Project info

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Grant Agreement Number	824212	
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Deliverable info

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	CI	Classified, information as referred to in Commission Decision 2001/844/EC.	
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Version history

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1.0	Davide Azzolini	First version	20/4/2020	Yes	20/4/2020

Disclaimer

Statement of Originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Contents

Executive summary

The 200SMEChallenge project consists in the experimental validation of an innovative scheme to support innovation in SMEs Public innovation agencies in seven European regions. The piloted support initiative has the format of an Innovation Challenge (a.k.a. innovation prize or contest). In particular, the proposed Challenge aims at impacting on SMEs awareness of the benefits of adopting design thinking and user-centred design validated practices (e.g. the Design Sprint) to the extent of validate market fit and technology requirements during the early stages of a new product development process.

By following a template provided by EASME contractor IGL – Innovation Growth Lab (https://www.innovationgrowthlab.org/), this deliverable describes the methodology of the "200SMEchallenge" Randomized Controlled Trial (RCT) study. It first describes the setting and motivation of the trial. Then it provides a detailed description of the target population, the selection of participating companies and the tested intervention. The experimental protocol will then describe the logic behind the tested intervention, the trial design, the randomization procedure and the data analysis plan. Also, the deliverable provides an overview of the monitoring activities and a risk assessment and contingency plan.

Due to the ongoing Covid-19, the timeline of the RCT included in this deliverable may be subject to delays. However, the overall research design will not be subjected to changes.

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1 Introduction

1.1 Complete project title	200SMEchallenge: Design-driven Open Innovation Challenge for 200 SMEs
1.2 Trial registration	The trial will be pre-registered at the American Economic Association's registry for randomized controlled trials (AER).
1.3 Protocol version	16.04.2020, v.1
1.4 Roles and Responsibilities	FBK-IRVAPP (Fondazione Bruno Kessler): Evaluation design and data analysis HIT – Hub Innovazione Trentino: project coordinator Seven regional innovation agencies: act as "National Coordinators" of the project and are in charge of field operation in their own regions. See the full list of the members of the consortium here: https://www.200smechallenge.eu/consortium/

2 Motivation and setting

2.1 Rationale	Pursuing optimal design and user experience of digital products is key for companies that seek to stay competitive in the market. User-centered design techniques inspired by design thinking, such as the "Design Sprint", have the potential of substantially improving the quality of digital products design. Yet, many SMEs are not aware of the added value of these techniques and are not equipped to adopt them. 200SMEchallenge project aims at providing evidence about the feasibility for innovation agencies of activating and making available to a set of European SMEs a 2-day Design Sprint initiative coming in the format of an innovation contest. The initiative is intended to impact on companies' awareness about benefits of user-centered design. We called this initiative: "UX Challenge" (User eXperience Challenge).

2.2 Main Research Question	For SMEs who operate in the digital industry sector or other SMEs who develops products bearing digital interfaces (the population), does participating in the UX Challenge (the intervention), rather than not participating (the control), enhance knowledge, awareness and intention to adopt the innovative approaches in the design of digital products (the outcome)?
2.3 Setting	The study will be conducted in Fall 2020 in seven EU regions: Trentino (Italy), Karlsruhe (Germany), Oulu (Finland), Vilnius (Lithuania), Castellon (Spain) Tallinn (Estonia), Copenhagen (Denmark).

3 Participants, interventions and outcomes

3.1 Participants	SMEs will be outreached in the seven EU regions exploiting different media channels and will be invited to respond to a public call for selection (see: https://www.trentinoinnovation.eu/wp-content/uploads/2020/03/UX-Challenge_call-COMPANIES_2020_draft.pdf).
	
	Among all applicants, participants will be identified in three steps:
	1) Eligibility check
	2) Suitability check
	3) Targeting (in case of oversubscription)
	
	These three steps will be carried out independently within each country but adopting the same approach.
	
	Step 1 - Identification of eligible applicants
	● Must be an SME:
	    ○ Employees: < 250 [AND]
	    ○ Turnover: having a 2019 turnover <= 50 M€ [OR] Balance sheet total <= 43 M€
	● Must complete "Company Application" entirely
	    ○ Send "UX Challenge Application Form" by (by a date to be defined, tentatively 31st November 2020) to the specified email address (will be slightly different between partners);
	    ○ Complete online "Baseline Survey" (see Annex A), which can be accessed via a hyperlink included in the UX Challenge Application Form.
	● Apply within the set deadline

An SMEs can send as many applications as many products it intends to bring to the UX challenge, but can participate with only one product.

Step 2 - Product "suitability" assessment
There is no restriction to industry sector but applications will be assessed on the basis of a number of criteria about the suitability of the products:
- EASE OF USE. Products that can be learned and used by the end user without the need for specific training, documentation, or previous experience (score: 1-5)
- GENERIC USERS. Products directed to end users that do not present characteristics that might make it difficult or impossible to involve such users in the Challenge as Testers (for example, users affected by serious illness or disability (score: 1-5)
- INTERACTIVE. Relevance of digital interaction in overall user experience of the product (score: 1-5)
- INNOVATIVE. Innovativeness of the Product's value proposition (score: 1-5)
- CHALLENGE. Presence and clarity of motivations and expectations that caused the company to apply to the Challenge (score: 1-5).

The applications with the highest scores will be the ones selected.

Targeted companies must design and or develop products or services having a digital interactive user interface. These could be mobile apps, software, of other types of digital interfaces (e.g. touch screens) to command industrial machineries. Therefore, not only software house or design firms are targeted, but also manufacturing companies. However, it is crucial to target the company that actually designs and develops the interface: it might be a design firm or a software company acting as a supplier to the manufacturing company (or the manufacturing companies itself, in certain cases). In synthesis (exemplificatory list):

1. **ICT Company**: developing app, software, possibly websites (in case they're very interactive and allow users to achieve a goal, e.g. marketplaces).

2. **Machinery manufacturing companies**: often also design / develops digital human-machine interfaces needed to command the machinery. These are normally badly designed and cater for errors and poor learnability.

	3. **White goods designers and manufacturers**: dishwashers, stoves, ovens, washing machines: now they have digital interfaces, and some have a not very good interaction design.
	4. **Digital consumer products**: whatever product having digital interfaces: from e-bikes to home appliances: e.g. thermostats.
	5. **Automotive sector**: everything is getting digital, and self-driving cars will provide a lot of entertainment. Some care infotainments are not as nice as they could be.
	Step 3 - Selection of applicants (targeting) Should the program be oversubscribed (i.e., more applications than the ones planned, i.e. 200), a targeting approach (meant to give higher priority to SMEs that could benefit more from the program) will be implemented: the plan is to use "past experience in design thinking or user-centered design" (coming from the Baseline Survey, see Annex A) to assign priority of inclusion to the SMEs with less experience in design approaches.
3.2 Interventions	**Actors** • Companies: see section 3.1 • Solvers: - are university students (including Ph.D. students) and young professionals (recently graduated students, e.g. up to 18 months from graduation) mainly with a background in UX design, interaction design and human-computer interaction (computer scientists, designers sociologists, psychologists, economists). Solvers are organized in teams, and each team is mentored by at least one senior mentor (a UX design professional). • Mentors: are UX design professionals that will support teams in the execution of the UX Challenge. They may be either freelancers or affiliated with a design firm, or even a software company. The buy-in for them to take part in the Challenge is to get in touch with potential clients (SMEs) and potential new talents to hire. • Testers: are potential users or customers of the products selected in the Challenge. And at least 4 users have to be selected per product / team (plus one reserve). This way, if 8 companies are selected to the treatment group and will take part in the challenge, each partner will have to select some 40 citizens applying to 8 different profiles.

Schedule

The UX Challenge is scheduled in a two-day format, as shown in Figure 1. Day one is normally a Thursday and day 2 a Friday, but this can change depending on local conditions. There are slots that involve both the solvers and the companies (or the larger public), from those that involve the solvers only. One very important slot is the final event (a.k.a. "plenary", during which all teams briefly pitch the results not only to companies, but to a larger public too).
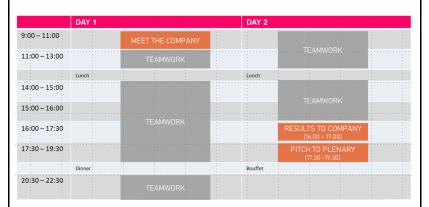
	DAY 1		DAY 2	
9:00 – 11:00		MEET THE COMPANY		TEAMWORK
11:00 – 13:00		TEAMWORK		
	Lunch		Lunch	
14:00 – 15:00				TEAMWORK
15:00 – 16:00		TEAMWORK		
16:00 – 17:30				RESULTS TO COMPANY (16:00 – 17:00)
17:30 – 19:30				PITCH TO PLENARY (17:30 –19:30)
	Dinner		Bouffet	
20:30 – 22:30		TEAMWORK		

Figure 1 UX Challenge's two-day schedule

The five phases

The UX challenge is organised in five consecutive phases.

- Phase 1: Scoping the Challenge. The scoping comes in the form of an initial meeting between the team (including the mentors) and the company which might last between 1 and 2 hours, depending on the complexity of the selected case. Goal of the meeting is to brief solvers about the challenge and to provide them all they need to start working on solutions
- Phase 2: Ideating the solutions. Overall, this phase lasts from 2 to 3 hours and is divided in two sub-phases: "sketch" (when team members diverge by ideate many different and competing solutions) and "decide" (when the team decide which one to prototype)
- Phase 3: prototyping. Normally the prototyping phase goes through a number of sub-phases through which the selected idea is refined and transformed into a more actionable and testable design solution. solvers are encouraged to utilize one of the following wireframing and prototyping tools and software in order to deliver outputs which can be utilized by companies.
- Phase 4: Test. each team will have available 4 users during morning of day 2, and each user will stay with solvers for one hour to do tests and interviews. The execution of the test will

occupy the whole morning two of the Challenge (e.g., 9.00 to 13.00) and could end before lunchtime. companies are not meant to take part in tests. However, in case they require that, they may take part in that just as observers (of course without saying to the tester that they own the product); for instance, they may be presented to users as "mentors", therefore with a methodologic role.

- <u>Phase 5: Tune and deliver</u>. This is the final phase of the UX Challenge, where the goal is to get ready for the presentation of the results both to companies and to the plenary. In this final event solvers compete for a prize in front of some 100 people, most of which are peers of professionals they wish to learn from); companies (they'll also have to present the company, the product and the challenge) and mentors.

Figure 2 shows the detailed schedule for the five phases of the UX Challenge.
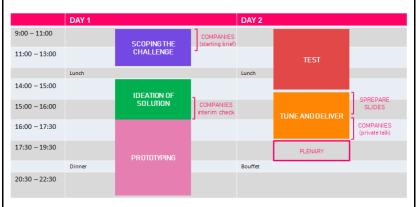

Figure 2 Detailed agenda of the two-day UX Challeng*e*

3.3 Outcomes	**Ultimate outcome (not measured):**
	● **SMEs Innovation capacity:** the intervention aims at improving the capacity of companies to design more innovative and valuable products and services and therefore being more competitive.
	Outcome (measured):
	● **Digital Design Readiness and Awareness (DDRA)** is meant as a mix of **knowledge**, **attitudes** and **behaviours** linked to SMEs' take up of digital design approaches in their activity
	DDRA will be measured through three specific outcomes:
	● Knowledge of user-centered design & design sprint

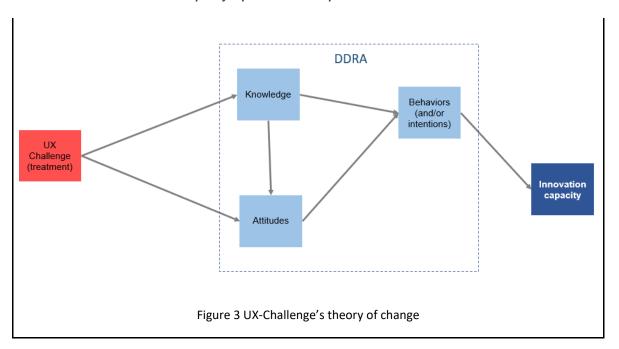|	● Attitudes towards user-centered design ● Intentions to adopt user-centered design The four outcomes will be measured through batteries of items as illustrated in Annex A. The three outcomes will be analysed independently and no single composite index will be computed.

4 Logic model

4.1 Logic Model

A positive link between DDRA and **innovation capacity** is assumed, but we do not measure companies' innovation capacity directly, as it is a theoretical construct.

The evaluation will assess the impact of treatment on the three DDRA dimensions independently. In identifying "measurable" outcomes, it is important to consider timing (i.e. time passed after treatment) in order to make sure that the expected changes can be realistically observed within the time duration of the project.

First, it is expected that the treatment leads to an improvement of the perceived and objective **knowledge** of user-centred design approaches and the design sprint by companies.

The treatment should also lead companies to develop more positive **attitudes** towards the use of innovative design techniques and to value the potential benefit of user-centred design for business.

Finally, as a consequence of increased knowledge and enhanced recognition of the benefits coming from user-centred design, companies should show higher **willingness to undertake concrete actions** to widen and improve the use of innovative design techniques in their business.

Figure 3 UX-Challenge's theory of change

5 Trial design

5.1 Description	The trial follows a **parallel 2 arms design**:
	• <u>Treated companies</u> receive access to the UX Challenge + post-experiment webinar;
	• <u>Control companies</u>: no access to the Challenge but can access the post-experiment webinar.
	The **unit of randomisation** is the single selected SMEs. If a company applies with more than one product, the company will enter the challenge only with its product that is regarded as the most suitable.
	Allocation ratio: .28 (T= 56; C= 144). A larger control group is planned to increase the experiment statistical power.

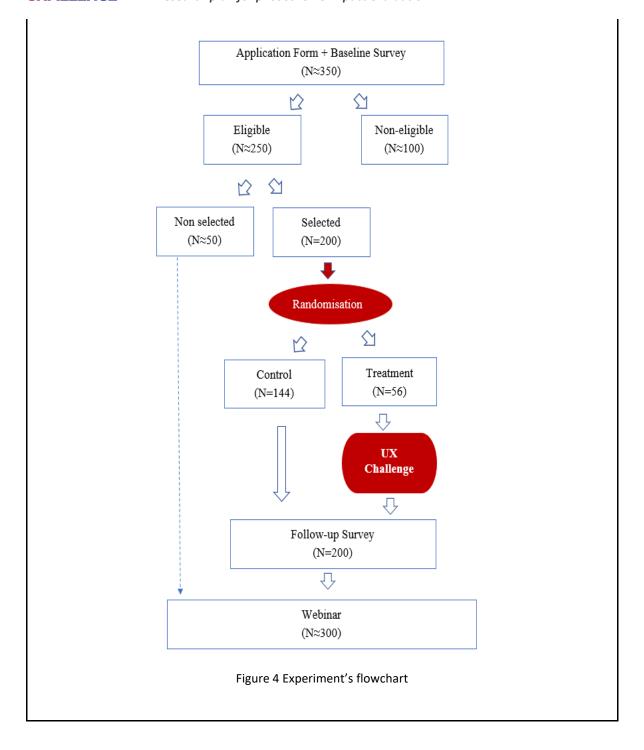| **5.2 Trial Diagram** |
|---|
| In order to reach the target number of SMEs (i.e., 200 eligible), the aim is to collect, across the seven EU regions, about 350 valid applications (which include a Baseline Survey duly filled in) and then retaining the 200 after the eligibility and selection procedures described in section 3.1. |
| The 200 selected SMEs will be equally split across the seven EU regions and within each region they will be randomly split in two groups according to an allocation ratio of .28. After treatment delivery, all 200 companies will fill in the Follow-Up survey. A webinar will be made accessible to all eligible applicants. |

Figure 4 Experiment's flowchart

6   Randomisation and assignment

6.1 Allocation Sequence	A **stratified randomization** design will be implemented ● Stratum 1: region ● Stratum 2: economic sector or company size ● Stratum 3: company's experience (high vs low) or past investments in digital design (again high vs low), as collected with the baseline survey. While stratum 1 is given by design as SMEs for at least 7 regions will be participating in the project, the decision on the use of strata 2 and 3 in randomization will be taken once the baseline data will be collected and analysed and, particularly, the empirical distribution of companies' characteristics will be known.
6.2 Allocation Mechanism and Implementation	Selected SMEs will be randomized to the two groups after all eligibility checks and upon completion of the Baseline Survey (which is a mandatory condition to be included in the project). FBK-IRVAPP will be in charge of the randomization.

7   Statistical analysis

7.1 Intended comparisons	Comparison of treatment and control groups along the knowledge, attitudes and behavioural outcomes. The outcome variables will be computed with principal components analysis. The outcome variables will be measured also with the baseline survey both to improve the statistical precision of the impact estimates as well as to allow for a back-up solution (i.e., a difference-in-difference estimation) in case randomization fails.
7.2 Statistical methods	The following linear regression model will be used to estimate the impact of the intervention: $Y_i = \beta_0 + \beta_1 \cdot Z_i + \beta_2 \cdot B_i + \beta_3 \cdot X_i + \varepsilon_i$ Where Y is the outcome of interest, Z is treatment assignment, B are the randomization stratification variables and X is a set of relevant characteristics (collected in the Baseline Survey, including also the pre-treatment measurement of the outcome variable) included in order

	to increase the precision of our estimates. Heteroscedasticity-consistent standard errors. In case of perfect compliance to random assignment, β_1 identifies the average treatment effect (ATE). In case of non-compliance (i.e., no-shows or crossovers), β_1 will identify an intent-to-treat effect (ITT).
7.3 Additional analysis	Given the limited sample size, no additional analysis is planned.

8 Power and sample size

8.1 Sample Size
Sample size fixed, as it is constrained by the budget available for the intervention. The size of the control group is planned as being larger than the treatment group, deviating from an equal distribution of treated and controls, to gain higher statistical precision. Since estimates of the variance of our outcome variables are not available, power analysis is calculated both in terms of minimum detectable effect size (in case of continuous variables) and dichotomous variables (assuming the worse scenario of a .50 distribution of the outcome). Estimated minimum detectable effect size is: .39 SD Estimated minimum detectable effect (dichotomous variable): .20 percentage points Table 1 provides an overview of the assumptions made to calculate the minimum detectable effect size of the experiment. Summing up, a number of tweaks in the RCT design are put in place to improve the experiment's statistical power: 1) a larger control group; 2) stratified randomization; 3) regression-adjusted estimation of the impact including covariates and pre-treatment outcomes.

Table 1 Potential assumptions relevant to sample size calculations

8.2 Assumptions to consider	**Value/Details**
Criterion for statistical significance (probability level; typically 0.05)	Statistical significance level (p-value) = .05
Power against alternative hypothesis (conventionally 80%)	Statistical power: 80%
Allocation ratio, i.e. proportion of randomisation units assigned to treatment (e.g. 50% of the total sample assigned to treatment in a two-arm trial)	28%

Treatment compliance - participants switching treatment groups - participants in the treatment group deciding not to take up the offered program - participants dropping out of the experiment entirely (such that we no longer collect their data)	• Perfect compliance • No dropout, i.e. no meaningful overall and differential attrition
Proportion of variance in the outcome explained by covariates (R-squared) - if applicable	Not available, hence our MDES estimate is conservative. Statistical precision will improve thanks to the use of the covariates and pre-test outcome measures
Correction for multiple comparisons	No
Software used for Minimum Detectable Effect Size calculations.	Spreadsheet

9 Recruitment and data collection

9.1 Recruitment	Promotional material will be produced by the project consortium and shared/adapted in each national context to increase the chances of reaching the largest number of SMEs possible. Especially each partner will create promotional webpages at a country level (e.g. https://www.trentinoinnovation.eu/en/area/innovationmarket/services-innovation/open-innovation-challenges/ux-challenge-2/). Also, the project website (www.200smechallenge.eu) as well its related social medial channels will be leveraged to create Hype on a EU level. Taking possible declines into account, a larger number of SMEs will be contacted as shown in the RCT flowchart above. SMEs will be reached out by national partners in each country exploiting the availability of the lists of companies operating in the different regions where the project will be fielded. SMEs will be contacted in different ways: website, social media, emails, informative meetings/webinar, phone calls.
9.2 Assessment of data collection	Baseline data will be collected at the moment of company application, most likely between October and December 2020, according to an updated and extended workplan as a result of an COVID-19 contingency plan being discussed with the EC at the moment this deliverable is written.

	As the data will be collected with an online survey tool (google form), the data will be immediately available to the research team for the usual data quality checks. The online form was subject to internal testing and was also tested with a small number of companies. The google form will be available in English and in the countries languages where requested (i.e., Italian, Spanish, Finnish and German).
9.3 Data collection instruments	The data will be collected with a baseline and a follow-up survey, which will be administered online and which will include Likert-scale questions, indices and a quiz. Principal component analysis will be employed to construct indices. See attachment A.
9.4 Business retention plan	A webinar on user-centered design and the Design Sprint is offered to all companies conditional Follow Up Survey response. National partners are going to offer additional incentives (still to be defined) for controls.
9.5 Cost-effectiveness analysis	Not planned

10 Implementation and process evaluation

10.1 Process evaluation and implementation: questions and purpose[1]	Implementation analysis will be carried out in order to understand the extent to which companies complied with the random assignment as well as the extent (e.g., number of company employees participating, number of sessions attended, etc.) to which each single company participated in the treatment. This information will be used to interpret the impact estimates.
10.2 Process evaluation: methods and data collection	National coordinators have to **make sure that the randomization is respected.** • <u>Compliance checks</u>: e.g., treated SMEs do show up or control SMEs somehow get to participate in the event

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[1] Process evaluation can be crucial for understanding the effects and exploring potential causal mechanisms of complex interventions or for assessing programme fidelity.

	• <u>Timely reports</u> on any deviation from random assignment to HIT & FBK-IRVAPP. National coordinators should **keep record of the activities actually delivered.** • <u>Intensity of treatment</u>: e.g., how much time does the SMEs spend at the event; how many sessions they attend; how many users take part in the event, etc.
10.3 Wider Impact evaluation	*n/a*

11 Ethics

11.1 Ethical concerns	No ethical concerns related to the participation of companies' representative in 200SMEchallenge project and the UX Challenge. The random assignment to treatment or control status will be made clear in the recruitment phase (i.e. through the public notice of companies' selection, annex A), so that all companies are aware of the research design. Companies, if randomized in, will receive access to an intervention, which in normal circumstances would have not been for free.
11.2 Consent or assent for participation in the trial	Companies will have to submit the application form and accept, by means of flagging one box in the same application form, the GDPR Privacy Consent Document that will be provided by the National Coordinator or Partner, as data Controller. A master version of the GDPR policy document is included as an annex to the Data Management Plan; at this link we make available the version from HIT – Hub Innovazione Trentino: https://www.trentinoinnovation.eu/wp-content/uploads/2020/03/200SMEchallenge_Privacy-Policy_HIT.pdf)
11.3 Confidentiality	Two sources of data will be collected from companies: a) application form where some identifiable information about the company and the reference person for the project will be collected and b) the baseline and follow-up surveys, which do not contain personal information about the respondents. Application form data will be managed by the national coordinators of the project while the

	evaluator will have access to the survey data only. All processes implemented to ensure data protection are described in the "Data Management Plan".
11.4 Data Protection	Personal data that will be collected in the project to allow for the participation of companies' staff, solvers, testers and mentors in the initiative will be stored and managed according to processes that are compliant to the GDPR regulation and that are thoroughly described in the "Data Management Plan". A GDPR Privacy Consent Document will be provided by each National Coordinator or Partner, as data Controller. A master version of the GDPR policy document is included as an annex to the Data Management Plan; at this link we make available the version from HIT – Hub Innovazione Trentino: https://www.trentinoinnovation.eu/wp-content/uploads/2020/03/200SMEchallenge_Privacy-Policy_HIT.pdf) No personal data will be collected with the surveys used in the evaluation. The evaluator will only have access to survey data.
11.5 Declaration of interest	None

12 Risks

Description of risks to the trial and how they might be addressed.

Table 2 Risk assessment

Risk	Assessment	Countermeasures and contingencies
Venture attrition	Likelihood: moderate Impact: moderate	The evaluator has taken part in the project's kick-off meeting as well as in all subsequent partner meetings to provide information to all national coordinators about the principles of the trial and the protocol to follow. Attrition will be monitored and reported according to CONSORT guidelines.
Interventions are not implemented well	Likelihood: low Impact: moderate	Each national coordinator has the responsibility of making sure that random assignment is duly followed by companies, minimizing the risks of non-compliance.

		A common monitoring system is also foreseen to carry out a detailed process analysis in each of the experimental site and to report non-compliance. In case of non-compliance, both intent-to-treat and local average treatment effects will be estimated.
Spillovers/ contamination	Likelihood: Low Impact: Moderate	In principle, companies belonging to either the control or the treatment group but operating within the same region could in principle interact about the contents of the initiative. Yet, the likelihood of contamination is considered low for two reasons. First, the treatment is very product- and company-specific, hence it is not easily transferrable from one company to another. Second, a great change in attitudes towards design is expected to come from the fact of experiencing "in person" the two days of the challenge and through the interaction with solvers and mentors.
Failure in recruiting ventures	Likelihood: moderate Impact: high	A promotional campaign will be carried out through different media. Each national coordinator will be responsible of reaching the national target of companies Covid-19 pandemic could impact negatively on the likelihood of reaching the recruitment target. Timescale could be revised to mitigate the adverse consequences of it.
The Provider does not follow trial protocols	Likelihood: moderate Impact: high	Partner's meetings are hold on a regular basis and a Partner's Handbook to the Experimental Scheme was shared with all partners in charge of the implementation of the initiative in the different EU regions (the handbook can be retrieved at https://www.200smechallenge.eu/deliverables/).

13 Timeline

The following table presents the RCT timeline, which has been adapted because of the ongoing COVID-19 pandemic. For the same reason, the entire RCT timescale could be postponed and is subject to further amendments.

Table 3 Timeline

Phase[2]	Time period
Phase 1: Trial design and preparation (trial protocol, survey design, etc.)	Sept. 2019 - March. 2020
Phase 2: Recruitment (engagement, baseline, randomisation, etc.)	March – December 2020 (updated according to the workplan extension currently being discussed)
Phase 3: Intervention Delivery (treatment period)	January – March 2021 (updated according to the workplan extension currently being discussed)
Phase 4: Data Collection and analysis (final follow-up survey, qualitative data, etc)	BS at application FuS about three/four weeks after intervention Data analysis by April 2021
Phase 5: Reporting (concluding analysis and evaluation report)	May 2021

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[2] Although this is the most common time structure for trials, not all projects follow this clear path. Feel free to change the phases if necessary.

Annex A "200SMEChallenge" Survey

What follows is a draft of the survey questions that are going to be used in the Baseline (BS) or in the Follow-Up Survey (FUS).

Brief introduction

Thank you for your interest in the UX Challenge. The UX Challenge is part of the "200SMEchallenge" project (www.200smechallenge.eu), an initiative funded by the European Union, aiming at accelerating the adoption of user-centered service and product design and design thinking in Small and Medium-sized Enterprises.

Filling in this short survey, together with the UX Challenge Application Form is a mandatory condition for applying to the UX Challenge.

This survey will take you approximately 15 minutes to fill and will cover aspects related with your company, your own professional background, and your knowledge of design-related methodologies.

If your application will be regarded as eligible for the project and the UX Challenge, please remember that you will be asked to fill in a second shorter survey that will be administered in November 2020. It is of outmost importance that all the selected companies fill in both surveys.

Your participation in this project will help us spreading the adoption of use-centered design and design thinking amongst European Small- and Medium-sized Enterprises. We sincerely thank you in advance for your help and commitment!

For any requests, please feel free to contact the national partner of the project at [ ].

Section A1 (A): Background information about the company

Q1. Country where the company's operational headquarters are located
Only one answer possible

1. Denmark
2. Estonia
3. Finland
4. Germany
5. Italy
6. Lithuania
7. Spain

[BS]

Q2. Company name

[alphanumeric space for company name]

[BS]

Q3. Company VAT number

[alphanumeric space for VAT number]

[BS]

Q4. Which industry sector does your company mainly operate in?

Only one answer possible, in case your company operates on more than one of the listed sectors, please select the most important one in terms of turnover.

1. Agriculture, forestry and fishing
2. Mining and quarrying
3. Manufacturing
4. Electricity, gas, steam and air conditioning supply
5. Water supply; sewerage, waste management and remediation activities
6. Construction
7. Wholesale and retail trade; repair of motor vehicles and motorcycles
8. Transportation and storage
9. Accommodation and food service activities
10. Information and communication
11. Financial and insurance activities
12. Real estate activities
13. Professional, scientific and technical activities
14. Administrative and support service activities
15. Public administration and defence; compulsory social security
16. Education
17. Human health and social work activities
18. Arts, entertainment and recreation
19. Other service activities
20. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
21. Activities of extraterritorial organisations and bodies

[BS]

Q5. Did your company engage in the following innovation activities in 2019?

One answer per item. Answer modalities: 1) Yes; 2) No; 3) I don't know

1. Intramural research and experimental development (R&D)
2. Acquisition of R&D services
3. Acquisition of machinery, equipment and software
4. Acquisition of external knowledge from other enterprises or organisations
5. Training to support innovation
6. Launching new products or services into the market
7. Activities to improve the design of goods or services

[BS]

Q6. Approximate number of employees and/or associates with a university degree in your company

[_ _ _] (number)

[BS]

Q7. Does your company have active collaboration(s) with universities or research institutes?

Only one answer possible
1. Yes
2. No
3. *I don't know*

[BS]

Q8. Please, indicate if there is at least one person in your company holding any the following roles:

One answer per item. Answer modalities: 1) Yes; 2) No; 3) I do not know
1. UX (User Experience) Designer
2. Interaction Designer
3. Information Architect
4. UI (User Interface) Designer
5. Service Designer
6. Research and development Staff

[BS]

Section B1 (B): Knowledge of user-centered design

Q9. Please, express the extent to which you agree/disagree with the following statements

6 point Likert scale

1. *Completely Disagree*
2. *Mostly Disagree*
3. *Slightly Disagree*
4. *Slightly Agree*
5. *Mostly Agree*
6. *Completely Agree*

1. I know what "User Centered Design" is
2. I would feel confident to explain to my colleagues what "User Centered Design" is
3. I know what "Design Thinking" is
4. I would feel confident to explain to my colleagues what "Design Thinking" is in practice
5. I know what a "Design Sprint" is
6. I would feel confident to explain to my colleagues what a "Design Sprint" is in practice

[BS + FUS]

Q10. Please, express the extent to which you agree/disagree with the following statements

6 point Likert scale

1. *Completely Disagree*
2. *Mostly Disagree*
3. *Slightly Disagree*
4. *Slightly Agree*
5. *Mostly Agree*
6. *Completely Agree*

1. I am able to **define a design problem** in such a way that it is easily comprehensible by people outside our company (consultants, suppliers, partners)
2. I am able to effectively managing **creative ideation** processes
3. I am able to **take up decisions** on the best design solution to implement starting from a large variety of ideas
4. I am able to pursue **rapid and cheap prototyping** of a design solutions (e.g. wireframing, mockups, interactive prototypes) in order to test it with users
5. I am able to set up and **execute reliable user testing** (the right profile and number of users) to validate those ideas/solutions

[BS + FUS]

Section B2: Knowledge of Design Sprint

In this section, you'll find five questions that will allow to investigate how widespread the knowledge of Design Sprint is among companies. If you don't know something that's totally ok!

QX. In the Design Sprint, how should the company frame the **design problem**?

Please, select, among the three options for each of the following questions, the one you think is the most appropriate. Select "I wouldn't know" only if you really can't choose from the previous three.

a. The problem should be described after a sound and extensive **research** within the company and possibly with the support of external consultants
b. Along with the problem, the company should envision the **ideal scenario** (final outcome) that it wants to achieve with a design solution (whatever it be)
c. The problem should **not be defined** at the beginning in order to allow for more creativity and serendipity
d. I wouldn't know

[FUS]

QX. How is the **ideation** phase done in Design Sprint?

Please, select, among the three options for each of the following questions, the one you think is the most appropriate. Select "I wouldn't know" only if you really can't choose from the previous three.

a. Team members involved in the Sprint develop a few ideas (2-3) **individually**, and only after they show ideas to their team members, one by one, to allow for a more informed discussion
b. Ideas must be developed in a group **brainstorming** setting, where everybody in the team is free to come up with as many rough ideas as possible, without elaborating too much on them
c. The **product manager** alone is responsible for the ideation, after a specific indication from the CEO; only afterwards the product manager shares with the rest of the team the chosen idea in order to define the product specifications to be developed
d. I wouldn't know

[FUS]

QX. How are **ideas of solutions** expressed and shared in the Design Sprint?

Please, select, among the three options for each of the following questions, the one you think is the most appropriate. Select "I wouldn't know" only if you really can't choose from the previous three.

a. After a considerable research investment, ideas of solutions should be described in detail **by designers** and creative people in a single-page document, and they should be shared afterwards with the rest of the team
b. Ideas of solutions must be carefully crafted by the **Art Director**; in general, only creative people should take part to the ideation process and should later present those ideas to the whole team.

   c. Ideas of solutions are produced by **all team members** and come in a visual format (low fidelity sketches) to make for team members easier to grasp their meaning and understand all the many options on the table

   d. I wouldn't know

[FUS]

QX. What is a **prototype** in the Design Sprint?

Please, select, among the three options for each of the following questions, the one you think is the most appropriate. Select "I wouldn't know" only if you really can't choose from the previous three.

   a) A prototype is a highly **technological device** that technology companies develop if they want to test system problems and bugs with external consultants

   b) A prototype is a first, **unfinished version** of the product, still missing many functionalities and normally cheaper than the finished product but essential to allow the realization of the final product.

   c) A prototype is an object that allows the team to **simulate the adoption** of certain design solutions by users and/or customers, in order to quickly and cheaply generate a feedback needed to evaluate its viability

   d) I wouldn't know

[FUS]

QX. What is the main purpose of **involving users and customers** in the Design Sprint?

Please, select, among the three options for each of the following questions, the one you think is the most appropriate. Select "I wouldn't know" only if you really can't choose from the previous three.

   a. Users and customers are involved in the testing phase of the Alfa or Beta versions of the product, so that the product's **bugs can be spotted** before the commercialization.

   b. Users and customers take an active part in the Sprint as they are asked to test and **provide feedback** on the developed prototype, in order for the team to evaluate whether it is the appropriate solution to the problem

   c. Users and customers are invited to take part to the **ideation session**, and possibly also to the prototyping phase according to a co-design approach, so that the needs and wishes of future users/customers are included.

   d. I wouldn't know

[FUS]

Section B3 (C): General attitudes

Q11. How would you rank the importance of the following aspects when pursuing innovation of products or processes in your company?

Answer modalities: From 1st (the most important) to 6th (the least important)

1. Having a **leadership** with a strong vision
2. Incorporating the state-of-the-art **technology**
3. Creating strategic **partnerships** with key players
4. Using design thinking and **user-centered design**
5. Optimizing processes, **organization** and operations
6. Focusing on **finance**

[BS + FUS]

Q12. How much do you think each of these aspects of design thinking could benefit your company?

Please, assign a value from 0 (no benefits) to 5 (max benefits)

1. Defining a design **problem** in such a way that it is easily addressable by others (consultants, suppliers, partners, customers, users)
2. Effectively managing **creative processes** to ideate solutions to design problems
3. Taking up **decisions** on the most appropriate design solutions to implement, starting from a large variety of ideas
4. Pursuing rapid and cheap **prototyping** of a design solutions (wireframing, mockups, interactive interfaces) in order to test it as soon as possible with users
5. Setting up and execute reliable **user testing** (the right profile and number of users) to validate those design ideas/solutions

[BS + FUS]

Section B4 (D): Planned actions

Q13. Thinking about the next 6 to 12 months, <u>WOULD YOU LIKE</u> that your company undertake any of the listed actions?

Only one answer per item is possible: 6 point Likert scale
1. *Definitely no*
2. *Mostly no*
3. *Rather no than yes*
4. *Rather yes than no*
5. *Mostly yes*
6. *Definitely yes*

1. Collect feedback from users or customers with regards of your **existing products** in order to improve their value
2. Involve users or customers to **test ideas and prototypes** of new products and services (or new functionalities of existing products)
3. **Hire new staff** trained/experienced in design (e.g., UX User Experience Designer; Interaction Designer; Information Architect; UI User Interface Designer; Service Designer)
4. Increase the **time** dedicated to the design phases of new projects
5. Increase the **budget** dedicated to design phases of new projects

6. Hire an **external** User Experience design agency or freelancer to improve our capability of designing better digital products
7. Invest in user-centered design **training** for its employees

[BS + FUS]

Q14. To what degree do you think that <u>in the next 6 to 12 months</u> your company WILL <u>ACTUALLY</u> undertake any of the actions listed below?

Only one answer per item is possible: 6 point Likert scale
1. *Definitely Not*
2. *Probably Not*
3. *Possibly*
4. *Probably*
5. *Very Probably*
6. *Definitely*

1. Collect feedback from users or customers with regards of your **existing products** in order to improve their value
2. Involve users or customers to **test ideas and prototypes** of new products and services (or new functionalities of existing products)
3. **Hire new staff** trained/experienced in design (e.g., UX User Experience Designer; Interaction Designer; Information Architect; UI User Interface Designer; Service Designer)
4. Increase the **time** dedicated to the design phases of new projects
5. Increase the **budget** dedicated to design phases of new projects
6. Hire an **external** User Experience design agency or freelancer to improve our capability of designing better digital products
7. Invest in user-centered design **training** for its employees

Q15. What do you think are the obstacles that your company would face in undertaking any of the actions listed in the previous question?
Only one answer per item is possible: 6 point Likert scale
1. *Definitely Not*
2. *Probably Not*
3. *Possibly*
4. *Probably*
5. *Very Probably*
6. *Definitely*

1. Prior investments
2. Market conditions or excessive perceived economic risks
3. Organizational rigidities within the enterprise
4. Lack of qualified personnel capable to coordinate and drive such initiatives
5. Lack of information on how user-centered design methodologies work
6. Lack of information on market suppliers (do not know potential service providers)
7. Insufficient flexibility of regulations or standards

8. Lack of customer responsiveness to new goods or services
9. Lack of trustworthy evidence about the benefits of these methodologies (e.g. ROI – Return on Investment)
10. Lack of awareness of benefits of these methodologies
11. We fear that adopting these methodologies will disrupt our current product development practices
12. We do not cover the entire manufacturing process (the interaction design is done by our suppliers or clients)

[BS + FUS]

Section A2 (E): Background information about the respondent

In this section, we kindly ask you to tell us something about yourself. These data will be treated in an anonymized and aggregate way, making it impossible to be traced back to you.

Q16. How old are you?
Only one answer is possible

1. Below 25 years old
2. 25-29 years old
3. 30-39 years old
4. 40-49 years old
5. 50-59 years old
6. Over 60
7. Prefer not to answer

[BS]

Q17. What is the highest education level that you have completed?
Only one answer is possible
1. Did not complete Upper secondary education
2. Completed Upper secondary education
3. Completed Post-secondary non-tertiary education
4. Completed Short-cycle tertiary education
5. Completed Bachelor's or equivalent level
6. Completed Master's or equivalent level
7. Completed Doctoral or equivalent level
8. Prefer not to answer

[BS]

Q18. Education field

Only one answer is possible (in case your study was across two or more different fields, please select the most relevant or recent one)
1. Computer sciences;
2. Business / economics
3. Engineering;
4. Architecture and design
5. Social sciences (e.g., psychology, sociology, anthropology, political science, etc.);
6. Humanities and arts (e.g. history, linguistics, religion, arts, philosophy, etc.)
7. Other sciences (e.g., natural sciences, mathematics, physics).
8. Other field of study
9. Prefer not to answer

[BS]

Q19. Gender

Only one answer is possible

1. Man
2. Woman
3. Other
4. Prefer not to answer

[BS]

Q20. Work experience in years

Please consider your entire professional career, not only your work experience in the actual company.
Skip or write "9999" if you prefer not to answer

|_ _ |

[BS]

Q21. What is your main role in the company?

Tick the answer that better describes your role in the company. Only one answer possible

1. CEO / founder / President
2. Manager / Department director (Chief Technical Officer - CTO, Chief Marketing Officer - CMO, CFO, CSO, CIO)

3. Head of unit / first line manager
4. Project manager / team manager
5. Employee
6. Other

[BS]

Q22. What is your job most related to?

Tick the answer that better describes your role in the company. Only one answer possible

1. Production
2. Research and development
3. Marketing / Sales
4. Logistics / Operations
5. Accounting / Finance
6. Strategy
7. Other

[BS]

Q23. Have you ever engaged in any of the following activities?

Think about your entire professional career. One answer per item possible.
One answer per item. Answer modalities: 1) Yes; 2) No

1. Involved users or customers to **test ideas or prototypes** of new products and services, or their functionalities
2. Collected direct **feedback** (e.g. via interview) from your users or customers about your existing products in order to improve their functionalities
3. Utilized **methods** such as "idea sketching", "scenarios", "storyboarding") to support the ideation and early design of new products or functionalities
4. Taken part to a "**Design Sprint**" (a 5-phase process developed by Google Ventures used to develop user-validated solutions to design problems)
5. Taken part to an **innovation contest** / innovation challenge (including hackathons)
6. Innovated existing products or ideated / designed new ones in **collaboration with customers**
7. Innovated existing products or ideated / designed new ones in **collaboration with suppliers**

[BS]

Section C: Satisfaction with the UX Challenge

This section is dedicated to collecting your opinion about the UX Challenge. Alongside the other data, your feedback is very important to us.

QCX. Overall, what is your opinion about the solutions developed by the teams from the UX Challenge (mockups, wireframes, prototypes, ideas, and feedback from users)?

Please, express the extent to which you agree/disagree with the following statements

6 point Likert scale

1. Completely Disagree
2. Mostly Disagree
3. Slightly Disagree
4. Slightly Agree
5. Mostly Agree
6. Completely Agree

1. The solutions regarded optimization of the existing product
2. The solutions regarded incremental product innovation (e.g. new functionalities)
3. The solutions featured radical product innovation (novel added value or new meanings)
4. The solutions were in line with the initial problem statement
5. The solutions were enough mature / completed to be exploitable by our company
6. The solutions increase the user experience of our product
7. The solutions will be used by our company to develop an improved version of the product

[FUS]

QCX. Please, express the extent to which you agree/disagree with the following statements

6 point Likert scale

1. *Completely Disagree*
2. *Mostly Disagree*
3. *Slightly Disagree*
4. *Slightly Agree*
5. *Mostly Agree*
6. *Completely Agree*

1. We will utilize the "Design Sprint" in future projects, probably without the help of external facilitators
2. We will utilize the "Design Sprint" in future projects, with the support of an external agency
3. We will stay in touch with the solvers of the UX Challenge to further develop the outputs of the Challenge
4. We will stay in touch with the mentors of the UX Challenge to further develop the outputs of the Challenge
5. We would apply to the next edition of the UX Challenge, in case there was one

[FUS]

QCX. Overall, how would you rate the UX Challenge?

From 0 (I did not like it at all) to 10 (I liked it very much)

|_ _|

[FUS]

Comments

You can shortly leave your comments and suggestions for improvement of the UX Challenge here
[space for comments]

Thank you for your participation

Baseline Survey Message:
Thank you for your participation! Remember that you will receive the invitation to fill in a shorter survey
later this year (in November)! Your participation in this second questionnaire will be key to the project's
success! For any doubt, clarification or request, please write to: [ ].
Website: www.200SMEchallenge.eu

Follow-UP Survey Message:
Thank you for your participation Your participation in this questionnaire made our research possible! You
will be informed about the results of the research as soon as they are available! You can learn more
about the project by visiting the project's website [Link: 200smechallenge.eu] or following us on Twitter
[Link: @2Echallenge]. For any doubt, clarification or request, please write to [ ]