

Digitisation funding for small and medium-sized enterprises in Germany using the example of the Digitalprämie Berlin

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ABSTRACT

In the following article, the Digitalprämie Berlin (Digital Premium Berlin) and its effects and impacts will be analysed and put into context with its new edition. The evaluation of the first funding period directly influenced the structure of the new edition. In this article, the current state of digitisation support for small and medium-sized enterprises and its change will be exemplified using the Digitalprämie Berlin. This article is based on the "Bericht zur Auswertung der Digitalprämie Berlin" by the public DAB Digitalagentur Berlin GmbH (DAB), which the author contributed to as part of his employment at DAB. The Digitalprämie Berlin, initiated by the state of Berlin, is a public funding programme to promote the digitisation of small and medium-sized enterprises in Berlin. It ran from 02.11.2020 to 31.10.2021. The new funding period began on 15.08.2022.

KEY WORDS

Digitisation, Funding, Small and Medium Enterprises, Digitalprämie Berlin

INTRODUCTION

Digitalisation is a megatrend that is nourished by networked production and globalisation and makes the digitalisation of companies and administration necessary across the board. Last but not least, the Corona crisis, its impact on consumer behaviour and supply chains, as well as the changing geopolitical situation, reinforce the need for the digitalisation of companies (Zimmermann 2021).

Digitisation as a term has no clear definition, but has various dimensions in its meaning. In a narrower sense, digitalisation refers to the transformation and representation of analogue processes, products and business models into digital ones. In a broader sense, it also refers to the digital revolution, similar to the industrial revolution (Bendel 2021).

Digitalisation is changing the way companies are founded, built up and developed. In addition to new business areas, innovative products and technologies, the sustainable digitisation of fundamental business processes of all market participants, especially small and medium-

sized enterprises (SMEs), is increasingly at the centre of state funding in Germany. (Bundesregierung 2022) and Europe (European Commission 2008).

According to the European Commission, small and medium-sized enterprises are all enterprises with fewer than 250 employees and less than 50 million euros in annual turnover, or an aggregate balance sheet total not exceeding 43 million euros (European Commission 2003). Small and medium-sized enterprises play a prominent role in Germany, accounting for 99.4 percent of all enterprises, 56.3 percent of all employees and 29.4 percent of GDP (Statistisches Bundesamt 2019). Small and medium-sized enterprises are therefore often referred to as the backbone of the German and European economy, as the distribution of SMEs is similar throughout the European Union (EU) (Papadopoulos 2018). Their importance for society and politics is steadily increasing (European Commission 2008).

However, small and medium-sized enterprises still have significant potential in the context of the digitalisation of business processes and business models compared to large companies and corporations. For example, 17 percent of German SMEs employ IT specialists. In contrast, 78 percent of large companies employ IT specialists. Furthermore, while 22 percent of German SMEs are making efforts in the area of digital training, the figure for large companies is 73 percent (Institut für Mittelstandsforschung 2021). Overall, it is assumed that about 30 percent of large German companies are digitalised in the sense of using data and algorithms for business processes and models. In contrast, only 20 percent of SMEs are considered digitalised, with 80 percent still in the computerisation stage, using technical tools for analogue processes (Lichtblau 2018).

This statistical disparity also manifests itself directly in economic disparities, e.g. when 19 percent of SMEs were able to increase their online turnover compared to the previous year, but in contrast 38 percent of large companies were also able to increase their online turnover (Institut für Mittelstandsforschung 2021). In principle, the digital transformation of business processes and business models leads to more turnover and profit. In addition to higher profits and new customers, digitalised processes also

make it easier to find and recruit employees. Furthermore, digital processes are generally more efficient and effective than comparable analogue business processes, which is due to the scalability of digital products. (Lichtblau 2018).

This increased efficiency and scalability has a direct impact on the global competitiveness and innovative strength of Germany and Europe as a business location, which is why the promotion of digitisation, including for small and medium-sized enterprises, is increasingly becoming the focus of political attention (European Commission 2008). This is particularly evident in the Federal Government's new digitisation strategy. In a total of 24 areas of this strategy, lighthouse projects organised by the ministries are being promoted and implemented. SMEs play an outstanding role here, particularly in the context of artificial intelligence (Bundesregierung 2022).

Grants are awarded on the basis of European state aid law, Art. 107 et seq. TFEU3 and the criteria established by the European Commission for "de minimis" aid (European Commission 2013). Germany ranks 13th out of 27 EU member states in the European Commission's Digital Economy and Society Index (DESI). The DESI measures the socio-economic status of EU member states on the basis of criteria such as digital infrastructure, digitisation of companies and administration, and the ability of the population to use digital technologies (European Commission 2022). This placement of Germany and Berlin's position as the capital of the largest economy in the EU, combined with an exemplary diversified economy, make Berlin an ideal candidate for consideration.

DIGITALPRÄMIE BERLIN

Initial Situation

Berlin is also characterised primarily by small and medium-sized enterprises. These regard above all the financial investment in digitisation projects as a significant hurdle (Mittelstand 4.0 Kompetenzzentrum Berlin 2021). Based on this initial situation, the Senate Administration for Economic Affairs, Energy and Industry launched the Digitalprämie Berlin on 2 November 2020 and commissioned Investitionsbank Berlin Business Team GmbH (IBT), a wholly-owned subsidiary of the Investitionsbank Berlin Unternehmensverwaltung, to implement the funding programme (Berliner Senatsverwaltung für Wirtschaft, Energie und Betriebe 2019a).

As the central coordination agency for all digitalisation measures for companies in Berlin and as a spin-off of Investitionsbank Berlin (IBB) and sister company of IBT, it is the responsibility of DAB Digitalagentur Berlin GmbH to evaluate and interpret the Digitalprämie Berlin and to derive possible recommendations for further measures from the data (Berliner Senatsverwaltung für Wirtschaft, Energie und Betriebe 2019b).

The Digitalprämie Berlin was primarily intended to strengthen the competitiveness and future viability of Berlin's SMEs by creating financial incentives for SMEs and the self-employed to invest in digitisation projects. The Covid 19 pandemic intensified the need for companies to digitalise their business processes and to open up new digital sales channels as well as new digital business fields. At the same time, slumps in sales and the continuing reluctance of consumers created worse conditions for investment in their own modernisation projects. In this respect, the Digitalprämie Berlin not only had the task of securing the future and innovative strength of Berlin companies, but also of counteracting the economic consequences of the pandemic.

The Digitalprämie Berlin can be applied for entirely online and had a comprehensive scope of funding that was not limited to specific industries, trades or social or geographical characteristics. The support measures themselves were also not limited to certain software or hardware or services, as long as it followed the purpose of the digitalisation of the company. In this respect, the Digitalprämie Berlin pursued a broad funding approach with the aim of reaching as many SMEs as possible and supporting their initial digitisation with the broadest possible funding (Berliner Senatsverwaltung für Wirtschaft, Energie und Betriebe 2019a).

First funding period

Structure

In principle, the Digitalprämie Berlin was a non-repayable grant for private companies. The amount of the grant differed in the first funding period in the "Basic" and "Plus" modules. The "Basic" module of up to 7,000.00 euros was aimed at SMEs and solo self-employed persons with up to 10 employees. While companies with more than 12.5 and up to 249 employees were assigned to the "Plus" module and could receive subsidies of up to 17,000.00 euros. In principle, only digitisation projects that had not yet begun were eligible for funding. However, it was possible for companies in the "Basic" module to apply for an early start to the measures. This was intended to speed up the implementation of the digitisation projects and counteract a possible overload of the administration. This was not possible in the "Plus" module. Funding was provided for operational investments in the areas of:

- Digital work and production processes
- Digital management processes
- Introduction or improvement of IT security
- Digital consulting and qualification

The funding programme was aimed at all companies with up to 249 employees and a branch in Berlin that comply with the Berlin state minimum wage. Applicants did not have to choose one of the above categories, but could put together a package of a maximum of ten individual measures from different areas and apply for these once

only (Berliner Senatsverwaltung für Wirtschaft, Energie und Betriebe 2019a).

Research questions & methods

The evaluation and analysis of the funding program was basically already carried out during the funding period, but was not fully addressed until the end of the measure. A special feature of the evaluation is the way in which data can be processed and evaluated. The applications were submitted by the companies together with the desired measures, but were separated from each other during the process, so that it is not possible on the system side to link the companies with the respective measures. The separation of the data and its anonymization in the process is based on the DSGVO (DAB Digitalagentur Berlin 2022).

Another challenge arose from the large number of free text fields in the application, which should ensure a certain low-threshold. These factors resulted in less concrete data and more many complex texts. Thus, the data was sorted primarily using Natural Language Processing (NLP), logical clustering, and keywording, and then transferred into presentable data. The entire process took place in several iterations.

The most important questions for the evaluation were above all the type, industry and size of the respective companies, their funding objects and the amount of the respective funding. Furthermore, the motivation for digitization and their level of digital maturity were of interest. The main aim was to find out who applied for the funding and what conclusions could be drawn from this for Berlin as a location, the digitization of SMEs and the funding program, and whether the funding was allocated in the interests of the funding provider. In this respect, the question is whether so-called windfall effects have occurred, and if so, how and to what extent. This gives rise to further questions, in particular about the possible avoidability of these possible effects.

Evaluation

The dataset evaluated by the DAB consists of 1,720 superordinate entries, which contain the key data of the approved funding applications and answers of the funded companies to several questions to be answered during the application. Since one application could contain up to ten individual measures, the finally evaluated data set comprises a total of 4,020 individual measures. The answers to the questionnaire provided information on the company's activities, the goals of the digitisation measures, the exact purpose of the subsidies and the course of the project. Further information such as number of employees, annual turnover and project costs made it possible to categorise the applicants.

The 18 entries per application and the sometimes large number of words in the free text fields for more complex questions made a more thorough analysis of the available

data difficult. For the statistical evaluation of this unstructured data, it was logically grouped by hand and then analysed using a machine learning method. With the help of, the entries were then classified using keywords and assigned to a series of predefined categories. In this way, despite the diversity and size of the data set, insights into the use of the Digitalprämie Berlin as well as an overview of the funded companies could be gained.

Keywords such as product names were used to group the digitisation measures according to hardware, software and other expenditures and to sort them into subcategories. In order to guarantee the most precise data analysis possible, the keywords that could not be assigned by the NLP procedure were categorised again manually. Despite the relatively high accuracy of the procedure, a certain error rate cannot be ruled out.

The technical implementation of the NLP procedure was carried out in cooperation with an independent Berlin-based service provider. The evaluation and interpretation of the data was carried out by the DAB Digital Agency Berlin with the cooperation of the author. The aim of this evaluation was to gain knowledge from the application data about the funding recipients, the funded projects and the type of digitisation projects (DAB Digitalagentur Berlin 2022).“

RESULTS AND INTERPRETATION

Results

A total of 25 million euros was disbursed to over 4,000 companies (Berliner Senatsverwaltung für Wirtschaft, Energie und Betriebe 2022). In this context, 71 percent of all funded companies had measures for the "Basic" module funded, while 29 percent had the "Plus" module funded. Of 4,010 approved individual measures and 1,720 applications (as of 25.10.2021), 71 percent were part of the "Basic" module and 29 percent were part of the "Plus" module.

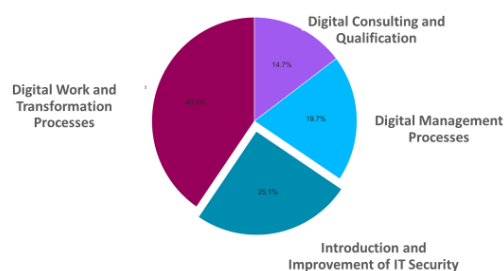


Figure 1 – Distribution of companies along modules

As can be seen in Figure 1, measures were registered primarily for the module Digital Work and Transformation Processes. This was closely followed by measures for IT security with 25.1 percent. The modules Digital Management Processes and Digital Consulting and Qualification accounted for 19.7 percent and 14.7 percent of the funded measures, respectively.

Mostly small projects with an average value of about 7,800 euros were funded by small and medium-sized enterprises with up to 180 employees. Of these, 66 per cent had fewer than 10 employees, 28.2 per cent had between 10 and 50 and only 5.8 per cent had between 50 and 249 employees, as can be seen in Figure 2.

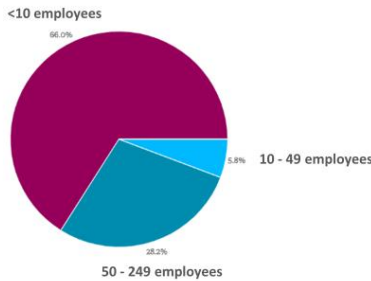


Figure 2 – Distribution along number of employees

Regarding the turnover of companies that partook in the Digitalprämie Berlin most ranged within the range of 10,000 to 1,000,000 euros. Logically the companies with the highest annual turnover applied for the module “Plus”. Otherwise the overall allocation above both modules as shown in Figure 3 shows that most companies were established SMEs.

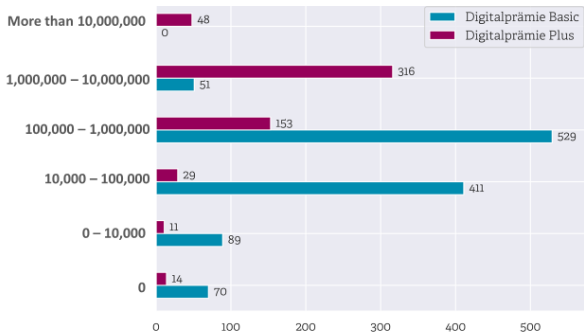


Figure 3 – Comparison of annual turnover along modules

The two largest individually stated sectors of the supported companies were information and communication technology (ICT) and medical technology. Construction and the food industry followed in third place. In total, there were 24 predefined sectors from which companies could choose. 45.9 per cent of all participating companies indicated otherwise. This is mainly due to the limited selection, which did not include important sectors such as trade or crafts. Nevertheless, the ICT and medical technology sectors are already well positioned in digitalisation in a cross-sector comparison. In turn, the evaluation of the economic sectors indicated independently shows that trade takes second place behind ICT.

As shown in figure 4, 44.7 percent of the approved grants were spent on the acquisition of software, another 29.7 percent went to the procurement of production-relevant hardware and 17.6 percent to hardware and software and 8 percent to qualification. Furthermore, 60.0 percent of

all projects were related to IT security, which underlines the increasing importance of the topic and corresponds to the overarching funding objective.

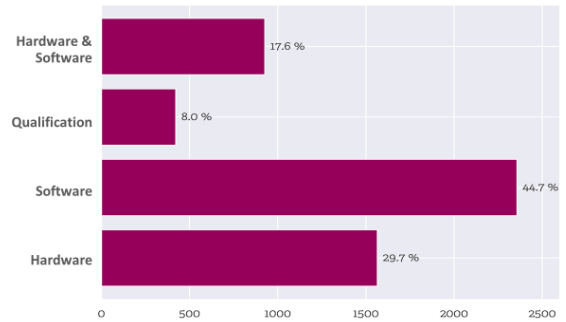


Figure 4 – Distribution of single measures along clustered use cases

37,4 percent of the funded measures of the cluster Software was also invested in IT security software, strengthening the importance of IT security. As shown in figure 5, another 22,6 percent of funded measures related to websites, web shops and merchandise management systems. 11,9 percent of measures related to tools for accounting and human resources tools.

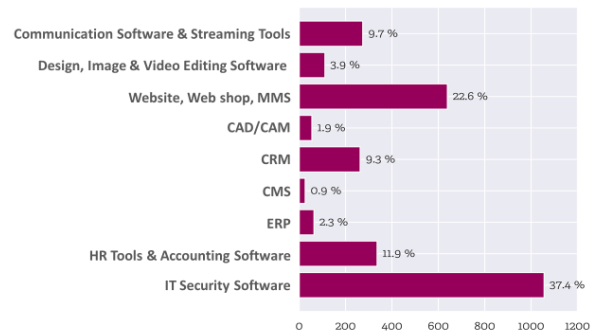


Figure 5 – Distribution of measures in the sub-cluster of Software

In the sub-category of Hardware 56,3 percent of all funded measures related to server and internet hardware, followed by 16,3 percent of funded measures relating to bureau hardware and another 9,5 percent relating to camera and video equipment. As figure 6 illustrates, the most invested hardware was either more advanced server hardware or either simple standard hardware.

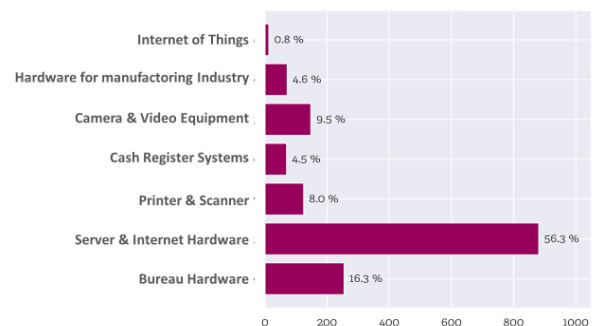


Figure 6 – Distribution of single measures in the sub-cluster of Hardware

The cluster of IT Security was mostly used for the acquisition of IT security-related hardware or licenses and certificates. Also more than two thirds of the funded companies came from the inner-city districts of Mitte, Charlottenburg-Wilmersdorf, Pankow and Friedrichshain-Kreuzberg.

Conclusion

Qualitatively, one of the greatest challenges of promoting digitisation measures is the measurement of actual digitisation progress and addressing companies that are particularly worthy of support. Furthermore, the correct and uniform recording of data before, during and after the individual digitisation measure is of extraordinary importance for a well-founded analysis.

In terms of content, it is particularly evident that the target group was recorded in its entirety, although most of the companies are established SMEs from the information and communication technology or medical technology sectors. This allows for several conclusions. Firstly, this suggests a windfall effect. A windfall effect is when a project is realised with funding that would have been implemented anyway. In other words, the funding was only taken along. Secondly, windfall losses and the sector distribution of the companies suggest that there is an information asymmetry between micro, small and medium-sized companies and between companies in the ICT sector and companies in other sectors. This indication of windfall effects also shows when looking at the distribution of funded single measures in the cluster hardware. Relatively sophisticated server hardware makes up over half of all funded measures in this cluster. This presumed information asymmetry can also be interpreted in the geographical distribution of the companies. Here there is a strong disparity between companies from Berlin's inner city and the outlying districts.

Otherwise the allocation of measures within biggest cluster Software and the high number of IT security related measures, together with the overall distribution of companies along number of employees and turnover shows a great need of SMEs for mostly basic services, software and hardware to overcome the initial burden of digitising.

The average funding level also shows that there are hardly any differences in the level of funding for small and medium-sized enterprises. It can be concluded here that both small and medium-sized enterprises, corresponding to the Basic and Plus categories, have a relative basic investment requirement, which for the Digitalprämie Berlin is 7,800 euros including a 50 percent deductible, i.e. 15,600 euros per enterprise. In practice, the funding requirements of the companies differ, but can be limited primarily to basic software and hardware.

However, many companies have had more than one individual measure funded. Furthermore, the costs of the digitisation projects did not increase the larger the company

was. This indicated some kind of shared initial investment obstacle small and medium companies need to overcome.

Second funding period

Structure

The first funding period, which expired on 31 October 2021, will be continued from 15 August 2022 until the end of 2023. The second funding period is also a non-repayable grant for SMEs with their registered office or place of business in Berlin and up to a maximum of 249 employees, including solo self-employed persons and freelancers in their main occupation without salaried employees. However, the foundation must now have taken place before 31 December 2021. The Basic and Plus modules have been combined and the distinction between SMEs has been removed. As a result, eligible applicants can apply for up to 17,000 euros. The maximum share of funding is still 50 percent of the eligible costs. Up to 10 individual measures can be funded in the areas of:

- Digital work and production processes and management processes
- Introduction or improvement of IT security
- Digital consulting and qualification

Changes

The most important changes are the combination of the two modules Basic and Plus and the introduction of a basic digital maturity measurement based on self-disclosure. Furthermore, the early start of measures is permitted for all applicants.

The disbursement of the approved subsidies will now take place after completion of the review of the proof of use, for which the subsidisation of the net costs is made possible regardless of the entitlement to deduct input tax. In addition to the adjustment of the cut-off dates, a binding limit of 27,000 euros in annual turnover is introduced for the income of solo self-employed persons. Furthermore, the possibility to subsequently submit proof of entry in the transparency database has been eliminated.

CONCLUSION AND OUTLOOK

From the evaluated data and the changes initiated by them, various possible conclusions emerge that must be further observed and documented in the course of the second period.

Windfall effects in digitisation funding result primarily from information asymmetry. At the same time, funding programmes are changing due to developments in digitisation such as the possibility of digital application and evidence management, the networking of data sources, user-centricity and real-time communication.

Instead of the previous, complex funding for specific projects in specific sectors with high application hurdles, funding programmes are becoming easier to access,

clearer in structure and more flexible in terms of the funding objects.

Simplifying the structure of funding programmes, their application and the use of evidence is a possible solution to make digitisation funding more accessible for companies that are not already digitised. There are three possible solutions here: On the one hand, the integration of a digital maturity model in the application process and the further standardisation of the application itself, a more sector-specific approach and the standardisation of the data requested during the application and the abolition of free text fields. Furthermore, it may be advisable to demand standardised short digitalisation concepts from companies that are willing to apply for funding. Combined with a commitment to follow-up appointments including a further maturity measurement after completion of the respective project, the data quality can be significantly increased.

The coordination of application and evaluation can not only help to increase data quality, but also provide continuous information on which measures are procured by which sectors and companies and when. In this respect, the second funding period of the Digitalprämie will also be analysed and documented by the DAB. The changes made to the second funding period and the standardisation and streamlining of the Digitalprämie Berlin are exemplary for a changing funding market, away from singular lighthouse projects with complex modalities towards simple, uncomplicated funding programmes for a large number of actors.

In order to improve the efficiency of public funding programmes for the digitisation of SMEs, public programmes have to overcome the tension between opening up and easing access to funding programmes and avoiding windfall effects.

A first consequence of this analysis was the recommendation to combine the "Basic" and "Plus" modules of the Digitalprämie Berlin and to set the maximum amount of funding that can be called up at 17,000 euros, including the self-employed and the liberal professions. This measure led to an expansion of the possible recipients and is intended to make the use of funding more participatory. Furthermore, the reduced complexity is expected to improve comprehensibility and communability. The extent to which this is successful will be the subject of the next evaluation of the Digitalprämie Berlin in 2023.

Furthermore, the number of free text fields was reduced and a basic self-assessment of the digital maturity of the applying companies was included in the application process. As a result of efforts by the Berlin administration, the application and approval of funds now only takes between one and three months, which should increase the plannability and flexibility of the program.

The expected improvement in data quality will enable a more in-depth analysis of individual companies and their measures for future funding periods of the Digitalprämie Berlin.

Nevertheless, there are further measures that could be taken to avoid windfall effects when promoting the digitization of small and medium-sized enterprises. For example, further harmonization and standardization of funding programs, especially in the application process and the required documents, would seem to be a possible means of countering the suspected information asymmetry. The consistent clarification and visualization of funding opportunities by public and private agencies is also essential in this regard.

Furthermore, the increasing digitization of administration and funding programs plays a crucial role in making funding more comprehensible and participatory, while at the same time avoiding possible windfall effects.

CONTACT

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