Results of the Digital Europe Programme (DEP) Survey

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1   Summary

1.1   Background

The 'Digital Europe Programme' (DEP) is a new programme from the European Union aimed at improving digital capacities. A total of EUR 9.2 billion has been earmarked for the programme, which will officially begin in 2021 and run until the end of 2027. The DEP is intended to achieve five specific objectives (pillars):

1. High Performance Computing (HPC)
2. Artificial Intelligence
3. Cybersecurity and Trust
4. Advanced Digital Skills
5. Deployment, Best Use of Digital Capacities and Interoperability.

New developments in the area of information and communication technologies (ICTs) are expected to remain an important and more prominent area of focus of research within EU framework programmes for research and innovation ('Horizon 2020' (2014-2020) as well as its successor program 'Horizon Europe' (2021-2027)). However, the use of research findings to develop marketable products and services as well as the spread and acceptance of strategic digital capacities and infrastructures in both the private and public sector will take place within the context of the DEP.

Following its decision of 5 September 2018 on the continuation of the Digital Switzerland Strategy, the Federal Council mandated the State Secretariat for Education, Research and Innovation (SERI) and the State Secretariat for Economic Affairs (SECO) to establish an interdepartmental working group on artificial intelligence (IDAG KI) to exchange knowledge and opinions in this area and better coordinate Switzerland's position in international bodies. A subgroup of the IDAG KI under the leadership of the SERI specifically analysed the second objective "Artificial Intelligence" of the DEP. The result of this analysis will be included in the final report of IDAG KI, which is to be submitted to the Federal Council in autumn 2019.

1.2   About the survey

In order to adequately assess the level of interest of Swiss research and innovation actors in a participation of Switzerland to the DEP, the State Secretariat for Education, Research and Innovation (SERI), the State Secretariat for Economic Affairs (SECO), the Federal Office of Communications (OFCOM), Armasuisse, the Directorate for European Affairs (DEA) and the Zürcher Hochschule für Angewandte Wissenschaften (ZHAW) prepared a questionnaire at the request of the Federal Council. The survey was conducted in February 2019 in the form of an online survey sent to public and private institutions and researchers in Switzerland. Both SERI and OFCOM sent the online survey by e-mail to a total of 850 people [1]. The survey was also shared on two Twitter channels with over 2,000 followers each and the survey link could be forwarded, which was done. Therefore, it is difficult to say how many people or institutions the survey has reached and no clear statement can be made about the response rate.

A total of 150 institutions and researchers took part in the survey, including cantonal universities, ETH Domain institutions and forty-three private companies. Given the number of employees working at the participating institutions, the 150 responses represent 205,721 people [2]. In order to take the size of an institution into account, the responses were weighted according to the people

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[1]   For privacy reasons, it was not possible to prevent a person from receiving the survey from more than one source.

[2]   The survey asked how many people were covered by the responses, assuming that the number of indicated people was directly or indirectly related to the specific DEP activities.

covered by the responses. Participants were free to decide whether to respond on behalf of their institution or to express their own views [3].

The questionnaire consisted of various types of questions. These were usually numerical questions with responses on a scale of 1-100. Multiple response or text responses were also possible where appropriate.

As the DEP is structured into five separate pillars, questions were asked not only about the level of interest in the overall programme, but also about the level of interest in specific objectives. Respondents were also provided with information about the DEP that is already available.

1.3   Survey conclusions

When the survey was conducted (February 2019), the information available on the specific objectives of the DEP was not equally detailed, which is partly reflected in the responses received. Based on the responses analysed, however, there is considerable interest and willingness among Swiss stakeholders to effectively take part in the DEP.

Respondents were free to answer questions on individual DEP pillars. Looking at the results, we find that for example 56% of the respondents answered questions about the second pillar (Artificial Intelligence) and given the very specific formulation of objectives in the field of High Performance Computing (HPC), only 25% of participants answered questions about the first pillar.

It is important to note that this survey was merely intended to sound out the level of interest of potential participants in Switzerland. In order for Switzerland to take part in the DEP, the next step will be to clarify the exact modalities of any participation (full association, partial association, or third country) at technical level. A possible participation in the DEP also depends on the overall context of European policy, the results of negotiations with the EU and Switzerland's financial standing.

At present, discussions are still taking place at EU level on the design of the DEP and on the conditions for non-EU states to take part in the programme (trialogue between the European Commission, the EU Council of Ministers and the European Parliament).

High Performance Computing (HPC) (Pillar 1)

One objective of the High Performance Computing (HPC) pillar is to finance R&D activities aimed at achieving a European high-performance computing ecosystem covering all scientific and industrial value-added segments. Respondents showed a strong interest in participating in these activities, scoring 88 out of 100 points.

Switzerland has been a member of 'EuroHPC' since March 2019. This joint European undertaking was launched and funded as part of the EU's current framework programme for research and innovation (Horizon 2020). EuroHPC will be transferred to the first pillar of the DEP in 2021. Through its membership status, Switzerland will be able to closely monitor the processes leading up to development of the DEP and at least provide support in the corresponding pillar (High Performance Computing (HPC)).

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[3]   A total of 32 persons gave an individual opinion

Artificial Intelligence (Pillar 2)

In the Artificial Intelligence pillar, respondents gave with an overall score of 84 out of 100 points, a clear vote in favour of developing a national AI strategy.

Responses to the development of ethical guidelines were more mixed. Respondents from the public sector (score of 90 out of 100 points) considered the topic to be essential, while respondents from the private sector (score of 68 out of 100 points) considered the topic as being not very important.

There were also mixed responses to the creation of a Common European Data Space. Public sector respondents (score of 76 out of 100 points) felt that this initiative would facilitate access to valuable data. Private sector respondents (score of 49 out of 100 points), on the other hand, felt that this initiative was less important.

Cybersecurity and Trust (Pillar 3)

In the area of cybersecurity, it is clearly public sector respondents (score of 91 out of 100 points) who feel that there would be dire consequences if Switzerland does not take part in this DEP pillar. Private sector respondents (68 out of 100 points), on the other hand, felt that the issue was not vital.

Respondents were less interested in the joint procurement of infrastructure (score of 64 out of 100 points), but rather more in public sector participation in European R&D activities in the area of cybersecurity (score of 89 out of 100 points). Private sector respondents (score of 62 out of 100 points) gave less importance to the issue.

Private sector respondents (92 out of 100 points) also felt that it was very important to be able to take part in the planned 'European Cybersecurity Competence Network and Centre', which will provide financial and technological support to start-ups and SMEs in the area of cybersecurity in the future.

Advanced Digital Skills (Pillar 4)

The need for specialised training was more keenly felt among private sector respondents than among public sector respondents (e.g. 86 vs. 55 points out of 100 on the topic of skilled workers in the High Performance Computing (HPC) pillar).

With a score of 81 out of 100 points, participants explicitly support access to long-term courses on advanced digital technologies such as artificial intelligence, cybersecurity, blockchain, HPC and quantum technologies to be offered by universities in collaboration with the institutions involved in the DEP.

Deployment, Best Use of Digital Capacities and Interoperability) (Pillar 5)

One of the priorities is to enable companies, in particular SMEs, to access advanced digital capacities. A network of Digital Innovation Hubs (DIH) will offer a wide range of digital services from a single source (one-stop shop), e.g. technological trials, training, access to business information and possible financing options, as well as networking opportunities in key technologies such as artificial intelligence, cybersecurity or high performance computing (HPC).

Public sector respondents were very keen on playing an active role in the provision of such digital services to national and regional stakeholders through the DIH (98%). Private sector participants, on the other hand, were much less interested in offering such services (76%).

Public sector respondents also show a strong interest in acquiring digital services from a DIH (98%). In the private sector, on the other hand, just about half of the participants are interested in making use of such services (45%). This is probably due to the profile of the respondents, who were predominantly from R&D organisations. It could simply be, however, that the need for such services does not yet exist or that companies are used to working with large existing international companies such as Google, Amazon and Microsoft.

Another priority of the fifth DEP pillar is to promote digital transformation in areas of public interest. In this context, we note that there is strong interest (83%) in taking part in joint European activities for decentralised solutions and infrastructures required for large-scale digital applications (e.g. smart cities to support transport, energy and environmental policies).

2   Digital Europe Programme

2.1   Objectives

The Digital Europe Programme (DEP) is intended to achieve five specific objectives (pillars):

1. High Performance Computing
2. Artificial Intelligence
3. Cybersecurity and Trust
4. Advanced Digital Skills
5. Deployment, Best Use of Digital Capacities and Interoperability.

New ICT technologies will continue to be researched and developed under the European Union's 'Horizon Europe' Framework Programme for Research and Innovation. In the future, however, the use of research findings to develop marketable products as well as encourage the dissemination and acceptance of strategic digital capacities and infrastructures in the private sector and in areas of public interest will take place within the framework of the DEP.

2.2   Supporting documents

Respondents were provided with the following publicly available documentation about the DEP:

Supporting document	Link
⇨ Factsheet	🔗
⇨ Regulation of the European Parliament and of the Council establishing the Digital Europe programme for the period 2021-2027	🔗

2.3   Survey results

Level of interest

Q: Bearing in mind the introductory information, are you interested in participating in the Digital Europe Programme?
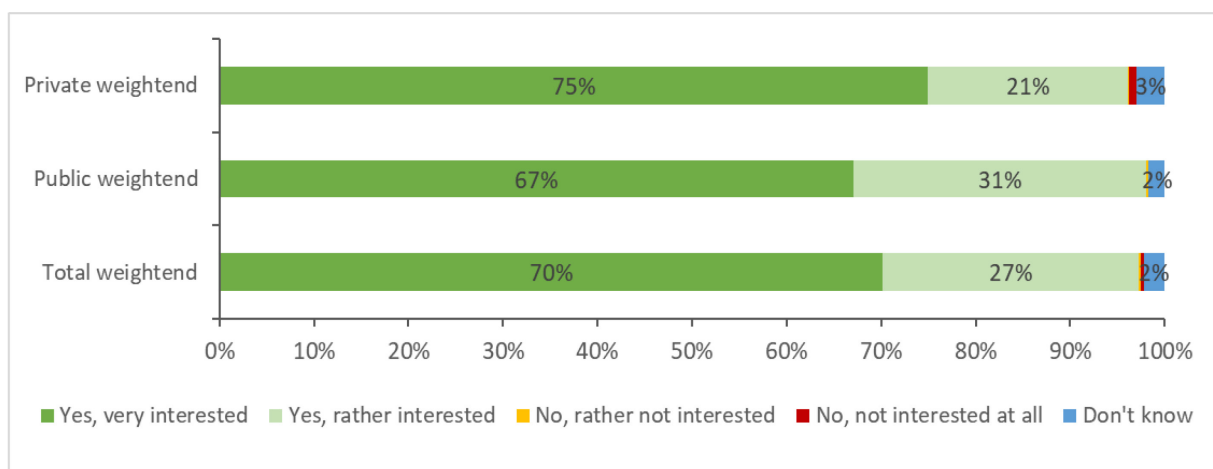
When asked to indicate the general level of interest in the DEP, respondents were very clear. Approximately three quarters of both private and public sector respondents (the latter comprised of individuals expressing the viewpoint of federal agencies and universities) stated that they are very interested in this new programme. If we consider the weighted results, the approval rate is 97%. If we consider only the number of responses received (unweighted results) then we find

that 85% of the total are interested in the DEP. This is an indication that large institutions are even more interested in taking part in the DEP than individual experts or smaller institutions.

Around 60% of respondents were aware of the content of the various DEP pillars, i.e. the score was 60 points for descriptions of the various pillars. The weighted total is even slightly higher. Large institutions are most likely monitoring developments in research programmes at the European level more closely and are more familiar with the subject matter. The first pillar on High Performance Computing (HPC) is worth mentioning here, as small private companies in particular stated that they do not yet fully understand the overall purpose. The unweighted total is therefore 39%. Basically, compared to private sector respondents, public sector respondents have a slightly better understanding of the content of each pillar. With the exception of the first pillar, the observed differences are actually minor, between 2-10 points.

In the survey, respondents were also asked what their motivations were - apart from securing funding - for participating in European projects. Both networking and competitiveness at European level are important motivations for most respondents. Access to unique European infrastructures was more important for private sector respondents than for public sector respondents. On the other hand, visibility was more relevant for public institutions. The response option 'no advantages' was only clicked twice in total. It can therefore be shown that European research cooperation initiatives are not driven merely by a desire to secure research funding; in fact, the motivations are highly complex.

The DEP regulation states that activities should be as market-oriented as possible. Therefore, the actors are expected to share the costs of DEP activities (co-funding). According to the survey, Swiss institutions are prepared to contribute an average of 30% of the project costs. It is striking that private sector companies are generally willing to invest more of their own resources than public institutions. The highest contribution threshold was in the area of Cybersecurity and Trust (Pillar 3), where the private sector is willing to bear 55% of the project costs on average. This illustrates how important this issue is for companies and even more so for large companies. In the area of Advanced Digital Skills (Pillar 4) and Digital Innovation Hubs (Pillar 5), however, the picture is different. Small companies in particular are prepared to accept a higher contribution threshold.

Consequences of not participating

For each DEP pillar, respondents were asked for their views on the possible consequences of Switzerland not participating in DEP activities. The respective number of responses is summarised in the following table (responses have been consolidated for all five DEP pillars):

Q: What would be the direct impact for you or your institution if participation in this pillar was not possible?

Potential consequences	Number of Responses
⇨ Delays in accessing latest technological developments, less technology transfer, skills, loss of competitiveness.	**77**
⇨ Isolation and lack of connections to international networks and collaborations as a driver of excellence. Less participation in multidisciplinary projects.	**52**
⇨ Lack of access to funding and investment opportunities.	**23**
⇨ Reduced ability to attract top talent, brain drain.	**16**
⇨ Switzerland will not be involved in defining the research agenda or in the standardisation and certification processes.	**16**

	Number of Responses
⇨ Negative effects on the education system/path and digital skills. Constraints on talent pool. Some training programmes will no longer be held in Switzerland.	**14**
⇨ The broker role 'Research ⇔ Industry/SME' is threatened (i.e. participation in light-house projects).	**14**
⇨ Increased dependence on infrastructures, services and competencies outside Switzerland.	**9**
⇨ Joint procurement of infrastructures and services with European partners not possible. No synergy potential. Higher investment needed from national budgets.	**8**
⇨ Lack of innovation capability.	**7**
⇨ Safety is at stake.	**6**
⇨ Less visibility and influence in Europe (i.e. in organisations such as PRACE in HPC). Reputation loss.	**4**
⇨ Increased fragmentation of national initiatives.	**1**

Conditions of participation

Respondents were asked to describe the parameters or conditions that would affect their willingness to take part in DEP activities. The same question was asked for each specific DEP pillar. The respective number of responses is summarised in the table below (responses consolidated for all five DEP pillars):

Q: On what parameters or conditions would your participation pillar depend?

Parameter or condition	Number of Responses
⇨ Financial contribution for Swiss participants (an appropriate co-financing rate is a prerequisite).	**35**
⇨ The proposed activities should be consistent with one's own strategy, a national strategy, and the challenges in the respective domain.	**9**
⇨ Swiss applications should be on an equal footing with EU applications (in terms of selection and evaluation procedures and success rate).	**5**
⇨ Access to the European network (data, infrastructure, know-how) required.	**4**
⇨ Possibility of shaping the common research agenda.	**4**
⇨ Industry participation an important factor in DEP activities (knowledge transfer).	**2**
⇨ Low level of bureaucracy in EU project management.	**2**
⇨ Basic research included in the DEP.	**1**

3 Pillar 1 – High Performance Computing (HPC)

3.1 Objectives

The DEP implements the European strategy for High-Performance Computing (HPC). The aim is to develop a complete EU-wide ecosystem delivering the requisite HPC and data capacity to enable Europe to compete on a global level. A world-class exascale [4] computing and data infrastructure is to be put in place by 2022/2023, and post-exascale capacity established by 2026/27, giving the EU its own independent and competitive technology. This could enable it to achieve the global level of excellence in HPC applications and expand the availability and use of HPC capacities.

3.2 Supporting documents

Respondents were provided with the following publicly available documentation about the High Performance Computing (HPC) pillar:

Supporting document	Link
⇨ Factsheet	↗
⇨ Council Regulation (EU) 2018/1488) establishing the European High Performance Computing Joint Undertaking	↗

3.3 Survey results

3.3.1 Level of interest and willingness to participate

A total of 37 participants are interested in the first pillar, of which 30 are public institutions or universities and only seven are private companies. These 37 responses cover a total of 103,516 people, 81,918 of whom are from the public sector and 21,598 are from the private sector. In the private sector, larger companies tend to show greater interest in this pillar.

Q: Would you participate in activities of this pillar?
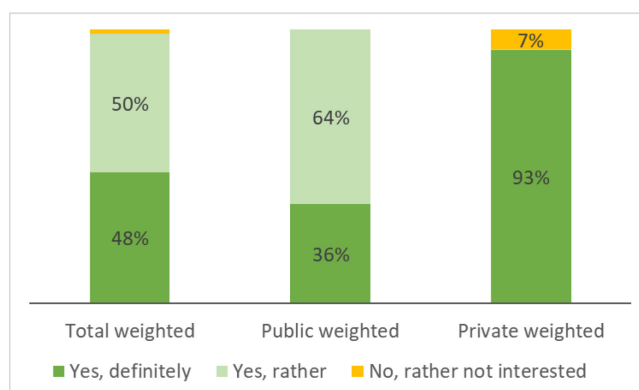
When asked whether they were interested in actually participating [5] in the activities of the first pillar, most of the respondents answered 'yes'. The figures here are somewhat lower than those observed for the other pillars, but the degree of willingness is still high. Over 90% of the public institutions state that they would certainly participate in activities of the first pillar. In the private sector, 36% would certainly participate and 63% say they would probably participate. Overall,

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[4] Exascale computing refers to computing systems capable of performing a minimum of 1 exaflop (10^{18}) floating point operations per second.

[5] In the survey, respondents were specifically asked whether they were interested in actually taking part in the activities of this pillar.

this brings the total percentage to 98% of respondents who either definitely or may want to participate in the activities of the first pillar. As this is a rather complex issue, specialised and/or larger institutions are more likely to be interested. Switzerland has been a member of the 'Euro-HPC' Joint undertaking since March 2019 and can take part in the various calls for tender funded from the Horizon 2020 budget for the period 2019-2020.

3.3.2 Preferred participation modality

Q: How problematic would the consequences be for Switzerland if participation in this pillar was not possible?

(1 = 'no problem', 100 = 'very critical')
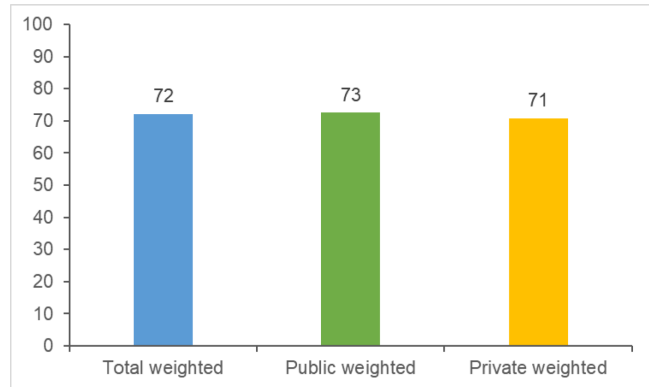
The participants agree that the consequences for Switzerland would be relatively serious if participation in the HPC activities were not possible. The response scores are consistently between 70 and 80, where 100 corresponds to 'very critical'.

The survey also showed that full association is preferred over project-based participation. Support for full association reached a total of 92 points (unweighted: 84 points), whereas support for project-based participation stood at only 64 points. Public sector respondents, in particular, were significantly less in favour of project-based participation (unweighted: 65, weighted: 57 points). Private sector respondents were somewhat less critical here, showing a level of support for project-based participation at 79. This indicates that private sector respondents are mainly interested in being able to participate in projects. The source of the subsidies seems to be of secondary importance here.

3.3.3 Assessment of planned activities and contents

The following charts show the importance that surveyed institutions give to the various objectives of the first pillar:
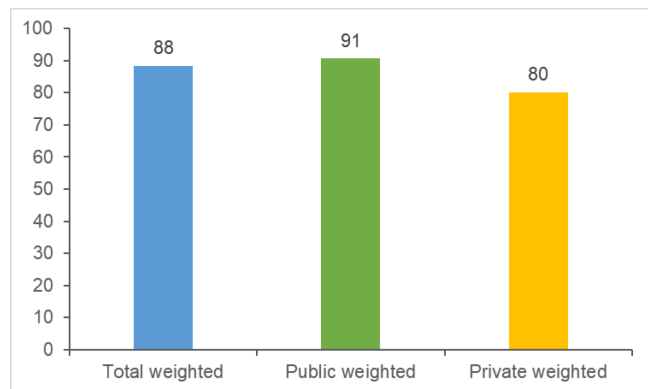
Q: One objective in this pillar is the joint procurement of an integrated world-class exascale supercomputing and data infrastructure. How important is it for you that Switzerland can participate in such a joint infrastructure procurement (bearing in mind that one country alone would have difficulty financing such big exascale infrastructure in the long run)?

*(1 = 'not important at all', 100 = 'very important')*
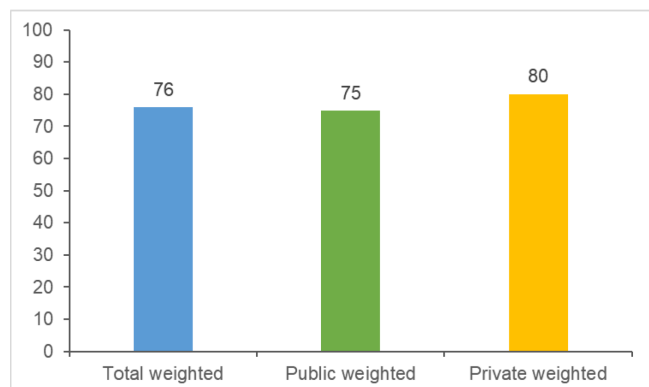
Q: One objective in this pillar is the funding of R&I activities for a high performance computing ecosystem, covering all scientific and industrial value chain segments, including hardware, software, applications, services, interconnections. How important is it for you that Switzerland can participate in such joint R&I activities?

(1 = 'not important at all', 100 = 'very important')

Q: One objective in this pillar is the provision of HPC resources, expertise and skills (especially to SMEs) via new 'HPC competence centres'. Do you consider this important for Switzerland?

(1 = 'not important at all', 100 = 'very important')
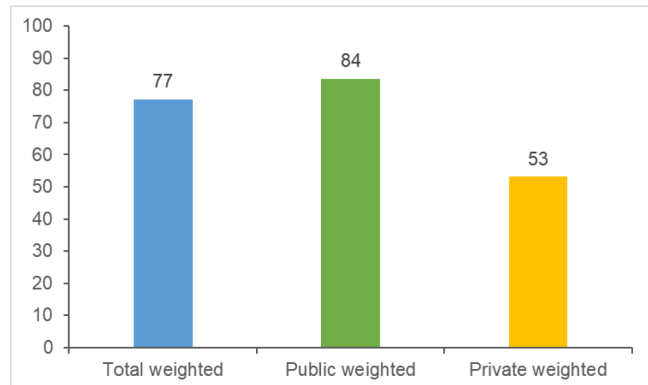
Q: What other topics/activities would you like to see being addressed under this pillar?

⇨ A link from HPC to CyberSecurity (DEP Pillar 3) is explicitly desired.

⇨ Greater focus on application software and social needs in general (e.g. weather, climate).

4 Pillar 2 – Artificial Intelligence

4.1 Objectives

The DEP is intended to build and strengthen core capacities in the area of artificial intelligence (AI), including data resources and algorithm libraries, making them accessible to all businesses and public administrations and fostering networking among existing AI testing and trial facilities in EU Member States.

The preparatory work for the DEP in the field of AI has already begun at European level (ramp-up phase). The European Commission and EU Member States have adopted a Coordinated Plan on Artificial Intelligence. Presented in December 2018, this plan includes several concrete measures, some of which are already to be implemented under the current "Horizon 2020" research framework programme. As a fully associated country to "Horizon 2020", Switzerland has been actively involved in the planning phase. In this DEP survey, Swiss stakeholders were also asked for their stance on the eleven concrete measures listed in the Coordinated Plan on Artificial Intelligence.

4.2 Supporting documents

Respondents were provided with the following publicly available documentation about the Artificial Intelligence pillar:

Supporting document	Link
⇨ Factsheet	🔗
⇨ Coordinated Plan on Artificial Intelligence	🔗

4.3 Survey results

4.3.1 Level of interest and willingness to participate

For the second pillar a total of 84 institutions indicated that they would be interested in the possibility of participation. Of these 84 institutions, 61 are from the public sector and 23 from the private sector. Of the 190,631 persons covered, 97,885 are employed in the public sector and 92,746 in the private sector. It is also worth noting that this topic appeals to smaller and larger institutions and organisations alike.

*Q: Would you participate in activities of this pillar?*
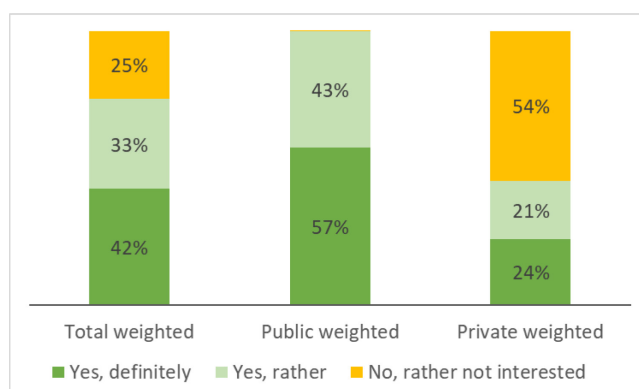
When asked specifically about their willingness to take part, there was a clear difference between respondents from the public and private sector. While nearly all respondents from the public sector seem willing to participate, participants from the private sector are more circumspect.

Nevertheless, a total of 75% of all surveyed institutions would participate in potential projects (unweighted, the proportion stands at over 90%).

4.3.2 Preferred participation modality

Q: How problematic would the consequences be for Switzerland if participation in this pillar was not possible?

(1 = 'no problem', 100 = 'very critical')
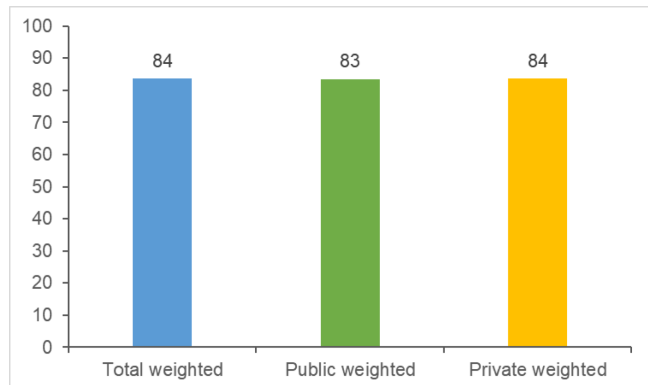
The responses given to questions on the second pillar reveal a clear consensus among stakeholders that non-participation would be detrimental to Switzerland.

On the issue of how Switzerland should take part in this pillar, 90% of respondents consider full association in Pillar 2 to be important. In contrast, two-thirds consider project-based participation to be desirable.

The surveyed institutions are prepared to bear an average of 35% of the project costs themselves [6]. This shows that this is an important issue both for the public research institutions and for the private sector.

### 4.3.3 Assessment of planned activities and contents

The following charts show the importance that surveyed institutions give to the various objectives of the second pillar.

The 'Coordinated Plan on Artificial Intelligence' from the EU released in December 2018 lists a set of concrete actions to be funded in the AI ramp-up phase under "Horizon 2020":

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[6] The question of a possible participation was raised on the one hand because the European Commission does not fund 100% of the project costs for products close to the market. On the other hand, it also shows how important a topic really is for researchers.

Q: 1 - Many European countries have already or are currently in the process of developing a national AI strategy. Do you think Switzer-land should also work on such a national dedicated strategy (in addition to the existing 'Digital Switzerland Strategy'?

*(1 = 'not important at all', 100 = 'very important')*
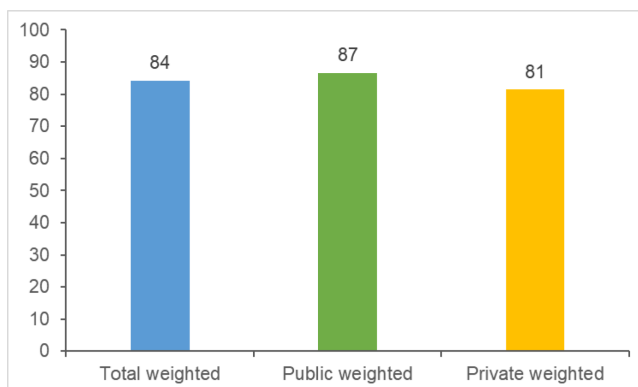
Q: 2 - The plan aims to provide substantial financial help (Thematic equity investment fund) for start-ups and innovators in AI and blockchain. How important is this from a Swiss point of view?

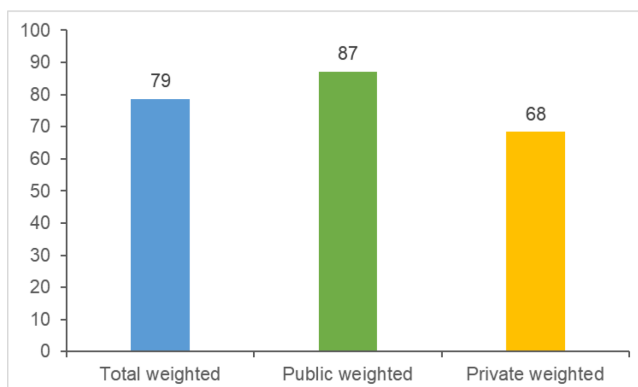*(1 = 'not important at all', 100 = 'very important')*
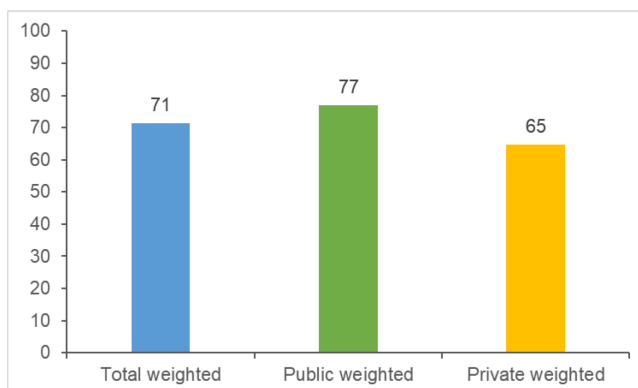
Q: 3 - The plan aims to strengthen research excellence through networks of European AI centres of excellence (mapping activities and funding of networks). How important is this from a Swiss point of view?

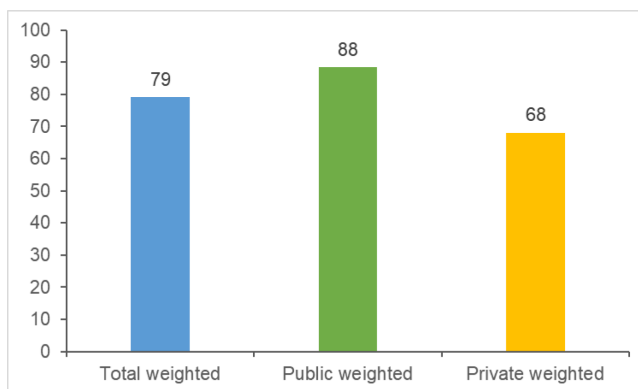*(1 = 'not important at all', 100 = 'very important')*
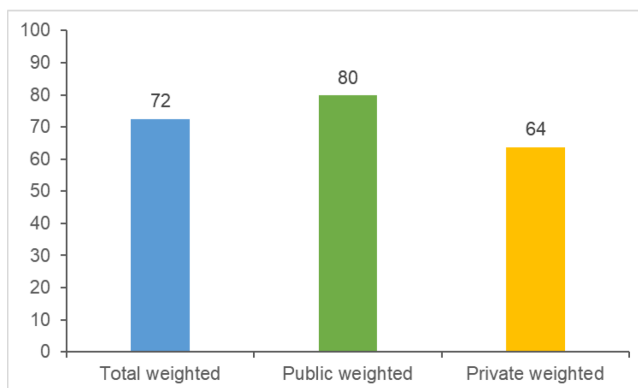
Q: 4 - The plan aims to establish world reference testing and experimentation sites for AI-powered products and services (i.e. 5G cross border-testing corridors for connected and autonomous driving). How important is this from a Swiss point of view?

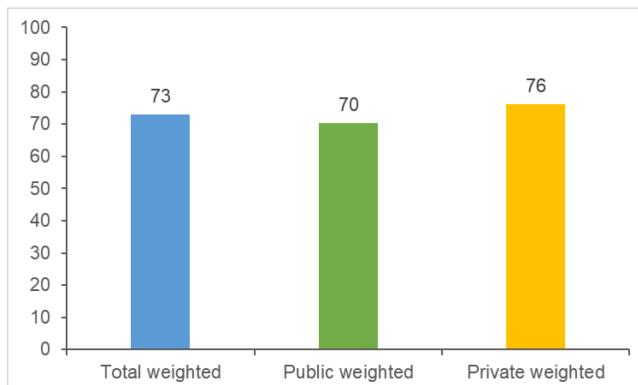*(1 = 'not important at all', 100 = 'very important')*

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Q: 5 - The plan aims to develop platforms and large-scale pilot schemes integrating AI elements (in energy, healthcare, manufacturing, geo information and agriculture). How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')

| Total weighted	Public weighted	Private weighted
79	88	68

Q: 6 - One objective in this pillar is to foster the uptake of AI in the wider economy, in particular by SMEs via Digital Innovation Hubs (one-stop-shops). How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')

| Total weighted	Public weighted	Private weighted
73	70	76

Q: 7 - The plan aims to create a Common European Data Space to makes high value data sets easily available for re-use to innovators, businesses and public sector. How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')

| Total weighted	Public weighted	Private weighted
64	76	49
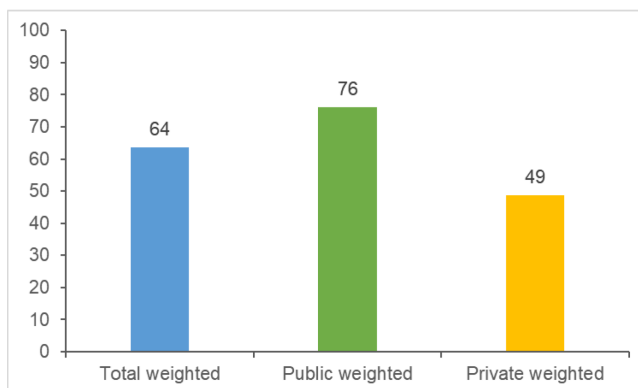
Q: 8 - The EC commissioned an expert group to draft an AI ethics guideline. The EC will also respect and anchor the 'ethics by design' principle in its calls for proposals that deal with AI. How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')

| Total weighted	Public weighted	Private weighted
80	90	68
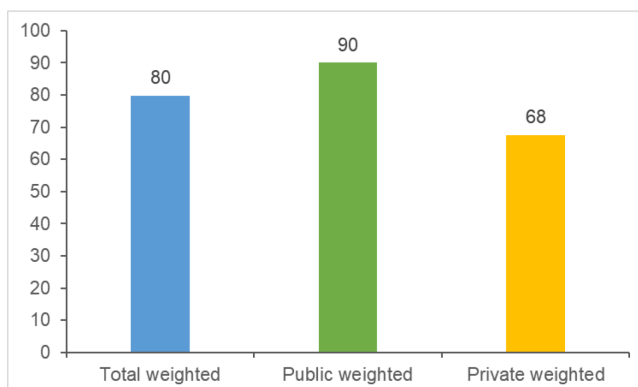
Q: 9 - MS are encouraged to work with the EC to identify areas for joint procurement of AI solutions for the public sector, leading to efficiency gains and better value for money. How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')
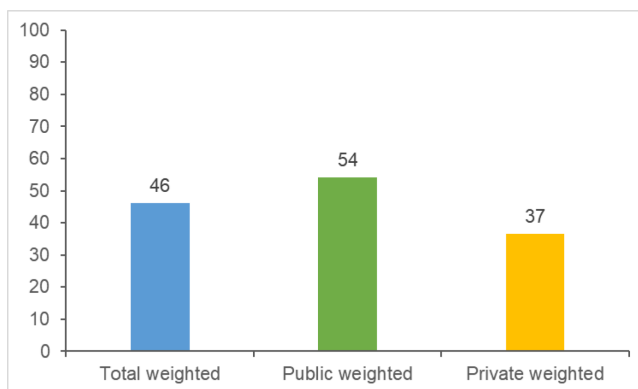

Q: 10 - The EC is planning to offer eTranslation, the AI-enabled automatic translation service developed under the Connecting Europe Facility (CEF), to public administrations in MS. How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')
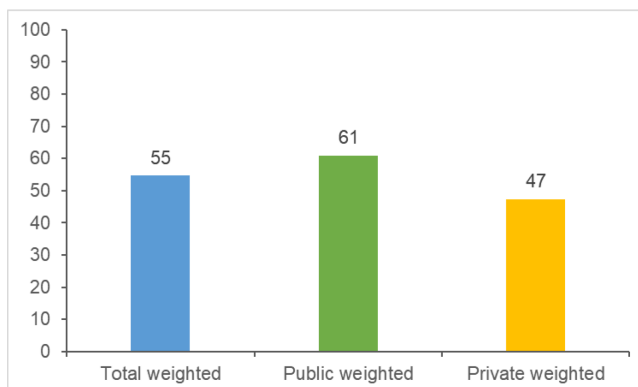
Q: 11 – The EC intends to contribute its expertise and dedicated financial means to anchor AI more firmly in development policy (Southern Mediterranean countries and Africa). How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')
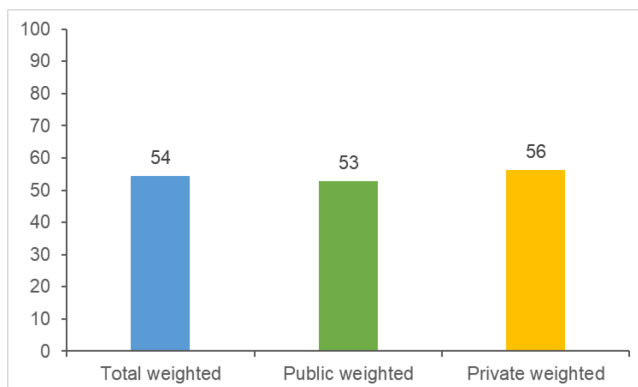
Q: Are there specific challenges (or opportunities) related to AI (not yet included in the DEP proposal or in the European Action Plan) that you consider important from a Swiss perspective (i.e. the explainability of AI or the AI bots race)?

⇨ AI transparency, explainability, comprehensibility (social acceptance).

⇨ Availability of data (security and IP issues), data exchange, data management, data protection.

⇨ The question how can AI be used in education/university education (support for the development of technology and related ethics).

Q: The current plan does not explicitly mention the provision of dedicated computing infrastructure for AI (i.e. for machine learning). How important is this from a Swiss point of view?

Responses	Number of responses
⇨ A link and access to HPC infrastructure (DEP Pillar 1) is necessary.	**5**
⇨ Commodity computing infrastructure is sufficient for most AI scenarios.	**4**
⇨ Data availability is more important than the computing infrastructure.	**1**

5 Pillar 3 – Cybersecurity and Trust

5.1 Objectives

The DEP is intended to foster the development of fundamental capacities to ensure that the EU's digital economy, society and democracy are safeguarded. This will be achieved by boosting the EU's industrial potential and competitiveness in the area of cybersecurity. At the same time, the capacities of the private and public sectors to protect European citizens and businesses against cyber threats should be improved, including support for implementation of the EU Network and Information Security directive (NIS Directive).

5.2 Supporting documents

Respondents were provided with the following publicly available documentation about the Cybersecurity and Trust pillar:

Supporting document	Link
⇨ Factsheet	↗
⇨ Regulation of the European Parliament and of the Council establishing the European Cybersecurity Industrial, Technology and Research Competence Centre and the Network of National Coordination Centres	↗

5.3 Survey results

5.3.1 Level of interest and willingness to participate

A total of 47 institutions (35 from the public sector and 12 from the private sector) expressed an interest in the Cybersecurity pillar. This corresponds to nearly one-third of all survey participants. Compared to the first two pillars, the third pillar seems to be less relevant to Swiss stakeholders. The 47 institutions cover a total of 152,964 people, of whom 109,741 come from the public sector and 43,223 from the private sector.

*Q: Would you participate in activities of this pillar?*
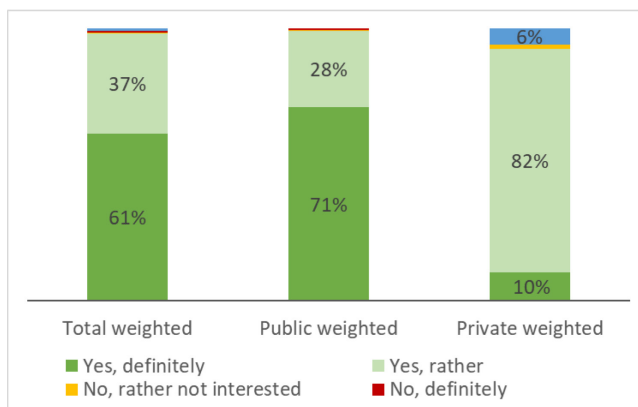
Respondents with an interest in cybersecurity seem to be very keen on taking part in this pillar. If the size of the institutions is taken into account, we find that 98% of all respondents would certainly or almost certainly participate in activities of this pillar [7]. Respondents from the public sector are much more enthusiastic about participation than those from the private sector. It cannot be determined why this is the case.

5.3.2 Preferred participation modality

Q: How problematic would the conse-
quences be for Switzerland if participation
in this pillar was not possible?

(1 = 'no problem', 100 = 'very critical')
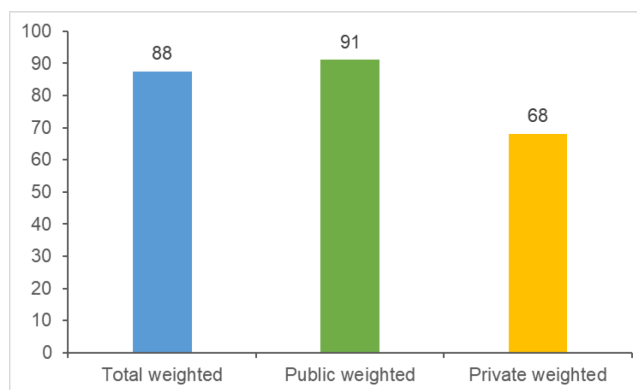
Respondents from the public sector are more convinced that non-participation in this pillar will have far greater consequences for Switzerland than respondents from the private sector. Overall, however, the consequences for Switzerland are considered to be critical.

Regarding the question of how Switzerland should take part in this pillar, we find very similar responses as those obtained when the same question was asked for the first two pillars: full association is preferred over project-based participation. The difference between respondents from the public and private sectors can also be clearly seen here. For public sector respondents, full association is more important than project-based participation. For private sector respondents, the type of participation does not seem to be nearly as important.

What is particularly striking about the third pillar is the fact that private stakeholders have a relatively high willingness to commit their own funds: unweighted, the average own-funds ratio stands at 55%; weighted, the own-funds ratio is 76%. This suggests that cybersecurity is a very important issue for private companies, but they would rather solve and fund it themselves. This result coincides with the finding that the private sector is more interested in effective participation. The average acceptable own-funds ratio for public institutions is 30%.[8]

### 5.3.3 Assessment of planned activities and contents

The following charts show the importance that surveyed institutions give to the various objectives of the third pillar:

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[7] The DEP Regulation proposed by the European Commission stipulates that only EU Member States and EEA States are eligible under this pillar. What this means for Switzerland cannot yet be estimated, as negotiations are still taking place at EU level.

[8] Within the framework of Horizon 2020, 30% self-financing has become the norm for companies in the development of market-oriented products. For the new programmes (Horizon Europe and DEP), however, this own-funds ratio has not yet been decided.
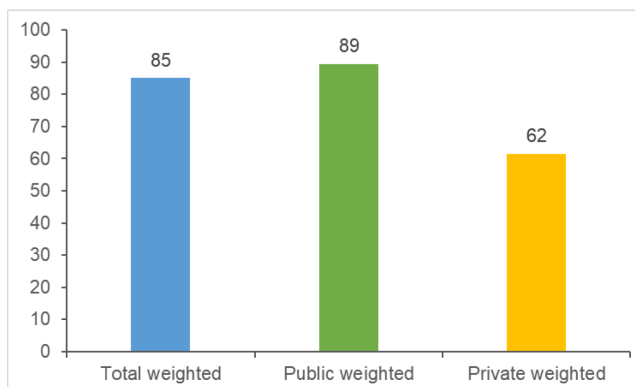
Q: One objective in this pillar is the public joint-procurement of advanced cybersecurity equipment, tools and data infrastructures (i.e. also the support of large-scale research & demonstration projects). How important is it for you that Switzerland can participate in such a joint infrastructure procurement?

*(1 = 'not important at all', 100 = 'very important')*

Total weighted: 64 Public weighted: 65 Private weighted: 58
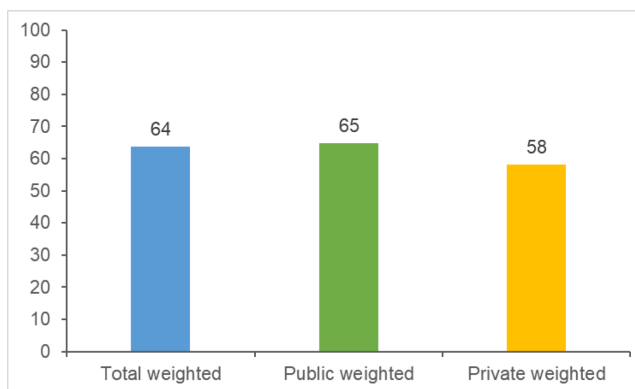
Q: One objective in this pillar is the funding of R&I based on a coordinated strategic cybersecurity technology agenda. How important is it for you that Switzerland can participate in such joint R&I activities?

(1 = 'not important at all', 100 = 'very important')

Total weighted: 85 Public weighted: 89 Private weighted: 62

Q: One objective in this pillar is to ensure a wide deployment of the latest cybersecurity solutions across the economy (i.e. a new 'European Competence Centre' is supposed to provide financial support & technical assistance to start-ups and SMEs). How important is this from a Swiss point of view?

(1 = 'not important at all', 100 = 'very important')

Total weighted: 81 Public weighted: 79 Private weighted: 92
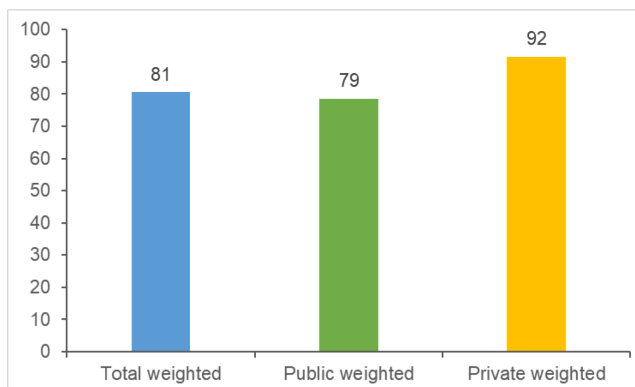
Q: How important do you consider other topics (so far not contained in the DEP proposal)? i.e. Cyber Defence (as a subchapter of Cybersecurity) Considering the 'National strategy for the protection of Switzerland against cyber risks (NCS 2018-2022)"

(1 = 'not important at all', 100 = 'very important')

Total weighted: 89 Public weighted: 90 Private weighted: 81
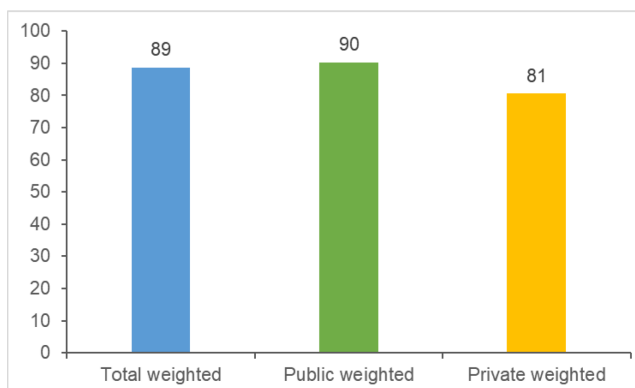
Q: What other topics/activities would you like to see being addressed under this pillar?

⇨ Cyber defence should also be covered by the 'European Competence Centre'.

⇨ Focus on critical infrastructures is required.

6 Pillar 4 – Advanced Digital Skills

6.1 Objectives

The DEP programme is intended to foster easy access to advanced digital skills, in particular in HPC, AI, transaction network technology (e.g. blockchain) and cybersecurity for current and future workers. This will be achieved by providing students, young graduates and employees with the means to acquire and develop these skills, wherever they may be.

6.2 Supporting documents

Respondents were provided with the following publicly available documentation about the Advanced Digital Skills pillar:

Supporting document	Link
⇨ The Digital Skills and Jobs Coalition	🔗
⇨ Digital Opportunity traineeships: boosting digital skills on the job	🔗
⇨ Upskilling Europe's small businesses for the digital age	🔗

6.3 Survey results

6.3.1 Level of interest and willingness to participate

A total of 71 institutions are interested in the activities of the fourth pillar, of which 51 belong to the public sector and 20 to the private sector. A total of 211,749 persons are covered by these 71 responses, 118,888 of whom are from the public sector and 92,861 from the private sector. The level of understanding of the activities in this pillar varied between 60 and 100 (100 = complete knowledge). Since the specific activities of this pillar are not yet known, respondents could not be given too much information in advance. Nevertheless, the pillar "digital skills" seem to spark a great deal of interest.

Q: Would you participate in activities of this pillar?
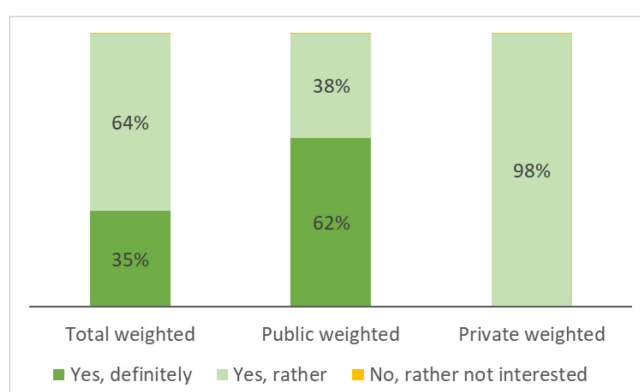
Over 99% of the interested institutions stated that they were also interested in taking part in the activities of the fourth pillar.

The level of interest from private institutions is at least higher (average of 85 on a scale of 1 to 100, where 100 is 'very important') than the level of interest from the public sector (average: 75). This value obtained in response to the question regarding project-based participation is 10

points lower, though still high. This means that respondents consider participation in this pillar to be important.

6.3.2 Preferred participation modality

Q: How problematic would the conse-quences be for Switzerland if participation in this pillar was not possible?

(1 = 'no problem', 100 = 'very critical')
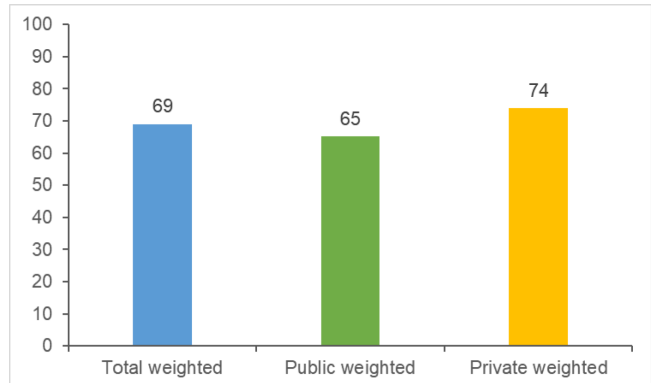
Respondents felt that there would also be negative consequences for Switzerland and its institutions if Switzerland does not take part in this pillar.

6.3.3 Assessment of planned activities and contents

Advanced digital skills to be offered under this pillar should contribute to increasing Europe's talent pool, fostering greater professionalism, especially with regard to high performance computing, big data analytics, cybersecurity, distributed ledger technologies, robotics and artificial intelligence. Possible offering to increase digital competences might include:

Q: 1 - Access to on-the-job-training by tak-ing part in traineeships in competence cen-tres and companies deploying advanced technologies (building on the Digital Op-portunity pilot). How important is it for you that Switzerland can participate in such joint activities?

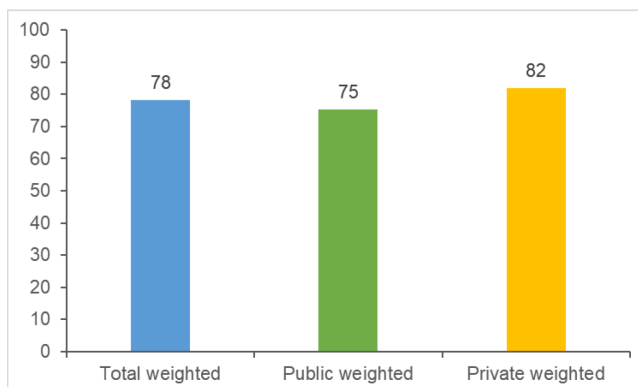*(1 = 'not important at all', 100 = 'very important')*
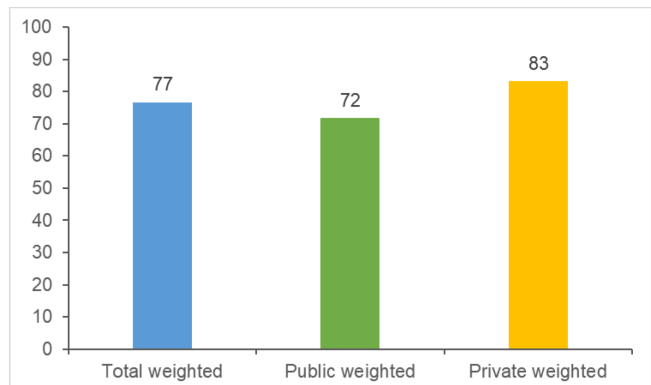
Q: 2 - Access to long-term courses in advanced digital technologies which will be offered by universities in cooperation with the bodies involved in the Programme (topics will include AI, cybersecurity, distributed ledgers (i.e. blockchain), HPC and quantum technologies). How important is it for you that Switzerland can participate in such joint activities?

(1 = 'not important at all', 100 = 'very important')
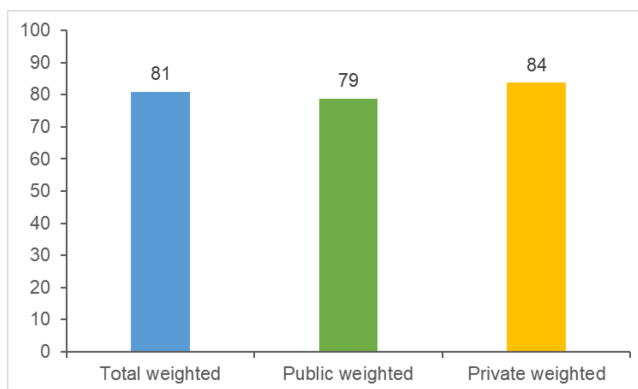
Q: 3 - Participation in short-term, specialised professional training courses that have been pre-certified for example in the area of cybersecurity. How important is it for you that Switzerland can participate in such joint activities?
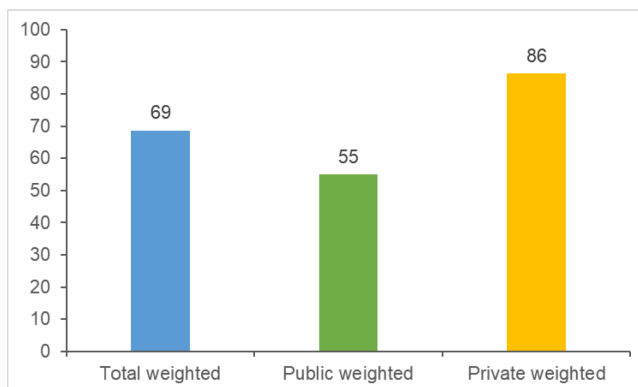
(1 = 'not important at all', 100 = 'very important')

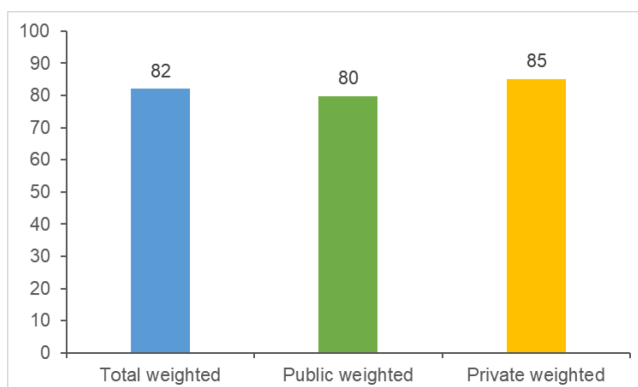Q: How important do you consider these other topics (so far <u>not</u> contained in the DEP proposal)?

1 - Address the lack of specialists in high performance computing (HPC).
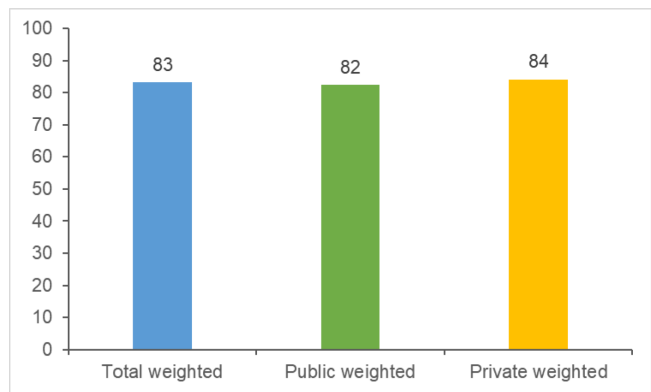
(1 = 'not important at all', 100 = 'very important')

2 - Address the lack of specialists in artificial intelligence (AI).

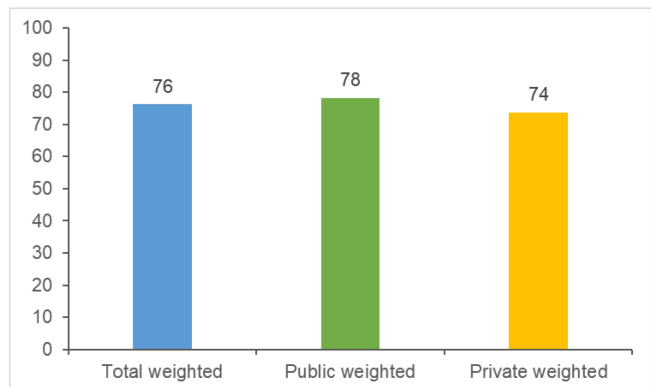*(1 = 'not important at all', 100 = 'very important')*

3 - Address the lack of data scientists.

(1 = 'not important at all', 100 = 'very important')

4 - Address the lack of specialists in cyber-security.

(1 = 'not important at all', 100 = 'very important')

Q: What other topics/activities would you like to see being addressed under this pillar?

⇨ Find a way to support lifelong learning for all, including older and disabled people.

⇨ Building critical capacity in general 'data literacy' and critical knowledge about ethics and the social impact of data

7 Pillar 5 – Deployment, Best Use of Digital Capacities and Interoperability

7.1 Objectives

One of the main objectives of the DEP will be to promote the widespread use of digital technologies in business and society. Digital Innovation Hubs (DIH) would be the means used to ensure the digital transformation of all businesses and public administrations.

The DEP would thus close a gap that currently exists on the market, as many European companies are still lagging behind at international level in the introduction of key technologies. The DEP would therefore focus on the widespread adoption of digital technologies (in particular AI, HPC and cybersecurity) and the development of digital capacities throughout the economy. This concerns not only innovative businesses ("early adopters"), but also public administrations.

7.2 Supporting documents

Respondents were provided with the following documentation about the Deployment, Best Use of Digital Capacities and Interoperability pillar:
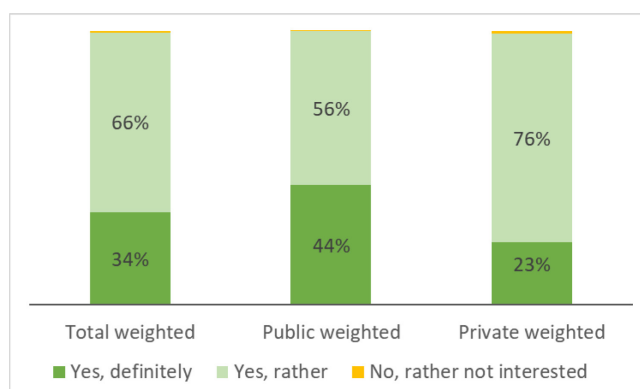
Supporting document	Link
⇨ Pillars of the Digitising European Industry initiative	⤢
⇨ Pan-European network of Digital Innovation Hubs (DIHs)	⤢
⇨ Digital Innovation Hubs (DIHs)	⤢

7.3 Survey results

7.3.1 Level of interest and willingness to participate

Of the respondents, a total of 78 institutions were interested in the fifth pillar: 57 of these are from the public sector and 21 are from the private sector. These 78 responses cover a total of 192,325 persons, of which 101,238 are employed in the public sector and 91,087 are in the private sector. The weighted level of knowledge of this pillar ranges from an average score of 52 (private sector) to 69 (public sector). Public institutions therefore seem to have a somewhat clearer idea of what the aims of the pillar are.

Q: Would you participate in activities of this pillar?

	Total weighted	Public weighted	Private weighted
Yes, rather	66%	56%	76%
Yes, definitely	34%	44%	23%

■ Yes, definitely   ■ Yes, rather   ■ No, rather not interested

Most of the survey respondents interested in the fifth pillar would take part in the corresponding activities. The desire for Switzerland to be able to take part is therefore relatively high.

A total of 81% of respondents considered full association to be important. The proportion of private sector respondents that felt this way (87%) is somewhat higher than that of public sector respondents (77%). But project-based participation seems to be a more acceptable solution for private stakeholders than it is for public institutions. This may well suggest that private sector respondents give less importance to where they receive funding. For them, the most important thing seems to be that Switzerland has the opportunity to be involved.

7.3.2 Preferred participation modality

Q: How problematic would the consequences be for Switzerland if participation in this pillar was not possible?

(1 = 'no problem', 100 = 'very critical')
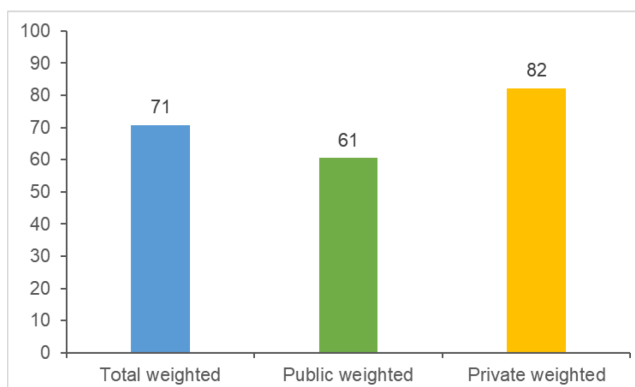
As shown in the chart above, this pillar appears to be slightly more relevant for the private sector than for the public sector. This is particularly apparent in the weighted figures. Private sector respondents perceive the consequences of non-participation in this pillar to be more serious than the public sector respondents anticipate. Researchers who are interested in this pillar also see problems for themselves if Switzerland is unable to take part. However, they feel that the consequences for them would be less severe than for Swiss research as a whole.

Both private and public sector respondents agree on the importance of self-funding. Here, the weighted value for both categories is an average of 29% own-funds ratio.

7.3.3 Assessment of planned activities and contents

The following charts show the importance that surveyed institutions give to the various objectives of the fifth pillar:

Q: A main objective of the Digital Europe Programme is the funding of a network of Digital Innovation Hubs (DIH) is order to ensure access to digital capacities to any business, notably SMEs. Under this pillar such DIH are to be co-funded together with the member states and to be integrated in a wider European context/network of DIHs. How important is it for you that Switzerland can participate in such joint activities? Note that DIH offering might include:
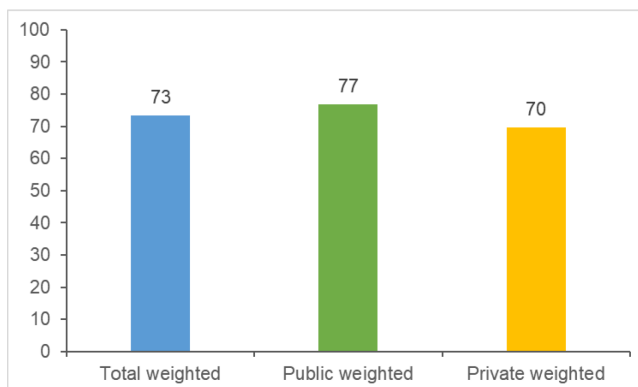
1 - Access to Common European Data space and AI platforms and European HPC facilities for data analytics and compute intensive applications.

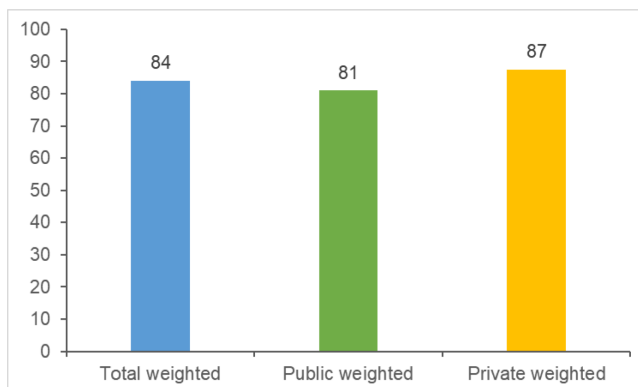*(1 = 'not important at all', 100 = 'very important')*
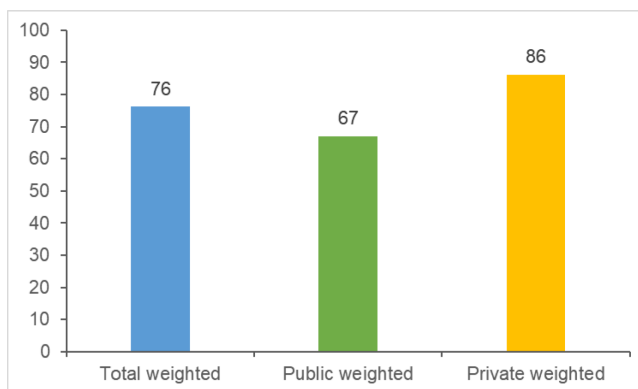
2 - Access to AI large-scale testing facilities and to advanced cybersecurity tools.

(1 = 'not important at all', 100 = 'very important')


3 - Access to advanced digital skills.

(1 = 'not important at all', 100 = 'very important')

Digital Innovation Hubs (DIH) are support facilities that help companies to become more competitive by improving their business/production processes, products and services through digital technologies. DIHs act as a one-stop-shop, providing customers with access to technology-testing, financing support, market intelligence and networking opportunities.

Q: Are you interested in actively participating in the offering of such digital services through such Digital Innovation Hubs for national/regional stakeholders?
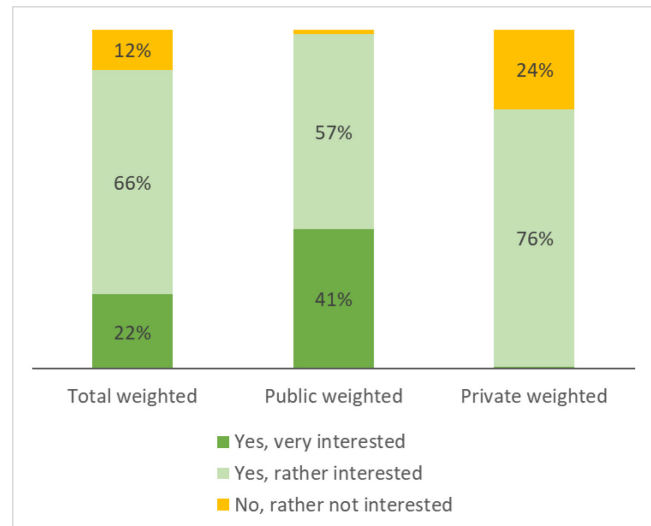
There seems to be clear interest among national or regional stakeholders in the digital services to be provided within the framework of such DIHs.

The chart below, however, shows that the level of interest within the private sector is less pronounced. This is likely due to the profile of the participants taking part in the survey, i.e. mostly institutions conducting R&D activities.

*Q: Are you interested in consuming digital services through such Digital Innovation Hubs?*
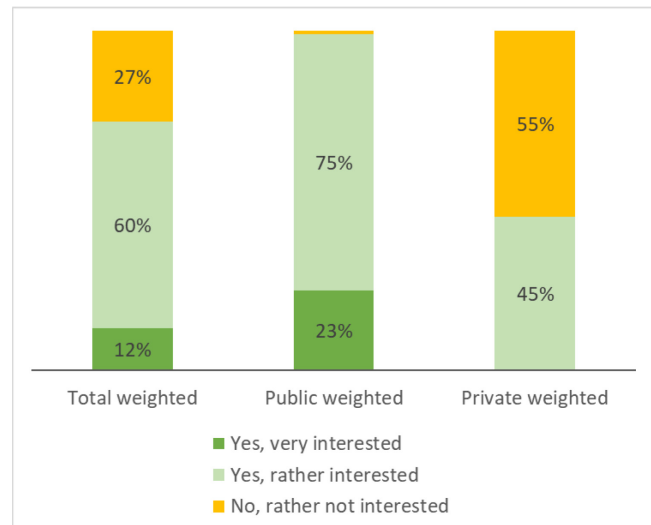
Q: Where would you procure digital services relevant to your activities (like HPC, AI, and Cybersecurity)?

⇨ The options are limited. Due to the lack of availability or access, digital services are procured from large corporations such as Google, Amazon and Microsoft.

⇨ Generally speaking, it is hard to keep up with ICT know-how.

⇨ It is difficult to find the right partners. You tend to be dependent on the willingness of others to collaborate 'for free' within Switzerland, but it is difficult to find the right level of expertise.

⇨ We want to build a digital hub with our technology transfer platforms in the areas of HPC, AI, cybersecurity.

Q: A further key objective of the fifth DEP pillar is the digitisation of areas of public interest. How important is it for you that Switzerland can participate in such joint activities? I.e. in the following areas:

1 - Health (i.e. ensure that EU citizens can access, share, use, and manage their personal health data securely across borders).

*(1 = 'not important at all', 100 = 'very important')*
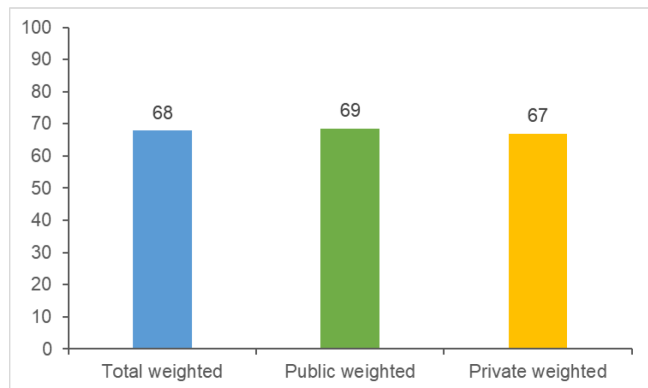
2 - Justice (i.e. enable seamless and secure cross-border electronic communication within and between justice authorities and other competent bodies in the area of civil and criminal justice).

(1 = 'not important at all', 100 = 'very important')
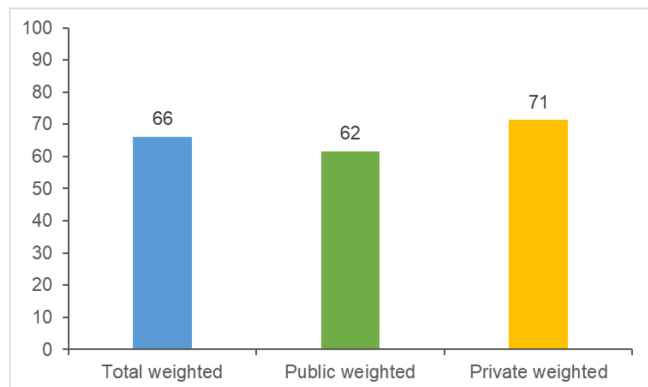
3 - Smart cities, energy and environment (i.e. deploy decentralised solutions and infrastructure required for large-scale digital applications such as smart cities in support of transport, energy and environmental policies).

(1 = 'not important at all', 100 = 'very important')
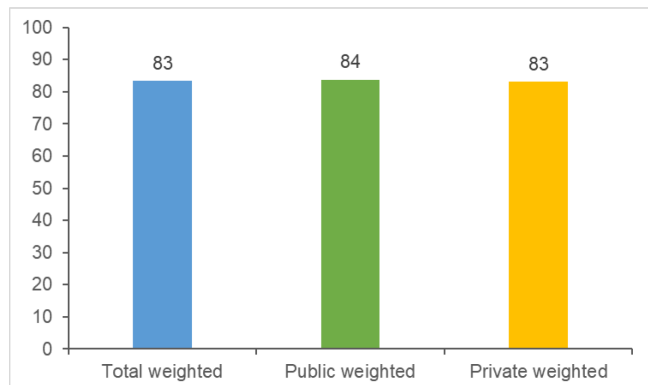
Q: Where have you procured digital services relevant to your activities (like HPC, AI, and Cybersecurity) to date?

Responses	Number of responses
⇨ National service providers (CSCS, SDSC, SWITCH)	**12**
⇨ International service providers	**6**

⇨ Own institution **5**