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POSSIBILITIES FOR THE MEASUREMENT OF THE INTELLECTUAL CAPITAL ON CASE OF COMPANY GORENJE D.D.

Rosmery Idina Mendez¹, Mateja Gorenc²

Abstract

In the article the importance of the measurement of the Intellectual capital in companies is presented. Article describe different methods of measurement. Later are used two groups of methods, market capitalization method with Tobin's Q and measuring of Intellectual capital with Value-added intellectual capital coefficient (VAIC) in company Gorenje d.d. for the business years 2015-17. After calculation of Intellectual capital by upper methods, conclusion is that VAIC method is the most appropriate method for the measurement of Intellectual Capital in company Gorenje d.d.. Method base on exact data of Balances and financial statements and is applicable on all levels in organization and give to company managers possibility for the right decisions for improvements and long run profitability.

Key words: direct Intellectual Capital Methods, return on Assets Methods, scorecard Methods, market Capitalization Methods

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Introduction

In the last decades we are witnessing fast technological advances. Innovations have accelerated and become an increasingly important driver of performance of leading companies. In accordance with this research problem is how to estimate influence of intellectual Capital in company in Knowledge based environment. To estimate how much influence intellectual Capital (IC) on company value have, we need to measure it. Peter F. Drucker said, that you cannot manage what you cannot measure. And managing the IC become very important for company long run prosperity. Therefore, research subject is then to find possibility of most suitable measuring, evaluation model, which will give

¹ Rosmery Idina Mendez is a Master's student at at the Faculty of Business and Technology, University of Nova Gorica, Slovenia (rosmery.idina@gmail.com)

² PhD Mateja Gorenc, College of Accounting and Finance, Ljubljana, Slovenia (mateja.gorenc@gmail.com)

answers how change of intellectual capital influence on successful business in company. Both, research subject and problem are concerning the research object, intellectual capital in company. Base on all three we can form scientific hypothesis: In today high technological world only evaluated intellectual capital give possibilities to Management for right decisions and thus long run profitability.

Different authors have different views on definition of IC, however there is common concept, that the IC means intangible value of business of the company. It is sum of everything what employees intellectually create, as inventions, knowledge with know-how, procedures and processes, organization in company, brands and could means competitive advantage in the market.

In generally: The most widely used definition of intellectual capital is "knowledge that is of value to an organization." Its main elements are human capital, which is represented by employees with their knowledge, skills, behaviour, abilities, structural (internal) capital with organizations ability, procedures, programs, infrastructure for human capital, and customer (external) capital, which means relations between company and buyers, suppliers and business partners, stakeholders. That definition suggests that the management of knowledge (the sum of what is known) creates intellectual capital. Bontis,N. (1996). Figure 1 show components of Intellectual Capital. Chen et al. (2004).

Measuring and reporting improving internal performance of the organization, but managerial control is not always well accepted, especially if we don't clearly explain to the employees the purpose and outcome of the measurements, that this is more learning then controlling.

Accuracy measurement and valuation of IC is important for banks when company needs loans, investment bankers, private equity funds, in case of merging and acquisitions, then for tax authorities, for auditing purposes, also in cases of arbitrary when business owners are going apart. Valuation is needed in number of businesses like:

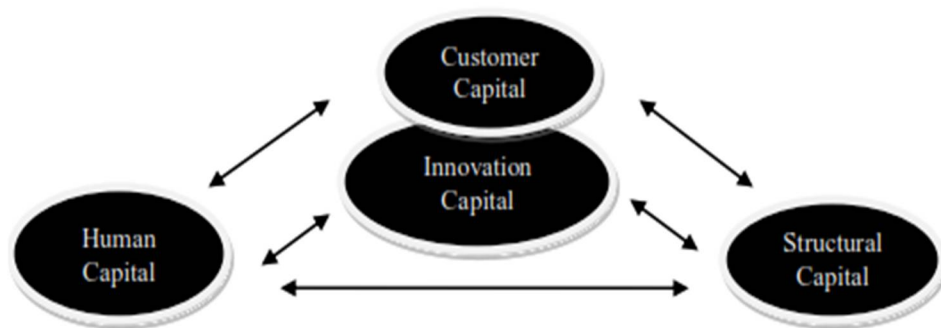
- In a sale, merger, joint venture and other case alike;
- when we are licensing IK
- In a situation when business partners going apart
- litigations
- company goes bankruptcy
- For planning purposes

The field of measuring or evaluation of IC is not unique settled in the world nor in Slovenian companies, although the matter is somehow covered with International accountancy standards. International Accounting Standard (IAS) 38 on intangible assets and International Financial Reporting Standard (IFRS) 3 have some possibilities and also limitations. The main problem is, that classical accountancy statements are useless, when costs of inputs are not connected with output costs. Accountancy came with industrial revolution when only machines had meaning for companies. When we have a knowledge economy, based on Intellectual capital on input, we don't know for sure future value, because inventions could be successful in future or not. For that reason, we have to show them separated.

In praxis we have many methods, which could be more or less suitable for our case.

I will shortly describe main of them and try to vague which model could be more accurate for measuring and evaluation of the intellectual capital in case of company Gorenje, Slovenia.

Figure 1: Components of Intellectual Capital



Source: Chen at al. (2004)

Methods

Increasing of the stock prices value of companies could not be explained by traditional balance sheet. Academics, consultants and practitioners developed a substantial number of intellectual capital measurement and reporting models developed for different companies or branches specifics and different criteria. Unfortunately, thus is not consistency between them. Compiled by Ramanauskaitė at al., 2013; according to Engström et al., 2003; Lev et al., 2003; Müller, 2004; Wall et al., 2004; Sitar et al., 2004; Westnes, 2005; Vaškeliėnė, 2006; Kok, 2007; Pukeliėnė et al., 2007; Vaškeliėnė, 2007; Jurczak, 2008; Kuzmina, 2008;

Sveiby, 2010; Znakovaitė et al., 2010; Salman et al., 2012., there are in general, four the most used groups of methods:

Direct Intellectual Capital Methods – DICM base on the evaluation of intellectual capital in monetary units by identifying the specific components or elements (e.g., Technology broker–IC audit, Total value creation, The value explorer, Citation-weighted patents, Accounting for the future, etc.)

Return on Assets Methods - ROA base on pre-tax average income versus average capital unit calculation. Afterwards, the obtained result is compared with the average value of the industry branch, and the result is treated as the average of return on intellectual capital. Part of these methods are based on discounted cash flow calculation and do not avoid some errors (e.g., CIV, EVA, VAIC, Knowledge capital earning, etc.)

Scorecard Methods – SC base Based on identification of various components of intellectual capital and attribution of specific indicators or indices to measure these components. The difference from the first type lies in the fact that this type does not seek evaluation in monetary units (e.g., Skandia navigator, IC index, Intangible assets monitor, etc.)

Market Capitalization Methods – MCM Based on the calculation of the difference between the market value of an enterprise and its assets, which is equaled to the value of intellectual capital. These methods are hard to apply in non-profit entities or enterprises of the public sector (e.g., market to book values, Tobin's q, Investor 's assigned market value, etc.)

As we see, there is a lot of different method for measurement and evaluation of IC and they aren't support each other. Field is not standardized and seems that the hardest part, practically state of art, is to choose appropriate, accurate method which will be also well accepted by managers, employees and also helpful at their long-term business decisions for added value creation. It is up to company alone which method will use in order to get the most adequate measuring results.

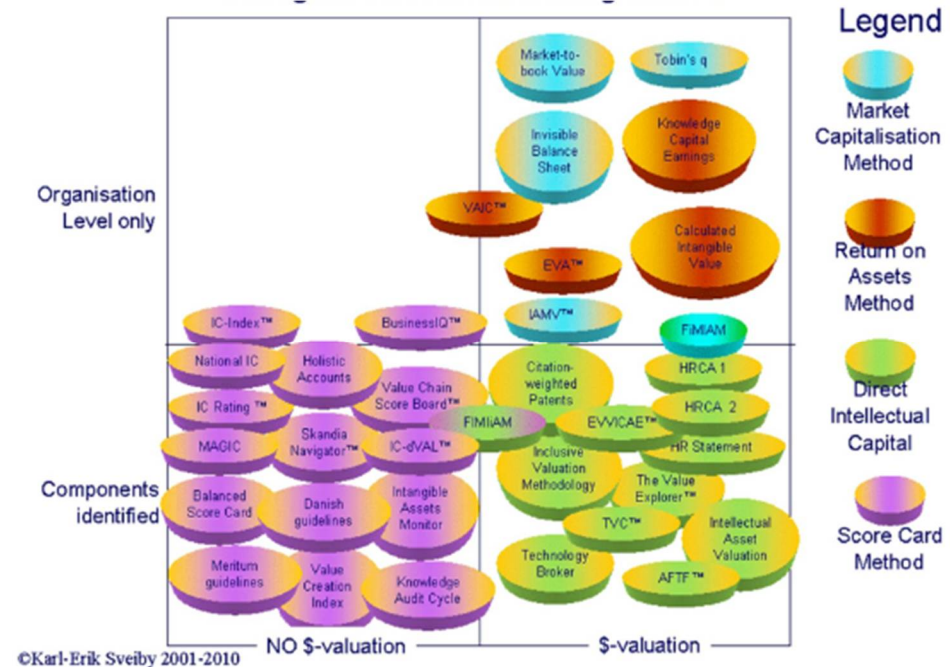
Each method is useful for different purpose or situation and gives certain advantage. For instance, the methods useful in merger and acquisitions, and stock market valuations, being calculate in money valuations like MCM and ROA. We can use them also to compare companies inside same industry and to express the financial value of Intangible assets and at the same time they are accountable, following accounting rules. They have also disadvantage, showing all in money terms, make them also doubtful. Furthermore, the ROA methods are very sensitive to interest rate and discounting rate assumptions. Problem is also that the methods

are measuring on organizational level only and therefore not of much use for managerial purposes externally. Some of them, specially MCM methods, are not useful for internal departments, non-profit and public companies.

The advantages of the DIS and SC methods are that they can create a more complete view into organization condition and out of financial measurement more applicable in the organization levels. Therefore, they are much more useful for internal departments, non-profit and public organizations. The bad side is that these new methods are organizational tailored for each organization and thus is practically impossible to compare with other organizations. More holistic we study the matter, more data we generate and this can blur our analysis and their results could be questionable and hard to interpret.

Figure 2 shows Intellectual capital measuring models by Karl-Erik Sveiby. (2001-2010)

Figure 2: Intangible Assets Measuring Models



Source: Sveiby 2001-updated2010

Results

Measuring of the intellectual capital by market capitalization method (MCM).

This method is one of the simplest and evaluates intellectual capital based on a difference between market capitalization (the number of issued shares, multiplied by market share value and book value (net value of company assets). Method it just means that accounting value is not a very good measure of the economic value of a company. The economic value of a company is determined by how much money it will make in the future, not what assets it bought in the past. Problem of this method is that market value of the company depends of variety factors, which influent on different way on companies' assets. Also, tangible assets are in many cases under evaluated and then the difference in reality is not so big, as is showed.

Failures of the method try to overcomes method Tobin's Q. The Q is the ratio of the company market value to the replacement cons of its assets.

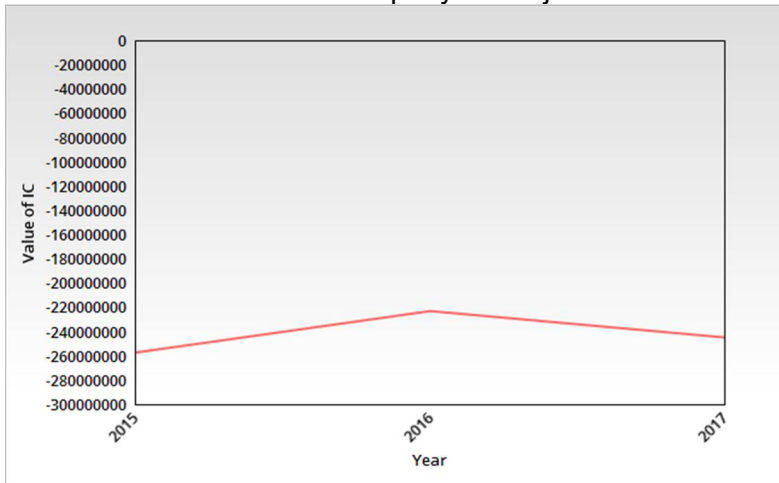
Advance in technology and human capital assets usually are connected with high Q values. In that case Q should be growing in trend. If not, company will make higher returns on investments. Using replacement value of assets rather than book value in principle makes this method more accurate. Anyway, Tobin's q is more accurate than the market to book method, however, finding these replacement costs is not so easy as using balance sheet values. From that reason, according to Edvinsson (1997) we can use simply book value.

Table 1: Calculation of Intellectual capital by method Market and book value and method Tobin's Q for company Gorenje d.d.

Company Gorenje d.d.	2015	2016	2017
Number of shares in trading	24.424.613	24.424.613	24.424.613
Market value of share in EUR (last trading day in year)	4,60	6,00	5,10
Book share value in EUR	15,14	15,14	15,13
Market value of the company in EUR	112.353.220	146.547.678	124.565.526
Book value of the company in EUR	369.788.641	369.788.641	369.544.395
Intellect. Capital = Market – Book Value	-257.435.421	-223.240.963	-244.978.869
Tobin's Q = Market / Book Value	0,30	0,40	0,34

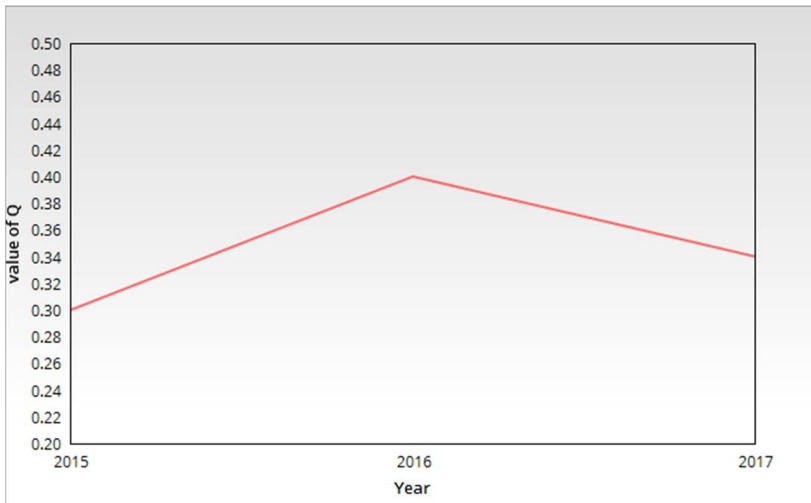
Source: Yearly report of company Gorenje, 2015, 2016, 2017

Figure 3: movement of intellectual capital by the method of market and book value 2015-2017 in company Gorenje d.d.



Source: Figure 3 author made on data from Table 1

Figure 4: movement of coefficient Tobin's Q in company Gorenje d.d. in 2015 to 2017



Source: Figure 4 author made on data in from Table 1

In our case we can observe from figure 4, that Tobin's Q was in all three years smaller than 1. Market value was significantly lower than the book value. Such investment is not profitable. But is also true, that is reality of the market value questionable. This also showing need for strategic partnership with another high-tech company, which would change such a trend.

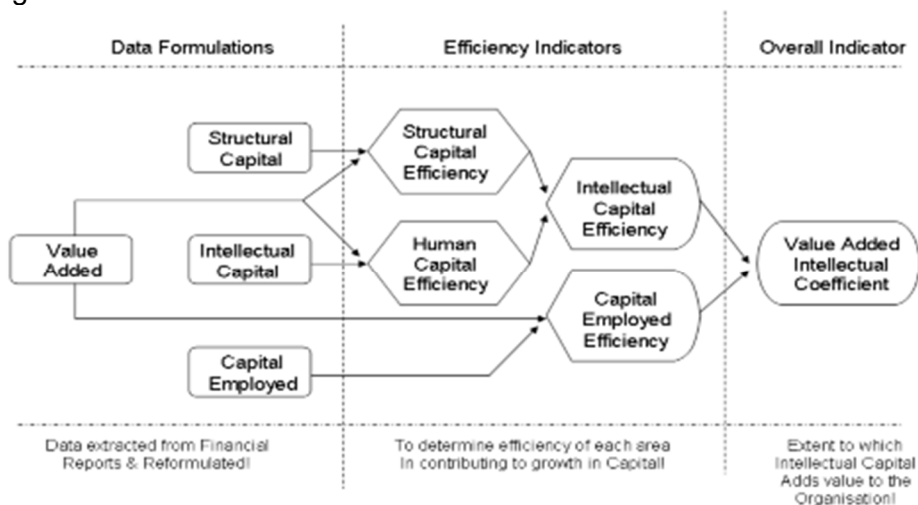
Measuring of Intellectual Capital with Return on Assets method (ROA)

Among these methods we can classify also Value-added intellectual capital coefficient (VAIC), method developed by professor Ante Pulic (1998,2000). The method has many positive impacts in efficiency of Intellectual Capital Measurement and it is in use in many countries. In England even over 300 companies use this method. The results show that companies' IC has a positive impact on economic and financial performance. However, the association between IC and stock market performance is only significant for high-tech industries. This is then useful exactly in our case of Gorenje d.o.o. The results also indicate that capital employed remains a major determinant of financial and stock market performance although it has a negative impact on economic performance. In praxis the VAIC method could be an important tool for many decision makers to integrate IC in their decision process according to Zeghal D. and Maaloul A. (2010).

VAIC became the most popular method for measuring the efficiency of value adding to corporate intellectual capital.

Dunn and Hughes-Lucas (2010) brought wider perspective to the VAIC model they connect VAIC elements with construct of three procedure stages of model application and their influence on the capital growing. Detail overview is presented in figure 5.

Figure 5: Overview of the VAIC model



Source: Laing, Dunn and Hughes-Lucas (2010, p.276)

Pulić VAIC method calculate coefficient VAIC as sum of three components: efficiency of human capital, financial capital and structural capital. Contrary to economic theory and praxis which threat employees as labour costs, here we calculate them as investment in their efficiency, because they contribute to the overall performance of the company.

Added value is difference between Operating income and Operating expenses without Labour costs, to which we then add Labour cost. Labour cost represent value of human capital.

Second component financial capital is equal to Resources of the company. Structural capital is subtraction between added value and human capital. Efficiency of the human capital is division rate between Added value and human capital. Efficiency of financial capital comes from division of added value and financial capital, meanwhile the efficiency of structural capital represents division among added value and structural capital. Finally, coefficient VAIC is the sum of all three coefficients of efficiency: human capital, financial capital and structural capital.

In our case we calculate method VAIC for company Gorenje, d.d. It is a Slovene multinational, global company that successfully operates on the most demanding global markets and even successfully takes over companies in the West, like the Dutch Atag and Sweden Asko. They are selling products in 90 countries, from the USA to Australia, and its employees come from 42 different countries. Gorenje is one of the last Slovenian large business groups, which is driving a record economic growth. More than 90% of its sales constitute exports. It is not about the sale of components, but of comprehensive products, which are mostly generated in Slovenia.

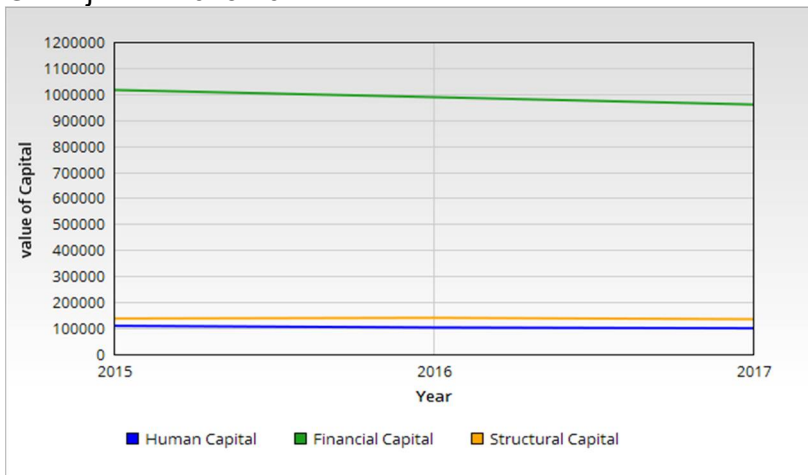
In table 2 we calculate coefficients of efficiency for company Gorenje d.d. in three years' period, 2015, 2016, 2017. Table 3 show 9 percent growth of Human Capital, meanwhile Financial capital grow for 6 percent, structural capital grows slow of 2 percent. Added Value was in observed period slightly grow for 5 percent. Efficiency of financial capital was without change, but one of human capital drop for 4 percent. Overall VAIC coefficient thus fallen for 1 percent.

Table 2: Calculation of VAIC coefficient in company Gorenje d.d. in 2015 - 2017

in EUR	2015	2016	2017	$I_{16/15}$	$I_{17/16}$	$I_{17/15}$
Operating income	700.284	718.806	822.975	3%	15%	18%
Operating expenses	565.595	578.902	685.654	2%	18%	21%
Labour costs	99.791	102.769	109.151	3%	6%	9%
Added value	234.480	242.673	246.472	4%	2%	5%
Human Capital	99.791	102.769	109.151	3%	6%	9%
Financial Capital	959.570	987.867	1.015.425	3%	3%	6%
Structural Capital	134.689	139.904	137.321	4%	-2%	2%
Efficiency of human capital	2,35	2,36	2,26	0%	-4%	-4%
Efficiency of financial capital	0,24	0,25	0,24	4%	-4%	0%
Efficiency of structural capital	1,74	1,73	1,79	1%	4%	3%
VAIC	4,33	4,34	4,30	0%	-1%	-1%

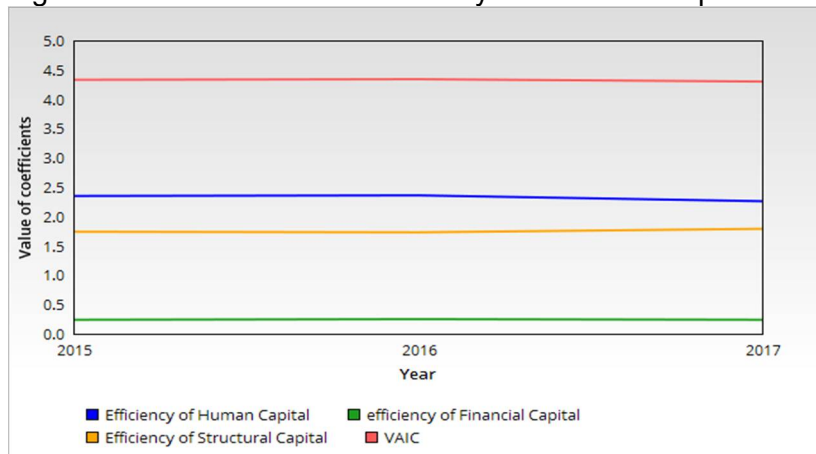
Source: Yearly report of company Gorenje, 2015-2017

Figure 6: Movement of Human, Financial and Structural Capital of Gorenje d.d. 2015-2017



Source: Figure done by data in Table 2

Figure 7: Movement of the efficiency of all three components of VAIC



Source: Figure 7 done over data available in Table 2

Figure 7 tells us, that all three components of VAIC are in stagnation, they don't really progress, which is pretty serious problem, meanwhile balances and financial statement show relatively good picture. The importance of VAIC method for the Management is therefore obvious. Good side of the VAIC method is, that do use accountancy data, what gives it certain trust and credibility inside the company. Also, it is useful on all levels in organization. Method shows how much value create each Euro invested in these three components of capital. Nevertheless, VAIC coefficient have relatively small value.

Practical implications – The VAIC method could be an important tool for many decision makers to integrate IC in their decision process, especially in high-tech companies, according to Zeghal D. and Maaloul A. (2010)

Conclusion

In the research, after study various method of evaluation of intellectual capital, study is focused on two methods: market capitalization method (MCM) with its improved version Tobin's and second measuring of Intellectual capital with Return on Assets method (ROA), and among these methods, classified Value-added intellectual capital coefficient (VAIC) in company Gorenje d.d. for the business years 2015-17.

In case of Tobin's Q, coefficient was in all three years smaller than 1. Market value was significantly lower than the book value. It was a kind of surprise, because company's business reports results are relatively good and company seems very vital. But Market capitalization methods have some failures like, the reality of the market value is questionable,

because could be speculative, under implanted negative statements of interested groups or influenced individuals and book value also doesn't always reflect real evaluation of the assets. When market value is smaller from book value, this imply that such investment is not profitable. This could also show need for strategic partnership with another high-tech company, which would change such a trend. However, this method is not really trustable and reliable, thus we could conclude that in our case is not really applicable.

Our focus further could be then on measuring of Intellectual capital with Value-added intellectual capital coefficient (VAIC) in company Gorenje d.d. Human capital as one of the most important components in VAIC method is certain privileged. Gorenje currently maintains about 90 employees for which it produces a quarter of a million euros a year; Among them are future masters and doctors of electrical engineering and computer science. The talented personnel are being discovered and developed in the programs of the University of Gorenje (CUG), both in Slovenia and in subsidiaries in the world. In recent years, hundreds of new developers have been employed in Slovenia. And growth of Human Capital really show progress. Meanwhile Financial Capital don't grow so much, because company is significantly indebted and Added value is low. This make Gorenje vulnerable and could be big problem for future. And problem is that Structural capital is stagnant, because intellectual human capital doesn't transfer or materialize into structural enough efficiently.

Also, the proportion of administrative workers in relation to employees in production is too high. Gorenje's core business is taking place in an industry that is already quite old even high-tech, so you have to work hard to stay competitive in big concurrence. They are interested for strategic partnership of company, for partner committed to the growth and preservation of the brand and the current volume of production in Slovenia, while also offering business synergies and access to new markets.

This give us conclusion, that Method VAIC it is the appropriate mean of measure of Intellectual capital, because first giving us right information about condition of all three component of VAIC, their efficiency, what could be right information for Managers, who can observe the condition of VAIC on all levels in organization and receive on basis of experiences and data adequate measures and right decisions for improvements and long run profitability. By this can help them, that method have sources in exact data of Balances and Financial statements, what give them credibility and also persuasive power among employees.

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