



# IP management 4.0

## *What digitalization means for intellectual property management in manufacturing industries*

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As the digitalization of society proceeds at a seemingly unstoppable pace, it brings together industry sectors that used to be breeds apart. Well-known examples of this so-called “industry convergence” can be found within manufacturing. SKF is internet enabling its ball-bearings in order to allow preventive maintenance, while Tesla has connected its Model S to allow over-the-air software updates<sup>1, 2</sup>. At the same time ICT companies such as Google are building prototypes of self-driving cars and thereby entering a new market space<sup>3</sup>. Additionally, the development of the Internet of Things (IoT) promises to revolutionize the world by connecting everyone to everything all of the time with the help of ICT<sup>4</sup>. The market for connected products is large and growing. For example, in the Nordic region alone, the IoT market was estimated to generate €5.3bn in revenue in 2015 and to grow with a CAGR of 17 percent between 2015 and 2020<sup>5</sup>.

One of the key results of digitalization is closer co-operation between traditional manufacturing companies and those within the ICT industry. Yet when it comes to IP management, ICT companies manage their intellectual property quite differently from more traditional industries. In this article the authors highlight the key success factors for traditional manufacturers to successfully manage IP in the context of digitalization.

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<sup>1</sup> ComputerSweden, It-tjänsterna håller SKFs kullager rullande, <http://computersweden.idg.se/2.2683/1.500219/it-tjansterna-haller-skfs-kullager-rullande>

<sup>2</sup> TeslaMotors, Model S Has You Covered, <https://www.teslamotors.com/blog/model-s-has-you-covered>

<sup>3</sup> Google Self-Driving Car Project, <https://www.google.com/selfdrivingcar/>

<sup>4</sup> Definition of ICT sector: The combination of manufacturing and service industries that capture, transmit and display data and information electronically, (according to the OECD).

<sup>5</sup> TeliaSonera and Arthur D. Little, Connected Things 2016 edition, <http://www.teliaSonera.com/en/newsroom/news/2016/new-iot-report-150-million-connected-and-communicating-things-in-the-nordics-by-2020/>

As a result, “traditional” companies from industries such as discrete manufacturing now find themselves both collaborating and competing with previously alien companies from the ICT sector. Unsurprisingly, we have found that ICT companies manage, protect and leverage their intellectual property (IP) very differently compared to companies in more traditional industries. If manufacturing companies are to benefit from the opportunities that digitalization has to offer, they need to ensure that they partner and compete with the ICT sector on an equal basis. This includes the management of IP. Besides the fact that IP enables a company to sell products that generate revenue, patents themselves have value. While this varies depending on the technology itself, public patent transactions indicate that on average a single patent can be worth as much as \$300,000<sup>6</sup>.

What does all of this mean for manufacturing companies? What are the key success factors to cope with digitalization from an IP management perspective?

## IP management in the digital age

In order to understand the implications of the industry convergence brought by digitalization, we need to look at some of the significant characteristics of IP management in the ICT industry, and set these against what we commonly find in discrete manufacturing sectors such as durable consumer and industrial goods. Three observations stand out:

### **1 – ICT companies are more mature in their IP management**

The ICT sector is generally viewed to be relatively mature in regards to IP management. For years, companies within the industry have been developing their IP and commercialization strategies, and now they have solid and proven strategies, processes and expertise in place. These companies deal on a daily basis with license negotiations, joint ventures, co-development and litigation. They leverage IP by, for example, clustering patents into so-called

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<sup>6</sup> Arthur D. Little analysis

patent pools, and partake in the creation of technology standards. The commercialization of a technology expands to include the commercialization of the intangible intellectual property right (IPR) itself. They have a mindset that IP is viewed as a strategic tool for commercialization and stand-alone value creation, increasing the number of alternatives available to yield the highest value. As an example, the telecommunication company Ericsson has a licensing portfolio which it uses to generate value in two main ways, defensively and offensively<sup>7</sup>. The defensive value is generated by assuring cross-license agreements with other major patent holders in order to protect the sales of Ericsson's products and services. The offensive value is generated by commercializing the portfolio via enforcement and licensing. In 2014, these efforts allowed Ericsson to gain \$1.2 billion in revenue from its IP portfolio, almost one-third of overall R&D spending.

Having worked extensively in all types of industries, we can identify three levels of "IP management maturity":

#### **Level 1 – "IP management as a reactive R&D support function"**

This is the level at which many of the traditional component and product manufacturers currently reside. They use the IP function as support to help protect their core product features and thereby protect the revenue generated from their products. The IP by itself is typically not leveraged, and out-licensing is rare. Cross-licensing is more common and the portfolio is enforced within its sector. Level 1 companies typically use patents to ensure freedom to operate and to avoid litigation. Therefore, the content of the portfolio is often quite narrow as it has not been drafted to be leveraged outside of the organization's core sector. IP functions in these companies are generally managed for (cost-) efficiency and are not promoted externally, or internally, as core capabilities.

#### **Level 2 – "IP management as a business-support function"**

The level contains more service-centric product companies. The IP function is leveraged to support the business of the company, and IP is acknowledged as important to protect and measure

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<sup>7</sup> Annual report 2014, [www.ericsson.com](http://www.ericsson.com)

innovation. “Combining intellectual asset management with a forward-looking and business-driven IP strategy generates cost-effective portfolios perfectly adapted for supporting our prioritized business objectives,”<sup>8</sup> says Martin Jansson, the manager of SKF’s Intellectual Assets and IP Strategy group. Furthermore, Level 2 companies leverage the IP function’s competencies for multiple purposes: to identify potential partners, to support innovation projects, M&A activities, etc. The content of the company’s portfolio is managed cost-consciously, with in-house inventions not always pursued, but analyzed against potential in-licensing. Patents are often closely linked to corresponding products, reviewed regularly and used as marketing tools. For example, SKF uses patents as a proxy to measure innovation.

*“Towards selected business areas, we have put in place business-driven IP strategies which clarify the business rationale for having and using IP within a specific area. In addition to reviewing the IP strategy annually, we regularly work with the heads of development to review new intellectual asset developments and initiate actions as prescribed by the IP strategy.”<sup>3</sup>*

*Martin Jansson, Manager Intellectual Assets and IP Strategy group, SKF*

**Level 3 – “IP management as a core strategic weapon”.** Companies at level 3 have transformed into, or started out as, knowledge-based businesses. IP is leveraged both for insight to drive R&D as well as ways to monetize R&D investments. These companies typically have steady, large portions of their revenues stemming from licensing, as in the Ericsson example mentioned above. Furthermore, they take an active part in shaping their industries’ future by, for example, setting industry standards. The IP function is often led by a chief intellectual property officer or similar, who reports directly to the CEO, and the function is viewed as core to

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<sup>8</sup> The IA Manager Blog, IAM in practice – Experiences from SKF, <http://blog.iamanager.se/iam-in-practice-experiences-from-skf/>

the company's business and future, both internally, as well as externally. As an example, Qualcomm mentions licensing in its annual report as a complement to the manufacturing and sale of products. Qualcomm has granted licenses to hundreds of companies, and it offers a substantial part of its entire patent portfolio for use in cellular subscriber devices and cell site infrastructure equipment. Approximately 30% of revenue stems from licensing. By way of illustration, Qualcomm mentions the word "patent" 136 times, and the word "license" 288 times, in its 2014 annual report. You would be lucky to find these words mentioned more than two to three times in an annual report of a typical manufacturing firm.

## **2 – Relative patent-intensity is much higher in ICT than it is in manufacturing**

The ICT technology field is highly patented. Between 2009 and 2011, 38% of all filed PCT-patents were within ICT<sup>9</sup>. Furthermore, there are often multiple patents that cover a single technology<sup>10</sup>. This vast number of patents creates a phenomenon referred to as a "patent thicket" which is far more common in ICT than in any other industry<sup>11</sup>. Entrenched players are used to navigating around such thickets, and tend to have several of their own, creating a level playing field amongst similar-sized ICT companies. As an example, Google dealt with this issue by acquiring Motorola Mobility, including around 20,000 patents, for \$12.5 billion<sup>12</sup>. The acquisition strengthened Google's patent portfolio and improved its ability to respond to ICT-related patent thickets, such as by establishing cross-license deals with other ICT companies.

Manufacturing firms wishing to enter the "digital arena" face a similar possible barrier. Their patent intensity in relation to connectivity is much lower than that of ICT companies (see Table 1), and they tend to use IP more defensively, as we have seen in the previous section.

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<sup>9</sup> JRC Science and policy report; Intellectual Property and Innovation in Information and Communication Technology; Comino, Stefano; Manenti, Fabio Maria; The European Commission; 2015

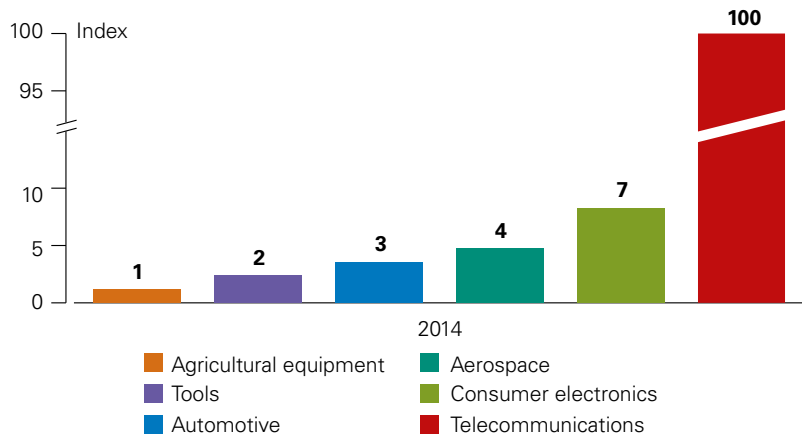
<sup>10</sup> Report – Workshop on Patent Thickets, European Patent Office (EPO); 2012

<sup>11</sup> JRC Science and policy report; Intellectual Property and Innovation in Information and Communication Technology; Comino, Stefano; Manenti, Fabio Maria; The European Commission; 2015

<sup>12</sup> Business Insider, Google: We Bought Motorola To "Protect" The Android Ecosystem, Jay Yarow, AUG. 15, 2011, <http://www.businessinsider.com/live-google-and-motorola-explain-the-big-acquisition-2011-8?IR=T>

Table 1 **Relative level of patent applications within connectivity by industry**

Source: Arthur D. Little analysis



### 3 – Litigation is more pervasive in ICT

As seen through the recent patent wars between companies such as Apple and Samsung, the ICT sector has an offensive climate when it comes to the commercialization and assertion of patents. Contributing to this climate of intense litigation are companies whose business models are to assert patents without the intent to manufacture or supply services based on the patented technology, so-called non-practicing entities (NPE) or patent assertion entities (PAE). Thus, manufacturing companies aspiring to enter the “digital area” are also likely to face such companies and need to be prepared accordingly. In fact, the climate has already begun to spread to other industries, such as automotive and consumer products. In 2014, NPEs filed 107 lawsuits against car-makers and suppliers, which is a six-fold increase in just five years<sup>13</sup>.

To summarize, these three characteristics within the ICT industry bring a new set of challenges which traditional manufacturing companies seldom had to worry about until the current digital revolution. Manufacturers aiming for a fair share of the “digital pie” (for instance, by selling new services to their customers) will need to ensure that their added value and competitive positions are also backed up by IP, and will hence often need to take a closer look at IP management from a strategic and tactical perspective.

<sup>13</sup> Wars on wheels – are patents the new revenue stream for car-makers? by Freshfields Bruckhaus Deringer

## *6x increase in lawsuits 2010-2014 by NPEs against car-makers and suppliers*

For instance, a manufacturing company that wishes to enter a technology field needs to assess the patent landscape within this field. If the field proves to have white space (unpatented areas), the company may invest in R&D to enter the area by itself. But if the technology area is controlled by another company, there is a need to invent around (find another technical solution to solve the same problem) or to take a license, whichever makes the most sense from an investment perspective. For licensing to be a viable option, it requires the right competencies and capabilities to negotiate fair licensing terms. Whatever route is chosen, mastering IP management is core for any company responding to the opportunity of digitalization. Here are some of the few key success factors to make this happen.

### **Key success factors for manufacturing industries**

#### **Form a clear IP strategy that is communicated and linked to business and technology strategies**

A first step to increase the IP management maturity level is to define an explicit IP strategy that clearly outlines the role that IP plays for the company, such as as a tool to protect revenue from products or as an asset used in licensing deals. The IP strategy must be closely linked to business and technology strategies and cannot be treated as something isolated. This is important since the IP strategy affects collaboration agreements, and has the potential to steer innovation and commercialization, as well as protecting competitive advantage. Furthermore, the IP strategy should be communicated internally to create a common understanding of how IP is to be used, and how it should be leveraged to generate value for the company. In essence, this will enable a company to decide whether to focus on internal innovation to develop a technology needed for a new digital offering or to focus on a partnership, depending on the level of control wanted over the generated IP.



### **Establish processes that regularly ensure an understanding of the coverage and value of the patent portfolio**

Having a clear understanding of the internal patent portfolio and how it maps to technology fields, identifying white spaces, and thicket areas, are important to ensure freedom to operate. Especially when looking at technology fields that enable new products or services using digitalization, there is a high risk that the patent landscape is quite complex. However, understanding the patent landscape will help drive R&D and guide decisions on where to innovate, invent-around, or enter a licensing agreement. Thus, a process for continuous review and analysis of the portfolio content must be in place. This analysis goes beyond looking at the pure number of patents or at the patent classifications, and requires competences that span technology, business and law.

Furthermore, the management of the patent portfolio must be closely linked to product management and marketing, as there is a need to ensure product-patent lifecycle management to maintain an efficient portfolio. Especially in the ICT area, technologies can become obsolete fast, rendering a patent useless. An efficient portfolio with strong patent-product linkages therefore enables the organization to cut unnecessary costs and maintain a manageable portfolio. This ensures that assets can be leveraged efficiently so that strengths and weaknesses within the portfolio are known, which is key to ensuring a business has freedom to operate.

### **Obtain competencies in the fields of licensing, enforcement and negotiations**

To actively manage IP and collaborate with the experienced ICT sector, the right competencies and skills are needed, such as those of patent engineers, standardization experts and IP negotiation experts. It is important that the organization has individuals who understand strategic and business opportunities for IP to act as an enabler for value creation and strategic direction. In addition, to ensure freedom to operate, the company may occasionally choose to license rights instead of inventing in-house. Having competence within, and understanding of, the patent landscape is crucial to be

able to both identify these occasions as well as negotiate collaboration and licensing agreements. It requires skills to negotiate agreements that are not only legally strong but also aligned with business strategy. Agreements must also be formed to optimize value long-term. In all agreements it is important to maintain crucial rights to ensure that the value of the portfolio is not diluted. Sub-optimized deals may limit the number of options for the company going forward. Lastly, competence and resources will be required to defend products and technology developments against patent assertions from both competitors and NPEs.

### Insight for the executive

The vast majority of manufacturing companies that we know see digitalization as a highly important development, and realize that it can offer new opportunities for growth and value creation by getting new offerings to the market faster and smarter. These promising innovations will very often require collaboration and partnerships with hitherto “unfamiliar” players from the ICT industry, and this brings new demands to the way these companies manage IP.

As with any other market place, the “digital arena” will be won by those who have the biggest and most defensible competitive strengths. ICT companies tend to manage IP much more strategically and have far more “digital” patents than do traditional manufacturing companies. And they, including NPEs operating within the ICT industry, are often more savvy or even aggressive when it comes to IP litigation.

Manufacturing companies should not copy this model, but build on their inherent strengths. In addition, they must ensure they create a level playing field when co-developing, partnering, negotiating or litigating with their ICT counterparts. This cannot be done overnight, and there is no common protocol to follow. But there are three general areas to work on if they are to be successful. First, they need to transform IP into a truly strategic function, as opposed to merely a reactive support function. There should be an agreed-upon IP strategy to follow and communication, both internally and externally, should be consistent with this strategy.



Second, manufacturing companies will often need to adjust their ways of working in IP management, as well as the interfaces with other functions and partners. This should ensure that they have the right oversight, forward visibility and decision-making power to act as mature players in the “digital IP arena”

And lastly, these companies will typically need to invest in obtaining the right competencies, skills and execution power to properly execute their IP strategies according to these improved processes. If IP is to be a business function of strategic importance, it should attract and retain people with the right backgrounds and skills, and be recognized as such by the rest of the organization and the outside world.

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