

1 END USER INTERVIEWS

1.1 Introduction

Based on the results of the survey, seven people were selected and sent an email to have a one hour personal interview. Five people agreed to participate in the interviews. The idea behind these interviews is to get a more in depth view on the problems that were highlighted in the survey results. The interviews were planned between the 13th and the 26th of April. As a reference, the transcripts of the interviews were added in full in the appendices.

As a guideline, several questions, divided in four sections, were written down in advance and used to provide structure to the interview and to try and get comparable responses, although it must be noted that not all questions were used in every interview. Every section was given a time estimate as well in order to maximize the allotted time. The following questions were used:

General information (**5 minutes**):

- Can I reference you in the report or would you like to remain anonymous
- Can you please describe your main job (briefly) and responsibilities
- How long are you working at ASML
- How long have you been using BI tools
- Do you consider yourself an expert user or a general user (consumer)
- What are your general experiences using BI at ASML

BI adoption (**10 minutes**):

- What is the main motivator for using BI in your department?
- Is there enough management buy-in?
- Is use of BI promoted/obligated?
- If you are using Excel/SharePoint lists? Is there a way you can migrate the data to an IT governed data source?

BI challenges (**20 minutes**):

- What hinders you for using BI more?
- Would a knowledge community help you and if so, are you willing to contribute to the community?
- Would it help you to use the knowledge community as a peer review tool for the reports you make (in order to make them more efficient) and would you be willing to post your reports there (with dummy data if needed)
- What was the biggest roadblock learning to use BI at ASML
- Since IT follows the 'One source of the truth' philosophy, can you find the data you need in the different available data sources? If not, what needs to change in order for this to work for you?
- Is the process of requesting something BI related (e.g. a change) from IT optimized enough (time, process flow, ...).
- Do you still use excel to manipulate or visualize data and if so, why?

BI training (**15 minutes**):

- Several people indicated they did not receive enough training for using BI tools, do you agree or disagree?
- Can you find all the training ASML provides? Would it help if all the training can be found on a central hub like myLearning
- Would a Stack Overflow-like community help you for finding solutions?
- When asking for help, is the expert (key) user you address always willing to help you? On what (average) timeframe does he provide help?
- Since people indicated an instructor-led classroom works best for education but this may be impractical, would instruction videos with an instructor on screen and a chance to get feedback on questions work for you? (example Udemy courses)
- Are you interested at periodically planned BI meetups as additional training? Should these be mandatory or voluntary

1.2 Interview results

1.2.1 BI use and motivation

When asked about the use and motivation of BI tools, answers vary significantly among interviewees. General use varies from initial experimentation and plain data retrieval to standard reporting and more experimental use, meaning making various legacy items work together within the Spotfire environment. However all respondents primarily use Spotfire to connect to SAP and retrieve data in some form to use in reports. One user indicated: “[...] I just use Spotfire as a data, let’s say, retriever from SAP, because I don’t like the feel of SAP. [...] I think it takes less time to load data through Spotfire. Other than that I use Spotfire to view reports.” (Appendices 4, Interview 1).

Getting data from legacy sources is however sometimes a challenge. As one user pointed out, a lot of detours often are mandatory. One user explains: “In the beginning we even first did a data dump from the Access database to Excel, because we couldn’t access Access directly. Then we put the Excel on SharePoint and that SharePoint we linked to Spotfire. But then the ability to link SharePoint to Spotfire ceased to work so we had to convert it to a shared drive. Then all of a sudden we could access Access in Spotfire, but only in the Report Builder and not in the web player. So we had to do a conversion of the shared drive and add it to the backend of the web player. Up until now, it has not been completely fixed [...].” (Appendices 4, Interview 2).

When asked if the use of BI is voluntarily or mandatory, everyone agrees it still is voluntarily. Management is more or less in agreement of the use of BI and sees the benefits it provides according to the survey, but when asked if it would upset the work floor if BI would become mandatory one user replies: “Yes that would definitely upset the work floor, at least for now. Since people have a lot of work, changing the workflow now will cause some turmoil.” (Appendices 4, Interview 1). One user added: “[...] because Excel is easy, people know it and there’s a bit of a

threshold for people to explore the new tool and learn to accomplish the same results." (Appendices 4, Interview 2). The full adaptation of BI can't be accomplished however if users are not guided towards the use of the new solution. When change is required, an external stimulus is required to start the change. If that external trigger is absent or not strong enough people will keep using the safe 'outdated' solution and only some pioneers will try and possibly adopt the use of BI tools in their daily work routine.

Some interviewees admitted that there is enough management buy-in to start using BI tools and some managers understand or would like to learn the benefits to efficiency BI can bring: "It's more of an interest of him and me to use a BI tool for reporting purposes. We investigate the potential use. It's not like we're going to make it mandatory, it's more of an investigation to see how much we can get out of it." (Appendices 4, Interview 1).

Also user personal interest is currently of key importance to start using BI. As one user states: "You really have to want to learn it though and I think you need an affinity with BI, which isn't given to everyone since it's more of a technical skill." (Appendices 4, Interview 5)

1.2.2 Roadblocks

While using business intelligence tools, all interviewed users experience roadblocks that hinder their current work. One recurring issue seems to be the available data sources. Users don't know where to look for the data they need. All data sources have technical names and there is no list available where BI users can check what they contain. As one user states it: "[...] and since all the databases have all these strange names you don't know what's what. You know what you are looking for, but you don't know where to look for it." (Appendices 4, Interview 1). Knowing where to look in the data sources means users can become more independent "[...] I want to be a bit more independent because right now I have to ask a lot for data from data owners and I know we have a whole landscape of BI that is used together, but now I'm just using a small part of it which is just the reporting." (Appendices 4, Interview 3).

Two users also state that as a BI user, knowledge of the info links is required and how to use them: "[...] I need training for the info links. Now I'm using data that's from Excel sheets and embedding it, but I still would like a live connection. [...] That's stopping my progress." (Appendices 4, Interview 3) and "[...] ideally the report that I have built should be live because real time data is evidently more beneficial. Now I update the report on a monthly basis, that's nice, but it could be better." (Appendices 4, Interview 3). The knowledge of these info links will also contribute to end-user independence and will boost user confidence in using BI tools.

A more in depth knowledge of the tool and the supporting architecture will also help to solve issues with linking legacy items to reports. One user stated he had issues with linking a legacy data source to the Spotfire tool: " I ask a lot of support about Access and interfacing Access with Spotfire. I can't manage to get the data

from my Access database that is hosted on a shared folder to display in the Spotfire web player. This issue is going on for several weeks [...]." (Appendices 4, Interview 2).

Linked to the use of data sources is the access users have to data sources. As two users state, this is an issue which blocks users development and makes BI users dependent of other users. As one user states: "Well sometimes IT just blocks connections, so Spotfire cannot connect to SAP due to security reasons. This makes that you become dependent." (Appendices 4, Interview 3). One user even sees issues for a group of people since he says: "[...] access rights to data needs to be solved. This last issue really needs to be fixed, since we have reports that people use on a daily basis. We can't have these kind of reports failing." (Appendices 4, Interview 2).

Sources aren't always as stable as they should be. When talking about working with BI tools, one user stated that: "[...] Spotfire stability is an issue at our department, mainly at end of month reporting." (Appendices 4, Interview 4). When asked if this was due to client stability or data source stability, the user didn't know. Since the issue happens at certain times when high traffic can be expected towards data sources, it's plausible to suspect they can't fulfill the data demand at those times. Since however Protiviti states data source performance is one of the key determining factors for users to keep using BI solutions (Protiviti, 2017, pp. 3), this issue needs to be addressed, especially if the amount of users is expected to increase.

One user also experienced the limitations of the software as a roadblock. He stated that: "Recently we had a report that exceeded the on-demand limit and refused to work. One of the colleagues had to redesign the report in order to make it work." (Appendices 4, Interview 4).

A last mentioned roadblock is time, the time to train and practice implementing the skills that are learned. Although agreements are made to learn how to use with a given BI tool, this time is often used for or deemed less important than regular work time. One user says: "Sometimes I arrive at work and I planned to spend some time on learning Spotfire, but the whole day things are going on and the training gets postponed." (Appendices 4, Interview 1).

This again requires a management buy-in and an awareness that the time spent on training BI skills will be beneficial on the long run. The management buy-in is really necessary since "People really need to be interested in BI in order for them to free time and dedicate themselves to learning to use the tool. But I think this does not happen enough." (Appendices 4, Interview 5), affirming that if not managed and governed properly, only those interested in using BI will try and master it and the rest will remain to use the old software.

However when enough time is invested, "some people [...] leave a lot of good automated well designed reports in their wake." (Appendices 4, Interview 5). This time investment needs to be persistent because, when these people "migrate to another job, their knowledge leaves as well and you can only hope that their successor has the same level of knowledge to maintain the reports." (Appendices 4, Interview 5). Losing the required knowledge results in "[...] the report [becoming]

unusable and people will revert back to downloads and the use of Excel." (Appendices 4, Interview 5).

1.2.3 Training

In the survey results 'more training' was one of the most repeated answers in multiple questions. The importance of training is summed up quite nicely by one user: "I think because a lot of people don't know how it works. It's never been learned. If you start working in [my department] and you take over Excel reporting from someone else, you maintain that report unless you really like to change it to something automated." (Appendices 4, Interview 5).

A big part of the interviews was therefore dedicated to training and to try and figure out what was going wrong and what could remedy user grievances.

The first issue is one the author experienced himself, and is actually finding the training content. One user sums the process up quite nicely: "Just knowing how to get started, how to get access to start the training. I looked at myASML to find info and there I found sites that didn't hold up-to-date information and then I had to approach the key-user, but I couldn't find who the key-users were. Next you had to wait for a couple of days to get the approval [...] everything prior to actually starting the training makes it very difficult to continue." (Appendices 4, Interview 2). This points out that the accurate information is hidden in a lot of outdated records that have gathered in the SharePoint myASML site.

Two other users stated they had third-party help in finding the training they needed and this seems the current way of working for finding information in general. If you are lucky or look hard enough, eventually you meet someone who knows where to go and you find the content you need: "[...] fortunately I had a good mentor, so he really helped me out with that, and I got in touch with IT." (Appendices 4, Interview 3) or "[...] I just received a link from someone with the statement: 'Just apply there'. I think however if they would make this more easy to find and apply, more people would start using BI and the community would be more alive." (Appendices 4, Interview 2). Having easier access to training would indeed facilitate the adoption of BI a lot.

This last argument was also confirmed in Interview 4 where the user had been waiting for 5 months for a training to become available on myLearning. He states: "I'm waiting 5 months now for a time slot or a meeting to start the training. I looked at myLearning where the training is listed as well. I registered myself there and checked the 'send-me-updates-when-available box' but up until now, I haven't received an email." It seems the listing of the BI training on myLearning is a dummy record, but apparently 48 people signed in or applied for a training and are still waiting (Bart Fisser, personal communication, 26/04/18).

Although lowering the threshold to find the training is a good start, the content of the education needs to be addressed as well. As one user states: "I had some basic training, but I don't see much value in that training, because there are lot of things unclear afterwards." (Appendices 4, Interview 1). There doesn't seem to be an issue

with the basic training, although some people are asking for more basic training that contains: “[...] the general concepts of the tool like how to make a graph, how to connect to a data source, where to go when I have a question and topics like that.” (Appendices 4, Interview 2), but with the follow-up training: “[...] after the training you can use the tool up to some point, but you don’t know what else is possible [...]. It’s mainly trial and error, but probably at a very inefficient way.” (Appendices 4, Interview 2).

1.2.4 Getting help

Besides issues finding the required training, people also have difficulties finding help. As one user states it: “[...] there was a training, but no one to really answer your questions and afterwards it took a long time to get your questions answered. So I took a self-initiative to look up information online, but at that time, Spotfire didn’t have a lot of online resources. Therefore I bought a book that I studied.” (Appendices 4, Interview 3). This indicates people search for ways to solve their questions, but, besides asking a colleague, are not able to find them within ASML. If they use the in-house help channels, they apparently not always get a proper answer: “Colleague or Google are the most used channels, but I have also sent mails to AIS or Spotfire support. The answer is usually pretty quick, however I do think they sometimes don’t know the answer as well [...]” (Appendices 4, Interview 2).

To find information, some users reach out to key users to get help. But when asked if key-users and colleagues seem irritated or less-willing to help, a user says: “Yes that happens a lot actually” (Appendices 4, Interview 1). So they are referred back to Google, learning by doing or “If they’re not available, you can’t advance the training and you have to wait.” (Appendices 4, Interview 5).

This also seems department or even team dependent. One team lead indicated the key-user for BI in his team “[...] didn’t give that feedback yet. Usually people ask pretty basic questions that are easily solved.” (Appendices 4, Interview 4)

On the other hand, one of the interviewed users was a key-user for AIS in his department. When asked if he received a lot of questions he replied: “I haven’t received any questions up until now” (Appendices 4, Interview 3). Surprised by this answer and since a lot of the replies in the survey state key-users are used to get information, the question was posed if his colleagues knew he was the key-user to which he replied: “I have no idea. But that’s not something I can promote myself, right. People should know, maybe an email should be sent to them” (Appendices 4, Interview 3).

This correlates to the response in Interview 2 where the user states when looking for training he couldn’t find who the key-users were. However when asked where key-users search for help, the reply sounds familiar: “I know in the Finance department there are users [...] that are super good at Spotfire, but they’re super busy as well because I had a hard time contacting them to get some help and then they answered me: ‘We would really like to help you, but we’ve had a lot of requests and we can’t help you just now’.” (Appendices 4, Interview 3).

1.2.5 Management buy-in

Although people indicate in the survey managers and colleagues value the use of BI, it appeared during the interviews this isn't always the case. When asked if BI is perceived as something valuable or something that adds value, one user states: "[...] not everyone shares that vision. It's not like [my department] has the vision that BI will help everyone. It's more like a vision of the future where we want to end, but not the road towards that vision, meaning we need to use this in order to achieve that future vision." (Appendices 4, Interview 5).

In all interviews, the use of BI is viewed as something voluntary, not mandatory, where "[...] it seems the general rule is we have data, we want a report, how you get there and what happens in between doesn't matter. Also how likely errors occur due to bad manipulation no one knows or cares, what ends up in the report is the truth and remains the truth." (Appendices 4, Interview 5).

Having enough management buy-in is key however as one user pointed out: "[...] if management isn't inclined to learn and use BI tools, there is less pressure for employees to start using it as well and you're left with people's own curiosity for exploring BI tools." (Appendices 4, Interview 5).

Management attunement towards the use of BI could however be dependent of department and even team, since one user in a team lead position stated: "[...] I still keep pushing the rest of the team towards BI and let them experience it's there and they really need to use it, since it's a good way of doing reporting." (Appendices 4, Interview 4).

Linked to that statement, one user notices a positive trend and says: "I see a trend of people moving to Spotfire [...] But right now more and more reports are moving to Spotfire and I see a positive trend to move to BI use. [...] I definitely see a change." (Appendices 4, Interview 3). This trend is however strongly department dependent since other users did not experience this feeling and state: "I think usually my co-workers prefer Excel to look at. The general acceptance of BI has to change in my department." (Appendices 4, Interview 1). This could be due to these departments being presumably on a different stage of the Transition Curve (Figure 6.1 , p. 18).

Although it seems some departments are on the right track, it is pointed out this opt-in could be advocated more since according to perception: "He's open for using BI, but he feels it's your own risk if you use it or not [...] I think it would motivate if a manager would really promote it, but I don't think in general it would have much effect. I do think the biggest factor is the people need to be willing to start using BI tools themselves." (Appendices 4, Interview 2). This could be interpreted as a sort of indifference and disinterest in the way the information is delivered and the delivery is the only thing that counts.

One possible to solution to stimulate manager buy-in is to clearly define the current strategy concerning the use of BI. As one user states: "What I don't know and I don't know if it exists is what [...] our vision and strategy is for implementing

BI and how we go from simple data to reporting or analysis and what the guidelines are for doing this." (Appendices 4, Interview 5).

1.2.6 Proposed solutions by users

The solutions to the problems stated above are both easy and a bit more challenging to accomplish. For instance the spread and outdated information issue could be solved by building one SharePoint BI portal where links direct users to various subsites, like for instance one per BI platform. One user also suggested to implement the RACI model for BI tools, since then: "[...] you'd know who to go to and who to ask for information. So implementing a RACI model would be a good idea and would save a lot of people some time." (Appendices 4, Interview 3) This RACI would help guiding new users to the people responsible and would indeed avoid users getting lost in the outdated SharePoint information.

A clear representation where the tool fits in the general picture would help managers understand the benefits and importance of using BI tools instead of Excel. One user says: "What we're missing is a master list that says what belongs where. [...] Where does everything fit in the entire scope and where does the scope fit in. If you want other users or managers to use BI tools, they have to know where it fits in, what it can do and why it is needed." (Appendices 4, Interview 3).

According to the users basic training can be provided in two ways. One user is in favor of instructor-led classrooms because: "[...] joint training is a good motivator to start learning at a normal pace. With a classroom training, your agenda is empty, you can make exercises on your own speed. The alternative is to provide a video-based learning platform. Users like this kind of tutorials as well since: "[...] I use Udemy for my courses in school as well and it's quite good. The nice thing about Udemy is, and that's why people love it I think, is the structure. First you get a general overview and then different topics are addressed as separate modules." (Appendices 4, Interview 3)

These modules could vary depending on the department, but having it set up in a modular way means courses can be built depending on the audience, but with the same content. The content should not only revolve around Spotfire, the general part could also hold: "[...] background information [...] where you can find all the data needed for the tool because having training about Spotfire is only half the story. Having information about the data and a proper description about the databases and their contents is vital for using them correctly." (Appendices 4, Interview 1)

One user had a previous experience at Philips using BI and he said "I followed a BW training which was a 2-day course. This training covered the use of reports and query building [...]. I liked the training though, since what I learned there, I used throughout my entire career. To have his kind of training though, it's nice to have a classroom training, where there is a good explanation and enough time to practice. I really think for basic BI tool education, this kind of training works. For the more advanced topics a computer based training could work as well. But I really

think a classroom based training is best for new BI users and people who have no previous experiences with BI tools." (Appendices 4, Interview 4).

Why an online course for new users wouldn't work he replied: "If you have to start by yourself, I assume the threshold is higher than when you attend a classroom-based training." (Appendices 4, Interview 4).

All users however are in agreement that the courses should be activity-based, as one user states it: "At least as long as you're doing something and not just following the video." (Appendices 4, Interview 1)

To counter the lack of training after the initial basic training several measures can be taken. First a good knowledgebase should be provided according to the users: "Training for people who already know the tool could be in the form of a very good wiki or a good knowledge base where they can find additional information and ask questions" (Appendices 4, Interview 2). The wiki should however contain: "different information than the Spotfire website. It has to contain the specific information relevant to working with Spotfire at ASML." (Appendices 4, Interview 2). This knowledge base could be something like Stack Overflow since: "there are so many different layers in using BI tools. [...] I think if there is an environment where I can just ask the question, the community can guide me to the right person." (Appendices 4, Interview 3). The user that held a team lead function even replied "If something like that would be available, I would definitely promote it in my team to use it to get answers to problems and such." (Appendices 4, Interview 4).

A help channel like the one proposed above already exists. One user points out that: "you already have for ASML the Yammer feed with various topics. [...] but it doesn't seem too alive. It could work if this gets more alive and used to share information." (Appendices 4, Interview 2)

Besides having a good wiki or reference base, regular meetups could also work to get new content to users. As one user states: "[...] often you keep solving problems the same way, but possibly the solution could be built more efficient with some minor alterations. Someone has to tell you this once though in order for you to know it." (Appendices 4, Interview 5).

All the interviewees seemed open for the idea saying: "Yes that would be a good idea if there is a good speaker [...]" (Appendices 4, Interview 1). The interviewed key-user is also willing to share his knowledge although: "[...] if it's a key-user group." (Appendices 4, Interview 3). If asked if he would share for the entire community, he nuances his willingness a bit: "Sometimes it's difficult for the entire community, because a key-user has enough information or knowledge. If you do it for the entire community, you need to tone it down quite a bit." (Appendices 4, Interview 3), highlighting why the lack of base knowledge prevents further growth of BI users in using the tools.

Meetups would also work for report consumers and not only for report builders. When asked if he would attend a meetup if the content is focusing on for instance evolutions of the BI landscape or new developments one user stated: "Yes certainly. This would be really interesting since you'll have a better picture of the possibilities

of the tool. Having that knowledge you can alter your requirements for reports." (Appendices 4, Interview5).

When asked when the meetups should be held, opinions are divided. One user states: "For me if it would be between 17:00h and 18:00h that wouldn't be a problem, but I do think a lot of people would prefer to hold this during work hours." (Appendices 4, Interview 4). The general agreement however is as one user says: "[...] it can be out of office hours. If you like what you're doing it's not difficult to spend more time." (Appendices 4, Interview 1)

To make the different trainings known to the public, one user also gives a solution: "[...] we have a learning center, but nothing is posted there. If however we could go there and browse the list of available training and I could be redirected to the proper location where I can find the information I need." (Appendices 4, Interview 3)

A BI performance gain can be obtained by automating more processes. One user used to work in a Philips BI team and he said "[...] a lot of actions are performed manually in Excel. Philips was ahead in that area and automated a lot." (Appendices 4, Interview 4). Also the level of reporting can be augmented. According to the same user "[...] we need a more visual approach. Color is used but at Philips more variety in graphs were used." (Appendices 4, Interview 4). Having better looking reports may be an incentive for other people to start using them or even start doing reporting in the BI tool as well. Management has to be willing to use these reports as well though, since one user stated: "A lot of reports are used for years now and have a certain look and feel. If you rebuild it in a different BI tool, it's appearance changes and management isn't always too happy with that change." (Appendices 4, Interview 2).

Linked to having color schemes, a style guide for reports would be a nice addition as well. According to one user, reports still need to be formatted in order to be able to use them for presentation purposes. He states: "" (Appendices 4, Interview 5). Having templates that sorts this before report building, lowers the threshold for end users to use BI even further.

Finally to get people to know BI tools the system of 'evangelists' or 'champions' was proposed. The interviewed users were very positive towards this role and the interviewed key-user was willing to take up this role. However as one user pointed out: "I think you need to be lucky if you find enough people willing to do this" (Appendices 4, Interview 2).