

Digital Tokens: who is innovating to ensure safety in payments?

In April 2020, EasyJet admitted that over 2,000 customers had had their credit or debit card information accessed by hackers. Around the same time, Bank of America announced that client information had been exposed. According to KPMG, both volume and value of fraud is increasing. Fortunately, there are technologies which can help mitigate these types of breaches, one of them being digital tokens. The patent landscape shows that not only are the usual tech firms such as Google and Ericsson innovating in this space, but payment companies and banks such as Visa and CapitalOne are also working to provide data protection solutions.

Digital tokens: Key findings

- This technology space has seen a large growth in investment. We estimate a 400% increase in patent publications in Tokens for Financial Applications and Token Management from 2011 to 2019.
- Interesting blend of patent owners: top patent owners include banks such as Bank of America, TD Bank and CapitalOne; payment companies such as Visa, MasterCard and PayPal as well tech companies such as Google and IBM.
- Payment companies and banks are gaining share of the patent landscape in tokens while tech companies are losing their share. This indicates payment companies and banks are increasingly becoming inventive and patent minded, at least in this technology field, which is of great importance to their business.
- Although it appears to be a field which banks and payment companies are increasingly focused on, we do not expect all of them to follow; some have chosen to team up with tech companies specialising in tokenisation.
- We expect continued growth in patent filings in this technology, based on the growth seen this far in combination with current industry standards.

Financial services and banking are industries going through significant structural changes. For example, an increased shift to cashless payments, both online and in-stores. Physical bank branches are losing significance, both in terms of managing accounts and how customers are choosing where to deposit their savings. The type of services on offer such as money transfers, banking accounts, money management advice etc. are changing, as are the type of companies providing these services.

These advances are made possible by technological inventions and driven not only by customer demand, changes in regulations and standards in payment technologies but also increased competition in the form of new entrants to a space traditionally dominated by well-established banks. Many technological trends can be seen in the development of banking and financial services such as increased use of artificial intelligence and machine learning, cloud management and digital tokens.

The way money is managed and how payments are made has been changing for years but has definitely been accelerated by the current Covid-19 pandemic. This is just one of the

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reasons why there is increased focus on technological developments, such as digital tokens, in this space.

What are tokens and how are they used?

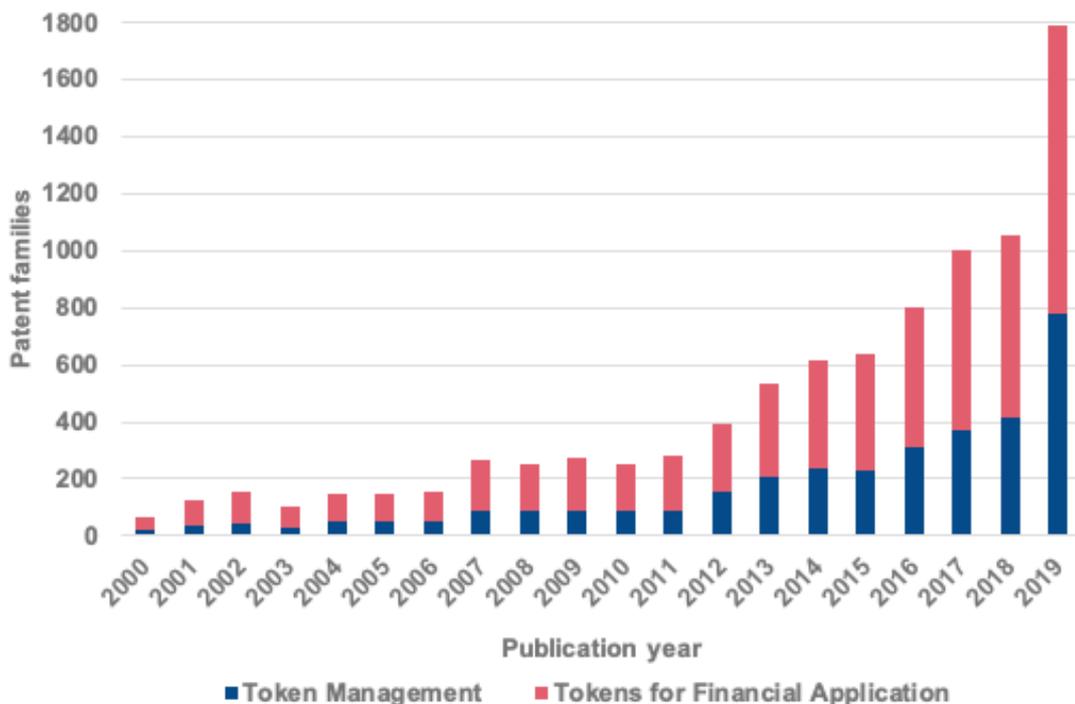
Digital tokens will undoubtedly have an important role to play in the next generation of banking, financial services and payments. Tokenisation is a process where sensitive data is replaced with a non-sensitive surrogate, which is referred to as a 'token'. The sensitive data can, for example, be your social security or credit card number. But tokens can also be used to represent a tradable asset such as a share in a company or a piece of art. The token itself is useless if stolen and can only be unlocked by a payments network.

One of the reasons for the spike in interest of tokens in financial services is that tokenisation directly mitigates risk exposure from holding sensitive data in a system, enabling security efforts to be focused on a much smaller set of data. It also increases efficiency for faster and cheaper transactions and makes it easier to manage compliance.

Two specific applications of tokens have been highlighted to illustrate the developments in this technology space (i) Token Management and (ii) Tokens for Financial Application. Token Management focuses on the communication and transmission of data which generates and transmits security tokens. Tokens for Financial Application include any patents covering tokens which are used for financial, banking or other monetary purposes.

Growth in patenting activity is a marker for the significant uptick in investment. Token Management has seen an increase of over 800% in patenting activity from 2011 to 2019, and over 420% increase for Tokens for Financial Application during the same period.

Digital Tokens: Published patent families by technology



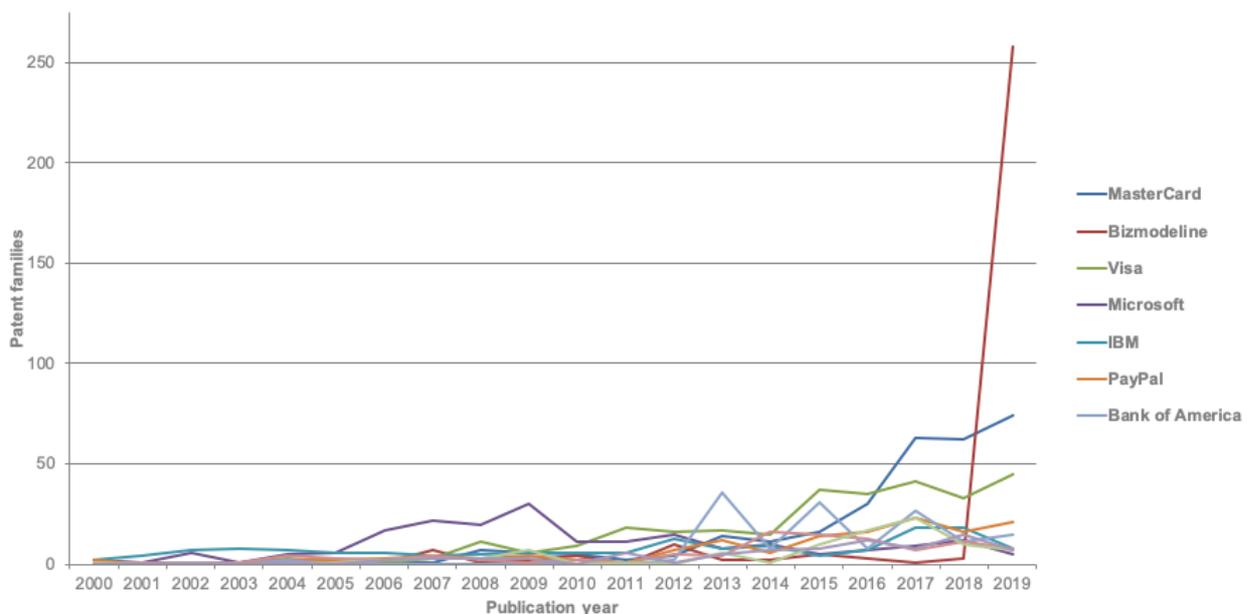
Tokens are now an essential security protection when paying online as well as in contactless payments, an adoption driven to a large extent by key payment players, Visa and MasterCard, who both started working on this initiative together in 2013.

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Their efforts to increase the use of tokenisation as a standard technology shows in the expansion of their token services to new verified partners as well as in their increased patenting activity. In May 2020, Visa signed 28 new partners to their Visa Token Service, and an increase in patenting activity from both MasterCard and Visa can be seen from 2014. In June 2020, MasterCard announced they will be providing tokenisation services to Amazon.com in 12 countries, where the Mastercard Digital Enablement Service (MDES) will be used. Visa, MasterCard and Facebook have also announced a partnership with WhatsApp in Brazil to enable P2P payments through the WhatsApp application. Visa will in this case leverage their Visa Cloud Tokenization to ensure that customer transactions are secure. These examples demonstrate widespread adoption happening today.

Also worth noting is South Korean company Bizmodeline, which in 2018 had only 3 patent families published compared to 2019 where they had 258 patent families published. The Bizmodeline token portfolio is heavily focused on Token Management patent families. The Korean entity controls 244 Token Management patent families and 89 Tokens for Financial Application patent families. In general, other patent owners have the opposite balance with fewer Token Management patent families than Tokens for Financial Application patent families.

Digital Tokens (Management & Financial Applications): Patent families per publication year



Tokens are not only essential in online and cashless payments but are always part of the discussion when designing the CBDCs (central bank digital currencies). CBDCs are digital currencies not dissimilar from the likes of Bitcoin, but typically issued by central banks.

This development is triggered by physical banknotes becoming increasingly obsolete. The Swedish Riksbank said in 2018, “if the marginalisation of cash continues a digital krona, an e-krona, could ensure that the general public still has access to a state-guaranteed means of payment.” Similar initiatives have been introduced by Banque de France and Bank of England in spring 2020.

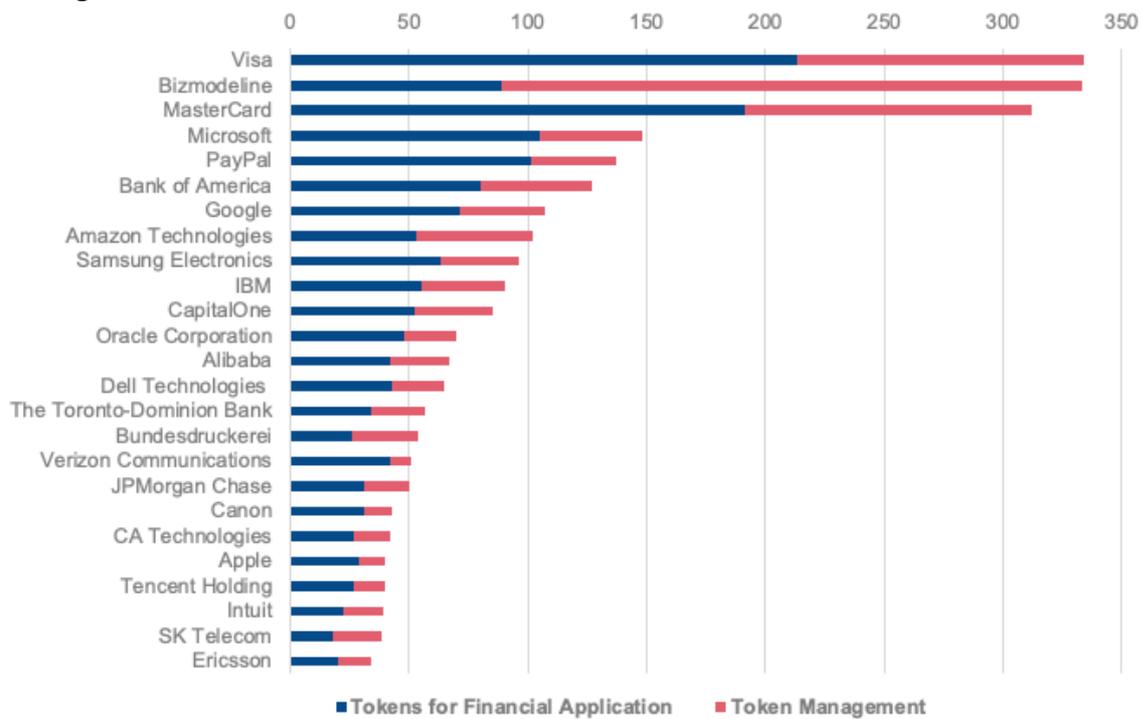
The investment in digital token technologies and growing adoption is not just driven by the decreased use of physical banknotes and need to combat fraud. Innovation is also determined by the need to meet the compulsory requirements of regulatory frameworks and standards such as PCI DSS (Payment Card Industry Data Security Standard) and ISO 20022.

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This puts another layer of pressure on banks and payment companies to innovate and become more tech savvy and agile.

Banks such as Bank of America, CapitalOne, TD Bank and JPMorgan Chase are among the top patent owners in this technology area. Thus highlighting the response to these developments in the shape of innovation and subsequent patenting in the digital token space. Only the top 7 patent owners own more than 100 patent families in this technology space. The top 25 companies control circa 37% of the patent landscape and a majority of the patent owners control small parts of the overall landscape.

Digital Tokens: Active patent families by organisations and technology, top 25 organisations



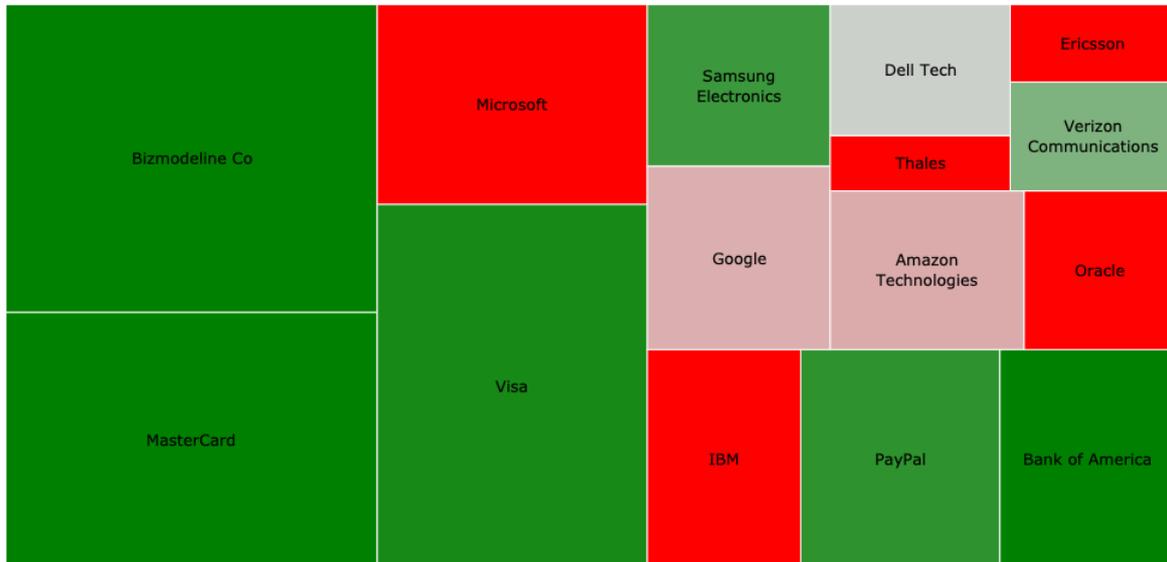
Although banks can be seen inventing in this area, not every bank will develop these technologies in-house. For example, the Swiss bank, SEBA Bank, has partnered with Tokensoft and will use the Tokensoft technology to manage digital assets on their platform.

When investigating the relative growth of active patent portfolios of the top 15 owners over the past 10 years, many tech companies are losing their share to payment companies and banks. Microsoft, IBM and Ericsson, for example, have lost in share, while Bank of America, MasterCard, Visa and PayPal are growing in share. Samsung Electronics is an example of a tech company growing in share, which is unsurprising as tokens are use by Samsung when their customers use Samsung Pay. Google is also using tokenisation to ensure mobile contactless payments are safe but have lost share of total active patent families.

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Digital Tokens: Current active patent families relative size-growth, top 15 organisations, 2009-2019

Rectangle area: Share (%), 2019
 Rectangle colour: Change in Share, 2009 to 2019

Difference in share of number of active patent families between organisations over selected time period. Share and change in share of active patent families is calculated relative to all selected organisations.

Traditional banks are sometimes assumed as less innovative, and while not filing patents to the same extent as payment companies, they do continue to grow their patent portfolios. In fact, both banks and payment companies are gaining share of the patent landscape while tech companies are losing share, which points to an increase in patenting activity and inventiveness from the financial sector as a whole.

The impact of the current boom in payment technologies on the patent landscape is not completely clear yet, but it is unlikely that there will be any marked slowdown in activity in the near future.

For more information on who owns what and where in the Digital Tokens space, access CIPHER via your subscription or if you'd like to understand more about the FinTech taxonomy used to run this report in CIPHER, contact us directly at www.cipher.ai.

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