

Europäisches Patentamt European Patent Office Office européen des brevets

# IT Report 2020

Driving digital transformation



## **Executive summary**

### Business continuity, despite the disruption

At the EPO, we believe that IT is the enabler for an organisation that remains "future-ready". The readiness of our IT was severely tested in 2020 as the COVID-19 pandemic struck.

The early weeks were focused on protecting the health of our staff and users, while ensuring the continuity of our operations. The sudden onset of the crisis put pressure globally on basic IT infrastructures as entire countries went into lockdown and relied heavily on these systems. Users, staff, service providers, software vendors and hardware manufacturers all had to adjust overnight. These were unprecedented conditions. Lockdown measures in some areas, notably Asia, where a lot of IT equipment is manufactured, also pushed supply chains for such equipment to the limit. Transportation was overstretched. Decisions had to be made fast, in a market that was suddenly disrupted. In addition, the shift to remote working challenged traditional information security mechanisms. We had to adapt fast to the additional exposure to cyberattacks to ensure a safe working environment.

Then, as the initial survival measures started taking effect, we developed proactive and targeted crisis management. We accelerated certain initiatives and leveraged the opportunities offered by technology to support a remote workforce, engage with users online and innovate in the way we perform our core activities. The focus shifted from meeting the most immediate needs to helping staff and users gradually improve their IT tools and their ergonomics, while ensuring data privacy, throughout the crisis, which is still with us at the time of publishing this report. It was no longer merely a matter of weathering the storm, but of understanding that the world had changed irrevocably and preparing the EPO accordingly.

More than ever, 2020 required everyone to pull together. Despite the challenging circumstances, the EPO saw excellent progress in its digital transformation, moving towards the goals set out in its Strategic Plan 2023 (SP2023), and sometimes even beyond. Not only have the results been outstanding; by supporting each other, we have emerged stronger and willing to continue this journey as an organisation, for the sake of our users.

#### Supporting an agile workforce

Overnight, the shift to working from home on a large scale became a necessity. Thanks to the initiatives already started under SP2023, we were able to accelerate our plans and ensure a smooth transition from a situation where almost all staff were working in the office to a world where almost all staff were working from home, across Europe.

Apart from the HR and management measures, a number of IT initiatives made this possible. They included issuing laptops to all staff, upgrading our internet connectivity and ability to connect remotely through the new data centre in Luxembourg, extending the availability of IT systems beyond normal core working hours to give staff greater flexibility in managing home and work commitments, and making all meetings and events virtual. A reinforced and retrained Business Information Technology (BIT) Service Desk provided support, assisting remotely in a fast-evolving teleworking landscape. Once basic equipment had been rolled out, the EPO embarked on a large-scale operation to enhance the quality of homeworking environments by providing ergonomic, ultra-wide screens, extra headsets and ergonomic desks and chairs.

## Accelerating delivery via a new highway

Adopting continuous integration and continuous deployment using cloud-native technologies with the highest levels of cybersecurity and data protection means that bugs can be fixed and updated software deployed in hours and new functionality tested and deployed every few weeks. This has enabled accelerated delivery of paperless workflows for the patent grant process, making 97% by volume of all examiner and formalities officer tasks possible without paper or email exchanges by the end of 2020.

## Focusing on decommissioning

The move to secure cloud-native architectures also offers enormous advantages in terms of availability and performance. But there is no place in the cloud-native world for 1970s technology, such as the mainframe. For this reason, in 2020 we continued to decommission legacy applications, progressively migrating new systems to the data centre in Luxembourg.

## Creating a culture of continuous improvement

Thanks to the high uptake of knowledge sharing events (6 000 visits) and the widespread launch of commercial online learning platforms, we continued upskilling BIT staff to equip us for the challenges of new technology. In the area of outsourcing and transparency, the number and value of contracts awarded directly continued to decline, despite the emergency situation in 2020.

The pandemic has transformed us. A number of measures that were introduced swiftly during 2020 – such as paperless working, remote collaboration tools, videoconferences for all types of oral proceedings and virtual events – will still be part of tomorrow's IT landscape, after the crisis.

## Ensuring a safe environment

In the shift to remote working, and as we build the EPO's future environment, we have focused on ensuring the continued integrity and confidentiality of our data. Privacy and personal data protection concerns have been central to the evolution of our platforms, with a number of specific data processing and non-disclosure agreements being put in place in close collaboration with the EPO Data Protection Office.

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# 1. Using IT to build an engaged, knowledgeable and collaborative organisation

Digital communication tools are a key component in the shift towards a collaborative organisation in a context where staff have greater flexibility to work remotely, core hours removed and IT Service hours extended. The EPO already had a number of remote collaboration tools, mostly used for interaction across the different sites. With the wide-scale move to working from home, however, they suffered from stability issues. They also lacked scalability. Migrating all staff to Microsoft Teams during 2020 made collaboration significantly more efficient and effective. Up to 60 000 virtual meetings take place every week and over 1 100 online spaces have been created to support collaboration and teamwork throughout the EPO.



#### Figure 1 – Daily online video calls



#### Source: EPO

Of course, digital communication also exists in the context of corporate communications. In early 2020, the EPO held one to two internal online sessions per month with an average reach of 500 attendees. As of the second half of 2020, however, the general use of virtual environments and their greater scalability saw a significant rise in the number of such events to more than ten per month, with even larger audiences. In 2020, the EPO organised two major online conferences, one on 3D printing and its impact on IP and another on the role of patents in an Al-driven world. Each was spread over more than one day and involved dozens of experts, including EPO staff, researchers, IP professionals, policymakers and business leaders. The ability to reach larger audiences and involve speakers from all over the world enabled us to improve the quality and impact of such communications.

Examiners are required to collaborate closely as a division, with important legal consequences, such as at oral proceedings. The launch of a pilot project for oral proceedings in opposition by videoconference resulted in the selection of Zoom as a new platform, providing a sound basis for a friendly, secure environment for attendees, including the possibility for simultaneous translation, deliberation rooms for the division and a waiting room.

In response to the COVID-19 crisis, the EPO also invested in a mass notification tool, allowing it to reach staff at all times. This tool, to be used only to broadcast an urgent message to all staff – typically when their safety is at risk – was activated on 13 November 2020, when a World War II ordnance was found on the Berlin site. All staff at the EPO Berlin office were safely evacuated and, using this system, instructed not to return to the building.

Despite social distancing and limited building occupancy levels in response to COVID-19, the EPO succeeded in safeguarding staff collaboration. In fact, 2020 was an eye-opener in terms of how digital tools enable operations to continue remotely. Needless to say, the human connection factor will still be important in the future. But as regards being able to work together, the digital tools already in place offer a solid foundation to build upon and improve.

## 2. Simplifying and upgrading IT systems

## 2.1 Delivering PGP and search

The first example of the new, cloud-native architecture was rolled out in the second quarter of 2020, when a rebuilt client data system for registered attorneys was deployed. This was the first step in replacing all legacy components. In addition to the performance and availability improvements that adopting the cloud brings, it has also ensured that new applications can be fully monitored by the new cybersecurity possibilities described below. This has been accompanied by further improved alignment with the latest data protection guidelines.



#### Figure 2 – Patent Workbench

#### Source: EPO

Although, by early 2020, good progress had already been made towards digitalised workflows and a fully digitalised, end-to-end patent grant process (PGP), the pandemic accelerated these efforts dramatically. In April 2020, a minimum viable product was delivered for a paperless search and examination workflow, assisting examiners, formalities officers and line managers in the core processing steps for European patent (EP) search and examination files. By the end of 2020, 97% by volume of basic workflows with basic functionality had been

97% by volume of basic workflows digitised digitalised, allowing examiner and formalities officer actions, as well as preparation for oral proceedings, to be carried out remotely and without paper. This has been a cornerstone of the EPO's response to the pandemic, enabling the majority of staff to work from home most of the time, ensuring social distancing and supporting the global effort to slow the spread of COVID-19. As the months passed, these workflows were progressively integrated into the Patent Workbench, which became the main platform for interactions between examiners and formalities officers. The accelerated delivery of PGP tools is the result of Business Information Technology (BIT) and Directorate General Patent Granting Process (DG 1) joining forces with a common goal: to overcome the challenging situation and build the future toolset at the same time.

Another crucial development in 2020 was new functionality enabling patent applications and prior-art documents to be annotated digitally. In a teleworking world, digital annotations are critical to enhance collaboration and efficiency in the PGP. Examiners can benefit from their colleagues' work, transforming apparently individual efforts into a collaborative activity. The ANSERA search tool now also enables digital highlighting and sticky notes. It was recently upgraded with functionality for sketching on drawings, marking objections and tagging relevant claimed features.

A pilot project using iPads for opposition and board of appeal hearings was an important step towards improving support for paperless oral proceedings. The 750 iPads deployed during the project and a dedicated app – Aly – enabled users to interact with digital dossiers, legal texts and cited documents, sharing annotations live during oral proceedings, even when working from home across Europe.

750 iPads deployed to support pilot project on paperless oral proceedings

In classification, several quick wins were implemented to address suggestions from users and remedy some longstanding bugs.

The PGP toolset provides a framework for organising our work. In addition, the EPO continued to invest in modern, AI-based modules that contribute to overall productivity and quality. In 2020, the EPO Data Science team built new AI preclassification models to provide an in-house alternative to the outsourced system used to assign incoming applications to teams. Tests showed that this new model is as accurate as the outsourced service, with the added advantages of being regularly updatable and re-tunable as technical fields evolve. The Data Science team also reviewed the existing pre-search algorithms, identifying a number of areas for possible improvement and building and testing new models.





Source: EPO

In September 2020, staff were given the opportunity to demonstrate their coding and AI skills in a machine learning code challenge. The challenge was to automatically apply classification symbols for climate change mitigating technology (Y02/Y04) to patent documents. Over 40 teams participated, with the eventual winners being invited to work on new projects with the Data Science team. One of the core technologies made available for this challenge was an inhouse BERT model, trained entirely on the text of millions of patent documents.

By the end of the year, an in-house machine translation system for translating German and French documents into English had been built, tested and deployed. Run in the EPO's dedicated Luxembourg computer centre, it can be safely used for the translation of unpublished documents.

Overall, the focus of IT work under the PGP and AI programmes was on developing new tools. Changes to the legacy system were only made where absolutely essential or to achieve significant short-term gains. In 2020, we introduced performance improvements in eDrex and the option of storing examiner actions from Trimaran in DI+. The next step in improving DI+ was to enable shared annotations on the content of applications.

## 2.2 Upgrading online tools

Since the outbreak of COVID-19, the EPO has pledged to support applicants and attorneys through the obstacles they face. In addition to enhanced communication, legal and administrative measures, we have also undertaken to adjust and improve our IT environment.

Ensuring that the customer service desk remained functional at all times was a priority. We adapted the infrastructure to allow all our agents to work from home while remaining fully operational. As attorneys also switched to remote working, we upped our capacity to issue smart cards and smart card readers in preparation for an increase in requests.

We received numerous requests from external users, particularly attorneys working from home, to increase the number of forms and documents sent using the EPO Mailbox. The service grew significantly, both in terms of the number of companies using it (+42%) and the total volume of correspondence in 2020.

Once the initial weeks of the pandemic had passed and the basic continuity of our services was secured, we continued to progress with strategic plans to improve and modernise our online tools. As a result, the limits for sequence listings and other large documents were lifted. In early December, all 72 opposition forms were added to the Mailbox. Not only does this make life simpler for users; it also significantly reduces the paper that the EPO consumes for printing and sending communications by post, contributing to our sustainability. 40 teams in an internal code challenge to use machine learning for automated classification

42% increase in number of companies using EPO Mailbox Figure 4 – Opposition by videoconference: screenshot from a mock session of oral proceedings



Source: EPO

A pilot project for conducting oral proceedings in opposition by videoconference was also launched. The need to support oral proceedings requiring simultaneous interpretation prompted us to look for an alternative technical platform to the existing setup. Zoom was selected as it allows not only simultaneous interpretation, but also remote attendance by the general public, as well as having other advantages over the previous platform. The EPO carefully monitored Zoom's security roadmap and its implementation during the period April to September 2020, and a thorough security assessment was performed by the IT security team. We were also in touch with the Zoom Chief Information Security Officer Council for the EU market and concluded a specific data processing agreement in collaboration with the EPO Data Protection Office. The project defined a sound and sophisticated configuration that ensures a controlled environment for attendees, including a waiting room, enhanced identity checking via video before the proceedings begin and the ability to share documents and desktops, under the supervision of the chair of the opposition division.

2 300 oral proceedings by videoconference, of which 333 in opposition, using new Zoom platform

#### Figure 5 – Online Filing 2.0

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Source: EPO

Work on a modernised channel for online filing – Online Filing 2.0 – continued. A pilot project with external users took place in the second quarter of 2020 for EP and Patent Cooperation Treaty (PCT) filings. After user feedback was integrated, a second pilot project was started – adding EP and PCT subsequently filed documents – with a view to launching Online Filing 2.0 in 2021.

Following the launch of the new Espacenet at the end of 2019, the underlying architecture for Espacenet and Open Patent Services was further enhanced in 2020 to take advantage of recent technical developments already in use for the ANSERA search layer and backend components.

## 2.3 Supporting corporate functions with advanced tools

After the World Health Organization declared COVID-19 a pandemic on 11 March 2020, the Supervisory Board of the European qualifying examination (EQE) cancelled the 2020 pre- and main examination papers. The months that followed resulted in a new orientation for the EQE. In July, the Supervisory Board decided that the 2021 exam would be conducted online. An e-EQE task force was set up, along with a working group to oversee and manage progress. The working group consisted of EPO staff and members of the Institute of Professional Representatives before the EPO.

The transition to the e-EQE began with a market study aimed at identifying the product that best met EQE requirements. Once a product had been chosen, further tests were carried out with a larger group of testers, mostly professional representatives. The protected environment was then opened to candidates for testing as of late December 2020.

A number of other corporate areas proceeded in 2020 with the modernisation and simplification planned under the EPO's Strategic Plan 2023 (SP2023). In early 2020, the SAP system that underpins the EPO's HR and Finance functions was redeployed from the EPO's mainframe to SAP HEC, a secure and private cloud environment. This is an important step towards decommissioning the mainframe while providing the basis for the EPO's future Finance 360 programme.

An important milestone in modernising payment processes was abolishing cheques for refunds and introducing a new central payment service that enables a single bank transfer instead of multiple, separate ones. Provided the payment reference is correctly indicated in the bank transfer, the payment is automatically reconciled and allocated. Since the process of submitting an order and the actual bank transfer are decoupled, the two steps can now be performed by different parties – for example the representative and the applicant.

The first step in modernising the EPO's internet presence took place in the second quarter of 2020 by migrating the EPO pensioners' website to a new platform. In August 2020, open source software was deployed as the new web analytics platform for two pilot websites, CPC International and the pensioners' website. This platform provides valuable insight into how users interact with these services in order to improve functionality and user experience.

Online EQE platform opened for testing by candidates in December With the necessary shift to working from home for a majority of our staff, and given how fast circumstances changed in 2020, being able to connect to every staff member was key. This underlined the importance of the intranet as a one-stop information hub. Several dedicated areas were created, including the Strong Together pages on EPO measures and services to tackle COVID-19 and the Digital Hub on the latest developments in our digital transformation. In addition, there was a shift towards a multimedia approach. These changes served to keep staff connected, despite being physically apart. However, the technical limitations of the current intranet also became apparent. With a view to keeping it a central information hub in the future, the EPO launched a project in mid-2020 to renew the Intranet based on more modern solutions. The project is to be completed in 2021.

A further step towards decommissioning legacy systems was achieved in 2020 with the partial migration from Skype for Business to Microsoft Teams. This is now the default platform for all internal video meetings, messaging and calling. It also has added collaboration options. A new support network of volunteer digital champions was set up to provide direct, colleague-to-colleague help as staff acquire new digital skills. This peer-to-peer approach proved very useful in reaching a large number of staff in a short time and provides a good basis for future configurations where a significant part of our workforce may telework.

## 2.4 IT infrastructure and cybersecurity

It was clear in early 2020 that the EPO would need to increase the infrastructure available to support staff working from home as a result of the pandemic. Several key actions were taken to strengthen and extend connectivity, including 4 000 extra VPN licences. Initially the existing 10 Gb internet connection to the newly equipped data centre in Luxembourg was used, but this was later enhanced with a similar increase in the capacity of the lines to Munich and The Hague, allowing all EPO traffic to and from the internet to be routed via the new data centre.

The EPO also accelerated the rollout of 5 800 laptops to modernise the previous workstation environment and support teleworking. This included an upgrade to the latest versions of Microsoft Windows and Office. IT subcontractors formerly working onsite on the basis of EPO infrastructure were given virtual desktop environments to enable them to provide their services remotely.

As a consequence of EPO network reconfigurations and migration to newer versions of software, information security was adjusted and improved. A state-of-the-art workstation endpoint manager was launched and antivirus software upgraded. A number of central protection systems were modernised to support teleworking on a massive scale.

To help staff respond to the exceptional circumstances of the pandemic, the EPO quickly gave staff the possibility to work between 07.00 hrs and midnight. This extended the hours when EPO-internal applications had to be online and triggered the reconfiguration of nightly IT batch jobs.

Fast-track delivery of 5 000 laptops with VPN, and upgrade to 10 Gb internet lines at main EPO sites

Extended availability hours from 07.00 hrs to midnight Once basic equipment had been delivered, the EPO offered staff the option of ordering extra equipment for ergonomic working from home, including desks, chairs, widescreen monitors and other peripherals. Over 1 900 chairs were delivered by the end of the year, along with around 750 desks and 4 700 ultra-widescreen monitors.

In the area of IT infrastructure and information security, progress continued – in parallel with urgent measures related to the crisis – on longer-term SP2023 initiatives and preparing for the post-COVID situation. The EPO continues to have a good ratio of spam to legitimate emails; only about 10-15% of all incoming emails are spam. The EPO's policies to protect emails, which are one of the most popular vectors for malware, therefore continue to be effective.

Vulnerability detection in applications and systems underwent organisational and operational improvements and the EPO took significant steps towards minimising its cyber risk through improved detection and reporting.

To ensure much better availability for users, the migration to the data centre in Luxembourg continued in 2020 with the first applications moving from the computer centre in The Hague. The first to be moved successfully included new online filing (CMS), Online Filing 2.0 and the Online Filing server, including the server for the German Patent and Trade Mark Office. A complete migration plan was also drawn up for all remaining applications in 2021.

With regard to decommissioning the mainframe, progress was made by moving the PHOENIX image archive to cloud-native servers running an off-the-shelf image archive, Scality.

In June 2020, the first disaster recovery exercise for several years – the first to be carried out with participants generally working offsite – was successful. This is particularly important, given the significant growth in hardware and the major changes to our landscape since the last exercise. The Munich environment was successfully run as a clone of the primary system in The Hague and the recovery of infrastructure elements, including the main virtual server and storage environment, went as planned. This was the first test of the Munich disaster recovery site after its renewal.

Kubernetes, an open source container orchestration platform at the heart of the EPO's cloud-native strategy, was put into production. This platform enabled the first applications, such as the PGP paperless workflow, to be deployed using a continuous integration and continuous deployment pipeline, which allows bugs to be fixed in a day or two and new functionality to be deployed every few weeks – compared to once or twice a year previously. This is the basis of our ability to accelerate delivery of the PGP.

Figure 6 – Disaster recovery room in Munich Phase 7



#### Source: EPO

In the third quarter of 2020, a highly privileged account management system was implemented. It controls privileged access across the IT environment to help prevent any damage arising from external attacks and secure confidential data from unauthorised users.

To prepare for a return to the Office – in whatever configuration may be needed – the EPO proceeded to deploy the new corporate WiFi across all buildings and meeting rooms. This will ensure that both EPO staff and visitors have access to the corporate network or guest access to the internet. The rollout was completed in New Main, the Shell and Isar buildings, Haar and Vienna and parts of the PschorrHöfe. The new WiFi was rolled out with a new authentication service, meaning that EPO laptop users can seamlessly access all their data and applications anywhere in the EPO's buildings without the need for a separate logon.

New corporate WiFi rolled out to all meeting rooms in all buildings

# 3. Driving the delivery of high-quality products and services

Combining high-quality prior art with performant tools for classification and priorart management remains central to assuring the quality of EPO products. The EPO therefore continued to invest in these tools in 2020 in several SP2023 programmes.

A series of improvements, known as the classification bridging package and requested by users of classification applications, were delivered in 2020. This package included usability changes in DOCTOOL/CLIPON and CLASMA, as well as a new feature in TRIMARAN for quality management and a new classification

data processing pipeline. The package also allowed the Cooperative Patent Classification quality assurance process to be restarted in June 2020.

The Backend Search Services, which power the core of the search functionality behind Espacenet and Open Patent Services, and particularly the master patent document database KIME, were migrated to Kubernetes, bringing another critical component to the new, cloud-native architecture. KIME can now take advantage of the reliability and resilience that comes "out of the box" with these technologies, such as self-healing, improved monitoring and alerts.

During 2020, new non-patent literature databases were made available to examiners, including Japanese standards and technical reports – the first-ever collection from an Asian standards organisation. The Europay, Mastercard and Visa standards for payment cards were added to the non-patent literature resources and a traditional Chinese medicine collection was made available in ANSERA.

## 4. Upscaling IT co-operation with member states

Despite the adverse circumstances, national patent office (NPOs) remained strongly committed to co-operation activities in 2020. The inability to travel and strict confinement measures in many countries required a switch to virtual collaboration environments, which was achieved in a matter of weeks.

There were four rounds of IT co-operation working group meetings in 2020, each with six working groups involving representatives from member states and partner offices. These working groups are a key instrument in managing and overseeing the IT co-operation programme and its projects.

As a result of these discussions, and following approval of the programme and project briefs, several products were defined and work got under way in 2020, with proof of concepts and tangible results being delivered.

Concerning the single access portal, which aims to regroup all information exchanged with partner NPOs – such as the directory of PATLIB centres – the working group and project teams focused on preparing proof of concept for launch in 2021.

As regards the front office, with the close involvement and guidance of the working group an electronic filing tool was developed as the basis for production versions to be deployed at some offices in 2021.

In the process mapping and quality management project, the filing processes were mapped at some NPOs with remote assistance from the project team. Expertise was shared.

The working group on data quality defined a modern exchange infrastructure – based on application programming interfaces – that can serve as the basis for modern data integration in the future.

Work on the Cooperative Patent Classification (CPC) continued with the delivery of tools to member states to help them deliver patents already CPC-classified, thereby aligning them with the standard and facilitating exchange.

Non-patent literature available in ANSERA

Four rounds of meetings of six IT co-operation working groups The back office working group continued to act as an exchange platform between offices that may derive mutual benefit from existing tools.

For search, the working group discussed some improvements to legacy tools and planned their implementation, while also designing the basis for a future joint search solution, based on ANSERA technology.

## 5. Contributing to long-term sustainability

Accelerated by the pandemic, the shift towards paperless work significantly reduced both paper consumption and CO2 emissions, which also fell thanks to the decline in duty travel and commuting. In 2020, we launched a project to carry out ICT initiatives using technology in an environmentally friendly way. The project aims to adopt a more sustainable approach, implementing both "green IT" and "green by IT".

Following approval of an IT sustainability policy that sets the objectives, outcomes, implementation means and principles for the relevant areas of Business Information Technology (BIT), we embedded its criteria in the hardware acquisition channel framework contract launched in the first quarter of 2021.

We implemented an IT energy consumption dashboard for data centres and local area network printers. So far we have calculated annual energy savings of approximately 300 000 kWh thanks to new laptops – equivalent to the consumption of about 100 households in Europe. We established measurements to monitor the energy consumption of the data centres in The Hague and Luxembourg, enabling us to assess the impact of decommissioning and migrating applications and services to Luxembourg.

300 000 kWh saved from new laptops

### Figure 7– Environmental dashboard



Source: EPO

## 6. Transforming our IT

The shift to teleworking in March 2020 led to a short, but intense peak in calls and emails to the BIT Service Desk. Staff satisfaction remained constant, despite the call and email volumes. The Service Desk was central to our endeavour to support all staff members through the rapid transition to working from home.





#### Source: EPO

The BIT upskilling programme progressed apace, with popular knowledge sharing events and the widespread launch of online learning platforms, such as Udemy, Udacity and LinkedIn Learning. The knowledge gap of our staff with respect to future skills – as measured in 2019 – continues to shrink.

Three online learning platforms for BIT upskilling

	Directorates						
	Enterprise Architecture	IT Co-operation	Search and Patent Grant Process	Corporate IT	IT Planning	IT Operations	Total
Strategy and management	+0.19	+0.21	+0.28	+0.42	+0.33	+0.26	+0.29
Business knowledge	+0.31	+0.00	+0.25	+0.36	+0.75		+0.29
Solution development	+0.31	+0.33	+0.13	+0.27	+0.46	+0.35	+0.27
Information management and security	+0.22	+0.00	+0.12	+0.24	+0.40	+0.24	+0.23
Service operations and support processes	+0.40	+0.10	+0.33	+0.40	+0.38	+0.46	+0.38
Base technologies	+0.43	+0.33	+0.25	+0.15	+0.40	+0.16	+0.23
Methods	+0.21	+0.21	+0.32	+0.27	+0.43	+0.63	+0.40
Data science and analytics	+0.33	+0.00	+0.24	+0.26	+1.00	+0.00	+0.28
Operating systems	+1.00		+0.00	-0.07	+0.35	+0.17	+0.21
Cloud computing	+1.23	+0.50	+0.85	+0.70	+2.00	+0.88	+0.99
Interface management	+0.22	+1.00	+0.17	+0.13		+0.55	+0.28
Platforms	+0.62	+0.53	+0.53	+0.60	+0.50	+0.77	+0.63
Programming languages	+0.70	+0.30	+0.32	+0.33	+1.50	+0.30	+0.37
Basic	+0.12	+0.04	+0.14	+0.10	+0.28	+0.21	+0.16
Personal effectiveness	+0.10	+0.00	+0.09	+0.14	+0.41	+0.15	+0.13
Working with others	+0.00	+0.24	+0.14	+0.27	+0.31	+0.12	+0.17
Leadership competences	+0.25	+0.25	+0.23	+0.33	+0.41	+0.21	+0.26

#### Figure 9 – Progress in upskilling

As regards subcontracting and vendor management, the situation developed positively in terms of transparency and sourcing strategy. Under the SP2023 digital administration programme, sourcing has been transformed, increasing the percentage of tender procedures from 60% in 2018 to 92% in 2020 and reducing the percentage of directly awarded contracts from 39% in 2018 to 8% in 2020.

92% of awards via tender procedures

A number of IT deliverables have already been realised as part of SP2023. Project managers and business units are working hand in hand to ensure all parties have a clear understanding of the road ahead. So that the entire process remains a shared journey, pipelines were introduced in 2020 to provide a holistic view of planning for business deliveries across the five SP2023 goals. The IT Project Office reviews the PGP and corporate pipelines regularly, assessing their risks, benefits and dependencies, and making updates to reflect any changes.

Pipeline approach to help manage IT deliverables from SP2023 projects



#### Figure 10 – PGP pipeline

#### Source: EPO

In many respects, 2020 was a challenging year. We had to guide our staff, users, member states and other stakeholders through an accelerated digital transformation. We have seen what is possible in a short time by remaining focused and working together.