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DISCLOSURE UNDER SSO IPR POLICIES: A THEORETICAL PERSPECTIVE

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ABSTRACT

Of the various roles, a standard-setting organization (SSO) is likely to play in the development of standards, the most important involves striking a balance between the interests of innovators and implementers. Towards that end, most SSOs require their members holding patents to disclose and license all essential patents on terms that are fair, reasonable, and non-discriminatory (FRAND). These obligations are imposed to facilitate the development of standards, while at the same time reducing the risk of opportunistic conduct by standard essential patent (SEP) holders. However, seeking their enforcement has proved to be difficult for both, the SSOs and the implementers relying on the same.

The academic literature is replete with theories that may help in understanding disclosure and further justifying the enforcement of disclosure obligations at SSOs. But despite the existence of these theories, most SSOs have been unsuccessful in seeking the enforcement of SEP holders' disclosure commitments. A part of the reason, it could be argued, is the approach to standard-setting, offered by the existing theories on disclosure. The present paper focuses on a qualitative assessment of some of these theories, with the object of understanding the obligations of disclosure in a better manner. In doing so, it carries out a comparative analysis of the strengths and weaknesses of each of these theories and discusses the possibility of an alternative theory for the enforcement of disclosure obligations at SSOs.

Keywords: Disclosure, FRAND, SSOs, SEP, standards, implementers

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1. INTRODUCTION

Of the various roles that a standard-setting organization (SSO) is likely to play in the development of standards, the most important involves striking a balance between the interests of innovators and implementers. The said balance is necessary to ensure that while innovators have enough incentives to contribute their technology towards the development of standards, implementers, on the other hand, continue to have access to standardized technology.[1] Towards that end, members of most SSOs are required to disclose and license all such patents that are potentially essential to a standard, on terms that are fair, reasonable, and non-discriminatory (FRAND).[2] The scope of this paper is limited to the former of the two obligations, i.e., disclosure. The obligation to disclose is imposed to facilitate the development of standards and reduce the risk of opportunistic conduct by standard essential patent (SEP) holders. However, with patent disclosure being self-declaratory in nature, there is, in the absence of a review of patent declarations by SSOs, a major risk that patents that may not be essential, may still be disclosed as essential; a phenomenon known as over-disclosure.[3]

The academic literature is replete with theories that may help in understanding disclosure and further justify the enforcement of disclosure obligations at SSOs. However, despite the existence of these theories, most SSOs have been unsuccessful in seeking the enforcement of SEP holders' disclosure commitments. A part of the reason, it could be argued, is the lack of a holistic approach to standard-setting, offered by the existing theories. Against this background, the present paper focuses on some of the theories in disclosure literature, with the object of understanding the obligations of disclosure more effectively. In doing so, it carries out a detailed analysis of the strengths and weaknesses of each of these theories in terms of the enforcement of disclosure obligations. The Paper begins with the justification for information disclosure, followed by its importance in the context of standard-setting. The next part focuses on the different theories present in disclosure literature and assesses the applicability of each of these theories to standard-setting. This is followed by an overview of the disclosure practices followed at some of the major SSOs operating in the information and communication technologies (ICT) sector. Having analyzed some of the existing theories and practices of disclosure, the next part presents a hybrid theory for understanding the disclosure obligations at SSOs. The last part involves a discussion on the adequate extent of disclosure in standard-setting, rounded off by the conclusion.

2. JUSTIFICATION FOR DISCLOSURE

When it comes to achieving transparency in corporate governance, information asymmetry has, over the years, proved to be a major obstacle.[4] The key to removing the said obstacle lies firmly rooted

[1] 'Balancing Innovation and Intellectual property Rights in a Standard-setting Context' *(ITU News*, 2012), (accessed 22 October 2019). https://itunews.itu.int/en/3049-Balancing-innovation-and-intellectual-property-rights-in-astandard-setting-context.note.aspx

[2] Ian D. McClure, 'Accountability in the Patent Market Part II: Should Public Corporations Disclose More to Shareholders?' (2016) 26(2) Fordham Intellectual Property, Media and Entertainment Law Journal 417.

[3] Robin Stitzing, Pekks Saaskilahti, Jimmy Royer and Marc Van Audenrode, 'Over-Declaration of Standard Essential Patents and the Determinants of Essentiality' (27 October 2017) Available at SSRN: (accessed 18 March 2021) https://ssrn.com/abstract=2951617

[4] Etienne Farvaque, Catherine Refait-Alexandre et Dhafer Saidane, 'Corporate Disclosure: A Review of Its (Direct and Indirect) Benefits and Costs' (2011) 128 International Economics 5; Rahul Ravi and Youna Hong, 'Firm Opacity and Financial Market Information Asymmetry' (2014) 25 Journal of Empirical Finance 83; William Fuchs, Aniko Ory and Andrzej Skrzypacz, 'Transparency and Distressed Sales Under Asymmetric Information' (2016) 11 Theoretical Economics 1103.

in disclosure. Disclosure, whether mandatory or voluntary, reduces information asymmetry and facilitates informed decision-making.[5] More importantly, imposing a disclosure obligation makes up for the need for regulatory authorities to evaluate stakeholder conduct.[6] There are five main pillars of transparency and disclosure, namely, truthfulness, completeness, the materiality of information, timeliness, and accessibility.[7] Truthful and complete disclosure of material information has the effect of ensuring market efficiency and assisting stakeholders in making informed investment choices.[8] What further contributes to transparent decision-making is timely disclosure and the ease of access to the information so disclosed, for all stakeholders.

In the context of standard-setting activities at SSOs, information asymmetry between the SEP holders and implementers finds its existence in the form of a lack of information regarding patents and pending patent applications. The possession of information regarding the status and essentiality of patents is skewed in favour of SEP holders, putting them in a fairly strong position vis-à-vis the negotiation of licenses. Meanwhile, the implementers, with little or no information on the essentiality front, are more often than not, left at the mercy of patent holders, leading to possible over-disclosure or under-disclosure by the latter. While under-disclosure results in some of the essential patents being disclosed post the development of the standard, over-disclosure leads to non-essential patents being disclosed as essential prior to the development of the standard. In both cases, implementers, in the absence of a truthful disclosure, are faced with the prospect of having to pay supra-competitive royalties for SEP licenses.

The relevance of information disclosure, however, is different for different stakeholders. To begin with, disclosure assists the SSO working groups with informed decision-making regarding the inclusion of patented technology in the standard, based on technical superiority, the implementation cost of the standard, and the availability of patent licenses for the use of technology. It is further helpful in facilitating the choice between different technology alternatives, or in designing around a patented technology. From the implementers' perspective, disclosure is fundamental in the identification of patent holders holding essential patents, as well as an assessment of whether the former shall be required to seek licenses from the latter. And in case of a need to seek licenses, it is further helpful in answering the question of whether the implementers would be under an obligation to pay royalties. In other words, disclosure assists implementers in reviewing the disclosed SEPs, their prospective value, and questions regarding their validity and essential nature. Disclosure is equally relevant for SEP holders, as it helps them in assessing their essential patent claims vis-à-vis the claims of others, and in the determination of the appropriate royalty rate, in line with their FRAND commitments.[9]

While it is true that in the context of standard-setting, SEP holders and implementers are the major stakeholders, it cannot at the same time, be denied that the relevance of disclosure isn't just restricted to the stakeholders but extends to regulatory authorities, as well as the courts. With standardization, there is always a risk involving abuse of dominance by SEP holders, owing to which standard-setting processes are closely watched by competition agencies. In case of alleged anti-competitive conduct being brought to their attention, competition agencies often seem to rely on the patent data stored in SSO databases.[10] The said databases contain the relevant patent data disclosed by patent holders in

[5] Michael D. Guttentag, 'An Argument for Imposing Disclosure Requirements on Public Companies' (2004) 32 Florida State University Law Review 123, page [124].
[6] Farvaque and Saidane (n 4) 6.
[7] Benjamin Fung, 'Demand and Need for Transparency and Disclosure in Corporate Governance' (2014) 2(2) Universal Journal of Management 72, pages [75]-[76].
[8] Fung (n 7) 76.
[9] Keith Maskus and Stephen A. Merrill (eds), *Patent Challenges for Standard-Setting in the Global Economy: Lessons from Information and Communication Technology*, (The National Academies Press 2013), page [73].
[10] Maskus and Merrill (n 9) 74.

fulfillment of their disclosure obligations and offer assistance to competition agencies in the assessment of anti-competitive conduct. For courts too, information disclosure is extremely useful in assessing claims regarding non-compliance with SSO IPR policies,[11] for the SSO members' conduct throughout the standards development process is evaluated against the commitments made by them to the SSOs, ex-ante. Moreover, with a majority of the courts and competition agencies in the United States (U.S.)[12] and European Union (EU)[13] having stated that FRAND royalties should be based on the economic value of the technology prior to its incorporation in the standard, accurate disclosure of patent information becomes extremely crucial in judicial proceedings.[14]

From a jurisprudential point of view, there are several theories in disclosure literature, that emphasize the importance of disclosure and offer an explanation for the reasons behind firms' decisions to voluntarily disclose less or more information.[15] Some of these theories are the agency theory, signaling theory, capital need theory, stakeholder theory, and legitimacy theory. In explaining voluntary information disclosure, these theories take into account the different factors responsible for influencing organizational behavior; the most important of which is information asymmetry. Furthermore, while the agency theory looks at information asymmetry and disclosure from the perspective of a principal and agent, signaling theory assesses the same in the context of a company and its investors. Similar to the signaling theory, the capital need theory holds the need to raise capital as a major determinant in the extent of disclosure, while the stakeholder theory views disclosure as being directly affected by the interests of various stakeholders of a firm. Yet another justification for disclosure is offered by legitimacy theory, according to which the true test of information disclosure is that of societal approval.

It is on account of these diverse perspectives on disclosure that it becomes essential to take an in-depth look at these theories-

2.1 AGENCY THEORY

Having its roots in information economics, agency theory was proposed by Stephen Ross and Barry Mitnick, albeit independently of each other.[16] While Stephen Ross is credited for devising the economic theory of agency, Barry Mitnick is the one responsible for the institutional theory of agency.[17] Under the agency theory, an agency relationship is defined as "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent."[18] The principal and

[11] Ibid.

[12] Koren W. Wong-Ervin, Methodologies for Calculating FRAND Royalty Rates and Damages (*ABA*, 22 October 2014) (accessed 29 October 2019) https://www.ftc.gov/system/files/attachments/key-speeches-presentations/wong-ervin_aba_program_frand_royalty_rates_10-22-14.pdf; Koren W. Wong-Ervin, 'Mehodologies for Calculating FRAND Damages: Part 1' (*Law360*, 8 October 2014). (accessed 29 October 2019). https://www.ftc.gov/system/files/attachments/key-speeches-presentations/wong-ervin_-_methodologies_for_calculating_frand_damages.pdf

[13] Commission, 'Setting out the EU Approach to Standard Essential Patents' (Communication) COM (2017) 712 final.

[14] Maskus and Merrill (n 9) 74.

[15] Francisco Bravo, Cristina Abad and Marco Trombetta, 'Disclosure Theories and Disclosure Measures' (2010) 39(147) Revista Espanola De Financiacion Y Contabilidad 393.

[16] Kathleen M. Eisenhardt, 'Agency Theory: An Assessment and Review' (1989) 14(1) Academy of Management Review 57.

[17] Barry M. Mitnick, 'Origin of the Theory of Agency: An Account by One of the Theory's Originators' (2006). (accessed 17 December 2019). http://www.pitt.edu/~mitnick/agencytheory/agencytheoryoriginrev11806r.htm

[18] Michael C. Jensen and William H. Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership

agent might have different interests and as a result, the actions of the agents might not always align with the interests of the principal.[19] In other words, such actions are likely to affect the welfare of the principal.[20] Furthermore, the divergence in interests of the two can be linked to agency costs. While the principal incurs monitoring costs to prevent its agent from indulging in aberrant activities, the agent incurs bonding costs to ensure that the principal does not suffer any harm as a result of its decision-making.[21] A divergence in decision-making results in a reduction of the principal's welfare and is referred to as residual loss.[22] Thus, agency cost can be defined as the sum of monitoring cost, bonding cost, and residual loss.[23] Having said so, according to the agency theory, it is information asymmetry between the principal and agent that leads to an increase in agency costs and gives rise to the likelihood of conflicts. It is further argued that the same could be minimized by bringing about an increase in the information disclosed.[24] Doing so would not only leave the agent in a position to carry out more informed decision-making but also reduce agency costs. What is worth noting, however, is the bulk of concentration of the Theory on the agent side of the issue, with no real attention being paid to the principal side.[25] In other words, the Theory ignores the possibility of information asymmetry arising from the side of the principal, something that finds instant support in standard-setting.

In the context of standard-setting, it may be held that the representatives of patent holders, while participating in the standard-setting process act in the capacity of agents and make all decisions related to the disclosure of essential patent claims. However, despite the agency involved, there have been allegations of over-disclosure, under-disclosure, and lack of disclosure levelled against patent holders.[26] One may attribute the same to the unwillingness on the part of principals (the firms holding patents in this case) to make an accurate disclosure to their agents, resulting in the agents making under/over disclosure. Once the standard has been developed and certain essential patent claims end up being claimed by the patent holder ex-post, the representatives (agents) plead ignorance, despite there being a possibility of a deliberate ploy on the part of SEP holders to withhold such information. The major drawback in the case of agency theory, when seen in the context of standard-setting, is the lack of accountability of SEP holders, in case of inaccurate disclosure made by their representatives. Unlike the principal's vicarious liability vis-à-vis the agent's actions, the SSO IPR policies do not hold the SEP holders vicariously liable for the actions of their representatives. As a result, any declarations of essentiality coming from the SEP holders' representatives (agents) if found to be false, would have no effect on the membership or future participation of the SEP holders at the SSO. In such a situation, with there being no accountability on the part of SEP holders for the actions of their representatives, it becomes difficult to apply the agency theory to standard-setting.

Structure' (1976) 3 Journal of Financial Economics 305.

[19] Bravo, Abad and Trombetta (n 15) 396.

[20] Nermeen F. Shehata, 'Theories and Determinants of Voluntary Disclosure' (2014) 3(1) Accounting and Finance Research 18.

[21] Jensen and Meckling (n 18) 308.

[22] Shehata (n 20) 19.

[23] Jensen and Meckling (n 18) 308.

[24] Bravo, Abad and Trombetta (n 15) 396.

[25] Charles Perrow, 'Economic Theories of Organization' (1986) 15 Theory and Society 11.

[26] Over-disclosure refers to a situation where patent holders, in order to extract higher royalties, declare more patents as essential than those actually essential. Under-disclosure results from a lack of adequate disclosure owing to third party ownership of patents, with the outcome being the assertion of such patents and demand for royalties accruing post the development of the standard.

2.2 SIGNALING THEORY

The origin of signaling theory can be traced to Michael Spence's seminal work on markets with asymmetric information in 1973.[27] Originally developed based on the existence of knowledge gaps between employers and employees, the Theory went on to be applied in other domains, including organizational behavior.[28] According to signaling theory, information asymmetry between a company and its potential investors leads to adverse selection.[29] To avoid such information asymmetry, it is common practice in the corporate sector for companies to signal certain information to investors. Most companies voluntarily disclose more information than what is mandated under a given law or regulation, to signal their credibility and attract greater investment.[30] The Theory further holds that voluntary disclosure is directly proportional to the size and profits of the firm,[31] meaning thereby that bigger firms are likely to disclose more information. In other words, the more profitable the firm, the higher is likely to be the information disclosure.[32] Having said so, the Theory does not account for the financial costs associated with the process of signaling. Furthermore, there is a lack of information on how to perceive alternative signals, and in certain cases, multiple signals at the same time.[33]

The other important aspect of the Theory is the assumption that the sellers are more informed than the buyers when it comes to their products (information asymmetry).[34] With a lack of information about the products, buyers are likely to value the products based on their perceptions, which in certain cases may end up being based on the average price of goods sold by different sellers (imperfect information).[35] This might result in manufacturers of high-quality products incurring losses, for their goods might have been sold at higher prices had there been enough information disclosure. On the other hand, manufacturers of lower-quality products might stand to benefit due to the market average working in their favour, in the absence of adequate disclosure. In other words, in the absence of a signal regarding quality, products of low and high quality might end up being sold for the same price. Therefore, it becomes essential for sellers to signal to prospective buyers, information about their product, which will aid informed decision-making by the latter.[36]

In standard-setting, it can be said that SSO IPR policies require firms holding patents to disclose all essential patents prior to the development of the standard. However, most firms holding essential patents are big, as a result of which the profits at stake are more and the disclosure is likely to be on the higher side. The basic problem that is likely to arise due to higher information disclosure is over-disclosure. Patents that may not in reality be essential, might end up being disclosed as essential by

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[27] Michael Spence, 'Job Market Signaling' (1973) 87(3) The Quarterly Journal of Economics 355; Victor Nee and Sonja Opper, 'Sociology and the New Institutionalism' in James D. Wright (ed), *International Encyclopedia of the Social & Behavioral Sciences* (Elsevier 2015); M.E. Page, 'Signaling in the Labor Market' in Penelope Peterson, Eva Baker and Barry McGaw (eds), *International Encyclopedia of Education* (3rd edn, Elsevier 2010).

[28] Michael Spence, 'Job Market Signaling' (1973) 87(3) The Quarterly Journal of Economics 355.

[29] Bravo, Abad and Trombetta (n 15) 397.

[30] Shehata (n 20) 20.

[31] Hamid Birjandi, Bahruz Hakemi and Mohammed Mehdi Molla Sadeghi, 'The Study Effect Agency Theory and Signaling Theory on the Level of Voluntary Disclosure of Listed Companies in Tehran Stock Exchange' (2015) 6(1) Research journal of Finance and Accounting 174.

[32] Laura Bini, Francesco Dainelli and Franceso Giunta, 'Signalling Theory and Voluntary Disclosure to the Financial Market: Evidence from the Profitability Indicators Published in the Annual Report' (34 EAA Annual Congress 2011), page 2.

[33] Ray Karasek and Phil Bryant, 'Signaling Theory: Past, Present and Future' (2015) 14(12) Electronic Business Journal 550.

[34] Richard D. Morris, 'Signalling, Agency Theory and Accounting Policy Choice' (1987) 18 Accounting and Business Research 69.

[35] Abdallah Al-Mahdy M.D. Hawashe, 'An Evaluation of Voluntary Disclosure in the Annual Reports of Commercial Banks: Empirical Evidence from Libya'(Ph.D. Thesis, University of Salford 2014), page 63.

[36] Hawashe (n 35) 63.

firms seeking to increase their profits. The implementers in the instant case can be analogized to investors in the corporate set-up. For the implementation of the standard and manufacture of standard-compliant products, it is essential for the implementers to be aware of all the necessary information regarding the essentiality of patents, so that investments can be made to that effect. Moreover, patent holders are the ones that have all the necessary information regarding their patent portfolios and more importantly, the essentiality of patents. It is, therefore, incumbent upon the SEP holders to signal such information about essentiality to the implementers. Although signaling theory states that bigger firms are likely to disclose more information, such over-disclosure when seen in the light of standard-setting, is likely to cause hardships to implementers. This is because the disclosure made by SEP holders is likely to be acted upon by implementers. In case the disclosure is found to be inaccurate post the development of the standard (ex-post), it is highly likely, that implementers would likely suffer losses on account of the investments having already been made to that effect. What further makes it difficult to apply the signaling theory is the lack of checks being placed by SSOs, on the over-disclosure of essential patent claims. All that is required under SSO IPR policies is for patent holders to make an honest disclosure regarding all essential patent claims that they may own. However, the SSOs do not adopt any verification mechanism for checking the actual essentiality of patents, leaving implementers at the mercy of patent holders.

2.3 CAPITAL NEED THEORY

Another theory justifying the need for disclosure is the capital need theory. The capital need theory first found a mention in Fredrick Choi's 1973 paper on financial disclosure in capital markets[37] and has since been adopted by several scholars to explain voluntary disclosure.[38] Choi stated that it is the prerogative of companies to attract investment and raise their capital at a minimum cost,[39] and what helps them in achieving the said objectives is the voluntary disclosure of information.[40] Capital need theory posits that companies resort to voluntary disclosure of information in an attempt to lower the cost of capital and uncertainty among investors.[41] The cost of capital is inversely proportional to the extent of disclosure; the greater the extent of disclosure, the lower the cost of capital for the company.[42] In other words, there is a reduction in the cost of capital for the company, when the information so disclosed is enough for the investors to gauge the economic prospects of the company.[43] It has been further stated that more disclosure is preferred over less, to reduce the uncertainty surrounding the prospects of a company and attract new investors.[44] An enhancement in information disclosure not only results in improved decision-making vis-à-vis allocation of capital but also assists

[37] Fredrick D.S. Choi, 'Financial Disclosure and Entry to the European Capital Market' (1973) 11(2) Journal of Accounting Research 159.

[38] Sidney J. Gray, Gary K. Meek and Clare B. Roberts, 'International Capital Market Pressures and Voluntary Annual Report Disclosures by U.S. and U.K. Multinationals' (1995) 6(1) Journal of International Financial Management and Accounting 43; Paul M. Healy and Krishna G. Palepu, 'Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature' (2001) 31(1-3) Journal of Accounting and Economics 405; Omaima A.G. Hassan, Gianluigi Giogioni, Peter Romilly and David M. Power, 'Voluntary Disclosure and Risk in an Emerging Market' (2011) 1(1) Journal of Accounting in Emerging Economies 33; Peter Schuster and Vincent O'Connell, 'The Trend Toward Voluntary Corporate Disclosures' (2006) 7(2) Management Accounting Quarterly 1.

[39] Choi (n 37) 160.

[40] Hawashe (n 35) 68.

[41] Mostafa I. Elfeky, 'The Extent of Voluntary Disclosure and its Determinants in Emerging Markets: Evidence from Egypt (2017) 3 The Journal of Finance and Date Science 45.

[42] Elfeky (n 41) 47.

[43] Shehata (n 20) 20.

[44] M. Kabir Hassan, Benito Sanchez and Jung-Suk Yu, 'Financial Development and Economic Growth: New Evidence from Panel Data' (2011) 51(1) The Quarterly Review of Economics and Finance 88.

investors in the assessment of the expected returns on investment.[45] The outcome is a reduction in information asymmetry between the management of the company and the prospective investors, thereby increasing the likelihood of increased demand for the company's shares.[46] At the same time, however, it has been argued that in the absence of a legal obligation to do so, disclosure of unwarranted information might lead to investors and shareholders suspecting or misinterpreting the intentions of the company.[47] Moreover, unverified disclosure of information regarding the enhanced prospects of the company might leave the company susceptible to legal action, in case the final consequence turns out to be inauspicious.[48]

Seen in the light of standard-setting, it may be argued that disclosure on the part of patent holders is driven by the intention to raise more capital through royalties. The investors in the instant case being implementers need the desired information about the essentiality of patents, to make investments towards that end. To maintain a balance between the interests of the innovators (patent holders) and implementers, SSOs mandate the timely disclosure of information relating to essential patent claims by the patent holders. However, with the inclusion of patented technology in the standard, the licensing revenues likely to accrue to patent holders are significantly more than a non-essential patent license, which is why there is a tendency on the part of SEP holders to over-disclose their patents. The same can be considered analogous to the desire to raise more capital for the firm. The Theory, however, is unable to offer a justification for the possibility of under-disclosure leading to possible gains for SEP holders, as observed in *Dell*[49] and *Rambus*[50] cases.[51] In the context of standard-setting, both over-disclosure and under-disclosure are distinct possibilities. There is evidence to account for under-disclosure on the part of SEP holders, therefore, it becomes quite difficult to apply the capital need theory in such a case.

2.4 STAKEHOLDER THEORY

One of the most holistic approaches to disclosure is offered by the stakeholder theory, which takes into account the interests of stakeholders other than mere shareholders of the company. A stakeholder may be defined as "any group or individual who can affect or is affected by the achievement of the firm's objectives".[52] Applying the said principle, stakeholders range from employees to creditors, as well as include customers, public interest groups, and regulatory and governmental bodies.[53] The roots of stakeholder theory can be traced to Milton Friedman's 1970 article, "The Strategic Responsibility of Business is to Increase Profits" in the New York Times, wherein the Nobel Laureate justified the

[45] Peter Schuster and Vincent O'Connell, 'The Trend Toward Voluntary Corporate Disclosures' (2006) 7(2) Management Accounting Quarterly 1.

[46] B.M. Craven and C.L. Marston, 'Financial Reporting on the Internet by Leading UK Companies' (1999) 8(2) European Accounting Review 321.

[47] Omaima A.G. Hassan, Gianluigi Giogioni, Peter Romilly and David M. Power, 'The Value Relevance of Disclosure: Evidence from the Emerging Capital Market of Egypt' (2009) 44(1) The International Journal of Accounting 79.

[48] S.P. Kothari, 'The Role of Financial Reporting in Reducing Financial Risks in the Market' in Eric Rosengren and J. Jordan (eds), *Federal Reserve Bank of Boston Conference Series No. 44* (Federal Reserve Bank of Boston 2000); Hawashe (n 34) 71.

[49] *Re Dell Computer Corp* 121 FTC 616 (1996).

[50] *Re Rambus Inc* 9302, 2007 WL 431522 (FTC Feb 2, 2007).

[51] In both instances, the SEP holders Dell and Rambus were alleged to have indulged in deliberate non-disclosure of SEP(s), with the intention of extracting exorbitant royalties post the inclusion of the said patents in VESA Bus standard and DRAM standards respectively.

[52] R. Edward Freeman, *Strategic Management* (Cambridge 1984), page 49.

[53] Robin W. Roberts, 'Determinants of Corporate Social Responsibility Disclosure: An Application of Stakeholder Theory' (1992) 17(6) Accounting, Organizations and Society 595.

focus of companies on maximizing profits.[54] Friedman stated companies are artificial persons having no moral responsibilities, with profit as their main motive. Furthermore, in supporting Adam Smith's argument of the "visible hand", Friedman stated that the attainment of social welfare was contingent on each carrying their interest.[55] According to the stakeholder theory, however, it is the responsibility of a firm to integrate the divergent interests of all stakeholders through transparent reporting of information.[56] One of the pioneer works on the stakeholder theory happens to be that of Ullmann, according to whom, what drives the behavior of a firm is the pressure exerted on it by the various stakeholders.[57] In other words, one of the most crucial determinants of organizational behavior happens to be stakeholder power.[58] What is important is how a firm responds to such pressure. A firm's success is to be seen in the light of its ability to balance the conflicting interests of all stakeholders.[59] Despite the aforementioned benefits, stakeholder theory has been subjected to considerable scrutiny. While some hold the opinion that it lacks specificity, making it difficult to allow scientific inspection,[60] others state the Theory to be offering an unrealistic view of the functioning of organizations.[61] It is further argued that stakeholder theory shifts the focus from achieving success in businesses to sharing the fruits of success.[62] Perhaps the most notable critique of the Theory is that morally responsible corporate behavior is an unrealistic possibility as long as wealth maximization and accountability to shareholders are at the top of corporations' objectives.[63] Having said so, it may still assume significant relevance in the context of standard-setting.

In standard-setting, stakeholder theory posits that patent holders are obliged to cater to the interests of all stakeholders, be it their shareholders, the implementers, the SSO, or the competition agencies. That also happens to be the advantage of the stakeholder theory over the earlier theories, since it takes into consideration the interest of SSOs and the competition agencies. Disclosure of information must be such that it not only provides enough information for implementers to make investments but also for the SSO to carry on the process of standards development, with an opportunity to look at technology alternatives in case there is no FRAND commitment. As for the competition agencies, proper and honest disclosure is important so that any risk of anti-competitive harm is averted. Another advantage of the stakeholder theory is the possibility of its applicability to SSOs. Since it is the primary responsibility of an SSO to balance the interests of the innovators and implementers, it must, in achieving the said objective, impose such disclosure obligations that provide for enough disclosure to reconcile the interests of all stakeholders involved. That shall include the innovators, the implementers, and the competition agencies. It may, however, be argued that the primary responsibility of a firm is towards its shareholders, and expecting it to cater to the demands of all stakeholders may make it difficult for the firm to sustain profitability and enjoy the shareholders' confidence. Moreover,

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54 Toukabri Mohamed, Ben Jemaa Olfa and Jilani Faouzi, 'Corporate Social Disclosure: Explanatory Theories and Conceptual Framework' (2014) 3(2) International Journal of Academic Research in Management 208.

55 Mohamed, Olfa and Faouzi (n 54) 214-215.

56 Susith Fernando and Stewart Lawrence, 'A Theoretical Framework for CSR Practices: Integrating Legitimacy Theory, Stakeholder Theory and Institutional Theory' [2014] The Journal of Theoretical Accounting 149.

57 Arieh A. Ullmann, 'Data in Search of a Theory: A Critical Examination of the Relationships Among Social Performance, Social Disclosure, and Economic Performance of U.S. Firms' (1985) 10(3) The Academy of Management Review 540.

58 Javier Husillos and Maria J. Alvarez-Gil, 'A Stakeholder-Theory Approach to Environmental Disclosures by Small and Medium Enterprises (SMES)' (2008) 11(1) RC-SAR 125.

59 Roberts (n 53) 597.

60 Susan Key, 'Towards a New Theory of the Firm: A Critique of Stakeholder "Theory"' (1999) 37(4) Management Decision 317.

61 Teppo, 'Stakeholder Theory, Again' (*orgtheory*, 2 August 2006). (accessed 18 December 2019). https://orgtheory.wordpress.com/2006/08/02/stakeholder-theory-again/

62 Tim Ambler and Andrea Wilson, 'The Problems of Stakeholder Theory' (2006) 4(1) Business Ethics A European Review 30.

63 Samual Mansell, 'A Critique of Stakeholder Theory' (Ph.D. Thesis, University of Essex 2009).

in the absence of any clear guidelines by SSOs as to the extent of disclosure expected of SEP holders, the latter is left with too heavy a burden to meet the aforementioned demands.

2.5 LEGITIMACY THEORY

Legitimacy theory derives its existence from organizational legitimacy, a concept defined by John Dowling and Jeffrey Pfeffer.[64] The Theory operates on the principle of a social contract existing between an organization and society.[65] Legitimacy can be defined as "the appraisal of actions in terms of shared or common values in the context of the involvement of the action in the social society."[66] According to the Theory, an organization derives legitimacy for its actions by working within the bond and norms of society.[67] For the said purpose, society is considered as society at large, without considering separate individuals.[68] The Theory further obligates companies to disclose information that would result in a change in the external users' views of them.[69] In other words, organizations are under an expectation to cater to the interests of society at large and not just those of their shareholders (as stated under the agency and signaling theories).[70] Legitimacy theory posits that an entity will only be allowed to operate if it complies with the terms of the social contract, and such terms may be implicit or explicit.[71] Moreover, legitimacy can be attained through mandatory or voluntary disclosure.[72] Although the ultimate objective of legitimacy theory, like all the other theories of disclosure, is to reduce information asymmetry, however, what sets it apart from others is the social perspective attached to corporate decision-making. When compared with stakeholder theory, legitimacy theory offers an additional perspective of societal values influencing the decisions of the firm. In other words, according to legitimacy theory, firms are expected to cope with shifts in societal perceptions through their actions, whereas stakeholder theory holds the management of stakeholder issues as the primary objective of firms.[73] Having said so, legitimacy theory does have its shortcomings: firstly, the Theory does not explain non-disclosure and selective disclosure by organizations. Secondly, societal expectations change quite frequently, meaning thereby that firms are expected to align their decision-making with the changing social norms and expectations, which may not be feasible owing to shareholder/stakeholder concerns. Such a situation might lead to a legitimacy gap between the two,

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64 John Dowling and Jeffrey Pfeffer, 'Organizational Legitimacy: Social Values and Organizational Behavior' (1975) 18(1) The Pacific Sociological Review 122. Organizational legitimacy is defined as "a condition or status which exists when an entity's value system is congruent with the value system of the larger social system of which the entity is a part. When a disparity, actual or potential, exists between the two value systems, there is a threat to the entity's legitimacy." See James Guthrie, Suresh Cuganesan and Leanne Ward, 'Legitimacy Theory: A Story of Reporting Social and Environmental Matters Within the Australian Food and Beverage Industry' in Stewart Lawrence and Markus J. Milne (eds), *Proceedings of the Fifth Asia Pacific Interdisciplinary Research in Accounting Conference* (APIRA 2007).

65 Shehata (n 20) 20.

66 Talcott Parsons, 'Structure and Process in Modern Societies' (1960) 66 American Journal of Sociology 5.

67 Craig Michael Deegan, *Financial Accounting Theory* (Mc-Graw Hill 2009).

68 Craig Michael Deegan, 'The Legitimizing Effect of Social and Environmental Disclosures – A Theoretical Foundation' (2002) 15(3) Accounting, Auditing & Accountability Journal 282.

69 Denis Cormier and Irene M. Gordon, 'An Examination of Social and Environmental Reporting Strategies' (2001) 14(5) Accounting, Auditing & Accountability Journal 587.

70 Fernando and Lawrence (n 56) 153.

71 Yi An, Howard Davey and Ian R. C. Eggleton, 'Towards a Comprehensive Theoretic Framework for Voluntary IC Disclosure' (2011) 12(4) Journal of Intellectual Capital 571.

72 Elfeky (n 41) 47.

73 James Guthrie and Lee D. Parker, 'Corporate Social Reporting: A Rebuttal of Legitimacy Theory' (1989) 19(76) Accounting and Business Research 343.

and the wider the legitimacy gap, the greater the risk of the firm losing its legitimacy and eventual survival.[74]

Standard-setting in the ICT sector, like other sectors, does have a major societal impact. The very purpose of standards development is the advancement and upgradation of technology. The likes of Wi-Fi, 4G, Bluetooth, and the Internet are a testament to the giant strides having been made by the standardization of technology. On the other hand, society too has become increasingly dependent on technology and possesses certain expectations. When it comes to SEPs, societal expectations would perhaps require the hassle-free licensing of patented technology for the development of standards. Towards that end, SEP holders are required to disclose any essential patents that they may hold, at the earliest. This is followed by the obligation to license, with the first preference being royalty-free licensing, and the second, licensing on FRAND terms. According to legitimacy theory, it could be said that societal expectations align with SEP disclosure being made in an honest and timely manner so that there is no delay in the standards development process. However, firms' conduct amounting to over-disclosure and under-disclosure may well be considered as going against the social norms, for they may affect the ultimate roll-out of standards efficiently. Applying the legitimacy theory to standard-setting might prove difficult, for societal norms and expectations would focus on the greater public good and invoke the moral responsibilities of patent owners. Moreover, patent licensing is done to get returns on investment, and in the case of standards and SEPs, these returns are likely to be multi-fold as opposed to the case of a non-SEP. Licensing of patents is legally permissible for a limited period and imposing moral obligations on SEP holders may result in their pulling out of the SSO and jeopardizing the standard-setting process. In other words, legitimacy theory may end up leaving most firms holding SEPs, in a difficult situation with their very existence being threatened.

Before proceeding to decide as to which of the aforementioned theories is most suitable for standard-setting, it would be worthwhile to take a look at the disclosure practices followed by some of the prominent SSOs operating in the ICT sector.

3. DISCLOSURE PRACTICES AT SSOs

When it comes to standardization, disclosure rules being central to SSO IPR policies, play a pivotal role in bringing about an increased level of transparency to the standards development process.[75] Having said that, disclosure practices vary substantially across SSOs. While some SSOs have laid down well-defined disclosure rules under their IPR policies, others do not impose an express obligation to disclose,[76] and obligations, if any, usually get triggered by the member's participation in the standard-setting process.[77]

3.1 DECLARATION OF PATENTS

To begin with, the IPR policy of the American National Standards Institute (ANSI) does not make it mandatory for its members to disclose, rather the ANSI guidelines merely encourage that disclosure is made. The Guidelines further stipulate the subsequent course of conduct in case of a disclosure is

[74] A. S. Sethi, 'Application of Administrative Theory to Hospital Operations' (1979) 16(1-2) Hospital Administration 38.
[75] Maskus and Merrill (n 9) 74.
[76] The members of American National Standards Institute (ANSI) are not mandated to fulfill disclosure obligations, though they are encouraged to do so. See Maskus and Merrill (n 9) 71.
[77] Maskus and Merrill (n 9) 71.

made.[78] In contrast, disclosure under the IPR policy of the Institute of Electrical and Electronics Engineers (IEEE) is mandatory, expressed in the following words- "For IEEE's patent policy to function efficiently, individuals participating in the standards development process: (a) shall inform the IEEE (or cause the IEEE to be informed) of the holder of any potential Essential Patent Claims of which they are personally aware and that are not already the subject of an existing Letter of Assurance, owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents; and (b) should inform the IEEE (or cause the IEEE to be informed) of any other holders of such potential Essential Patent Claims that are not already the subject of an existing Letter of Assurance."[79]

Similar to the IEEE IPR policy, the IPR policy of the VMEbus International Trade Association (VITA) also requires mandatory disclosure by its members, and states that "Each working group member ("WG Member") shall disclose to the working group ("WG") in writing the existence of all patents and patent applications owned, controlled, or licensed by the VITA member company ("VITA Member Company") the WG Member represents, which are known by the WG Member and which the WG Member believes contain claims that may become essential to the draft VSO specification ("Draft VSO Specification") of the WG in existence at the time, after the WG Member has made a good faith and reasonable inquiry into the patents and patent applications the VITA Member Company (or its Affiliates) owns, controls or licenses."[80] The disclosure obligation enshrined under the IPR policy of the European Telecommunications Standards Institute (ETSI) is arguably the broadest of all SSOs, with the obligation extending to all members and activities, irrespective of the member's participation in the standard-setting process.[81]

Finally, there is the IPR policy of the Internet Engineering Task Force (IETF), which imposes a mandatory disclosure requirement without making the licensing assurance mandatory. [82] The fact that disclosure and licensing obligations usually go hand-in-hand makes the said IPR policy different from the rest.

3.2 ESSENTIALITY AND TIMING OF DISCLOSURE

In addition to the requirement of a declaration, the practice of disclosure also involves other key aspects, such as the essentiality of declared patents and the timing of disclosure. One of the foremost objectives of standard-setting is compliance with antitrust or competition law, which is why the scope of SSO IPR policies is limited to patents deemed "essential" to the standard (or in other words, SEPs).[83] The determination of essentiality, therefore, becomes extremely important in light of the accompanying disclosure obligation. The said determination, however, is left to the patent holders, without any intervention on the part of the SSO.[84] For instance, the IEEE IPR policy makes it clear

[78] 'Guidelines for Implementation of the ANSI Patent Policy' (*ANSI*). (accessed 16 October 2022). https://standards.ieee.org/wp-content/uploads/import/governance/audcom/ansi_patent.pdf

[79] 'IEEE-SA Standards Board Bylaws' (*IEEE SA*) (accessed 16 October 2022). https://standards.ieee.org/about/policies/bylaws/sect6-7/https://standards.ieee.org/about/policies/bylaws/sect6-7/

[80] 'VITA Standards Organization (VSO) Policies and Procedures' (*VITA*, July 2022) (accessed 16 October 2022). https://www.vita.com/resources/Documents/Policies/VITA%20Standards%20Policies%20and%20Procedures%20%20Revision%203.1%20July%202022.pdf

[81] Rudi Bekkers and Andrew Updegrove, 'A Study of IPR Policies and Practices of a Representative Group of Standards Setting Organizations Worldwide' (2012) US National Academies of Science, Board of Science, Technology, and Economic Policy (STEP) Commissioned Paper, page 51.

[82] Scott Bradner and Jorge L. Contreras, 'Intellectual Property Rights in IETF Technology (RFC 8179)' (accessed 16 October 2022). https://datatracker.ietf.org/doc/html/rfc8179#page-10

[83] Manveen Singh, 'Disclosure Practices at SSOs' in *Standard-Setting Organisations' IPR Policies: Intellectual Property and Competition Issues* (Springer Singapore 2022).

[84] Singh (n 83) 50.

that the identification of essential patent claims or the determination of essentiality shall not be the responsibility of the SSO.[85] The said burden instead, is shifted onto IEEE members. Furthermore, members of almost all SSOs are expected to disclose patents essential to the standard, in good faith. But with the lack of involvement on the part of SSOs in scrutinizing the said disclosure, there is a potential risk of over-disclosure and under-disclosure, which can be substantiated through the IPlytics 2017 and CRA 2016 studies.[86] The said studies revealed that only about 10-50% of the total declared patents were found to be essential.[87]

The other issue requiring deliberation is the timing of disclosure. Whether the disclosure is made early or late, both suffer from their fair share of drawbacks. In case of late disclosure, there is a risk that those involved in the standards development process might find it extremely difficult and time-consuming to switch to alternative technologies.[88] On the other hand, early disclosure is likely to be inaccurate, since the determination of essentiality is contingent on the specifications of the standard, and till the time work on the final draft standard is ongoing, patent holders might not be able to determine the essentiality of patents with precision.[89] In other words, patents declared as essential at the initial stage might witness a change in their status by the time the final draft is ready, and might no longer be essential to the standard. Furthermore, if a technology alleged to be reading on the standard is still to be patented and is like a pending patent application, it may so happen that the scope of the issued patent for the said application is narrowed down, so much so that it no longer contains claims essential to the standard.[90] This has left the SSOs having to grapple with the choice between early and late disclosure.[91]

Starting with ANSI, the standards body promotes early disclosure, despite the absence of an obligation to disclose.[92] The ETSI, on the other hand, requires its members to disclose all essential patents in a timely fashion and treats intentional delay in disclosing such patents as a violation of its IPR policy.[93] One of the most detailed guides on disclosure, including the timing of disclosure, is offered by the IPR policy of VITA, with the Policy requiring disclosure to be made within a specified period in various instances.[94] At the IEEE, members are required to disclose essential patents during

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[85] 'IEEE-SA Standards Board Bylaws' (*IEEE SA*) (accessed 17 October 2022). https://standards.ieee.org/wp-content/uploads/import/documents/other/sb_bylaws.pdf

[86] Commission, 'Setting out the EU Approach to Standard Essential Patents' (Communication) COM (2017) 712 final.

[87] EC Communication COM (2017) 712 final (n 86) 5.

[88] Singh (n 83) 51.

[89] Singh (n 83) 52.

[90] R.N.A. Bekkers, L. Birkman, M.S. Canoy, P. De Bas, W. Lemstra, Yann Ménière, I. Sainz, N. Gorp, Van B. Voogt, R. Zeldenrust, Z.O. Nomaler, J. Baron, T. Pohlmann, A. Martinelli, J.M. Smits, A. Verbeek, 'Patents and Standards: A Modern Framework for IPR-Based Standardization' (2014) European Commission, page 115. (accessed 25 October 2022). https://doi.org/10.2769/90861

[91] Singh (n 83) 52.

[92] Bekkers and Updegrove (n 81) 60.

[93] Ibid.

[94] "A VSO member who proposes to VSO a specification for consideration to become a Draft VSO Specification must disclose all patents and patent applications owned, controlled, or licensed by the VSO member that contain claims that may become essential to the Draft VSO Specification prior to the date the study group or WG, as applicable, adopts the proposed specification as a Draft VSO Specification.

Upon formation of a WG, all WG Members must disclose, on behalf of the VITA Member Company he or she represents, all patents and patent applications owned, controlled, or licensed by the VITA Member Company that contain claims that may become essential to the Draft VSO Specification within sixty (60) days after the formation of the WG.

In anticipation of a ballot to adopt the Draft VSO Specification as a VSO or VITA Specification (including an IEC Industry Technical Agreement or an American National Standard), all WG Members must disclose, on behalf of the VITA Member Company he or she represents, all undisclosed patents and patent applications owned, controlled, or licensed by the VITA Member Company that contain claims that may become essential to the Draft VSO Specification no later than fifteen (15) days from the date of publication of a Draft VSO Specification.

In addition, at the commencement of all face-to-face WG meetings, the WG Chairperson shall ask WG Members to disclose,

the working group meetings, as a response to a call for patents."[95] The IPR policy of the World Wide Web Consortium (W3C) presents an interesting take on disclosure, with its IPR policy, in holding disclosure to be a continuing obligation, also states that, "*if a participant files for a patent based on W3C work, it must disclose that application earlier than disclosure would otherwise be required. It makes no legal assertions about the validity of such applications.*"[96] A common thread running through the aforementioned disclosure practices at various SSOs is the lack of clarity concerning the timing of disclosure. For instance, while disclosure might be required to be made in a timely manner, what is to be considered "timely" is not defined and may be interpreted differently by different stakeholders.[97] Furthermore, very few SSOs impose any kind of sanctions on those making inaccurate or delayed disclosure.

4. SUSTAINED SIGNAL THEORY: A PROPOSED THEORY FOR SEP DISCLOSURE

Having discussed the various academic theories employed to explain the need for information disclosure, as well as the disclosure practices at some of the major SSOs, it may be argued that there is no single theory having universal applicability since each of these theories works on certain assumptions.[98] The same applies to standard-setting, which is why the present paper proposes a hybridized version of some of the theories discussed above. This hybrid theory, known as the "sustained signal theory" takes into account the various aspects of agency theory, signaling theory, and stakeholder theory to propose a theoretical foundation for the imposition of disclosure obligations in a standard-setting.

The process of standards development takes place under the aegis of SSOs, and the IPR policies of most SSOs require SEP holders to disclose all essential patent claims that may be relevant to the standard being developed. The said disclosure is expected to be made by SEP holders prior to the standards development process (ex-ante). Applying the signaling theory, it may be held that the said disclosure acts as a signal and is necessary since the implementers require this information to make investments toward the implementation of the standard and manufacture of standard-complaint products. The other reason for drawing an analogy with signaling theory is that knowledge regarding essentiality is exclusively within the domain of SEP holders, as a result of which such information cannot be disclosed by anyone other than the SEP holders. Furthermore, signaling such information is important not just from the perspective of the standards development process, but also from the perspective of SEP holders in terms of the royalties expected to be generated through licensing of patents. The signaling theory states that disclosure is directly proportional to the profits of the firm, meaning thereby that if SEP holders expect to generate higher royalties from licensing their patents,

on behalf of the VITA Member Company he or she represents, any undisclosed patents or patent applications owned, controlled, or licensed by the VITA Member Company that contain claims that may become essential to the Draft VSO Specification in accordance with the requirements set forth in this Patent Policy. If any WG Member thereupon discloses such a patent or patent application, the WG Chairperson shall ask the WG Member to submit and the WG Member shall submit, on behalf of the VITA Member Company he or she represents, a Declaration with information regarding that patent or patent application within thirty (30) days of the meeting at which the disclosure is made." See 'VITA Standards Organization (VSO) Policies and Procedures,' s 10.2.3 (*VITA*, July 2022) (last accessed 26 October 2022). https://www.vita.com/resources/Documents/Policies/vso-pp-r2d8.pdf

[95] 'IEEE-SA Standards Board Bylaws' (*IEEE SA*). (accessed 17 October 2022.) https://standards.ieee.org/wp-content/uploads/import/documents/other/sb_bylaws.pdf

[96] 'W3C Patent Policy', ss. 6.6-6.8 (*W3C*). (accessed 26 October 2022). https://www.w3.org/Consortium/Patent-Policy-20170801/#sec-disclosure-timing

[97] Singh (n 83) 53.

[98] Foued Khlifi and Abdelafettah Bouri, 'Corporate Disclsoure and Firm Characteristics: A Puzzling Relationship' (2010) 17(1) Journal of Accounting, Business & Management 62.

they must be prepared to make voluntary and accurate disclosure of information regarding their patent portfolios. Having said so, although signaling theory would require information disclosure to be made prior to the development of standards, there might, however, be situations where disclosure is made of pending patent applications. The status of these applications might be subject to change post the standards development process. In other words, while some of them might be pending at the time of declaration of essentiality ex-ante, they might stand rejected or modified ex-post, leading to a possibility of alleged over-disclosure and subsequent detriment being caused to the implementers. It is, therefore, suggested that the signal regarding essentiality given ex-ante, must be repeated ex-post and the same be expressly stated in SSO IPR policies. Thus, SEP holders must signal the essential patent claims for a second time, post the development of the standard, making it a sustained signal regarding essentiality, and one that will allow implementers to stay informed of the royalties likely to be demanded by SEP holders.

Signaling theory, however, is not sufficient to form the basis of SEP disclosure. While it is important to recognize the importance of timely and accurate disclosure of essential patent claims, it is equally important to fix the accountability in case of inaccurate disclosure. When it comes to participating in the standards development process, firms holding patents appoint certain representatives to act as their agents and carry out the various disclosure and licensing obligations imposed on the firm by virtue of their holding essential patents. Ordinarily, the principal is supposed to be liable for the actions/decisions of the agent, however, in the case of standard-setting, the principal being the SEP holder, does not incur any liability for the calls/declarations made by its representative at the SSO. The representatives, too, have the opportunity to plead innocence on account of a lack of knowledge regarding patent portfolios. Since these declarations pertain to the essentiality of patents, it becomes extremely important to enforce the duty to disclose, in a vicarious manner, holding the SEP holders responsible for essentiality declarations made by their agents. It is proposed that the same can be imposed by applying the agency theory of disclosure, wherein the SEP holders can be held accountable for the disclosure calls made by their representatives. This will reduce the information asymmetry existing between the SEP holder and its representatives, by pushing the SEP holders toward conveying complete information regarding essential patent claims of existing and pending patents. Furthermore, it will also help in introducing transparency in disclosure and reducing the risk of over-disclosure and under-disclosure, something that has been causing a major problem for implementers.

While the agency and signaling theories form the basis of SEP disclosure by patent holders, the stakeholder theory offers a justification for the need to cater to the interests of not just the shareholders but all stakeholders involved in standard-setting. As discussed above, disclosure is relevant not just from the perspective of implementers, but also from SSOs, competition agencies, and the courts of law. While SEP disclosure aids implementers' decision-making regarding investment towards the manufacture of standard-compliant products and the royalties likely to be paid to patent holders, it also helps SSO working groups in making informed choices about the viability of patented technology's inclusion in the standard and the available technology alternatives. Disclosure also aids competition agencies and courts in assessing instances of alleged anti-competitive conduct and licensing disputes, arising out of standard-setting.

The biggest obstacle in the licensing of SEPs is the information asymmetry existing between implementers and innovators, and like buyers in the case of transactions, implementers do not know the status and essentiality of patents. Their knowledge to a large extent is dependent on the disclosure made by SEP holders. If SEP holders reveal all the information regarding patents and pending patent applications, implementers would come to the table better informed and the negotiations too will be conducted smoothly. Furthermore, it is usually argued that patent holders have large patent portfolios and it is not feasible to conduct a thorough examination of each patent. However, if patent holders plead the inability to carry out a patent search and are aware of the status of their patents, how then

can the implementers be expected to possess knowledge regarding the same? Disclosure by patent holders plugs this gap (in the shape of information asymmetry) and helps implementers in making informed decisions regarding licensing of SEPs. More importantly, it may also help in maintaining the required equilibrium between the rights of innovators and implementers.

In light of the aforementioned uses of information disclosure, it becomes important to adopt a holistic approach toward disclosure obligations at SSOs, one that is possible only when the tenets of signaling, agency and stakeholder theories are combined. Furthermore, the applicability of sustained signal theory remains contingent on SSOs bringing about certain amendments to their IPR policies, for it may not be feasible to apply the Theory in its entirety, with SSO IPR policies retaining their present form. Express provisions stating the duty of SEP holders to declare the essentiality of patents ex-post and the accountability of SEP holders for the essentiality calls made by their representatives, must find a place in the SSO IPR policies for the Theory to be effective and achieve its desired result.

5. EXTENT OF DISCLOSURE

While it is clear that having disclosure obligations in place streamlines the standards development process, what does present a challenge is the extent of disclosure. What is the objective test for the determination of essentiality, i.e., whether the disclosure is limited to patents deemed essential by the patent holder making a disclosure, or should it be extended to include all the patents considered to be essential by a reasonable person?[99] There is also a question of including unpublished patent applications and pending but published patent applications. Moreover, whether the scope is narrow or wide is regarded as a matter of trade-off. While a narrower scope helps cut down the risk of over-disclosure of patents, it does not, however, completely negate the possibility of subsequent assertion of patents by patent holders, post the development of the standard. A broader scope meanwhile, might entail the disclosure of a wide patent set, however, at the same time, it may also result in the likelihood of such patents being disclosed that may subsequently turn out to be non-essential.[100] Against this background, a question that arises is, what must be considered sufficient disclosure?

To explain the necessary extent of disclosure, reference may be held to disclosure requirements under the United States Securities and Exchange Commission (SEC). Just as disclosure is fundamental to the success of any standards development process, disclosure in securities regulation has played the all-important role of safeguarding investors against exploitation and fraud by corporations. Having come into existence in 1934, the SEC advocates full disclosure of material information by publicly traded companies, for the protection of investors,[101] much the same way as required under real estate transactions.[102] In the case of the latter, sellers are required to furnish a disclosure form with all material facts, and in case of a deliberate lie or concealment, may end up being imposed penalties. "Full disclosure" in real estate implies that "the real estate agent or broker and the seller disclose any property defects and other information that may cause a party to not enter into the deal."[103] The SEC meanwhile, requires public companies to furnish material information to investors and shareholders,

[99] Gil Ohana and C. Bradford Biddle, 'The Disclosure of Patents and Licensing Terms in Standards Development' in Jorge L. Contreras (ed), *The Cambridge Handbook of Technical Standardization Law* (Cambridge 2018).

[100] Ohana and Biddle (n 99) 250.

[101] Securities and Exchange Commission, 'Business and Financial Disclosure Required by Regulation S-K' (2016) (accessed 18 November 2019). https://www.sec.gov/rules/concept/2016/33-10064.pdf

[102] Will Kenton, Full Disclosure (*Investopedia*, 18 April 2018) (accessed 18 November 2019). https://www.investopedia.com/terms/f/fulldisclosure.asp

[103] Kenton (n 102).

on an ongoing basis.[104] In terms of disclosure, public companies are required under the SEC to file three separate forms: 10-K, 10-Q, and 8-K. While 10-K is filed annually, the 10-Q is filed quarterly. The third form: 8-K caters to disclosure during certain specific circumstances and material events.[105]

Under both, Forms 10-K and 10-Q, public companies are required to disclose audited financial statements, including information concerning net sales, loss arising out of operations, total assets, and long-term obligations.[106] These disclosure requirements are aimed at furnishing transparent information to potential investors, about the business, financial condition, risk factors, management, and operations of the company.[107] Furthermore, it "provides a common pool of knowledge for all investors to use to judge for themselves whether to buy, sell, or hold a particular security."[108] On the other hand, Form 8-K performs the function of facilitating disclosure during instances of significant importance, such as acquisitions or dispositions, material impairments, creation of financial obligations, etc.[109] Having said so, what is important from the perspective of disclosure filings is the materiality of information. The Supreme Court of the United States has defined "materiality" as "a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the 'total mix of information made available."[110] What is material under the law, however, is subjective and may vary on a case-to-case basis. Perhaps the best explanation for materiality is that information that is important to the investor and helps make a decision.[111] It is important to view materiality from the perspective of investors, i.e. the consideration should not be limited to whether a particular disclosure will attract a sanction from a regulatory authority, rather it should also consider what might be deemed essential by investors, or is likely to affect the market price.[112] In the U.K., a piece of information is held to be material if "its misstatement or omission might reasonably be expected to influence the economic decisions of users of those financial statements."[113] More importantly, under the Financial Conduct Authority's (FCA) Disclosure and Transparency Rules, companies are mandated to release relevant information, as soon as it becomes available and all prospective shareholders and investors must have access to the same quality of information at the same time.[114]

Seen in the context of standard-setting, it is essential for implementers to not just have information but timely and material information regarding SEPs. Similar to the disclosure requirements under SEC, disclosure of essential patent claims holds significant value for implementers, for their decisions are reliant upon the information so disclosed. The appropriate extent of disclosure must, therefore, be

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[104] 'Form 10-K' (*U.S. Securities and Exchange Commission*) (accessed 18 November 2019).https://www.sec.gov/fast-answers/answers-form10khtm.html

[105] Ian D. McClure, 'Accountability in the Patent Market Part II: Should Public Corporations Disclose More to Shareholders?' (2016) 26(2) Fordham Intellectual Property, Media and Entertainment Law Journal 417.

[106] 'SEC Disclosure Laws and Regulations' (*Inc.*). (accessed 18 November 2019).https://www.inc.com/encyclopedia/sec-disclosure-laws-and-regulations.html

[107] 'How to Read a 10-K' (*U.S. Securities and Exchange Commission*) (accessed 18 November 2019). https://www.sec.gov/fast-answers/answersreada10khtm.html

[108] 'What We Do' (*U.S. Securities and Exchange Commission*) (accessed 18 November 2019). https://www.sec.gov/Article/whatwedo.html

[109] Form 8-K (*U.S. Securities and Exchange Commission*). (accessed 18 November 2019). https://www.sec.gov/fast-answers/answersform8khtm.html

[110] Basic v. Levinson 485 US 224 (1998), page 232.

[111] Steven Davidoff Solomon, 'In Corporate Disclosure, A Murky Definition of Material' (*The New York Times*, 5 April 2011) (accessed 18 November 2019). https://dealbook.nytimes.com/2011/04/05/in-corporate-disclosure-a-murky-definition-of-material/

[112] Solomon (n 111).

[113] Institute of Chartered Accountants in England and Wales, 'TECH 03/08 Guidance on Materiality in Financial Reporting by UK Entities' (*Croner-I*, June 2008) (accessed 18 November 2019). https://library.croneri.co.uk/tech03-08#Ftech03083

[114] 'Disclosure Guidance and Transparency Rules Sourcebook' (*FCA*, November 2019) (accessed 18 November 2019). https://www.handbook.fca.org.uk/handbook/DTR.pdf

synonymous with full disclosure in financial and real estate transactions. Just the way there is a risk of a party backing out of a transaction in the absence of incomplete or selective disclosure, SEP holders by indulging in over-disclosure or under-disclosure, run the risk of pushing implementers away from entering into a license. It is further required that the said disclosure be made promptly and on an ongoing basis. However, the nature of standardization is such that essential patent claims are required to be disclosed ex-ante. And with the process for the grant of a patent stretching over some time, the probability of a change in the status of a pending patent application throughout the standards development process is quite high. In such a scenario, there must be a continuous disclosure of updated information by SEP holders, as envisaged under Form 8-K of SEC, and under the sustained signal theory (as discussed above). Just the way Form 8-K mandates the disclosure of information during circumstances having significant importance to shareholders, disclosure of information regarding changes in the status of pending patent applications is of equal importance to both, the SSO and implementers. While the SSO working groups might want to assess possible technology alternatives, the implementers get the desired information that may help them assess the extent of royalties payable to the SEP holder(s). It is for this very reason that information regarding the essentiality of all patents relevant to the standard, is material as far as implementers are concerned. In other words, such information is relevant from the perspective of a reasonable implementer, enough to facilitate informed decision-making. As for the inability of SEP holders to carry out the patent examination in case of large patent portfolios, seen from the perspective of implementers, it may be argued that in such cases, signaling the patent family to which an allegedly essential patent belongs, may constitute material disclosure.

Against the above backdrop, it is stated that the extent of disclosure in the case of standard-setting should be such that both, the innovators and implementers come to the negotiation table with the same information. Implementers can only be expected to enter into a license if they come forward having received material information regarding the essentiality of patents. In case they do not possess the same information as is within the knowledge domain of SEP holders, it might result in a deadlock or delay in the licensing negotiations, with the undesirable result being a subsequent delay in the roll-out of the standard.

6. CONCLUSION

For an SSO to strike a balance between the interests of innovators and implementers, it is at the very outset, important to ensure the enforceability of disclosure obligations of patent holders. As discussed throughout this paper, several theories have been used in academic literature to justify the imposition and enforcement of disclosure obligations on patent holders, however, each of the theories comes with its fair share of limitations. In other words, neither of the agency, signaling, capital need, stakeholder, and legitimacy theories can alone account for the need to ensure voluntary disclosure of patent information by SEP holders. The sustained signal theory, in taking into consideration the relevant aspects of agency, signaling, and stakeholder theories present a strong basis for ensuring the voluntary disclosure of essential patent claims by SEP holders and seeks to aid the SSOs in striking an equilibrium between the rights of innovators and implementers. A key role in this regard though is likely to be played by SSO IPR policies, for it is these policies that form the very basis of the rights of the parties. However, the IPR policies of most SSOs at present, suffer from ambiguities, often leading to the enforcement of disclosure obligations being sought through the instrumentality of courts and competition agencies. Seen in the light of the same, the sustained signal theory might prove beneficial to SSOs in bringing about modifications to their IPR policies.

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