

SIMULATING SUDDEN CHANGE AND THE VALUE OF TIMELY INFORMATION

Helmut H. Hergeth
North Carolina State University
hhh@ncsu.edu

ABSTRACT

The paper describes the use of a board-based business simulation to demonstrate sudden technological change, the value of information, and business strategies to cope with sudden technical substitution. The paper describes the simulation model with particular emphasis on avoiding the element of chance during the simulation.

INTRODUCTION

Business simulations are an important part of today's management education, at the undergraduate, graduate, and executive education levels (Solomon, Weaver, and Fernald, 1994, Wolfe, 1993, or any number of business course syllabi). Simulations attempt to provide some "real life" experiences into classroom settings, so to allow experiences and learning by doing, but at the same time simulations create teachable moments rather than having to wait for them in an actual company setting. This combination of theory and practical experience is considered especially important in entrepreneurship education (e.g., Hergeth, 2010, Babson College, 2010).

Business simulations often focus on a particular functional aspect of business, e.g., operational or logistic scenarios, marketing, pricing, or negotiation simulations (functional simulations). Other business simulations try to address the business as a whole, simultaneously simulating key aspects of a business (typically manufacturing and marketing in a competitive setting) to show interdependencies of business decisions across functions (total enterprise simulations). The idea of simulations, whether they are board and discussion based or whether they are computer based, is to strike a balance between realism and big picture overview. If they become too abstract and focused on the big picture, participants may find it difficult to see how they relate to real life and reality. If they become too detailed, participants become focused on specific details and don't make the connections. Even when the results of a simulation round or the simulation as a whole are linked and dependent on the individual decisions, the participants may not see the connection and participate almost like in a game of chance.

Another aspect of simulations and games is the link to discussions of the decision process and the results. Discussions in the Socratic methods of teaching as well as inquiry

-guided learning in general are meant to increase the degree of participation and interest as well as the level of retention (Lee, 2004, Faria, 2001). More abstract simulations require as part of their discussions and debriefs that the results are linked to real life situations. Detailed computer based simulations usually require a discussion showing how the decisions were linked to the results, and that this link reflects reality.

Lastly, one of the key elements of business games and simulations is a certain degree of transparency for the participants. This does not mean that participants should be able to immediately see how to "win" the game, but it needs to be transparent how the participants' decisions lead to the results of the simulation. Unless the results are clearly linked to decisions, participants will assume that the results are due to luck or chance, and this will severely undermine learning and understanding. Simulating surprises, unexpected events, or sudden changes needs to be realistic and transparent while at the same time not ruining the surprise itself.

SIMULATING TECHNICAL SUBSTITUTION

Technology substitutions represent a major change in manufacturing and product technology that impacts markets and demand structure. The more fundamental a technology change is, the more difficult is it to predict the direction, degree, and rate of change in all functions of a company. Business simulations can teach how to analyze such changes, what kind of information may help in predicting technological changes, and what strategies can be utilized to react to sudden change. Similar approaches can be used to determine best strategies for risk management in general, and to teach organizational flexibility to deal with sudden changes in markets and supply chains.

To simulate a "sudden" change in a business simulation, it needs to run for a while in a format that is perceived to be stable by the participants. This stable state requires not only some actual time, but also several iterations of the simulation in the stable environment. Whether this happens in a computer or board based simulation is less relevant, as long as participants get into some kind of routine for their decision making process. Depending on the availability of time, minor "surprises" can be introduced as storylines or discussion points, or major changes can be introduced as a

change in the overall simulation. The two methods are described using the Level 2 version of the Income/Outcome™ simulation by Andromeda Training, Inc. (Andromeda, 2010).

The Level 4 business simulation of the Income/Outcome™ system by Andromeda is a facilitated, board based business simulation where participants make decisions about all corporate functions, compete as teams for orders in a market, and learn how their decisions lead to financial results at the end of each decision making round (each round simulates a month). After each round, the competing teams are debriefed, and they compare and analyze their results. Market forecasts are provided for the duration of the simulation, and all teams receive the same information needed for investment decisions and the like. The market function is a realistic simulation of a closed bidding situation. There is no element of chance as all results and outcomes are directly linked to the decisions of the individual teams, even though the interdependence of decisions between teams sometimes gets perceived as a “lucky break”. An example of this might be the relative pricing of products in the market, as each team (“company”) does not know the planned pricing of other teams. Between the simulation rounds new management tools are introduced by the facilitator assisting the teams in their decision processes.

Elements of surprise can be introduced in two ways: The facilitator can go to an individual team and provide them with an unscripted and unexpected event, e.g., “your products cannot be delivered as your workers are on strike”, or “your ordered raw materials will not arrive on time because of a fire at your supplier’s facility”. Such scenarios are familiar from typical risk management programs, and they can provide an opportunity for all participants to discuss how to safeguard against and react to such events. At the same time, the simulation provides the basis to discuss what the effects of such surprises would be on the financial outcome for the company. However, it is important to undo the effects of such events after the discussion, because a business simulation must remain “fair” to all participating teams, and singling out one company with a strike etc. would result in unequal opportunities to make a profit.

The other element of surprise is an integrate part of this specific simulation and addresses the issue of technological substitution. After a number of rounds that establish a certain routine, the topic of technological substitution is discussed during a regular briefing of the entire group, and the teams have the opportunity to purchase further information about the new technology and its impact on market forecasts. This kind of unexpected event is not being reversed after it has been discussed, as it affects all teams equally, and they still have same opportunities. Participants decide if they want to purchase more detailed information, and after reviewing the information they can then decide how they may want to act on it. Such a scenario is quite realistic, and it provides the opportunity to discuss and ex-

perience the value of information as well as how to react to major changes in the market.

In an inquiry-guided learning environment it is important to create teachable scenarios that trigger students to want to find out more and that describe a problem the students want to solve (Hergeth and Smith, 2004). Adding the problem of technological change to the business scenario provides such a basis for problem solving for the participants in the simulation. However, in addition to simply discussing the issue and creating a strategy to address the issue, a simulation is supposed to allow participant to experience the consequences of their decisions. As mentioned earlier, it is important that such consequences are perceived as fair in the sense that all teams have an equal chance to access the information and decide on it. As the Income/Outcome™ simulation utilizes a facilitator, it is very important that all participants are addressed simultaneously regarding the opportunity to purchase further information and this not be discussed in individual team interactions. Additionally, there are several opportunities to access such information in case a team changes its original decision not to purchase.

SIMULATION RESULTS

Summarizing the experiences of several Income/Outcome™ Level 4 simulations, all participants consider the “sudden script change” introducing a new technology and change in market forecast to be fair and realistic. This is important so that the focus remains on the learning experience rather than discussing if it was fair that a particular team did or did not “win”. Participants have the opportunity to provide written feedback after the simulation, and in no case was the change scenario described as unfair or unrealistic. Additionally participants discussed technology changes over several debriefs following the rounds that introduced the changed scenarios, and they were specifically asked if this kind of change would be considered realistic and how they felt about it as part of the simulation. In all cases the sudden and drastic changes were considered realistic, and many of the participants contributed examples of their own industries to the discussion.

During simulations, for the facilitators it is very interesting to observe how the different teams discuss their strategies, especially right after some of the teams purchased information that other teams did not buy. The use of new market information in the strategic decision making process is of course critical and an expected outcome, but additionally the teams used the knowledge of who did and who did not purchase information to anticipate competitors’ strategies.

As the teams during the simulation are not only discussing market and business situations and coping strategies but also experience the outcomes of their decisions firsthand and verify them in financial statements after each round. Given the level of intensity in experiencing the consequences of their decisions this becomes a great way to

introduce and discuss the results of other unexpected events. Such discussions, even if they do not become part of the actual experience in the simulation as their impact on the company financials is not calculated, tend to become more lively and memorable since they are conducted within the framework of the simulation experience. Thus the background of a business simulation provides a great opportunity to discuss all kinds of risk management topics while at the same time providing the tools to explore the impact of specific scenarios.

CONCLUSIONS

Business simulations, especially facilitated simulations, provide a great opportunity to discuss issues beyond the scope of the actual simulation.

Strategic level business simulations need to have a robust enough structure to accommodate discussions that vary significantly from the scripted simulation to be useful in risk assessment planning.

Business simulations allow participants to experience outcomes of their decisions in planned and in changing situations. It is essential that changing situations are perceived as fair and realistic by the participants to ensure that the experiences have a learning impact.

REFERENCES

- Andromeda Training, A Family of Business Simulations, <http://www.income-outcome.com/the-family-of-simulations/>, November 2010.
- Babson College, <http://www3.babson.edu/ESHIP/academic/co-curricular/>, 2010.
- A. J. Faria, The Changing Nature of Business Simulation/ Gaming Research: A Brief History, *Simulation Gaming*, 2001; 32; 97.
- H. Hergeth, Experiential Learning in the Classroom and Sustainable Entrepreneurship, presentation at the 2nd Annual Symposium on Executive Education, June 3, 2010, Kennesaw, GA.
- H. Hergeth and G. Smith, Inquiry-Guided Learning in a Management of Technology Environment, *Journal of College Teaching & Learning*, Volume 1, Number 5, May 2004, pp. 11 - 18.
- M. Jones and H. Hergeth, Teaching Marketing and Finance through Entrepreneurship Concepts, *Journal of Textile and Apparel Technology and Management*, Volume 2, Issue 3, Summer 2002.
- V. S. Lee (editor), Teaching and Learning Through Inquiry: A Guidebook for Institutions and Instructors, Stylus Publishing, 2004.
- G. T. Solomon, K. M. Weaver, and L. W. Fernald, Jr., A Historical Examination of Small Business Management and Entrepreneurship Pedagogy, *Simulation and Gaming*, Volume 25, Number 3, September 1994, pp 338 – 352.
- J. Wolfe, A History of Business Teaching Games in English-Speaking and Post-Socialist Countries: The Origin and Diffusion of a Management Education and Development Technology, *Simulation and Gaming*, Volume 24, Number 4, December 1993, pp 446 – 463.