INDIMO

TOOLBOX

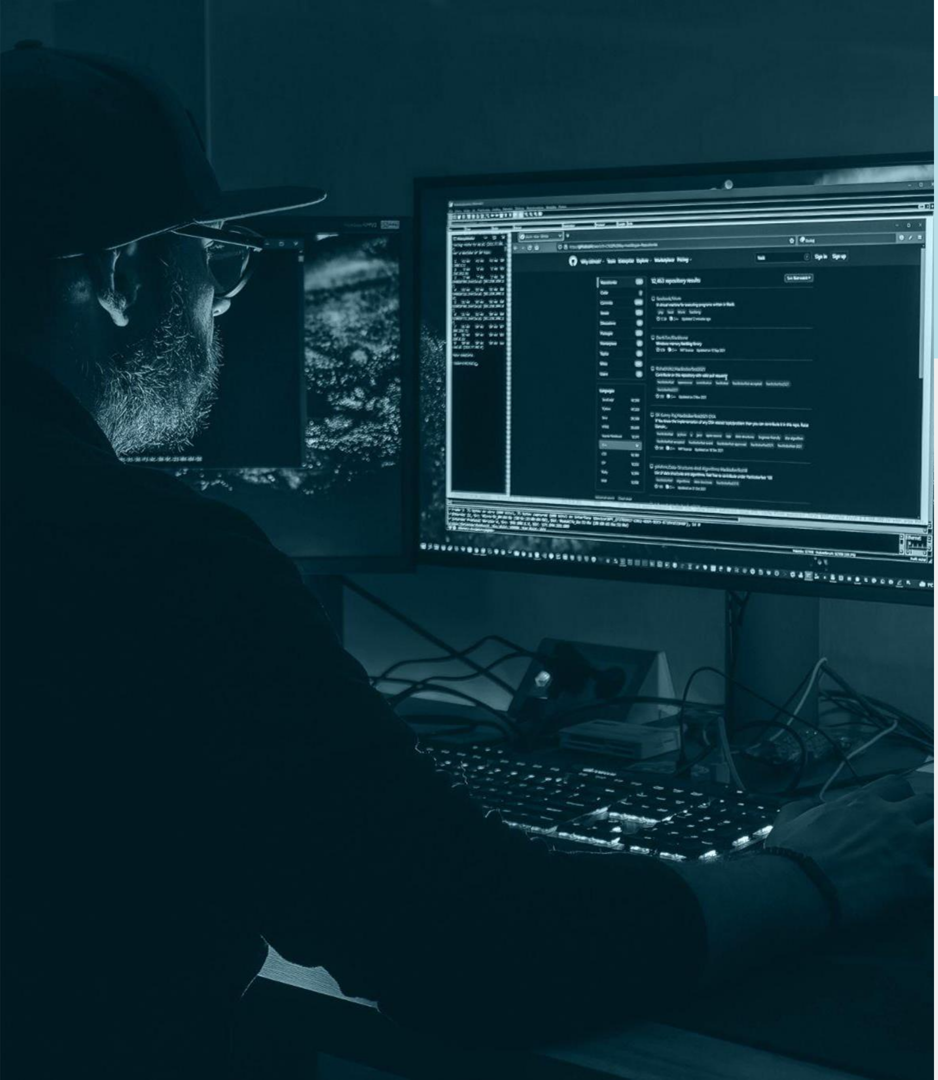
INDIMO

INCLUSIVE DIGITAL MOBILITY SOLUTIONS

CSG

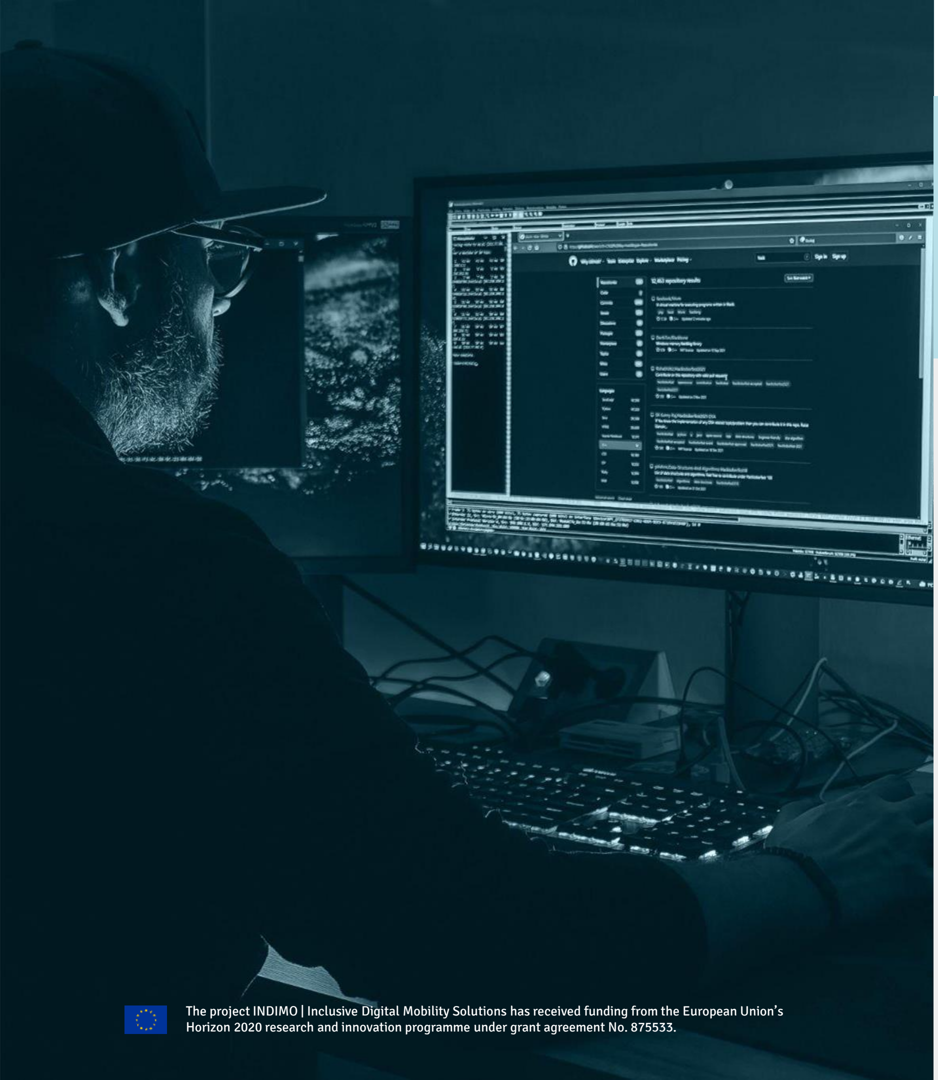
Cybersecurity and **privacy assessment guidelines**

```
RegisterController.php    JS app.js
You, 7 months ago | 1 author (You)
import VueRouter from "vue-router";
import routes from "./routes/routes";
import store from "./store/index";
import vuexI18n from "vuex-i18n";
import enLangFile from "./lang/en";

// Set config file into the global variable
window.config = require("./vue.config");

// Import bootstrap file
require('./bootstrap');
```



Cybersecurity and privacy assessment guidelines

The CSG defines **guidelines and recommendations for improving cybersecurity** towards inclusion in the development of digital mobility and delivery services. They help the **integration of cybersecurity and data protection during the design or re-design phase of a digital service,** providing guidance to professionals and practitioners in different phases of the development and operation of digital mobility and delivery services.



Cybersecurity and privacy assessment guidelines – INDEX

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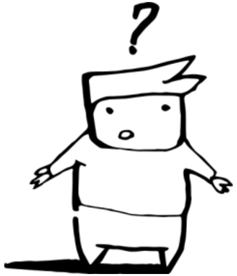

How to navigate the tool?

Tips and tricks

Slides index

Toolbox webpage

Dynamic navigation index

Full screen mode

Move back and forth

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How to navigate the tool?

Choose your navigation style

DEEP-DIVE
- click on the links provided in each slide to open contents contextually

READ-ON
- read thoroughly the slides and download all templates in a compressed file at the end

SPEED-UP
- fast-read and skip slides or jump to the final slide whenever you want

1. What is the CSG?

The CSG ambition and challenge

The Cybersecurity and privacy assessment guidelines (CSG) are part of the **INDIMO Inclusive Digital Mobility Toolbox**.

The CSG defines **guidelines and recommendations for improving cybersecurity** towards inclusion in the development of digital mobility and delivery services. They help the **integration of cybersecurity and data protection during the design or re-design phase of a digital service,** providing guidance to professionals and practitioners in different phases of the development and operation of digital mobility and delivery services.

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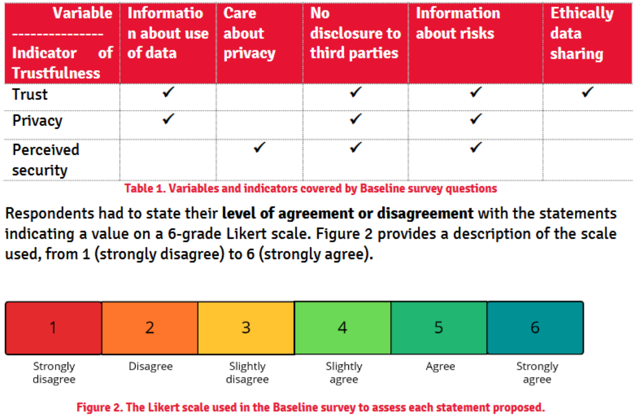
1. What is the CSG?

Key features of the CSG



Variable --------------- Indicator of Trustfulness	Information about use of data	Care about privacy	No disclosure to third parties	Information about risks	Ethically data sharing
Trust	✓		✓	✓	✓
Privacy	✓		✓	✓	
Perceived security		✓	✓	✓	

Table 1. Variables and indicators covered by Baseline survey questions

Respondents had to state their **level of agreement or disagreement** with the statements indicating a value on a 6-grade Likert scale. Figure 2 provides a description of the scale used, from 1 (strongly disagree) to 6 (strongly agree).

1	2	3	4	5	6
Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree

Figure 2. The Likert scale used in the Baseline survey to assess each statement proposed.

The Cybersecurity and privacy assessment guidelines:

1. Help **investigate ethics, data protection and cybersecurity issues** in inclusive digital mobility solutions derived from privacy design principles and human-factors principles.
2. Supply guidelines for designing **user friendly data protection and cybersecurity procedures** for digital applications and services
3. Define a more **inclusive cybersecurity risk assessment** framework based on ISO27001 for digital mobility and logistics services.
4. Provide recommendations to **improve the accessibility of data protection and cybersecurity** through the INDIMO Toolbox.

Click to download the extended document ➔

Download the full CSG pdf file

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1. What is the CSG?

From co-creation to recommendations

The INDIMO Toolbox provides a **user-centric design approach** and a set of **recommendations** based on the empirical research carried out in the Communities of Practice (CoPs) and the Co-creation community (CCC), also drawing from literature review and desk research.

In the following sections you can read more about the CSG methodological process, the results and find the other downloadable templates and documents.

Click on one of the links to visit the online interactive recommendations repository

CSG recommendations

All recommendations

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2. Why do I need the CSG?

Find yourself!

NGO or association representing people with special needs and/or impairments

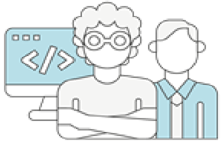
You know the needs of the people you represent, but you face difficulties in expressing this expectation to other professionals.

The CSG will help you **provide cybersecurity related recommendations** to increase data privacy inclusivity.

Mobility/delivery service providers

You want to be sure your service can be used by everyone and be as inclusive as possible to increase your customer base.

The CSG will help you **assess possible cybersecurity and privacy risks and provide guidelines** to implement inclusive cybersecurity.



Developers, UX/UI and graphic designers

While developing a digital mobility or digital delivery system (DMS/DDS) you try to do it for the widest audience as possible and be able to adapt it to emerging needs.

The CSG will help you focus on **cybersecurity and privacy** issues, in order to implement a more inclusive cybersecurity.

Policymakers

As you are in charge of promoting accessibility, you either elaborate, deploy or execute policies, or you shape laws and regulation that directly affect mobility and delivery services.

The CSG allows you **identify essential privacy and cybersecurity issues and requirements for all users.**

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3. How can I use the CSG?

The CSG objectives

You can use the CSG to achieve the following objectives:

- Apply the **inclusive risk assessment methodology** to evaluate risks related to security information and privacy of digital mobility and delivery services.
- Use the **CSG recommendations** for improving the accessibility of cybersecurity and data privacy of digital mobility and delivery services.

Navigate the CSG to analyse, develop or redesign a service in two ways:

DEEP-DIVE | Discover and **apply the 2-step CSG methodology** to evaluate the accessibility and inclusiveness of a service cybersecurity and data privacy policy.

SPEED-UP | Identify and **apply the appropriate CSG recommendations** for the inclusive design of visual icons and user interface of a new or existing service.

Continue navigation to DEEP-DIVE

Click here to skip slides

CSG recommendations

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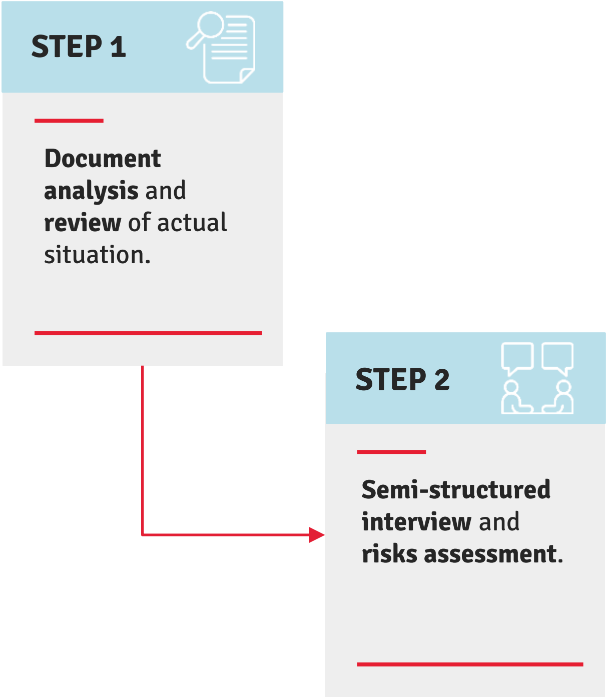
3. How can I use the CSG?

The 2 steps CSG risk assessment methodology

This methodology can be applied to various stages of the service design process to evaluate cybersecurity and data privacy risks, and to identify possible mitigation strategies to reduce them.

We suggest a **two steps** approach:



STEP 1

Document analysis and **review** of actual situation.

STEP 2

Semi-structured interview and **risks assessment.**

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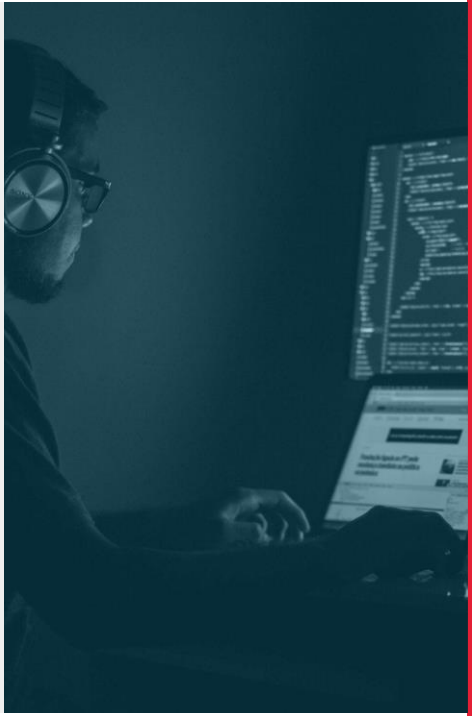
3. How can I use the CSG?

STEP 1 - Document analysis and review of actual situation

To start the risk assessment process it is necessary to have a good overview of the actual situation. To do so, **drafting a secondary data collection report** is a good way to start the analysis and clarify the current cybersecurity scenario.

Documents and relevant material to be collected should consider:

- The IT architecture of the system.
- Data and risk management plans.
- Enforced regulatory frameworks.
- Cybersecurity strategies already in place.
- All the relevant documentation that could be used to contextually describe the cybersecurity state-of-play in the organisation.



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3. How can I use the CSG?

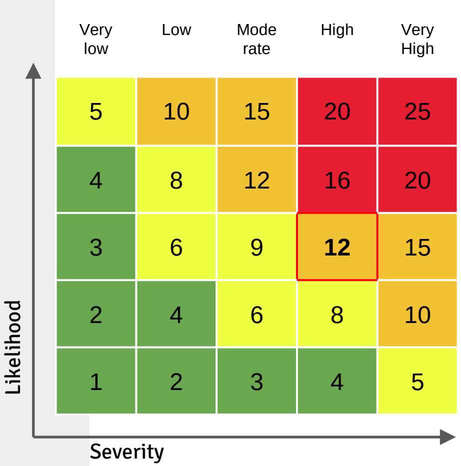
STEP 2 - Semi-structured interviews and risk assessment

The CSG risk assessment questionnaire shall be administered by a team composed of developers and at least one information security referee. The same team should follow-up with semi-structured interview sessions with end users.

The semi-structured interviews are performed to assess.

- Managerial processes to plan and improve cybersecurity.
- Third parties involved and main data exchange.
- Risk assessment measured as impact and likelihood.
- Threats involving vulnerable users.
- Protective measures in place.
- Efficiency / effectiveness KPIs.

A final report of the risk assessment and of the interviews summarises the outcomes and the main risks identified in order to implement mitigations.



Likelihood	Very low	Low	Moderate	High	Very High
	5	10	15	20	25
	4	8	12	16	20
	3	6	9	**12**	15
	2	4	6	8	10
	1	2	3	4	5
	Severity				

Likelihood = moderate 3
Severity = high 4
Risk score = 3x4
Risk = High

Download risk assessment questionnaire

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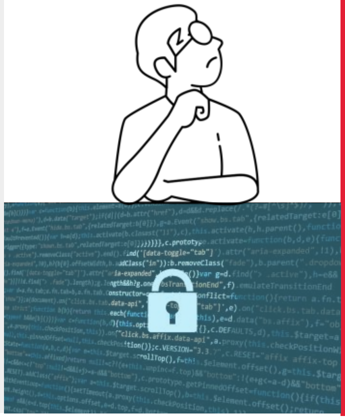
4. What is the science behind the CSG?

…and why is it essential?

Digital technologies pose new challenges for cybersecurity and privacy that **need to be fully addressed, especially from the accessibility point of view**.

In fact, such challenges are even more critical when end users with some degree of impairment are often experiencing barriers due to poor accessibility of services. **Due to the lack of technical skills, impairments or language limitations, many users are more at risk of cyber attacks** (G. Sonowal et. al., 2017) **and less aware of disclosing private information** than others.

Since most people use digital services on a regular basis, the **Universal Design of all data-sensitive features could prevent users from fearing identity theft or cyber attacks** (e.g. phishing).



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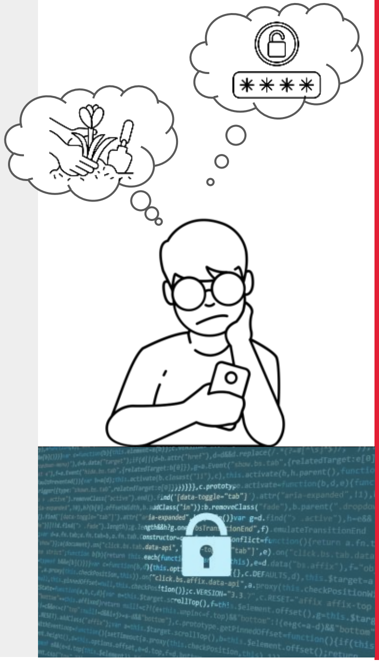
4. What is the science behind the CSG?

The Human Factors and the risk mitigation

The Human Factor approach is essential for a truthfully effective security, also considering that **successful attacks are a consequence of multiple factors**, not only **technological**, but also related to **culture, policies and practices of an organisation** (Besnard and Arief, 2004).

The human contribution has been defined as "the first line of defence" (Parsons et al. 2017) against security threats, highlighting how a consistent approach **considering the role of people in any cybersecurity scenario improves the response and preparedness** to attacks.

Specific non-technical risk prevention countermeasures shall back-up the recommended technological protective measures.



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4. What is the science behind the CSG?

User-centred risk prevention

Non-technical risk prevention countermeasures to back-up technological protective measures (Pollini, 2021), start with:

1. **Adopting user-centred design approach** to promote and implement **realistically applicable rules** and practices.
2. Improving the usability of tools supporting specific needs and ensuring that **compliance with security restrictions does not jeopardize the user experience and navigation**.
3. Defining security policies and **customised training programs fitting the knowledge and skills of the employees** and targeted to specific information security areas (e.g. different trainings for IT people and non-IT people).

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4. What is the science behind the CSG?

Privacy by design

“Privacy by design” is a concept defined to address the systemic effect of the emerging pervasive Information and Communication technologies (ICT), making visible how **the consideration of privacy should become a default mode of operation** for organisations. In the literature there are seven main foundational principles defined (Cavoukian 2011):

- Proactive not reactive.
- Preventative not remedial.
- Privacy as default setting.
- Privacy embedded into design.
- Full functionality—Positive-sum, not zero-sum.
- End-to-end security—Full lifecycle protection.
- Visibility and transparency—Keep it open.
- Respect for user privacy—Keep it user-centric.

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4. Conclusions

Make it easy, but don’t take it easy

Main CSG question: How can privacy and cybersecurity issues be accessible by design in the context of digital mobility and delivery services?

Key recommendation: data privacy and cybersecurity aspects are by definition complex and detailed. Nevertheless, the level of overall safety and security can only be increased if end users truly understand it. Ask end users advice, learn from best practices: collect feedback. In simple words…

Make it easy, but don’t take it easy!

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See some recommendations examples ↓

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5. CSG Recommendations

Three examples

Source CSG

Implement technical accessibility paying attention to inclusivity

Theme/Aspect: UD principles / Cybersecurity

Read all

Source CSG

Protect from intrusive cyber-attacks on impaired users' devices

Theme/Aspect: UD principles / Cybersecurity

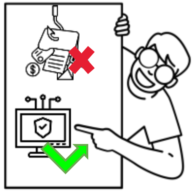
Read all

Source CSG

Inform all users about security provisions in place

Theme/Aspect: UD principles / Organisational measures

Read all



Go to online list

CSG recommendations

All recommendations

Continue navigation

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5. CSG Files and templates

All in one click

Congratulations!
You've come to the final part of the CSG. Continue navigation to find useful links, references and project info. Alternatively you can:

1. **Download in one click** all the documents and templates provided in this CSG tool.
2. **Use the Service Evaluation Tool** to evaluate your service accessibility performance and get a specific selection of recommendations.
3. **Explore all other tools** from the main INDIMO Toolbox page.

Download all CSG files as a compressed folder

SET tool

INDIMO Toolbox

Continue navigation

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6. Useful links and references

- **ISO IEC 27001 standard:** https://www.iso.org/isoiec-27001-information-security.html
- **NIST information security guidelines:** https://csrc.nist.gov/publications/detail/sp/800-55/rev-2/draft

- Besnard, D., & Arief, B. (2004). Computer security impaired by legitimate users. *Computers & Security, 23*(3), 253–264. https://doi.org/10.1016/j.cose.2003.09.002

- Cavoukian, A. (2011). *Privacy by design. The 7 Foundational Principles*. 2. https://iapp.org/media/pdf/resource_center/pbd_implement_7found_principles.pdf

- Parsons, K., Calic, D., Pattinson, M., Butavicius, M., McCormac, A., & Zwaans, T. (2017). The Human Aspects of Information Security Questionnaire (HAIS-Q): Two further validation studies. Computers & Security, 66, 40–51. https://doi.org/10.1016/j.cose.2017.01.004

- Pollini, A., Callari, T. C., Tedeschi, A., Ruscio, D., Save, L., Chiarugi, F., & Guerri, D. (2021). Leveraging human factors in cybersecurity: An integrated methodological approach. *Cognition, Technology & Work*. https://doi.org/10.1007/s10111-021-00683-y

- Sonowal, G., Kuppusamy, K. S., & Kumar, A. (2017). Usability evaluation of active anti-phishing browser extensions for persons with visual impairments. 2017 4th International Conference on Advanced Computing and Communication Systems (ICACCS), 1–6. https://doi.org/10.1109/ICACCS.2017.8014654

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Project Information

End users categories

End users targeted in the research

Lower-income citizens

People living in peri-urban or rural areas

Ethnic minorities

Foreigners

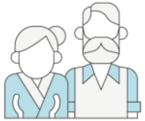
Lower-educated citizens

Caregivers

Women

People lacking digital skills

Non-connected people



Older people

People with mental health impairments

People with reduced vision or mobility

Socially isolated people

Covid-19 confined people

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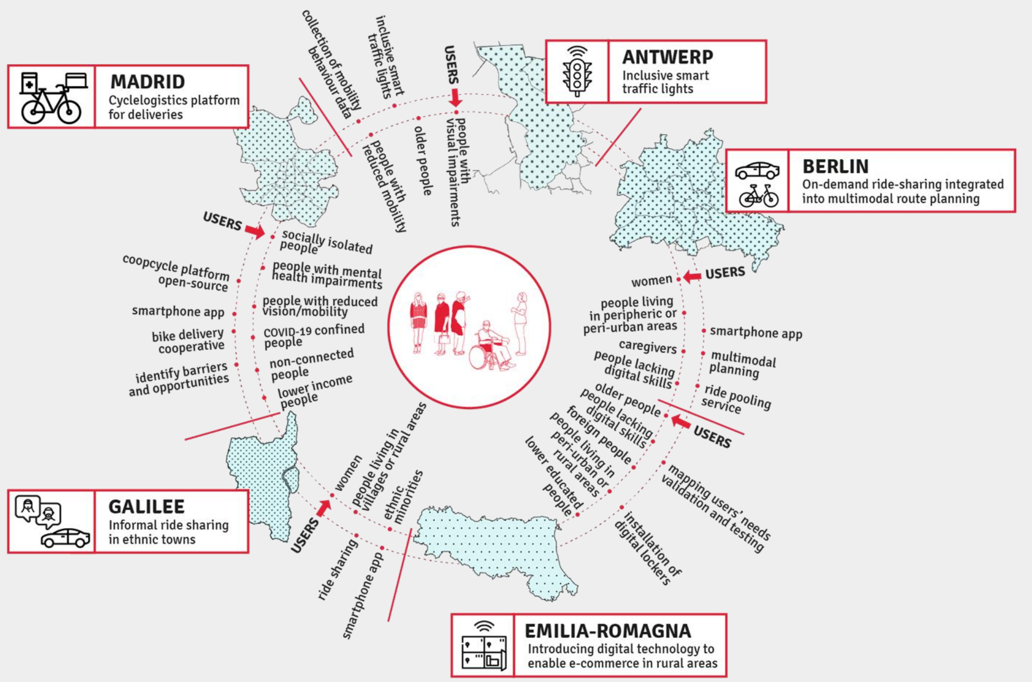
Pilot projects

The five European pilot sites, their goals and target groups



MADRID
Cyclelogistics platform for deliveries

coopcycle platform open-source

smartphone app

bike delivery cooperative

identify barriers and opportunities

USERS

socially isolated people

people with mental health impairments

people with reduced vision/mobility

COVID-19 confined people

non-connected people

lower income people

collection of mobility behaviour data

inclusive smart traffic lights

USERS

people with reduced mobility

older people

people with visual impairments

ANTWERP
Inclusive smart traffic lights

BERLIN
On-demand ride-sharing integrated into multimodal route planning

USERS

women

people living in peripheric or peri-urban areas

caregivers

people lacking digital skills

smartphone app

multimodal planning

ride pooling service

USERS

older people

people lacking digital skills

foreign people

people living in peri-urban or rural areas

lower educated people

mapping users' needs validation and testing

installation of digital lockers

EMILIA-ROMAGNA
Introducing digital technology to enable e-commerce in rural areas

USERS

women

people living in villages or rural areas

ethnic minorities

ride sharing

smartphone app

GALILEE
Informal ride sharing in ethnic towns

Open pilot projects webpage

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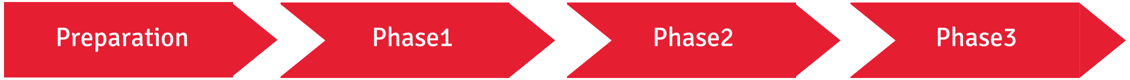
Pilot implementation

Strategic phases



Preparation

Assess the state of the art and define high level guidelines to design, prepare and implement pilots’ activities.

Phase1

Assess users’ needs and requirements towards digital mobility solution, by investigating general population as well as specific groups living some kind of barriers to access services.

Phase2

Redesign of existing services or set up of new services based on the assessment and use of the first version of the **INDIMO Digital Mobility Toolbox** in co-creation workshop.

Phase3

Implement (re)designed services, based on final testing and transferability assessment.

Disseminate and exploit the Toolbox across all potentially interested actors in the digital mobility services domain

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Co-creation Community

Involving stakeholders in the redesign of services

The **co-creation community has been strongly involved** in the development of the **INDIMO Toolbox** through **workshops**, **consultations** and **interviews**. The co-creation process was based on the establishment of a Co-creation Community in each pilot, composed of **transport user representatives, policymakers, operators, and developers.**

Several meetings took place both in the individual pilot site cities and in online plenary sessions, supported by the European Transport and Mobility Forum discussion platform.

Visit the INDIMO Co-creation community webpage

Take-up pilot cities

Online ETM forum community

Co-creation workshops

INDIMO PAGE

Communities of practice

Involving end users to create common knowledge

The INDIMO **Communities of practice** established in each pilot included **end users,** mobility service providers and developers, in order to **create common knowledge on travel behaviour and barriers** in the use of digital mobility services.

They built on the knowledge and experience of their members to propose solutions adapted to local users' needs and interest, in a peer-to-peer learning context.

Visit the INDIMO
Communities of practice webpage

- Develop productive services
- Empower end users depending on their skills
- Create common knowledge

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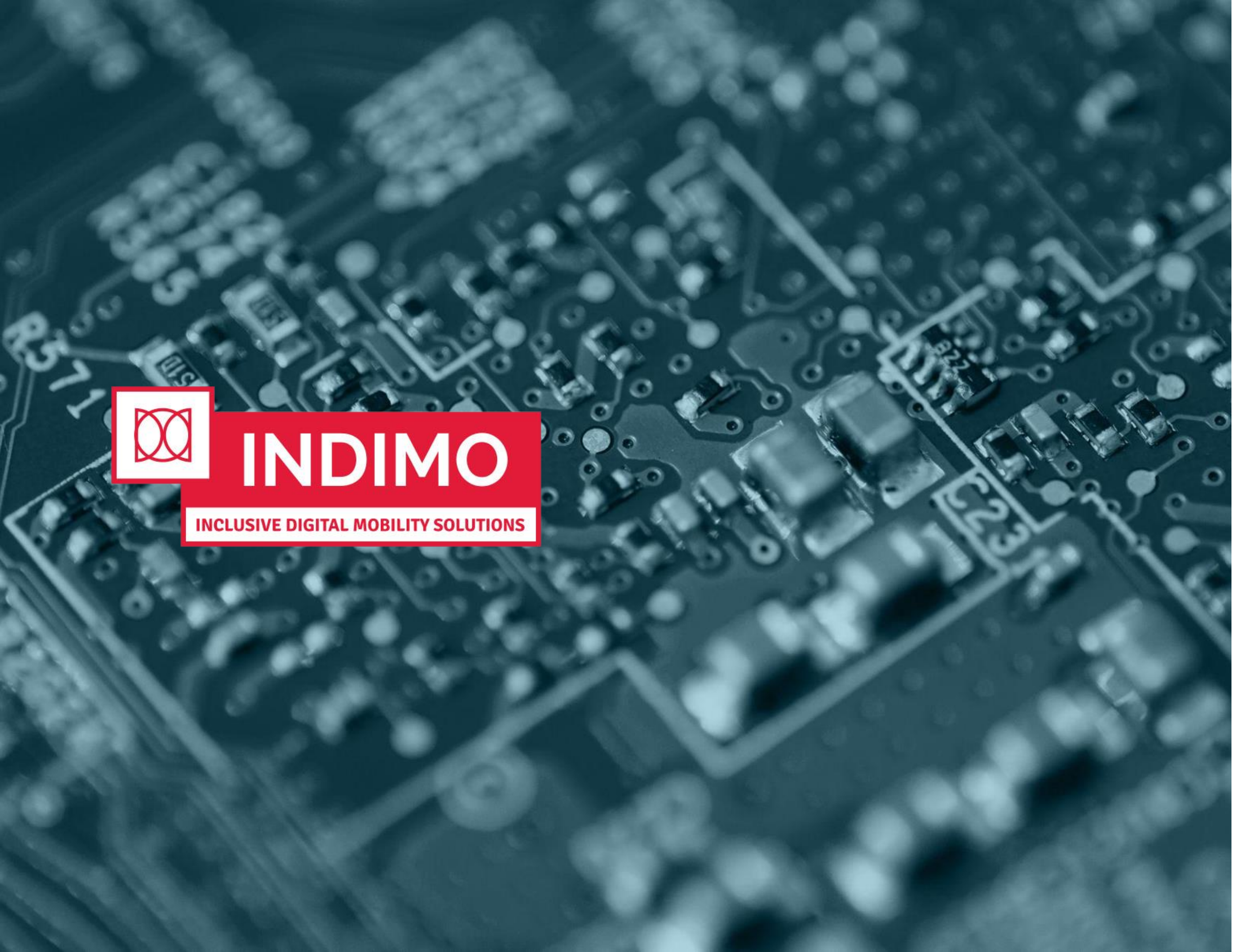

THANK YOU FOR YOUR ATTENTION!

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