

Harald Storrle: This is ACM ByteCast, a podcast series from the Association for Computing Machinery, the world's largest education and scientific computing society. Talk to researchers, practitioners, and innovators who are the intersection of computing research and practice. They share their experiences, the lessons they've learned, and their own visions for the future of computing. I am your host, Harald Storrle.

So, hello Darja and hello everybody. I'd like to introduce to you our guest from today, that's Darja Smite. And Darja is a professor of computer science, software engineering in particular at the Blekinge Tekniska Hogskola in Karlskrona, Sweden. And first up, Darja, can you tell us a little bit how you got into the IT field when you were young and studying and what motivated you and what were your first experiences there?

Darja Smite: First of all, hello everyone and I'm very happy to be invited here. Thank you, Harald. My story, I think is not very unique. When I was growing and studying in school, I was very good in math and I did not want to become a math teacher. I did want to become very different things like architect or journalist or movie director. So there was a lot on the table, but at the end, my passion for solving problems, and math problems in particular drove me to a field, so to study in the faculty of physics and mathematics, but in a particularly practical field.

So I wanted to have a job which is not boring, which is not maybe a teacher teaching the same subject for the end of their career, must be very passionate about working with kids. I was not very passionate about working with kids. I was more passionate about the math side of it. So I had to select some profession that would ensure that the job profile would be interesting to me. I had no clue about computer science or computing at that moment, but I was very intrigued by what was happening in the late 90s in IT field, and I saw that it's an uprising field, so that's why I'm here.

Harald Storrle: All right. Now you said in the late 90s, so almost 30 years after, do you think that was a wise decision and would you decide that way again?

Darja Smite: Absolutely. Every day. I'm very happy for my decision. In fact, when I was approaching universities, I got in several universities and several different study programs including management and foreign affairs. And I'm very, very happy that I did not go into a school of management and instead studied in computer science.

Harald Storrle: So towards the end of your studies, you already sidelined as a teaching assistant, if I'm [inaudible 00:03:14] correctly. Did you also work a little bit in industry at that time or was that later?

Darja Smite: Oh, yes. I started second year into my bachelor degree, I already started working, which is a common practice where I'm from. So I'm from Latvia. Although I have a position now, I live in my country of residence is Sweden, I

come from a small country where it's very common to work aside of the studies. And I think that's a very good practice because you study in a different way. So you look at the subjects and the knowledge that you gain in the university knowing what is applicable, where it is applicable, and you have a different drive towards knowledge, I think, than sitting and learning from more theoretical perspective.

Harald Storrle: Absolutely. That's exactly way I feel and what is, I think it's common these days pretty much everywhere. If there's an opportunity work on the side, that's definitely something I would recommend to young people. Definitely. And then at some point you switched over to Sweden, you just mentioned that, and you also have a part-time job in Norway, I believe.

Darja Smite: Yes. So I have a full-time position in Sweden, Blekinge Institute of Technology as south in Sweden as I could go. And I do work in Norway part-time in SINTEF in Trondheim. That's quite far north. That was not one of the places where I would consider moving. But having said that, Norway has very interesting IT industry. It's very different to what we have in Sweden. And it's particularly interesting also to work with a group of scientists in SINTEF who work with software development and software engineering field. And we have a very long-lasting tradition of cooperation and conducting research studies together.

Harald Storrle: In fact, BTH, Blekinge, is, as far as I know, one of the best places if not the best place for doing empirical research in software engineering in the world. Definitely a very prominent place in this domain. Sweden in general has a very strong empirical research community, Norway as well. Can you pinpoint for us what's essential for this? How did this come about? And how does this cooperation between industry work?

Darja Smite: I think that's quite well known as a Scandinavian research tradition, pinpointed also by scholars that worked with engaged scholarship, Van der Ven and others. I think one of the reasons is also that we employ people who have had positions in industry, so they come with a different mindset. So I mentioned that one of the things that drove me to do not necessarily research but to select this field is the passion for solving problems. And I think this passion is something that we all share to solve practical problems, something beyond theoretical research.

And I'm not saying that theoretical research is not needed or important or not applied. Everything can be applied. I think that academia in general has a little bit of a lag of understanding which problems are relevant if we only look into academic press. So let's say we look for interesting problems to address by reading journal publications. A journal publication before it is published and readable or today papers are readable a little bit earlier because you have online access to them a little bit before they are included in an issue.

But even then there is a delay of waiting for reviews, acceptance of the article, conducting the article, writing up the article. So it's a long way since the

problem was actual and when you read in a journal about it. So I think that's why we want to have a very big window in the industry or at least a common door. So to visit them regularly and see what's today urgent, because from my perspective and my experience, things change very quickly.

Harald Storrle: Right. Now you highlighted, and quite correctly I must say, the long latency between a problem popping up and an answer being given by science if there is to be a scientific research on that. So certainly that is something that academia can't help. Industry would like it to be faster, but academia can't help because if you want to be conducting proper research, it'll just take some sweet time and the publication process doesn't help exactly. So how do you overcome this when you work with companies?

Darja Smite: By very frequent knowledge drops. So we cannot sit on the results that we collect the data, analyze the data, and wait until something is published to come back to the companies and say, "Hey, now you can read it online." No, it would not work. You would lose momentum of cooperation with industry and the companies will say, "The latency is too long and we're not interested to be a part of this," because by the time they would read about the insights about themselves, it might be not relevant anymore or not interesting. And I think these seminars that we provide to industry and different newsletters and flyers that we distribute with the insights into results, we have become also better in writing linked in articles to share the research results which are very well-read to be honest.

Harald Storrle: Yeah.

Darja Smite: So those are the things to be done to prove that we are relevant and not so slow.

Harald Storrle: Right. I see. Now going a bit deeper into the work that you have actually done. Historically speaking, some of the most interesting papers that you've wrote, at least interesting to me or useful to me in my current work, have to do with outsourcing and offshoring work, that is taking an IT development piece of work and giving it to some other company that may be not close by, certainly not in-house, maybe a subsidiary, maybe some other company sitting on the other end of the world. And there is a couple of things that we've learned about that over the years. Can you give us a little rundown about the most important insights, maybe some surprises, maybe some things that are actually not surprising, but good to know for sure after doing some research?

Darja Smite: I think one of the fundamental topics that I have attacked is the very foundation of offshoring and outsourcing. So it's very fair to say that the main driver for both offshoring and outsourcing is the run-up to the cost-cutting strategies. So it becomes, even though not all companies would admit it, this is number one reasons for starting an outsourcing collaboration or establishing your own subsidiary somewhere in a low-cost country.

Harald Storrle: If I may, in the 90s and early 2000s I believe that was the main factor. But in the last couple of years when I talk to people that are about to do that or that have subsidiaries, their main argument is not so much cost these days, but also-

Darja Smite: Is it talent?

Harald Storrle: It's talent, exactly.

Darja Smite: That's a very good reason to lift. Unfortunately, it's not the main reason. Yes, indeed in some cases it is. But why wouldn't you find talents locally in the same country? Within the reasonable commute distance for example? So even within the country, I must say that there are higher cost and lower cost regions and salaries. Some companies choose to set salaries based on the cost of leaving and others set the salaries based on meritocracy, paying for a profile, a competence and skill profile.

Harald Storrle: Right. Certainly if you go to let's say Stockholm, you'll have to pay higher prices than if you go down to Blekinge, because Blekinge is a little bit rural and it's a bit far away from the centers. And so that definitely accounts for something. Housing is probably a lot cheaper down there than in Stockholm say or Malmö. That's for sure. But it intrigues me when you start out saying it's about cost-cutting and there's various alternatives. In the end of the day, you have a ratio between the amount of effort you put in and the cost that you have to cover.

So if you can get more done with fewer people by automation or by these days employing GenAI in your co-pilots and whatnot, then you have higher productivity. And thus in the end of the day, lower cost. And that wasn't the case 20 years ago. Sure, we had MBA and tried to automate stuff there. And sure, today's programming languages and tooling environments do a lot more than what they used to do 20, 30 years ago. And so productivity definitely has risen over the past three decades all over the world. And also costs have kind of narrowed down.

Back in the day, Poland was dirt cheap for programming. These days I don't see much of a difference. Vietnam maybe still is a bit of different to European countries. But if I look at what Silicon Valley pays are, I get probably a third of that. I don't know. But certainly substantially less. And I know that because the people from Google and whatnot that work in Munich where I'm based get a lot more money than I do. So definitely where you are in terms of which country and within which country that makes a difference and productivity makes a difference.

And in particular, GenAI is said to make a difference at least to some kinds of jobs, to some kind of activities in the whole software engineering environment. So do you think that this is a major factor that we will see have repercussions in the next couple of years? That the automation makes it jump ahead so that maybe some or other outsourcing locations will become less profitable?

Darja Smite: That's a very good question. So it's a question of what do we outsource? Do we outsource very basic stuff that a machine can replace? Or do we outsource the problematic areas that we don't want to take care of by ourselves? So for many years, and in my experience from research into product transfers to India, I have seen a lot of these problematic products that are going into maintenance phase that nobody wants to maintain. You want to perhaps utilize your talents and resources in the best possible way, which is a new development. And then you outsource some old stuff and nobody wants to take care of the old stuff.

Of course, if you replace people with 20 years of experience, this is very important to understand, and replace them with young graduate, the hourly rate difference is huge, but not because that people are cheaper in different locations, but because of the experience differences.

Harald Storrle: Yeah.

Darja Smite: So experience and talents cost everywhere.

Harald Storrle: Right.

Darja Smite: And this is one of the highlights I must say of the research that I have done in this area, that we cannot compare hourly rates. We want to understand what we pay for. And returning to your questions, of course automation will speed up productivity for basic stuff. This will make the jobs of software engineers perhaps less boring. So the boring stuff we will minimize. And the first surveys of how people feel about using ChatGPT or Copilot, they show that people perceive that the boring stuff can be outsourced to the machines-

Harald Storrle: Yeah.

Darja Smite: ... and they can focus on value creation and value adding activities. And I definitely don't think that we can be replaced entirely and that we will actually have as a goal 100% of software code generation. It will be a combination of people and machine automated tasks.

Harald Storrle: In parallel, we have this other big mega trend all over the western, or the developed world, and that is demographic changes. I mean we are right now in the era where the baby boomers, people that have been born in the 1960s approach retirement age and sooner or later will be going into retirement. And that is a bump in the demography all over the developed countries, not so much in developing countries, China, India, all of Africa, South America. So we have a number of conflicting trends.

We have increases in productivity by GenAI. We have decreases in workforce size by demographic changes. We have the developing countries catching up in terms of living standard, but also in terms of cost. And so these various factors act against each other. So I find it very hard to make up my mind what I think

will happen. Do you have any expert guess as to what the development will be like in the next 10, 20 years?

Darja Smite: That's a challenging question, of course, for researcher who would not like to speculate.

Harald Storrle: [inaudible 00:17:49] expert on the podcast. So I can't go without asking that question.

Darja Smite: Okay. I think they are not conflicting necessarily. So declining demographics in the Western Europe for example is combined with productivity gains based on automation is going to perhaps preserve our status quo because we also have one of the interesting things about Western Europe is that people stay with their jobs-

Harald Storrle: Yeah.

Darja Smite: ... loyal to the companies very, very long. So we have deep understanding of the customers, of the products we produce. And innovation potential, because of this, is much higher than in perhaps nations where job hopping or jumping from one job to another is a common practice-

Harald Storrle: Yeah.

Darja Smite: ... where you don't get a very deep understanding even of the code base that you're working on.

Harald Storrle: Right. The last project I was on, I can't say names obviously, but it was in a large German telecommunications outfit and they had tons of software development going on. They also had a near-shoring center in Greece and they had a far-shoring center in India. And all the time over many years that I was in this project, the people working from Germany were pretty much the same. Of course people come and go a little bit, but it's a core. So after three years, you know everybody, you know your product, you know your system, you know procedures. And it was really a challenge to get the new colleagues from Greece up to replace us. That was not easy. It worked out and they did a great job, but it was a challenge.

And in that time about half of the people in Greece switched jobs and more than half, I think it was like three quarters of the Indian colleagues switched out. And I was told, maybe you can confirm that from your experience, I was told that when they don't see a challenge, when they don't see a way ahead within weeks, they tend to look for better jobs. Which is certainly in Sweden and Germany, very, very uncommon. I mean, it's common for people to stay years, decades maybe their whole professional career in one company. And I don't see that as much neither in the US, nor in Greece, or India, to name these two examples. Do you have any evidence about this being a key factor in the

offshoring business? Is there any variation that you can report of different countries?

Darja Smite: It's one of the factors that we looked at. Why do people quit? And being not challenged within their work is a factor, but it's not the main factor, I would say, at least in my experience. I would say that the Swedish engineers want to be challenged every day as much as Indian engineers. This is something common to the profession. So the-

Harald Storrle: So [inaudible 00:20:55] like challenge? Yeah.

Darja Smite: Yes, passion to solve problems complex with a growing complexity, otherwise you wouldn't go to become an engineer. Right? So the factor that we found is also deeply rooted in cultural differences in a society, how the society functions. So one of the traits in Indian society, or this is a huge generalization and probably the listeners will not like such a generalization, but at least 10 years ago it was very common that the family of an engineer, a software engineer would ask when he or she is becoming a manager.

So if you don't have managerial role and responsibility for other people, this is something wrong going on with your career. That's why the challenge in terms of seniority of a role and being responsible for others, mentoring others, this was very important back when I did my offshoring and outsourcing studies about four or five years ago.

Harald Storrle: Yeah. Clearly culture is the central thing that is different between various countries in the industry. I happened to read this book right now that's by Erin Meyer, The Culture Map, and she's been studying cultural differences and how they affect how to run business, how to run projects, what kind of misunderstandings may arise, and all of that. And have you mapped this or some other kinds like tariff status, cultural map onto the empirical findings in the IT industry? And can you maybe explain to us the differences between countries definitely or between cultures are definitely large, but then again the differences between individuals are also pretty important.

And if I look at myself and compare myself to my neighbors, say, who's working in a completely different field, let's say a teacher, then the difference between us two individuals is large. And whenever I am in the context of the ACM talking to people from all over the world or in a scientific conference, there's people from South America and the Far East and North America and you name it, I always feel some kind of similarity. You just described how engineers just want to be challenged and that's engineers no matter where they're from. So can you somehow balance the cultural differences on the one hand versus the professional formation and how that affects the way how we're working together? Can you compare that a little bit?

Darja Smite: Absolutely. I tend to believe that the culture is not something that is aesthetic. It develops all the time.

Harald Storrle: Yes.

Darja Smite: And we gel as individuals and evolve in the face of the challenges and the work experiences that we have, the family life, the societal impacts, and so on and so forth. They inevitably change who we are. Individual differences definitely are much stronger than the cultural differences, but I also tend to say that stereotypes for a reason. So there are things and traditions in this society that impact how we approach certain behaviors including behaviors at work.

I have looked at [inaudible 00:24:24] differences in cultural dimensions among Indian developers, software engineers, and Swedish software engineers, and try to understand what it means for the daily work routines. So we have together with my colleagues, developed a training course for cross-cultural communication for agile team members. So we wanted to understand how the cultural differences propagate on the ability, for example, of a software engineer to say no to a product owner who comes and says, "Can you do this by Monday morning or Friday evening for that matter?"

And the answer to this question with the likelihood will differ across the different countries. Also, punctuality, so how punctual you are when you come to the meetings, and so on and so forth. And what is important to understand is that there is no good culture or bad culture. Cultures differ for a reason. And the key in this course is to understand these reasons. If you have a reasonable explanation for someone's behavior, even if it is a different behavior from yours, it is a half of the solution. Then you can have a workaround or agree on a common way of behaving in a certain situation. And what our research also shows is that over time, your work culture and work behaviors can change.

Harald Storrle: Yes.

Darja Smite: So if you are in a stable distributed team with members from different countries, you will find a common ground and common ways of working what's acceptable, what's not acceptable, the norms of the team.

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Right. I mean that's the perfect segue to another topic that I want to visit and that is how our work practices, at least in the IT business, have changed globally in the past five years. I mean when the pandemic came along, pretty much the whole world went into lockdown and all of a sudden everybody had to work remote. And many of the practices that we used to have before, the informal chats and the water cooler for the Americans or the coffee hitching for the

Swedish, many of those things had to change drastically and overnight. And this change affected the whole world and it still affects the IT industry, because, at least from my vantage point, very many of my colleagues work from home the better part of the work.

In fact for our viewers who can't see us, but just our listeners who can't see us, but just the listeners, both of us are working from home right now, we're doing this interview from our home offices. And I'm in the office once, twice a week maybe. Not sure about you. But that has definitely changed. And we have after this initial period of total remote work, seeing a period of hybrid work and it kind of goes back and forth. And over the last couple of months many big companies have announced that they want to have their staff back in the office all of the time or most of the time.

And that definitely interacts with this idea of productivity and the idea of getting talent and staffing or sourcing talent, not just locally but other places. Because if you want to have 100% work from office, then we will have to live close by. I mean otherwise it simply doesn't work. On the other hand, living in the countryside is a pro because you don't have to experience rush hour twice a day if you're living in a big city like in Munich. So those are factors that have come up in the last couple of years. And I understand you've done a lot of research on that topic as well.

Can you tell us a little bit about the main factors that drive people, employees to work from home or not and that drive employers to require work from the office or be more generous about that or don't care about that?

Darja Smite: Absolutely. I was very well positioned in 2020 to start research on this topic. As you can imagine, it was a very unexpected boost in my career and a challenge, a new challenge that I saw as a big opportunity to study distributed development just on a completely different scale. So we have followed up many companies both during the pandemic and since the pandemic to understand the impact, the long-term impacts of increased remote working. And I must say the answer is varied typical to a researcher. It depends.

Harald Storrle: It always does.

Darja Smite: The main drivers of people, employees willing to work remotely, yes, the main driver is the focus time to be not interrupted by anyone and enjoy this flow. However, research which is not new at all shows that the state of flow is not available to just everyone working on any task. It is for example, not possible to be in the flow for people new to their career, new to their tasks, who are not skilled to do what they are about to do. So in our research, we see that more senior developers tend to stay more working remotely than more junior developers who would like to be in the office and to learn from more senior developers who are out but not there.

This is one of the drivers. Of course, the second driver is the flexibility and autonomy as such. Some people are more productive in the morning, for example. Others are more productive at 6:00 in the evening and until 10:00 in the evening. So it's flexibility, time, and locational, temporal locational flexibility gives them an opportunity to maximize their productivity.

Harald Storrle: Right.

Darja Smite: And this is very important for many. And then of course, work-life balance, which I think is fair to say that for some people, work-life balance is when you can integrate work and life and others consider things in balance when they can close the door to the office, go home, and start their personal life outside of the work, and the facilities.

Harald Storrle: To just get over with it and just do something else and not think about work anymore and ignore your email and whatnot.

Darja Smite: Yes. So the balance is not to think constantly about work. And I must say that our research perfectly shows that the likelihood of someone working over hours when you work remotely from home is much higher.

Harald Storrle: Yes. Yeah.

Darja Smite: So in two surveys in two different companies, we came up with 50 and 52% of people on days when they work remotely, they report working more than eight hours a day.

Harald Storrle: Yeah. Yeah. Now all that you say, I can totally agree from my own point of view, and that's exactly what I see. That's what I see my colleagues do. There's various factors, it depends. Now I also see my industrial colleagues saying, "Yeah, but that's obvious. So why do I need a researcher to tell us that? Because I knew that in advance." Right. "I knew that by just thinking long and hard." And in fact if you introspectively do that or look at your colleagues around you, you can come up with this kind of patterns. You don't have quantitative evidence. You can't say 25% of this do it and 15% of that do it. But in terms of deriving actionable insights, what is the extra that proper scientific research brings to the table here that would help me convince my boss to run a study just like that rather than having an insightful discussion with a cup of coffee?

Darja Smite: I think most of the findings on an individual level are quite straightforward. At the same time, the proportion of senior versus junior employees in different companies is different. So extrapolate that one data point that you have about yourself and the few that you observe every day. And of course if you work four days or five days remotely, you don't observe anyone. So you hardly know what's going on in heads and homes of your colleagues. So extrapolating and understanding that in a system inside the company is not that obvious. And also I would say that there is a tension between individual level and a group level. So

although we all know what's good for us, it becomes a me-me-me-centered equation. Whereas the impacts of me not being in the office on a group level that I belong to are not that obvious to me, especially if I work increasingly from home or remotely for that matter, from anywhere.

Harald Storrle: One good thing that research does is of course to compare various situations, not just the one I live in, which is special in many ways. What are the kind of differences that you find across companies? So are there types of companies or camps of, I don't know, cultural differences between companies? That's something like company culture as well, and that certainly comes to the table here as well, doesn't it?

Darja Smite: Absolutely. We can start with who is the main hero in this story and to me it's not an individual, it's about the work we do. And the work we do in different companies is very different. So for example, we see that they're in companies that apply agile ways of working, have focused on teamwork for many, many years, have invested in having stable teams with agile coaches, and so on and so forth. There is a great individualization of work. People work on individual tasks rather than group tasks or collaborative tasks.

So this is a very interesting change and I don't know what to say about it in the future, how the nature of work we do will change because of this hybrid and remote work phenomenon. On the other hand, we can also say that the companies are culturally different in terms of leadership approaches. So in the big study that is ongoing at the moment with currently 45 companies participating, we can see that some companies that want to be office first, they have mandatory office days and they try to formally regulate the amount of remote working, while other companies that also want to be office first and collaboration oriented, they still stick with a flexible hybrid working, recommending, carrying out their people duties or employee duties in the office, but without making it the formal requirements. And these are radically two different approaches with the same goal at hand.

Harald Storrle: Right. That was very interesting indeed. And I would like to kind of come back to a little bit here. We've talked about how cultures, individual cultures, professional cultures, company cultures come together, how various variables shape the landscape of IT work worldwide. And again, since you entered this field 30 years ago and reminiscing how you felt about this field when you came into, do you have any advice for our young listeners that are about to make up the mind or start in the IT business? Do you have any recommendations for them? Any advice that you would give regarding all these different obstacles to navigate?

Darja Smite: I think one of the things that I would like to suggest is that collaboration is very important to our business and intellectual work in general immensely depends and relies on collaboration. So I know that young people, the digital natives collaborate and communicate in a different way. I'm not insisting on a way to

collaborate, but just collaborating is very important. Sitting alone and working in isolation, to me, sounds like a time travel going into the wrong direction. We're not going forward but backward where I've actually developed a presentation for young school children.

We regularly visit schools to ensure that children are interested in STEM disciplines and professions. And one of the set of slides that I made is with the way our offices have changed over time with a cubicle and the stereotypical thick glasses mathematician, coding the software code in a very big computer. So the computers have become smaller and lighter, the glasses are now replaced with the lenses. Right. And what's important is that the landscape around us in software companies has also transformed into being more diverse, more inclusive and collaborative. So we work in teams. We also recruit people who can work with others.

If you look at recruitment strategies for many tech companies, they don't look at deep talents that cannot collaborate with anyone. They rather prefer different skilled people, individuals working in a cross-disciplinary, multi-skilled teams. That's our strength. And I think now I am an observer, a very careful observer to see what happens in the future, because I really don't want to travel in time into the lonely, cold contributors times.

Harald Storrle: So no more going back to the dark basement and the cold pizza and the cliché of the lone coder. I think that's very important to highlight that point because the cliché is still out there. I mean, when I was young, I was, well, not sitting in the basement, not eating pizza, but otherwise that was pretty much where I was at that time. And the culture of the profession has changed. We are now at a very different point. And I don't think that the general public has really realized where we are at now. And certainly kids, young people that are in this position, might be misled by these old clichés. So definitely, we should work to inform them and make them see what the reality is like these days.

Darja Smite: And I think one of the things that young people see is their parents.

Harald Storrle: Yeah.

Darja Smite: I mean most of engineers are children of engineers. They observe how their parents work, what their job is like, what their mood after they return from work-

Harald Storrle: Yes.

Darja Smite: ... or not return nowadays is like. So when they see a person who is working overtime, who is tired, who is maybe burnout, it's probably not a good role model.

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Harald Storrie: And that is, I would say, the perfect endpoint of our interview. We were joking before to have a glass of wine or a glass of water and I think that would be the perfect ending of this afternoon's work. Darja, thank you so much. That was a pleasure talking to you and have a nice evening and see you soon, I hope.

Darja Smite: Thank you very much for your questions and a wonderful discussion.

Harald Storrie: Bye-bye.

Darja Smite: Bye.

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