

## OWNER-MANAGED CLOSED IT COMPANIES IN CROATIA: CORPORATE GOVERNANCE AND IP PROTECTION ISSUES

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### *Summary*

*Intellectual property protection is an important ingredient in the market success of knowledge-intensive enterprises operating in the information technology industry. The governance and the extent of protection of intellectual property related to software often seem to be connected to certain characteristics of an enterprise, such as its type and size. By analyzing the publicly available data, the author identifies various patterns primarily concerning the structure of ownership and management of the software enterprises in Croatia. The analysis reveals that all of the top 500 software enterprises according to revenue are closed, with the overwhelming majority being owner-managed and small or micro-sized. This would suggest that most software enterprises in Croatia are passive when it comes to their intellectual property. In relation to this, the author describes three profiles of enterprises depending on their attitude towards the governance of intellectual property. The author also formulates and explores four possible complementary approaches to the protection of intellectual property, both legal and non-legal, in addition to discussing various types of intellectual property rights with the aim of identifying those that are more suitable for the protection of different types of software.*

**Keywords:** *intellectual property; software; patents; copyright; trade secrets; governance.*

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## 1. INTRODUCTION

Knowledge-intensive industries are widely considered as the key driver of innovation and economic development today.<sup>1</sup> One of such industries deserves special attention, if not for anything else then because it is single-handedly responsible for more than a half of the overall productivity growth in the European Union. This is the information technology or IT industry.<sup>2</sup>

The revenue and, therefore, the existence and survival of knowledge-intensive IT enterprises revolves around one thing and one thing only – the product for which the terms software, computer program or application are often used interchangeably as they are also used in this paper.<sup>3</sup> The product, intangible in its nature, is developed and refined predominantly by using the collective knowledge, creativity and intellectual efforts of various persons engaged by the IT enterprise, whether the founders themselves, the employees, outsourced personnel or a combination thereof. The unique blend of their inputs embodied in the product is key to the success of any knowledge-intensive IT enterprise. Accordingly, it is no wonder that intellectual property protection often plays an essential role in the well-being of any such enterprise. However, there are many issues that might complicate the protection and the management of intellectual property in software enterprises. The complications may be connected to governance issues and behavioral patterns characteristic for the type or size of enterprise concerned, but many of them also arise from the facts that the product to be protected is of intangible nature, that it can be disseminated with ease via the internet, and that it can usually be relatively quickly imitated by competitors.

Bearing this in mind, the first part of this paper is dedicated to the analysis of the Croatian software industry with the purpose of determining the types of enterprises operating therein, their size and any patterns related to the structure of ownership

- 1 Päällysaho, S., Kuusisto, J., Informal ways to protect intellectual property (IP) in KIBS businesses, *Innovation: Management, Policy & Practice*, vol. 13, no. 1, pp. 62-76, p. 62.
- 2 See IDC European Competitiveness and Innovation Expertise Centre (IDC Italy), *Study on Innovative ICT SMEs in Europe (EU 25) - Final Study Report*, IDC EMEA, 2007, p. 6. and Organization for Economic Co-operation and Development, *Innovation and Knowledge-Intensive Service Activities*, OECD Publishing, 2006, p. 73.
- 3 Even though these terms are almost always used as synonyms, at least colloquially, there is a technical difference between them. Software is the broadest of the three terms and encompasses both applications and computer programs. It is often used to denote everything on the computer that is not hardware, including preparatory designs (description of the program) and additional or auxiliary (user) documentation. An application is a type of software the purpose of which is to help end users perform certain tasks. It can consist of one or more computer programs and is characterized by a user interface. For example, a word processor is an application. A computer program is a set of instructions that can be executed by a computer. Although many computer programs are applications, some are not. One example of the latter is BIOS – a computer program used to perform hardware initialization during the booting process. BIOS does not communicate with the end user but directly with the computer hardware. For a similar discussion about the technical and legal definitions of computer programs and software see Kunda I., Matanovac Vučković R., *Raspodaganje autorskim pravom na računalnom programu - materijalnopravni i kolizijskopravni aspekti*, *Zbornik Pravnog fakulteta u Rijeci*, vol. 31, no. 1, pp. 85-132, p. 90-92.

and management of these enterprises, which might point to the possible general governance issues. The second part of the paper focuses on specific issues related to the protection of intellectual property in software enterprises, with the purpose of identifying the types of intellectual property rights suitable for the protection of particular types of software, classifying the possible legal and non-legal methods of protection and formulating the possible behavioral patterns of software enterprises in relation to the governance of intellectual property.

## **2. GENERAL CORPORATE GOVERNANCE ISSUES IN KNOWLEDGE-INTENSIVE IT COMPANIES**

The initial plan when researching for this paper was to draw some general conclusions about the possible governance issues in knowledge-intensive IT enterprises in Croatia from the already available statistical data, and then focus on and deal with the specific issues related to the governance of intellectual property in such enterprises on a more theoretical basis. However, due to the fact that neither official nor unofficial statistical data concerning knowledge-intensive IT enterprises in Croatia was available, which would be sufficiently complete to achieve the defined goal, it was necessary to first collect such data independently from various sources and then analyze it in order to identify any patterns related to the structure of ownership and management of such companies. Therefore, the following three sections concern the methodology used (2.1.), the analysis of the collected data (2.2.) and the conclusions made in the process (2.3.).

### **2.1. Scope and methodology of research**

The data listed in section 2 of this paper concerns the top 500 enterprises according to the revenue generated in 2017, which reported “J6201 computer programming” as their main business activity according to the Croatian National Classification of Activities (Official Gazette No. 58/07; hereinafter: NKD 2007).<sup>4</sup> Even though NKD 2007 lists many other activities which would broadly speaking fall into the information technology category,<sup>5</sup> only the enterprises in the computer programming segment were considered because this is one of the most knowledge-intensive parts of the IT industry, in which intellectual property plays a much more important role than with most other activities related to IT. The revenue was chosen because it is an important criterion in determining the size of an enterprise and it can also be viewed as one of the most straightforward, albeit one-dimensional indicators

4 Note that the activity category is reported by the enterprises themselves, based on their own decision. This means that it is possible that some of the enterprises from the sample do not have computer programming as their predominant activity in reality, even though they officially claim so. One possible explanation as to why an enterprise would report computer programming as its main activity when this is not so in reality is the fact that more government and EU subsidies are available for the computer programming activity than any other activity related to IT.

5 For example, J6311 Data processing, server services and related activities, J6202 Computer-related consulting and etc.

of success of an enterprise on the market.

The data was collected from the following publicly available sources and was then combined and cross-checked: the list of top 1000 technology enterprises in Croatia prepared by the “Who is Who in IT” online platform,<sup>6</sup> the Registry of Annual Financial Statements maintained by the Financial Agency (FINA),<sup>7</sup> the Court Register of the Republic of Croatia,<sup>8</sup> the Registry of Business Subjects maintained by the Croatian Bureau for Statistics,<sup>9</sup> the Registry of Crafts maintained by the Ministry of Economy, Entrepreneurship and Crafts,<sup>10</sup> and the Registry of Business Subjects maintained by the Croatian Chamber of Economy.<sup>11</sup>

The statistical data listed in the following section is, in principle, substantiated by listing the names of the enterprises the data refers to in footnotes. This was not done only in the case of larger numbers. In such cases, the names of enterprises the data refers to were not listed for practical reasons. However, the data is available with the author.

## ***2.2. Statistics related to the top 500 software enterprises in Croatia***

The data related to enterprises having computer programming as their main business activity is sorted below under three sections: general data (2.2.1.), data concerning the structure of ownership of the enterprises (2.2.2.) and data concerning the structure of management and supervisory boards (2.2.3.).

### *2.2.1. General statistics*

Among the observed 500 enterprises none of them have their shares listed or otherwise publicly traded. Only one of them is a joint stock company.<sup>12</sup> However, its shares are not listed on the Zagreb Stock Exchange for public trading.<sup>13</sup> With the exception of 3 registered crafts<sup>14</sup> and 5 branch offices of foreign limited liability companies with headquarters outside of Croatia<sup>15</sup> which made the top 500 list given their revenue, all other 491 enterprises are Croatian limited liability companies, albeit

6 TOP 1000 hrvatskih visoko-tehnoloških tvrtki, available at <https://www.whoiswhoinit.com/novosti/26-top-1000-hrvatskih-visoko-tehnoloskih-tvrtki>, 2018 (15 September 2018).

7 Available at <http://rgfi.fina.hr/IzvjestajiRGFI.web/main/home.jsp> (15 September 2018).

8 Available at <https://sudreg.pravosudje.hr/registar/?p=150:1> (15 September 2018).

9 Available at <https://www.dzs.hr/hrv/important/roj/roj.asp> (15 September 2018).

10 Available at <https://or.portor.hr/pretraga.htm> (15 September 2018).

11 Available at [http://www1.biznet.hr/HgkWeb/do/extlogon?lang=hr\\_HR](http://www1.biznet.hr/HgkWeb/do/extlogon?lang=hr_HR) (15 September 2018).

12 Namely, MEĐIMURJE IPC d.d. This company was formed through transformation from a socially-owned company in Informacijsko-projektantski centar and has been active on the market since 1976 through various organizational forms. See the company’s website available at <http://www.ipc.hr/hr/o-nama/povijest> (15 September 2018).

13 See the information on the IPC-R-A share at the website of the Zagreb Stock Exchange, available at <http://zse.hr/default.aspx?id=10006&dionica=688> (15 September 2018).

14 Namely, E-COMPUTING, Tinjan; IDEA STUDIO, Samobor; and OPTIMUS DATA, Zagreb.

15 Namely, AMPLEXOR ADRIATIC D.O.O. SLOVENIA, ATRON ELECTRONIC GMBH GERMANY, T-MATIX SOLUTIONS GMBH AUSTRIA, HERE EUROPE B. V. THE NETHERLANDS AND SKILJA GMBH GERMANY.

7 of them are still in the form of simple limited liability companies.<sup>16</sup> It is interesting to note that some of these simple limited liability companies were established as early as 2012, yet they still haven't transformed into full-fledged limited liability companies.

In 2017, the joint total revenue of the top 500 enterprises in class J6201 amounted to 5.860.414.215,00 HRK,<sup>17</sup> whereas the average revenue per enterprise amounted to 11.720.828,43 HRK. The top enterprise in the observed sample generated the revenue of 625.785.704,00 HRK,<sup>18</sup> whereas the 500<sup>th</sup> company on the list earned the revenue of 1.606.405,00 HRK in 2017.<sup>19</sup>

As of 31<sup>st</sup> December 2017, the observed 500 enterprises employed a total of 9476 persons based on employment contracts or an average of 18.95 person per company. The largest number of employees in a single company was 375,<sup>20</sup> whereas 11 companies operated without a single employee hired on the basis of an employment contract.<sup>21</sup> The highest of such companies on the list generated a revenue of 8.627.401,00 HRK in 2017.<sup>22</sup> Interestingly, 5 of such companies operating without employees are foreign-owned, including the company with the highest revenue amongst them.<sup>23</sup>

By applying the criteria laid down in the Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises, only 2 enterprises on the list could be categorized as large enterprises,<sup>24</sup> 10 could be categorized as medium-size enterprises,<sup>25</sup> 94 could be categorized as small enterprises, whereas the remaining 394 enterprises would fall into the category of micro enterprises.

In 2017, 117 enterprises that were founded in 1995 or earlier generated a total revenue of 1,801,028,567 HRK, with an average of 15,393,407 HRK. The 42 enterprises that were established in the period between 1996-2000 had a total revenue of 1,379,235,538 HRK, with an average of 32,838,941 HRK.<sup>26</sup> The total revenue

16 Namely, PEGASUS RJEŠENJA J.D.O.O., MT MOBILE TICKETING J.D.O.O., HEXIS J.D.O.O., BIOINFO J.D.O.O., CONSEMEL J.D.O.O., FACTORY X J.D.O.O. and LOOP J.D.O.O.

17 Or roughly the equivalent of 781.388.174,80 EUR.

18 Namely, KING ICT D.O.O.

19 Namely, WEB BITE MEDIA D.O.O.

20 Namely, APIS IT D.O.O.

21 Namely, BROADSTREAM SOLUTIONS D.O.O., CALIGO PROGRAMSKA RJEŠENJA D.O.O., CAPITAL EXECUTIVE GROUP D.O.O., EURO-REAL D.O.O., FARMERON D.O.O., ITURUS SUM D.O.O., IMPLEMENTACIJA SNOVA D.O.O., PRAVI KLIK RAZVOJ D.O.O., SEM D.O.O., CODETECH D.O.O., MARSHALLING D.O.O.

22 Namely, BROADSTREAM SOLUTIONS D.O.O.

23 BROADSTREAM SOLUTIONS D.O.O., CALIGO PROGRAMSKA RJEŠENJA D.O.O., CAPITAL EXECUTIVE GROUP D.O.O., EURO-REAL D.O.O., FARMERON D.O.O.

24 KING ICT D.O.O. and APIS IT D.O.O.

25 SPAN D.O.O., ASSECO SEE D.O.O., IN2 D.O.O., CROZ D.O.O., MICROSOFT HRVATSKA, ERSTE GROUP CARD PROCESSOR D.O.O., NANOBIT D.O.O., B4B D.O.O., PIS D.O.O., DANIELI SYSTEC D.O.O.

26 However, if we excluded KING ICT D.O.O. from the list, which was on the very top of the 500 list according to earnings and is sort of an abnormality because the earnings of the second enterprise on the list were almost half that amount, then the total revenue of the enterprises established between 1996 and 2000 would be a much less 753,449,834 HRK, with an average

of the 65 enterprises established in the period between 2001-2005 amounted to 1,116,728,466 HRK, with an average of 17,180,438 HRK per enterprise. The 109 enterprises, which were established between 2006-2010 earned a total of 789,213,739 HRK or a mean of 7,240,493 HRK per enterprise. The 136 enterprises on the list were founded in the period between 2011-2015 and have made a total of 749,274,277 HRK or an average of 5,509,370 HRK per enterprise. Finally, the remaining 26 enterprises that were established in 2016 or in 2017 have earned a total of 85,266,416 HRK in the period between 2016-2017 or 3,279,478 HRK per enterprise.<sup>27</sup>

The overwhelming majority of enterprises had their registered office in Zagreb and the Zagreb metropolitan area (313),<sup>28</sup> followed by Split (34), Rijeka (18), Čakovec (13), Varaždin (13), Osijek (11), Pula (8), Dubrovnik (5) and others.

### *2.2.2. Structure of ownership*

For reasons unknown to the author, the online court register does not show information about the ownership of one company.<sup>29</sup> Unlike this company for which the information is lacking, the 5 registered branch offices of foreign companies were not excluded from the analysis even though their ownership structure is self-explanatory. Therefore, the sample used for this particular purpose was 499 enterprises from the top 500 list according to revenue.<sup>30</sup>

In relation to the number of shareholders per enterprise, the vast majority of enterprises (286) had a sole shareholder, which was a natural person in 194 cases and a legal person in 92 cases. The total revenue of enterprises with one shareholder was 3,574,900,890 HRK, with an average of 12,499,653 HRK per enterprise with one shareholder. The 194 enterprises in which natural persons were sole shareholders jointly earned the total revenue of 1,733,602,005 HRK in 2017. On average one such enterprise earned 8,936,093 HRK. If we excluded the top earning company in the J6201 class, KING ICT d.o.o., the total earned revenue of enterprises in which natural persons were sole shareholders would be a much less 1,107,816,301 HRK.<sup>31</sup> In this case the average per company with a single shareholder who is a natural person would be 5,739,981 HRK. In comparison, the 92 enterprises in which legal persons were sole owners jointly earned the total revenue of 1,841,298,885 HRK in 2017, whereas on average one such enterprise earned 20,014,118 HRK.

Two shareholders were present in the case of 112 enterprises. Out of these, both shareholders were natural persons in 103 enterprises, one was a natural person and the other was a company in 5 enterprises,<sup>32</sup> and both were companies in the remaining

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of 18,376,825 HRK per enterprise.

27 These numbers do not include the five registered branch offices of foreign companies.

28 To be more precise, 295 in Zagreb proper and remainder in the nearby towns of Samobor, Zaprešić, Jastrebarsko and Velika Gorica.

29 Namely, LUATECH D.O.O.

30 Namely, LUATECH D.O.O.

31 KING ICT D.O.O. alone had the revenue of 625,785,704.00 HRK in 2017. In comparison the revenue of the second company on the list, SPAN D.O.O., was almost half than amount – 323,442,489.00 HRK.

32 2E SYSTEMS D.O.O., ITURUS SUM D.O.O, EMAKINA.HR D.O.O., PARDUS D.O.O.,

4 cases.<sup>33</sup> The total revenue earned by all enterprises with two shareholders in 2017 amounted to 1,121,332,997 HRK, whereas the average revenue per enterprise was 10,011,902 HRK. The total revenue earned by the 103 enterprises in which both shareholders were natural persons was 842,151,876 HRK, with an average revenue per enterprise of 8,176,232 HRK. The total revenue of the enterprises in which one shareholder was a natural person and the other was a company was 27,684,526 HRK. The average revenue of such enterprises was 5,707,279 HRK. Furthermore, the total revenue of enterprises in which both shareholders were companies was 250,644,627 HRK, whereas the average per enterprise was 62,661,157 HRK. Finally, it might be interesting to note that in 20 of those 103 enterprises in which both shareholders were natural persons, the two shareholders were spouses or relatives. The total revenue of such enterprises was 197,823,523 HRK, while the average revenue was 9,891,176 HRK.

Furthermore, 49 enterprises had three shareholders, of which all of them were natural persons in 41 companies, whereas in 8 observed companies one or two shareholders were companies in addition to natural persons.<sup>34</sup> There were no enterprises in which all three shareholders were legal persons. The total revenue of enterprises with 3 shareholders was 331,721,581 HRK, with an average revenue of 6,769,828 HRK per enterprise. The total revenue of enterprises in which all shareholders were natural persons was 275,584,447 HRK, whereas the average revenue of such enterprise was 6,721,572 HRK. The total revenue of enterprises in which the three shareholders were natural and legal persons was 56,137,134 HRK. On average, such enterprises earned 7,017,142 HRK in 2017. In none of those 41 enterprises in which the three shareholders were natural persons, all shareholders were spouses or relatives. In 10 enterprises two shareholders were spouses or relatives, whereas the third one was unrelated to them or a legal person.<sup>35</sup> The total revenue of such enterprises amounted to 276,169,946 HRK, with an average earning of 9,205,665 HRK per enterprise.

The remaining 52 enterprises had 4 or more shareholders, all of which were natural persons in 43 of them. The total revenue of all enterprises with 4 or more shareholders was 936,308,956, with an average revenue per enterprise in the amount of 18,005,941 HRK. The 43 companies in which all shareholders were natural persons earned the joint revenue of 830,208,408 HRK and an average revenue of 19,307,172 HRK per enterprise. Various companies had shares along with natural persons in 9 observed companies. Such enterprises earned the total revenue of 106,100,548 HRK, whereas their average revenue was 11,788,950 HRK per enterprise. In 18 enterprises

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INFTEC D.O.O.

33 APIS IT D.O.O., LIBUSOFT CICOM D.O.O., CENOSCO CROATIA D.O.O., AGRIVI D.O.O.

34 MINUS5 D.O.O., TIS - OBJEKтни INFORMACIJSKI SUSTAVI D.O.O., DOVIKIVATI D.O.O., INTENDA NET D.O.O., IDONEUS D.O.O., LOGNET D.O.O., INEO D.O.O., SOFTWARE AUTOMATION CONCEPTS D.O.O.

35 POSLOVNA INTELIGENCIJA D.O.O., ZMS INFO D.O.O., INTEGRIRANI POSLOVNI SUSTAVI D.O.O., ENVOX D.O.O., RAZVOJ TEHNOLOGIJA D.O.O., MAŠINERIJA D.O.O., LOGNET D.O.O., PROSPEKT D.O.O., SAND PLUS D.O.O., INEO D.O.O.

two or more shareholders were spouses and/or related to each other.<sup>36</sup> However, given the number of additional shareholders who are not related with them or each other, it seems that the vast majority of companies with 4 or more shareholders, with two possible exceptions,<sup>37</sup> were established and/or grew into partnerships of several persons brought together by reasons other than family or marital relations. In none of the 52 enterprises with 4 or more shareholders all of the shareholders were spouses and/or related to each other. Excluding the one joint stock company in the sample, the highest number of shareholders in an enterprise – a limited liability company – was 10.<sup>38</sup>

Regarding the gender of the shareholders who are natural persons, women held shares in 81 enterprises. Merely 17 enterprises were 100% owned by women, whether as sole shareholders (14) or two shareholders (3).

Concerning the origin of the shareholders,<sup>39</sup> legal or natural persons with registered headquarters or residence outside of Croatia held 100% of shares in as many as 85 enterprises from the list,<sup>40</sup> whereas foreign companies or foreign natural persons held shares in further 19 enterprises, along with companies or natural persons from Croatia. All shareholders of the remaining 395 enterprises had registered headquarters or residence in Croatia.

Only two enterprises on the list were state-owned, one directly<sup>41</sup> and the other indirectly,<sup>42</sup> whereas 497 were owned by private legal or natural persons.

### *2.2.3. Structure of management and supervisory boards*

In relation to the management of 194 enterprises with the sole owner who was a natural person, the following was observed. The owner was the sole director in 141 enterprises. In 11 of those 140 enterprises, commercial powers of attorney (in

36 CROZ D.O.O., DIVERTO D.O.O., BLINK D.O.O., INFODESIGN D.O.O., ENEL SPLIT D.O.O., INFOMARE D.O.O., KONTO D.O.O., ZAGREB DATA D.O.O., QUALITY IN QUALITY OUT D.O.O., JADRIJA D.O.O., INTERCORONA D.O.O., MICRONIC D.O.O., TASK POSLOVNA INFORMATIKA D.O.O., GOINFOZG D.O.O., NET MEDIA SISTEMI D.O.O., TIS-GRUPA TELEMATIČKI INŽENJERING I SOFTWARE D.O.O., PANDORA STUDIO D.O.O., NET MEDIA MEĐUNARODNE USLUGE D.O.O.

37 KONTO D.O.O. and INTERCORONA D.O.O., in which there are more related or married shareholders than the other shareholders.

38 Namely, ISTRA TECH D.O.O.

39 Due to the fact that the information on the citizenship of natural persons is not available to the author, the criteria of residence in or outside of Croatia as listed in the court registry was used for the purpose of determining the origin of shareholders who are natural persons. Therefore, it is possible that persons who hold Croatian citizenship, yet have their residence abroad, are labeled as foreign natural persons and that persons who do not hold Croatian citizenship, yet have their residence in Croatia are labeled as domestic natural persons.

40 This number includes the branch offices of foreign companies.

41 Namely, APIS IT D.O.O. is jointly owned by the Republic of Croatia and the City of Zagreb.

42 However, MIPS D.O.O. is owned by HRVATSKA POŠTA D.D., which is, in turn, a stated-owned company.

Croatian *prokura*) were conferred upon one (in 8 enterprises),<sup>43</sup> two (in 2 enterprises)<sup>44</sup> or three additional persons (in 1 enterprise).<sup>45</sup> All holders of these commercial powers of attorney were relatives or spouses of the owner<sup>46</sup> in the case of 6 enterprises (4 enterprises had 1 such holder,<sup>47</sup> 1 enterprise had 2 such holders<sup>48</sup> and 1 enterprise had 3 such holders).<sup>49</sup> In one of the 140 enterprises with the owner as the sole director, the director was supervised by a two-member supervisory board.<sup>50</sup>

The owner was one of the directors in further 30 of the 194 enterprises with a sole owner, along with one other (in 26 enterprises)<sup>51</sup> or two other directors (in 4 companies).<sup>52</sup> The other directors were all relatives or spouses of the owner in the case of 18 of those 30 enterprises. In 2 of such family-managed enterprises in which one person was the owner, non-family holders of a commercial power of attorney were also present.<sup>53</sup> Furthermore, in 1 enterprise in which the other director was not a relative or a spouse of the owner, a relative or a spouse of the owner was the holder of a commercial power of attorney.

The owner was not the manager, but he/she has participated in managing the enterprise as the holder of a commercial power of attorney in further 11 of the 194 enterprises.<sup>54</sup> In those 11 enterprises, in addition to the owner as the holder of the commercial power of attorney, other persons participated in the management of the enterprise as per the following structure: a spouse or a relative was the holder of the other commercial power of attorney and another spouse or a relative was a director in 2 enterprises;<sup>55</sup> a spouse or a relative was the sole director in 2 enterprises;<sup>56</sup> two

43 ANALYTICOM D.O.O., MEDIA-SOFT D.O.O., ADRIA SCAN D.O.O., S.D. INFORMATIKA D.O.O., VITAM AGERE D.O.O., 234 D.O.O., FERIA PROJEKT D.O.O., INFO NOVITAS D.O.O.

44 DRAP D.O.O., STANIĆ AUTOMATION D.O.O.

45 IMAVES D.O.O.

46 The cumulative criteria used to determine whether a person is a relative or a spouse were the same surname and the same address as the owner.

47 MEDIA-SOFT D.O.O., ADRIA SCAN D.O.O., S.D. INFORMATIKA D.O.O., INFO NOVITAS D.O.O.

48 STANIĆ AUTOMATION D.O.O.

49 IMAVES D.O.O.

50 JADRAN - INFORMATIKA D.O.O.

51 ACQUISITUM MAGNUM D.O.O., ETRANET GRUPA D.O.O., NETCOM D.O.O., AMPHINICY D.O.O., TOMSOFT D.O.O., CENTAR MCS D.O.O., ELEKTRONIKA PERHOČ D.O.O., FILOS D.O.O., TETRA NAVIS D.O.O., GDI GRUPA D.O.O., VENIO INDICIUM D.O.O., CITUS D.O.O., SWING INFORMATIKA D.O.O., ENSO D.O.O., KLISING D.O.O., MOLA MOLA D.O.O., INTERSOFT D.O.O., NOMEN D.O.O., WEB STUDIO D.O.O., EURO-REAL D.O.O., PROGIS D.O.O., EURO-TERA D.O.O., FIDENS ALARM D.O.O., PROMONA D.O.O., SICOM D.O.O., UNIQCAST D.O.O.

52 ALFATEC GROUP D.O.O., GDI TECHNOLOGY PLATFORMS D.O.O., ICE D.O.O., INPRO D.O.O.

53 GDI GRUPA D.O.O. and GDI TECHNOLOGY PLATFORMS D.O.O.

54 SEKOM D.O.O., INFOPROJEKT D.O.O., RI-ING NET D.O.O., MARCO D.O.O., C TIM D.O.O., GRC GRUPA D.O.O., DODIG D.O.O., EXCEL COMPUTERS D.O.O., LOGIKA D.O.O., POSLUH D.O.O., ANADA D.O.O.

55 SEKOM D.O.O., DODIG D.O.O.

56 GRC GRUPA D.O.O., EXCEL COMPUTERS D.O.O.

relatives were directors in 1 enterprise;<sup>57</sup> a spouse or a relative was a director, along with another non-related director in 3 enterprises;<sup>58</sup> a spouse or a relative was a director along with another two non-related directors in 1 enterprise;<sup>59</sup> a non-related person was the sole director in 1 enterprise; and two non-related persons were directors in 1 enterprise.<sup>60</sup>

The owner was neither the manager nor has he/she participated in managing the enterprise as the holder of a commercial power of attorney, but his/her spouse or relatives were managers or holders of a commercial power of attorney in further 6 enterprises.

Persons not related to the owner managed the remaining 6 enterprises, in which neither the owner nor his/her spouse or relatives were officially involved in management, neither through commercial powers of attorney nor the position of the director.<sup>61</sup> In one of those enterprises, however, the owner was a member of the supervisory board.<sup>62</sup>

In relation to the management of 20 enterprises in which both shareholders were natural persons and spouses or relatives of each other, the following was observed. Both shareholders were directors, with no other directors or holders of commercial powers of attorney present, in 8 enterprises.<sup>63</sup> One of the shareholders was the sole director, with no other directors or holders of commercial powers of attorney present, in 6 enterprises.<sup>64</sup> One shareholder was the sole director, while the other shareholder was the sole holder of a commercial power of attorney in 2 enterprises.<sup>65</sup> One of the shareholders was one of the three directors, whereas the other two were both related to the shareholders, in 1 enterprise.<sup>66</sup> Both shareholders were directors with a non-owner relative as an additional director in 2 enterprises.<sup>67</sup> Finally, both shareholders were directors, with the third director unrelated to them, in 1 enterprise.<sup>68</sup>

The two prevailing management structures for the 83 enterprises with two shareholders who are natural persons not related to each other were as follows. Both shareholders were directors, without the participation of other persons in the management, in 47 enterprises and one of the shareholders was the sole director, without the participation of other persons in the management, in 17 enterprises. Various other management structures were present in the remaining 19 enterprises.

57 POSLUH D.O.O.

58 RI-ING NET D.O.O., ANADA D.O.O., C TIM D.O.O.

59 INFOPROJEKT D.O.O.

60 MARCO D.O.O.

61 KING ICT D.O.O., CROSSVALLIA D.O.O., OPTIMUS LAB D.O.O., SOFISTIKA D.O.O., SAAN RAČUNALA D.O.O., S.O.E. ICT D.O.O.

62 KING ICT D.O.O.

63 MANAS D.O.O., POINTER D.O.O., NUCLEUS D.O.O., POLITEC AUTOMATIKA D.O.O., TRIA D.O.O., IMPADDO D.O.O., FORMEL D.O.O., ZELENE TEHNOLOGIJE D.O.O.

64 PIS D.O.O., SERENGETI D.O.O., INFOSIT D.O.O., DIVERSITAS IT SUSTAVI D.O.O., APLIKACIJA D.O.O., D.L.D. D.O.O.

65 HARD JURA D.O.O., PRATI ME D.O.O.

66 DUPLICO D.O.O.

67 CODE EXPERT D.O.O., INFO EXPERT D.O.O.

68 INGEMARK D.O.O.

In the 10 enterprises in which two of the shareholders were spouses or relatives, whereas the third one was unrelated to them or a legal person, the structure of management was as follows. All three shareholders were directors in 1 enterprise.<sup>69</sup> One of the two shareholders who were spouses or relatives was the sole director in 6 enterprises.<sup>70</sup> Both shareholders who were spouses or relatives were directors with no other directors or holders of commercial power of attorney, in 1 enterprise.<sup>71</sup> A non-owner relative of the two shareholders who were spouses or relatives was the sole director in 1 enterprise.<sup>72</sup> Finally, the unrelated shareholder was the sole director in only one instance.<sup>73</sup>

In the remaining 39 enterprises with three unrelated shareholders and 52 enterprises with 4 or more shareholders all sorts of shareholder participation in the management were observed. Importantly, all of those enterprises had at least one shareholder participating in managing the company. There wasn't a single case where the management was composed exclusively of persons who were not shareholders.

As of 31<sup>st</sup> December 2017, merely 7 companies on the top 500 list had supervisory boards.<sup>74</sup> This is, however, not surprising, given that the vast majority of enterprises on the list do not meet the legal thresholds for mandatory supervisory boards as prescribed by the Croatian Company Act (Official Gazette Nos. 111/93, 34/99, 121/99, 52/00, 118/03, 107/07, 146/08, 137/09, 125/11, 152/11, 111/12, 68/13, 110/15). As per the composition of the 7 supervisory boards, in 3 companies they had 5 members,<sup>75</sup> in 3 companies they had 3 members,<sup>76</sup> whereas in the remaining company, the supervisory board had 2 members.<sup>77</sup>

With regard to the gender of the managers or holders of commercial powers of attorney, a total of 74 women participated in the management of 70 enterprises as directors and 27 in the management of 24 enterprises as holders of commercial powers of attorney. Merely 19 companies had only women as directors, albeit in some of them men sometimes participated in the management as holders of commercial powers of attorney. Compared to the number of male directors or proxies, the numbers pertaining to women are truly negligible.

### **2.3. The takeaways**

The data presented in the previous section shows that the most successful part of the Croatian computer programming segment of the IT industry is fully composed

69 POSLOVNA INTELIGENCIJA D.O.O.

70 ZMS INFO D.O.O., INTEGRIRANI POSLOVNI SUSTAVI D.O.O., MAŠINERIJA D.O.O., LOGNET D.O.O., PROSPEKT D.O.O., SAND PLUS D.O.O.

71 INEO D.O.O.

72 ENVOX D.O.O.

73 RAZVOJ TEHNOLOGIJA D.O.O.

74 MEDIMURJE IPC D.D., KING ICT D.O.O., APIS IT D.O.O., ASSECO SEE D.O.O., LAUS CC D.O.O., JADRAN - INFORMATIKA D.O.O., INTENDA NET D.O.O.

75 LAUS CC D.O.O., KING ICT D.O.O., APIS IT D.O.O.

76 MEDIMURJE IPC DD, ASSECO SEE D.O.O., INTENDA NET D.O.O.

77 JADRAN - INFORMATIKA D.O.O.

of closed companies, with none of the companies having their shares publicly traded. Some of the reasons for this might be the still young age of the Croatian market and its small size, coupled with the complexities that arise from a bumpy transition to the market economy and a socialist mindset that is still present in parts of the Croatian society. Given that there are no listed enterprises in the sample, it is unsurprising that the enterprises are almost exclusively organized as limited liability companies.

Furthermore, the Croatian computer programming sector is almost in its entirety driven by SMEs, considering that as many as 99.6% of the top 500 enterprises are medium-sized, small or micro enterprises. This percentage is even higher and it rises to 99.99% if one considers not just the top 500 list, but the entire computer programming segment in which more than 4000 enterprises operate. Among the SMEs on the top 500 list, as many as 97.99% are small and micro enterprises, which shows that even middle-sized enterprises are a rarity. To reiterate, this might be owing to the small size of the Croatian market and its relatively young age.

Regarding the age of the enterprises on the list, according to the revenue criteria the enterprises established before 2005 are much more successful than those established after 2005. This might be the consequence of many things, of which two should be highlighted. First, the enterprises established before 2005 that are still in business today were filtered by many different types of crises the Croatian economy has been through since the inception of the Croatian state and the transition to the market economy, meaning that only the fittest and the most capable enterprises managed to survive until the end of 2017. These enterprises are, therefore, on average probably more shock-proof and possess more efficient tools for generating revenue than the younger enterprises on the list, which, for example, did not have to survive the uncertainties of the Homeland War and the period that followed shortly thereafter. The younger enterprises, even if they might enjoy a certain level of success which landed them on the list, did not have a chance to go through such extensive filtering, so as a whole are not as capable to generate high revenues, amongst other things. And second, in knowledge-intensive companies, technological processes are cumulative and an enterprise's experience might play a significant role that contributes positively to innovative results,<sup>78</sup> which usually increases the chances of generating higher revenue.

Considering the number of enterprises having their main business address there, Zagreb is the absolute center of the Croatian software industry. This is unsurprising, since more than 1/4 of the Croatian population lives in and in the close proximity of Zagreb and all other major business sectors are concentrated there as well.

The analysis of the structure of ownership, coupled with the analysis of the structure of management has revealed that the sector is largely dominated by owner-managed enterprises.<sup>79</sup> Most of those enterprises had a sole shareholder and in almost

78 Gomez Vietes, A., et. al., *A Study of Innovation Activities and the Role Played by Ownership Structure in Spanish Industrial Companies*, in Smyrnios, K. X., et. al., *Handbook of Research on Family Business*, Second Edition, Edward Elgar Publishing, Cheltenham, 2013.

79 The European Commission defines a family business as a business where: 1. The majority of decision-making rights are in the possession of the natural person(s) who established the firm, or in the possession of the natural person(s) who has/have acquired the share capital of

all cases the sole shareholder participated in managing the company in some way. In the overwhelming majority of such enterprises, the sole shareholder was the sole director, but there were also cases in which the management involved other persons as well, albeit in many cases the members of the owner's family, including spouses. Similar patterns were observed in the enterprises with two or more shareholders, although not so predominantly. This, read together with the fact that an overwhelming majority of the enterprises are small or, rather, micro in size, suggests that the computer programming segment of the IT industry in Croatia is largely vulnerable to many risks arising from the disadvantages generally recognized in scholarly literature as inherent to family businesses, such as succession problems, possible family conflicts, a high degree of nepotism, unstructured governance, inadequate capital and lack of professional management.<sup>80</sup> An additional observation related to the computer programming segment of the Croatian IT industry, which is not specifically related to family businesses, is that it is extremely male-dominated.

Even though owner-managed enterprises certainly have a greater chance to exhibit longevity in leadership which leads to the overall stability of the enterprise in the long run, it seems that at least in Croatia, this is not enough to overcome the lack of financial sources for growth and the lack of professional management. Namely, the comparison between such enterprises and enterprises which are owned by domestic or foreign companies and that are, therefore, more likely to have professional management and access to the necessary capital, shows that the latter enterprises are on average almost four times more successful in Croatia in terms of revenue than those that are owner-managed. This might also be the consequence of the fact that smaller enterprises are more prone to unstructured governance lacking planning or strategy in any business area. One of such areas that is particularly important for the enterprises having computer programming as their main activity is the protection of intellectual property. The following sections deal with the specific issues related to the governance of intellectual property in such knowledge-intensive IT companies.

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the firm, or in the possession of their spouses, parents, child, or children's direct heirs, 2. The majority of decision-making rights are indirect or direct, 3. At least one representative of the family or kin is formally involved in the governance of the firm, 4. Listed companies meet the definition of family enterprise if the person who established or acquired the firm (share capital) or their families or descendants possess 25 per cent of the decision-making rights mandated by their share capital. However, this paper opts for the use of the term "owner-managed enterprises" instead, because it seems to be more precise given that the enterprises that have a sole shareholder or two non-related shareholders, which participate in the management are not necessarily family businesses, even though they are encompassed by the aforementioned definition of family businesses. In principle, the term "owner-managed enterprise" as used in this paper means an enterprise in which the natural persons who are controlling shareholders are substantially the same set of persons who run the enterprise.

80 For more on family business see, for example, Smith, N., *Advising the Family Owned Business*, Bristol, LexisNexis, 2017; Smyrnios, K. X., et al., (eds.), *Handbook of Research on Family Business*, Second Edition, Cheltenham, Edward Elgar Publishing, 2013; Koeberle-Schmid, A., et al., *Governance in Family Enterprises*, Basingstoke, Palgrave MacMillan, 2014; May, P., Bartels, P. (eds.), *Governance im Familienunternehmen*, Köln, Bundesanzeiger Verlag, 2017; Vogt, H.-U., et al., *Recht der Familiengesellschaften*, Tübingen, Mohr Siebeck, 2017.

### **3. SPECIFIC ISSUES RELATED TO THE GOVERNANCE OF INTELLECTUAL PROPERTY IN KNOWLEDGE-INTENSIVE IT ENTERPRISES**

Placing intellectual property in the front and in the center of an enterprise's agenda is one of the ways to help maximize the potential for commercial success of software. Unfortunately, many small and micro-sized knowledge-intensive IT enterprises more often than not lack the awareness of the importance and the potential of protecting and properly managing intellectual property. Such an enterprise, in addition to two other types, is profiled in section 3.3. concerning the behavioral patterns in the governance of intellectual property in knowledge-intensive IT companies. Before that, section 3.1. explores the types of intellectual property rights relevant for particular types of software, whereas section 3.2. classifies the methods of protection of intellectual property related to software.

#### **3.1. Types of intellectual property rights relevant for software**

Basically, there are four types of intellectual property rights relevant for software: (3.1.1.) patents, (3.1.2.) copyrights, (3.1.3.) trade secrets and (3.1.4.) trademarks. Whereas the first three protect the product itself, trademarks are more applicable to the marketing side of the story, participating in the overall market success of the product in a different way. One must always bear in mind that all four of these rights are not universal in nature, but are rather territorially limited rights. According to the territoriality principle, which is one of the underlying principles of intellectual property rights, they do not extend beyond the territory of the sovereign that has granted the rights in the first place.<sup>81</sup> In other words, different requirements for protection might apply in different countries or regions and different persons might be the holders of those rights in different countries or regions. The following sections primarily touch upon the requirements for intellectual property protection of software as applicable in Croatia and the EU.

##### **3.1.1. Patents**

A patent is a registered intellectual property right that provides its holder, who is at the same time not necessarily the inventor,<sup>82</sup> a 20-year exclusive monopoly to make, use and sell the invention in exchange for a public disclosure of the invention.<sup>83</sup>

81 See Drahos, P., *The Universality of Intellectual Property Rights: Origins and Development*, in *Intellectual Property and Human Rights*, Geneva, World Intellectual Property Organization, 1999, pp. 13-41, p. 16.

82 See *infra* section 3.2.1.

83 There is general consensus amongst the patent law scholars that a patent is actually a bargain between the inventor (or rather the holder of the patent) and the public. The inventor/patent holder gets the monopoly for a limited time covering all ways of implementing the technology, whereas in return the invention is not kept secret, but rather enters the public domain and once the time of patent protection expires it becomes free to use by everyone. See, for example, Ghosh, S., *Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor after*

Patents are perhaps the most powerful intellectual property rights, because they basically allow the monopolization of an idea, not just the monopolization of a single original expression of that idea. In the context of software, this would mean that one might be able to obtain a monopoly on, for example, certain user-interface features and not only on one of the many possible sets of source or object code by which these user-interface features were built. Therefore, competitors would not be allowed to use their own original set of source or object code to arrive to and use the same user-interface features.<sup>84</sup> Due to this very broad grasp, patents could obviously be used as game-changing economic tools by software companies. Of course, there are certain downsides to software patenting too, which will be mentioned at the end of this section.

The most important question to be answered here is the one that has been a matter of much controversy in Europe over the years: is software even eligible for patent protection, i.e., can it be considered an invention?<sup>85</sup> The controversy stems from the fact that the Convention on the Grant of European Patents of 5 October 1973 (hereinafter: the European Patent Convention), to which Croatia is a party and which is arguably the most important legal instrument dealing with both substantive and procedural aspects of patenting in Europe,<sup>86</sup> in Article 52 paragraph 2 prescribes that “programs for computers”, in addition to discoveries, scientific theories, mathematical methods, aesthetic creations, schemes, rules and methods for performing mental acts, playing games or doing business and presentations of information, shall not be regarded as inventions within the meaning of the Convention.<sup>87</sup> Many national patent laws in Europe, including the Croatian Patent Act (Official Gazette Nos. 173/03, 87/05, 76/07, 30/09, 128/10, 49/11, 76/13, 46/18, hereinafter: the Patent Act) in Article 5 paragraph 6 essentially contain the same provision. However, even though European countries traditionally have a more restrictive stance towards the patenting of software compared to, for example, the US where software patents were not a matter of debate until very recently,<sup>88</sup> it is actually a myth that software or, as the

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Eldred, *Berkeley Technology Law Journal*, vol. 19, no. 4, 2004, pp. 1315-1388.

84 This does not, however, mean that source and object code can be patented. See, for example, Soininen, A., *The Software and Business-Method Patent Ecosystem: Academic, Political, Legal and Business Developments in the U.S. and Europe*, IPR Series B, No 1/2005, IPR University Center Publications, p. 51.

85 Amongst Croatian legal scholars, computer program patents were explored by Parać, Zoran, *Patentna zaštita kompjutorskog programa u europskim i prekomorskim pravnim sustavima*, *Privreda i pravo*, vol. 30, br. 9-10, 1991., str. 570-587.

86 Currently, 38 states are parties to the European Patent Convention, including all 28 members of the European Union. European patents, as granted under the European Patent Convention, are actually a bundle of national patents granted for the countries designated in the patent application.

87 These items as such are considered “non-inventions“, devoid of any technical character and are deemed to be purely abstract concepts. See, for example, Technical Board of Appeal, Decision of 21 April 2004, no. T 0258/03 (Auction method/HITACHI).

88 See, for example, Volpe S., A., Vartanian, H., *Alice and the Search for Patent Eligible Software Patents*, *The Legal Intelligencer*, 1 May 2018, available at <https://www.law.com/thelegalintelligencer/2018/05/01/alice-and-the-search-for-patent-eligible-software-patents/?slreturn=20180827121046> (15 September 2018).

European Patent Office calls them, computer-implemented inventions<sup>89</sup> cannot be patented in Europe at all.<sup>90</sup>

The key to software patenting in Europe lies in the qualification laid down in Article 52 paragraph 3 of the European Patent Convention, and the corresponding counterpart in the national patent laws – in the case of Croatian Patent Act, Article 5 paragraph 7 – which prescribes that computer programs and other items from the Article 52 paragraph 2 EPC list are excluded from patentability only if the patent application or patent refers to them “as such”. Over the years, the practice of the Boards of Appeal of the EPO and the national courts in the Members States, who strive to align with the decisions of the EPO even though they have no obligation to do so apart from the practical necessity,<sup>91</sup> have come to an interpretation that the words

89 According to the EPO Guidelines for Examination, “Inventions involving programs for computers can be protected in different forms of a “computer-implemented invention”, an expression intended to cover claims which involve computers, computer networks or other programmable apparatus whereby at least one feature is realized by means of a program.”. European Patent Office, Guidelines for Examination in the European Patent Office, November 2017, available at [http://documents.epo.org/projects/babylon/eponet.nsf/0/D94333C1A028BC0AC12581C90057921F/\\$File/guidelines\\_for\\_examination\\_2017\\_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/D94333C1A028BC0AC12581C90057921F/$File/guidelines_for_examination_2017_en.pdf) (15 September 2018), Part F– Chapter IV-8, Section 3.9. The European Patent Office has decided to use the term “computer-implemented inventions” because the term “software” lacks precision and because Article 52 EPC refers indeed to the exclusion of computer programs from patenting. Quinn, Gene, Exclusive with Grant Philpott: Patenting Computer Implemented Inventions in Europe, 12 September 2017, available at <http://www.ipwatchdog.com/2017/09/12/grant-philpott-patenting-computer-implemented-inventions-europe/id=87865/> (15 September 2018).

90 In the period between 2008 and 2017, the total number of submitted European patent applications in the field of computer was 93,404, out of which 27,571 patents were granted by the EPO. Whereas the average number of patents granted per year between 2008 and 2015 was 2,450, the number of granted patents grew to 3,384 in 2016 and to 4,584 in 2017. See European Patent Office, “European patents granted 2008-2017 by field of technology”, 22<sup>nd</sup> January 2018, available at [http://documents.epo.org/projects/babylon/eponet.nsf/0/5F76E784867AC2D2C125824700558F7A/\\$File/Granted\\_patents\\_by\\_technology\\_field\\_2008-2017\\_en.xlsx](http://documents.epo.org/projects/babylon/eponet.nsf/0/5F76E784867AC2D2C125824700558F7A/$File/Granted_patents_by_technology_field_2008-2017_en.xlsx) (15 September 2018) and European Patent Office, “European patents applications 2008-2017 by field of technology”, 22<sup>nd</sup> January 2018, available at [http://documents.epo.org/projects/babylon/eponet.nsf/0/5F76E784867AC2D2C125824700558F7A/\\$File/Applications\\_by\\_field\\_of\\_technology\\_2008-2017\\_en.xlsx](http://documents.epo.org/projects/babylon/eponet.nsf/0/5F76E784867AC2D2C125824700558F7A/$File/Applications_by_field_of_technology_2008-2017_en.xlsx) (15 September 2018).

91 For example, the UK Court of Appeal in its judgement of 6 March 1997 in the matter of application no. 9204959.2 by Fujitsu Limited said the following: “From this brief reference to the European Patent Convention one point which emerges is that it is of the utmost importance that the interpretation given to section 1 of the Act by the courts in the United Kingdom, and the interpretation given to Article 52 of the European Patent Convention by the European Patent office, should be the same. The intention of Parliament was that there should be uniformity in this regard. What is more, any substantial divergence would be disastrous. It would be absurd if, on an issue of patentability, a patent application should suffer a different fate according to whether it was made in the United Kingdom under the Act or was made in Munich for a European patent (UK) under the Convention. Likewise, in respect of opposition proceedings.” See England and Wales Court of Appeal (Civil Division), FUJITSU LIMITED [1997] EWCA Civ 1174 of 6 March 1997, available at <http://www.bailii.org/ew/cases/EWCA/Civ/1997/1174.html> (15 September 2018).

“as such” from Article 52 paragraph 3 EPC separate the patent-ineligible computer programs, which do not to have any technical features beyond the “normal physical interactions between the program (software) and the computer (hardware) on which it is run”, from patent-eligible computer programs, which have technical features, i.e. a “further technical effect”.<sup>92</sup> Simply put, it matters what the computer program does. For example, if a program is only a sequence of computer-executable instructions running on a computer used for automatic alphabetical sorting of pdf files, it will not be patent-eligible subject-matter because it only has organizational features and not a further technical effect. On the other hand, if at the same time the described program automatically reduces the size of the files during the sorting without compromising the quality of the files, thus also reducing the computer disk space necessary to save the files, it has a further technical effect along with the business features and is patent-eligible.

In addition to having technical features, in order to be patented software must also satisfy the three substantive patentability requirements: novelty, inventive step and industrial applicability. Whereas industrial applicability has proven not to be a particularly difficult hurdle to surpass for inventions in any field of technology,<sup>93</sup> most software would most likely fail at the inventive step requirement, which is a much larger bite compared to eligible subject-matter. Namely, when assessing whether a computer-implemented invention satisfies this requirement or not, only the technical features of the invention are assessed and compared with the solutions to a certain technical problem, which are already offered by the prior art. The many possible non-technical features, such as business features of the software, no matter how revolutionary they may be, cannot contribute to the inventive step.<sup>94</sup> Even the novelty

92 This approach to patenting of computer programs was first formulated in a landmark decision by the Technical Board of Appeal of the EPO in the case T 1173/97, also known as Computer program product/IBM or simply Computer program product. In its decision of 1<sup>st</sup> July 1998, the Board held that “a computer program claimed itself is not excluded from patentability if the program, when running on a computer or loaded into a computer, brings about, or is capable of bringing about, a technical effect which goes beyond the “normal” physical interactions between the program (software) and the computer (hardware) on which it is run”. See Technical Board of Appeal, T/1173/97 of the 1 July 1998 in T/1173/97 (Computer program product/IBM), available at <https://www.epo.org/law-practice/case-law-appeals/recent/t971173ex1.html> (15 September 2018).

93 For general information about industrial applicability, see, for example Tritton, G., et. al., *Intellectual Property in Europe*, London, Sweet & Maxwell, 2002, 2<sup>nd</sup> edition, p 103; Cornish, W., Llewelyn, D., *Intellectual Property: Patents, Copyright, Trade Marks and Allied Rights*, London, Sweet & Maxwell, 2003, 5<sup>th</sup> edition, p. 206-207; Hacon, R., Pagenberg, J. (eds.), *Concise European Patent Law*, Alphen aan den Rijn, Kluwer Law International, 2007, p. 59-60; European Patent Office, *Case Law of the Boards of Appeal of the European Patent Office*, 8<sup>th</sup> Edition, July 2016, available at [http://documents.epo.org/projects/babylon/eponet.nsf/0/5148B6F13CBE8990C1258017004A9EF6/\\$File/case\\_law\\_of\\_the\\_boards\\_of\\_appeal\\_2016\\_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/5148B6F13CBE8990C1258017004A9EF6/$File/case_law_of_the_boards_of_appeal_2016_en.pdf) (15 September 2018), p. 254-260.

94 To assess whether an invention satisfies the inventive-step requirement, the EPO uses the so-called “problem-and-solution approach”. This approach includes establishing the closest prior art, determining the differentiating features and technical effects of the invention and the closest prior art, formulating an objective problem and then deciding whether the solution to

requirement might prove difficult in many cases, because it mandates that the idea to be patented was not a part of the state of the art at the time of filing the patent application, i.e. that it has not been made publicly available by any means prior to submitting the patent application.<sup>95</sup> This might be particularly hard to satisfy in the case of software, because many ideas and possible solutions to problems are discussed and put forward amongst programmers and developers publicly online. Furthermore, the *modus operandi* of the ever-growing open-source community, which strives to provide free or freeware software, is to make source codes and extensive documentation for such software available to everyone. This might also be detrimental to novelty in certain cases, in the same way patents may be detrimental to the open-source community.<sup>96</sup>

Even though a lot might be gained by successful software patenting, one must always consider the downsides too. Primarily, patenting is an extremely lengthy process. It usually takes several years from the moment the patent application is submitted until the possible grant of the patent, which might as well be a life-time. Things are moving at light-speed in the software world and very few products can survive on the market for more than a few years, thus making a patent obsolete. A patent would, therefore, make sense only in the case of fundamental pieces of software, which could remain relevant for a longer time. Furthermore, given that a patent is a territorial right and as such neither globally registered nor enforced, while the use of software knows no boundaries, it can be too expensive for small or medium enterprises to obtain and then enforce patents in all countries where their potential market lies. The unattractiveness of the large expense is particularly enhanced considering the unsecure outcome of the patenting process. Such enterprises might, therefore, be keener to rely on copyright and even more-so on trade secret protection.

### 3.1.2. Copyright

Copyright is an exclusionary intellectual property right that protects original literary, scientific and artistic works. Copyright protection begins *ipso iure* at the moment a work is created, with no further formal requirements to be met in order for protection to begin, such as filing an application or registering the copyrighted work.<sup>97</sup>

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this problem would be obvious to the person skilled in the art. For more on the “problem-and-solution” approach see, for example Szabo, Gabriel S.A., *The Problem and Solution Approach in the European Patent Office*, *International Review of Intellectual Property and Competition Law*, vol. 26, no. 4, 1995, p. 457-487.

95 According to the EPO Guidelines for Examination, “state of the art” is defined as “everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application”. European Patent Office, *Guidelines...op. cit.*, Part G – Chapter IV-1. For general information about the novelty requirement, see, for example, Tritton, Guy, et. al., *op. cit.*, pp. 88-93; Cornish, W., Llewelyn, D., *op. cit.*, pp. 174-191; Hacon, R., Pagenberg, J. (eds.), *op. cit.*, pp. 36-48.

96 In fact, the open source community has been one of the loudest in voicing concerns about software patenting in relation to the failed proposal of the Directive on the Patentability of Computer-Implemented Inventions. See, for example, Szattler E., *Patentability of Computer Programs*, *Masaryk University Journal of Law and Technology*, Vol. 1, No. 1, 2007, pp. 97-108, p. 103.

97 See Gliha, I., Part I. Copyright, in: Sikirić, H., et. al., *Intellectual Property Croatia*, *International*

The duration of copyright protection is the life of the author plus 70 years thereafter.<sup>98</sup> Article 5 paragraph 2 of the Croatian Copyright and Related Rights Act (Official Gazette Nos. 167/03, 79/07, 80/11, 125/11, 141/13, 127/14, 62/17, hereinafter the Copyright Act)<sup>99</sup> explicitly lists computer programs as literary works which are protected by copyright.<sup>100</sup> This is further elaborated in Article 107, which states that a computer program is protected if it is original in the sense that it represents an own intellectual creation of its author. Unlike patents, however, copyright does not protect the novel ideas and principles around which any element of the computer program or its interfaces is built. Instead, copyright protects “the expression of a computer program in any form, including preparatory design work.”<sup>101</sup> This means that ideas, concepts, principles and the like embedded in the software are fair-game to competitors, to the extent, of course, they are not protected by patents or trade secrets. Therefore, competitors are allowed to independently create computer programs with exactly the same functions and achieving the same results, provided they use their own sets of original source code to achieve those results and their own original graphics in the case of applications.

The key requirement for copyright protection of computer programs is originality, as for any other type of work. However, the originality threshold for computer programs is lower than in the case of other works. This is the result of Article 1 paragraph 3 of the Directive on the Legal Protection of Computer Programs, which mandates the fulfilment of only one simple requirement for the computer program to be deemed original – it must be the author’s own intellectual creation.<sup>102</sup>

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Encyclopedia of Laws, Supl. 36, Kluwer Law International, The Hague, 2006, p. 67. See also Kunda, I., *Pravo mjerodavno za povrede prava intelektualnog vlasništva*, Doctoral dissertation, University of Zagreb, Faculty of Law, 2008, p. 148.

98 Article 99 of the Copyright and Related Rights Act.

99 The Copyright and Related Rights Act is the key piece of legislation regulating copyright in Croatia. It is fully harmonized with the Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version) (hereinafter: The Computer Program Directive), and other relevant EU directives concerning copyright.

100 For more about the historical development of copyright protection of computer programs see Kunda, I., Matanovac Vučković, R., op. cit., pp. 87-90, Katulić, T., *Protection of Computer Programs in European and Croatian Law - Current Issues and Development Perspective*, *Zbornik Pravnog fakulteta u Zagrebu*, vol. 65, no. 2, 2015, pp. 237-262, pp. 241-244. For more about the introduction of copyright protection of computer programs to Croatian law see, for example, Parać Z., *Autorskoppravna zaštita kompjuterskih programa*, in: Hennenberg I. (ed.), *Nove tehnologije i autorsko pravo*, Autorska agencija za SR Hrvatsku, Zagreb, 1989., pp. 21-32, Parać, Z., *Autorskoppravna zaštita kompjuterskih programa nakon izmjene Zakona o autorskom pravu, I.: kategorizacija kompjutorskog programa, pretpostavke za pružanje zaštite, zaštita algoritama i programa u ROM-u, Privreda i pravo*, vol. 29, no. 9-10, 1990, p. 645-661; Parać, Z., *Autorskoppravna zaštita kompjuterskih programa nakon izmjene Zakona o autorskom pravu, II.: nosilac autorskog prava, autorskoppravna ovlaštenja, ograničenje autorskog prava, Privreda i pravo*, vol. 29, br. 11-12, pp. 793-807. Fikeys Krmić, N., *Problemi autorskoppravne zaštite kompjuterskih programa, Zakonitost*, vol. 44, no. 1, 1990, pp. 96-101;

101 Article 107, Copyright and Related Rights Act.

102 In addition to this provision, recital (8) of the Directive lays down the following: “In respect of the criteria to be applied in determining whether or not a computer program is an original work,

Even though this should not be a particularly difficult barrier to overcome, one should certainly consider the fact that many programmers, in search of efficiency, like to take shortcuts. Instead of taking the time to create their own sets of code, for example, to emulate a certain function which is to be a part of the product they are working on, they might avail themselves of the ready-made solution for the function which is shared online by their peers and simply copy substantial chunks of code already written by someone else, or copy the code while making only slight amendments. It is also not uncommon that employees attempt to reuse a substantial amount of code created while they were working for their previous employer and, thus, belonging to another company. This is certainly less time-consuming and is very tempting in the rush to put the product on the market as soon as possible. However, it often results in programs which are not completely the programmers' own intellectual creations but at best an amalgam of the programmers' original code and code taken from various other sources or code belonging to someone else. This might later lead to problems in relation to successful enforcement of copyright protection.

Even though copyright is obtained immediately and automatically, taking the time and costs associated with the granting process of registrable intellectual property rights out of the equation, copyright protection of computer programs also has its weaknesses. This is particularly true for types of software in which the functional manifestations of code are what attracts the customers, such as business software,<sup>103</sup> unlike types of software in which the expressive manifestations of code is what makes a market difference, such as in the case of computer games.<sup>104</sup> The problem with copyright protection of the former type of software stems from the fact that there are numerous ways to write the source code in order to achieve exactly the same functions. On top of that, especially in the case of static on-premises software,<sup>105</sup> any skilled programmer could analyze the behavior of a competitor's program and reproduce all of its functions without even once having to take a look at the original code. Unfortunately for the programmer or programmers who were first to write the program with the wanted functions, such reverse engineering is often less time

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no tests as to the qualitative or aesthetic merits of the program should be applied". For more on the originality criteria as applied to computer programs see Margoni, T., *The Harmonization of EU Copyright Law: The Originality Standard*, SSRN, 29 June 2016, available at <http://dx.doi.org/10.2139/ssrn.2802327> (15 September 2018).

103 As one legal scholar has recently put it: "no one would purchase a software that did not function, no matter how elegant or creative the program's code might be." Ballardini, Rosa Maria, *Scope of IP Protection for the Functional Elements of Software, In Search of New IP Regimes*, IPR University Center, 2010, pp. 27-62, p. 33.

104 See Mann, R. J., *Do Patents Facilitate Financing in the Software Industry*, *Texas Law Review*, vol. 84, no. 4, pp. 961-1030, p. 1012-1013.

105 On-premises software is a type of software that is installed and runs on computers on the premises of the person or organization using the software, so it is more readily accessible, rather than software-as-a-service or on-demand software, which runs on a server farm or cloud. On-premises software is usually purchased and not rented, unlike in the case of software-as-a-service, where the users subscribe to use to software. See Sweeney, M., *The Difference Between SaaS Applications and On-Premises*, Clearcode, 17 December 2014, available at: <https://clearcode.cc/blog/saas-applications-vs-on-premises/> (15 September 2018).

and labor-consuming.<sup>106</sup> Due to this, it could be argued that copyright is a relatively weak intellectual property right if the goal is to protect the functional rather than the expressive aspects of the software from competitors, because it will only prevent competitors to reuse the same code and not to rewrite the program with their own code. This might be one of the reasons why there is a relatively small number of cases related to copyright infringement between IT companies in Europe.<sup>107</sup> However, if the goal is to limit the ability of customers to obtain or use the software without payment to the holder of the copyright than copyright is a much stronger intellectual property right in relation to software.<sup>108</sup> This is particularly so if the software was a commissioned work custom-made for use of one large client and the copyright remained with the software company.<sup>109</sup>

### *3.1.3. Trade secrets*

A trade secret is a less conventional form of intellectual property rights that protects commercially valuable and sensitive information generally not known to others, which is kept secret by the owner to gain a competitive advantage on the market. However, unlike patents and copyright, trade secrets are not exclusionary rights. As long as the information can be kept secret, the protection may continue indefinitely, i.e. it has no time limit. Legal rules about trade secrets were recently harmonized within the EU through the Directive (EU) 2016/943 of the European Parliament and of the Council of 8 June 2016 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use

106 Carleton, D. M., *A Behavior-Based Model for Determining Software Copyright Infringement*, Berkeley Technology Law Journal, vol. 19, no. 2, September 1995, pp. 405-432, p. 416. See also, Mann, R. J, op. cit., p. 1014-1015.

107 One of the most known such cases concerning the EU is *SAS Institute Inc v World Programming Ltd*. In its decision number C-406/10 of 2 May 2012, the EU Court of Justice ruled that “neither the functionality of a computer program nor the programming language and the format of data files used in a computer program in order to exploit certain of its functions constitute a form of expression of that program and, as such, are not protected by copyright in computer programs”. It further ruled that “a person who has obtained a copy of a computer program under a license is entitled, without the authorization of the owner of the copyright, to observe, study or test the functioning of that program so as to determine the ideas and principles which underlie any element of the program, in the case where that person carries out acts covered by that license and acts of loading and running necessary for the use of the computer program, and on condition that that person does not infringe the exclusive rights of the owner of the copyright in that program”.

108 There are quite a few cases in which copyright was used as an argument to prevent the customers from using the software the customers have stopped paying or in similar situations. In Croatia, see for example, High Commercial Court of the Republic of Croatia, Pž 6945/04-3 of 26 April 2006; High Commercial Court of the Republic of Croatia, Pž 343/06-3 of 14 February 2006; High Commercial Court of the Republic of Croatia, Pž 2501/05-3 of 7 August 2007; Supreme Court of the Republic of Croatia, Gr1 250/2005-2 of 22 August 2005; High Commercial Court of the Republic of Croatia, Pž 6122/06-3 of 30 October 2006; Supreme Court of the Republic of Croatia, Revt 167/2003-2 of 7 September 2004, Supreme Court of the Republic of Croatia, Revt 76/2002-2 of 27 May 2003.

109 For the statutory provisions regarding the presumed holders of copyright see *infra* section 3.2.1.

and disclosure (hereinafter: The Trade Secret Directive).<sup>110</sup> The recent adoption of the Trade Secret Directive highlights the increasing importance of trade secrets in the current business climate. According to Article 2 of the Trade Secret Directive, in order to merit protection as a trade secret, the information has to meet the following requirements: (a) it is secret in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question; (b) it has commercial value because it is secret; (c) it has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret. While trade secret holders may apply for the measures, procedures and remedies prescribed by the Directive in order to prevent, or obtain redress for, the unlawful acquisition, use or disclosure of their trade secret,<sup>111</sup> the Directive also explicitly lists the cases in which the acquisition, use or disclosure of a trade secret will be considered lawful. These are: (a) independent discovery or creation; (b) observation, study, disassembly or testing of a product or object that has been made available to the public or that is lawfully in the possession of the acquirer of the information who is free from any legally valid duty to limit the acquisition of the trade secret; (c) exercise of the right of workers or workers' representatives to information and consultation in accordance with Union law and national laws and practices; (d) any other practice which, under the circumstances, is in conformity with honest commercial practices.<sup>112</sup>

Obviously, trade secrets can play a very important role in the software industry. However, due to the fact that they are not a defense against reverse-engineering, in the cases where software is distributed to the end-user and is thus more directly accessible making it more prone to reverse-engineering, they will be most valuable in the phase of software development, prior to putting the product on the market or filing for a patent (provided the software is patent-eligible in the first place). Taking every reasonable step to preserve the secrecy of what and how is being developed in the pre-market stage is in many such cases exactly what makes or breaks an advantage over

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110 The Trade Secret Directive was transposed into Croatian law through the Act on the Protection of Undisclosed Information with Commercial Value (Official Gazette 30/18; hereinafter: The Trade Secret Act), which came into force on 7 April 2018. Interestingly, the Trade Secret Act did not repeal the 1996 Act on the Protection of Confidential Information (Official Gazette 108/96), which is still in force and regulates the same subject-matter, albeit in not so much detail. One can hardly find a reason why this might be done on purpose instead of consolidating all the rules on trade secrets in one piece of legislation. It might very well be that the legislators simply omitted to repeal the 1996 law. In fact, the Final Proposal of the Act on the Protection of Undisclosed Information with Commercial Value does not even mention that there is a law in force, which specifically regulates matters related to trade secrets. See Government of the Republic of Croatia, Final Proposal of the Act on the Protection of Undisclosed Information with Commercial Value, Zagreb, March 2018, available at: <http://www.sabor.hr/fgs.axd?id=52578> (15 September 2018). Whatever the case, having two pieces of legislation regulating exactly the same subject-matter is fertile ground for legal uncertainty and might lead to serious problems in practice.

111 See Article 4 and Chapter III of the Trade Secret Directive.

112 Article 3 paragraph 1 of the Trade Secret Directive.

competitors. Of course, trade secrets can be used to gain or maintain that advantage even after the software is marketed, provided that the software is not easily reverse-engineerable. This is, in fact, increasingly likely to be the case, for two reasons. First, because the industry-trend in the last few years has been to develop and offer cloud-based software to end-users instead of on-premises software<sup>113</sup> and second, more and more software is developed using the so-called agile software development methodologies.<sup>114</sup> These result in software that is not static but is undergoing constant change. Thus, it is more difficult for the programmers to reverse-engineer by observing and analyzing the behavior of software, since its code is dynamic.

The biggest advantages of trade secrets, which come to the forefront especially in the case of small and medium enterprises, are that they are relatively straightforward, they do not entail any registration costs or lengthy registration processes, the protection may last indefinitely as long as they are not revealed to the public and they protect a broader array of software information than patents or copyright. On the other hand, a software enterprise must always consider the fact that the entire software package is unlikely to remain a trade secret, as trade secret protection can do nothing in the case a competitor arrives to a substitute product or a partial substitute through independent development or even reverse engineering. It also has to make sure that reasonable steps to keep the information secret under the given circumstances are always taken and observed without an exception, or otherwise the information will lose the trade secret protection. One little mishap, such as giving only one single person a trial of the software without concluding a confidentiality agreement may be destructive to the trade secret status.

#### *3.1.4. Trademarks*

A trademark is an intellectual property right that protects words, designs, letters, numerals, colors, the shape of goods or of the packaging of goods, or sounds, with the purpose to distinguish goods and services of one enterprise from those of another. Trademark registration is one of the most effective ways to build and to protect a brand. In theory, a trademark can last for an indefinite period of time, provided the relevant renewal fees are regularly paid. With the exception of well-known trademarks, which are afforded a somewhat different status, in general, two basic requirements need to be met in order to register a trademark. The trademark has to be distinctive and

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<sup>113</sup> See above footnote no. 105. However, on-premises software is still very much used in large organizations, amongst other reasons because it is considered to be more secure. Furthermore, buyers of software-as-a-service are at the mercy of the vendor because they do not have any rights in the code in most cases. Should the vendor decide to take a different product direction or if it goes bankrupt, the consequences for the buyers can be serious and their entire business may be at risk. See Barney, D., "The death of on-premises IT is greatly exaggerated", 26 May 2015, Network World, available at: <https://www.networkworld.com/article/2926337/cloud-computing/the-death-of-on-premises-greatly-exaggerated.html> (15 September 2018).

<sup>114</sup> Agile software development is an approach to software development under which requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their customer(s)/end user(s). Collier, K. W, *Agile Analytics: A Value-Driven Approach to Business Intelligence and Data Warehousing*, Pearson Education, 2011, pp. 121 ff.

it has to be non-descriptive. There is a dual system of trademark protection within the European Union. One can register an EU trademark through the European Union Intellectual Property Office, which is then applicable on the territory of the entire European Union.<sup>115</sup> The EU trademark is unitary in character, which means that an objection against the validity of the EU trademark in one EU Member State can defeat the validity of the entire application. Equally so, it can be enforced in all Member States of the EU.<sup>116</sup>

The second route to take is the national route. In case an enterprise wishes to protect a trademark only in one or merely in a few EU Member States, then it makes more sense to apply for a national trademark through the national intellectual property offices in the chosen EU Member States or state – State Intellectual Property Office in the case of Croatia. The national trademark will then be applicable only on the territory of the chosen EU Member States or states. Importantly, given that trademark protection in EU Member States coexists with the EU trademarks, in order to reduce the areas of divergence within the trademark system in Europe as a whole, the national trademarks laws in the European Union<sup>117</sup> have been harmonized through the Directive (EU) 2015/2436 of the European Parliament and of the Council of 16 December 2015 to approximate the laws of the Member States relating to trademarks (Recast).<sup>118</sup>

Even though in software development most would probably single out only the technical aspects of an application when trying to determine what contributed to its success, one must always bear in mind that, without exception, anything that is being purchased or sold has a name and/or some other sort of identity label. Trademarks are, hence, an extremely important piece of the puzzle. Not all software is revolutionary regarding the functions it offers and there are many applications out there on the market that are actually substitute products. If a customer can remember only what the software does, but not its name or visual identity then it might very well end up using a substitute product produced by a competitor next time. Arguably, this is

115 This is regulated by the Regulation (EU) 2017/1001 of the European Parliament and of the Council of 14 June 2017 on the European Union Trade Mark (Codification) (hereinafter: The EU Trade Mark Regulation), Commission Delegated Regulation (EU) 2018/625 of 5 March 2018 supplementing Regulation (EU) 2017/1001 of the European Parliament and of the Council on the European Union trademark, and repealing Delegated Regulation (EU) 2017/1430 and Commission Implementing Regulation (EU) 2018/626 of 5 March 2018 laying down detailed rules for implementing certain provisions of Regulation (EU) 2017/1001 of the European Parliament and of the Council on the European Union trademark, and repealing Implementing Regulation (EU) 2017/1431.

116 Article 1 paragraph 2 of the EU Trade Mark Regulation.

117 Including the Croatian Trademark Act (Official Gazette Nos. 173/03, 54/05, 76/07, 30/09, 49/11, 46/18).

118 For more on trademark protection on the level of the EU and in Croatia see, for example, Kunda, I., *Pravo mjerodavno...cit.*, p. 56-68 and 174-182, Kunda, I., Matanovac, R., *Žig Zajednice i dizajn Zajednice – osnovna obilježja i mjesto u novelama hrvatskih zakona iz 2007. Godine*, in: Matanovac, R. (ed.), *Prilagodba hrvatskog prava intelektualnog vlasništva europskom pravu*, Narodne novine, Zagreb, 2007, pp. 53-86. Marinković Rački, A., *Žigovi prijavljeni u zloj vjeri u hrvatskom pravu i pravu Europske unije*, *Zbornik Pravnog fakulteta u Zagrebu*, Vol. 59, br. 2-3, 2009, pp. 307-341, Matanovac Vučković, R., *Razlikovnost kao pretpostavka za registraciju žiga*, *Zbornik Pravnog fakulteta u Zagrebu*, Vol. 62, no. 3, 2012, pp. 929-960.

particularly true in the case of online or mobile-phone applications, where trademarks consisting of words or icons coupled with domain names<sup>119</sup> play a crucial role, especially with the ever-growing importance of search engines such as Google search and Bing in the case of online applications, or mobile app distribution platforms such as Google Play and iOS App Store in the case of mobile-phone applications. Mobile app distribution platforms are perhaps a place where the fight between application developer enterprises is the fiercest. Therefore, trademarks with characteristic and distinguishing features, which are at the same time in accordance with the rules of the chosen mobile app distribution platform, might be exactly what makes a customer opt for one run-of-the-mill application over another.<sup>120</sup>

### ***3.2. Approaches to the protection of intellectual property in software***

As the above analysis of the intellectual property rights relevant for software illustrated, there is no one-size-fits-all approach to the protection of software. Equally so, there is no single strategy for the protection of intellectual property in software applicable to all knowledge-intensive IT enterprises. Each enterprise should adopt, diligently apply, and also constantly adapt and improve its own protective policy in order to obtain the maximum possible protection for their current specific software product, but also in order to have a general framework and action plan in place in case of software yet to be developed. In theory, one could formulate four possible approaches or, rather, levels of protection of intellectual property in software an enterprise might apply:<sup>121</sup> (3.2.1.) protection through contracts (3.2.2.) protection through registration, (3.2.3.) protection through enforcement and (3.2.4.) protection through non-legal actions. Whereas contracts, registration and enforcement are all primarily legal methods of protection, non-legal actions relate to alternative ways of protection achieved mostly through specific business conduct and processes. The approaches are not mutually exclusive, but complement each other and should, therefore, be applied cumulatively by knowledge-intensive IT enterprises in accordance with their specific needs and capacities, particularly those related to finance and personnel.

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119 Although there is an on-going discussion among legal scholars whether domain names are contractual or property rights, in principle, legislators do not classify them as intellectual property rights. For more on the legal nature of domain names see, for example, Alramahi, M., *The Legal Nature of Domain Names Rights*, *Journal of International Trade Law and Policy*, vol. 8, no. 1, 2009, pp. 84-94, Bakhtiarvand, M., *Legal Nature and Protection of Domain Names with Emphasis on Iranian Law*, *Journal of Intellectual Property Rights*, vol. 21, 2016, pp. 166-174.

120 For more on the intricacies of mobile apps trademarks see, for example, Asbell, M. D., Cassidy, M., *Protecting Trademarks for Mobile Apps*, Ladas.com Education Center, 30 April 2014, available at: <https://ladas.com/education-center/protecting-trademarks-mobile-apps/> (15 September 2018).

121 These approaches were formulated on the basis of the author's personal experience and insights accumulated during almost a decade of managing IT enterprises in Croatia in combination with the insights gained in the process of studying the relevant scholarly writings and surveys.

### 3.2.1. Contracts

If not the most important, then certainly the most basic step any knowledge-intensive IT enterprise must take if it is to act diligently in relation to the protection of its intellectual assets, is to contractually regulate the relationship with all the persons involved in developing and marketing the software, as well as with other persons who gain insight into the information related to the software in any other way, be it employees of the enterprise or outsourced personnel. The contracts must be concluded in a timely manner, that is beforehand in order to avoid any problems, and must regulate three crucial issues: the rights in the software, the confidentiality of information related to the software and competition.

When regulating the rights in the software, one must never forget to consider the statutory provisions dealing with certain types of intellectual property rights, because they may prescribe presumptions as to the holders of the right, if the matter is not otherwise contractually regulated. With some exceptions, this issue is not harmonized on the level of the European Union, so it is possible that the legal status of intellectual creations of employees differs in different Member States.<sup>122</sup>

In the case of an employer-employee relationship, there are several such provisions in Croatian law. A general rule in the case of copyright is laid down by Article 76 of the Copyright Act.<sup>123</sup> According to the latter, an employment contract must explicitly prescribe that the employer will have the right to exploit the copyrighted work created by an employee as part of the work performed under an employment contract, as well as the scope and the duration of such a right. Otherwise, the copyright on the work will belong to the employee, without any limitations. However, Article 108 contains an exception to the general rule that relates specifically to copyright in computer programs and was taken verbatim from Article 2 of the Computer Programs Directive: "Where a computer program is created by an employee in the execution of his duties or following the instructions given by his employer, the employer exclusively shall be entitled to exercise all economic rights in the program so created, unless otherwise provided by contract". Therefore, the employer has all economic rights in the program and does not have the obligation to pay the employee anything on top of his or her salary, unless something different is agreed.<sup>124</sup> On the other hand, the employer is not automatically given those rights if a computer program is written by the employee outside of his duties or absent any instructions of the employer.<sup>125</sup> In relation to patents,

122 For more on the regulation of intellectual property rights in employment see, for example, Matanovac Vučković, R., Kunda, I., Materijalnopravno i kolizijskopravno uređenje intelektualnog vlasništva nastalog u radnom odnosu, Zbornik Pravnog fakulteta u Rijeci, vol. 32, no. 1, 2011, pp. 75-125.

123 For more on copyright for works made under an employment contract or for commissioned works see Gliha, I., Prava na autorskim djelima nastalim u radnom odnosu i po narudžbi, Zbornik Pravnog fakulteta u Zagrebu, vol. 56, no. Posebni broj, 2006, pp. 791-836.

124 Such a presumption to the benefit of the employer represents a statutory copyright license which is not typical for civil law regimes. It is the only instance in the Croatian copyright law in which a person other than the author is given the right to use the work on the basis of law. Gliha, I., Prava...cit., p. 819.

125 However, one must also bear in mind that, according to Article 101 of the Employment Act

the Employment Act (Official Gazette Nos. 93/14,127/17, hereinafter: Employment Act) differentiates between inventions made at work or in relation to work and those related to the employer's business activities, but made outside of work. The former type of inventions belongs to the employer, whereas the employee has the right to a contractually agreed reward.<sup>126</sup> The latter type of inventions belongs to the employee, but the employee has the obligation to notify the employer of the invention and to offer the assignment of the rights in the invention to the employer.<sup>127</sup> Only if the employer does not accept the offer within one month, the employee is free to dispose of the invention as he or she wishes.<sup>128</sup>

In this day and age, cooperation between companies or with freelance personnel related to research and development is becoming more and more common. Software industry is no exception to this trend. One should, therefore, be aware of the possible statutory provisions regulating the situation in which the work on software is outsourced to other companies or freelance developers. In this context, the Copyright Act lays down the presumption that the copyright remains with the external developers without any limitation, unless it is otherwise contractually agreed.<sup>129</sup> Therefore, the transfer of the economic rights in the software to the enterprise that has commissioned the work and the extent thereof must be explicitly prescribed in the contract between the enterprise and the external developers. In relation to patents, the Patent Act prescribes that the right to obtain a patent belongs to the inventor,<sup>130</sup> who is defined as a natural person that made the invention through his or her creative work.<sup>131</sup> If there is more than one person participating in the inventing process, then all those persons have a right to a joint patent.<sup>132</sup> However, the Patent Act also allows for the possibility to transfer the right to obtain a patent to a legal successor by means of a contract.<sup>133</sup> Therefore, if there is any chance of the software being patented, the contract regulating the relationship between the enterprise, which commissioned the software or which is developing the software jointly with external developers, and the external developers should include

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(Official Gazette Nos. 93/14, 127/17), the employee is not allowed to compete with the employer for the duration of the employment contract, i.e. conclude business transactions related to the employer's business activities. Otherwise, the employer has the right to damages or earnings from such transactions.

126 Article 98 paragraph 3 of the Employment Act. The employee is statutory bound to keep the information about the invention confidential and treat it as a trade secret. Article 98 paragraph 2 of the Employment Act. Furthermore, Article 14 paragraph 2 of the Patent Act prescribes that the Employer is to be considered a legal successor of the inventor when the right to obtain a patent for the invention made by the employee under the employment contract belongs to the employer according to applicable law or the employment contract.

127 Article 99 paragraph 2 of the Employment Act.

128 Article 99 paragraph 2 of the Employment Act.

129 This is prescribed by Article 74 of the Copyright Act which pertains to commissioned works in general. There is no provision in the Act that would pertain to computer programs specifically.

130 Article 12 paragraph 1 of the Patent Act.

131 Unlike a person who only provided technical support in the process. See Article 13 paragraphs 1 and 2 of the Patent Act.

132 Article 12 paragraph 2 of the Patent Act.

133 See Article 14 of the Patent Act.

a clause to that effect.<sup>134</sup> Otherwise, the enterprise might be in a precarious position to inadvertently lose the patent to or be forced to share the patent and all of its benefits with the external developers.<sup>135</sup>

The second issue that needs to be covered contractually is confidentiality of any information in connection to the software being developed. The most important item to regulate is the scope of information that is to be treated with confidentiality. In this respect, both laws regulating this issue in Croatia seem to allow a very broad array of subject-matter to be eligible for trade secret protection.<sup>136</sup> Considering that in any type of cooperation the companies necessarily gain professional knowledge from each other, the contract should delimit as clearly and as precisely as possible the protected information from the kind of know-how that the contracting party has the right to make use of in its own business.<sup>137</sup> As for the parties involved, it goes without saying that non-disclosure agreements should be concluded with all in-house personnel, not just the personnel having direct access to information about the software. The next on the bucket list, but not any less imperative, are partner software companies and freelance developers participating in the development of the software, if any are used. Finally, due to the fact that many auxiliary activities are nowadays being outsourced, especially by SMEs, one mustn't forget any other external participants which are not perhaps directly involved in the development, but might possibly come into contact with any information related to the software being developed, such as those providing accounting, legal, administrative, cleaning or similar services. Importantly, non-disclosure agreements can be a precondition for the successful implementation of the other two legal levels of protection – registration and enforcement. For example, patents cannot be registered without satisfying the novelty requirement, for which maintaining secrecy before filing the patent application is of the utmost significance to avoid any disclosure, which might be deemed novelty-destructive by the patent authorities. On the other hand, trade secrets revolve in their entirety on the notion that confidentiality is diligently maintained and implemented by all the parties involved. Therefore, non-disclosure agreements are absolutely necessary for legal enforcement of trade secret protection.

The third issue that should be contractually resolved is the matter of competition between the enterprise and the developers, be it in-house or external. The software start-up sector is particularly characterized by employees rapidly moving from firm to firm.<sup>138</sup> This can make such enterprises vulnerable to the plundering by larger and established companies, because there is a danger that the employees will take large

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134 However, note that Article 13 paragraph 3 and 4 of the Patent Act give the inventors non-transferable moral rights to be named as inventors in the patent application.

135 Lose if the external developers developed the software without any participation of the in-house personnel and share if the external developers developed the software with participation of the in-house personnel.

136 See Article 3 of the Trade Secret Act and Article 19 of the Act on the Protection of Confidential Information.

137 Jämes, S., Protecting the Unprotected Methods of Protecting Knowledge and Innovations in Finland, *International Journal of Business, Economics and Law*, vol. 1, 2012, pp. 91-97, p. 94

138 Mann, R. J, op. cit., p. 1018.

pieces of the innovative up-and-coming product to their new powerful employer, as a sort of dowry. The statutory provisions in Croatia do regulate the matter to an extent, but the enterprise has to take active steps via contracts in order to make the most of them. In particular, in addition to the statutory non-compete arrangement,<sup>139</sup> the Employment Act prescribes the possibility for the employer and the employee to conclude a non-compete contract under which the employee would agree not to work for any competitor of the employer and not to partake in any transactions which would compete with the employer.<sup>140</sup> The Employment Act limits the duration of such contract to two years after the termination of employment.<sup>141</sup> In return, during the validity of the contract the employer must pay half of an average monthly salary, which was paid to the employee in the three months before the termination of employment.<sup>142</sup> Such compensation might be too big of a financial burden for smaller companies, but there is a way around it, which is often overlooked even by practicing lawyers. Namely, Article 106 of the Employment Act allows for the possibility to agree on the contractual penalty even if the employer does not agree to pay the compensation. In practice, this means that if such a clause is included in the contract, the employer does not have to pay any compensation for the duration of the contract to the employee, who regardless must obey the non-compete contract or otherwise he or she will be liable for payment of the contractual penalty. As for the non-compete contract with external developers, anything really goes, provided it is in line with the general principles of the Croatian obligations law.<sup>143</sup>

### *3.2.2. Registration*

Unlike copyright and trade secrets, which are not registrable rights in the European Union as a whole or in Croatia in particular, the rights that have to be registered in order to enjoy protection are patents and, in principle, trademarks.<sup>144</sup> The most important aspects of these two types of intellectual property rights were already discussed at length in sections 3.1.1. and 3.1.4., so in order to avoid the unnecessary reiteration, the reader is referred to those sections respectively. What was not explicitly mentioned before is the fact that both of those rights are registered on the first-come-first-served basis. In other words, it is, generally speaking, not important who invented first or who used a trademark first, but who was first to file the application with the relevant registration authorities. Even though it would certainly be a setback to lose a great

139 See *infra* footnote 125.

140 Article 102 paragraph 1 of the Employment Act.

141 Article 102 paragraph 2 of the Employment Act.

142 Article 103 of the Employment Act.

143 Subject-matter related to contracts in Croatia is regulated by the Obligations Act (Official Gazette Nos. 35/05, 41/08, 125/11, 78/15, 29/18).

144 Whereas the European Union trademark system is based on registration, the laws of some EU Member States also protect unregistered rights, which can be held against the use and registration of later EU trademarks. Von Bomhard, V., Geier, A., "Unregistered Trademarks in EU Trademark Law", *The Trademark Reporter*, vol. 107, no. 3, 2017, pp. 677-700, p. 679. Croatian Trademark Act acknowledges the validity of unregistered well-known, trademarks. See Article 6 paragraph 2 subparagraph 4 of the Trademark Act.

name or logotype if someone else files a trademark application for it first, arguably it would be much easier to come up with a new trademark for the software than to come up with the new software. Therefore, the preference of the first-to-file over the first-to-invent system<sup>145</sup> is extremely important in the case of software that is patent-eligible, because having someone else filing a patent application for such software first could be a blow from which an SME which lost the patent race, especially if it is a start-up, would hardly be able to recover. Therefore, the possibility of filing for a patent should not be rejected in advance, but should always be considered, regardless of its complex and expensive registration process. If finances are the main problem, which is most likely to be the case, in order to mitigate the costs in some way while not giving up on patenting independently, the enterprise might consider filing the patent application only in the most important markets for its particular type of software, or the largest markets. If not even that is a possibility, then the enterprise might consider non-legal methods of protection, which might at least prevent the competitors from registering the patent.<sup>146</sup>

### *3.2.3. Enforcement*

Conceivably, the statutory provisions that convey a certain level of protection by default, as well as the conclusion of contracts and registration of trademarks and patents are likely to serve as a deterrent for many clients, competitors, people involved in the development of software and people within reach of the information about the software. They might, absent these legal instruments, be more prone to infringing the intellectual property rights in the software or to theft of information considered a trade secret. However, if the infringement or the theft actually occurs,<sup>147</sup> the default statutory protection and all the contracts and registrations will be completely useless, unless the enterprise uses them to legally enforce its intellectual property rights. As for the venues which might be used for this purpose, generally speaking there are four possibilities: the patent and trademark registration authorities, in the quasi-judicial proceedings commonly known as opposition proceedings; the civil courts, for example in the case of infringement; arbitration, for example in case where it is so agreed between the parties to the dispute; and criminal courts, for example in the case of counterfeiting. Regarding the possible particularities as per different types of software there are many possibilities. For example, enforcement of intellectual property rights in software is relatively straightforward in cases when a software company is specially developing custom software for some specific local clients only

145 Actually, as of 15 September 2018, all countries in the world use the first-to-file system. The last one to use the first-to-invent system was the United States. The United States have switched to the first-to-file system on 16 March 2013 after the enactment of the America Invents Act, albeit to a modified version, which is dubbed by the United States Patent and Trademark Office (hereinafter: the USPTO) as the first-inventor-to-file system. See the website of the USPTO at <https://www.uspto.gov/patent/first-inventor-file-fitf-resources> (15 September 2018).

146 See *infra* section 3.2.4.

147 Ironically, the budding technologies which are so intrinsic to the world of today, are exactly what has enabled infringement of intellectual property rights in software to a previously unparalleled degree.

and uses only local staff to this end. In this case, it is likely that the infringement or any other reason for a dispute, such as a breach of contract, will be contained to the country where the software enterprise is located.

On the other hand, in the case of software developed for the international mass-market, especially if external developers from other countries are also used, it might not prove to be a simple task, but a costly and a long-lasting process instead. One of the issues concerning enforcement of intellectual property rights that is exacerbated in the case of the latter type of software is the fact that the enterprise which is a holder of any intellectual property right has to be its own policeman, meaning it has to monitor for any infringement itself. However, because such software is truly a global product that transcends borders particularly due to the ubiquitous nature of the internet, software enterprises would have to constantly keep an eye on users and competitors not only on the markets where they actually sell it, but in the entire world. Anyone with a bit of common sense can conclude that this is virtually impossible for SMEs and it is difficult even for largest IT companies, therefore some sort of compromise or filtering must be used instead.

A similar issue related to the enforcement of IPRs in mass-produced software intended for the global market is the antagonism between its universal nature and the territoriality of intellectual property rights. To be more precise, the effects of infringement of such software by a competitor in one country might spread like a virus to many other countries, which in turn might, at least in theory, lead to the need to apply a country-by-country enforcement scenario in which a separate legal case has to be brought in each country concerned.<sup>148</sup> Even though such a scenario is unlikely, issues regarding jurisdiction are still quite complex. For example, in the scenario where copyright related to the software is infringed by one person by offering it for sale in several EU Member States, according to Article 4 of the Regulation (EU) No. 1215/2012 of the European parliament and of the Council of 12 December 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters (recast) (hereinafter: Brussels I bis Regulation), an action may be brought against this person in the Member State where the person is domiciled. However, if the infringement relates to a software patent and the defendant raises the issue of patent validity, then this issue would have to be judged by the courts of every Member State in which the patent is registered, because they have exclusive jurisdiction according to Article 24 paragraph 4 of the Brussels I bis Regulation. In a different scenario in which the copyright in software or a software patent is infringed by multiple persons in multiple Member States, then there is a possibility of joint proceedings according to Article 8 paragraph 1 of the Brussels I bis Regulation provided there is a risk of irreconcilable judgments. However, this is very problematical and the case law of the Court of the European Union does not give any specific answers or guidelines in this respect.<sup>149</sup>

<sup>148</sup> For more on the jurisdiction for cross-border intellectual property infringement cases in Europe see, for example, Torremans, P., *Jurisdiction for Cross-Border Intellectual Property Infringement Cases in Europe*, *Common Market Law Review*, vol. 53, no. 6, pp. 1625-1645.

<sup>149</sup> See Torremans, P., *Jurisdiction for Cross-Border Intellectual Property Infringement Cases in Europe*, *Common Market Law Review*, vol. 53, no. 6, pp. 1625-1645.

Even in cases in which only one court has jurisdiction, the issue of enforcement might be legally complicated by the conflict of laws rules. For example, in the case of infringement, the court might have to apply the law of each country for which the protection is sought.<sup>150</sup> In contractual disputes, such as those between the enterprise and foreign external developers, depending on the agreement of the parties to the contract, enforcement for each country in which the contract was breached could be subject to the law of the country or countries chosen by the parties.<sup>151</sup> In this context, it would be wise from the governance point of view for the parties to choose the applicable law of only one country to govern their entire contract. Besides contractual and non-contractual disputes, an enterprise can find itself in disputes related to some core intellectual property issues, such as initial ownership. In these types of disputes as well, the law of each country for which the protection is sought should be applied.<sup>152</sup> Finally, in the case of initial ownership disputes when software was developed under an employment contract, there might be different approaches to determining applicable law. However, in the EU, the tendency is to apply the law which is applicable to employment contracts.<sup>153</sup>

### *3.2.4. Non-legal actions*

On top of the previous three levels of protection, many other non-legal methods can be used in order to at least partially mitigate some shortcomings of the former. These methods should seriously be considered by SMEs in the software industry because they can be effective at least to an extent, and, what's more, they are certainly cheaper than any of the three legal levels of protection and they are always in full control of the enterprise.<sup>154</sup> However, one has to bear in mind that the effects of the non-legal methods of protection are primarily of preventive nature, protecting against both external and internal risks. In this paper the methods are catalogued in four groups: organizational, technological, psychological and market-related.

There are many steps an enterprise could take from the organizational aspect to protect its intellectual property. First, non-disclosure agreements could be reinforced by restricting the access to information only to key personnel. Keeping crucial information

150 On the EU level this issue is codified in Regulation (EC) No. 864/2007 of the European Parliament and of the Council of 11 July 2007 on the law applicable to non-contractual obligations (Rome II). See Kunda, I., Uredba Rim II: ujednačena pravila o pravu mjerodavnom za izvanugovorne obveze u Europskoj uniji, Zbornik Pravnog fakulteta Sveučilišta u Rijeci, vol. 28. no. 2, 2007, pp. 1269-1324.

151 See Kunda, I., Law applicable to intellectual property rights in the European Union, Korea Private International Law Journal, vol. 22, no. 2, 2016, pp. 451-472.

152 See Kunda, I., Law applicable to intellectual property rights in the European Union, Korea Private International Law Journal, vol. 22, no. 2, 2016, pp. 451-472.

153 See Matanovac Vučković, R., Kunda, I., Materijalnopravno i kolizijskopravno uređenje intelektualnog vlasništva nastalog u radnom odnosu, u Čulinović-Herc, E., Jurić, D., Žunić Kovačević, N. (ur.), Financiranje, upravljanje i restrukturiranje trgovačkih društava u doba recesije, Pravni fakultet Sveučilišta u Rijeci, Rijeka, 2011., pp. 303-336.

154 See Dabić, M., Bašić, M., SMEs' Needs for Intellectual Property: Harry Potter's Magic or Systematic Education Support?, in Martin, L. (ed.) Conference of the Institute for small business and entrepreneurship, Cardiff, 2013, pp. 1-12, p. 5.

only in the hands of a very narrow circle of employees might prevent a trade secret ending up in the hands of a competitor.<sup>155</sup> Another similar method would be to divide the duties between several members of staff in a way in which none of the staff would know or understand the entire concept of the software, but only the necessary bits and pieces.<sup>156</sup> However, these methods should be applied with care and measure because they might have some unwanted results. One of the possible consequences is the negative effect on innovativeness, which can arise as the employees are not allowed to see the big picture and as the interaction between them might be hindered.<sup>157</sup> Another deficiency which is particularly prominent in smaller companies with less staff is the problem of losing knowledge if a key employee or employees suddenly leave the enterprise. Since mobility is very high in the software industry, there is always such danger, especially if moderation is not used. Therefore, in some cases, it might even make more sense to apply a completely different approach and to circulate the staff between tasks in order to make sure that the enterprise does not become dependable on a small circle of personnel and to make sure that the knowledge is preserved within the enterprise.<sup>158</sup> This might also be achieved by documenting the ideas, resources and latest development steps automatically and simultaneously as soon as the idea or the development step takes place.<sup>159</sup> One more organizational method which is often disregarded when non-disclosure agreements are in place is regularly informing and reminding the personnel who have access to information of its secrecy and of the obligations they have in relation to that information. Especially when an enterprise has diligently taken the step of implementing non-disclosure agreements, it is often wrongly presumed that the employees who have signed them actually understand their scope. Even if the scope was clearly understood at the time of signing such contracts, it is possible that as time goes by and since the issue never comes up, employees simply forget their obligations and later, innocently, disclose something valuable which should have remained a secret. To raise awareness, it would also be meaningful to periodically organize educational sessions to familiarize both managers and staff of the statutory provisions related to trade secrets.<sup>160</sup>

As for the methods of protection that are technological in nature, perhaps the most important and the most complex one to apply is the so-called code obfuscation. This is an act where the software code is deliberately obfuscated by programmers, either manually or using an automated tool. In the process, the code is made unintelligible but still identical to the original code in its functional manifestation. This can be done for many reasons, but the crucial motive to do it is the fact that programs with obfuscated code are more difficult to understand to human beings. Therefore, such programs will be more resistant to reverse engineering, which might prevent the infringement of intellectual property rights vested in the program. Many other technological measures are available and could be applied in addition to obfuscation, such as encryption of

155 See Päällysaho, S., Kuusisto, J., op. cit., p. 69; Jämes, S., op. cit., p. 95.

156 Loc. cit.

157 Loc. cit.

158 See Päällysaho, S., Kuusisto, J., op. cit., p. 69, Jämes, S., op. cit., p. 96.

159 See Päällysaho, S., Kuusisto, J., op. cit., pp. 70-71.

160 Jämes, S., op. cit., p. 96.

information, firewalls and password protection. One sneaky method that is sometimes also used is incorporating specific identification codes into the software. These codes can later be very valuable for the purpose of proving the copyright.<sup>161</sup>

When it comes to the human factor, one of the most efficient and powerful tools is building commitment and loyalty of the personnel. This is a purely psychological method and, if successfully applied, may completely alleviate the need to restrict information only to the key members of staff, thus facilitating the free exchange of ideas and supporting innovativeness. Perhaps the easiest way to achieve individual staff loyalty is by using financial incentives. At the same time, this must be done carefully because if some employees receive financial rewards while others don't there is a danger of increasing the negative competition between employees and, hence, discouraging productive cooperation within the enterprise. However, the financial rewards are absolutely a necessity with key employees, especially in the case of smaller companies, where it is possible that only a few people carry the whole business operation by themselves while others are in reality just supporting and replaceable staff. With the former type of employees, it makes sense to even take it up a level and offer them some sort of an ownership arrangement. Other ways to increase loyalty are providing ample training and personal development opportunities.<sup>162</sup>

The fourth group of non-legal actions are those related to the marketing of software. Again, there are many available, but there are two which might be very effective for software specifically.<sup>163</sup> The first one is the application of short innovation cycles. This means that new software is launched to the market at a steady, but quick pace, with no lingering whatsoever. The result of such behavior is a constant step ahead of competitors, who might still be busy creating and launching their own version of the same-purpose software when the enterprise already launches a new and more advanced product, which will make the old software redundant. With such behavior, the effects of imitation, which might equal the infringement of intellectual property rights, are reduced to the smallest possible degree.<sup>164</sup> The second method is particularly important if the software is patent-eligible and the enterprise has no financial means to seek patent protection in the relevant markets. In that case, an enterprise might resort to a very unexpected tactic and that is publishing the information which would be a part of the patent application, particularly the information related to the concept behind

161 Päällysaho, S., Kuusisto, J., op. cit., p. 71.

162 Ibid., p. 69.

163 As for the other methods which would be, according to this paper, qualified as market-related methods, in addition to the two mentioned in the further text of this paper, Päällysaho and Kuusisto, Jämes and Kitching and Blackburn also mention customer relationship management. See Päällysaho, S., Kuusisto, J., op. cit., p. 64; Jämes, S., op. cit., p. 96, Kitching, J., Blackburn, R., *Intellectual Property Management in the Small and Medium Enterprise (SME)*, *Journal of Small Business and Enterprise Development*, vol. 5, no. 4, pp. 327-335, p. 332. Kitching and Blackburn also mention the method of occupying a market niche which reduces any threat. See Kitching, J., Blackburn, R., op. cit., p. 332.

164 Birk, F., *The Use of Intellectual Property Rights among Nordic Service Companies*, Nordic Innovation Centre, 2006, available at: <http://nordicinnovation.org/Global/Publications/Reports/2006/Use%20of%20Intellectual%20Property%20Rights%20in%20Service%20Companies.pdf> (15 September 2018), p. 7.

the software. This might seem a bit of controversial after all the talk about the need to maintain secrecy, but it may produce some priceless effects for the enterprise in the long run. First, the enterprise might become widely recognized and well-known as the initial developer of the concept – the enterprise that was first, i.e. the original innovator. This can have positive effects on the marketability of other software produced by the enterprise and significantly increase overall sales. And second, publishing is novelty-destructive. This means that, by publishing key software information, the enterprise not able to patent the software itself due to financial constraints will have effectively prevented any other company which was working on similar software from obtaining a patent and the monopoly to sell it.

### ***3.3. Behavioural patterns in the governance of intellectual property in knowledge-intensive IT enterprises***

Theoretically speaking, one could formulate three general patterns of behavior in relation to the governance of intellectual property in knowledge-intensive software enterprises: passive, reactive and active. The following are the profiles of such enterprises laid down in general terms, leaving aside the many possible nuances within and between each profile.<sup>165</sup>

Passive enterprises<sup>166</sup> would be those which are either completely unaware of the concept of intellectual property or, which is more likely, are on some level aware of what intellectual property rights entail, but are ignorant or completely rejective as to their potential and importance for their own software business. In such enterprises, the only beneficial effects in relation to the protection of intellectual property are purely accidental. They are the result of activities taken by the enterprise as part of running the business in general and without the intent to protect intellectual property. For example, an enterprise decides to hire an initially freelance collaborator on an employment contract basis in order to have more control over his or her workflow and hence unintentionally gains the status of the holder of economic copyrights for the work on software performed by the collaborator as of the date of the employment contract. Another example would be if the very organization of work was incidentally

165 These profiles were formulated on the basis of the author's personal experience and insight accumulated during almost a decade of managing IT enterprises in Croatia in combination with the insights gained in the process of studying the relevant scholarly writings and surveys.

166 In scholarly literature not necessarily concerning software enterprises, enterprises with more or less similar descriptions are also called dormant and inactive. See Gibb, Y., Bilić, S., Small Business and Intellectual Asset Governance: An Integrated Analytical Framework, *GSTF Journal on Business Review (GBR)*, vol. 2, no. 2, October 2012, pp. 252-259, p. 254; Kern, Sander, van Reekum, A. H., The Use of Patents in Dutch Biopharmaceutical SME: a Typology for Assessing Strategic Patent Management Maturity, Paper presented at 16th Annual High Technology Small Firms Conference, HTSF 2008, Enschede, Netherlands, available at: [https://www.researchgate.net/profile/Rik\\_Van\\_Reekum2/publication/255639961\\_The\\_Use\\_of\\_Patents\\_in\\_Dutch\\_Biopharmaceutical\\_SME\\_a\\_Typology\\_for\\_Assessing\\_Strategic\\_Patent\\_Management\\_Maturity/links/55debe0b08ae79830bb590db/The-Use-of-Patents-in-Dutch-Biopharmaceutical-SME-a-Typology-for-Assessing-Strategic-Patent-Management-Maturity.pdf](https://www.researchgate.net/profile/Rik_Van_Reekum2/publication/255639961_The_Use_of_Patents_in_Dutch_Biopharmaceutical_SME_a_Typology_for_Assessing_Strategic_Patent_Management_Maturity/links/55debe0b08ae79830bb590db/The-Use-of-Patents-in-Dutch-Biopharmaceutical-SME-a-Typology-for-Assessing-Strategic-Patent-Management-Maturity.pdf) (15 September 2018), p. 4.

conducive to intellectual property protection.

Whereas they are at least partially aware of the concept and the potential and importance of intellectual property rights for their own software business, reactive enterprises<sup>167</sup> are generally characterized by the absence of any plan or strategy regarding the protection of intellectual property. In such enterprises the protection of intellectual property is usually not an item very high on the priority list for various reasons, mostly because the focus of the management and staff is on the day-to-day activities more directly contributing to the financial well-being of the enterprise, such as software development, sales and nurturing relationships with the existing clients. In smaller companies especially, taking strategic action in relation to intellectual property would in many cases mean taking time away from those people who are the creative brains behind the software. This time would otherwise be used for software development. Therefore, actions related to the protection of intellectual property are taken in reactive enterprises only when deemed necessary, which is usually in response to external incentives. For example, the enterprise might implement technological measures of protection as a response to a security breach of their cloud-based application or it might file a trademark application as a reaction to a competitor starting to use a similar name for a same-purpose mobile application.

In contrast to passive and reactive enterprises, active enterprises<sup>168</sup> are fully aware of the concept, the potential and the importance of intellectual property rights for their software business. On top of that, they are making conscientious efforts in order to protect their intellectual property as much as their circumstances allow, particularly considering the available staff and finances. Importantly, active enterprises will plan their governance of intellectual property and will have internal policies and strategies in place specifically directed at its protection, adapting them in the course of time. Furthermore, they will actively enforce their intellectual property rights, if necessary.

Since to the best of the author's knowledge no studies related to the intellectual property protection were conducted in relation to the Croatian IT industry, it is difficult to say what is the percentage of software enterprises in Croatia corresponding to each of the presented profiles. However, supported by the results of certain studies conducted in relation to the software industry of some other EU Member States,<sup>169</sup>

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167 Kern and van Reeken use the same name for enterprises with similar behavioral patterns in the Dutch biopharmaceutical industry. *Loc. cit.* Other authors use "ad-hoc" and "defensive". See Gibb, Y., Blili, S., *op. cit.*, p. 254.

168 Other authors have formulated several different levels of what would roughly correspond to the active enterprises as described in this paper. Amongst other names, they are called dynamic, ambitious, pioneering, visionary, active and proactive. See Gibb, Y., Blili, S., *op. cit.*, p. 254.

169 For example, some studies have shown that most micro-businesses (i.e. businesses with less than 10 employees) in the UK and Finland software sectors, compared to their larger counterparts, do not see any reason to hide information from their staff or external business partners, have rather negative attitudes towards secrecy and thus the limitation of key information only to selected staff is not very common, enforce the most relaxed rule in relation to visitors, provide very few financial incentives, training opportunities or other motivational incentives to improve their staff loyalty, protect their intellectual property through documentation less frequently, are less likely to hold any registered intellectual property rights and only a minority have a planned strategy. See Päällysaho, S., Kuusisto, J., *op. cit.*. See also Kitching, J., Blackburn, R., *op. cit.*

one can claim with relative certainty that the business size plays a significant role in determining the possible profile of an enterprise. The rule of thumb would be that the larger an enterprise, the more likely to match the active profile and vice versa, the smaller the enterprise, all the more likely to match the passive profile.

#### **4. CONCLUSION**

The governance of intellectual property rights in case of software is a complicated, but a very necessary step to take for any software enterprise if it is to maximize the value of software produced by the enterprise and to minimize or at least mitigate any risks associated with competitors or clients. The analysis of the types of intellectual property rights available to protect software has shown that the efficiency of each of the three rights protecting the technology, i.e. patents, copyright and trade secrets, depends on the type of software to be protected, but it can also depend on the purpose which an enterprise wants to achieve. Copyright seems like a very efficient tool of protection in the case of software wherein the expressive manifestation of code is the most important feature and as protection against the acts of users, such as in the case of the use of pirated software. Patents might be cost-effective in the case of software with longer shelf-life. Even though patents provide very broad monopolies, trade secrets would be even more useful than patents when reverse engineering is not as probable, because they last indefinitely and no information is shared with the public, thus preventing the competitors to use the concept of “inventing-around”. The fourth right – a trademark – is somewhat different than the other three because it does not protect the technology and it would seem to be the most useful in the case of applications which are sold at online app market places, where customers sometimes decide on which application to choose based solely on the name and look of the icon labeling the application.

It is probable that most software enterprises in Croatia, given their small and micro size, as well as the structure of ownership, do not have the financial or human resources required for the registration and enforcement levels of protection, at least concerning patents. However, as illustrated in this paper, there are many non-legal methods which could not only be implemented in an enterprise without any substantial costs, but would at least partially decrease both the external and internal risks for infringement of intellectual property or theft of valuable information belonging to the enterprise. The contractual level of protection in most cases also does not require any particular financial or human resources, but it does require a little vision by the management, which must have sufficient knowledge of the concept of intellectual property rights in order to realize the importance of timely conclusion of non-disclosure and similar contracts with the persons participating in the growth of the enterprise or specifically in software development. However, given the fact that the majority of the Croatian software enterprises is sole-owner-controlled and managed and probably never seeks any professional guidance related to matters not strictly concerning the technology itself, the majority of the enterprises operating in the computer programming segment of the Croatian IT industry is very likely to belong to the passive profile of enterprises

as described in this paper, with the possibility to transform to a reactive enterprise over the course of time and with the right external incentive.

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Sažetak

## **ZATVORENA IT DRUŠTVA U HRVATSKOJ KOJIMA UPRAVLJAJU VLASNICI: PITANJA VEZANA UZ UPRAVLJANJE I ZAŠTITU INTELEKTUALNOG VLASNIŠTVA**

Zaštita intelektualnog vlasništva važan je sastojak tržišnog uspjeha društava znanja koja djeluju u informatičkoj industriji. Upravljanje i opseg zaštite intelektualnog vlasništva vezanog uz *software* često su povezani s određenim značajkama trgovačkog društva, kao što su njegova vrsta i veličina. Analizirajući javno dostupne podatke, autorica identificira različite obrasce koji se prvenstveno odnose na strukturu vlasništva i uprave društava koje se bave računalnim programiranjem u Hrvatskoj. Analiza pokazuje da je svih 500 najboljih društava po kriteriju prometa koja se bave računalnim programiranjem zatvorenog tipa, a ogromnom većinom upravljaju vlasnici te su po veličini mali ili mikro poduzetnici. To upućuje na zaključak da je većina takvih društava pasivna u odnosu na svoje intelektualno vlasništvo. S tim u svezi autorica opisuje tri moguća profila društava ovisno o njihovom odnosu prema upravljanju intelektualnim vlasništvom. Također uobličuje i raspravlja o četiri moguća komplementarna pristupa zaštiti intelektualnog vlasništva, pravne i nepravne prirode, a raspravlja i o različitim vrstama prava intelektualnog vlasništva s ciljem utvrđivanja koja su prikladnija za zaštitu različitih vrsta *softwarea*.

***Ključne riječi:*** *intelektualno vlasništvo; software; patent; autorsko pravo; poslovna tajna; upravljanje.*

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Zusammenfassung

**INHABERGEFÜHRTE GESCHLOSSENE IT-  
UNTERNEHMEN IN KROATIEN: FRAGEN DES  
MANAGEMENTS UND SCHUTZES DES GEISTIGEN  
EIGENTUMS**

Schutz des geistigen Eigentums ist ein wichtiger Bestandteil des Markterfolgs von wissensintensiven Unternehmen in der IT-Branche. Das Management und der Schutzzumfang des auf *Software* bezogenen geistigen Eigentums sind oft mit manchen Eigenschaften der Handelsgesellschaft, beispielsweise mit derer Art und Größe, verbunden. Durch die Analyse öffentlich verfügbarer Daten identifiziert man in diesem Beitrag die Muster der Eigentums- und Vorstandstruktur von Softwareunternehmen in Kroatien. Die Analyse weist darauf hin, dass alle nach Umsatzkriterium gewählten 500 besten Softwareunternehmen geschlossen sind, dass sie meistens inhabergeführt sind und der Größe nach Klein- oder Mikrounternehmen darstellen. Daraus lässt sich schließen, dass die meisten dieser Unternehmen ihrem geistigen Eigentum gegenüber passiv sind. Damit verbunden beschreibt man in diesem Beitrag drei mögliche Unternehmensprofile bezüglich des Managements von geistigem Eigentum. Ebenfalls diskutiert man im Beitrag über vier komplementäre juristische und nicht-juristische Ansätze zum Schutz des geistigen Eigentums und über unterschiedliche Arten und Rechte des geistigen Eigentums, alles mit dem Ziel, die angemessene Ansätze und Rechte für den Schutz unterschiedlicher Softwarearten zu bestimmen.

*Schlüsselwörter:* geistiges Eigentum; Software; Patent; Urheberrecht; Geschäftsgeheimnis; Management.

Riassunto

**LE SOCIETÀ IT CHIUSE AMMINISTRATE DA  
PROPRIETARI IN CROAZIA: QUESTIONI RELATIVE  
ALL'AMMINISTRAZIONE ED ALLA TUTELA DELLA  
PROPRIETÀ INTELLETTUALE**

La tutela della proprietà intellettuale costituisce un importante tassello della concorrenzialità delle società del sapere che operano nell'industria informatica. La gestione e la portata della tutela della proprietà intellettuale connessa al *software* sovente sono collegate con determinati elementi della società commerciale, come ad esempio il suo genere e la sua grandezza. Analizzando i dati accessibili, l'autrice identifica i diversi tipi che in primo luogo si riferiscono alla struttura della proprietà

e dell'amministrazione delle società che si occupano di programmazione informatica in Croazia. L'analisi dimostra che tutte le 500 migliori società in base al criterio del reddito, le quali si occupano di programmazione informatica di tipo chiuso e nella stragrande maggioranza dei casi sono amministrate dai proprietari stessi, per grandezza sono rappresentate da piccole o micro imprese. Ciò porta alla conclusione che la maggiore parte di tali società è passiva rispetto alla propria proprietà intellettuale. Al riguardo l'autrice descrive tre possibili profili di società a seconda del loro rapporto nei confronti della gestione della proprietà intellettuale. Altresì si inquadrano, discutendone, quattro possibili approcci complementari di tutela della proprietà intellettuale di carattere giuridico e no; mentre si dibatte anche dei diversi generi di diritti della proprietà intellettuale al fine di accertare quali siano maggiormente idonei alla tutela dei diversi tipi di software.

***Parole chiave:*** *proprietà intellettuale; software; brevetto; diritto d'autore; segreto professionale; gestione.*

