What's Wrong with Business Games?

Is Budget Based Decision-Making up to Date?

Timo Lainema
timo.lainema@tukkk.fi
Turku School of Economics and Business Administration

Abstract

This paper first poses some criticism against conventional business game processing methods. This criticism is based on the extensive changes in almost any business environment within the last two decades. On the basis of this criticism some new ideas are represented for a better way to construct an interactive business game. Finally, a new business game construction is set forth.

Keywords: Business Games, Simulation, Learning, Business Training

BRT Keywords: AK04, HB08, HB26

1. Introduction

Today, the information needs of decision-makers are likely to change rapidly. So far the focus has been on improving traditional information, which is mainly information about what goes on inside an organization. Increasingly, decision-making will require information about external environment: competitors, new producing technologies, new delivery channels, and so on. Only with such information can we prepare for changes and challenges arising from sudden shifts in the turbulent business environment. The development of decision-making skills of employees in any business arganization will increasingly become a major challenge for businesses. Thus, there is a demand for the training methods to be able to describe the properties of the recent and future competitive environment and to train the employees to be able to operate effectively and productively in this environment.

Whatever the level for productivity improvement is, people as decision makers and as responsible for task execution need to understand thoroughly what they are part of in order to be able to cope with every day tasks. This means that every employee in a company must be able to change his/her ways of working. In this process of continuous changes the teaching methods play a considerable role. While the world around businesses is changing with growing speed the business game processing methods are still the same as 25 years ago.

The purpose of this research is to introduce some advanced business game techniques and operation models. This paper first describes the environmental changes of recent business environment. Secondly, on the basis of the environmental argumentation, the paper sets forth a proposition how the present environment could be better simulated in business games. This proposition is based on interactiveness and is technically realized with real-time processing. Thirdly, a business game construction based on real-time processing is presented. And finally, the author gives a suggestion for future research.

2. Trends in Present Business Environment

Within the last decade or two the changes in the competitive business environment have been more rapid than ever. While the speed of change is still increasing, many researchers have interestingly described the properties of this change.

2.1 The Degree of Autonomy in Decision-Making

Milan Zeleny (1989, pp. 77-84) mentions two modes of planning and decision making. In the first one, all local knowledge is conveyed to the central planning authority, which integrates the information and then communicates back plans to the local agents for the purpose of coordinating local action. In this mode coordination is separated from action. Thus, the value of local knowledge is neglected and the local agents transform into simple executors of substantially limited responsibility without freedom to act. But, at the times of rapid change and required flexibility, this is not desirable. Local agents possess crucial and irreplaceable knowledge of the particular circumstances of time and place. According to Zeleny we should treat this unique knowledge of people, local conditions and special circumstances as an asset to be enhanced and enriched, not replace it with context-free and locally useless directives.

In the second mode the central or strategic knowledge is supplied to the individuals as an additional knowledge, needed by them in order to coordinate their own plans and action. Zeleny states: *At the times of rapid change and required flexibility, adaptation and responsiveness, ultimate decisions must be left to the people who are familiar with particular and local circumstances. Their knowledge has to be enhanced.* So, proper use of the locally operational knowledge increases organizational flexibility and its responsiveness to external and internal fluctuations.

Enhanced flexibility is necessary for coping with the ever increasing uncertainty, turbulence and changeability of environmental conditions. In a knowledge-oriented society, planning must be a process of continuous broadening of requisite organizational ability to cope with the ever-wider ranges of relevant internal and external fluctuations. In this pursuit actions which increase organizational flexibility are important. Achieving flexibility demands increase in employee responsibility taking, self-control, and decision-making in ever-wider areas. Characteristics for this are local agents' responsibility for the purposes and execution of their own autonomous action coordination. Integration, systemization, multipurposiveness and multifunctionality all enhance flexibility. All these are properties, which ask for holistic training in organizations to be learned and internalized.

Senge (1997, pp. 30-32) predicts, that in the future leadership will be distributed among diverse individuals and teams who share responsibility for creating the organization's future. This building a community of leaders within an organization requires recognizing and developing:

- local line leaders; managers with significant bottom-line responsibility, such as business unit managers, who introduce, and implement new ideas;
- executive leaders; top-level managers who mentor local line leaders and become their 'thinking partners'; and
- internal networkers; people, often with no formal authority, such as internal consultants or human resources professionals and front-line workers, who move about the organization spreading and fostering commitment to new ideas and

practices.

In knowledge-creating organizations, these three types of leaders absolutely rely on one another. None alone can create an environment that ensures continual innovation and diffusion of knowledge. Thus, the organizations need capasity building, the enhancement of people's capabilities and knowledge to achieve results in line with their deepest personal and professional aspirations. Learning arises from practise, too: people working together to achieve practical outcomes and building practical know-how in the process.

2.2 The diminishing time for decision making

Business decisions are traditionally divided into strategic and operative decisions. The present business environment affects on the manner of execution of both of these types of decisions. Traditionally strategic decisions have been long range decisions, and operative decisions have been every-day-like, executed often by a sudden change or need in the business environment. Today, the world is changing more rapidly than ever, mainly because of technological development and huge increase of information. The speed of change reflects, of course, on the way operational decisions are carried out, but it also reflects on the way strategic decisions are made. The way the development has affected on strategic decisions shows clearly how drastic the change has been. It is sometimes even difficult to divide the decisions to strategic and operational ones, because the natures of these decision types are approaching each other.

Some years ago the strategic planning process was seen as a planning tool with which (Näsi, 1991, p. 46) *the environment is forced to bend if the company only knows its planning procedures properly... we are dealing with an ideal world: Information is available, the company has money and resources to create and shape things; the CEO and the secondary management have time to discuss the matter; they are also capable of understanding all the preconditions of good decision making and the connections.*

Strategic planning originated in a time, when the growth was fast and the future was relatively easy to forecast. The main goal in strategic planning was to make the right prediction of the future. When the planning process was systematic, the attention was in planning methods. Nowadays, the future is very difficult to predict, but it is also realized, that mastering the future does not necessarily demand predicting. The faster and more effectively we can react to changes, the less we have to be able to predict them.

Näsi (1991, pp. 26-38) states that the development of the traditional strategic thinking has moved from the strategic planning and portfolio management stages to a new stage which he describes as strategic gameplaying stage (Näsi, 1991, p. 35): *the central task of a strategist is to make good moves on the play ground. The key to the third stage is to view strategic thinking as gameplaying… The limits of the ground or board are more undetermined, the rules are only partially known and can change, and the player must create and develop the alternatives - by him/herself.*

The turbulence in the business environment and the technological change put pressure on organizations to be sure they can effectively meet the fundamental changes that are occurring (Scott Morton, 1991). Morton mentions that all external forces associated with environmental turbulence (social, political, technical and economic) must be reacted to for survival. There is no reason why organizations will necessarily continue in their present form. It is not possible to survive as a company just by working harder within existing organizational structures and using conventional practises and tools. The environment may be so uncertain that no amount of analysis will allow us to predict the future.

3. Calling for Business Games Better Describing the State of Things

While the changes in the business environment are so extensive, this must mean some new demand for business training, too. Obviously the demand to understand the overall business structure is becoming more and more important. The workers in any business face the world around them to change in growing speed. This means also that the employee must be able to change his/her way of thinking and working more often than before. The general knowledge on how a company works helps the worker to adopt new behaviour.

Business games are proven to be good tools in business training. E.g. Faria and Dickinson (1994, p. 48) mention three benefits of using business games in management training:

- To orient and train new employees
- To screen current managers or would-be managers
- For ongoing management training

The value of business game training is highly relative and depends on the objective of the training event. The use of business games in business education is mainly addressed to decision-makers of an organization. Business games offer the participants knowledge on how the decisions carried out affect in the business environment and thus prepare the participant to learn more about decision-making by experience. The game used should hereby describe the actual decision-making environment of the organization. In this sense it is rewarding to analyze how the decision-making environment of businesses in general has evolved during the last decades, as was done in previous sections.

Saffo (1997, p. 30) has noted: *In the next decade, the most important new sense-making tools will be those that help people visualize and simulate. Visualization techniques reduce vast and obscure pools of data into easily comprehended images. And simulation systems will become intellectual training wheels for executives, allowing them to experiment with strategies in the forgiving world of cyberspace, in much the same way that pilots in the Gulf War ran practice missions before flying the real thing.*

Ju and Wagner (1997, p. 79) note that *adventure game-like applications could have a significant impact in managerial training. While such "management adventure games" could potentially be suited for all levels of management for routine as well as non-routine tasks, return-on-investment considerations would suggest their predominant use for skill development of large numbers of operational and first-line management staff.*

In the future, the use of management games in learning will probably be at least as common as today (Elgood, 1996, p. 111): *Technological development will certainly not slow down, and one will be able to simulate more situations with greater realism and greater ease. Variety will not slow down either - one reason being the increasingly international context of management education and the exchange of concepts between societies. More arguable is the extent to which work will be seen as an activity that should be rewarding in itself, and enjoyable, and therefore something to which game-playing can reasonable be linked.*

3.1 The Old Budget-like Decision-Making Mode

Whicker and Sigelman (1991, p. 42) divide simulations into two categories by the way

they deal with the progressing of the simulation model. The first one is batch-processed or non-interactive model, in which all behaviour subroutines are spelled out beforehand, in the computer code. Thus, no human input is required. The second one is the interactive model, in which the model's performance periodically is adjusted to account for input supplied by the modeller while the model is running. According to Whicker and Sigelman this requires the model to stop in midstream and pose a question to the modeller. When the model receives the answer, it will proceed accordingly.

So far the computer based business games have worked in batch-process mode (figure 1). E.g. Whicker and Sigelman describe how 'business strategy games' are processed (p. 4): *Typically, the player feeds information into a computer program and receives back a series of optional or additional data that are conditional upon the player's initial choices. The game proceeds through several series of these interactive, iterative steps*. Or to take another illustration: *Each decision period normally represents three months of business activity. The decisions of each management team are evaluated by computer model and a wide range of sales and financial results are returned to the participants. Based on the results, a new set of decisions is formulated* (Faria and Dickinson, 1994, p. 47).

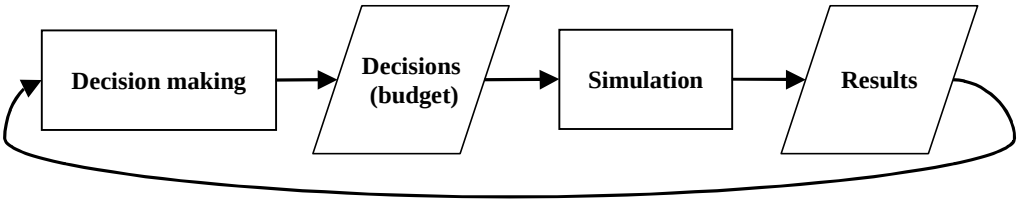

Figure 1: Batch-processed business game.

The problem with the batch-processing method is that world very rarely works in such a pure sequential order. There are hardly no business areas where the decision makers first enter all their decisions for the next budgeting term, then rest during all the actual term, and enter again the business in the end of the term to analyze the term results executed and to prepare the next budget.

In management simulations the budget mode is bound to batch processing. The batch-processing mode does not permit any other decision-making modes because the participants don't have any possibility to intervene with each other, customers, or suppliers during the actual simulation (simulation meaning the processing of the simulation model).

To take one example, there are very few business branches in which a company sets the price of it's product for the whole next term before the term even has begun and then keeps to that selling price during all the term. The batch-processing model does not give the decision maker the possibility to change the decisions according to the competitor's actions. The batch-processing method suites to be used to describe stagnant environments, where the markets are stable, the competitors are well known, the competitors' actions are relatively easy to predict, and controlling the costs is more important than scanning the market situation. Using batch-processing method means that main emphasis is on budgets, the main instrument to steer the company is the budget and reacting to the changes in the market is done afterwards.

In the real business world any company would face major problems if it would have to keep to the decisions made in the budgeting process (Lawrence, 1997): *The batch*

simulation locks companies into fixed reporting forms and procedures. At the end of the period a predetermined set of reports is delivered to each company. There is no freedom to structure the simulation output in a manner that facilitates the company's chosen decision processes. In general, such business simulations tend to lock their participants into a particular approach towards decision making which reduces their potential value. The acute lack of flexibility discourages creativity which is often a trait which should be emphasised in management training. Such an architecture also means that the only data available for analysis are period to period macro or aggregate level parameters. No data is provided on the transactional level because batch simulations do not generate it.

The question remaining open is how harmful the batch-processing method is for the participants if they need to learn to cope with complex, time causal business transactions and business process chains? At least the batch-processing method does not describe these subjects realistically, if at all. Is it possible that the batch-processing method distorts the participants' business perception? This could be a possible future research topic.

3.2 The Lifelike Interactive Decision-Making Mode

For the business game participants the conventional business game processing method creates an image of budget steered planning, decision-making, and control. Today the nature and significance of budgets is very different from the days when first business games were developed. To better describe the present business environment, the business games should include:

1. The influence and importance of time embedded in the business game (to describe the turbulence in business environment),
2. The holistic business view (all business functions) to be represented for the game participants (to give the participants skills needed when they execute their own autonomous action coordination), and
3. The ability to configure the business game to describe the actual participant business environment

The evidence for the two first arguments was put forward in previous sections. The third argument is based on the fact that if we want the game to describe the holistic business environment, the game will become quite complex. To reduce the inconvenience of complexity, the game should be as easy to learn as possible, in order to make the participant it easy to get in to the business game decision-making. Thus, it should be made possible to configure the game model to describe the actual business environment of the participants. Furthermore, there is some evidence reporting that for the learning itself it is important that the business model adequately resembles the real world business environment of the participants (e.g. Elgood, 1993, p. 50), although there is some disagreement on this. Once again, this is a potential source of future research. Configurability means that the business game computer model must have sufficiently environmental variables and by changing the values of these variables the game environment can be changed to represent the actual real world environment.

The three arguments mean also that the connection between the players, the supply market, the customers and the capital market needs to be interactively (real-time) processed. What is essential is the role of time in simulating the time-bound business processes, decision making, and the communication between the companies and different stakeholders.

Furthermore, we need to have automated information gathering and data

processing. This is important if we want to control the holistic business structure and have reports on company efficiency and profitability. This requires the use of computers. This is a reason, why man-simulations (board games, manually operated games) are insufficient in describing the holistic business functioning. Because these games don't use computers as part of the game process, they do not include realistic balance sheets, inventory reports, sales reports, and so on. Without consolidated reports it is difficult to get a holistic picture of the effectiveness and profitability of the game organization. Actually some of these games include the use of computer as an optional extension, but still the intersection between the game processing and the information system needs some input effort from the participants. And this in turn is troublesome and will reduce the fascination of gaming. Still, man-simulations or games are at best the best possible means to simulate restricted decision making areas, and the real challenge is to transform these positive properties to be used in wider range of business training.

What is suggested here is a real-time processed business game. Decision-making and having results from the decisions made should be in interactive real-time mode as they are in the real-world environment. Interactive mode means that decisions are made continuously when in the game model and game market situations occur which need to be reacted to by the participants. In the interactive model decisions are made as soon as they are needed or at least as soon as the decision-maker notices that the market situation needs actions from him.

To sufficiently realistically represent the turbulent business decision environment the significance of time must be included. This is accomplished by building a business game, which includes internal time - a game which works as a normal business environment so that different business events and decisions are processed, executed, and decided on in virtual real-time. In a real-time processed business game all the events and processes take place continuously. The participants who steer the company see all the market events and internal processes on-line. What ever happens can be seen instantly and reactions can also be carried out instantly. The game works exactly as in real world business environment with the exception that the internal simulation time is exhilarated compared to the real world (figure 2).

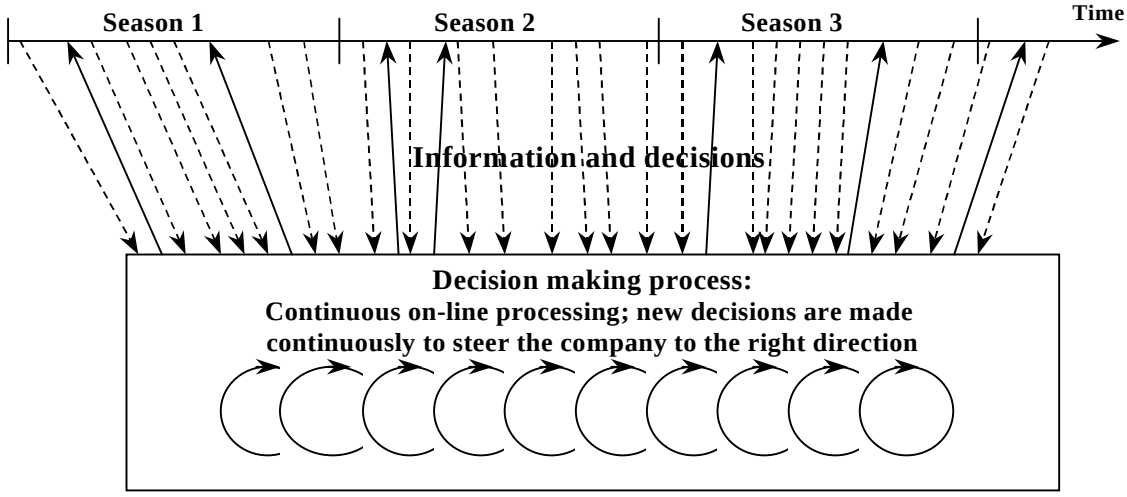

Figure 2: The real-time processed business game environment.

Real-time processing demands a platform, which offers on-line connections between the different parties in the business game. This means a network environment. With present

network technology the participating computers (i.e. competing companies) can be geographically decentralized. With this structure based on a network the different entities (companies, suppliers, customers and funding organisations) are distributed. But with the network environment the entire functional decision making inside the company can also be decentralized. In this form the company transaction data bases are maintained in the network server and can thus be shared with several workstations, all working on the account of one company (figure 3).

Because the company databases are shared, the different company workstations can also be geographically distributed. In this structure the collaboration between the company branch offices and remote members is vital and it is possible only with teamwork between the offices.

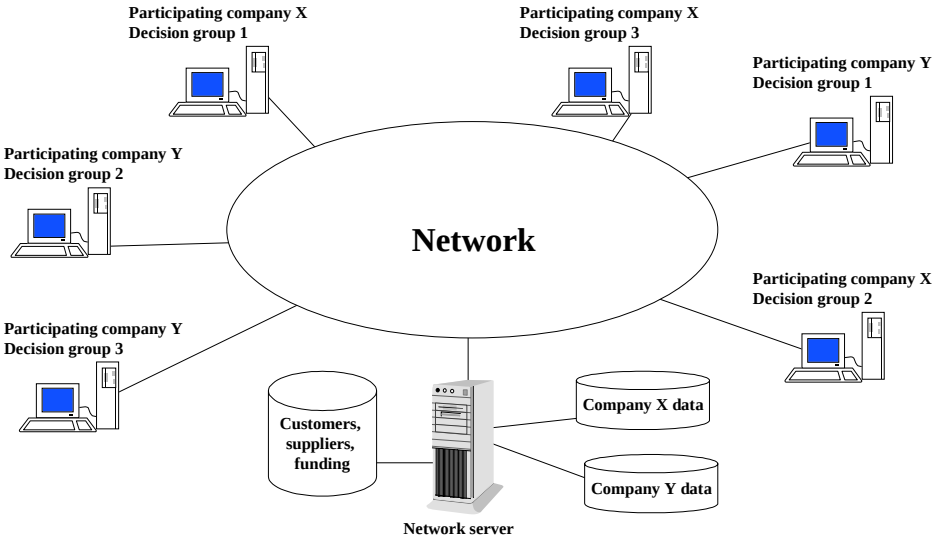

Figure 3: Distributed business game based on a network

The impact of time in real-time and batch-processed business games in some company operations and processes is described in table 1. The examples in the table illustrate just some of the deficiencies in batch-processed games compared to real-time processed games.

Operation / Process	**Batch-processing**	**Real-time processing**
Response time to competitor actions	The speed in which the competitor actions are reacted by does not have any significance, because all decisions are processed at the same moment. E.g. competitor price dumping can not be answered until the next season, and by the next season it may already be too late (market share has already been lost).	Competitor actions (e.g. competitor price dumping) can be reacted as soon as noticed.
Speed of delivery process	The speed of delivery process has no (or minimal) significance as a competitive advantage.	The time of delivery may have crucial impact on which company the customer will order from.
Response	A misleading production plan can not be	A misleading production

to misleading production plans	straighten until the decisions for the next season are being made.	plan can be straighten as soon as it is discovered.
The advantage of faster product develop-ment	In some cases the speed of the product development process does not have any significance. E.g. consider two companies (A and B) developing similar novel products. Company A develops the new product during the season in half of the duration of the season. Company B develops the new product during the season but it takes all the length of the season. In this case the company A has minimal - or none - advantage of being faster in the development process.	The company being faster in development processes earns all the benefit it deserves from being faster. E.g. it can benefit from being the only provider of the novel product by demanding higher prices.

Table 1: The impact of time in real-time and batch-processed business simulations in different company operations and processes.

4. The Construction

The premises described above have been the foundation for the author's constructive research. The research started in summer 1997 and since then the new business game model has been programmed. The model is validated with an industrial business partner for whom the model is configured. In spring 1999 the model has been tested once in the company and another test is carried out in June 1999. The first training with the product will be arranged in August.

In the following screen copies some parts of the delivery process will be demonstrated. The parties, items and numbers are fictional. Note that almost everything presented on these screens is configurable (e.g. amount of suppliers, their names, their supply volume, raw material prices, terms of shipment, names of the products produced, needed raw material prescriptions, number of production phases, number of production cells in each phase, the amount of machines and workers in each cell, the amount of customers, the volume of customers, and so on). The ultimate aim is that the game environment describes the case company's internal and external environment as well as possible, in order the game to be as easy as possible to adopt by the participants.

Note also, that all suppliers and customers are located in the network server, which means that suppliers and customers are common to all the companies in the business game event. This causes competition between the companies and further increases the lifelike touch of the game.

Figure 4 illustrates the purchase function. The players may select from several suppliers and every supplier may have several products available. The suppliers are common to all participating companies so there may be competition for the supply, and thus there may exist scarcity. In every offer by the suppliers there are several terms of shipment: unit price, promised delivery time, term of payment and term of delivery. In addition to the purchases in figure 4 there is a possibility to establish contractual

shipments.

If the company decides to purchase raw material from the suppliers, the material delivery will depart towards the company store. The delivery will be in store within the promised delivery time (e.g. 48 hours), with some randomness. The payment for the materials will be booked to accounts payable and paid when the term of payment expires.

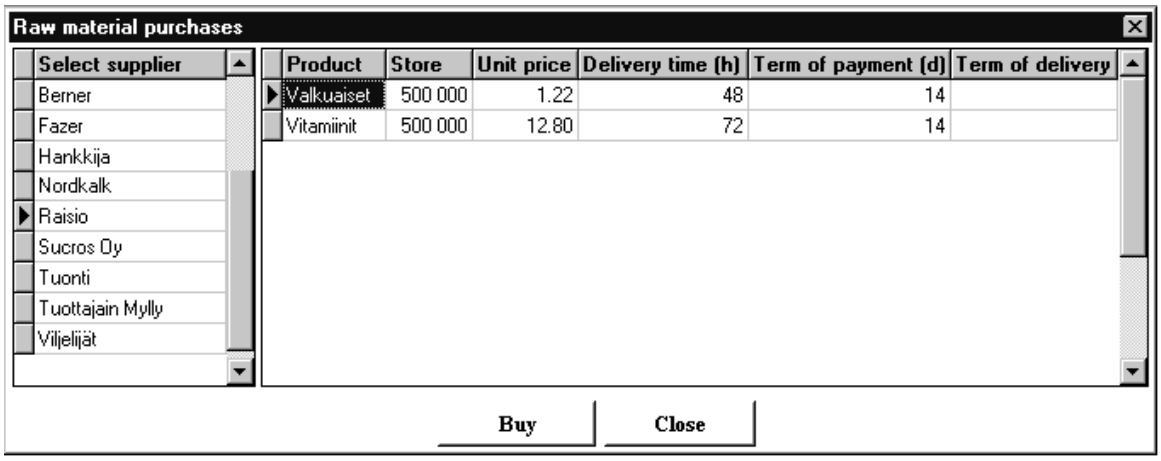

Figure 4: Raw material purchases.

Figure 5 describes the store of the business game company. The purchased raw materials are marked with type ‘Raw’. Some of the products in the company’s production process are in buffer storage (semi-finished products) and need to be further processed to become saleable goods. Some times these semi-finished goods are also saleable (‘Semi/Finished’ products). And the products complete are named ‘Finished’.

The amount in the store is the on-line store size of the material in question. This amount updates every time there will occur material supply, production, or sales. Average price includes variable costs per material unit. Variable costs include material prices, production salaries, energy, and so on. Also costs are updates on-line.

Store

Item	Amount	Average price	Type
Kivennäiset	4 051	2.02	Raw
Leike		0.35	Raw
Leike, säkitetty	1 908	13.37	Finished
Leikerae	30	0.51	Semi/Finished
Leikerae, säkitetty	5 141	23.39	Finished
Leseet	5 000	0.55	Raw
Melassi		0.35	Semi/Finished
Mellit			Raw
Mellit, säkitetty	5 000	29.00	Finished
Nautatiiviste		1.10	Semi/Finished
Nautatiiviste, säkitetty	5 025	50.07	Finished
Palautus	30 071	0.16	Raw
Puristeleike	27 935 338	0.26	Raw

Figure 5: The store of the business game company.

Figure 6 illustrates part of the production process (bagging phase is not shown). In this window the participants can steer the production process. They can start or stop production cells (dehydrating, either of the production lines, or bagging), select which product to produce in each cell (e.g. Mellit or Nautatiiviste or Täysrehu in Nautatiiviste production cell), hire or sack workers, and buy or sell machines.

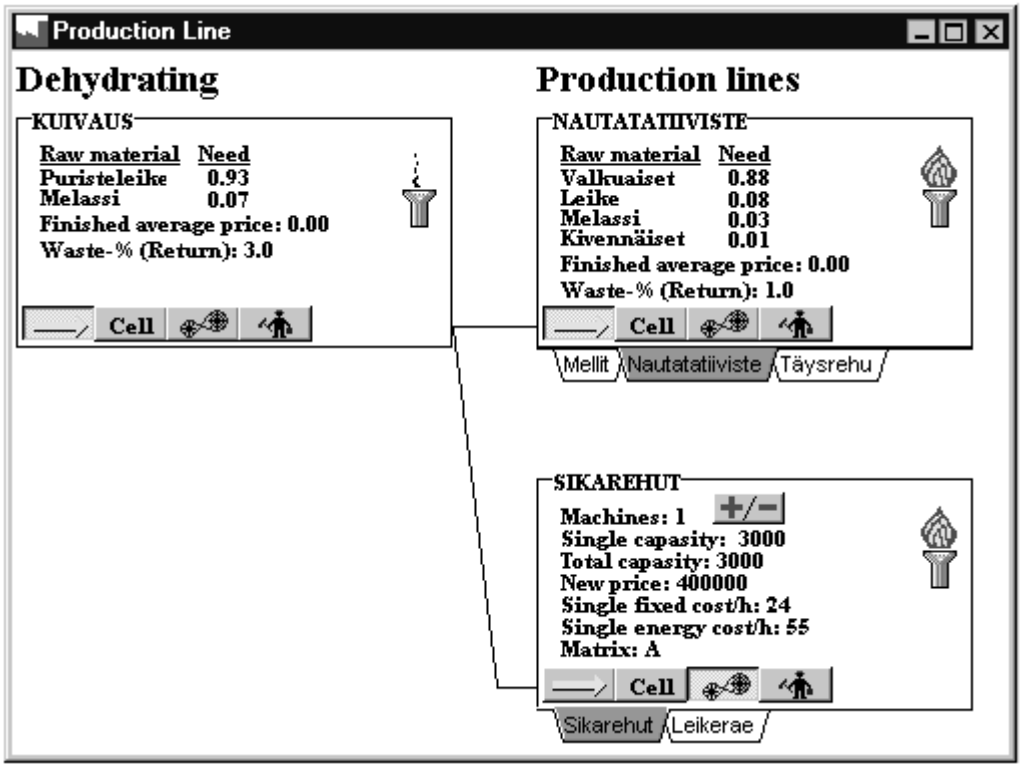

Figure 6: The production process of the business game.

Figure 7 illustrates the composing of sales offers. The company can offer all of its materials (raw, semi, finished), although there may be demand for just some of these. After selecting the product to be offered, the participants define e.g. the market area(s), sales price, term of payment, term of delivery, promised delivery time and valid until date for the offer. After sealing the offer it is communicated automatically to the markets and customers will probably consider the offer next time they make purchases.

Figure 8 illustrates incoming orders. In this case the orders are not delivered automatically, although that is possible too. The players have to prioritize the order in which the orders are delivered. In some cases some deliveries may depart so late that the delivery will not arrive at customer's store within the promised delivery time. This will cause decrease in the customer's future eagerness to buy from the company.

When the players deliver a customer order, they also select a transport medium for the delivery (e.g. airplane, truck, train, or van). This affects on the delivery time of the delivery but also the delivery expenses. Thus, with some extra expenses a delivery otherwise late can be delivered in promised time.

Figure 9 illustrates the announcements from the markets (from suppliers, competitors, customers, or funding organizations). In the example below the company has received several announcements of new orders and one claim from a customer.

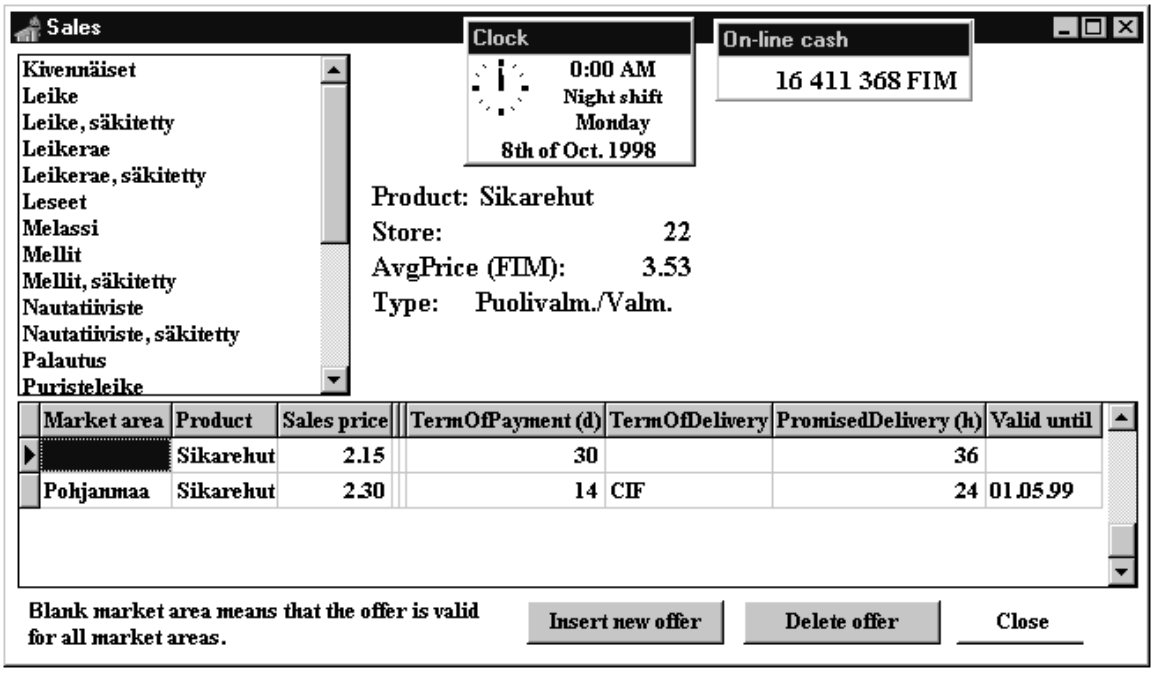

Figure 7: Composing of sales offers.

Figure 8: Incoming orders

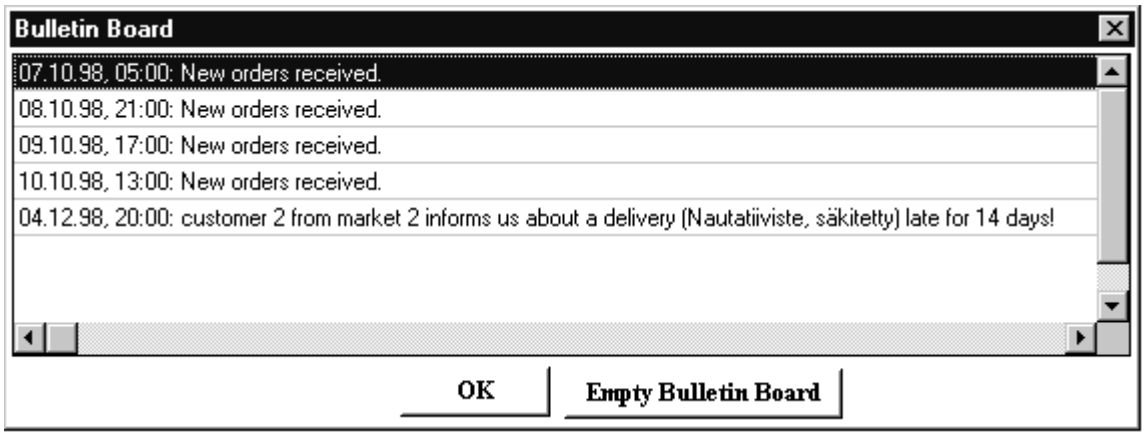

Figure 9: The bulletin board for market announcements.

5. Future Research

Now that the business game construction is ready for production use, the aim of future research is to study whether the interactiveness of the game is a benefit considering enhancing the business perception of company employees. The future research may focus on the use of decentralized real-time processed business game on training and to survey the possibilities, benefits and disadvantages of the game compared to conventional business game training. These studies will be carried out as action research with some industrial business partners who will use the game in their internal training.

Real time processing demands a platform, which offers on-line connections between the different parties in the business game. This means network environment. The present state of networks enables the training to be also geographically decentralized. The real time processed business game could also serve as a research platform to gather information about how people behave in environments where they are greatly dependent on tele-working mediums.

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