Simulation MANAGER

1/2022

FlexSim is in the game

An interview with professor Krzysztof Nowosielski

Digital twin of an innovative process line at Valmont Poland

Piotr Sender, chief computer simulation engineer at Valmont Polska LLC

PAGE 11

Study of the effect of buffer capacity increase on filling line throughput

Dawid Dąbal, vice president, FlexSim program director at InterMarium LLC

PAGE 15

Creating digital twins in the internal logistics industry

Wojciech Skwira, director of the internal logistics section, MPL TECHMA LLC

PAGE 20

An interview with professor Krzysztof Nowosielski

LEADER

An interview with Krzysztof Nowosielski, PhD, originator and manager of Business Process Simulation Center (BPSC) at Wroclaw University of Economics and Business (WUEB).

Let's start with some basic facts about you. What is the scope of your career interest?

I am a researcher and lecturer at Wroclaw University of Economics and Business. I work in the Department of Process Management and, most recently, I have been the manager of Business Process Simulation Center. I should point out that this facility is the outcome of project PORTAL – Integrated Programme for WUEB Development, and that this project is co-financed by the European Union . My early beginning at the WUEB is related to management control systems, that is budgeting, cost accounting, management reporting and that sort of thing, but for several years business process management has been my main area of interest.

And what is BPSC?

First of all, it is an original, ultra-modern research and didactics facility, designed for interactive simulation of business processes. It was incorporated in the WUEB infrastructure several months ago. It offers 20 high-performance PC stations, powered by FlexSim, including 6 independent VR workstations, which allow the users to visualize and interact with the designed processes in a computer-generated environment with objects that appear to be real. Currently, the users of BPSC have at their disposal dozens of virtual decision-making games centered around logistics, production and service process models, all developed in FlexSim. These games are used as teaching aids during classes, allowing users to get acquainted with 3D model of the process and its flow. We copy real processes and managerial problems from business and implement them in FlexSim. Thus, students can play the role of managers, decision makers, realistically affecting the process performance without leaving the WUEB campus. Our first experiences are very encouraging.

Could you explain a little more the topic of ultra-modernity of BPSC?

This facility goes far beyond the solutions applied at Polish, or even European universities. It was specially designed to allow comfortable work with process models, both when it comes to process design and its visual simulation. In its own way, it meets the requirements of the Industry 4.0 concept, but applied in an academic environment. In addition to the aforementioned virtual decision-making games, which in themselves are a novel and original use of FlexSim, BPSC is a unique facility. An undeniable advantage of this object is its modular construction, which allows it to be upgraded relatively easily. Now it is a one story facility, but we can attach several more modules to it, each with a different functionality. Moreover, this object sets new standards in terms of complexity of intelligent solutions for building management systems (BMS) and access control, making it extremely user friendly, but also cost-effective. Thanks to the implemented "audio-video cloud" integrated with BMS, or virtual reception, the users can have access to a unique, fully automated, highly efficient and economic platform. The use of a heat pump makes it ecological too, which is very important nowadays, isn't it?

Where did the idea for this kind of a facility come from?

The idea came to me about 10 years ago. It was just after reading an article presenting the results of an experiment comparing push and pull production systems. What inspired me most was one shortcoming of the research method. The experiment required 2 groups of students to execute a certain scope of manual activities, separately for each production system. I thought it would be nice to have some kind of a way at our university to visualize and flexibly affect such processes without the need to have someone carry them out. Unfortunately, at that very moment, the idea could not have been implemented and I put it aside for the time being. In 2017 the idea was reactivated. The technology was ready, the money was accessible and the authorities of WUEB gave a green light to start the idea of BPSC.

What was the biggest challenge in this project?

Because the facility is unique and original in every way, it was not possible to use ready-made solutions or patterns to benchmark against. It was impossible to find any similar examples and see what is and what is not worth doing. Obviously, both hardware and software solutions had existed on the market before this project started. What I mean here as an example, is FlexSim, or the system for transmission and management of the AV signal. However, figuring out how to use, combine and configure these elements into a single, coherent and logical system was probably the biggest challenge I faced. I was very fortunate to come across specialists who understood my ideas and expectations and engaged in 100% in this project.

What part did people play in this undoubted success?

Without doubt, people play enormous role in this project. Both my team, made up of WUEB employees and external co-operators, have influenced the BPSC creation and made it possible so that its shape and functionality are like originally planned. I didn't have to give up any of my ideas and I didn't have to simplify any of my assumptions. I was supported by specialists in every important issue. When you have an idea in which you believe very strongly, but you don't know the operating solutions or have an unclear vision, you need professionals around you to help you understand and explore the topic and find the right way.

How suitable is FlexSim for decision-making games, and what dictates how successful a decision-making game is going to be?

In my opinion, FlexSim is a very good environment for decision-making games. It has several important attributes that give it an advantage over other solutions. First, it provides the ability to design a process using 3D graphics objects, both in terms of active and passive process participants, i.e. the resources used in the process and so-called flow items. This is a very important feature, especially when we consider the expectations of students of the Z-generation regarding the graphical presentation of the contents of the class. Visualizing the process models in 3D, as well as in VR, helps us, academic teachers, reach the audience in a better way. The next thing is FlexSim's high flexibility, which allows us to design and visualize not only typical production or service processes, but also to show, for example, the flow of documents, which is of great importance to academic teachers leading such management courses as management control, cost or management accounting. The huge advantage is that FlexSim features experimenting and optimization tools, and that makes it possible to use decision-making games in the research area as well. With FlexSim's open development environment, we can add custom solutions to our models. Decision-making games, which are available on the market, do not allow us to make changes or improve models without the manufacturer's participation. FlexSim is primarily a simulation environment that allows us to implement any concept of process model or managerial decision problem. We prefer to invest money in our academic staff so that we can create and improve process models by ourselves.

What would you advise someone who wants to carry out a similar venture? How to go about it?

As I said before, human factor is the key to success in any project, especially when it has innovative outcomes. This must be borne in mind, because either alone or with a poorly chosen team, we will not go far, or waste our energy in vain doing so. We also need to remember that the idea itself is more important than financial or other material resources. If a valuable idea – that is, one that responds to certain needs, even those that are just beginning to outline – is internally consistent and logical, it will quickly reach the audience, inspire people to act, and engage them in the project. When you start your project thinking about its financial performance, or the return on investment, you may easily lose motivation. I think the idea is the most crucial. The financial, organizational or technical matters are of secondary importance.

Can we say the project has been already finalized?

Certainly not! Today I can't reveal the details of our new idea, but I can say that we are working hard to incorporate FlexSim functionality and our decision-making models into some research projects. But now we are still in the conceptual phase of this project, with more questions than answers. Thank you for the interview. I wish you every success with all your projects.

The interview was conducted by
Natalia Witkowska-Cempel
the editor of *Simulation Manager*

Production process engineering

Postgraduate Program

Acquire new skills and develop your competencies

The program is directed to future:

- production engineers
- process engineers
- production managers
- production plant managers

FIND OUT MORE:

With the possibility of completing the program 100% online
Convenient form of study for those who can't or don't want to attend full-time classes