

Tomasz Galewski, Paweł Kuśmierczyk

Wrocław University of Economics, Wrocław, Poland

REAL TIME ENTERPRISE – A NEW APPROACH TO COMPETITION

1. Introduction

In the classical theory of economics a firm was modelled as the economic agent having perfect knowledge about all its environment. This knowledge involved the complete information on its customers, its competitors and all the relevant aspects of economic and political system. Moreover, in this theory the firm did not have any problems with the processing of such an amount of information; it made optimal decisions in “zero time.” A good example of such a theory can be the perfect competition, still one of the most popular economic models.

Of course the economists knew that the assumptions of perfect knowledge were far from reality, but they believed that the model described the behaviour of the firms in a fairly good way. It was not until the mid of the XX century, when the economists finally started to realize the importance of information on the situation of the firm (see for example [Stigler 1961]). The new models which arose showed how imperfectness of the knowledge system (because of the lack or asymmetry of information) may have completely changed the standard predictions of economics. Knowledge became one of the key factors. In an environment full of data it became impossible for a company to process all the information. Thus firms made their decisions in ambiguity and their results could no longer be believed to be always optimal.

Present economics seems to be as far from the classical models as it is only possible. Scientific journals are full of game-theoretic, behavioural, stochastic models, all very distant from the simple models of perfect knowledge and rationality. So are these old models inevitably doomed to oblivion? Well... not necessarily, as the RTE economy emerges the old models which might surprisingly turn out to be useful again.

2. What is RTE

Growing amount of information which has to be analyzed and growing competition forced the companies to adapt management techniques that help them survive in such environment. Companies nowadays must be able to react to trends and customer demand without significant delays – capable of responding to events as they happen [Crouchman 2006]. Keywords of the contemporary business are: “collaboration,” “real-time” and “on-demand.” To achieve a robust market position companies must plan transformation focused on improving the speed of their processes. The benefits include faster decision making, clearer insight into how the company is performing, more accurate forecasting and budgeting, as well as the ability to spot potential problems and anomalies more quickly through early-alert functions (compare [Leahy 2006]). All of these can supposedly be achieved thanks to RTE.

The concept of RTE, which stands for Real Time Enterprise, is not new. It has been around for many decades, but technology limitations made the implementation of RTE impossible. Now because of a combination of technical and economic factors it seems to be feasible. For one thing, technology has evolved so that real-time is now less unreal. Functionally real-time is more feasible than ever and financially it is more affordable. Besides, in the current business and financial market climate, transparency and fundamental value-creation efficiency are becoming much more important; keeping in mind the cases of Enron, Worldcom and Andersen, managers in many businesses are now less inclined to base their decisions on late, low-grade management information. After the Enron case in the USA the new corporate governance regulations (Sarbanes-Oxley Act) were introduced. According to it public companies must now report in the real time.

There are many definitions of RTE. One of them says that RTE is about getting things done quicker, that it is a state of the organization in which it competes more effectively by taking time out of its critical business processes. Gartner Group defines the real-time enterprise as “an enterprise that competes by using up-to-date information to progressively remove delays from the management and execution of its critical business processes”. In other words, a company that employs automation to trounce its competitors [Gartner Group 2006].

Currently many companies want to implement real-time management in their enterprises. It is now a subject of many articles and presentations that discuss concepts such as [http://dev.hyperion.com/resource_library/articles/real_time_enterprise_article.cfm]: RTA (Real-Time Analytics), ZLE (Zero Latency Enterprise), STP (Straight Through Processing) and RTE (Real-Time Enterprise).

Using up-to-date information, getting rid of delays, and using speed for competitive advantage is what the real-time enterprise is all about. Of course to be able to implement real-time companies have to know how to plan ahead to become

a real-time enterprise, how to develop and maintain the right infrastructure, and how to support their business goals with time-based initiatives.

The RTE sets strategic business targets for reducing end-to-end cycle times in the process areas that are most critical to its particular business strategy. They might be operational, day-to-day areas, such as the order-to-cash cycle. They may also be in high-impact, strategic areas, such as mergers and acquisitions, or new product development. There are a number of these different target areas [Raskino 2002].

The benefits of introducing real-time approach can be seen at different levels of the company [Gartner Group 2006]. At an operational level the main benefits are: improved customer service, reduced inventory, risk reduction and lower process costs. At the managerial level these are: faster exploitation of emerging opportunities, less damage when things go wrong and increased agility when dealing with large and small threats and changes. And at leadership level the main benefits are faster implementation of the strategies that are needed to meet changing circumstances.

However, RTE is not an idea that should be implemented in the whole company. The definition talks about optimizing only selected processes – enterprise cannot improve everything at the same time. Besides, it would not make any sense – many companies are already “overoptimized”, especially in the purchasing area. Such firms often keep investing in improving their supply chains, although it does not influence their business results [Ostrowiecki 2006]. That is why it is important to have a clear vision of introducing the “real-time” approach to company.

There are four strategic benefits of RTE [Raskino 2002]:

1. Reduction of waste and inefficiency – the majority of processes in the majority of enterprises could be run more quickly and efficiently if they were re-engineered to take full advantage of the technologies of the Internet era. It has been observed before that radical exercises in reducing elapsed time often generate significant cost savings as well.

2. Competitive customer service – this is the age of the “time tortured” consumer who will trade price for improved speed and convenience. Customers have higher expectations and demand faster response times. But it is not just tactical service-delivery times that win customers. Enterprises that can quickly deliver new products and improvements to the market will more likely win customer attention and competitive advantage.

3. Better management decisions – the ever-increasing economic pace gives managers ever-decreasing windows of time in which to make decisions. Managers need time to assimilate, deliberate, formulate and communicate. The earlier that accurate and complete information is brought to their attention, the more time they have to meet deadlines and of the better quality the decision is likely to be.

4. More-transparent management decision making – managers given low-grade, late information will have to work on assumptions and make decisions that

they are uncomfortable with. Occasionally, the temptation will be to “post-rationalize,” that is, to revise tardy information to make the “facts fit the decision.”

3. RTE in practice

What made RTE feasible are the astonishing changes in the information technologies. The key to achieve time savings is an easier and quicker access to information. The RTE needs comprehensive IT support – it demands new business processes, better data-capture techniques and changes in the managerial culture. Enterprises cannot remove the latency from their processes without the right IT. This must include applications, especially the major process supporting packages, software and IT infrastructures [Gartner Group 2006].

That means significant changes for IT executives, because for the first time IT becomes the primary enabling force that can drive competitive advantage, seize new market share, forge new alliances and serve the customers better. Real-time processes are only possible if the applications that support them are able to operate in real-time. The best applications in major categories, such as enterprise resource planning (ERP) and customer relationship management (CRM), are able to operate in real-time but often do not. Real Time Enterprise relies on IT infrastructure which merges application systems into a single system reflecting all critical business processes. However, most firms use a portfolio of “packaged” applications which were not inherently designed for integration, so IT infrastructure is a bundle of client devices, servers, storage facilities, networks, databases and middleware, all supporting the delivery of business applications and IT-enabled business processes. It causes these applications to be treated as the separate, autonomous “islands of information.” Such a cumbersome environment of IT is not a good way to succeed.

Hence, the software infrastructure for a real-time enterprise is not a single piece of software – it is a comprehensive portfolio of technology and applications that enables enterprises to execute the critical business processes more efficiently and accurately. The RTE software infrastructure integrates people and applications and empowers workers with higher-quality information [Raskino 2002]. With RTE infrastructure, data flows faster and more efficiently.

Firms unfortunately cannot buy an RTE infrastructure – because there is no such product. A company must build RTE software application by application, process by process, partner by partner – using a combination of new and existing applications’ systems and integrating middleware so that, ultimately, the collaboration between people and the IT infrastructure reflects critical business processes [Raskino 2002]. Yet another problem appears when firms develop through mergers and acquisition and the information systems of their partners are not complementary. CIOs (Chief Information Officers) must focus on reducing this inherent complexity because an enterprise cannot run effectively with multiple platforms.

A very similar and sometimes even greater problem is to improve the efficiency of business processes between the enterprise and its customers and partners. T. Leahy says that Real Time Enterprise projects fall into two broad categories: internal and external [Leahy 2006]. An internal part of it has already been described. The external projects are about extending the firm out to the customer and suppliers via automation which can cause threat of information safety. Companies must decide how much information they can publish and what should remain proprietary.

Links between the firm and the partners are essential for supplying data and are the basis for the RTE processes. The IT infrastructure of all business partners must be compatible and an enterprise should use the power of persuasion and diplomacy to convince partners to integrate information systems.

RTE must include applications, especially the major process-supporting packages and software and IT infrastructures. To do this the companies must redesign their software infrastructures to create an enterprise nervous system (ENS). The key technologies within or complementing the ENS should provide their functions through architecture oriented around the level of service it will offer. These technologies include [Gartner Group 2006]:

- business process management (BPM) – this software controls the flow of work between the steps in a business process; steps that may be either human-assisted or automated;
- database management systems (DBMS) – these hold and manage the information needed by the major business applications;
- data warehouses – they contain the data and support the tools needed to provide decision-makers with insight into business operations;
- knowledge management tools – these provide workers and decision-makers with the knowledge and skills they need to play their parts in real-time processes;
- enterprise portals – they give staff easy access to up-to-date information;
- content management systems – these tools ensure that corporate unstructured information is up-to-date;
- integration brokers – this software links applications in real-time without loss of data or meaning;
- real-time analytics – this software provides sophisticated analysis of data in real-time.

A very important feature of a “real-time” information system is the transparency for business processes, which means the ability to reconfigure quickly to match the current business model, just after it changes. That makes companies flexible – allows them to act efficiently when the situation in the market changes and to beat the competitors.

The benefits of implementing Real Time Enterprise infrastructure are substantial. There are a lot of examples which show that applying this concept is possible and profitable. The implementation of RTE helped Ford reduce its design time from seven years to four, save \$1.2 billion annually and improve quality by 50% [Leahy,

2006]. Bell Canada significantly increased productivity and order volume when it got broadband provisioning time down from (between) 30 (and) 60 days to 18 days [Leahy, 2006]. Real-time system applied in Camden helped them extract information 24 hours sooner than before [Leahy, 2006]. When Kearney Inc. turned to an RTE system it helped them significantly reduce the time needed for the submission of requests for purchasing things like computers or marketing products. Now it typically takes less than 30 minutes, compared to a week or two weeks under the old manual system. The system also helps with forecasting and keeping budget on track because managers can see more clearly and more frequently how well they are meeting their budget restrictions for travel and purchase of products and services [Leahy, 2006].

One of the most famous examples of the successful application of RTE comes from ZARA. The company is a part of the Inditex (one of the world's largest fashion distributors) and has 2800 shops in 64 countries in Europe, the Americas, Asia and Africa. The most crucial thing for ZARA is adapting the offer to customer's desires in the shortest time possible. The inspiration of creative designers (there are over 300 of them employed in ZARA) comes from prevailing trends and from customers, through information from the shop. Also many people from the marketing department travel around the world and visit discos, pubs, campuses etc. to recognize customers' desires. Those employees use digital cameras etc. to preserve pictures of people's clothes and transmit it to the headquarters. Thanks to this the designing and sewing (with 30 000 models a year) lasts only 15 days [Teluk 2004, p. 20]. Also the logistic system operates in "zero time" with time between receiving an order at the distribution centre to the delivery of the goods in the store being on average 24 hours for European stores (see [www.zara.com/i06/index.html]).

4. Consequences of RTE for the theory of economics

As it has been shown, RTE is feasible and can be very profitable for the companies that implement it. The companies operating in "real time" gain competitive advantages over other companies, resulting from better access to all the essential information. This may lead to a further popularization of the RTE systems, because soon it may turn out that the company lacking such a system will not be able to compete effectively with the other companies in the market. This of course will not affect every market as there are some, where the quickness of reaction to the new information is not that important (consider for example the energy market). But in the markets where quick adaptation to the changes in the environment is an issue of utmost importance the RTE systems might become indispensable. And soon only the companies having it will survive in the market.

One might begin to wonder what would be the theoretical consequences of such a dissemination of the RTE systems. How will it influence the markets? Will

a new microeconomic theory be needed? To answer this question we must first realize what the consequences of the widespread implementation of RTE systems in terms of the assumptions of the microeconomic theory are. In essence the goal of using the RTE system is to gain immediate access to every important information that influences the company's situation. Thus (at least theoretically) the company having the RTE system gains the perfect knowledge on every element from its economic environment. It has perfect knowledge of its consumers, their tastes and expectations. It is fully aware of its competition's investments, quality of the products and their prices. And furthermore it is not surprised by the changes in the legal or tax system as the RTE system enables it to predict such changes well in advance. It turns out that the popularization of the RTE systems might take us back to the economics of almost perfectly informed and rational economic agents. So will the old, classical models of perfect competition turn out to be useful again?

Well, there are of course substantial differences between the classical models and the real time enterprises. The perfect competition model assuming that companies have access to all possible information without any cost is not of course true in case of RTE. The costs of implementing RTE include both the cost of rebuilding the whole information system and maintaining it. A company needs a lot of investments to make information system an innovative and advantageous platform. These kinds of investments are often long-term and it is impossible to assess the return of investment in a simple and objective way. Companies have to invest not in new products, but in the ability to be faster than the competitors in launching new products in the future [Byzia 2006]. But even from the strategic point of view, the expenses of deploying real-time analytics or sending real-time messages might actually exceed the revenues.

Another cost-related issue is the maintenance of the system. The time is wasted when employees have to wait for repairing the hardware or for fixing some parts of the software that does not work properly. There are also costs of training the staff how to use new applications. According to researches, such losses can exceed the limit of system maintenance costs in a company. As a result, the costs of computer infrastructure can be twice as high, as it stands in the accounts.

The necessity of building the costly real time information system hinders new entrants from entering the market thus leading to a lower competition level within the market. Moreover, even though the development of the Internet facilitated the access to information for the consumers, it seems that their knowledge is less perfect than that of the companies. This puts the companies in a better situation and may lead to a lower consumer surplus (than in the perfect competition model). For example in 2000 it was revealed that Amazon used price discrimination, setting the prices higher for the consumers whom it considered better off.¹ There is no reason to believe that other companies possessing information on consumers will not be doing the same.

¹ This was discovered by the consumer who observed that after deleting the cookies files from his computer the price of a dvd offered to him by Amazon dropped from \$26.24 to \$22.74.

5. Conclusions

Fast technological advances accompanied by the liberalization of markets turned the world's economy into the global village. The companies spread worldwide and compete fiercely with each other for the global consumer. In the situation of dynamic changes a fast access to the information became a top priority for companies that want to survive in markets and be able to make profits. The challenges mounted by the new economy forced the companies to create new management systems. Thus emerged the concept of the Real Time Enterprise.

The economy dominated by the Real Time Enterprises might still be a thing of the future but this future seems to be much closer than many thought. The advances in IT and in knowledge management make the dreams of the firms operating with zero latency real. And because the growing competition forces the companies to implement such solutions we might soon live in times of perfectly informed firms making almost perfect decisions.

Whether such a situation is good or bad for the consumers is still to be seen. As it has already been noted a perfectly informed firm might have an advantage over the consumer. Theoretically a firm having perfect knowledge on consumer's preferences can set the prices so as to take over all the consumer's surplus.² This is called a perfect price discrimination and the example of Amazon's policy shows that this danger is real. On the other hand the perfectly informed companies understand the consumers' preferences better and are able to supply them with the best possible product. And if the competition among the firms is really strong, the prices will go down and therefore the price discrimination practices will be less threatening.

How will the economy filled with the Real Time Enterprises look like is still to be seen. A key factor will be the costs of building and of the maintenance of such a system. The higher those costs are the more difficult it will be to start an enterprise and the less competitive the markets will be. All in all the step back to the (pure) perfect competition model does not seem possible.

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² By setting the price equal to (or slightly lower than) the price reflecting the consumer's maximal willingness to pay.

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