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University of Applied Sciences helps SMEs to use AI in forecasting

“We make the translation between the existing AI and the practical application”

Joyce Mesdag, freelance journalist

VIVES University of Applied Sciences is looking at how it can use existing AI models to help SMEs estimate future demand for their products. Smaller companies have less data available, and that makes the step to AI slightly less obvious for them than for large multinationals.

Correctly estimating in advance how great the demand for a particular product will be is essential for successful business. It allows companies to tailor their purchasing and stock policy to demand and to optimize their production and capacity planning. Artificial intelligence is increasingly used to forecast as accurately as possible. But AI technology usually needs a lot of data to make predictions. And that is precisely where the problem lies for SMEs.

VIVES researcher Yves Sagaert, professor at the IÉSEG Management School: “Large companies such as Amazon or bol.com have no shortage of data: from surfing and click data to advertisements and cookies. A small physical electrical store who sells the same devices does not have all that data, and that makes predicting more difficult. The barrier for SMEs to get started with AI is therefore high. In that respect they must fight with unequal weapons. We have therefore set up a research project with VIVES to tailor AI technology to environments with more limited data.”

Laying the puzzle

To achieve this, it is necessary to think out of the box by analyzing data according to three different levels. The first two seem quite logical. “We analyze the previous sales according different periods: per season, per month, per week and per day. We also group products, so that we can, for example, apply general trends in vegetables to tomatoes, for example.” The third level involves AI: “We also look for subpatterns between things that at first glance have nothing to do with each other. For example, it is possible that the sales of pears in the first week of November are the same as those of tomatoes in the second week of April. We will continue to work with these sub-patterns.”

“We are looking for patterns between cases which at first glance has nothing to do with it to make each other to have."

Yves Sagaert, AI expert VIVES

Today, VIVES already has several concrete projects in collaboration with SMEs to help them use AI*(see boxes)*. “On the one hand, you have the AI that universities create in a laboratory environment and which is mainly aimed at larger companies,” says Stefaan Haspeslagh, Liaison Officer AI at VIVES. “On the other hand, you have the needs that smaller companies experience and for which AI can provide a solution. Create with VIVES we are a bridge between the two.” “You can compare it with a puzzle: we look for the puzzle pieces in existing AI technology that are useful for a specific challenge,” says Sagaert. “If there are still pieces missing to complete the puzzle, we develop them. We therefore make the translation between the existing AI and its practical application. We look at, among other things, how that AI can be visualized and what tools are needed. We then transfer all the pieces of the puzzle to the companies and it is up to them to get started, together with an external consultant and possibly with innovation support from VLAIO.”

Predicting exam results

A lot is possible with AI, more than most people think possible. Even predict exam results. “Six weeks before the exams, we can use AI to predict students' exam results,” says Sagaert. “We do not communicate the exact score to the students, to avoid them either thinking that they no longer have to study, or thinking that the calf has already drowned. But we do let them know in which areas they can make additional efforts to improve their results. Then we give, for example, the tip to use the PowerPoint presentations of a certain person

Yves Sagaert (left) and Stefaan Haspeslagh: "The barrier for SMEs to get started with AI is sometimes high." © Luc Demiddele

review the chapter, or ask additional questions in a discussion forum. How many points they will score is calculated based on factors such as the topics they click on on platforms, or answers to questions about their study behavior.”

“By incorporating AI can put employees the freed up time in other tasks to invest."

Stefaan Haspeslagh, Liaison Officer AI VIVES

The applications in business are also numerous. Haspeslagh: “AI can be a particularly useful tool for, for example, optimizing business processes. It helps employees do their jobs more efficiently, makes their tasks less complex and can even help address labor shortages. AI is sometimes seen as a threat to employment, but that is not the case. By means of

Employees can use AI invest the freed up time in other tasks.”

In all possible sectors

Whether it concerns education, healthcare, logistics or the manufacturing industry: AI means added value for all possible sectors. “If we look at the logistics sector, for example, we see that companies now arrange transport for their freight separately. By road, rail or water: it doesn't matter, as long as the delivery arrives. What the future could be: every company brings its freight to a certain hub, such as the port of Zeebrugge or the edge of an industrial zone. From there, all freight is bundled towards another hub. There are currently insufficient hubs to fully develop that system. But we are already working on simulations and algorithms, because the AI must be ready when those hubs are there.”

Healthcare can also make major progress thanks to AI, for example to monitor patients more accurately. “Anyone who has ever been in intensive care has an increased risk of kidney failure later in life. It However, it is currently impossible to follow up all those patients. Thanks to AI, we could predict which patients are more susceptible and therefore need to be checked more often than others. We are currently already working with AZ Groeninge, UZ Leuven, VIVES and KU Leuven.”

In the front row

And there are still many applications that can be imagined. “I am happy to have a front-row seat to this technological revolution,” says Sagaert. “I like to compare it with Microsoft Excel. When it emerged in the 1980s, everyone was convinced that the program would change the world. Now, so many years later, the program is completely established. The possible applications of AI may be less clearly defined than those of Excel, but I am happy to contribute in the search for valuable applications. For example, if you use AI to make predictions about the work orders that come in, this will contribute to a more stable workplace and ultimately even job security for your employees. Fantastic, right?”


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Hanssens Catering (Gullegem): “More correct forecasts based on AI”

Hanssens Catering from Gullegem supplies hot meals to 500 schools in the wider region. “We now use a simple system to determine the quantities,” says co-manager Arthur Hanssens. “The day of the week plays a very important role: generally fewer children eat at school on Friday than, say, on a Tuesday. We also notice that more and more people are eating à la carte. If it is fries, spaghetti or macaroni with ham, more children will continue to eat and more will be eaten than if there is roast pork or fish on the menu. When calculating the quantities, we therefore also take the popularity of the dishes into account.”

These are very broad lines, while it could be a lot more specific. “At some schools, the popularity of a dish has more or less influence, and at entry times after certain holidays, a few toddlers always join the class. All factors that we can take into account, but that is too much for the human brain. AI can process all that data. This would not only allow us to limit our food surpluses but also make our work easier. For example, we now make an estimate per school ourselves and set up the correct packaging base is already ready. But when a school orders a different quantity, we have to quickly adjust the packaging. A more correct forecast based on AI can avoid that.”

In the meantime, VIVES started working on Hanssens Catering's figures from the past three years. “We will receive the result in May and we can put a first rudimentary model into use. We will of course make double estimates during the first weeks, both with AI and with our current system. But I really expect that AI will be more accurate and that we will eventually use that AI estimate as a new guideline.”

“We would not only limit our food surpluses, but also make our work easier.”

Arthur Hanssens, Hanssens Catering


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Welfare association Ruddersstove (Bruges): “Avoiding food surpluses with AI”

Ruddersstove was founded by the OCMW of Bruges. Director Lieven Astaes: “Ruddersstove prepares around 2,200 meals every day. These are intended for residential care centers and service centers in Bruges, but also for private individuals who have meals delivered to their home.
We prepare two main courses and two cold dishes every day, from which people can choose.”

Estimating the correct quantities is not always easy. “People don't know a week in advance what they will like. You can order meals from us until 10 am the day before. But of course we have to place our orders with suppliers earlier, and our production is already in full swing at that time. That is why we use orders received two days in advance as a guideline quantity, plus a few extra meals to take into account last-minute orders.

Because we work in the healthcare sector, it is crucial that everyone who orders a meal actually receives a meal. We therefore calculate quite generously, to ensure there are no shortages.”

This means that Ruddersstove often has food surpluses. “About 35 kilos a day,” says Astaes. “We ensure that these surpluses end up with people who are having financial difficulties, but we would of course prefer to avoid them as much as possible.” AI could help with that. “Many factors play a role in the quantities ordered: the weather, the day of the week, the season, the popularity of a dish or the combination of options. For example, hutsepot is ordered more at the beginning of winter than at the end. If we want to take all these parameters into account, we need a full-time employee. But that makes the cost of the meals more expensive and is therefore not feasible. AI can process all that data smoothly.”

Ruddersstove provided VIVES with an extensive amount of anonymized data from recent years. The university is now developing an algorithm based on this. “Our expectations are high,” Astaes adds. “The forecasts for expected orders based on AI will undoubtedly be closer to reality than the estimate we are making now.”