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# Viasa's Microworld: A Strategic Management Learning Laboratory

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## ABSTRACT

This paper describes work and experience gained by a system dynamics team in developing a microworld to support a strategic management learning laboratory at Venezuela's international airline Viasa and a computerized case study at IESA. The opportunity for this experience arose from an atmosphere of change produced by Viasa's transition from state to private ownership. This work is intended to form part of a managerial development effort at Viasa and as a teaching and research tool at our business school.

## BACKGROUND

Creating a microworld is a complex and rich experience. So much so that it takes a while to identify and assimilate all that has happened, all that has been learned. In this paper we describe our work and experience gained in developing one such microworld, which we built with two purposes in mind. First, to support a strategic management learning laboratory at Viasa. Second, to be used as a teaching and research tool at our business school.

### Viasa

Viasa, Venezolana Internacional de Aviación S.A., started in 1960 to provide passenger and cargo air service on international routes out of Venezuela. From its inception it was partly state owned (55%), partly private (45%) until 1981 when Venezuela's government saved the airline from bankruptcy and became its sole owner. During recent years, Viasa has covered long international routes to Europe, North and South America with eight airplanes and about 3500 employees.

Over the years, Viasa confronted several managerial, financial and labor problems, which were overcome mostly through state intervention and subsidies. The decision to privatize this airline was part of the process of economic aperture and modernization taking place in

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Venezuela during the last few years. This coincided with deep changes in the structure of the worldwide airline industry, characterized by some bankrupted firms and many others joining together through alliances, mergers, buy outs, etc., in an effort to cover larger geographical areas and to improve connectivity, which is one of the most important attributes of a modern airline. To survive in this international context, it became urgent to overcome Viasa's internal problems. Selling it to a private consortium, which included a large international aircarrier, became part of the solution.

### **Our project: a learning laboratory and a computerized case study**

Viasa's president during the privatizing process<sup>1</sup> recognized the importance of developing strategic analysis tools and modern managerial skills. The airline's Flight Services Manager<sup>2</sup>, who was familiar with system dynamics and knew about our experience in this area at IESA, joined in with us to start a modelling process leading to a learning laboratory at Viasa. Inspiration came initially from People Express, the managerial flight simulator built by John Sterman (1988), and by the work with Hanover Insurance Companies reported in Senge and Sterman (1990). Specifically, we wanted to create a computerized simulation game which could be useful to Viasa for improving its management teams strategic analysis capabilities. In an effort to involve Viasa's managers in the overall modelling learning process, we had several interviews with Viasa's president and included its Flight Services Manager in our research team.

At the same time, we aimed at creating a computerized case study for teaching purposes, Benbunan et al., IESA 1992. For this we used the same basic model as for Viasa, changing some figures and without revealing its internal structure to the users. In contrast, the simulator presented to Viasa includes the possibility of discussion of the internal logical structure of the model. The open model, in Viasa's version, can then be changed to reflect the managerial group's scenario analysis and understanding of the firm's dynamics.

### **The modelling team**

In early 1991, we set up a modelling team including several faculty and researchers from IESA<sup>3</sup> and two currently active line managers<sup>4</sup>, one from Viasa already mentioned, another from a totally unrelated firm. We spent about nine months of continuous work, involving much analysis and discussion. Our team evolved into a learning laboratory in itself. We interviewed Viasa's president several times, top managers from other airlines to learn about industry characteristics, interacted with a large number of people knowledgeable about the transportation industry in general and the aircarriers sector in particular. Our team's modelling process was enriched by international contacts with John Sterman at MIT, John Morecroft at LBS and Ernst Diehl at MicroWorlds Inc.

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<sup>4</sup> Lolly Romero and Francisco Antelo respectively.



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## Software

We constructed the system dynamics model underlying Viasa's Microworld with Stella 2.0, a software by High Performance Systems. Then we used the Microworld's Creator software, Ernst Diehl (1992), which imports equations from Stella, to construct the graphical interface that allows interaction with the model and the simulation of the decision making process during a period of time. We decided to set a five years period, with quarterly reports and decision opportunities. Ernst Diehl helped us with this part of our work. We worked with a Macintosh SE provided by Plus Sistemas, Apple's representative in Venezuela.

## THE TRANSITION MACHINE

The system dynamics model in Viasa's Microworld was designed with the idea of building a "transition machine": the model is expected to simulate the dynamics of the privatization process by introducing the conceptual notion of a strategic alliance with a large airline, which would impact in most functional areas, and by explicitly representing the sistematization process necessary to modernize Viasa's management. Such transition machine would operate in an environment sensitive to its behavior.

### Functional areas, decision variables and presentation of simulation results

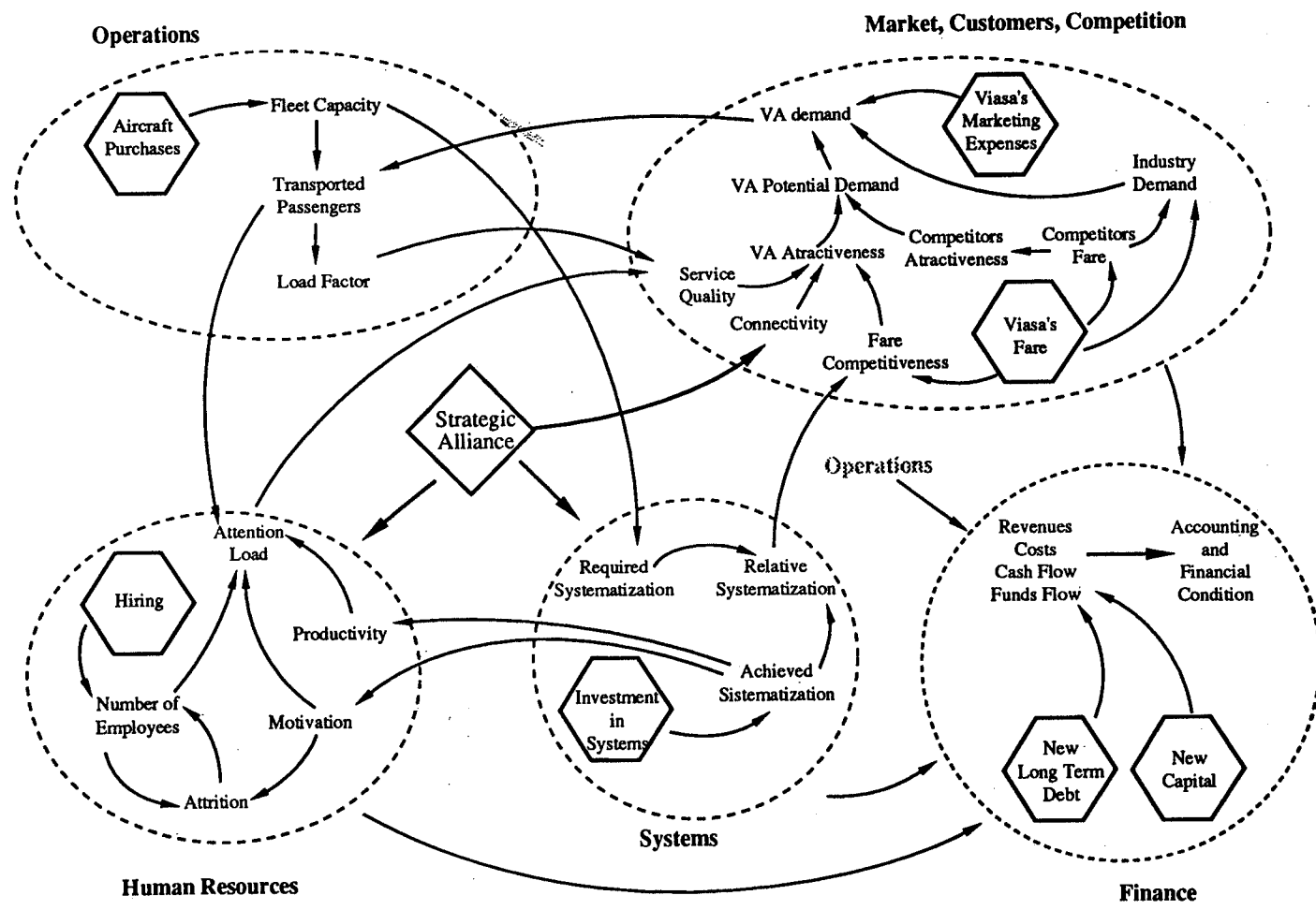
The simulator includes complex interactions among five functional areas (operations, marketing, human resources, information systems and finance). In each of these areas decisions are made which have to be aligned strategically. There was substantial debate amongst the modelling team, including Viasa's managers, about which decision variables to choose and develop. Several topics were left out, for example: labor contract conditions, routes and flights realignment. The final choice of the decision variables is a compromise that reflects and allows for quite a complex panorama of Viasa's transition process. The decision variables are:

- Aircraft purchases
- Hiring
- Viasa's fare
- Viasa's marketing expenses
- Investment in systems
- New long term debt
- New capital

Results from simulations include the trajectories of most model variables, presented both in tabular and graphical forms. A number of performance indicators are also displayed for each functional area.

### Environment factors

In addition to the structure that simulates the impact of a strategic alliance with a large airline, Viasa's simulator includes several environment factors: competition is modelled by lumping together all other airlines; customer reaction to service quality and comparison of Viasa's attributes versus the competition is simulated; industry demand has a vegetative



Viasa's Transition Machine

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growth modified by industry wide price elasticity; lastly, there is an economic subsector encompassing inflation, interest rates and fuel costs. All these areas are intimately interconnected and produce the simulated environment in which a user of the Viasa Microworld has to manage this firm.

## **THE STRATEGIC MANAGEMENT LEARNING LABORATORY**

The organizational learning process supported by Viasa's Microworld deals with scenario analysis, strategic issue discussion, and strategy formulation, testing and discussion. The focus is on operationalizing alternative strategies in order to enhance Viasa's mission while making the privatizing transition.

### **A strategy workshop**

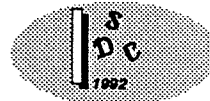
John Morecroft helped us design an innovative workshop in order to launch the simulator at Viasa. Its purpose is to introduce Viasa's top managers to their Microworld and to strategic thinking in a system dynamics fashion. This workshop creates an opportunity to use Viasa's Microworld for executive debate and strategic analysis, as described in Morecroft (1990). Unfortunately this workshop has not yet taken place by the time we wrote this paper.

To setup the right atmosphere for working with the management simulator, the workshop will begin by giving participants a chance to try out the flight simulator used for training purposes by Viasa's pilots. Then a few hours are planned for discussion of the airline industry, with emphasis on Venezuelan international transportation, competitor analysis, industry pricing and demand scenarios. Concurrently, Viasa's Microworld would be updated with several parameters coming out of this discussion. This is intended to have the effect of model ownership (at least partially) by the workshop participants. Debate then continues about the strategic issues facing Viasa, clarifying its mission and success criteria. This half day discussion ends focusing on strategy operationalizing, creating a "bridge" with the gaming simulator which is expected to check the feasibility of the company's mission given an industry demand scenario. This "bridge" is of utmost importance for the success of the workshop: it should convey an understanding of the transition machine, described earlier, and of the underlying model's scope.

During the afternoon the participants will gain first hand experience on how to use the Viasa simulator. Teams will first design and explicitly indicate their intended overall strategy, specify the functional decisions that operationalize it, and the expected results. Then they will use the gaming simulator to experiment and try out their ideas and expectations. Afterwards, participant teams fill-in result sheets which will be the basis of their presentation to the whole group for the final debriefing session.

### **Guidelines for a permanent facility**

The strategic management learning laboratory could be described as an organizational meeting ground dedicated to exploring and testing hypothesis about current situations, desirable futures and the paths that lead to them. Teamwork and learning would be achieved through dialogs, discussions and workshops, experimenting with Viasa's Microworld and developing it further. Outside speakers could be brought in for



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expanding and deepening the analysis. Contact with business school faculty would contribute to strengthen the theoretic basis for this work and to incorporate such experience into academia. This facility would aim at improving strategic thought amongst Viasa's management and their decision making process. On the other hand, the Viasa simulator could also be used for induction purposes for new employees and for clarifying the company's evolving vision and mission amongst all stakeholders.

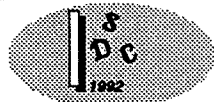
### THE COMPUTERIZED CASE STUDY

The version of Viasa's Microworld used for teaching purposes involves several parts:

- A written case study, describing Viasa, its background and current situation. The reader is challenged to understand the important issues Viasa's management faces and to propose strategic avenues which may be tested using the accompanying software. In Viasa's case the main current problem, as discussed earlier, is to manage the transition from a state owned firm to a private company.
- A manual, introducing the user to Viasa's Microworld. The data used in the simulator is simplified and explained carefully to the user. A number of forms intended to help the student plan the decision process are included for presenting results in a suitable format for discussion.
- The Viasa gaming simulator itself, which is a computer software presented in the Microworld format. The student is encouraged and challenged to implement solutions, to experiment and try out different ideas.
- A workshop design for using the Viasa Microworld with MBA students. The class is divided into two to three member teams. Individual reading and team initial experimentation with the software is then required. A mid-workshop discussion is held with the whole class to enrich the strategic analysis and challenge students further. Finally, the class meets for team presentations and discussions.

Working with IESA's MBA students we have gained the following lessons:

- Viasa's computerized case study offers a vehicle for simultaneously analyzing several complementary aspects of MBA courses related to the strategic management of a firm in transition.
- Developing a mind for strategy is facilitated by the "clarify it, do it, and evaluate it" approach inherent in using the Microworld.
- Conducting the case discussion in order to share the mental models behind the strategic thought is a challenging task, but also an illuminating and rewarding one.
- Students experienced how a future can be created by imagining it first, and proceeding thereafter in consonance with an appropriate strategy. They achieved a better understanding of the learning nature of the microworld development methodology, in contrast to the predictive purposes of other modelling approaches.



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## CONCLUSIONS

After having developed Viasa's Microworld we can point out several concluding remarks about the construction process itself and about the goals such a simulator fulfills.

- Developing a microworld can be a very time consuming process, involving many people.
- Deciding what the key issue of the Viasa Microworld, its overall game and model purpose, was difficult. It is one of the most important parts of the whole process. Deciding what to include and what to leave out is by itself an important exercise.
- Because a microworld reflects the mental models and knowledge of the modelling team, the importance of gaining strong support from top management echelons and of involving managers' views at the various stages of the construction process cannot be overstressed. This is particularly true in a strategy oriented microworld. The challenge of developing a system dynamics model for a firm, acting as an external group, requires to identify effective ways to interact with the organization.
- Developing a shared vision and team learning abilities with the research colleagues is a most satisfactory achievement.

Up to this moment, our Microworld has proved to be a valuable tool for managerial teaching. It allows the integration of knowledge from several functional areas and the vision of the organization as a system. We hope it will also be useful for Viasa, as a tool for managerial learning in the firm.

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