Evaluation project period
February 1, 2022 - July 31, 2022

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From February 1, 2022 to July 31, 2022, we tried to help SMEs a step further with Data Science at NHL Stenden in Leeuwarden (Netherlands) for the Future by Design project. We tried to do this in two ways:

• put students to work with in the context of their graduation internship;
• organizing 'data inspiration days' for SMEs.

This memo summarizes per section which points we have learned from this.

Graduation internship students

We put three students from the Finance & Control program to work to help companies with Data Science as part of their graduation internship.

The result of their graduation internship is a developed tool that analyzes the menu of a catering company, based on their data, and categorizes all drinks and dishes into stars (high number of sales, high margin), plow horses (high number of sales, low margin), puzzles (low number of sales, high margin) and dogs (low number of sales, low margin). The result for the Future By Design project is that they have helped seven SMEs with the developed analysis.

Although we have achieved good results for the project efficiently and the students have graduated with good results, we have learned a number of things.

Goal alignment

Immediately at the start of their graduation internship, we brought the students into contact with an intermediary organization that has a membership of thousands of SMEs. During the conversations that took place, we quickly established that there were different interests or goals at play:

1. The Future by Design project aims to assist SMEs in their data science journey in order to achieve a result in terms of growth, innovation and/or productivity. This mainly concerns companies that are still in the early stages in that regard and may even think that data science is not for them.

2. The graduation internship of the students had two learning outcomes that they had to meet:

   • advising on the design and/or evaluation of an organization's management control system, aimed at directing, controlling and monitoring value creation by an organization, in such a way that the (strategic) goals are achieved;
   • selecting and applying appropriate analysis methods and techniques aimed at making appropriate operational/tactical decisions for the organization.

3. The intermediary organization was willing to cooperate, but they did not want to send the students to their customers without a clear business case. The students themselves had to come up with solutions for data science problems at SMEs and then convince the intermediary organization of their solution.

So we had three parties (the project, the intermediary organization and the students) with all kinds of objectives and preconditions. The challenge for the students was to find an overlap, because not everything in the field of data science matched their study objectives. And if they had come up with something, they also had to convince the intermediary organization of their business case before they finally sat down with the SME entrepreneur.

Learning point: goal alignment

When deploying students, make sure that you have carefully considered in advance the connection between educational objectives, project objectives and the objectives of all other parties involved.

Choose the right course

The Finance & Control students who worked for us did an excellent job within their capabilities. However, within Finance & Control the knowledge and skills in the field of IT & Data Science only form a small part of their education programme. For these students, these are a number of compulsory learning objectives and they have not opted for a course that mainly consists of IT & Data Science for reasons of intrinsic motivation. The employability of these students was therefore limited.

Learning point: choose the right course

When deploying students, consider deploying students with above average knowledge and experience in IT & Data Science in order to maximize the employability of the students.

In the case of a graduation internship, students should carry out the work at the level of a starting professional. However, one student is not the other and they do not have much experience in practice. So make sure you have someone else who has enough time and knowledge to instruct, review and supervise their work. The extent to which depends on the specific student and the expectations of an SME. If the data science project at the SME is 'nice to have', then the supervisor can of course let the students work more independently than if it's is a 'need to have'.

> **Learning point: provide adequate guidance**
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> Make sure you have someone who has enough time and knowledge to instruct, review and supervise the work of the student.

Data inspiration days

How do you help as many SMEs as possible with as little effort as possible? We have tried this by organizing data inspiration days. An SME could register for such a day, whereby the following results were promised:

- insight into the data maturity of your company;
- inspiration about using data and thinking about it with others;
- getting started: your first steps with Power BI.

Approximately 20 people from approximately 14 SME companies attended the inspiration days, all of whom had a great time and were inspired. Most went home with the Data Brainwave, the Data Ethics Scan and a Project Plan. Everyone has gone home with a lot of inspiration and ideas. We have also learned a lot from this initiative.

One day concept success

All participants, without exception, have indicated that they found it a valuable day. They also indicated that the theory and inspiration on the one hand and hard skills (Power BI) on the other hand are a nice combination in one day.

It was also a successful formula for us, because the entire administrative settlement with all kinds of project documents (Data Jumpstart, Data Brainwave, Data Ethics Scan, Project Plan, Evaluation Form) were fully completed at the end of an inspiration day. The day can also easily be duplicated, with possible adjustments due to the sector and data maturity of the participants.

> **Learning point: one day concept success**
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> Try to get as many SMEs as possible in one room for one day, ensure a varied day that is tailored to the sector and the data maturity of the participants and ensure that you handle the entire administrative settlement on the same day.

Recruit participants on time

In May we started recruiting participants for the first data inspiration days in June. That was really too late; SME entrepreneurs are very busy and the approaching summer holidays may have played a role here as well. We have learned that you should preferably start recruiting at least six weeks before the start of the inspiration day to maximize the number of participants.

> **Learning point: recruit participants on time**
>
> Start recruiting at least six weeks before the start of the inspiration day to maximize the number of participants.

Same sector not necessarily needed

We started by organizing a data inspiration day for accountancy firms as a pilot. The idea behind this was to bring SMEs from the same sector together, so that they can inspire each other based on the same background knowledge and challenges.

We organized the second inspiration day for SMEs in general. In attendance were a large shipping company, a production company for ambulances and fire engines, an internet strategy company and two freelancers from the financial sector.

Learning point for ourselves from this day was that these various organizations were also very well inspired. We paid more attention to exchanging each other's organizational knowledge and discussed the possibilities with data science in a very interactive way. Due to time constraints, we therefore left out the Data Brainwave, Data Ethics Scan and the Project Plan this day, but had participants at least as satisfied as the first day.

This of course depends on the wishes of specific participants and the data maturity of the participants. I had already seen from the Data Jumpstarts that the companies had filled out earlier, that these companies had a pretty high degree of data maturity. We also inventoried and discussed the wishes at the start of the day and they were all open to this changed approach. I think organizations with a lower degree of data maturity have a greater need for the project documents.

> **Learning point: same sector not necessarily needed**
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> One of our success factors was that we made the program of the day specific to the sector and the data maturity of the participants. A successful data inspiration day could also be organized in for companies from different sectors.

Focus on warm and hot contacts

We have had no success with cold calling recruiting. We mainly used social media (LinkedIn) for this. We have only recruited two participating SMEs with this.

All other participating organizations came from our own business network. We called and/or emailed them directly. This also ensured that we mainly had financials in the room. However, that was also our target group because they have a central role in an organization and they will most often have the development role of Power BI.

Should we therefore disregard social media? I don't think so, because we did publicize the project and it was only the first publicity for this kind of inspiration days. We also published the successful days afterwards, so we don't know the (medium) long-term effects of this yet. The power of repetition can of course cause SMEs to register more and more.

> **Learning point: focus on warm and hot contacts**
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> When starting this kind of data inspiration days, participants can be recruited most successfully through warm and hot contacts. Publicity via social media could then be important to recruit SMEs outside your own business network.

Cross-pollination with education valuable

We involved education in the data inspiration days in two ways:

1. We involved the three graduation project students in the data inspiration days by having them attend and participate in the workshops. The students learned how the SMEs thought about data science and the SMEs were inspired by fresh perspective.

2. We invited teachers from the accountancy education program to the data inspiration days for accountancy firms. A similar effect applied here: the teachers were very interested in how the accountancy firms deal with data science nowadays and the accountancy firms were interested in what education can offer. Concrete success: a graduation student was even immediately appointed to carry out the data project conceived on that day!

> **Learning point: cross-pollination with education valuable**
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> By involving students and teachers in the data inspiration days, knowledge and inspiration can be exchanged between education and SMEs.

Points of improvement for Data Jumpstart

We had critical participants in the room, especially about the Data Jumpstart that they should have filled in beforehand:

- Some questions from the Data Jumpstart ask for company-sensitive information, but there is no privacy statement. They thought this was extra special because it is a project that revolves around data science.

- Some questions do not have sufficient or unclear answer options according to the participants.

- The Data Jumpstart is often completed by one or two specific participants from an organization, while the questions from the Data Jumpstart and the data maturity focus on an entire organization. That sometimes makes it very difficult to fill in, because one department often does not know what another department does with data science.

  For a reliable data maturity scan, the Data Jumpstart will therefore have to be completed by someone who can oversee the entire organization and/or jointly by all department heads. Maybe, it is also recommended that the Data Jumpstart is completed by ourselves, together with the SME, instead of sending a link by e-mail. We can then better control the reliability of completed Data Jumpstarts.

Learning point: points of improvement for Data Jumpstart

To be recognized as an authority in the field of data science, the Data Jumpstart must be put in order in terms of privacy statement and quality of questions and possible answers.

The correctness of the completed answers depends on which person from an organization completes the Data Jumpstart. This cannot be checked by sending a link by e-mail, but you can, by example, by filling it in together with the SME.