

Connections among CRM, Cloud Computing and Trading Income of Selected Companies

Jan Němeček, Lucie Vaňková

Abstract — This article is focused to time period 2007-2010. It was time before and during the economic crisis. In this article the readers can find how the selected companies doing business in the Czech Republic are using information technology and business strategy Customer Relationship Management (CRM) and how it have impact to the Trading Incomes. This article also found the answer to the question whether the companies use complete solutions of CRM as purchase and installation of software or whether they use the CRM system only as part of services which are provided through Cloud Computing technology. Also there try to find connections between implementing CRM and Trading Income of companies. Apparently also because of ending of the economic crisis is CRM in the Czech Republic beginning more use. The main goal of implementing CRM is to help to company increase quality of relationship and communication with customers. In this article there are described types of Cloud Computing and most common definition of CRM. The analysis of using of CRM and Cloud Computing in the selected companies, which are grouped by number of employees, is described, too. After that it is comparing Trading Incomes of companies grouped by number of employees. At the end of this article is summary of analysis results and assumptions and found contributions of CRM and Cloud Computing.

Keywords — Business Strategy, Cloud Computing, CRM, Customer Relationship Management, Information Technology, Trading Income.

I. INTRODUCTION

Cloud Computing belongs to topics, which have recently influenced information technologies (IT). It is not only a marketing term. Thanks to its development and support from important companies in IT industry, it comes as new model of providing IT services. On one side there are providers, who have new business opportunities, and on the other side are users, who have the opportunity to decrease costs and take advantage of better quality of IT services.

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Recently when majority of companies are still dealing with impacts of the economic crisis, new solutions, how restructure the company and keep customers, are being searched. There are a lot of options. This article deals in detail with utilization of technology and business strategy Customer Relationship Management (CRM) in a company together with possibility to use of Cloud Computing services. Also we try to find connections between implementing CRM and Trading Income of companies doing business in the Czech Republic. We focused to Trading Income of selected companies in time period before the economic crisis and time period during and after the economic crisis.

II. CLOUD COMPUTING AND CRM

A. What is Cloud Computing?

There exist many of different definitions of Cloud Computing. In general is with this term connoting a service provided by the Internet network, which is used by subjects for running their information technologies (IT). In business environment companies are not investing in their IT infrastructure, they are hiring the Cloud Computing providers, who are taking care of companies' IT. These services are mainly processing power, storage and business applications. Types of Cloud Computing are distinguished by provided services. Most common model is Software as a Service (SaaS).

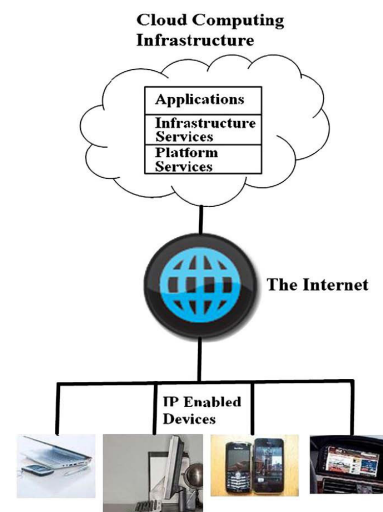


Fig. 1: Scheme of Cloud Computing Model – How can be approached to different processing resources in a Cloud (software applications, an infrastructure, a platform) from different devices through the Internet. Source: [1].

Part of Enterprise Resource Planning (ERP), which is provided by this model, is CRM.

One of the Cloud Computing definitions, which summarized more business aspect, is as follows [1]: "This is a new model of information technology services, where services (hardware and software) are provided on demand to customers through the network independently of the terminal device and location. Users pay for services used, such as operating costs, without requiring significant initial capital expenditures".

B. Types of Cloud Computing and Its Benefits

From beyond mentioned examples is evident, that Cloud Computing comprise many of varied services, which encompass all parts of company's IT. According to the types of services, which are offered, is possible to distinguish following categories and types:

- IaaS - Infrastructure as a Service - A provider of Cloud Computing services is committed to provide the infrastructure. It is a hardware (HW) hiring (servers are typical). A customer is using the infrastructure and is not taking care about maintenance.
- PaaS- Platform as a Service - A provider is hiring not only the platform, on which the application is running, but also complete resources to support whole life cycle of the application creation.
- SaaS - Software as a Service - It is the most common Cloud Computing model. The idea „Software as a Service“ is not new. It is a successor to Application Service Provider (ASP) [5]. A customer is not buying any software, but hiring it as a service from a provider. The provider offers the application and the needed infrastructure. The customer pays for the use of the software as a subscription. So there is no investment in the application, no maintenance, just use of the application by the Internet.

Here are mentioned some examples of use of Cloud Computing:

- Google for e-mail, working with text, tables and data saving,
- Yahoo and Microsoft Hotmail for e-mail services,
- Zoho for spreadsheet applications,
- Mozy for online backup,
- Picassa for sharing photographs,
- YouSendIt for files transfer,
- HealthVault from Microsoft for saving medical records,
- Facebook, LinkedIn, MySpace for social network,
- YouTube for sharing videos.

Among the main benefits of Cloud Computing are followings [4]:

- no need of any big investment to HW, SW or infrastructure,
- no need of any software maintenance,

- minimum work for an administrator,
- it is one central solution, which can be the substitute for several solutions at once,
- no dependency on platform,
- it is user friendly,
- user pays what really uses,
- there is not a HW lifetime period limit,
- this approach is also better from the point of view of environmental impact.

C. What is Customer Relationship Management (CRM)?

What is Customer Relationship Management and what to expect from CRM? According to research GAČR "Evaluation of the benefits of advanced technologies" [6] conducted in the years 2008 to 2009 the company expected in particular to increase product quality, increase efficiency, retaining existing customers, improve communications with customers, identifying and predicting possible future demand and also to gain new customers and improve market competitiveness.

How is defined CRM? According to the available literature is not entirely uniform definition. For example, Scott Fletcher defines CRM as "a set of ideas and enterprise business processes, which have a direct impact on addressing, contact and customer retention, in the areas of marketing, sales and service" [13]. According to Schneiderman [7] is the CRM not only technology and information system, but also a business strategy focused on understanding our customers and based on anticipating the needs of current and future customers of the company.

Österle [8] defines CRM as an alternative to increase turnover and profits of the company through the coordinated integration of all business contacts with its suppliers, business partners and customers. Storbacka defines CRM as follows: "CRM is an interactive process aimed at achieving the optimum balance between corporate investments and meeting customer needs. Optimum balance is determined by the maximum gain of both parties "[9]. A little bit more concise definition is from Lawrence Handen: "CRM is the process of addressing, maintaining and further developing relationships with profitable customers" [11].

From the Czech definitions of CRM let us mention probably the best known definition by Dohnal: "CRM is comprised of employees, business processes and technology IS/ICT in order to maximize customer loyalty and consequently the profitability. It is part of corporate strategy and as such becomes part of corporate culture. Technologically CRM systems are using more potential and possibilities of the Internet" [10].

It is clear that CRM have not yet uniform and consistent definition. From the questionnaires mentioned GAČR research in which CRM was included as one of the possibilities of advanced technology showed that management of companies are thinking under CRM only information system. These systems provide on the market mainly

Microsoft, SAP, Oracle, IBM and Dakota [14]. Analyzing and comparison of their IS CRM solutions will be the subject of further research.

CRM is not only the information system (IS). High quality IS is only one of CRM components. CRM is mainly a business and marketing strategies, including methodology, which aims to acquire customers in the company to keep, identify their needs, requirements, and consumer shopping behaviour and develop long-term relationship with him. From these customers the company have long-term benefits. This creates a lifelong customer value for the company (Customer Life-Time Value [15]). It includes not only what the customer brings us today, but what the customer can bring for the whole future collaboration (relationship).

D. Why the Cloud Computing is Suitable for CRM?

As the most comprehensive and the most advanced model of Cloud Computing is considered the SaaS model. This model provides complete functionality to address specific needs of companies. Although the most typical applications using a model of Cloud Computing include e-mail or other communication tools such as web, video or office suite, this SaaS model is currently the best approach to automation for Customer Relationships Management through CRM systems. Given that CRM is tied directly to servers or personal computers and is available on the Internet users need only a web browser to be able to utilize the full functionality. This means that users of CRM can achieve full productivity even when they are travelling at business way and business processes become more mobile.

Important benefits of Cloud Computing are lower costs. CRM software, which is used by Cloud Computing, is available on the Internet or on the server. Users using CRM software it really do not own. It is not stored in their personal computers. They do not know how the program works because it is not installed. They are using it only through the web browser. Significant savings are achieved in the initial investment into the hardware and software. It is also significant cost savings in the cost of whole system maintenance, staff training and load internal IT staff.

Rental of the software means that the company does not need to buy CRM application and do not need to install it on every computer in the office or to keep it up to date. The interface is operated in the web browser and is very intuitive. Because it is a dynamic service all expenditures are under the control. Companies pay only for the computing capacity and storage that is actually used. That is the main difference between the Cloud Computing and outsourcing, which pays for a predetermined, agreed volumes of data and services.

Cloud Computing is not a solution for each company, but many companies can actually benefit from the use of computing services, for example commercial banks [22]. The use of Cloud Computing can provide their users the same quality of service as in the case that the company invested into external software and servers for storage and search of

information. In fact, Cloud Computing generally allows to organizations to manage their data and information more effectively and enables it to provide better customer services. The advantage of Cloud Computing is also easy and quick option to enable CRM.

However, it is necessary to consider the disadvantages of Cloud Computing model in companies. Among the main ones are limited to customization. For example, there are limits for changing screens, add fields, user interface, etc.. Other examples of disadvantages of Cloud Computing model are limited integration with other information systems in the company and storage of very sensitive company's data in service provider's servers outside the company.

III. METHODOLOGY AND AIMS OF RESEARCH

A. Research Methodology

We had a specific-project scientific research that we made analysis by comparing Trading Income and Overall Turnover for the accounting period of selected companies with implemented information technology and business strategy Customer Relationship Management (CRM). This project used data collected from questionnaires obtained during the GAČR research [6]. More relevant information about this research was published in [18]-[21]. In this specific project was part of research and subsequent analysis focused on comparing of selected companies, which responded in the questionnaire that CRM have implemented, with companies which responded that CRM have not implemented yet. Detailed results of these surveys are published by Němeček in the Journal of Competitiveness [16] and in the conference proceedings [17] and [23]. Subsequently by consulting with management of companies with the implemented CRM it was investigated whether the companies are using CRM through the Cloud Computing services or whether they have purchased and installed the software with the completed CRM solution. After this were data compared with Trading Income of these selected companies in time period before the economic crisis and during the economic crisis.

B. Aims and Assumptions

The aim was to ask the management of companies doing business in the Czech Republic with the implemented CRM and determined whether are using CRM software as part of services Cloud Computing technology or not and comparing with Trading Incomes.

The first assumption (A1) was that small and medium-sized companies have tendency to buy completed CRM software solution.

The second assumption (A2) was that large companies have tendency using CRM software through the Cloud Computing services.

The third assumption (A3) was that the companies which had implemented CRM before the economic crisis (in year 2008 or earlier) had better Trading Income during and after the economic crisis than companies without implemented

CRM before the economic crisis (in year 2008 or earlier). They implemented CRM during or after the economic crisis in years 2009-2010. Also was needed to found their actual financial results.

C. Composition of the Sample of Companies

The extensive questionnaire survey carried out in the GAČR research [6] were questions about the using CRM. Total of 131 companies received questionnaires sent back completely filled. Total of 29 from 131 answered question about the using CRM. From these companies 22 companies expressed that CRM have implemented in the company in years 2007-2008 and 7 companies expressed that do not using CRM but are thinking about its implementing in the near future.

For purposes of further analysis the companies were divided according to their size expressed by number of employees. You can see it at the following Table 1.

TABLE I
DIVIDING OF COMPANIES BY SIZE

The Number of Employees	The Number of Companies	The Number of Companies with CRM in Year 2009
1-100	11	9
101-200	8	6
201-400	5	4
401 and more	5	3
<i>Total Number of Companies</i>	29	22

Source: Own processing.

Subsequently it was necessary to find more actual information about these 29 companies. Especially find contacts to the competent persons from the IT department and actual records about Trading Incomes of companies in years 2007-2010. This was accomplished by searching in a database of companies Creditinfo [12] and on the websites of companies. Then these people during February to April 2011 were approached. First contact was through electronically way and if it was necessary second contact was through the phone call. Obtaining this information was extremely difficult. Addressing representatives of companies from the IT department was usually referring to business secrets. However, after consultation with the management of the company and guaranteeing the anonymity of the results the IT employee answered the questions and agreed with the subsequent processing.

IV. RESULTS OF RESEARCH

For a better overview was created the Table 2 with the results. It showed that all 7 companies, which at the time of the survey within the project GAČR [6] in years 2008-2009 only considered about implementing of CRM, it

in year 2011 despite the economic crisis really CRM implemented.

The research showed that addressed companies, which in previous research in years 2008-2009 [6] have expressed that CRM have implemented or are planning to implement it, were very satisfied with the implementing of CRM. Expected results as for example increasing the number of permanent customers and savings of managing their customer database have been satisfied.

TABLE II
COMPANIES WITH PURCHASED CRM SOFTWARE AND WITH CRM THROUGH CLOUD COMPUTING SERVICES

The Number of Employees	The Number of Companies with CRM in Year 2011	The Number of Companies with Purchased CRM Software	The Number of Companies with CRM through Cloud Computing Services
1-100	11	11	0
101-200	8	7	1
201-400	5	2	3
401 and more	5	1	4
<i>Total Number of Companies</i>	29	21	8

Source: Own processing.

Of those obtained results of selected companies (see Table 2) were confirmed established assumptions (A1 and A2). The first assumption (A1) that small and medium-sized companies have tendency to buy and use complete ready software CRM solution, was confirmed. Small and medium-sized companies with the number of employees from 1 to 100 and from 101 to 200 used during the implementation of CRM only the software solution. Most occurred was products Microsoft Dynamics CRM and Oracle CRM. However addressed companies had not the newest versions of these products. Using older versions and slowing recovery software and hardware are the small and medium-sized companies trying to save on costs for their IT.

In large and larger companies with number of employees from 200 to 400 and from 401 and more were showed a tendency rather to use CRM within complex IT services through Cloud Computing technology. This confirms the second assumption (A2). Was used mainly SAP CRM with other SAP products. This solution large company decided to use due to effort to reduce the cost of their hardware and software IT infrastructure in time of economic crisis. Thanks to the Cloud Computing services have large companies versus small and medium-sized companies benefit from the latest versions of software and cheaper operating of hardware.

For a better overview of analyzed Trading Incomes of selected companies and for confirm or unconfirmed the third assumption (A3) were created graphs 1-4 (Figures 2-5).

The surveyed companies implemented CRM but due to the economic crisis in years 2009-2010 their Trading Incomes increased less than was expected. The most of the surveyed companies declined Trading Income during the economic crisis years compared to non crisis year 2007.

Readers who are interested in further details about the analyses of CRM systems and business strategy CRM are advised to look at researches by Němeček [15], [16] and [23], where are comparing Overall Turnovers and Trading Incomes of selected companies in the Czech Republic depending on implementing technology CRM.

Decline of their Trading Income was caused by the economic crisis and by the subject of business – secure of buildings. The remaining companies with implemented CRM before the crisis had better financial results during the economic crisis than the companies which were implementing CRM during the crisis years 2009-2010. These small-size companies were very flexible during the economic crisis and most of them had positive financial results. None of the small-size companies is using CRM within complex IT services through Cloud Computing technology.

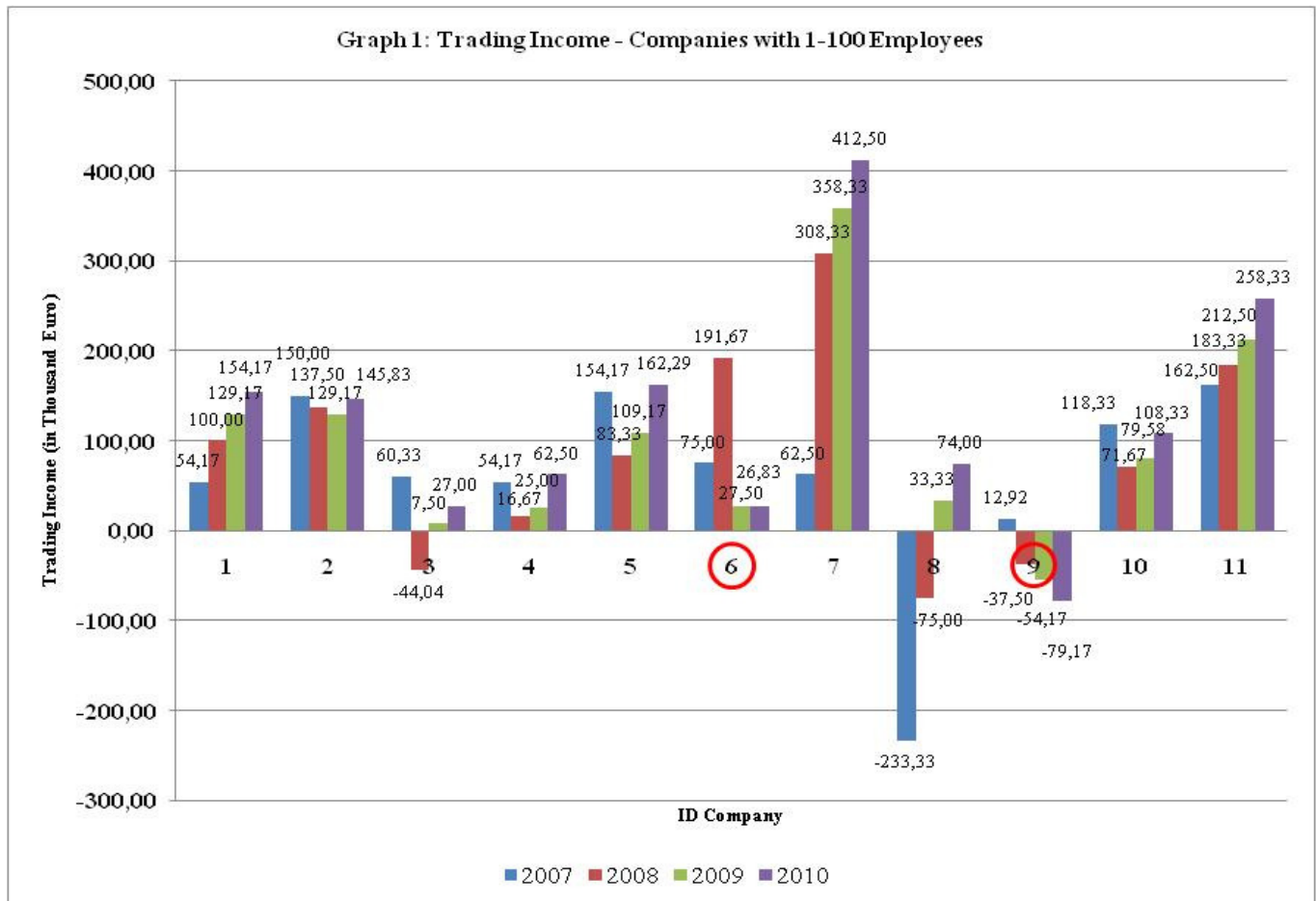


Fig.2: Graph 1 with Trading Income of Selected Companies with 1-100 Employees.

Source: Own processing.

In the circle is company which implemented CRM during the economic crisis.

In the square is company which is using CRM within complex IT services through Cloud Computing technology.

In the Graph 1 (Figure 2) are Trading Incomes of the selected companies with number of employees from 1 to 100. There are marked by circle the companies with ID number 6 and 9. These companies in the questionnaire indicated that they did not implement CRM before the economic crisis (in year 2008 or earlier). In the company number 6 had declined Trading Income in year 2009. It was caused by the main subject of their business – telecommunications and repairing the mobile phones. In the company number 9 had economic crisis huge impact.

In the Graph 2 (Figure 3) are Trading Incomes of the selected companies with number of employees from 101 to 200. There are marked by circle companies with ID number 15 and 16. These companies in the questionnaire indicated that they did not implement CRM before the economic crisis (in year 2008 or earlier). In these companies were significant impacts of the economic crisis during the years 2009-2010. These companies compared to the companies with implemented technology CRM before the crisis was not able to increase their Trading Incomes

in the year 2010. It could be caused by worse communication with their suppliers and customers during the economic crisis. The companies with implemented CRM before the economic crisis were able to have standard and good communication with their suppliers and customers and were able to quickly make new contracts in the year 2010. Company number 12 marked by square is using CRM within complex IT services through Cloud Computing technology.

In the Graph 3 (Figure 4) are Trading Incomes of the selected companies with number of employees from 201 to 400. There is marked by circle company number 22 without implemented CRM before the economic crisis (in year 2008 or earlier). Because of the economic crisis this company had significant losses in Trading Income and was near the bankruptcy. For this company it could be recommended implementation CRM before economic crisis. Main subject

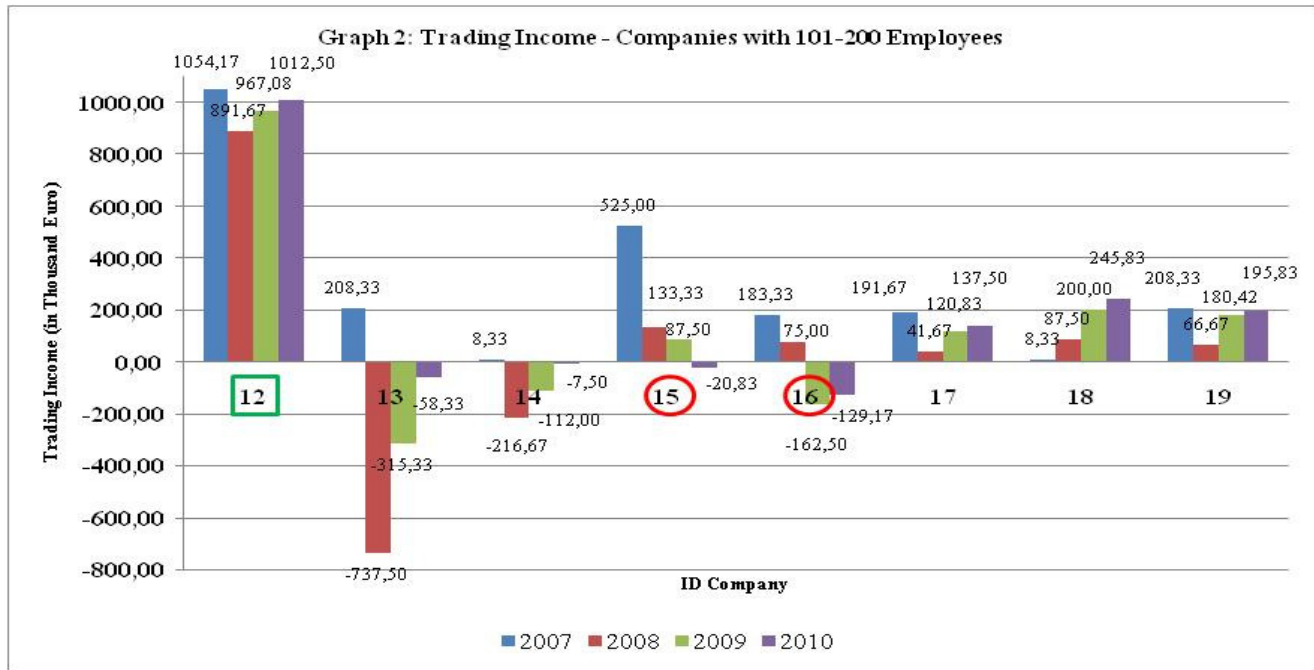


Fig.3: Graph 2 with Trading Income of Selected Companies with 101-200 Employees.

Source: Own processing.

In the circle is company which implemented CRM during the economic crisis.

In the square is company which is using CRM within complex IT services through Cloud Computing technology.

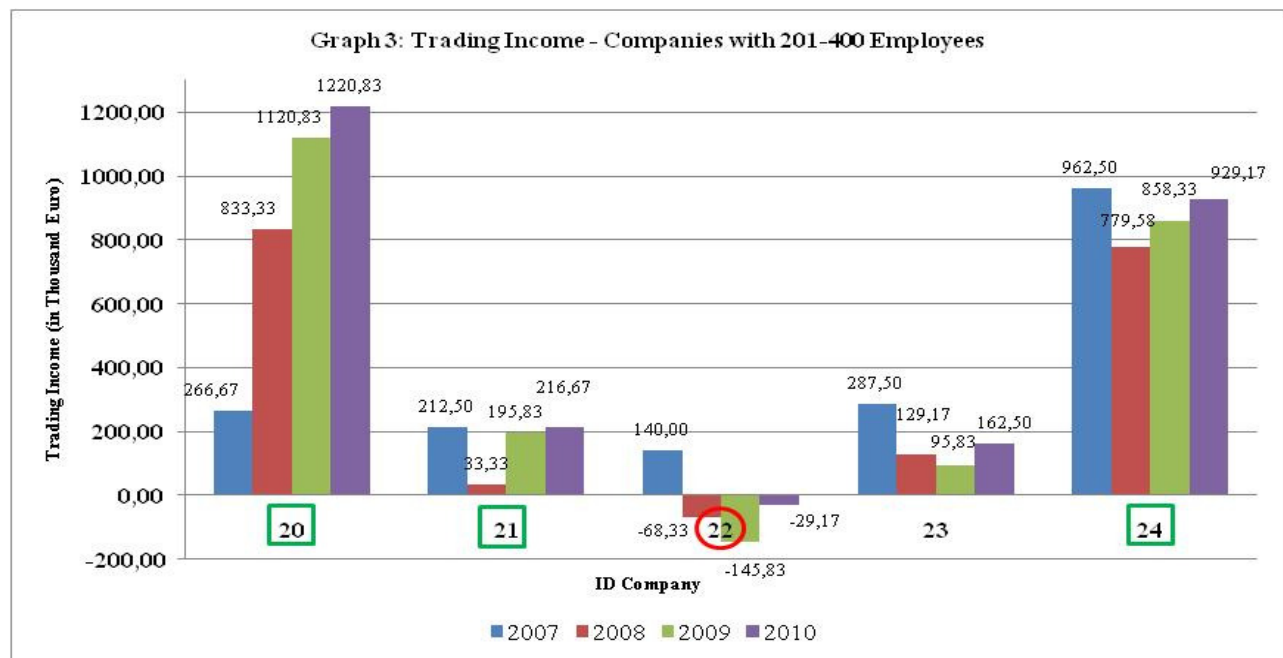


Fig.4: Graph 3 with Trading Income of Selected Companies with 201-400 Employees.

Source: Own processing.

In the circle is company which implemented CRM during the economic crisis.

In the square is company which is using CRM within complex IT services through Cloud Computing technology.

of business of these company is sales and services of agricultural and forestry machines. If the company has implemented CRM before the crisis, it could better communicate with their customers and develop permanent relations with them. It could also identify customer needs and their current views on the products of the company. It could help this company to improve competitiveness earlier than nowadays after implement CRM. The remaining companies with implemented CRM better overcome the crisis and had only positive Trading Incomes. The companies with number 20, 21 and 24 marked by square are using CRM within complex IT services through Cloud Computing technology (in the year of this research-2011).

crisis had worse financial results during the economic crisis. In the companies with CRM is significant quick increasing and positive trend of financial results during the year 2010. They had positive Trading Income for all the time of the research period. CRM had positive impact for keeping customers and their trust for the companies during the crisis. The companies with number 25, 26, 27 and 29 marked by square are using CRM within complex IT services through Cloud Computing technology (in the year of this research-2011).

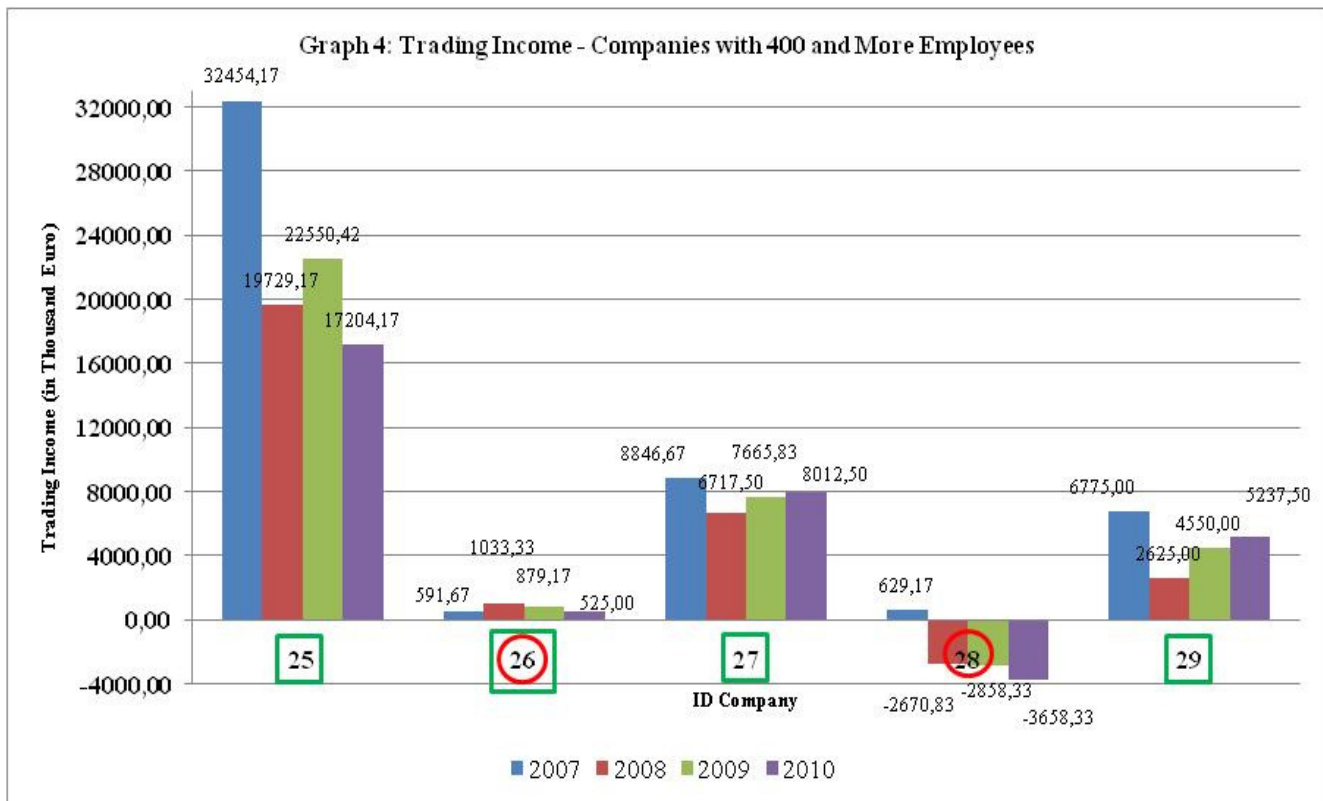


Fig.5: Graph 4 with Trading Income of Selected Companies with 401 and More Employees.

Source: Own processing.

In the circle is company which implemented CRM during the economic crisis.

In the square is company which is using CRM within complex IT services through Cloud Computing technology.

In the Graph 4 (Figure 5) are Trading Incomes of the selected companies with number of employees higher than 401. There are marked by circle companies number 26 and 28 without implemented CRM before the economic crisis (in year 2008 or earlier). Main subject of business of company number 26 is producing high quality and in the world unique demand specific types of components for machineries such as for example turbines, marine propellers and plates. Main subject of business of company number 28 is software solutions for business companies. In these big companies is significant decreasing trend of Trading Income during the crisis years 2009-2010. These companies compared to the companies with implemented CRM before economic

V. CONCLUSION

For companies that are using computer support for Customer Relationship Management (CRM) Cloud Computing is a way how to use it as their advantage. With the SaaS model are offered a suite of software that the user selects according to the needs of company's business strategy. Cloud Computing allows to combine software applications and storing data with much bigger computing capabilities than many companies can afford. This form of CRM allows companies to pay a monthly fee and therefore it is cost effective. Cost reduction, flexibility and convenience

are often the main factors that lead the companies to CRM and other software applications transposed into the Cloud Computing. Once this solution occurs often it is found that Cloud Computing offers a competitive benefits and new strategic opportunities for greater innovation.

From the analysis of results of selected respondents companies doing business in the Czech Republic showed that the current trend is for small and medium-sized companies rather to purchase CRM at once and as ready software solutions. The first assumption (A1) that small and medium-sized companies have tendency to buy and use complete ready software CRM solution, was confirmed.

For large companies is usually CRM one of parts of services providing through Cloud Computing technology. Whether and how much the small and medium-sized companies save on their costs if they transferred the existing IT structure, including CRM software, to Cloud Computing will be the subject of further research. This confirms the second assumption (A2).

The third assumption (A3) was proved and confirmed. The companies with implemented CRM before the economic crisis (in year 2008 or earlier) had significant Trading Income during the economic crisis better than the companies which implemented CRM during the economic crisis years 2009-2010. The companies with implemented CRM before crisis had positive trend of financial results in the year 2010. The companies which implemented CRM during the economic crisis had negative trend of financial results in the year 2010.

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