.
- Visa Technology Holdings, a paid member of Visa, is cited actively.

SAMPLE

Company	No. of registered patents	Total citation count
Visa		



Company	No. of registered patents	Total citation count
Marshall Feature Recognition		

Involving Self-Service Terminals [SST]

Global companies

- The global company that owns the largest number of patents for Automatic Service Devices (ASDs) in the U.S. electronic security system is the company that owns the largest number of ATMs.
- Cummins, a power supplier, draws attention to its large citation count, which indicates the degree of technological utilization of patents.

SAMPLE



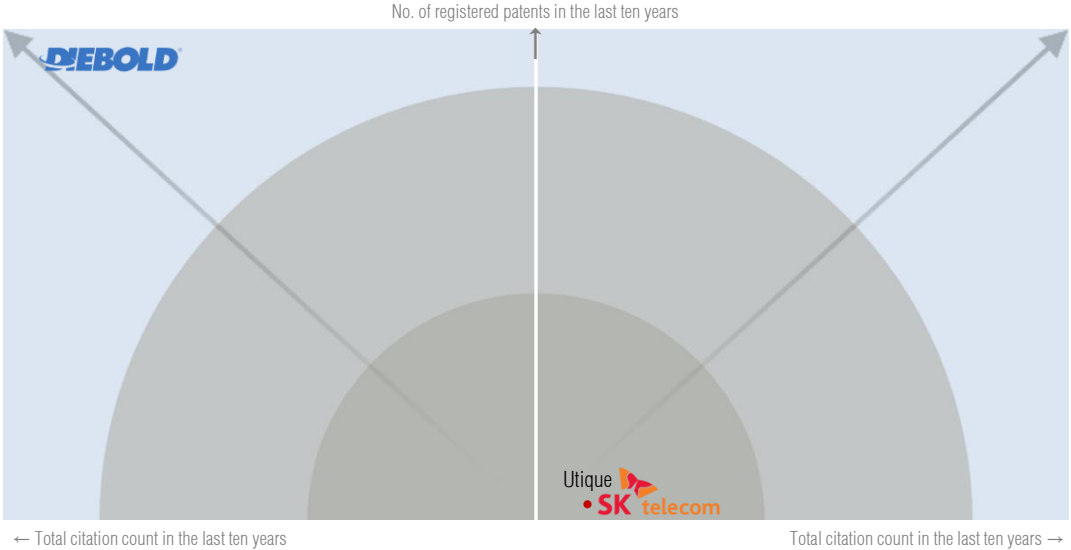
Specialized companies

Among specialized companies, Union Holdings, a household item company, owns the largest number of patents. In addition, a POS system supplier is cited actively.

SAMPLE

Payment architecture of automatic service devices, such as vending machines and ATMs

Company	No. of registered patents	Total citation count
Sony	4	3



Company	No. of registered patents	Total citation count
Sk Telecom	1	0

Billing System

Specialized companies

- The global company that owns the largest number of patents for "Billing Systems" is the global company. This company also has a large number of patents in comparison to the number of patents owned by other companies.
- The patents of this company are also cited actively.

SAMPLE



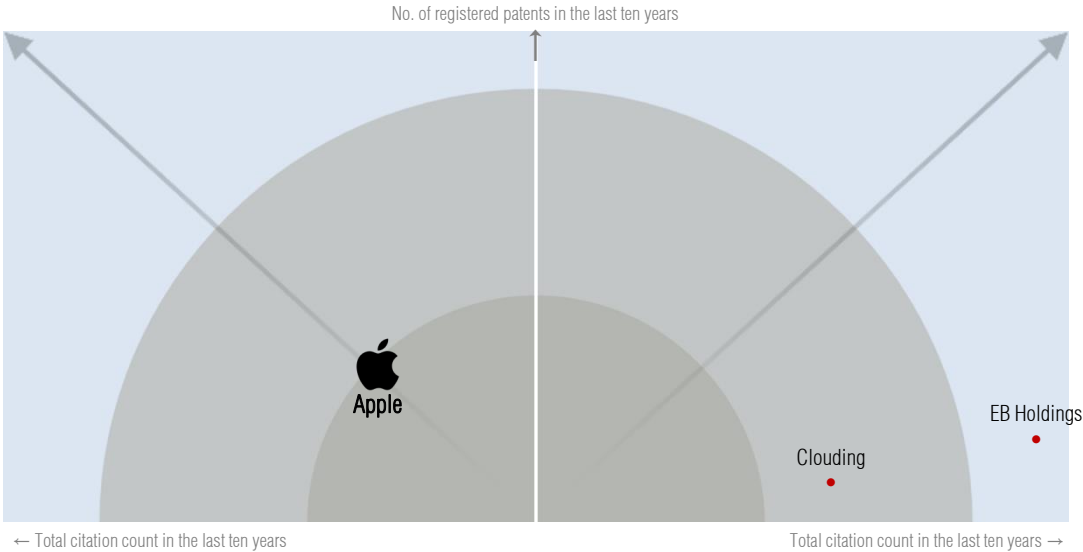
Billing system to check usage and bill accordingly

Specialized companies

- The specialized companies that own the largest number of patents for "Billing Systems" are CloudParc, which is a cloud-based parking system supplier.
- Nomadix, a wireless network equipment developer, draws attention as its patent citation count is large.

SAMPLE

Company	No. of registered patents	Total citation count
Apple		



Company	No. of registered patents	Total citation count
First Access	1	0

Payment Architecture etc

Global companies

- The global company that owns the largest number of patents for 'Other Payment Architectures' is The Western Union Company, a global financial and communications company.
- Visa draws attention with a high citation count, which indicates a high technological utilization of patents.

SAMPLE



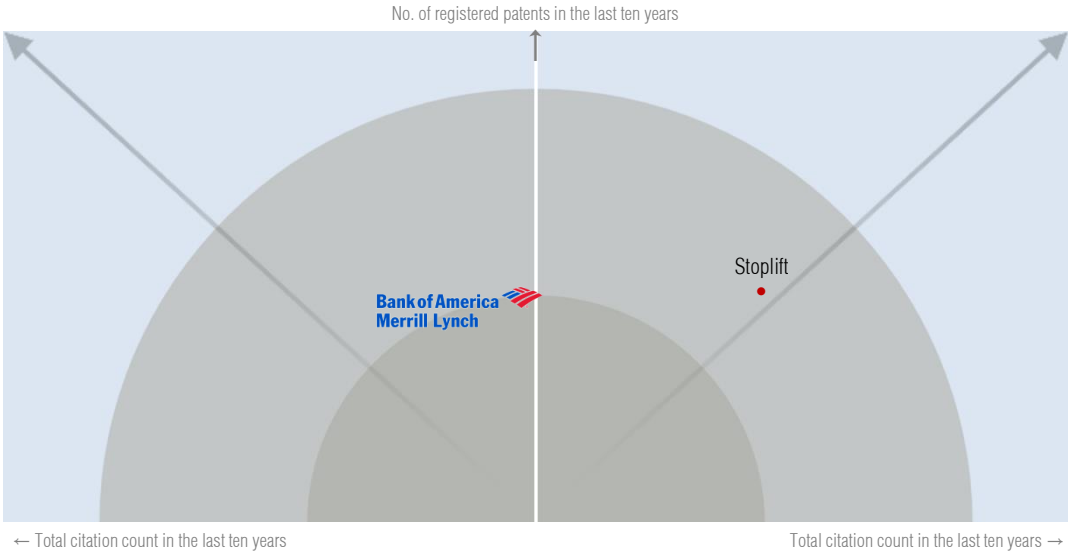
Payment architecture protocols, payment program installation and fund charging

Specialized companies

- Among specialized companies, Stoplift, a personal authentication solution developer, and Macronix International, a personal authentication solution developer, own the largest number of patents.
- Stoplift, an electronic signature solution developer, are also cited actively.

SAMPLE

Company	No. of registered patents	Total citation count
Visa		



Company	No. of registered patents	Total citation count
Boku		



Details of FinTech technologies - 2

Payment circuits



Payment Circuits

Global companies

- The global company that owns the largest number of patents for payment circuits is First Data, a commerce and payment solutions provider. The company's degree of patent utilization, which indicates the degree of patent utilization of patents, is also high at 1.0.
- Visa and Citibank also draw attention for their large citation counts.

SAMPLE

Specialized companies

- Among specialized companies, Signature Systems, a POS system specialist, and CheckFree, a payment solution provider, own the largest number of patents for payment circuits.
- Signature Systems, a payment solution developer in Canada, also has large patent citation counts.

SAMPLE

Company	No. of registered patents	Total citation count
Visa		



Company	No. of registered patents	Total citation count
Paypal		

※ Specialized companies are extracted considering the number of patents owned and total citation count in enterprise groups excluding competitors.



Startups and specialized companies drawing attention in the Payment Citcuits segment

Company	Rdm	Eufora	Davo Technologies	Authernative	Hyperwallet Systems
Key Products & Services					

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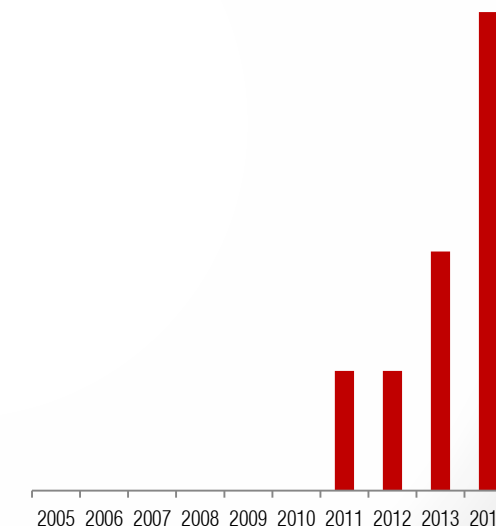
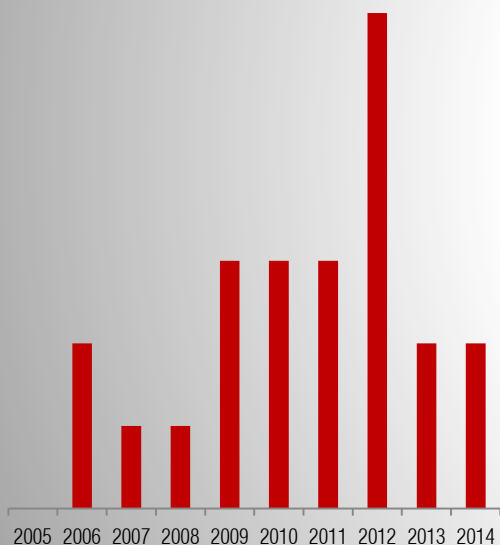
SAMPLE

PayPal is preparing to enter the FinTech market by applying for a patent relating to security of financial products.

Alibaba is preparing to enter the FinTech market by applying for a patent for its payment platform for logistics and transportation services.

● PayPal's Fintech patent registration(Unit:count)

● Alibaba's Fintech patent registration(Unit:count)



'US 8515871 B2,' a patent on endowment of privilege for financial product utilization applied for by PayPal is used to verify users' credit cards, accounts and financial products, and thus ensures convenient financial transactions without the usage of currency.

'US 8626596 B2,' a patent for a payment platform for logistics and transportation services applied for by Alibaba ensures swift and safe brokerage transaction between merchants and consumers using Alipay, the company's electronic payment service.

Checking Circuit

Global companies

- The global company that owns the largest number of patents for 'Checking Circuit' is First Data, an e-commerce and payment solution developer, owns a large number of patents.

SAMPLE



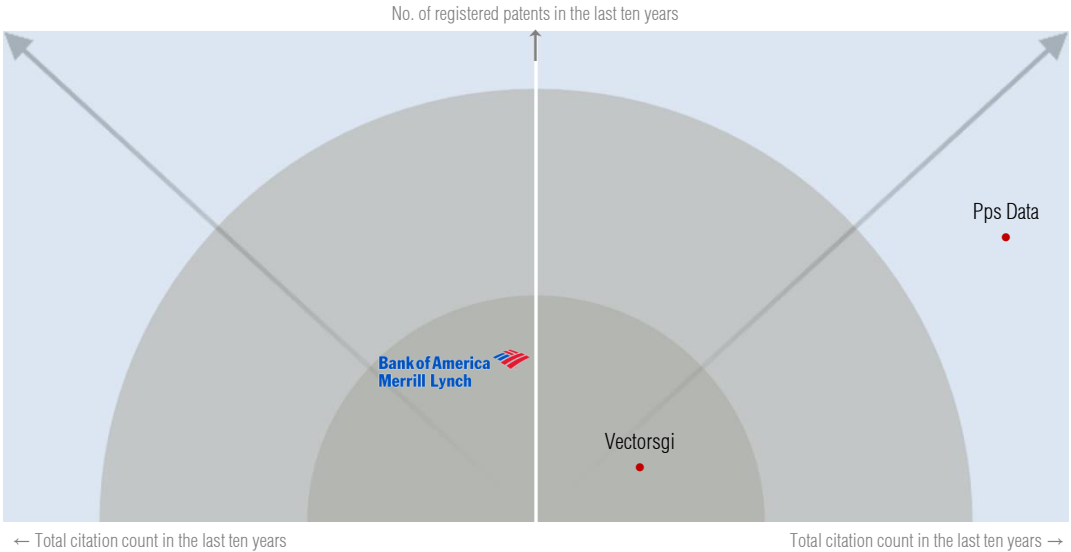
Specialized companies

- Among specialized companies, Pps Data and Advanced Security Design, a financial security solution developer, are cited actively.

SAMPLE

Payment protocols including inspection stage

Company	No. of registered patents	Total citation count
Qualcomm		



	No. of registered patents	Total citation count
Viamerica		

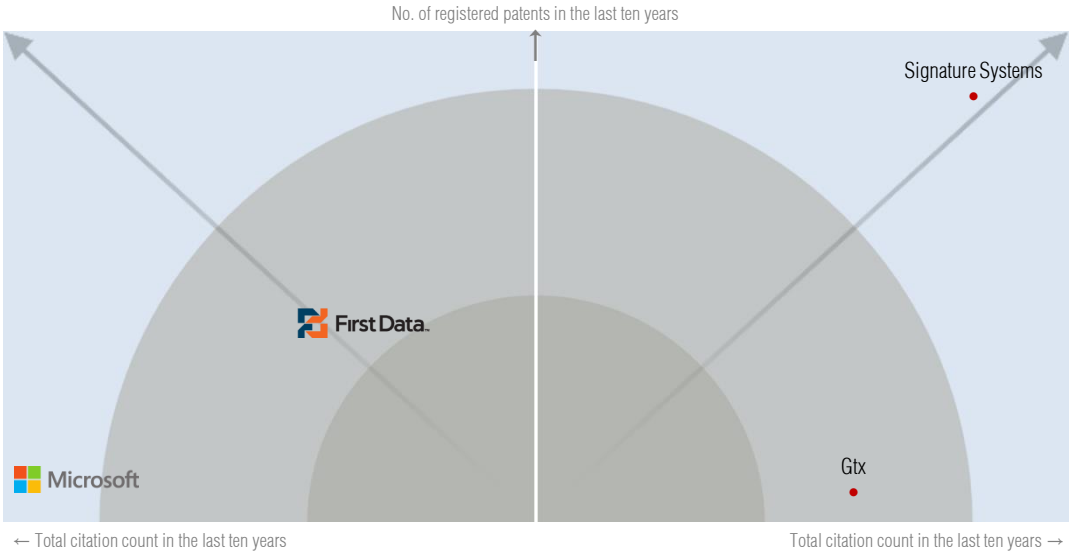
※ Specialized companies are extracted considering the number of patents owned and total citation count in enterprise groups excluding competitors.

Private Payment Circuit



Private circuit for electronic currency used by those participating in payment method utilization

Company	No. of registered patents	Total citation count
Sony		



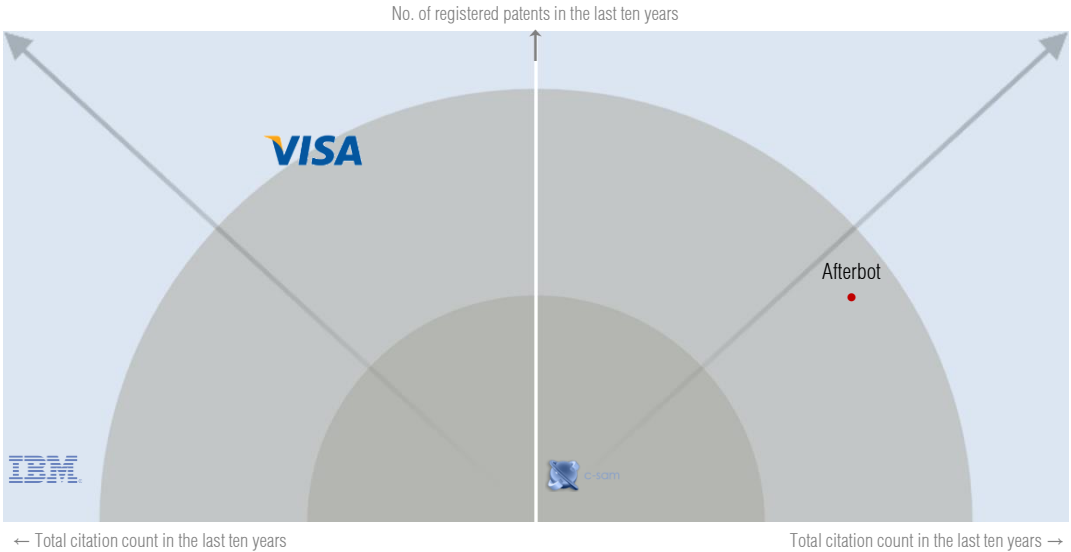
Company	No. of registered patents	Total citation count
Paypal		

Ticket Type



Ticket-type digital currency and digital receipt circuits

Company	No. of registered patents	Total citation count
Visa		



Company	No. of registered patents	Total citation count
Afterbot		

Other Circuits

Global companies

- The global companies that own the largest number of patents for "Other Circuits" are Visa, Mastercard, American Express, and First Data.
- Citibank has the highest citation count, which indicates the technological utilization of patents, in comparison to the number of patents owned.

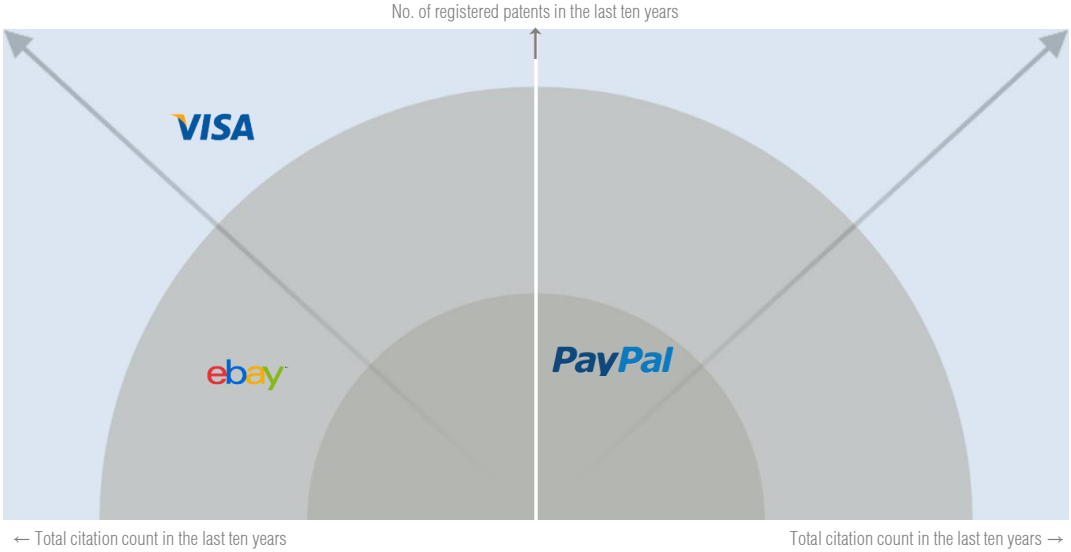
Specialized companies

- Chase Payment Services Corp., a U.S. payment services provider, and Your Technology, a solution provider, own the largest number of patents in the "Other Circuits" category.
- Patent-based companies developing fuel distribution systems and facilities, are also active.



Cryptography, registration and item payout, etc

Company	No. of registered patents	Total citation count
Visa		

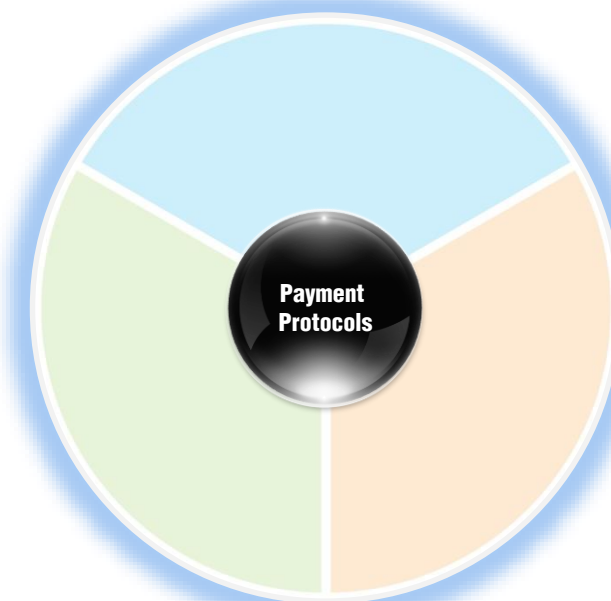
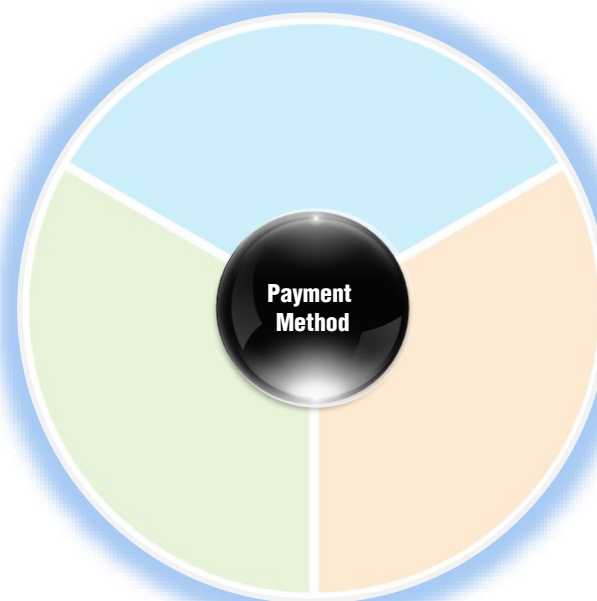
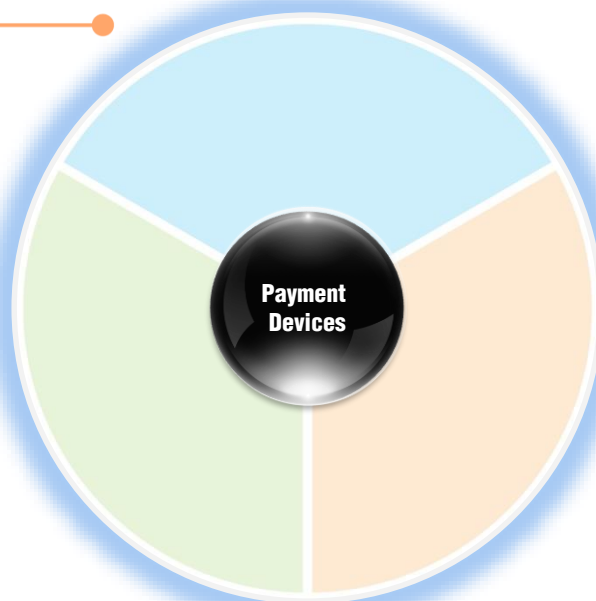
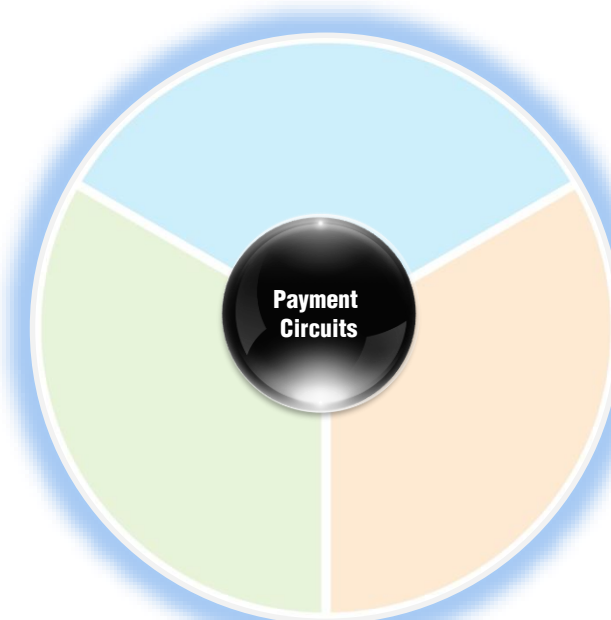
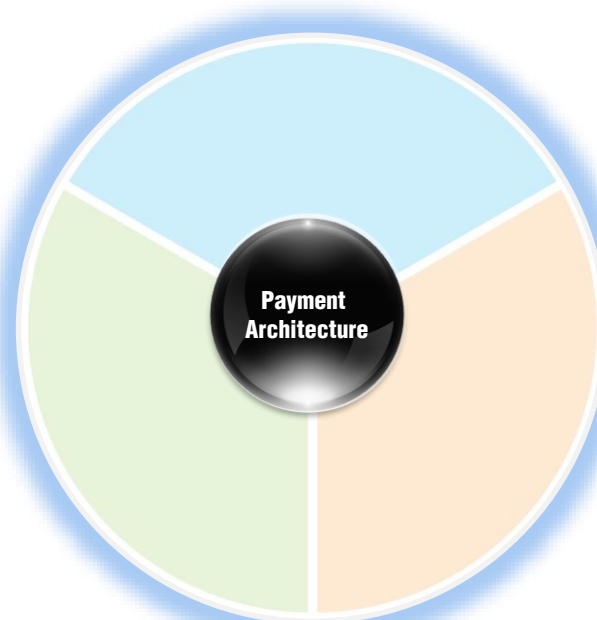
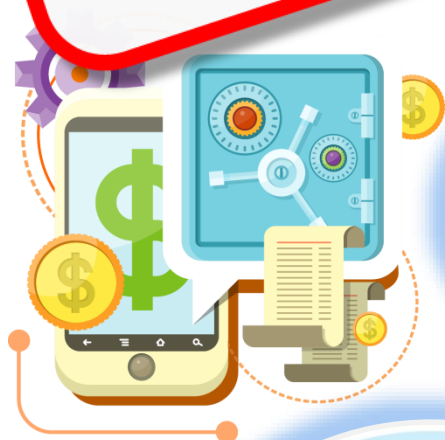


Company	No. of registered patents	Total citation count
Paypal		

◆ Tech pin (Fintech) Who is the winner? Pin - Tech Company Analysis is viewed as a patent

As a result of analyzing the top 5 Fintech technologies and corporate networks, it has been found that the industry is currently being led by the traditional financial institutions. Accordingly, global ICT companies and IT solution startups are rushing into the industry.

SAMPLE





Appendix

* Fintech Patent citations and registration by company in the **Payment Architecture** segment #1

[illegible][illegible]

SAMPLE

* Fintech Patent citations and registration by company in the **Payment Architecture** segment #2

[illegible][illegible]

SAMPLE

* Fintech Patent citations and registration by company in the **Payment Architecture** segment #3

[illegible][illegible]

* Fintech Patent citations and registration by company in the **Payment Architecture** segment #4

[illegible][illegible]

SAMPLE

* Fintech Patent citations and registration by company in the **Payment Architecture** segment #5

[illegible][illegible]

* Fintech Patent citations and registration by company in the **Payment Architecture** segment #6

[illegible][illegible]

*** Fintech Patent citations and registration by company in the Home banking segment #1**

[illegible][illegible]

*** Fintech Patent citations and registration by company in the Home banking segment #2**

[illegible][illegible]

SAMPLE

* Fintech Patent citations and registration by company in the POS Network System segment #1

[illegible][illegible]

SAMPLE

* Fintech Patent citations and registration by company in the **POS Network System** segment #2

[illegible][illegible]

*** Fintech Patent citations and registration by company in the Electronic Shopping Systems segment #1**

[illegible][illegible]

SAMPLE

*** Fintech Patent citations and registration by company in the Electronic Shopping Systems segment #2**

[illegible][illegible]

SAMPLE

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

SAMPLE

* Fintech Patent citations and registration by company in the **Billing System** segment #1

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

* Fintech Patent citations and registration by company in the **Payment Architecture etc** segment #1

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

* Fintech Patent citations and registration by company in the **Payment Architecture etc** segment #2

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

* Fintech Patent citations and registration by company in the **Payment Circuits** segment #1

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

* Fintech Patent citations and registration by company in the **Payment Circuits** segment #2

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

* Fintech Patent citations and registration by company in the **Payment Circuits** segment #3

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

* Fintech Patent citations and registration by company in the **Payment Circuits** segment #4

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

*** Fintech Patent citations and registration by company in the **Payment Circuits** segment #5**

[illegible]

[illegible][illegible]

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

* Fintech Patent citations and registration by company in the **Payment Circuits etc** segment #1

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

*** Fintech Patent citations and registration by company in the **Payment Circuits etc** segment #2**

Company	No. of registered patents	Total citation count
<div>SAMPLE</div>		

[illegible]

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