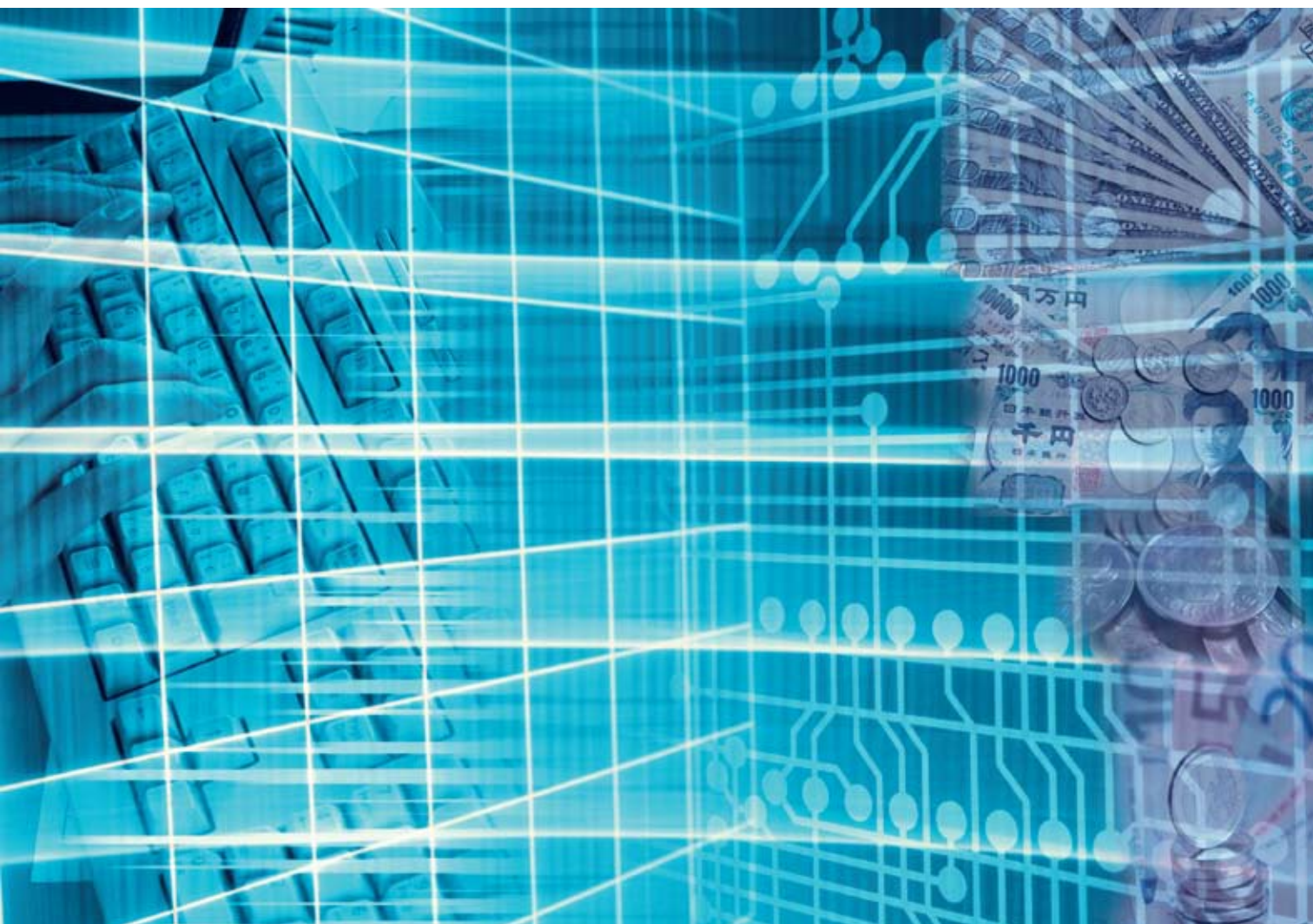
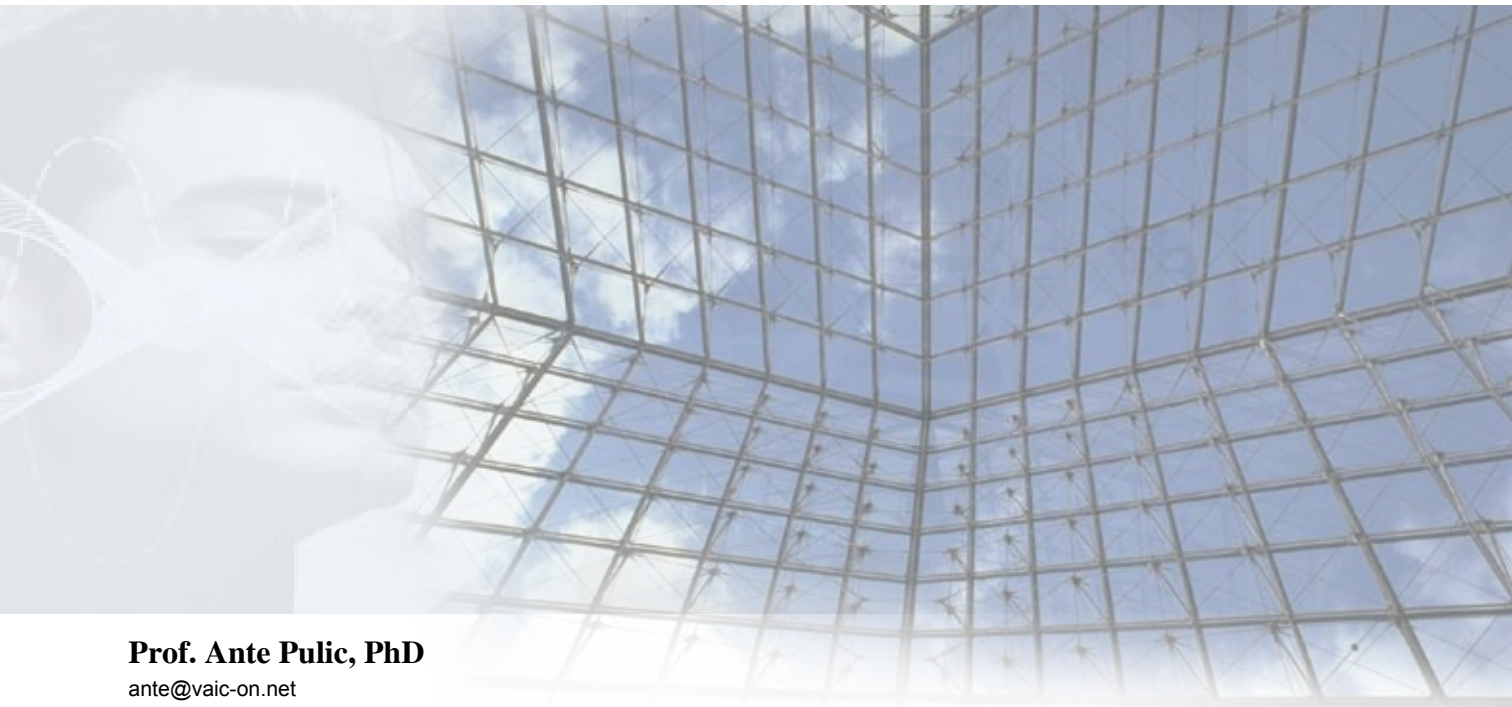


Ante Pulic



*The Principles of Intellectual
Capital Efficiency
- A Brief Description*

Zagreb, June 2008.



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The Principles of Intellectual Capital

Efficiency - A Brief Description

Introduction

It has taken quite some time to write this paper, starting in 1998 when the VAIC™ concept was presented at the 2nd IC congress in Canada, and finishing in spring 2008, during a visit to Acapulco. It features both, intensive theoretical and practical work. Theoretical thesis was tested in business practice, corrected and re-examined, while practical experience inspired new theoretical solutions. The past 10 years of research and examination have been true laboratory work and the results are described in this article.

The main finding is actually very simple and short: being efficient is no great philosophy or art, but a very practical and applicable skill. Moreover, efficiency can be executed and achieved by everyone, be it by managers in business or by individuals in private life.

But let me start at the beginning, with the key question: What is the root problem of efficiency today? The answer is that we are facing a similar situation with intellectual work as was faced by manual work before Taylor. Measurement of intellectual work still implies “rules of thumb”, which means, that everybody does it “his way”. Such practice must be replaced with a system that enables precise insights into IC performance at all levels of business activity and continuous improvement of intellectual work efficiency, similar to what Taylor did with physical work.

The following research confirms our thesis.¹ More than 1600 presidents and board members of biggest

¹ The Economist (2006), Economist Intelligence Unit, pp. 93

companies worldwide see possibilities in improving productivity in the field of knowledge management, that is, intellectual capital management.

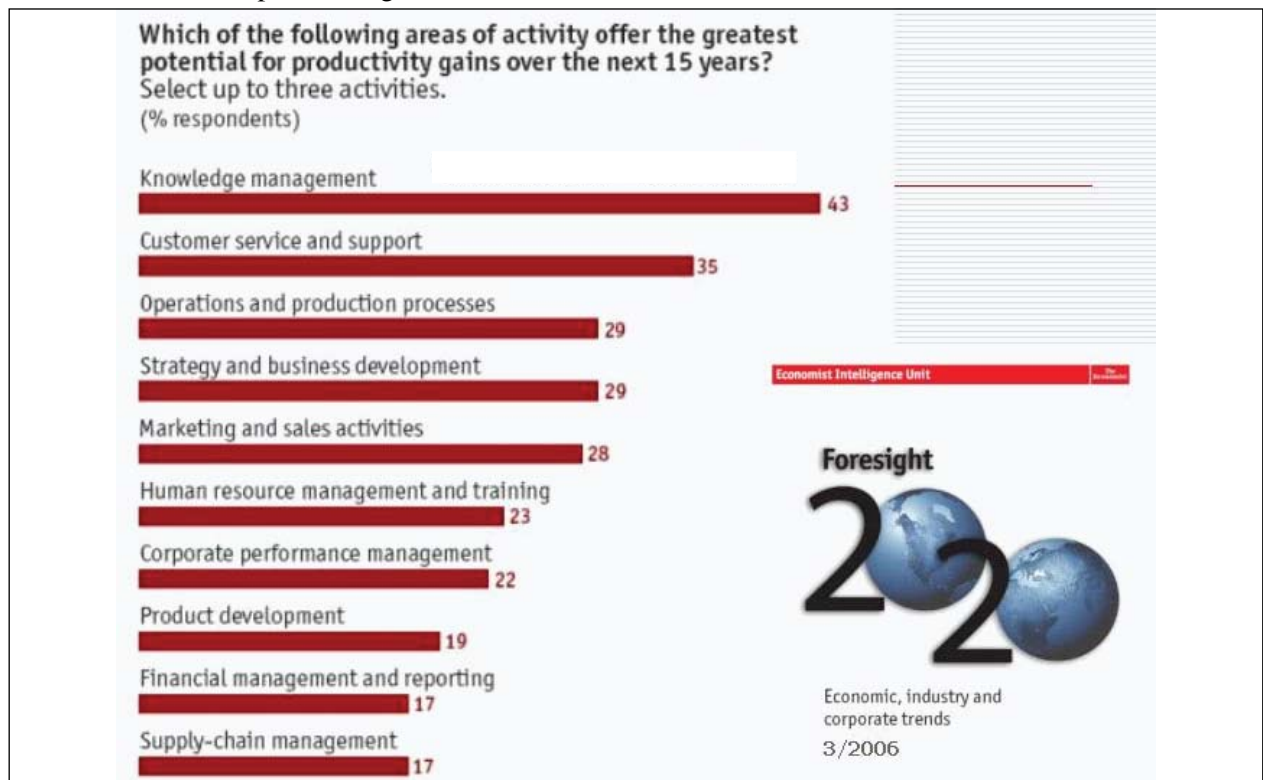


Figure 1. Activities with the greatest potential productivity gains next 15 years

Nature of Value Creation in Knowledge Economy

Today it is possible to state with certainty that the focus of working activity is out of classical production, which represents the dematerialization of economic activities. The named process of dematerialization, which has been almost fully overlooked by economic theory, has become more and more evident.² We can confidently say that we have entered the epoch of intellectual value creation.

In the current economy the predominant activity is **no longer production of goods but production of knowledge**, which is then built into goods and services. This is the starting point of any further economic analysis. This transformation has affected at least two areas: the production of goods and the value of goods. There is a considerable difference between knowledge based added value and physically added value.

During the industrial era, the dominant way of value creation was mass production of goods, in other words, physical creation of value added. In the real world that meant that financial capital had a determining role. An enormous number of workers was engaged in poorly paid jobs trying to create as many goods as possible because value creation depended upon quantity. Today, the situation is different. The created value added does not depend upon the increase of produced goods but the knowledge content incorporated into goods and services. Value is not created by the quantity of produced goods but through the quality created by knowledge workers in designing, e.g. new software programs or inventing new medicine. This leads to following conclusion: **as value of the products/services was once determined by the quantity of raw materials and physical work, nowadays it is mainly determined by knowledge content incorporated into goods/services.**

All of this changes the nature of value creation dramatically. It is no longer possible to think of goods as a physical manifestation of value.³ This means that the loss of value of goods does not happen due to its physical wear but due to out-dated knowledge built into it. Basically, the reason we buy a new product is

² P. Drucker (1986), «The frontiers of Management – Where Tomorrow’s Decisions are Being Shaped today», New York 1986. If something exists, then it is the small group gathered around the new theory of growth, with P. Romer.

³ Kenney, Martin (1997), “Value Creation in the Late 20th Century: The Rise of the Knowledge Worker.” In J. Davis, T. Hirshl, and M. Stack (eds.) Cutting Edge: Technology, Information, Capitalism and Social Revolution (London: Verso): 87-102

not because the previous one fails to fulfil its function, but because the new one contains more knowledge. Therefore, it is not the physical component of the product that becomes obsolete; it's the immaterial component - the knowledge. This has become true for all industries, from software industry to tourism and other sectors.

Since we are dealing with knowledge-based economy it is a necessity to explain the distinction between knowledge and intellectual capital. As far as capital is concerned, economic thought defines quite precisely what that implies. Let's take money as an example. Is all money capital? No. Money stuffed in a sock or put away in its more modern version, a home safe, is not capital. Capital is only the money or property - buildings, machinery, raw materials - that is used to create new value. The same analogy applies to knowledge. There are many people that dispose of very impressive knowledge, but their knowledge will never become intellectual capital if they are not able to transform it into value creating action that will cause a reaction on the market – a demand for whatever that person has to offer. In the same way as money is not capital if it doesn't serve the purpose of creating value, knowledge that fails to fulfil the same function is not either. From an economic point of view it is possible to conclude that only such knowledge becomes intellectual capital that can be transformed into value identifiable on the market, or in other words, into benefits the customer pays for.

Although people talk of knowledge as the main carrier of power in this era, that power actually refers to its manifestation in business, and that is **intellectual capital**. In the new economy the concept of intellectual capital is used as a synonym for those employees, who have the capability of transforming and incorporating knowledge into product and services that create value.

People are the main carriers of knowledge. In order to go one step further a new employee status needs to be found. And this requires a big breakthrough: intellectual capital needs to receive the status of key resource, which at least means, becoming equal with physical and financial capital. In reality this should not be hard to achieve. If we all agree on the fact that employees are the key resource of the 21st century and that today knowledge is what once were land and money, then it is only reasonable to give this resource the status it deserves: **of investment and not cost any more**.

Employees, who are treated as investment, are the beginning and the end of the new, knowledge based, economy. In the same way as investments were made in plants and machinery in order to create value during industrial economy, today, we invest in employees, who are the main value creators of contemporary economy. Today, companies combine two key resources: physical and financial and intellectual capital. Within their interaction – the different business activities – value is being created. The above mentioned shift seems inevitable in moving forward to knowledge based economy. Treating the knowledge worker as investment, not only in words but also in accounting terms, makes the popular slogan become true: “The knowledge worker is the most valuable asset of companies in the 21st“ century

Business Success in the Knowledge Economy

We are faced with the following questions: How can business processes, companies and whole national economies be successfully managed with the immaterial component of business, knowledge, becoming ever more dominant? And, even more importantly: How do we know whether this is done successfully or not, that is, how productive they are? Over the past 20 years many methods and approaches, categorised by different criteria, have appeared in an attempt to answer above questions. Since a thorough overview of the methods already exists, there is no need to go deeper into this now.⁴ However, an interesting question is why they have not been applied in a wider range in business practice.

According to managers and some academics the main problems of most methods and procedures are as follows:

- In general, measurement results refer to company level only, which isn't by any means sufficient for successful management of intellectual capital. Try to imagine management, who, e.g. is monitoring expenses on company level only.

⁴ Sveiby, K.E.(2002): Methods for measuring intangible assets. Available at: <http://www.sveiby.com/articles/IntangibleMethods.htm> Andriessen, D. (2004): Making sense of intellectual capital: designing a method for the valuation of intangibles, Elsevier Butterworth-Heinemann, Burlington, USA

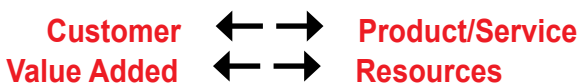
- Measurement of IC performance and therefore management in value creating processes is not enabled. Remember professor Juran’s saying: «If you don’t manage the processes, you don’t manage the company at all». This implies that if it is not possible to measure IC performance in processes we can not say that we have measurement methods adequate to satisfy the needs of modern companies.
- Most methods and procedures are applied during limited time periods – e.g. monitoring intellectual capital is conducted once or twice a year. Imagine management making decisions based on business reports issued every 6 to 12 months. This can not meet business needs.
- With non monetary approaches the possibility of comparison with others is difficult or impossible, no matter whether on company, sector or national level. Without benchmarking possibility with other business subjects, it is impossible to determine one’s position in business environment. Like a ship without navigation instruments.
- Last but not least, after having obtained various results, many managers are still clueless of whether their company’s intellectual capital has created more or less value as compared to the previous time period. Or in different words, whether the company has created value and how much. It is therefore that after all the analysis conducted IC productivity is still unknown.⁵

Taking into consideration all that is said, there is no valid argumentation against a monetary based measuring system which is real economy. We will continue to work in a business environment of monetary transactions for many more years. Because of that there is no other way but to lay a bridge between the intellectual capital output on the one side, and money, which is used in all transactions, on the other side.

The goal must therefore be to find a measuring model for the knowledge economy, which will serve employees, management, investors, business partners, and states in the same way. This model has to be able to indicate how much value has been created and how productive it is at all levels of business activity: with business processes, segments of the company and at company level. It has to provide the possibility of comparison with others, and to cover both, micro and macro level of business activities.

Under the new circumstances, value is determined by the relationship between the customer and the product/service in which the quantity of knowledge is the key. On the other hand we have the relationship between created value added and the resources engaged in value creation.

This leads us to following two relations:



Because of the limited space we will deal with the second relation (2) only. Here we have a key indicator, value creation efficiency, that features the relationship between value added and utilized resources.

Economy	Industry age	Knowledge age
Measuring system	Quantity	Quality
Scope	Revenue	Value
Business success	Profit	Efficiency

This way a base for the creation of a new measuring framework is given in which created value added and efficiency of resources become the new measuring units for business success – that is productivity – in knowledge-based economy.

“Intellectual assets are intangible. After all, so is value. Let’s make the link between the two more “visible”.⁶ The measuring framework, as presented before, gives a signpost how to connect knowledge and money.

The new measuring system is based on value added, which, on the one hand visualizes companies’ business capability and, on the other hand, creates a bridge between intellectual capital as a non material resource

⁵ Sveiby K.E. (2004), Learn to Measure to Learn, Opening Key Adress IC Congress, Helsinki 2 Sept. 2004.

⁶ Zambon Stefano (2006): Intellectual Assets and Value Creation: Exploring the “Black Link”, International Policy Conference: “Intellectual Assets and Innovation: Value Creation in the Knowledge Economy”, Ferrara, 20-22. october 2005

and the monetary sphere. Value added reflects business success in an appropriate way in accordance with knowledge economy's logic, according to which, knowledge is incorporated into products and services. In short, value added indicates the power of companies in wealth creation.

Neither revenue nor profit, the basic indicators of industrial economy, do not really show whether and how much value has been created and I would like to demonstrate this with following examples.

Rang	Company	Revenue	Value Added
200	KONCAR-ING.	234.523.170	31.190.413
1254	KONČAR-INSTITUT	55.325.411	31.601.272
184	KONCAR-TRANSFORMES	264.429.731	13.964.793
835	KONCAR-MONTING	58.418.084	13.005.953

We can see four companies, with a considerable difference in revenue (up to five times) but the same value added. In the second table the companies have similar value added but totally different profit (which is also not suitable for establishing a link to real value creation).

Company	Value Added £M	Operating profit £M
Siemens, Germany	24200,9	2423
DaimlerChrysler, Germany	23546,0	1957
Deutsche Telekom, Germany	23296,1	5281

The new concept, which is introduced in this paper, has a number of advantages that, whilst not replacing existing measures, complements them in a significant way. Value added is an objective indicator of business success since output and input, the two categories, which it is derived from, are taken from the market. On the contrary, profit is an indicator that is based on numerous subjective transactions and calculations.

Easy calculation is possible at various levels of business activity, from process inside the company to company units, at company level, regional and national level. This makes value added a universal unit that unites the entire economy. Furthermore, it can be calculated whenever it is necessary and, in accordance with classical business reports, on a weekly, monthly, quarterly and annual basis.

Value added is a measure that reflects employee's and management's contribution to value creation. The use of value added can be an important step in encouraging and involving all employees to make a participative contribution to their work situation and increase wealth, especially if it is linked to a productivity bonus scheme, which can be geared to increase in value added. Even more, management has a precise system to receive feed back on their activities. Higher added value and higher employees' salaries ensure higher dividends for investors – shareholders, taxes (state), and higher investments in further development. Value added, as a measure, unites all participants of economic activity with one goal: creating as much value as possible.

After having obtained the business result, value added, calculation of the efficiency of utilized resources – intellectual and physical/financial capital – is a matter of simple mathematics. The efficiency parameters are received by putting the business result into relation to each of the resources.

First, let us deal with today's key resource, intellectual capital, consisting of two basic components, human and structural capital.⁷

The human capital of a company is represented by its workforce and, in accounting terms, by the expenditures for employees. **In the presented concept expenditures for employees are not part of input any more.** In accordance to this, **employees are** not treated as cost but as investment. The logic behind this is that people invest their knowledge and capabilities whereby their engagement is evaluated through company's activities at the market and reflected in the created value added. I have published this concept in a rudimentary form in my work in 1992, and in the papers published in 1997 and 1998.⁸

We can state the following: as the **quantity of products produced in a certain time unit was a productivity indicator of manual work and manual workers, in the same way represents the quantity of value added**

⁷ With regard to the limited space, it is not possible to deal with structural capital.

⁸ Pulic, A. (1993), Elemente der Informationseconomie, Wien

per invested monetary unit (efficiency of intellectual capital – ICE), an indicator for the productivity of knowledge workers. Therefore it becomes a new key indicator.

In order to gain total insight into the performance of resources in value creation, financial capital is not to be excluded. Although its significance has been diminishing with the rise of knowledge economy its role in value creation can not be ignored. Intellectual capital can not create value by itself. Actually, to be more accurate, business efforts will give optimal results only if intellectual capital is combined with financial capital. This is why information on this resource's value creation efficiency is needed as well.

The sum of both indicators, intellectual and capital employed efficiency gives us an aggregated indicator that shows the overall efficiency of a company in value creation and features its intellectual ability. In simple words this aggregated indicator (VAIC) shows how much new value is created by each monetary unit invested in resources. The higher this coefficient, the better is a company's intellectual capital in creating value for its stakeholders.⁹

What is the benefit of this? We are dealing with two issues that traditional economy did not have answers to.

First, in real economy only the two afore mentioned indicators (value added and efficiency) **show whether value is created or destroyed**. One of the reasons why companies face difficulties today is that managers are not aware of the fact that they might have been destroying value for years until their final break down. This happens because traditional indicators like revenue or EBIT can create an illusion of business success by showing positive trends although value is destroyed at the same time, which becomes visible through the new indicators. This will be elaborated in more detail in the next part.

Second, value added and efficiency of value creation reconnect the micro and macro levels of economy after a long time. This is due to the fact that these measures are equally relevant at all levels of business, from processes and units inside the company to company level, at the level of virtual communities, to city, regional and national economy level. Intellectual Capital Efficiency (ICE) connects the two spheres since both, micro and macro level, are treated in the same way and the same data base is used for calculation.

For example, at national level value creation can be monitored with sectors by determining which sectors are above and which are below national economy's efficiency average. Reasons for the situation have to be found and actions for improvement of weak areas are to be initiated if possible. The same principle applies for the economies of regions within a national economy and companies within a sector.

Another advantage of applying the same measure to all levels of business activity is that companies can receive orientation with regard to their performance related to national or regional efficiency. All of the afore mentioned provides new insights to government administration allowing for a totally new scope of action and a far more efficient management of national and regional resources.

Finally, next to the economic implications, the shift towards value added and the efficiency of resources in value creation has an additional sociological component. For the first time in history, value added and above all, the efficiency of intellectual capital, unites all actors of business activity. Until recently, there were opposing interests of the ones who owned wealth in any form – gold, land, financial capital – and those who worked in creating that wealth – slaves, serfs, blue collar workers. Today, that gap can easily be bridged since creating more value means a benefit for all parties: the employees, managers, shareholders, government. They all unite in a common goal, creating value more and more efficient (in particular if the rewarding system is tied to value creation and efficiency). Therefore, all parties are motivated to know whether their intellectual capital creates or destroys value.

Reasons for the Fall of Productivity

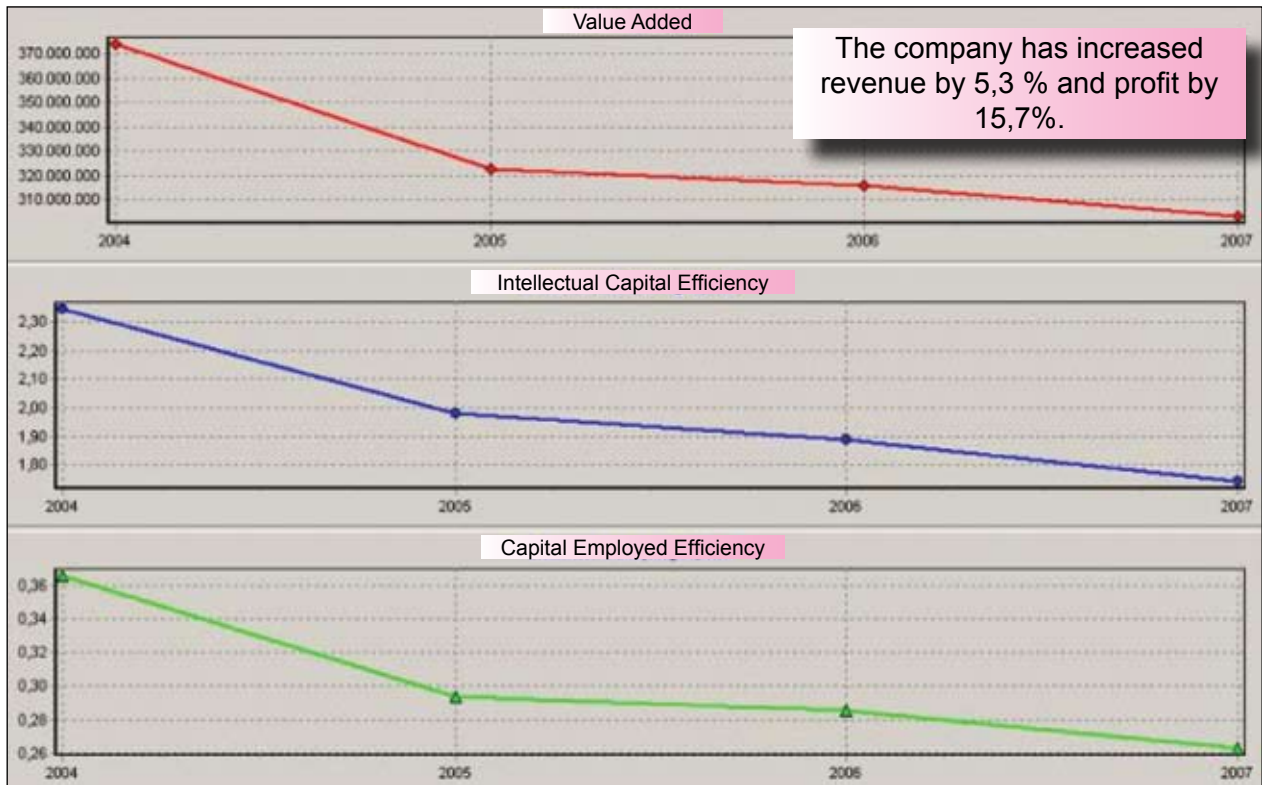
In this part of the paper I will bring up arguments in favour of a new way of monitoring business success and explain the problem of falling productivity in knowledge economy. For this reason it is necessary to focus on the results provided by the two measuring systems: the classical one and the new one, presented in this paper. The main difference between these them is that the first one encompasses and therefore controls only

⁹ Pulic, A. (2000):VAIC - an accounting tool for IC management. Available at: www.vaic-on.net

Pulic, A. (2004): Intellectual Capital – does it create or destroy value?, in *Measuring Business Excellence*, Emerald, Volume 8, Number 1 2004.

financial capital performance and the second one encompasses and therefore controls both key resources, but first of all intellectual capital.

When the data, which has been derived from annual reports is analysed according to **both measuring systems** some illusions can be discarded: at the same time, while promoting positive business results, meaning an increase in revenue and profit, many companies might actually face value destruction in the way that value added and efficiency of value creation are decreasing.



In this example, management's achievement, a 5,3% increase in revenue and a 15,7% in profit, is questionable due to the fact that all new parameters show a falling trend: year long decrease in value (VA), a 50% decrease of intellectual capital efficiency (ICE) and a 38% decrease of financial capital efficiency (CEE). Throughout the world, in numerous companies, many a manager lives and works guided by such illusions.

The usual first reaction of managers, who are confronted with such a situation, is disbelief. They can not believe that the results come from the same database. This is what gives proof that time has come for a change with traditional indicators of business success. Analysing a case of scientific reorientation a renowned historian referred to such transition periods as processes which include "dealing with the same bunch of facts as before just establishing new kind of relationships between them, providing this way a totally different framework".¹⁰ This is what intellectual capital efficiency is about. **The same basic data – revenue, costs – is brought into a new system of relationships, more complex than before, and new results are received, more objective and more appropriate for a new business reality.**

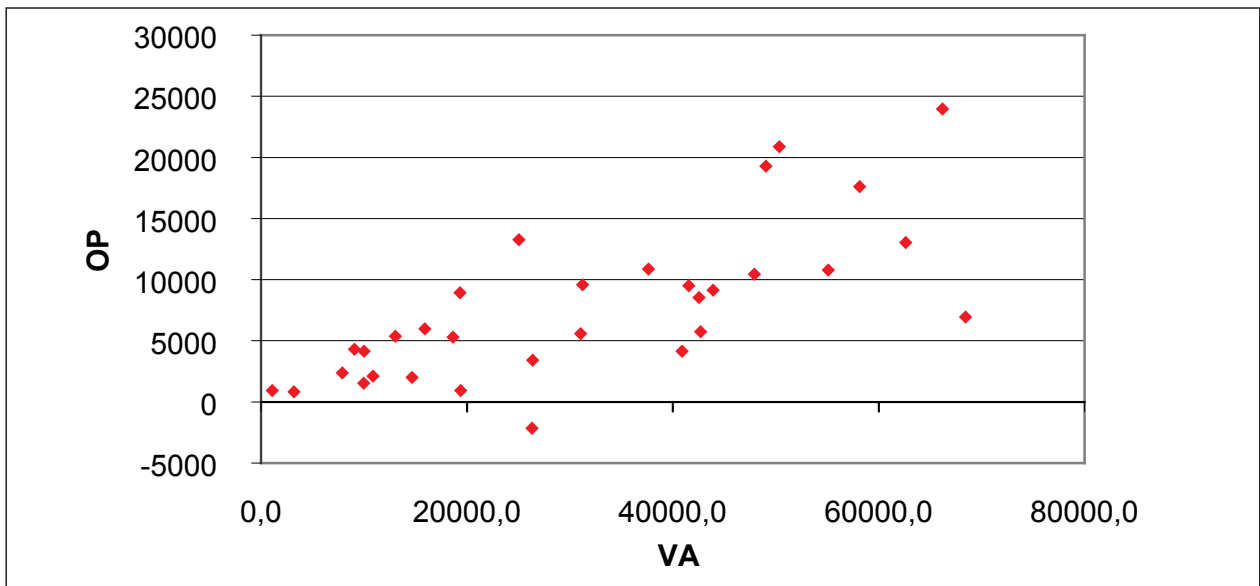
Managers can easily get into trouble by relying on the traditional measuring system only, since they make decisions based on data that is not featuring modern business reality. This illusion is a result of the following paradoxes.

The first paradox, EBIT (operative profit – OP) is in no relation to the created value in the company. Being one of the basic indicators of business success, EBIT is used by many managers in operative decision making. Since EBIT is a consistent part of value added it is to be expected that they are in some kind of interdependent relationship, or, in other words, that a higher value added would result in a higher EBIT.

Empirical analysis, which was conducted at 700 of the largest European companies from 36 sectors, investigating the relationship of VA and operative profit (EBIT) showed the following:¹¹

¹⁰ Butterfield, H. (1949), *The Origins of Modern Science*, London, pp.1-7

¹¹ Value Added Scoreboard, DTI, 2006, http://www.innovation.gov.uk/value_added/downloads/2006_ValueAdded_Data.pdf

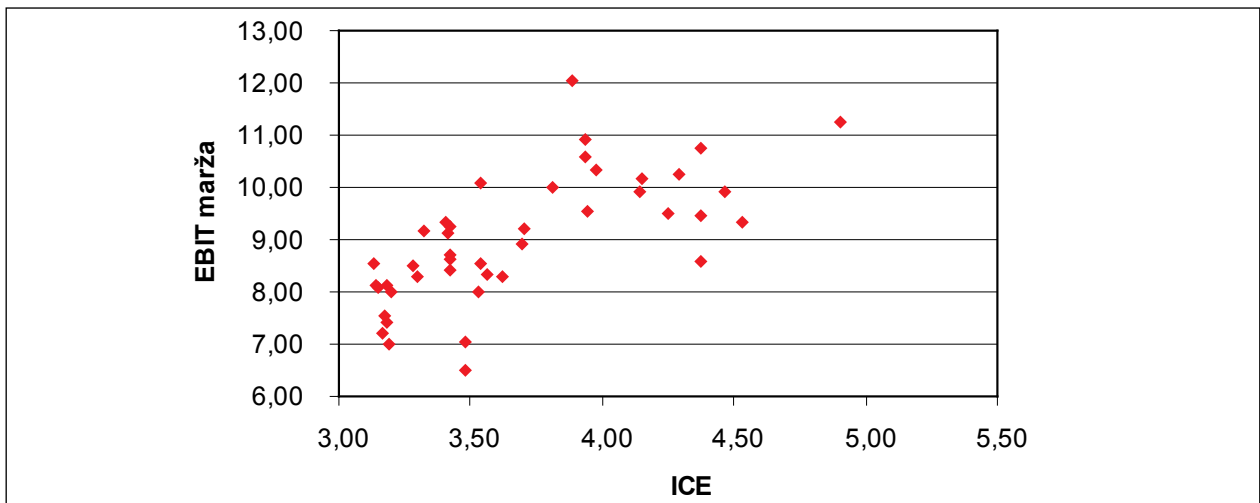


As can be clearly seen, there is no significant correlation between created value and EBIT. **In other words, this means that profits are determined no matter of the value added created.** Hence, company's success is not evaluated on the basis of its capability to create value, but on the basis of calculations that do not have direct connections with value creation.¹²

I have received almost the same result in analysing a big retail company. The analysis encompassed 300 stores, which had been operating for at least three years. The finding was that stores with hardly 500.000 VA and those with over 950.000 VA showed the same EBIT, in this case 200.000.

This empirical research gave way to my main finding: **EBIT is in no correlation to value added** and it does not indicate the capability of companies (or lower units - stores) in value creation. Relying only on that indicator, managers do not make optimal decisions.¹³

The second paradox is that the EBIT margin, which should be reflecting business efficiency, is in no way related to the productivity of resources, in particular intellectual capital.



The graph above shows relation between EBIT margin and ICE. Analysis of 300 stores has given following results:

¹² With all the analysed sectors, there have been only 5 where a close relationship between EBIT and created value added could be found. Those are: mining, chemicals, fixed line telecommunications, nonlife insurance, oil & gas producers. Having the nature of their business in mind this result makes sense since intellectual capital does not have a key meaning there.

¹³ According to reasearch, due to ignorance of IC efficiency criteria, the mentioned retail chain had a fall of value added amounting up to around 7 million € in 2005.

Stores, that had a high EBIT margin, about 9,5%, showed an ICE index in a scale from 3,5 to 5,0. This means that the same margin was found with stores, where 3,5 monetary units were created per one invested unit, as well as those, where 5,0 value added was created per one invested monetary unit (that is over 40% more).

The similar result was received with analysis of stores that had a low EBIT margin – with the same EBIT margin they had 30% range of IC efficiency.¹⁴

With regard to the displayed results I would like to conclude the following: business decisions based on EBIT margin are not reliable since, as shown, it is in no direct relationship to company's value creation and intellectual capital efficiency.

Unfortunately, this shows that many of the good intended efforts of managers, who want to create good for themselves and their companies, actually do not create wealth for the company, or nations as a whole. On the contrary, they destroy value rather than create it.

Now, based on the presented two paradoxes, an answer can be given to the issue of continuing fall of productivity in the most developed countries of the world. These economies have deeply entered knowledge based economy, where intellectual capital is a predominant resource in value creation. However, management of this resource is still based on measuring systems focussing on financial capital only. This way the chance to measure the performance of this vital resource is missed and, furthermore, to manage it in a successful way, herewith influencing efficiency of value creation

Principles of Intellectual Capital Efficiency

“A whole generation of managers refuses to accept reality and oversees a paradoxical decrease of productivity, because people, who own economic power, have lost touch with economic reality.”¹⁵

If productivity has been decreasing for years it is not because it has to be, but it is rather a consequence of business decisions which are being made based on inadequate indicators which do not display the real state of everyday business. In order to change the current state of the art new principles of business efficiency have to be introduced.

1. Intellectual Capital Efficiency has no Limits

In the industrial epoch productivity was limited. It was not possible to create more than it was allowed by the limitative factors, technical and natural ones. Let us take a carwash for example. The productivity of the employees will be determined by the time which is necessary for the machine to complete the job.

In knowledge economy there are no limitations to value creation. When software, movies or similar knowledge-based products are created, the only restraint is the attitude of the customer towards the product.

Therefore it is possible to continuously increase efficiency of value creation depending on:

- clear definition of goals regarding value creation,
- knowledge and capability of management and all other employees in the realization of the goals set.

The ones who will follow the instructions below will certainly and undoubtedly be able to increase continuously their efficiency. The increase will be exactly proportional to the clarity of their vision, which means defining clear goals and the strength in pursuing them.

2. Value Creators are the Presupposition of Efficiency

Today's companies do not need better managers. They need better value creators – individuals who do not only understand organizational processes but also the way of functioning, which enables continuous increase of value added.¹⁶

¹⁴ Cicek, M. (2007), Intellectual Capital in Retail, Zagreb

¹⁵ Glen Richard, Internet Society, <http://www.isoc.org>

¹⁶ Thakor Anjan V., (2000), Becoming a Better Value Creator: How to Improve the Company's Bottom Line - And Your Own, John Wiley & Sons

The existing productivity problems are caused by lack of business imagination in utilizing new possibilities and less due to the optimizing solutions in given circumstances. Therefore, a new manager type is needed, **who will manage value creation, not just people.**

According to Proudfoot Consulting research: The reasons for low productivity have been the same for years: managers do not care enough about unproductive processes. They just do not know what is going on.”¹⁷

This is confirmed by a survey, which highlights that existing productivity problems are mainly a result of poor management and unsatisfying labor control. If bad communication is added as the third reason, then the state of productivity is not surprising. Is it necessary to mention that all those weaknesses refer to intellectual capital management, which is the dominant resource today?

3. Continuous Increase of Value Added

Value creation is the precondition of efficiency. In order to increase productivity of knowledge work the first step is to monitor what is going on with value added.

It is of a great importance to be aware of the fact, that without continuous increase of value added, survival of the company and workplaces is endangered.

There are various combinations that lead to an increase of value added, and all of them are based on various movements of income and costs. Increase of value added can be achieved if income grows faster than costs or if the same income is achieved with lower costs. A third possibility is that income overgrows costs. As for other combinations, they do not require great mathematical skills.

In order to ensure continuous growth of value added the following factors are of crucial importance:

Innovation – enables continuity in increasing the knowledge content of products/services. As said before, in contemporary economy building in of knowledge into products and services (but also in all other business activities) is a vital activity, which makes innovation a basic requirement for market survival. Continuous innovation is nothing else but implementation of new knowledge in order to ensure continuous growth of value added.

If that can be done then all the presumptions for market domination are given. Thorough analysis of market position (benchmarking) has to show where the company is positioned in relation to its competitors in order to ensure leadership and the necessary quantity of output.

Continuous investment in developing employee’s competences, meaning their knowledge and capabilities. Employees are the carriers of knowledge, which is the crucial substance of products and services. Hence, this substance has to be continuously improved in order to provide new results.

By following the above, results in continuous growth of value added are likely to be achieved and thus a safe future of company and workplaces ensured.

4. Efficiency in Value Creation

Creating value added is not enough; it has to be done efficiently as well. Efficiency means creating more and more value with one invested monetary unit in utilized resources – financial and intellectual capital. In the old times productivity meant producing more and more physical units in a certain period of time, today we can see productivity as producing more value per invested monetary unit in each of the resources.

This means that for each sector average efficiency can be calculated in order to provide orientation for companies. For example, let us take that average intellectual capital efficiency in retail is 2,15. Companies below this efficiency have a very specific goal: do whatever they can to achieve sector average. Others have to focus on retaining the leading position with regard to value creation efficiency. It is a huge advantage that one strong criterion has been introduced that indicates their market position.

What is gained by this? A realistic new system is introduced that brings order into business, similar to Taylor’s system of manual work improvement. The introduction of time, as criteria for manual work operations, provided a base for productivity increase in those days. Similar to that today, the criteria of value

¹⁷ Financial Times Deutschland, 5.1.2008.

creation per invested monetary unit – intellectual capital efficiency – is introduced providing a base for productivity increase of knowledge workers.

5. Increasing the Level of Intellectual Capital Efficiency

As much as it is important to monitor value creation, it is vital to take care of the efficiency of resources utilized in business. Herewith, the **relationship between the created value added and intellectual capital (human and structural)** is of decisive importance. In order to receive a general overview of productivity at all levels (processes, units, companies, regions, nations) parameters are provided:

Efficiency Description of efficiency levels

- 2,50 (Or more) is a sign of very successful business performance. This result is mainly received by companies from hi-tech businesses and other conjunctive sectors. This is the lowest level of efficiency that can really ensure safe business and workplaces.
- 2,00 This is a minimum for efficient business performance in most sectors (enough value is being created in order to cover for employees' salaries, amortization, bank interests, taxes, dividends to shareholders). Enough is left for intensive investment in development.
- 1,75 Business is in relatively good shape but does not guarantee long term safety. All liabilities are liquidated, however, there is not enough for business investments and therefore future business success is uncertain.
- 1,25 Worrying – survival of company is endangered – not enough value is created to ensure business development. Some inputs are not covered, as well as some liabilities towards stakeholders.
- 1,00 Much worrying, on the edge of the survival – OUTPUT is insufficient for covering all inputs necessary for operational business – with this efficiency only labor expenses are covered. In case that efficiency is below 1, then not enough value is created to cover obligations towards employees.

6. Control of Value Added and Efficiency

The process is a group of tasks, where it is possible to trace precisely how much value it creates. Creating new products or services includes various activities that are realized through processes. In some of them value is created and in some it is destroyed. **Therefore, it is important to have insight into the contribution of each process to value creation and efficiency, both, short and long term.**

In order to find out the efficiency of intellectual capital it is necessary to identify the processes that destroy value, which are the ones that work below company's efficiency average. Possible causes have to be found and eliminated if possible. This should become a key activity in all companies and I think that it is impossible to lead a company without such insights.

Therefore, thorough and continuous control of value creation is a must. This is not just a talk, but an ongoing task, even a mission. In order to increase value creation of the company successfully it is necessary to determine how much value is created in each process and, if possible, for each workplace. It is the only way to get an idea of company's weak and strong parts.

Even if a company creates value successfully at company level there are units, where value is destroyed. Here we do refer to general jobs such as accounting or HRM. These departments have a supporting function to the core activity, and therefore need to be related to value creation. It is of a crucial importance to locate company parts, which are focused on core business activities but destroy value. It is here that improvements have to be done first. This way, by controlling value creation in processes, knowledge based business is possible.

This is not only true for current business. It is of no less importance to control the effects on value creation caused by decisions on key issues. This means that each action, primarily by management, but other employees as well, has significant influence on company's value creating or destroying ability. Analysis of management's decision making and its impact on value creation has to become an important part of the decision-making process.

If these conditions are not met, we talk about value destruction. The following situations are signals warning of possible problems in current business:

- fall of value added in relation to the former period,
- fall of value creation efficiency,
- efficiency that is below the average of the environment, companies' and national.
- increase of value added which is lower than inflation.

The first alarming signal is a decrease of value added in relation to the former period. If value added inside the company is monitored on a continuous basis it is less probable that top management will be taken by surprise. Even if such a situation occurs management should do its best not to let it continue for a longer time period.

It is important to stress that not each decrease is a tragedy. For example, due to certain investments, a fall of efficiency could happen and is completely normal. Since returns on investments can be expected decrease will surely not last for long in such a case.

A fall of value creation efficiency in relation to former periods, e.g. the previous year, means value destruction as well. A certain efficiency level tells us how much of the resources – intellectual and financial capital – are needed in order to create a certain mass of value added. Basically, that level is determined by companies', sectors' or national economy's average efficiency level. A fall of efficiency below that level means that more resources had to be engaged in order to create the same mass of value added.

For example, let us take a situation where average intellectual capital efficiency is 3,15 on company level. Each company consists of organizational units, subsidiaries or similar entities. Efficiency results of each one generate average company's efficiency. This general, average efficiency, is only a result of the units below and above average company's efficiency. All units that operate below the average efficiency actually destroy value. Reason: they use more resources to create a single unit of added value than it is necessary on the company level.

One other way of destroying value is efficiency that is below average of the business environment. Let us take the former example, a company with average efficiency of 3,15. If the productivity of IC in that sector is 5,50 (like e.g. in telecommunications) then the mentioned company is destroying value as well since it is performing below sector average. The reason is the same: more resources have been utilized than it is average in that sector.

7. Continuous Elimination of Value Destruction

In order to keep the business productivity increasing, control of intellectual capital efficiency is necessary, starting at business processes that destroy value. Experience has shown that solving problems is less a problem than detecting the areas, where value is being destroyed. After such analysis, some of the companies were truly surprised to find value destruction in those company units, which were classified as successful before.

Creation of any product or service requires manifold activities. Some of them add to value creation some do not. It is very important to know what each activity is doing with regard to value creation, short and long term. Only because a company creates value as a whole it does not mean that there are no units/parts where value is not destroyed.

Improvement of business processes where value is destroyed leads to an increase of efficiency in critical parts of the company as well as of company's total efficiency. Value creation efficiency or inefficiency of each unit transfers to total efficiency of the company. That is valid for all levels of business (from the business processes to the national and global economy).

8. Efficiency Remuneration

Intellectual capability is based on the potential of employees. Their knowledge and capability transformed into value at the market are the fundamentals of contemporary business and will be in the future as well. It is therefore of utmost importance to exactly define the remuneration which the employees ought to receive for their intellectual efforts.

In the past that was dependent on two factors: the time spent at work and the quantity of physical output. Today, that is not valid any more since individual and group value creators (the knowledge workers) have

entered the scene. Therefore, remuneration has to be based on the capability of individuals to firstly create value, and secondly, to do it efficiently.

The principle “as much my work contributes to value creation and increases efficiency” would be a fair criteria for remuneration of employees and management.

This criterion is actually in use today, in the form of employees’ participation as shareholders, especially in high-tech businesses. However, only a small number of employees is encompassed by this way of remuneration. Therefore this practice should be expanded to all work places where it is possible.

Conclusion

The presented principles shall be used for elimination of all kinds of losses, which might occur at all levels of business activity. If non efficiencies are spotted they can be removed with help of the principles and there is no company that could not increase its efficiency and thus contribute to more efficient national economy by applying them. How come this can be claimed with certainty? Because now, causes for inefficiencies can precisely be pin pointed by recording in which way they diverge from one or more listed principles.

As Frederick W. Taylor introduced control of movement and time necessary to perform manual work at the beginning of 20th ct., now, at the beginning of 21st, the approach described in this paper, introduces control of value creation and efficiency, not only with company units but also within a national economy.

Owners (in any form, state, shareholders, funds) are the ones who will face the challenge first: they now have instruments to control management. Calculation of average efficiency on national or sector level is used as a base for benchmarking of all companies. Under such conditions, the mode of ownership is not important any more. What is important? It is enough that the owner determines the level of efficiency management ought to achieve.¹⁸ This might not suit many managers but it is the only way to increase productivity.

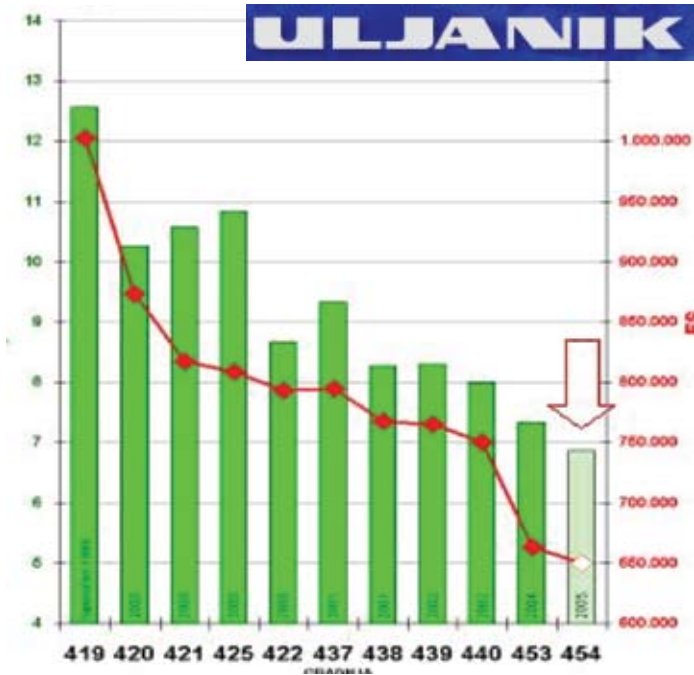
We have to start accepting the fact that economy has faced a Copernican change, based on a totally new worldview and occurring events. For a long time people believed that the sun was circling around the earth and that was the accepted reality. No one even doubted that something could be wrong with that notion until 500 years ago, when Copernicus provided a totally different explanation – the earth is circling around the sun. This shift in world view was not caused by a change of natural flows – the movements of the planets were the same all the time – but due to **a new interpretation of existing reality**. And this is what we are doing now, interpreting existing economic reality of companies and national economies in a new way, by introducing new principles of intellectual capital productivity.

In the end I will repeat one more time: it is impossible not to increase efficiency of value creation if everything said in this paper is done. The advantages and benefits, which arise from it will make everybody happy: the employees who will be able to keep their jobs with their families, the shareholders, because they will achieve the goal of their investments, the state, because it will have more money for social and other programs, management, because it was successful in fulfilling its business and social function. In short: continuous increase of value creation efficiency leads to individual as well as wealth of nations.

¹⁸ In particular, this is crucial with state or para state owned companies. For the past decades, there has been a story going on, that these companies can not be efficient (profitable), since the state is a bad owner. Although there are many examples that this does not have to be true, now the alledged reasons cease to be valid. The state, as any owner, can require a certain efficiency level for all companies it owns, depending on the sector and market position.

APPENDIX 1.

The Efficiency by the Application of Principles of IC Efficiency Shipyard ULJANIK

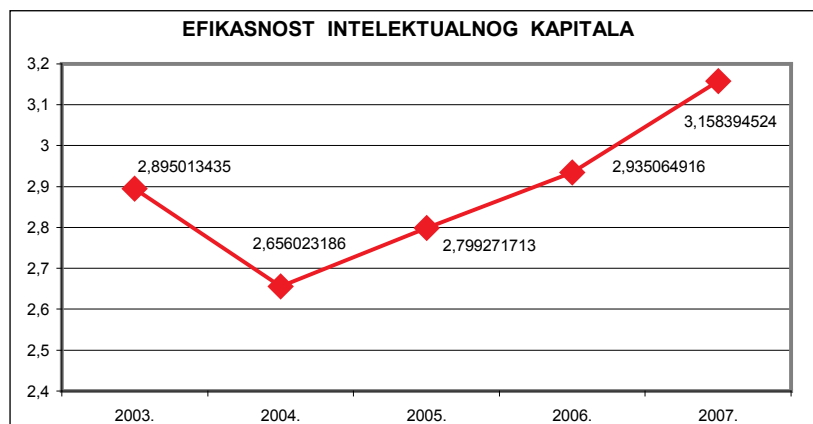


From: 2000 – 2005:

- the time needed to build a ship has been reduced by 54% (green columns)
- reduction of effective working hours by 65% (red line)

«The case study of our company indicates that by applying the principles of intellectual capital efficiency, combined with the application of the VAIC™ methodology – which helps to visualise the intellectual ability of the whole system and the processes - as well as by using the knowledge, the talent and the creativity of our employees, it has been possible to achieve continuous improvement of business results.»

Dr. Klaudio Tominović
Director of Intellectual capital



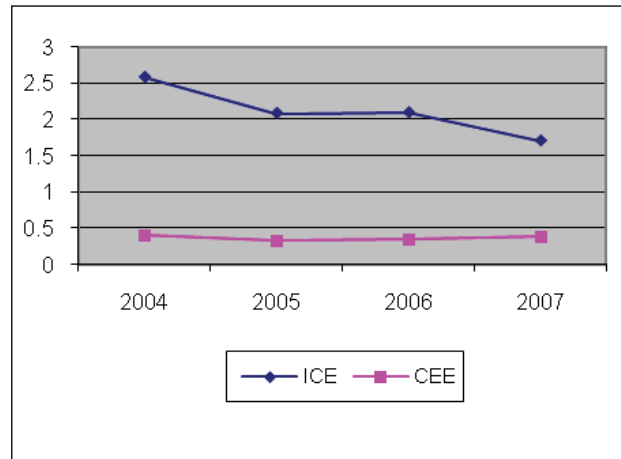
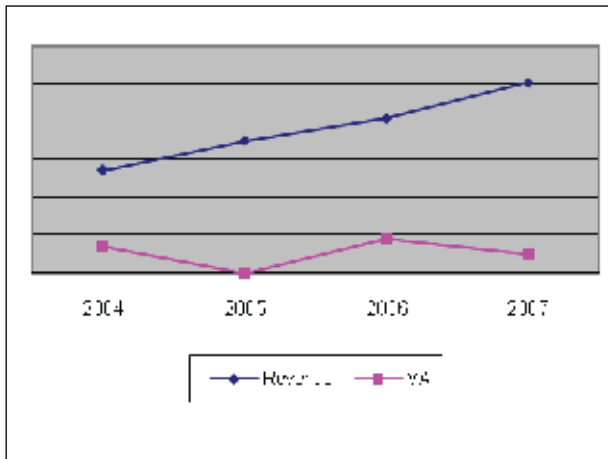
“The principles have opened new perspectives and helped us to increase value added of our business processes. This concept has enabled us to control value creation and efficiency in all of our 23 profit centers. This way, we have been able to increase business efficiency year by year. The principles have proved to be of great benefit to CEO and management. Of course, just for those who are capable of coping with reality, no matter how positive or negative it is.”

Predrag Mikulčić, CEO

APPENDIX 2.

The Loss by Ignoring Principles of IC Efficiency

Example 1: ERICSSON NT – Croatia



Although revenue keeps increasing continuously, value added oscillates

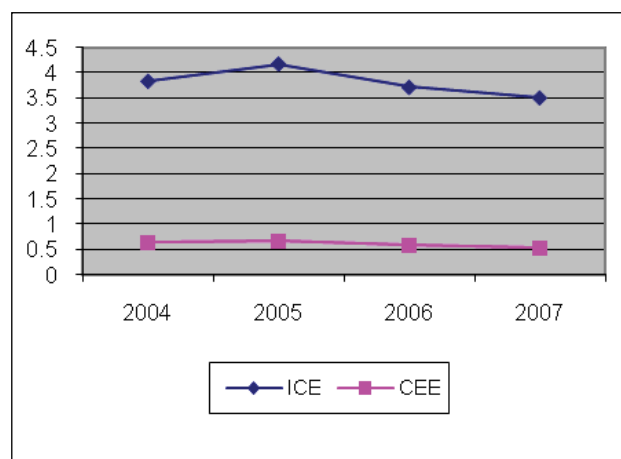
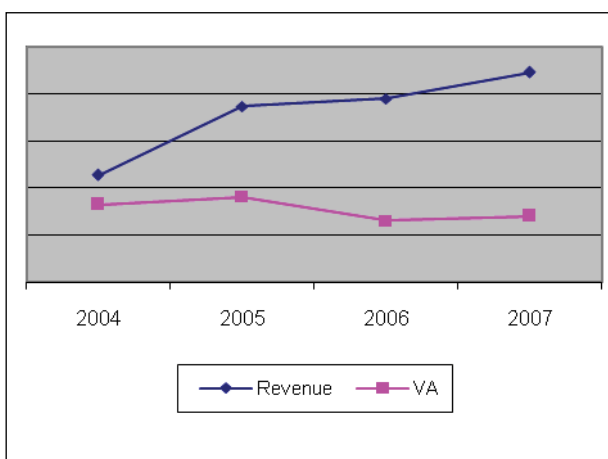
In 2004 at each € invested in employees more than 2,5 € value added was created. In 2007 only slightly above 1,5 €, one € less than four years ago

Or, even more specifically:

in 2004 investments in employees:	35.428.877 €.	Value added was:	91.812.545 €
in 2007	52.132.778 €		89.252.508 €

Loss due to fall of IC productivity was: 45.771.372 €

Example 2: InBev Croatia - world's leading brewer



In this case the trends of revenue and value added diverge.

In 2005 at each € invested in employees more than 5 € value added was created. In 2007 value creation was 3,5 € per 1 € invested in employees .

Or, even more specifically:

in 2004 investments in employees	12.381.861 €.	Value added was:	53.556.077 €
in 2007	14.363.346 €		50.689.171 €

Loss due to fall of IC productivity was: 8.932.008 €

APPENDIX 3.

The Calculation of Value Added and Intellectual Capital Efficiency

1. The business result is value added, which is calculated as the difference between output and input. The basic definition is as follows:

$$VA = OUT - IN$$

Where: VA = value added for company

OUT = total Sales

IN = cost of bought – in materials, components and services

Value added can be calculated from company's accounts as follows:

$$VA = P + C + D + A$$

Where: P = operating profit

C = employee costs

D = depreciation

A = amortisation

2. Human capital efficiency is received as a result:

$$HCE = VA / HC$$

Where: HCE = human capital efficiency coefficient for company

VA = value added

HC = total salaries and wages for company

3. Structural capital, as the second component of IC is calculated as following:

$$SC = VA - HC$$

Where: SC = structural capital for company

VA = value added

HC = total salary and wage duty's for company

4. Structural capital efficiency (SCE) is calculated in the following manner:

$$SCE = SC / VA$$

Where: SCE = structural capital efficiency for company

SC = structural capital

VA = value added

5. By adding up the partial efficiencies of human and structural capital the Intellectual Capital Efficiency (ICE) is obtained:

$$ICE = HCE + SCE$$

Where: ICE = intellectual capital efficiency coefficient

HCE = human capital efficiency coefficient

SCE = structural capital efficiency coefficient

6. Capital Employed Efficiency is calculated in the following manner:

$$\text{CEE} = \text{VA} / \text{CE}$$

Where: CEE = capital employed efficiency coefficient
VA = value added
CE = book value of the net asset for a company

7. Until now the formulas for the value creation indicators have been presented, but in order to enable comparison of overall value creation efficiency all indicators need to be added:

$$\text{VAIC}^{\circledR} = \text{ICE} + \text{CEE}$$

Where: VAIC[®] = value added intellectual coefficient
ICE = intellectual capital efficiency coefficient (HCE + SCE)
CEE = capital employed efficiency coefficient

This aggregated indicator indicates the overall efficiency of a company and indicates its intellectual ability of value creation. In simple words VAIC indicates how much new value has been created per invested monetary unit in each resource. The higher this coefficient the better the company's intellectual capital, which creates value more and more efficiently.

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