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Claiming a Fintech Patent Relying on the use of the Blockchain Technology as one of its Essential Components: Role of Free and Open Source Software in Claiming Such Patent- a Global Legal Perspective

by

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ABSTRACT—*This article introduces the Financial Technology (hereinafter 'FinTech') industry, the challenges it sets for the conventional financial services players and the importance of patent protection in FinTech. It then examines the difficulties surrounding patent protection in FinTech, specifically pertaining to the software and technology used by them with focus on the ones relying on blockchain technology and the role of free and open source software licenses here.*

It postulates the hypotheses that: a) patent laws generally make it difficult for FinTechs to claim patents over their software and technology; b) claiming and enforcing a patent for software or technology relying upon blockchain technology software, which is widely used in FinTech, is even more difficult; and c) reliance upon free and open source software licenses by blockchain technologies generally, significantly contributes to this difficulty.

The objectives of this study are to establish these hypotheses in different markets from conceptual and doctrinal angles, by giving a comparative perspective of the difficulties surrounding this in India, Singapore, UK, US and otherwise globally.

This study is important as FinTech revolution has been one of the most disruptive innovation in the financial services sector and



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continues to drastically transform the way we pay, send money, borrow, lend or invest. This disruption has also brought about changes in the approach of the conventional financial industry - who are now attempting to bring them in tune with the changing technology. However, FinTech's heavy reliance on software and technology, specifically the ones relying on blockchain technology, is not protected by patents to a large extent. This study endeavors to answer the why behind this.

INTRODUCTION TO THE FINTECH REVOLUTION

Although the financial services landscape is still dominated by the conventional banks providing regular services such as deposits, payment and credit, they are not the only players providing such services. Digital banks competing with their bricks-and-mortar counterparts are fast becoming a default payment system. Partly due to the recent financial crisis, the trust which banks enjoyed has been eroded to a large extent and the increasing conduct related costs incurred by banks substantiates this.¹ Research² suggests that the younger generation, is more excited about financial services by technology companies, rather than their banks, thus signalling that at least a substantial chunk of customers no longer see banks as a default provider.³ BBVA chairman and CEO, Francisco Gonzalez, in early 2015 even forecasted disappearance of about half of the existing banks due to the digital disruption of the technology with a caveat that the forward-looking banks may thrive only if they

migrate the majority of their customers to their digital banking system.⁴ With a not so distant possibility of being able to regularly borrow money P2P through Rateseller, make payment through Transferwire, make deposits into Alibaba money market fund just by a few clicks from one's mobile bank account, the conventional banks may not be able to compete unless they match the digital speed.⁵ In a world, where technology is changing every moment, the conventional banks may not be able to compete with competitors, or even with bank counterparts which rely heavily on digital technology. Going digital thus appears to be the only way forward.

The challenges described above are being brought up mainly by financial technology, which is a new wave of companies transforming the way we pay, send money, borrow, lend or invest, with the most disrupting services possibly being Transfer Wire (for money transfer), Square (for mobile transfers), Kickstarter (for crowdfunding).⁶ In its simplest form, FinTech can be said to

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mean 'Power to the People', be it in the form of money transfers by enabling customers to have control over their money (end users know better how much they pay which is less than what they used to pay), or providing them with money (easy loans by way of peer to peer lending by connecting buyers and lenders), or better access to investments⁷ (by crowd funding, robo advisors etc.).⁸


FinTech's birth can be said to be related to the last financial crisis and the consequent erosion of trust in the conventional banks, with the timing of the crisis, possibly acting as a catalyst since the millennial generation was just coming to age to be potential customers of a digital market which is now worth more than the US \$600 billion a year.⁹

DIFFICULTIES IN CLAIMING A FINTECH PATENT

Need for Patents Protection in Fintech

With the digital revolution for financial industry underway, competitors are forming partnerships to collaborate, develop and deploy new FinTech products and services.¹⁰ Protecting FinTech intellectual property thus becomes more important. FinTech may be protected by different intellectual property rights such as copyright (which automatically extends to computer code, visual interface features and other works extensively used in FinTech), trademarks, combination of trade secrets and patents. Patents perhaps deserve more emphasis, as patents for core technologies will necessarily provide a mechanism to exclude others *inter alia* from using those technologies, while at the same time permitting use of patented technology by others will contribute to a patent pool using various licensing arrangements maintaining its intellectual property rights.¹¹ There is already a war¹² of patent filings in FinTech space and whoever is successful in getting more (relevant) patents will win.

Under FinTech, the payments category has the highest number of patents sought, followed by banking, wealth management, capital-market insurance and lending patents. The key enabling technology in FinTech includes data and analytics, internet of things, mobile platforms, security, cloud computing and

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cryptocurrency.¹³ The technology sought to be patented under Fintech most often refers to software or business methods, the patentability of which has been a crucial

issue in patent law in many countries.¹⁴ In order to assess the difficulty level of obtaining a FinTech patent, the patent law mainly relating to software and business methods is thus the point of discussion here.

Patent Law and Fintech Patent

To understand the implications and application of patent law on FinTech patents, this paper will specifically focus on three interconnected technologies/applications of technology which are widely used in FinTech industry. These are: (a) distributed ledger technology (hereinafter 'DLT') - an asset database (financial, legal physical or electronic) which can be shared across a network of multiple sites, geographies or institutions, with a possibility that all network participants have their own identical copy of the ledger and any changes in all its copies can be reflected in a matter of seconds; (b) block chain - the underlying technology for distributed ledgers technology with block chain algorithms enabling bitcoin transactions to be aggregated in 'blocks' to be added to a 'chain' using cryptographic signature; and (c) bitcoin - an online equivalent of cash but with a ledger that records transactions which ensures their authenticity so that there are no forgeries.¹⁵


In India¹⁶, like many other jurisdictions such as UK, US and Singapore, the validity of a patent is based on three criteria, which need to be cumulatively satisfied for a patent to be granted. These criteria are - patentable invention, novelty and inventive step. But for software related patents (which FinTech patent claims mainly are) there is also an additional requirement since they are in the nature of computer related inventions (hereinafter CRI).¹⁷ The examination procedure of patent applications relating to such CRI is common with other inventions to the extent of considering novelty, inventive step and industrial applicability but there is also an additional requirement here to determine if they fall under any of the exclusions of under Section 3(k)-(n) of the Patents Act. One of the exclusions (Section 3(k)) is that it should not be a mathematical



or business method or a computer program per se or algorithm.¹⁸ If the claims in any form such as method/process, apparatus/system/device, computer program product/computer readable medium fall under the said excluded categories, they would not be patentable.¹⁹ This essentially means that they may be patentable if they involve something more apart from the program. Although the latest guidelines on the subject, in July 2017, made an effort to bring out clarity in terms of exclusions expected under section 3(k) so that eligible applications of patents relating to CRIs can be examined speedily, it did not do much to make it easy to get software patents.

In US, derived from the legislation and the case law on the subject, there is a threshold requirement that: (a) the claim is directed towards the 4 patent-eligible subject matter categories: process, machine, manufacture, or composition of matter; and (b) is not wholly directed to subject matter falling within judicially recognized exceptions which include laws of nature, natural phenomena, and abstract ideas.²⁰ Abstract ideas include long standing financial practices, practices which are routine and conventional²¹, and possibly also algorithms²²; (c) where a claim is directed to the aforementioned judicial exception then the claims must be more than the exception, which essentially means that it must have an inventive step.²³ A patent for an algorithm to achieve the specific function in the process of molding rubber to cured products was regarded as an inventive concept bringing the claim outside the purview of the judicial exception.²⁴


In UK, similar to Sections 3(k)-(n) of the Indian Patents Act there is a provision that, while business methods and computer programs are not patentable per se, they may be patentable if they involve something more.²⁵ A four-step technical effect approach²⁶ is used for determining the subject matter patentability by (a) construing the claim; (b) identifying the actual contribution (what has the inventor added to human knowledge); (c) determining if the claim falls

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solely within the excluded subject matter; and (d) checking if the actual or alleged contribution is technical in nature.²⁷

In Singapore, the original version of their Singapore Patents Act had a non-exhaustive list of matters which were declared not to be inventions '*as such*' but this was later deleted.²⁸ Under this non-exhaustive list²⁹ there were things such as discovery, scientific theory, mathematical method, scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer; or the presentation of information, to the extent that a patent or patent application relates to that thing as such.³⁰ Reason for exclusion of discoveries, scientific and mathematical methods *inter alia* was the public policy to exclude monopolies being claimed over them and for exclusion of software. Software had an already existing strong protection under copyright laws along with a conventional reason that software are mathematical algorithms for solving a particular mathematical problem and hence comparable to the already excluded mathematical methods and laws of nature.³¹

Although getting a patent for business methods and computer programs appears to have become relatively easy after the deletion of this non-exhaustive list, the deletion of this provision has led to three possible interpretations: (a) there are only three patentability criteria, which are novelty, inventive step and industrial application and if these are satisfied then the subject matters can be a patentable invention - but this interpretation eliminates the principle of discovery/invention dichotomy which is fundamental to patent law; (b) despite the repeal, there is no change in the fact that there must be an invention as the term 'invention' still appears in Section 13(1) and thus the list of excluded matters still needs to be consulted as a guide to what may or may not be inventions - but this interpretation may give rise to uncertainty which is evidenced by different methods used to determine if a patent is for a software or a business method '*as such*'; and (c) a 'middle of the road' approach that the concept of 'invention' is retained where the deletion of the list of excluded matters should not be taken to mean that there is no more 'invention' in Singapore patent law, thus discoveries of things such as abstract ideas should still not be patentable, but an inquiry for novelty, inventive step and industrial application is to include the assessment as to whether or not the subject-matter of a patent is an invention, thus suggesting that though the true focus of the inquiry is on the three positive criteria, there is also a fourth criterion that the subject matter must be an invention.³²

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It is however submitted that although the middle of the road approach appears to be a balanced approach for determining the patentability of software and business

methods and has also been applied by the courts,³³ there is an element of uncertainty as to which interpretation would apply for determining such patentability, especially after the *First Currency case*.³⁴ In this case the issue was patentability of an automated process for using bank codes to match the card holder's default payment currency against the purchase currency which was challenged on the premise that it lacked novelty and inventive step as there already was a manual process which used bank code comparison and also that there was an existing patent which applied a similar concept. The court, in this case, applying a strict interpretation of the notional skilled person's common general knowledge, held that the earlier patent was not within the patentor's contemplation.


The above analysis suggests that claiming a FinTech patent is certainly difficult not only in India but also in other jurisdictions. There is also a fair amount of uncertainty due to the lack of clarity on the correct interpretation for the subject matter patentability criteria, primarily due to the difficulty level in fulfilling the requisite standards set forth by subject matter patentability, novelty and inventive-step criteria for software or a business method patent which is what FinTech patents claims essentially and mostly are.

CLAIMING FINTECH PATENTS RELYING ON USE OF BLOCKCHAIN TECHNOLOGY AS ONE OF ITS ESSENTIAL COMPONENTS: THE OPEN SOURCE ASPECT

Open-Source Software in Fintech Industry: Specifically, for Blockchain Technology

Software is the basis of blockchain and open-source software is widely used there. In fact, the only way a blockchain can work is to have open APIs and 'open source approach'.³⁵

Under the open license, public blockchain technology may be used to assist third parties with the technology offering and associated security levels so that interoperable and secured solutions may be built.³⁶ There are likely to be many implementations of DLT which would benefit all if they are interoperable and

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not just one blockchain technology to rule all others.³⁷ That open source is a trend in FinTech industry is clearly visible from facts such as open sourcing of majority of blockchain code by IBM,³⁸ global open source collaborative effort to create blockchain technologies for cross-industry in Hyperledger project, public blockchain offering Ethereum (Bitcoin 2.0) containing a virtual machine using a cryptocurrency.³⁹

Patent Hostility of Free and Open Source Software: Its Effect on Blockchain Reliant Codes

In traditional proprietary software licenses where only the object code is provided to the user, the absence of the source code makes it difficult for the user to enhance, maintain or develop the code, except by reverse engineering which could *inter alia* result in breach of copyright, infringement of patents, breach of confidentiality or even the conditions of the software license.⁴⁰ In contrast to this, a free software movement was started by Richard Stallman (now managed by Free Software Foundation) which gave the users four freedoms to: run the program for any purpose; modify the program (with access to source code); redistribute copies (with or without fee); and distribute modified program.⁴¹ A program offering users all of these freedoms is 'free software'.⁴² Based on free software, an initiative for open source software was set up which essentially was a fragment of free software community and as per Richard Stallman focuses only on access to source code accommodating licenses not

permitting free modification.⁴³

GNU General Public License ('GPL'): Most Used Open Source License

Although there are many variants of open source licensing (few of them discussed below), the most prevailing 'open source' license currently in use is



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the GPL version 2 (hereinafter GPL 2).⁴⁴ It is regarded as the legal heart of the free software movement⁴⁵, with a goal to use copyright law for creation of shared resources which may be altered by anyone but from which nothing can be permanently removed and this concept of using copyright for shared resources instead of a domain of exclusive ownership is sometimes referred to as 'copyleft'.⁴⁶ As a form of copyleft license, it allows the licensee under it to use, copy and modify the GPL licensed software, but further distribution of such software is subject to the conditions that redistribution to: (a) occur under GPL only without any additional license terms; (b) also include the source code making it easy for the programmers to understand and modify the software; and (c) include a GPL copy, thus making the users aware of their rights to copy, modify and distribute, and these conditions together help GPL achieve its goal of 'creating a commons'.⁴⁷ GPL thus essentially protects its copyleft from being undermined by legal or technological developments and the more recent version protects against three recent threats of: (a) tivoization (by creating devices running GPL's software and then rigging the hardware such that the software can be changed without giving the user any right to do so); (b) Laws prohibiting free software (such as which criminalizes making or sharing any software that can break Digital Restrictions Management); and (c) Discriminatory patent deals (for example Microsoft's recent effort to try collecting royalties for the use of free software, thus restricting users' freedom).⁴⁸

Derivative or Collective Works Under GPL: Considered Non-Proprietary

GPL's aim is to control the distribution of derivative or collective works and it thus allows developing a new work based on the original program with a caveat that such work is licensed to all third parties without any charge under the terms of the GPL.⁴⁹ A derivative work will have the meaning assigned under the US copyright law and thus the licensor must have changed the code in the GPL's code for the work to be a derivative work.⁵⁰ To claim copyright, the author is required to show that it has not unlawfully used the pre-existing work, thus to assert copyright in derivative works it will have to comply with GPL (so that it is not regarded as unlawful) and thereby lose control over the derivative works.⁵¹ GPL software and the derivative work can thus never be proprietary if published as an incorporation of GPL work. In order to keep the



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proprietary work separate from the GPL's work, the company originally licensing the software may engage in two kinds of licenses, one under GPL to be used/modified freely and the other under a proprietary license without giving such rights to the subsequent licensee. However, since those receiving the software under GPL are not entitled to engage in such dual licensing, anyone modifying the software under GPL should release even the modified version as per GPL requirements.⁵² This, it is submitted, results in a loss of control over the derivative works (carried out over the GPL's work) which consequently will result in loss of any power to assert any

intellectual property rights (including patent rights) in the derivative work.

Open Source Software's General Hostility Towards Patent

It is submitted that, as patent represents a negative right by preventing others from using ones' inventions, it runs counter to the open source licensing model generally, which is a positive right to free usage of software released, presuming that all four freedoms are present in such open source license. In GPL 2 there is no express mention of patents, except in its preamble which clarifies that to prevent the danger that free program redistributors will make the code proprietary by individually obtaining the patent licenses, the patent must be licensed for everyone's free use or not licensed at all. But the patent aspects are to an extent still preserved in this GPL version by providing that if the licensor does not comply with both the license and any patent license or court judgment, the licensor will be prohibited from distributing software under GPL 2⁵³ and that if any conditions are imposed upon the licensee, *inter alia*, due to patent infringement which contradicts the conditions the license, even then the licensee is not excused from the license conditions.⁵⁴ This, it is submitted, suggests that a patent of the contributory work does not in itself allow the contributor to exercise all its right with respect to such patented software in violation of the GPL license.

GPL version 3 (hereinafter GPL 3) made a number of improvements to GPL 2 making the license easier to use and understand and was essentially a clarification of what GPL 2 provided.⁵⁵ One of the issues with GPL 2 was that a few content developers were using GPL software to implement technologies limiting the distribution, use or consumption of the content that was copyrighted.⁵⁶ To cover this aspect, GPL 3 in Section 3 specifically requires that conveyance of a covered work would mean losing power to forbid circumvention in such work. There is thus now a specific mention of patents in GPL 3, requiring the



contributor to either make the source code of the contributed work available to the downstream recipients, if the GPL covered work is being transferred in reliance of a patent license, or be deprived of the benefits of the patent license for such contributed work.⁵⁷ An effort by any licensee to stop another user to exercise the GPL rights by way of a patent suit may thus result in termination of such licensee's license, meaning thereby that users and developers need not worry of being sued by a contributor for patent infringement in relation to the contributor's work.⁵⁸ With respect to patent aggression, GPL 3 thus provides more defences to its users than any other licenses for free software.⁵⁹ MySQL case⁶⁰ dealt with this point, where SQL was successful in its injunction claim against Progress software which violated the provision of the GPL requiring its proprietary software NuSphere MySQL Advantage, which among other things put together MySQL like a bookself⁶¹, to provide the MySQL source code which violated Section 3 of the GPL 3.

It is thus submitted that the approach of open source, especially in GPL 3, is patent hostile, suggesting that even if a contributed work is patented, the contributor may still not be able to exercise its patent rights to its fullest as it needs to comply with the GPL licenses. It is further submitted that the way GPL 3 will impact any existing patents on the contributed work, by making the patent rights ineffective against the subsequent licensees (as they would be free to modify etc. the work), puts a question mark on the idea of patenting such work by the contributor as it might not then be worthwhile to patent the invention relying on the GPL. This, it is argued, is also the

case for patentability of the software relying on blockchain technology licensed under GPL 3 where again it would be difficult to bring a claim against the subsequent recipient for patent infringement of the contributed work if such work relied on the GPL license.

Avoiding Viral Effect: Extent of Reliance Important

Derivative work in reference to GPL refers to a derivative work as defined in copyright law.⁶² The viral effect of GPL in the derived work would be present only when *'it has substantially been copied from (the prior GPL) work'*.⁶³ Also, as copyright protects only expression and not ideas⁶⁴, the latter is not protected by copyright. The expression may, however, include a software



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architecture as well.⁶⁵ Just because a software is 'linked' to GPL licensed code may not be interpreted to mean that the software is derived from GPL (for e.g. merely referencing the font does not create a derivative work of that font).⁶⁶ It is thus submitted that the degree of reliance is important here, but this at least gives a room for patenting a technology relying on blockchain technology and effectively using it without being infected by GPL, if the reliance is less in degree or is insubstantial for the purposes of copyright laws as in such an event the GPL license will not apply to the relied work which may be considered proprietary.

There are, however, other open source licenses as well, such as MIT which do not even mention patents and allow the licensed works, modifications and larger works to be distributed without source code.⁶⁷ It is thus submitted that software relying on such MIT open source licenses is not infected by the MIT licenses and in fact allows a restriction on modification and may thus be treated as a proprietary software which if patented may be used without the limitations generally contained in open source license. Another variant is LGPL license which is an addendum to GPL 3 but meant to be used for libraries. In LGPL, the viral effect is less than GPL 3 as the source code of only the work based on LGPL is to be shared with subsequent recipients and not the source code of all derivative work as was the case with GPL.⁶⁸

It is however submitted that which open source license is applicable is not within the control of the FinTech applying for patent or endeavouring to exercise its patent rights with respect to derivative work based on blockchain technology and hence it is not an always an option to choose the open source license with least viral effect (e.g. LGPL) or with a capitalist approach (e.g. MIT) but the difficulty level of exercising the patent rights effectively is certainly higher in case of open source in general and higher still for GPL 3.

Consequences of Violation of Open Source License

Under GPL 2, any violation of license meant that the licensee's rights under the license were permanently lost in an automatic manner and the licensee in order to restore its license was required to petition the copyright holder. But as this policy was causing problems for unintentional violations, GPL 3 made some relaxations by providing that the licensee will get its right upon stopping the violation, unless it is contacted by the copyright holder within 60 days, but even after receiving such a notice the licensee may have its rights under the



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license fully restored if it is a first-time violator and the violation is corrected within 30 days.⁶⁹

CONCLUSION

The above analysis suggest that claiming a FinTech patent is certainly difficult, with also a fair amount of uncertainty, primarily due to the difficulty level in fulfilling the requisite standards set forth by subject matter patentability, novelty and inventive-step criteria for software or a business method patent which is what FinTech patents essentially are.

Depending on the software license on which the blockchain technology has been obtained by the Fintech, claiming patent relying on the use of blockchain technology is more difficult. Even if this patent is claimed, enforcing this patent's claim (i.e. exercising the patent rights so conferred in the new work developed by relying on the blockchain technology) is even more difficult. This is essentially due to a conflict between the negative patent rights and the positive free license rights, with the latter being conferred in the form of free and open source licenses, reliance upon which is in vogue in FinTech industry.

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