

VIRTUAL ENTERPRISE, A MANAGEMENT TRAINING TOOL

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ABSTRACT

A Virtual Enterprise is a virtual environment where participants can use management applications to improve enterprise performance. The environment emulates an organization with five positions occupied by individuals. The production operations are simulated by a model receiving the actualized data. After model runs, results are used in a balanced scorecard indicating how key performance indicators were affected with the changes made. After completing the training cycle, participants mentioned how difficult was at the beginning to be involved in order to achieve the challenge of improving profitability, but after well understood the production process, with a well communication system among them, and analyzing the key indicators, they could find the causes of low productivity and improved it. In this way, they were able to understand how strategies help to improve profitability. Considering this tool as a serious game, it is expected to reach an approach to situated learning in management field.

1 INTRODUCTION

The basic idea of a Virtual Enterprise is to show the participants how models are used to evaluate alternative strategies, starting with production operation models, which are simulated to get a better understanding of production operations, see page 332 of Sheer (1994), then integrated with a business process model and its architecture and data transfer, see pages 335 and 695 of Sheer (1994), and finally, with a balanced scorecard model which represent the objectives and goals of this enterprise defined by the team members. Because these models are simple and exposed to participants in order to understand how indicators are calculated and data is stored in the database system, the participants are in conditions to develop their own model in future projects.

In this Study Case, the production operation simulator represents the operations in an open pit mine. From the set of the model variables, it has been selected some have been selected, which are read from an external source, in this case, from a database on Internet. The value of these selected variables, can be changed through a workflow system representing a business process oriented to define the resource planning and scheduling for the next production period. These adjustable variables are associated to the Marketing, Personnel, Operations, and Strategic areas, one for each participant, and finally, the participant with the financial role, must check if the return on equity (ROE) is achieved with the financial data available.

When the expected productivity level has been reached, the whole team analyses the enterprise performance through the balanced scorecard model.

2 METHODOLOGY

Virtual Enterprise have a website with a public home page and also with restricted access to each particular one (<http://centro.evirtual.cl/evrajo>). These web sites have three main buttons, the first one is to access production management using a model simulation of the process, the second one is to use the work-

flow system for changing operation conditions in the model, and the third one is to review the performance indicators.

In the production management environment, directions in how to install the simulator and how to analyze results can be found. A User Guide is available with system description and results explanation. The User Guide also has directions about how members can modify the new values of the initial operation conditions. These changes are made in the environment accessed through the second button which redirects to the workflow platform. Finally, the third button allows access to the pages that show the performance level of this enterprise using the balanced scorecard report.

The model also has an Excel spreadsheet with a DuPont structure for estimating the ROE, and then can be compared with previous operational conditions.

A view of the three buttons accessing to the three integrated software as constituents of a Virtual Enterprise is as follows.



Figure 1. (a) The website the Open-pit Mine Virtual Enterprise. This homepage shows information for a Demo version. Access to individual enterprises are restricted to specific users. (b) Architecture of the platform of a Virtual Enterprise. Simulation models are built according to real production processes and fed with data stored in a database system. Production results are consented by the team using a workflow environment. After that, enterprise performance is depicted by a control management system.

The role playing starts with the General Manager setting up the new production level, runs the model and publishes the result in the web site. Informs the results to the rest of the team. Each member of the team check the parameters under their control and make the adjustments necessary to improve the performance indicators of their responsibility, and Optimize operating conditions. The access to the results is done through the button "Análisis Productivo", shows the operational results. Using those results, the team members make changes in the operating conditions building new scenarios and runs the model to be sure about the improvements. All the team must do their own adjustments because modifications affect the whole performance. These modifications are done using the button "Automatización de los Procesos Administrativos". When reporting the data in the web site, it also is actualized the control panel and the balanced scorecard defined for this enterprise, and again, each team member review the new results until a consensus is reached.



Figure 2. Role playing cycle. When new production level is given, each member of the team has the challenge to optimize the performance of their correspondent areas. Making the adjustments, new scenarios are built. Then the simulation model is run and the new results are reported to the whole team by publishing in the web page.

3 FINDINGS AND CONCLUSIONS

In all the cases when this tool is used, it was found that participants did not feel familiar in using simulators to analyze the system and insecure in making a decision. After analyzing the results and discussing them with the other team members, participants became more confident and secure in using methodologies and theories for improving productivity and profitability.

Even though these findings are observed, they have a subjective appreciation requiring a more systematic evaluation in the situated learning, (Lave and Wenger 1991) to be sure that participants have acquired the necessary skills in a community of practice using an experimental methodology. (Gunter, Kenny, and Vick 2008).

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