
Measuring Successful Digital Transformation Investments

Policy Project with the European Investment Bank

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21 June 2021

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Introduction - Digital Transformation in the Spotlight

Digital Transformation

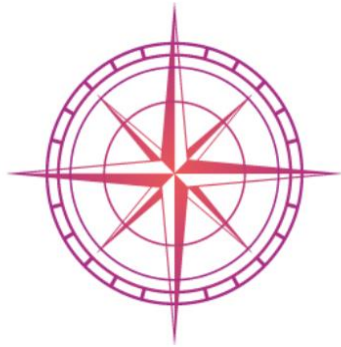
A continuum of transition from analog to digital to a full stack review of policies, current processes, and user needs and results in a complete revision of the existing and the creation of new digital services



Introduction - Shaping EU's Digital Future

The Digital Compass:

EU's digital ambitions



Digital Europe Programme:

EU's funding programme



Introduction - The Emerging Need of Measurement

Trouble	With Digital Transformation represents one of the twin strategic directions within the EC Industrial Strategy, EIB does not have a measurement framework to gauge its contribution to the EU's digital decade strategy.
Owner	EIB
Success Criteria	High-level Sector-agnostic User-friendly Complementary to EIB's existing assessment framework
Constraints	Face-to-face/On-site interviews are not possible Incomplete access to internal case due to confidentiality
Actors	EIB, EC, and Promoters

Introduction - Understanding the Question



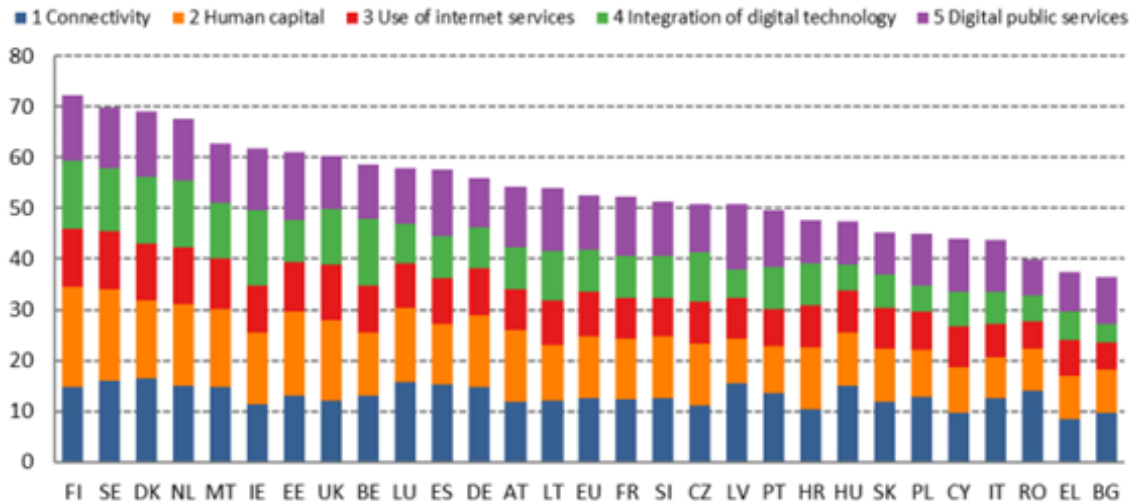
Impact



Digital Transformation

Analysis 1 - Understanding Impact: Digital Transformation from EU's Point of View

The EU has fostered its core concepts through: 1) single market, 2) research & innovation 3) data and privacy protection.



European Commission, Digital Economy and Social Index 2020

The progress varies and significant differences appear among member states

→ **Need to be bottomed up as the whole region**

EU's Vision towards a Digital Society

Europe's Digital Decade: Digital Targets for 2030

- New EU's strategy for enabling Digital Transformation
- Highlighting its vision for a digital future as “**common values**” and “**enriching lives all**”

The EU seeks to achieve:

democratic society based on collectivity, where human-centered and trustworthy technologies are encouraged and all actors can benefit from them.

6 Impacts

- **6 impacts** which could be brought Digital Transformation how they give influence the society and people in the context of the EIB investments:

Access

More people/devices to have access to high-quality networks etc.

Use

Improve digital literacy, diffuse digital technologies, shift business/services online etc.

Innovation

boost innovation with digital technologies

Jobs

Adopt jobs for the digital age

Inclusiveness

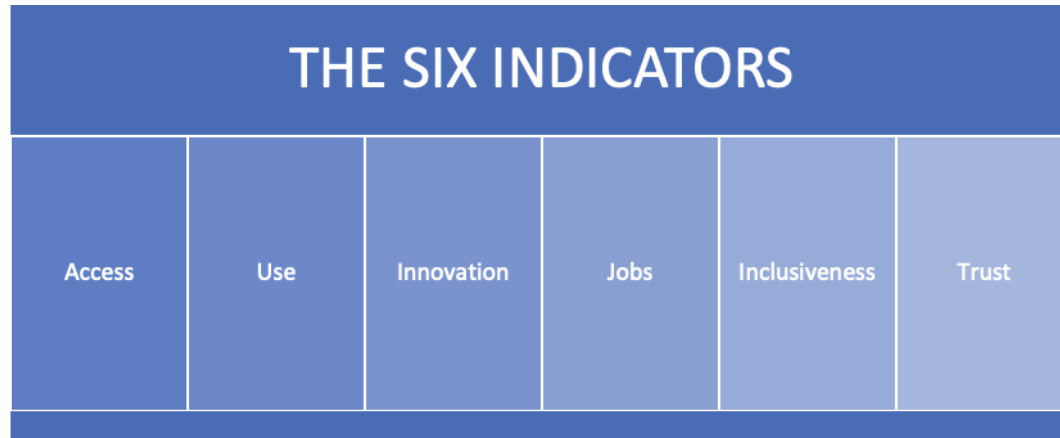
Contribute to an inclusive digital society for all

Trust

Enhance digital security and privacy, improve people's trust towards the digital age

Analysis 2 - Understanding Digital Transformation

Now we have the 'Impacts' that the EU expects to generate with Digital Transformation and that we need to measure.



BUT, there are still two crucial problems!

Analysis - Understanding Digital Transformation

Problem 1:

How does Digital Transformation generate those Impacts?

→ The missing link between Digital Transformation and the Impacts

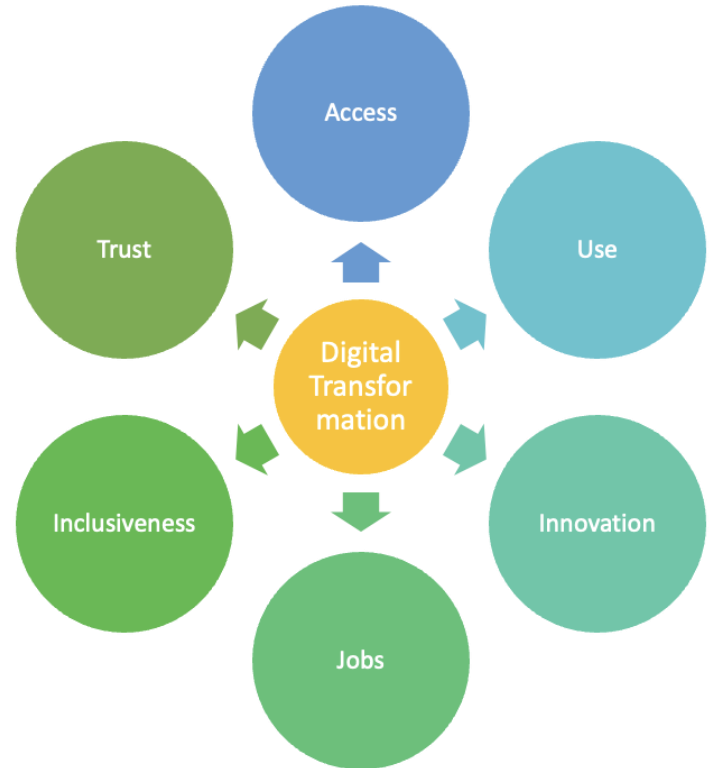
Problem 2:

How to measure those Impacts?

→ The immeasurability of Impacts

The solution:

To further understand Digital Transformation and [decompose](#) it into more granular facets, which reveals the connection between Digital Transformation and the Impacts it generates.



Analysis - Understanding Digital Transformation

Digital Transformation and its facets: What constitutes Digital Transformation?

The EU's Four Cardinal Points (from *the EU's 2030 Digital Compass*)

- A digitally skilled population and highly skilled digital professionals ([Skills](#))
- Secure and performant sustainable digital infrastructures ([Infrastructures](#))
- Digital transformation of businesses ([Business](#))
- Digitalization of public services ([Government](#))

Four Cardinal Points

(by 2030)

- **A digitally skilled population and highly skilled digital professionals:**
 - o In addition to the target on basic digital skills established in the European Pillar of Social Rights Action Plan, there are 20 million employed ICT specialists in the EU, with convergence between women and men.
- **Secure and performant sustainable digital infrastructures**
 - o All European households will be covered by a Gigabit network, with all populated areas covered by 5G.
 - o The production of cutting-edge and sustainable semiconductors in Europe including processors is at least 20% of world production in value (meaning manufacturing capacities below 5nm nodes aiming at 2nm and 10 times more energy efficient than today).
 - o 10,000 climate neutral highly secure edge nodes are deployed in the EU, distributed in a way that will guarantee access to data services with low latency (few milliseconds) wherever businesses are located.
 - o By 2025, Europe will have its first computer with quantum acceleration paving the way for Europe to be at the cutting edge of quantum capabilities by 2030.
- **Digital transformation of businesses**
 - o 75% of European enterprises have taken up cloud computing services, big data and Artificial Intelligence.
 - o More than 90% of European SMEs reach at least a basic level of digital intensity.
 - o Europe will grow the pipeline of its innovative scale ups and improve their access to finance, leading to doubling the number of unicorns in Europe.
- **Digitalization of public services**
 - o 100% online provision of key public services available for European citizens and businesses.
 - o 100% of European citizens have access to medical records (e-records).
 - o 80% of citizens will use a digital ID solution.

So far...

Step 1: Understand the problem	Step 2: Identify two keywords	Step 3: Understand Impact & Digital Transformation	Step 4: ?
Measure the impact of Digital Transformation	Impact	(...decomposition) <ul style="list-style-type: none">● Access● Use● Innovation● Jobs● Inclusiveness● Trust	(Next page) The MATRIX
	Digital Transformation	(...decomposition) <ul style="list-style-type: none">● Skills● Infrastructure● Business● Public services	

Proposal: The Matrix

MATRIX		Vectors of Impact					
		Access	Use	Innovation	Jobs	Inclusiveness	Trust
Facets of Digital Transformation	Skills	-	Users' digital literacy	Number or percentage of digital specialists	Transformation of jobs for digital age	Digital literacy of digitally disadvantaged people	Employees' digital security skills
	Secure and sustainable digital infrastructures	Coverage of digital infrastructure	-	-	-	-	-
	Digital transformation of business	-	Coverage of digital private services	Accessibility of transformative digital technologies	-	Usability/Accessibility of digital private services among digitally disadvantaged people	Compliance with digital security regulations
	Digitalization of public services	-	Coverage of digital public services	-	-	Usability/Accessibility of digital public services among digitally disadvantaged people	Transparency of the government

Proposal: The Indicators and Their Key Factors

- **Access**
 - Increasing coverage of quality broadband, users and devices connected or other digital services
 - Increase the quality of the connectivity/service (QoS)
- **Use**
 - Percentage of business accessible online
 - Percentage of public service accessible online
 - Percentage of user upskilling
 - Numbers of ICT tools adopted
- **Innovation**
 - Increasing the number of high-level digital talents / Upgrading the overall level of digital skills or the percentage of individuals having advanced digital skills (ICT specialist skills) in the company compared to sectoral/regional average level
 - Adopting transformative digital technologies such as IoT, AI, Blockchain, and etc.
- **Jobs**
 - Adapting current jobs to meet the demand of the digitally transformed businesses
- **Inclusiveness**
 - Reducing the digital divides caused by personal attributes and positions
- **Trust**
 - Enhancing digital security and individual privacy
 - Increasing government transparency
 - Mitigating cyber security risks

INDICATOR	Definition	Key factors	Grading criteria				Data collection
			A (5)	B (3)	C (1)	D (0)	
Access	The project allows more people/devices to have access to high-quality communication networks, or access to digital services	- Increasing coverage of high-quality broadband, users and devices connected or other digital services;	- Coverage of the digital service is significantly increased compared to baseline figure	- Coverage of the digital service is moderately increased compared to baseline figure	- coverage of The digital Service is slightly increased compared to baseline figure	Zero contribution	- A forecast of the number of increased access to the service (users, devices) - Data on Quality of service (QoS)
Use	The project improves people's digital literacy, diffuses digital technologies, or shifts business/services to online channels	- Percentage of business accessible online; - Percentage of public service accessible online; - Percentage of user upskilling - Numbers of ICT tools adopted	- The share of public services accessible online is significantly increased, OR - The share of product/services(s) accessible online is significantly increased compared to baseline figure, OR - The coverage of training for the use of ICT tools is significantly increased compared to baseline figure, OR - Three or above ICT tools adopted.	- The share of public services accessible online is moderately increased compared to baseline figure, OR - The share of product/services(s) accessible online is moderately increased compared to baseline figure, OR - The coverage of training for the use of ICT tools is moderately increased compared to baseline figure, OR - Two ICT tools adopted.	- The share of public services accessible online is slightly increased compared to baseline figure, OR -The share of product/services(s) accessible online is slightly increased compared to baseline figure, OR -The coverage of training for the use of ICT tools is slightly increased compared to baseline figure, OR -One ICT tool adopted.	Zero contribution	- An estimate of the percentage of business/services shifted online - Number of ICT tools adopted - Percentage of employee getting digital training - Percentage of online user of public services
Innovation	The project has the potential to boost innovation with digital technologies	- Increasing the number of high-level digital talents / Upgrading the overall level of digital skills or the percentage of individuals having advanced digital skills (ICT specialist skills) in the company compared to sectorial/regional average level; (refer to DESI chapter 4 Human Capital) - Adopting transformative digital technologies such as IoT, AI, Blockchain, and etc.	- The percentage/number of individuals having advanced digital skills (ICT specialist skills) in the organization will be significantly increased compared to baseline figure; OR - The project adopts at least one of the transformative digital technologies as listed.	- The percentage/number of individuals having advanced digital skills (ICT specialist skills) in the organization will be moderately increased compared to baseline figure; AND - The project adopts only non transformative digital technologies.	- The percentage/number of individuals having advanced digital skills (ICT specialist skills) in the organization will be slightly increased compared to baseline figure; AND - The project adopts only non transformative digital technologies.	Zero contribution	- An estimate of the percentage/number (before and after the project) of individuals having advanced digital skills (ICT specialist skills) in the organization - A list of the technologies to be adopted in this project - A list of the technologies defined as 'transformative technologies'
Jobs	The project adapts jobs for the digital age	- Adapting current jobs to meet the demand of the digitally transformed business	- The percentage/number of individuals equipped with 'Internet user skills' - which is the average of 'at least basic digital skills', 'above basic digital skills', and 'at least basic software skills' - will be significantly increased compared to baseline figure.	- The percentage/number of individuals equipped with 'Internet user skills' - which is the average of 'at least basic digital skills', 'above basic digital skills', and 'at least basic software skills' - will be moderately increased compared to baseline figure.	- The percentage/number of individuals equipped with 'Internet user skills' - which is the average of 'at least basic digital skills', 'above basic digital skills', and 'at least basic software skills' - will be slightly increased compared to baseline figure.	Zero contribution	- Estimates of the percentage/number (before and after the project) of individuals equipped with 'at least basic digital skills', 'above basic digital skills', and 'at least basic software skills'
Inclusiveness	The project contributes to a inclusive digital society for all	- Adopting special measures to promote convenience for digitally underprivileged people - Providing digital upskills or training for specific groups	- The project adopts special measures to promote convenience for digitally vulnerable people such as elderly, low-income people, disabled, ethnic minorities; AND - The project provides digital upskills or trainings for specific groups (elderly, low-income group, disabled, ethnic minorities and women) regularly.	- The project adopts special measures to promote convenience for digitally vulnerable people such as elderly, low-income people, disabled, ethnic minorities; OR - The project provides digital upskills or trainings for specific groups (elderly, low-income group, disabled, ethnic minorities and women) regularly.	- The project adopts non-sufficient special measures to promote convenience for digitally vulnerable people such as elderly, low-income people, disabled, ethnic minorities; OR - The project provides digital upskills or trainings for specific groups (elderly, low-income group, disabled, ethnic minorities and women) occasionally.	Zero contribution	- An estimate of qualitative actions taken by the promotor to include the digital vulnerable people (elderly, low-income, disabled, ethnic minorities and women)
Trust	The project enhances digital security and privacy and thus improves people's trust towards the digital age	- Enhancing digital security and individual privacy - Increasing government transparency - Mitigating cyber security risks	- The project sets rules on cyber security and personal data protection complying with GDPR; AND - All staff (all full-time and part-time staff) learn digital security through trainings (including online materials etc.); OR - Staff specialized in-house security staff (at least 1% of the total staff) and maintenance of the updated cyber security system are allocated.	- The project sets rules on cyber security and personal data protection complying with GDPR; AND - Partial staff (all full-time staff) learn digital security through trainings (including online materials etc.); OR - Staff specialized in-house security staff (at least 1% of the total staff) or maintenance of the updated cyber security system is allocated.	- The project sets rules about cyber security and personal data protection complying with GDPR; OR - Partial staff (not all full-time staff) learn digital security through trainings (including online materials etc.); OR - Staff specialized in-house security staff (less than 0.5 % of the total staff) or introduction of the cyber security system is allocated.	Zero contribution	- An estimate of the coverage of staff equipped with basic knowledge about cyber security and data protection - An estimate of the number of staff specialized in cyber security - Promoters' compliance plan with digital security and privacy regulations in along with EU's regulations

Case Study: Connected Schools in Serbia

- Serbia under accession process to EU
- Keen to promote Digital Transformation as one of top policy priorities
- Enhance basic skills (①) and the digital environment (②) in education sector along with national digital strategies

Connected Schools in Serbia

(2020, EUR 65mil.)

①

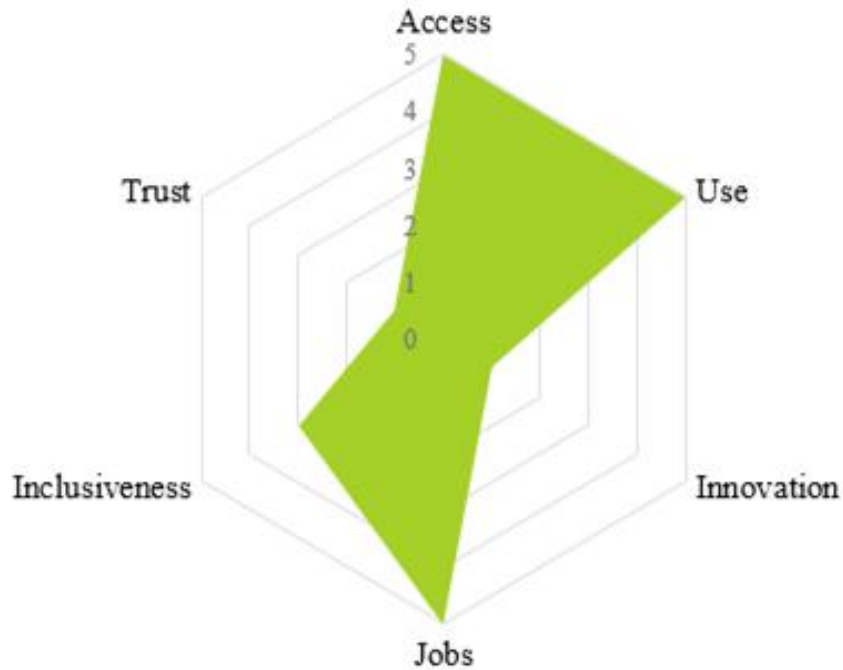
Digital skill training for 50,000 teachers

②

New digital equipment and content

Upgrade of academic network tc.

Rollout of WLAN in all classrooms of primary and secondary schools



Significant impact (A = 5): Access, Use, Jobs

Moderate impact (B = 3): Inclusiveness

Slight impact (C = 1): Innovation, Trust

Access

A	Coverage of the digital service is significantly increased compared to baseline figure.
<ul style="list-style-type: none">• The new strategy for digital skills development emphasizes the improvement of communication infrastructure shall be completed by the end of 2021 in all domestic school facilities and provide secure and reliable wireless internet access in all teaching and administrative school premises.• The project targets the expansion of the basic digital infrastructure, including WLAN in all primary and secondary classrooms across the country, in accordance with the national strategy.• The number of digitally equipped classrooms before the launch of the project was 10,000 (2019) as a baseline. Given we assume that the number of classrooms at the end of the project will be almost the same as before the project started, it will be approximately 36,000 nationwide. Therefore, the target figure to be achieved at the end of the project will be equivalent to about a 3.5-fold increase in terms of quantity compared to the baseline. <p>→ The project is expected to give a huge and positive impact for the aspect of Access that could be highly assessed.</p>	

Use

A	<ul style="list-style-type: none">● The share of public services accessible online is significantly increased; OR● The share of product/services(s) accessible online is significantly increased compared to baseline figure; OR● The coverage of training for the use of ICT tools is significantly increased compared to baseline figure; OR● Three or above ICT tools adopted.
<ul style="list-style-type: none">● The national strategy puts emphasis on the boost of digital education in schools based on the proper environment, necessary equipment and materials. It is an urgent task since computer science and programming will become compulsory in the primary schools as the response to the digital era.● The project will greatly contribute to the use of ICT tools both directly and indirectly. Compared to the baseline, as the Access clearly illustrates, there will be a significant increase of the network coverage in terms of classrooms. The 50,000 teachers will newly enhance their digital capacity through training. It shows that the project can assure not only the use of digital tools by teachers but also children who will be taught by those teachers. <p>→ The project is expected to give a huge impact for the aspect of Use.</p>	

Innovation

C	<ul style="list-style-type: none">● The percentage/number of individuals having advanced digital skills (ICT specialist skills) in the organization will be slightly increased compared to baseline figure; AND● The project adopts non transformative digital technologies.
<ul style="list-style-type: none">● The national strategy shows the strong intention to increase the number of skilled human resources in the digital field so that the country can enhance the competitiveness internationally.● The project component is quite simple: setting a better environment for digital education. It does not include transformative digital technologies, regardless 50,000 teachers will benefit from upskill training. And the training itself does not aim to be at an advanced level.● As an impact of the project, it is expected that 700 new jobs with advanced skills will be created in the future as a result of the enlargement of the digital base. <p>→ The project is expected to give a little direct contribution for the aspect of Innovation.</p>	

Jobs

A

The percentage/number of individuals equipped with 'Internet user skills' - which is the average of 'at least basic digital skills', 'above basic digital skills', and 'at least basic software skills' -will be significantly increased compared to baseline figure.

- The national strategy clearly defines that the teachers' digital skills are essential to realize effective digital learning, and this measure is regarded as one element comprising a quality digital environment in the education sector.
- The project will give training for 50,000 teachers to improve their digital skills. As of 2018, the number of teachers in primary/secondary schools are 46,318 (full-time) and 86,579 (both full-time and part-time). This number could be translated as, at least, all full-time teachers will be covered and enhanced their digital skills by this project, and there will be a possibility to give a privilege for part-time teachers as well.
- According to statistics, 46% of Serbians are equipped with basic skills in 2019. Compared to this general trend, one of the target groups of the project (= teachers) will be able to exceed the national average in terms of basic digital skills.

→ The project is expected to give a huge impact for the aspect of Jobs that contributes to boost the sector.

Inclusiveness

B

- **The project adopts special measures to promote convenience for digitally vulnerable people such as elderly, low-income people, disabled, ethnic minorities;** OR
- The project provides digital skills or training for specific groups (elderly, low-income group, disabled, ethnic minorities and women) regularly.

- The national strategy declares to provide equal opportunities and benefits for all citizens by digital transition. One of its priorities is to reduce the digital divide among the vulnerable groups.
- The project aims at improving the digital environment in schools across Serbia in order to ensure equal and inclusive access to digital education, create equal opportunities in both rural and urban areas and empower young people with digital skills to prepare them for a competitive labor market.
- Training for teachers will be provided in a collaboration with UNICEF. UNICEF has implemented technical training in the education sector in Serbia targeting vulnerable groups in the society, including children from low-income and/or ethnic minority families. However, this project does not expect to provide training directly with those groups.

→ The project is expected to greatly support the vulnerable groups directly and indirectly through the project component, and the objective of the project meets requirements satisfactorily for the aspect of Inclusiveness by minimizing the digital divide among the vulnerable people.

Trust

C	<ul style="list-style-type: none">● The project sets rules about cyber security and personal data protection complying with GDPR; OR● Partial staff (not all full-time staff) learn digital security through training (including online materials etc.); OR● Staff specialized in-house security staff (less than 0.5 % of the total staff) or introduction of the cyber security system is allocated.
<ul style="list-style-type: none">● The Government of Serbia complies with the EU's GDPR on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (EIB 2020d).● The training for teachers does not include the contents about digital security issues. <p>→ The project is expected to meet the minimum level of the EU standards on the digital risks. If the project will be extended the scope of this aspect the grading might be evaluated higher.</p>	

Concluding remarks

Indicator	High Level	Sector Agnostic	User friendly
Access	✓	✓	✓
Use	✓	✓	✓
Innovation	✓	✓	✓
Jobs	✓	✓	✓
Inclusiveness	✓	✓	✓
Trust	✓	✓	✓

For investors:

Assess the contribution of the project

For promoters:

Better structure the proposal

For policy-makers:

Monitor the progress of Digital Transformation

Thank you !

Note

Grade	Score	Grading criteria
A	5	The project contributes to a certain impact significantly.
B	3	The project contributes to a certain impact moderately.
C	1	The project contributes to a certain impact slightly.
D	0	The project has almost zero contribution to a certain impact.