ComputerWeekly.com | TechTarget

E-guide

CW+ Content

Benelux: New skills in a digital world

In this e-guide

In this e-guide:

It seems the best way for Dutch IT professionals to get a pay rise these days is to forget loyalty and look to change ships. Well that is according to a recent survey anyway.

In fact the survey, carried out by management consultancy Berenschot, found that IT workers that change jobs can make substantial gains.

But to get new jobs in today's rapidly changing IT sector, professionals need to skill up. In this e-guide, as well as featuring an article about the said study, we look at some of the technologies being adopted in the Benelux region. This gives a taste of what is in demand.

In this e-guide

Read about how Dutch organisations and the Netherlands in general are witnessing the rise of technologies like virtual reality, no-code programming platforms, smart neighbourhood, as well as fintech. The IT industry is growing through technologies like these and there is demand for people with the right skills.

Karl Flinders, EMEA content editor

In this e-guide

Loyal Dutch IT professionals not being rewarded enough, survey shows

Kim Loohuis

Dutch businesses may be risking their digital future by failing to reward their existing IT staff with sufficient pay rises.

Demand for IT professionals is high, with almost all companies undergoing a digital transformation and needing the personnel to drive it.

But according to a survey by management consultancy Berenschot, carried out on behalf of Dutch IT trade magazine *AG Connect*, IT salaries for long-serving IT workers in the Netherlands increased by only 2.3% last year, whereas IT professionals who have changed jobs recently are receiving pay rises of up to 15%.

Hans van der Spek, manager of the human capital management (HCM) knowledge centre at Berenschot, said he expects the battle for IT professionals to erupt on the Dutch labour market. “This shows that people who change jobs can make substantial financial gains,” he said. “On the other hand, we see companies do not yet automatically include their loyal IT professionals in this remuneration correction.”

In this e-guide

Van der Spek said this is because employers often have to deal with collective bargaining agreements. “If, for example, a hospital wants to increase the salaries of its IT staff, this means there may be complaints from, for example, nursing staff, who in principle fall under the same collective labour agreement,” he said. “This will have a restraining effect on salary increases.”

Berenschot’s survey was expected to reveal significant pay increases, said Van der Spek. “But it didn’t happen again – which surprised me.”

The average salaries of Dutch IT professionals have increased slightly over the past two years, but given the glaring shortage of IT professionals, the rise has been disappointing, said Van der Spek. “It almost seems as if employers don’t want to take their wallets out, and when they do, it’s to attract new people. The IT professionals who continue to do a job faithfully are not rewarded for their loyalty. If this continues, the Netherlands will soon see a huge exodus of IT personnel from companies.”

This year’s salary survey was the 20th conducted by Berenschot for *AG Connect*. Improving employment conditions other than salary can be a way to retain desirable IT professionals, but the study showed that this is not happening, despite increasing demand for IT talent.

In the survey, 79% of respondents said their terms of employment had remained the same in the past year, and only 14% said they had improved. A

total of 2,682 Dutch IT professionals were interviewed, of whom 1,688 were employed.

Almost half of those questioned said they do not see a bright future with their current employer when it comes to improving terms of employment and salary. Strikingly, the positivity among IT professionals who are employed by an IT company is higher than that of IT professionals employed by a non-IT company.

Higher salaries appear to be the biggest motivation for IT professionals to change jobs, according to the survey. Van der Spek said: “Salary has almost always been one of the top three reasons for changing jobs, but this year it has been ranked number one. IT professionals who changed jobs last year increased their salaries by 10% to 15%.
“Companies run the risk of IT professionals and their knowledge leaving the organisation, at a time when companies face an enormous challenge to digitise the business.”

The survey also found that 34% of Dutch IT professionals feel they do not earn the market rate. “In the media, IT professionals read about the growing IT labour market and the enormous demand for IT professionals – so they are wringing their hands waiting for this huge pay jump,” said Van der Spek.

New IT professionals in particular can demand high pay levels, he said. “But I think it is important that Dutch companies do not forget their existing employees and reward them in the same way.”

In this e-guide

Nearly two-thirds of the IT professionals surveyed who are not actively seeking a new job said they could do so if a good opportunity comes along. “Only 11% of IT professionals are actively looking for a new challenge, according to our research,” said Van der Spek. “That’s not surprising when you consider that, for most of them, jobs offers often come along.”

According to the survey, nearly 80% of respondents said they had been approached for a job in the past year and a quarter said receive a job offer every week – some even every day.

Van der Spek warned of the risks if Dutch organisations forget their loyal IT staff. “Throughout our economy, you can see that IT is an extremely important component,” he said. “It is wise for an organisation to ensure that it has sufficient capacity to cope with digital developments.”

When IT staff leave to earn more elsewhere, Dutch companies are left with the cost and inconvenience of having to acquire new knowledge and expertise, said Van der Spek. Or an organisation could be delayed in realising its business strategies, which will ultimately be at the expense of its competitive advantage.

“It is essential for Dutch organisations to ensure they attract the right IT professionals, but also to keep them and keep updating their knowledge so that they continue to retain their value for the company in the future,” he said.

In this e-guide

Dutch virtual reality can help reduce teacher shortage worldwide

Kim Loohuis

Stan van Ginkel, a lecturer and researcher at the Archimedes Institute and the Intelligent Data Systems professorship at Utrecht University of Applied Sciences in the Netherlands, researches the use of virtual reality (VR) glasses as a means to reduce teacher shortages.

Once a geographer, Van Ginkel ended up in the educational field when five years ago he decided to start a PhD at the University of Wageningen, where he looked into the effectiveness of the design of learning environments.

Never had he thought of incorporating technology into this field. “I am not one who always has the latest technological gadgets,” he said. In his initial study, Van Ginkel found that three out of seven design principles have to do with feedback, so he set up experiments on this subject.

“We wanted to see whether it matters who gives you feedback,” he said. Does it make a difference if your teacher gives you feedback, or your peers?

“It seemed the teacher feedback had the most impact – but that posed a new challenge,” he said. “We now knew that the feedback of a teacher is the most

useful to students. And in the previous study we had already found that that practice was crucial for the development of the students. But the combination of those two is nearly impossible. A teacher can't give students endless possibilities to practice, as well as valuable feedback to every individual. There is just not enough time in a day for that."

Virtual reality offers valuable student feedback

Then the opportunity arose to incorporate virtual reality in the experiments.

"VR is a very good way to simulate real-life situations and the technology can be used to give real-time feedback to a student," said Van Ginkel. His team set up a VR lab and conducted experiments within the existing oral presentation skills course.

"We had the students do presentations in the first and third sessions of the course so we had a pre-test and a post-test situation from which we could then conclude the development of the students' skills."

In the second session, the students were randomly divided into two groups. One group received feedback from the teacher – the most optimal form, as previous research concluded – and the other group received feedback from the VR system.

"The results were remarkable. There was no difference in outcome between the groups. And the VR system was only in its infancy," said Van Ginkel.

The first group valued their teacher's feedback because of its positive and constructive character. The VR group, meanwhile, said they had never before received such detailed analytical feedback.

Endless practice and feedback

The VR system Van Ginkel developed with his team and his technological partner CoVince Adventurous Learning analyses three important aspects of oral presentation: eye contact, the use of your voice, and your posture and gestures.

While the complete setup contains not only VR glasses, but also sensors for posture and gesture measurements, Van Ginkel and CoVince have now developed a mobile environment that students can use at home with just their smartphone and simple VR glasses.

"That means students can practice endlessly at home, with a virtual real-life audience," he said. "Afterwards, you get feedback from the system: how was your intonation, your volume, your speed? And did you look your audience enough in their eyes? It is a very safe feeling to practice speaking in public in a very secluded and virtual environment."

Personal learning environment

Although VR glasses in Dutch education are not new, most of them only have limited possibilities. Geography students can look inside a volcano for instance.

In this e-guide

"But our system provides the opportunity to learn self-reliantly through a personal, digital learning environment that matches a student's own personal learning demand. And that is totally new," said Van Ginkel.

One of the advantages of this personal way of learning is that students don't have to wait until a course is on the curriculum.

"Presenting is a crucial skill that students need throughout their education. So when they are working in groups and have to present something to their peers, they can perform the oral presenting skills course themselves, instead of having to wait until later in the year, when the course is on the school curriculum," said Van Ginkel.

The quality of education can be greatly increased through virtual learning, according to Van Ginkel. "Not only by the detailed feedback and the possibility of perpetual practice, but [because] the teacher has time for other things, like coaching. Furthermore, the data from the system can be used by the teacher to monitor the development of students throughout the years."

Highly sought after technology

The VR glasses and the platform that Van Ginkel developed in the VR lab at the Archimedes Institute for the second-degree teacher training course at the Utrecht University of Applied Science, are highly sought after. Not only courses within the Archimedes Institute use the VR glasses, but also the teacher training

in Dutch and English and the law school of the Utrecht University of Applied Science use the VR course for their students.

“Other universities are also offering our VR course for oral presentation skills to their students,” he said.

Van Ginkel published the results of his research in several leading education journals. “Recently, I even had the chance to show 200 people from all over the world the possibilities of VR in education, when I was invited to speak at a United Nations conference,” he said.

The interest was so great that he was invited to the Teachers Task Force of Unesco to help solve the worldwide shortage of teachers.

“Within this task force we are going to research in what way AI [artificial intelligence] can play a role in education,” said Van Ginkel. “For example, with correcting schoolwork, preventing absenteeism, exercises and administrative tasks. On the other hand, VR can also contribute to the training of teachers, as is planned in South Africa.”

Van Ginkel and his team are currently working on translating their platform in English so companies, educational institutions and other organisations from outside the Netherlands can also benefit from his research and his platform.

In this e-guide

In this e-guide

Dutch province pioneers no-code platform

Kim Loohuis

The Netherlands province of Zuid-Holland has signed an agreement with rapidly growing Dutch "no-code" platform supplier Betty Blocks to replace outdated applications and develop new ones. Other Dutch provinces and governments are also showing interest.

"No-code" or "low-code" platforms enable businesses to create applications without having to write in any programming language.

Alkmaar-based software company Betty Blocks is growing quickly, according to CEO Chris Obdam, who runs the software company with his brother Tim.

The brothers established the company 17 years ago. They developed tailor-made software, Chris working as programmer and Tim as operational director.

To date, Betty Blocks has focused entirely on building a no-code platform, and has been recognised as a visionary in Gartner's Magic Quadrant and a leader in the Forrester Wave. It now has overseas branches in London and Atlanta, and continues to grow steadily, despite being without venture capital or other investors.

In this e-guide

At the moment, Betty Blocks is seeing the strongest adoption of its technology in the Netherlands. “The Netherlands has always been progressive in the field of software tooling,” said Chris Obdam. “All major players in the field of no-code platforms are active in the Netherlands and also have a sales office, simply because our market is already the most accustomed to this concept.”

The company has sealed a strategic partnership with Zuid-Holland, a region of 3.68 million inhabitants that is responsible for developing regional plans, zoning guidelines and environmental management.

All 12 provinces in the Netherlands are currently under pressure to step up their digital innovation by 2020.

Mike Gonesh, business applications team manager at Zuid-Holland, said: “In the past, it could take quite some time before we came back to users with an answer to their questions. What is more, the search for the answer to a question always took place within the IT department.”

The speed of action, agility and user participation offered by a low-code/no-code platform appealed to the province, said Gonesh. Initially, it looked at the market-leading platform, but soon several suppliers were on its doorstep to show off their technology.

In this e-guide

"Betty Blocks was one of them," said Gonesh. "We put a number of use cases to various suppliers to gain insight into the differences between their platforms, the functionality and which solution best suited our organisation.
"In fact, their platforms did not differ much from each other, but the feeling about Betty Blocks was very good, as was the price they offered."

The two parties signed up for a three-year collaboration, with a possible extension. "In this way, we are assured of good service in the coming years," said Gonesh.

If Gonesh and his team now receive a question from the organisation, they have an extra asset to use. "We currently have about 130 applications," he said. "This requires a lot of maintenance and management in terms of functionality. All the new requirements from users require a bit of customisation. With the Betty Blocks platform, we can set this up quickly and flexibly."

It is always possible to buy off-the-shelf applications from the market, said Gonesh, but the agility and ease of deployment of the no-code platform is appealing. "In our organisation, Excel sheets have always been used as a kind of application, but these files become difficult to manage, although there is quite a lot of business-critical information in there," he said. "The Betty Blocks platform is a good way to secure information from, for example, Excel and Access."

Obdam said: “Users are looking for a tool that solves their problems precisely. This is often done with Excel or Access, because everyone wants to make their own work more efficient, so they are more successful and can work more pleasantly.

“Platforms like ours offer the ability to build real applications that can be used by multiple people, comply with laws and regulations, and are secure.”

Gonesh added: “Collaboration is vital in the development of no-code applications. When we start working with a question, a team is formed including the users themselves and the developer – in our case, this is often EsperantoXL, a partner of Betty Blocks with whom we work a lot.

“You try to bypass the programming language as much as possible in order to make it as simple as possible for the users in their professional jargon.”

Completely satisfied

Zuid-Holland province is now using its first Betty Blocks application – for the administration and settlement of damage claims – and users are completely satisfied, said Gonesh, adding: “I have only heard positive noises about the process and the final application.”

It is not the province’s intention to transfer all of its 130 applications to the no-code platform. It makes a distinction between business-critical (mode 1) applications and smaller systems (mode 2 applications). “With regard to the

latter, we must take a critical look at what it costs to repurchase them, what it costs to convert them into no-code and what advantages this offers compared to what is already available on the market," said Gonesh.

Gonesh is surprised how often he is approached by other Dutch provinces and government agencies that are interested in how Zuid-Holland works with the no-code platform. "They are curious about our experiences, what we do, what we use it for and what it brings us," he said. "We are really ahead of Netherlands governments in this area."

According to Gonesh, the province is only at the beginning of its use of no-code platforms. "If this really takes off and our organisation and IT department have a clear idea of the possibilities offered by this type of platform, I think it will become the standard for our organisation in the future," he said.

In this e-guide

In this e-guide

Smart technology will transform Dutch neighbourhood

Kim Loohuis

A neighbourhood in the Netherlands is to be transformed in a pilot project to design the urban environment in conjunction with new smart technologies for transport, health and energy.

The locality, in Brandenvoort, will be a testing ground for new products, services and systems through the Brainport Smart District (BSD) project.

BSD director Peter Portheine said: “In cooperation with the Eindhoven University of Technology, we looked at where we could create such a district. We ended up in the Brandenvoort district in Helmond, because it was already largely smart and has space for the construction of 1,500 homes and 12 hectares of business destinations.

“We are striving for a new, smart neighbourhood that does not further burden, pollute or deplete our planet – a neighbourhood that uses technology to add meaning to the lives of the people who use it or go to live in it.”

Portheine has been involved in setting up the BSD programme since the end of 2017. The ambition is to create a sustainable and socially cohesive neighbourhood.

“BSD will not be designed first and built afterwards,” he said. “Instead, design and construction will go hand in hand through step-by-step co-creative development. We are learning on the job and will be able to apply everything we learn directly in the further development of the neighbourhood.”

One of the interesting aspects of BSD are its goals around data. The basic principle is that residents themselves will have control and freedom of choice over their data. At the same time, their generated and anonymised data is needed for companies to test their innovations. Clear rules are being drawn up to ensure compliance with legislation and regulations. The infrastructure needed to make the data flows possible, including datacentres, will be included in the urban development plan.

The BSD Foundation is inviting companies and knowledge institutions to submit proposals for the project.

“Numerous experiments have already been submitted and are now being critically examined by a selection committee,” said Portheine. “The experiments that can actually be carried out must be innovative and add something to the world, but also to our programme. The first experiments, in the field of circular housing, should start by the end of this year.

"Our own office, a circular building with its own energy system, will also be located there. In this way, we will be pushing the edges of innovation, not only in the field of technology, but above all in the field of regulations.

"At the moment, we see that we want more than is actually possible. That is why we are working with various ministries to see how we can make innovative experiments possible. After all, laws and regulations may have to change in order to achieve this. Innovation is, by definition, touching the edges of legislation and regulations. At the moment, this governance is a large part of our work."

The seven programme lines that guide the BSD projects

1. **Circular and sustainable district:** It will be an attractive living environment in which self-sufficiency, co-creation with end-users and sustainable use of natural resources are combined with existing and future technologies. Circularity is crucial in all programme lines.
2. **Resident participation:** Developing a new smart district offers great opportunities to improve people's living environment and use new technology in a meaningful way.
3. **Social and safe district:** The ambition is for all residents to join in, get by and get ahead. Social cohesion also contributes to a district that is safe and where people feel safe.
4. **Healthy district:** Health and welfare are being promoted by helping each other and by creating a clean, green and attractive outdoor space that encourages people to exercise and interact.
5. **Digital district:** Data is needed in order to optimally tailor the district to the residents' wishes and facilitates different information streams and

innovations. The starting point is that residents have control and freedom of choice when it comes to their data.

6. **Mobile district:** New technologies such as self-driving cars and new organisations such as "car&ride-sharing" offer opportunities to make travelling more comfortable and reduce its environmental impact.
7. **District with energy:** Designing a user-focused energy system, including a "smarter grid" approach, is very important to create an adaptive energy system.

One of the organisations that wants to experiment with residents' data in the new district is UNSense. The project it wants to launch is intended to research and develop new models in which inhabitants of the district as a whole can benefit directly from data. UNSense wants to investigate what happens when data is used for the benefit of the community.
"The residents remain the owners of their own data at all times," said Portheine. "They decide whether they want to cooperate with an experiment."

To guarantee this, a trusted body is currently being formulated that can provide a guarantee for experiments, so that residents can see whether they meet requirements on privacy, property, security and ethical considerations.

Sensors in and around a person's home can collect valuable information, said Portheine. "When a resident's energy or water consumption suddenly shows big differences, it says something about the residents," he said. "This can help older, vulnerable residents to live independently for longer."

In this e-guide

But all kinds of data about how people live can also provide valuable insights. By using data actively and passively to create a picture, organisations and governments can gain insights into the services that residents need and how they can actually be helped, but also where there may be risks.

Portheine expects residents in the neighbourhood to organise themselves in order to exert more influence on, for example, how mobility and energy are organised.

Bad examples to learn from

Citizen participation is an important factor in the development of the smart neighbourhood. Portheine and his team are therefore looking with interest at two cities where the smart city concept has been introduced less successfully. "In the South Korean city of Busan, a new housing estate with apartments full of sensors and technology has been built from the ground up, but without the participation of citizens," he said. "But it has now become a kind of tech ghetto where no one wants to live."

Another example also serves as a lesson for the BSD Foundation – the Sidewalk Toronto initiative in Canada, which was developed by Google owner Alphabet's Sidewalk Labs in collaboration with the City of Toronto.

"Google thought it would be possible to build a district there and so become the owner of all the data from that district," said Portheine. "But they were sent back

to the drawing board by the city council of Toronto in order to give residents more influence."

The BSD Foundation has reflected on these projects. "That is why we started with governments and knowledge institutions in the first place," said Portheine. "If you bring in private companies too quickly, there is a risk that the importance of the market will become too great too soon and that the residents will be lost sight of. We want to prevent this from happening.

"At the same time, we want to intensify cooperation with the market in the coming year, and we now have frameworks for that cooperation."

Portheine said 250 temporary homes of various types and for different target groups will be built over the next three years and the first 10 experiments are under way. "Not every experiment has to be a success, but when the whole system proves itself in a public-private partnership, we speak of a success," he said. "And when, in six to seven years' time, some 3,000-4,000 people are enjoying living in the Brainport Smart District, the ultimate goal will have been achieved."

In this e-guide

In this e-guide

European fintech investment continues to grow as global investment falls

Karl Flinders, Emea Content Editor, Computer Weekly

Financial technology (fintech) sectors in Germany, the UK, Sweden and France recorded huge growth in investment in the first six months of this year, while total global funds received fell due to a distortion caused by a large deal in the same period last year.

In the UK, investment in fintech firms in the first half of 2019 almost doubled to $2.6bn, compared with the same period in 2018. A similar increase was seen in Germany, where investment also doubled to reach $812m. Sweden had the highest proportional increase in Europe, with investment quadrupling to total $573m. In France, meanwhile, investment increased by 48% to reach $423m.

This is according to analysis by Accenture, which put the total value of fintech deals globally in the six months to the end of June at $22bn, down from $31.2bn in the same period of 2018. The 29% drop was largely due to figures for the first half of 2018 including the Ant Financial $14bn funding. Stripping that deal out of the total for the first six months of 2018 would put investments at 28% higher in the first half of this year.

In this e-guide

The first half of the year saw contrasting fortunes in the two biggest markets. The value of deals in the US increased by 60% to $12.7bn, while investment in China ground to a halt, according to Accenture.

In the UK, challenger banks stood out, with Monzo, a mobile-only challenger bank which received its banking licence in April 2017, raising $144m during the period, while $211m was invested in Starling Bank. Meanwhile, money-transfer startup TransferWise received $292m in May and WorldRemit raised $175m in June.

“There’s been a lot of interest and demand from consumers for new fintech propositions, particularly in the UK and elsewhere in Europe, which helps explain the big jump in investments there,” said Julian Skan, a senior managing director in Accenture’s financial services practice.

“Fundraising is also moving to support the scaling up of challenger and collaborative fintech, which will cause lumpiness in some rounds as we get to the business end of the investment cycle where investors look for returns based on a sustainable bottom line, rather than another buyer,” he said.

But Skan added that there are questions about how long can that last? “Fundraising is likely to reach a plateau soon, and will most likely dip going forward.”

In this e-guide

GDPR faces growing pains across Europe

Pat Brans, Independent consultant/affiliated professor

The implementation of the General Data Protection Regulation (GDPR) across European countries has been far from homogeneous – and it would be no surprise if large multinationals factored nations' different stances on GDPR into their decisions on where to set up headquarters.

What is more, the European Union (EU) has done almost nothing to prepare for the impending tsunami of technology coming from China, a country whose privacy culture is worlds apart from that of the EU.

By 25 May 2019, the first anniversary of the implementation of GDPR, €56m of fines had been issued – and €50m of that was a single fine imposed on Google by France.

In terms of sanctions, France has taken by far the hardest stance. Not only did CNIL, the French data protection authority (DPA), fine Google €50m, but it also fined Bouygues Telecom €250,000, Uber €400,000, Dailymotion €50,000 and Optical Center €250,000.

European countries have clearly demonstrated different strategies on penalties. Also, they have set up different structures for implementing the regulations. In

Germany, for example, DPAs are organised on a German state level – but there is also a separate DPA at federal level, with jurisdiction over telecom and postal service companies. The result is that Germany has 17 data protection authorities, instead of just one.

Another area where European countries disagree is in their interpretations of some of the finer points of GDPR. For example, Austria's DPA ruled that all a data controller has to do in response to a request for data deletion is to remove individual references to that data.

Nations have also demonstrated differences of opinion on how to calculate fines. For example, some local legal authorities in Germany have argued that the GDPR fines imposed in that country should be calculated according to German law, which would result in much lower fines than those imposed at the European level.

Perhaps the most important difference in interpretation by the different countries lies in determining who imposes – and, ultimately, collects – the fine. When France's CNIL issued its €50m fine on Google, it danced around the GDPR's one-stop-shop rule that says a company will be fined in the country that hosts its headquarters – in Google's case, Ireland.

The CNIL argued that Google had no main base in the EU in relation to the fine in question, because all decisions concerning the processing of data related to

Android and Google accounts were made at the company's headquarters in the US.

In stark contrast to France, many other EU countries have taken softer approach, investing most of their efforts into educating companies and issuing warnings, rather than imposing fines right away. Such differences in communication strategies lead to different perceptions of risk among data controllers from one country to another. These differences in perception may partially explain the differences in the number of data breaches reported.

A report by DLA Piper on the number of breaches notified during the first eight months of GDPR indicates that the top three countries in terms of number of data breaches – the Netherlands, Germany and the UK – had almost twice as many breaches reported than in all the other EU countries combined. DLA Piper reported that many organisations had notified authorities largely because they knew they could suffer heavy sanctions for not notifying.

"If there is a breach, we will notify the authorities and cooperate very closely with them to understand what really happened and for them to judge how far to go with a fine," said Hanna Hennig, CIO of German-based manufacturer Osram. "If you do not meet the obligations, you have to pay the fine."

However, many companies are left hanging after they report a breach. According to DLA Piper, the large number of notifications has created a backlog

and many organisations have to wait a long time to hear back from regulators whether action will be taken against them for the breaches they reported. Given the disparate interpretation of GDPR across the EU countries, it is no wonder that data controllers are befuddled – but they are not the only ones. Citizens are, too. All the, often confusing, data privacy messages that started to appear after May 2018 have certainly made browsing the internet a little more arduous.

"We need to simplify the message of GDPR," said Giovanni Buttarelli, European data supervisor. "We need to invest more on training. Many citizens in the EU are not well informed about their rights."

One of the other big issues to be addressed is how to handle technology coming in from outside the EU. Big data and artificial intelligence (AI) will pose the biggest problems, especially as China plays a growing role in those two technologies.

The EU has already invested a lot of effort in getting around the fact that the country where most of the data is stored – the US – has different views on data privacy than the EU. Thanks to bilateral agreements – (Safe Harbor, then Privacy Shield – EU-based data controllers feel safe in storing data on servers from certified US companies.

"We use Microsoft Azure as well as IBM private cloud," said Osram's Hennig. "They all have their datacentres in Europe. My understanding is that if they have

the Privacy Shield framework, then you are protected to some degree. Also, we apply standard model clauses in contracts with US suppliers. Of course, a company can never protect itself against criminal minds, but you can look to make sure the cloud provider has the right behaviour for security."

While the EU has done a good job of harmonising with the US, it may have to take a different approach for China. "In China, if you say you need privacy, it is interpreted to mean you have something to hide," said Buttarelli. "The country has an entirely different approach to privacy, and that will clash with our views on privacy in the future."

He added: "Today we are in a dialogue with Silicon Valley, and we have worked out a way to do business together in a way that ensures the protection of privacy in accordance with EU regulation. But by 2021 and 2022, the globalised Chinese systems will be prevalent. If they want to be operational in the EU, they need to have a dialogue with us."

In this e-guide

Getting more CW+ exclusive content

As a CW+ member, you have access to TechTarget's entire portfolio of 140+ websites. CW+ access directs you to previously unavailable "platinum members-only resources" that are guaranteed to save you the time and effort of having to track such premium content down on your own, ultimately helping you to solve your toughest IT challenges more effectively—and faster—than ever before.

Take full advantage of your membership by visiting www.computerweekly.com/eproducts

Images; stock.adobe.com