

Conceptual framework and research protocols

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Abstract

This document presents the conceptual framework guiding the UNTANGLED project and a glossary of key terms and concepts related to the topics that it covers. The framework considers definitions, measurement, available data, and indicators. This document also presents research protocols underpinning the quantitative and qualitative research carried out in the project. *Keywords*: conceptual framework, protocols



1. Introduction

This deliverable builds on the state-of-the-art review and gap analysis (Task 2.1). It first provides a conceptual framework and glossary of key terms and concepts related to the topics covered by the project, with a specific focus on labour impact issues. It considers various core definitions, measurement issues and indicators, and methodological approaches as well as overviews of available data concerning the quantitative research. For the latter a separate deliverable (Task 2.4) is devoted to the Data Management Plan (DMP). This overview, which will feed into WPs 3-6 and is referred to in WPs 7-8 on policy and stakeholder engagement, should foster coherence of the work carried out within the project and for dissemination purposes. The second aim of this deliverable is to develop protocols for undertaking the qualitative research tasks. These protocols outline in detail the objectives, research procedures (e.g. identifying and contacting individuals, interview guidelines), data to be gathered, quality control, bibliographical referencing and related topics. Special attention is paid to ethics, gender, privacy issues and the General Data Protection Regulation (GDPR). Along with these protocols, supporting documents will be prepared for all partners to use (e.g. letter of consent, reporting template, summary sheets). The protocols and supporting documents will be made available to other researchers. As such, this deliverable (comprising Tasks 2.2 and 2.3) should feed into Task 2.5 on setting up a common research infrastructure. Other issues concerning stakeholder engagement and dissemination activities are tackled in separate work packages (specifically WP8 and WP9).

2. Common conceptual framework and glossary

2.1. Introduction

The UNTANGLED project conducts research about how the three key megatrends - technological transformations, globalisation and demographic changes - will affect EU countries. These trends will create opportunities but will also pose profound socioeconomic challenges for the EU that still have to be fully understood and addressed. Although these megatrends have been ongoing for some time, they have accelerated and are likely to continue to do so over the next decades. Technological transformations in the form of digitalisation and automation are now accompanied by progress in artificial intelligence (AI) and Industry 4.0. Globalisation in the form of a rising volume of trade and increasingly interwoven global value chains expands as the scope of tradable goods and services broadens, while new superpowers play an increasing role in defining the global rules. Demographic changes become more acute as popu-



lation ageing reduces labour supply and reshapes the consumption patterns in the EU countries, while increasing flows of intra- and extra-EU migration challenge the cohesion of the EU. Although the EU as a whole still offers higher living standards than most of the rest of the world, these global trends will create winners and losers, shape inequality within and between countries, and will require novel policy responses.

Against this background, the objective of the UNTANGLED project is threefold. First, to contribute a comparative diagnosis of the individual and combined effects of technological transformations, globalisation and demographic changes on employability, skills, wage and income inequality, and labour mobility and migration in the EU. Second, to construct credible, multifaceted scenarios of technological progress and globalisation and their impacts on national, regional and sectoral labour markets and incomes in the EU. And third, to identify policy measures that are conducive to shared prosperity by helping to reap the benefits from these megatrends and cushioning their negative impacts. This overarching objective will be reached within an interdisciplinary research framework, always accounting for the gender aspect and for vulnerable groups in the labour market (e.g. low-skilled) and actively involving key stakeholders.

The project is guided by three main research questions:

- What are the effects of technological transformations, globalisation and demographic trends on labour market outcomes, skills, inequality, and labour mobility and migration in Europe?
- What are the plausible scenarios of megatrends and their impacts in the decades to come?
- Which combinations of policies could be most effective in managing these megatrends towards shared prosperity?

To answer these questions, some key conceptual and methodological issues need to be addressed. The premise of UNTANGLED is that these megatrends may have country-wide effects, may affect particular sectors and regions, and may also drive horizontal inequality by affecting various groups of workers in different ways. Moreover, economic, institutional, political and sociocultural contexts, needs and obstacles may shape how the megatrends are adopted, reacted to and absorbed by particular societies and economies. Finally, the interactions with emerging and developing countries and their performances co-determine the effects on the EU countries. Hence, a comprehensive picture that accounts for the interplay between the megatrends and for their joint effects on employability, skills, productivity, wage



and income inequality, mobility and job quality at the macro, meso and micro levels is needed. So far, such comparative, cross-country knowledge is lacking. The UNTANGLED project aims to fill this gap.

Understanding the socioeconomic consequences of megatrends is a necessary - but only the first - step in devising comprehensive scenarios for the future and effective policy responses. UNTANGLED aims to take the next step by formulating implications for scenarios from the diagnostic part of the project, moulding them into scenario inputs with the help of a wide range of stakeholders who are involved in each step of the project, and applying various modelling approaches to evaluate the effects of scenarios on employability, skills and inequality. As European countries differ both in their institutional settings and their exposure to various trends, our approach supports both EU-wide and country-specific policy agendas, which will be prepared in feedback loops with stakeholders.

The research agenda of UNTANGLED is the product of a well-balanced, interdisciplinary consortium of renowned institutions with complementary expertise and experience, unified by a focus on socioeconomic and inequality-related effects of technological transformations, globalisation and demographic changes and combining EU-wide, country-specific and regional perspectives. It benefits from the first-hand knowledge of partners based in other continents to ensure a thorough coverage of global issues. This integrated approach ensures that the study of past trends feeds directly into comprehensive scenarios that go beyond the perspectives of individual disciplines.

2.2. Organisation and objectives

UNTANGLED is organised around nine work packages, each of which is designed to help reach the objectives of the UNATNGLED project and answer the three key research questions.

The specific objectives of UNTANGLED, related to particular work packages, are described below (Figure 1 provides an overview of the interconnection of the work packages). ¹

• Propose a new framework for studying the effects of technological transformations, globalisation and demographic changes that integrates the analysis of all megatrends

¹ These objectives are in line with initiatives pursued by the European Commission and Parliament, as well as international organisations. These include the European Pillar of Social Rights and the political guidelines of the President of the European Commission, Ursula von der Leyen; the Human Behaviour and Machine Intelligence-HUMAINT project of the Joint Research Centre and the European Commission's science and knowledge service; the European Jobs Monitor and the European Restructuring Monitor by Eurofound; the Future of Work initiative by the International Labour Organisation (ILO); the 'Developing lifelong learning' and 'Identifying skills needs' projects by Cedefop; and the OECD Future of Work initiative.



at the macro (country), meso (sector, region) and micro levels (subpopulations, skill types, etc.). It relies on a mix of quantitative and qualitative methods and extensive stakeholder engagement, accounts for the feedback loops between particular mega-trends and provides research results that directly inform scenario building (WP2).

- Measure the macro, country-level effects of megatrends across the EU countries, especially the effects of technological transformations and globalisation on wage and income inequality and gaps in employment outcomes between younger and older people; how technology shapes the demand for skills and how migration affects the supply of skills, interactions between technology, and offshoring, reshoring and trade flows (WP3).
- Understand the context-specific impacts of megatrends on employment, skills and inequality in different sectors of the economy and how they shape the actions of social partners and workplace environments; evaluate the effects of information and communications technology (ICT) capital, in particular tangible and intangible ICT capital, on industry productivity, spillovers and resulting income inequality; assess the regional heterogeneity in skills, technology adoption and participation in globalisation and the consequent heterogeneity of regions in employment outcomes (WP4).
- Evaluate the socioeconomic consequences of technological transformations and globalisation trends on firms (productivity and profitability), employees (job quality, wages and income inequality); identify winners and losers from these trends considering institutional, demographic (gender, age, migration, education), occupational and sectoral characteristics in various EU countries (WP5).
- Identify the challenges and opportunities resulting from the evolution of global value chains around the world (North America, South America, Southern Africa and China/ East Asia) and their interactions with European developments, challenges and policies (WP3, WP6).
- Develop scenarios for Europe using a novel modelling framework that combines two complementary models tailored for constructing pathways of GDP, employment, income inequality and regional inequality in particular EU countries, in variants that allow understanding the effects of potential policy actions (WP6).
- Formulate and validate policy conclusions and recommendations based on the project's research activities in a feedback loop with relevant stakeholders, and explore and propose relevant areas and opportunities for national and international governance and multilateral cooperation and support capacity building in areas such as job



quantity and quality, upgrading skills and lifelong learning, supporting equality of opportunities and incomes, facilitating labour mobility and migration, and redirecting innovation to match the skills of the current and future labour force (WP7).

- Maximise the relevance and applicability of findings by covering recent issues (e.g. the current health crisis triggered by the COVID-19 outbreak and its impact on trade and global value chains), as well as by involving and engaging a community of stake-holders from various parts of society, in order to have their voices heard and expectations reflected in the research agenda and outcomes (WP8).
- Disseminate the lessons learned and the guidelines to European policymakers and stakeholders regarding the challenges and opportunities created by technological transformations, globalisation, migration, labour mobility and demographic change, and the policy solutions that are conducive to shared prosperity (WP9).



Figure 1. The links between the work packages

Work packages 2-8 constitute the core and main contribution of UNTANGLED (work package 1 is devoted to project management and coordination). Establishing the conceptual framework, protocols and a joint infrastructure as well as setting up the joint infrastructure is part of WP2. WPs 3-6 are dedicated to research and are organised into two phases: a first phase, which assesses past and current trends and their impacts (WPs 3-5), and a second phase, which consists of scenario building and potential future impacts, also drawing lessons from past economic



shocks (WP6). The findings of the first phase will feed into the second phase, which explains the overlap.

Rather than organising research tasks into separate WPs according to trends or impacts, UNTANGLED purposely integrates them. The logic and added value of this approach is that it allows for a better assessment of interactions and combined effects of the three main trends, namely technological transformations, globalisation and demographic changes. This is not possible if trends and impacts are studied in isolation. For that reason, WPs 3-6 cover all three trends and the full range of impacts studied - employment, skills, inequality, and labour mobility and migration - for the entire European Union. All WPs devote special attention to vulnerable groups in the labour market, including the low-skilled.

More specifically, in the first phase WPs 3-5 aim at measuring these trends and the interplay between them, to capture their individual and combined effects on employment, skills, inequality, and labour mobility and migration. In doing so, these WPs account for the economic, institutional, political and sociocultural contexts at different levels. WP3 addresses the trends and impacts at the macro level (country), WP4 encompasses the meso level (sector, region) and WP5 focuses on the micro level (firm, worker, job, task, skills):

- WP3 examines the country-level effects and relationships with non-EU countries, such as the effects of technological transformations and globalisation on income and wage inequality and gaps in employment outcomes; how technology shapes skills demand; how migration affects skills supply; how technology shapes offshoring, reshoring and trade flows; and the challenges and opportunities resulting from changing global value chains;
- WP4 is dedicated to the impacts of the trends on employment, skills, inequality and mobility in different economic sectors and how they shape the actions of social partners; the effects of ICT capital on industry productivity, spillovers and income inequality; regional heterogeneity in skills, technology adoption, participation in globalisation and employment outcomes;
- WP5 looks into the socioeconomic consequences for firms (productivity, profitability) and for workers (wages and income inequality, job quality), identifying the winners and losers from the trends taking into account institutional, demographic (gender, age, migration, education), occupational and sectoral characteristics in various EU countries.



WP6 on scenario building launches the second research phase. Like WPs 3-5, WP6 covers all trends and impacts but uses two complementary models to analyse potential future developments in GDP, employment, regional inequality and the skills composition of the labour force. These models are fed with the findings from WPs 3-5 and stakeholder inputs gathered in WPs 6 and 8 through feedback loops. The modelling allows to simulate the impacts of different policy interventions and is closely linked to WP7.

WP7 is dedicated to synthesis and policy. First, WP7 aims to synthesise the findings of the research activities at different stages of project implementation. This is important in order to see the full picture, as the different research WPs (WPs 3-6) complement each other. This synthesis will be further enriched with the newest insights from the literature. Second, WP7 looks into existing policies and derives policy implications from the risks and impacts and their possible development described in WPs 3-6. WP7 focuses on policies on employment, skills, inequality, and labour mobility and migration. In each of its tasks, WP7 considers areas for national and international collaboration, accounting for past and possible future shocks.

WP8 comprises UNTANGLED's stakeholder engagement activities, which complement the research activities and maximise the relevance, applicability and impact of UNTANGLED's outcomes. Key stakeholders representing various parts of society are engaged from the early stages of the project until project completion, to offer inputs and feedback at all stages via feedback loops. Stakeholder engagement relies on a range of activities, such as workshops, webinars, an online platform and other tools and activities.

2.3. Definitions of the three key megatrends

At the core of the research in the UNTANGLED project are the three identified megatrends: technological transformations, globalisation and demographic change. Within the UNTANGLED project a broad definition of these mega trends is adopted.

• Technological transformation is meant to refer to technological innovation in fields such as the internet of things (IoT), robotics, artificial intelligence (AI), augmented reality or cyber-physical systems, but also to derived innovation in how work and the workplace are organised as a consequence of technical innovations. This also includes the digitalisation of business processes and innovation in the type of business, including innovation in big data and data analytics.



- Globalisation refers to the increasing economic, cultural and political interdependence and interconnectedness of countries and regions around the globe, accelerated as a result of advances in transport and communication technologies. The concept of globalisation includes the world trade system, trade specialisation and cross-country value chains, but also the increased ability to manage teams remotely.
- Demographic change relates to changes in the population and employment structure due to ageing and migration.

2.4. Approach and methods

UNTANGLED uses a mixed methods approach across the work packages with extensive stakeholder engagement and feedback loops in order to accommodate the complexity of the research questions and the wide scope of the project in terms of the trends and impacts considered. UNTANGLED's approach allows triangulation (to neutralise biases and validate information), ensures complementarity (capturing different aspects using multiple approaches and sources), and hence deepens the understanding of these phenomena. The gender dimension is accounted for throughout the project (in research, dissemination, stakeholder engagement). Figure 2 illustrates the approach and methods and how they are used in UNTANGLED.





We acknowledge the wealth of existing relevant data sources from national and international agencies, spanning macro-, industry-, regional- and micro level data, which draw partly on data sources to which some partners of UNTANGLED have contributed (e.g. EU-KLEMS, WIOD). As underlined in the call, we do not plan to compile quantitative data ourselves and research will be based on existing ones. However, we will conduct qualitative interviews and case studies to fill data gaps and validate our hypotheses and results. Moreover, UNTANGLED will develop and



implement an ambitious stakeholder engagement strategy. In all activities we will pay attention to those most affected by technological transformations, globalisation and demographic change, e.g. low-skilled workers. Finally, UNTANGLED's Gender Equality Team will ensure that the gender dimension is accounted for throughout the project (in research, dissemination, stakeholder engagement). Figure 3 illustrates the methods and how they are used in UNTANGLED. Table 1 lists the databases that will be used in the project.²



Figure 3. Methodological approaches used in UNTANGLED

2.4.1. Methods to collect qualitative information and data

Desk research for qualitative information

In WP2 we create a digital inventory that gathers journal articles, working papers, reports, policy briefs, documents prepared by social partners and international organisations and other literature. This will serve to identify state-of-the-art and research gaps (Task 2.1), the conceptual framework and glossary (Task 2.2), and establish the knowledge base for WPs 3-6. Where needed, it will be complemented in WPs 3-7 by newly published or context-specific literature.

² Over the course of the project a Data Management Plan (DMP) will be elaborated, first at the start of the project (07/2021) and then updated throughout the project implementation (updates are foreseen for 01/2022, 01/2023, 01/2024), documented in D1.1. together with progress reporting. This DMP will cover the entire data management life cycle (beyond the end of the project) and will address the following aspects: (i) data sets identification; (ii) data sets description; (iii) standards and metadata; (iv) data sharing; (v) data archiving and preservation. The DMP will be prepared and updated by the Data & IPR Manager (RWI), based on inputs from all partners.



Desk research for quantitative information

Collection of internally harmonised databases with EU coverage

In WP2 existing databases are collected, the joint research infrastructure is established, and the conceptual framework is developed. These all support the research activities in WPs 3-6. We collect survey data on individuals (EU-LFS, EU-SES, EU-SILC, PIAAC, EWCS, CVTS, ESJS, EVS, etc.) and firms (e.g. Orbis Europe), macro and sector level data (COMTRADE, WIOD, KLEMS, IFR), regional data (EPSON, ARDECO), as well as data sets on policies and institutional settings (e.g. OECD's EPO Regpat, EPL, Quality of Government indicators). Nearly all the databases we use have an EU-wide coverage; some will be used throughout WPs 3-7, and some in particular WPs (Table 1).

2.4.2. Qualitative methods

Semi-structured interviews

Semi-structured interviews provide insights into the perceptions and attitudes of leading experts on the risks and opportunities related to technological progress, demographic change and evolving value chains (WP3), of social partners, industry associations, sector experts, company managers and employee representatives on the quality of these changes and their impacts (WP4), and of academic experts, policymakers and labour market actors regarding four policy areas (employment, skills, inequality, and labour mobility and migration) (WP7). Information collected via semi-structured interviews is summarised using qualitative methods. Specifically, content analysis is used to examine the meaning and representation provided by participants (Schreier, 2012). Joint protocols will be developed at the start of each task using interviews.

Delphi technique

The Delphi technique is used to involve UNTANGLED's stakeholder community in the scenariobuilding process (WP6). It involves a series of sequential questionnaires or 'rounds', interspersed with controlled feedback, to attain the most reliable consensus of opinion of a group of experts (Powell, 2003; Niederberger & Renn, 2019). Stakeholders are first asked to validate the assumptions (derived from the results of WPs 3-5) and then to validate the scenarios to ensure that these are in line with their experiences and expectations, but also to suggest alternative angles on policy implications.



Stakeholder engagement

UNTANGLED's stakeholder engagement approach uses multiple ways of bringing research evidence to the project's stakeholder groups and gathering further insights from them (WP8). This approach is inspired by social innovation research, which centres on the active participation of stakeholders (see European Commission, 2017). In UNTANGLED, stakeholder involvement is organised through participation in face-to-face workshops, webinars and an online platform for ongoing exchange. All these channels use open and participatory methodologies, such as participatory mapping of issues, conceptual modelling, storytelling and visualised (Metaplan) facilitation. Stakeholder representatives and other experts are recruited through the partners' existing contacts and additional desk research and with the assistance of the Advisory Board, aiming for a balanced representation of societal spheres, collective interests and academic disciplines, and also along the lines of gender and age. In this way we leverage expertise and experience from various fields, refine research questions, validate recommendations and results, and translate them into accessible and applicable outputs.

2.4.3. Methods of analysis

Statistical descriptive analyses

The preparation of summary statistics is the first step in any analysis in UNTANGLED. It provides first insights into the variables of interest (e.g. how many jobs have disappeared in the past five years in Europe). Comparative descriptive analyses are used in WPs 2-7, for instance to map changes in indicators of interest (job quality, technology adoption, trade flows etc. (WP2); to trace changes in the age-specific employment structures by routine task intensity (WP3); to characterise migration/skill structures (WP3); to describe changes in connectivity, offshoring/reshoring and various trade flows (WP3, WP5); to collect key facts on changes in inequality (WP3); to characterise the evolution of tangible IT and CT and intangible capital stocks and managerial and organisational capabilities (WP4, WP5); to describe long-term employment patterns in EU regions (WP4); and to identify job quality and gender gaps (WP5). In WP6, comparative summary statistics are inserted in the forecasting models (Tasks 6.2-6.5). WP7 outlines the context in which policy measures were implemented or proposed (Tasks 7.2-7.5).



Econometric analyses

Micro level regressions

In WP3 and WP5 we estimate the impact of technological transformations, globalisation and demographic change on several dimensions of employment outcomes (labour mobility, job quality, wages and income) and firm outcomes (productivity, profitability, reshoring) at the macro, meso and micro levels. Individual-level analyses control for sociodemographic variables (e.g. gender, age, education level). Firm-level analyses control for variables such as product and partner countries. All analyses control for firm characteristics (e.g. size, sector, managerial and organisational capabilities, innovation) and labour market institutions (e.g. employment protection legislation).

Micro-econometric techniques used include the following: recentred influence function (RIF) regressions (Firpo *et al.*, 2018) to quantify the impacts of technological progress and globalisation on returns to skills/occupations and parametrise microsimulations (Task 3.6); Roy model wage regression decompositions (Autor & Handel, 2013; Ñopo, 2008) to analyse gender gaps (Task 5.3); the extensive margin approach to quantify what types of companies relocate their economic activities back to Europe (Bernard *et al.*, 2009; Task 3.5); average treatment effect techniques to study the effects of managerial and organisational capabilities and technological transformations on productivity (Task 5.1) and to study the influence of training investments on employment and wage inequality (Task 5.4); the instrumental variable method (Acemoglu & Restrepo, 2018); Dauth *et al.* (2017), combined with the mapping method of Baumgarten *et al.* (2013), to evaluate the effects of exposure to technology and globalisation on worker flows (Task 5.2); and firm-level and worker-level fixed and random effects panel and pooled regressions (e.g. linear, multinomial or binary) to quantify the effects of technological transformation, globalisation on job quality (Task 5.5).

Macro, sector and cohort level regressions

Cohort pseudo-panel regressions (Martin & Omrani, 2015) are used to assess the effects of technological transformations and globalisation on various age groups (Task 3.1, Task 5.5). Sector pseudo-panel regressions are used to study the effects of population ageing on productivity and capital accumulation (Task 3.2). Macro and sector level fixed and random effects panel regressions are applied in various tasks (Task 3.3, Task 4.1, Task 4.2, Task 4.4), and when appropriate, dynamic panel approaches and GMM estimations are implemented.



Spatial regressions

The impact of labour demand shocks at the regional level (Task 4.8) is estimated using an error correction model built on the Rosen-Roback framework and the recent extension of Amior and Manning (2018). We use the general-to-simple model selection rule and the test procedure proposed by Elhorst (2010) to decide whether a spatial model is the most appropriate, and if so, which (Task 4.6).

Microsimulations

The tax-benefit microsimulation model EUROMOD is used in WP3 (Task 3.6) to decompose changes in income inequality. EUROMOD is an integrated tax-benefit calculator covering the EU27 (and the UK) using the EU-SILC data (Sutherland & Figari, 2013). We use it to calculate, in a comparable manner, the effects of taxes and benefits on household incomes and work incentives in each country and for the EU as a whole. We account for demographic, labour market and tax/transfer differences across the EU. We apply counterfactual scenarios of changes in returns to skills and occupations (created on the basis of RIF regressions on SILC and SES data; Firpo *et al.*, 2018) to identify the effects of technological transformations and globalisation on income inequality in the EU.

Scenario building

We use two models in the scenario-building process (WP6). The first model is the MASST model, which combines national and regional components and has been used to produce a range of territorial scenarios on different challenges that Europe is facing, such as the risk of the EU dismantling (Capello *et al.*, 2015; 2017). The MASST model is based on estimated structural relations. It uses Eurostat's regional and urban database, but also EVS data on social capital; ORBIS data on the regional stock of foreign direct investment; ESPON data on regional multimodal accessibility; EU-LFS data on employment structures; the University of Gothenburg's Quality of Government indictors on the regional quality of governance; CIS data on regional innovation rates; and regional input-output tables provided by the EU Joint Research Centre in Seville. Future national and regional growth rates and labour market outcomes are simulated on the basis of quantitative assumptions prepared in line with WP3-5 results and feedback loops with stakeholders, in a quali-quantitative scenario-building effort that sets targets for endogenous variables.

The second model is a multidimensional version of the Roy (1951) model of regional labour markets in general equilibrium with trade and migration. It is based on a state-of-the-art task



framework of production (Acemoglu & Restrepo, 2018). The model accounts for the self-selection of individuals into occupations and endogenous demand for skills of firms. The modelling of the matching of skills to tasks makes this model particularly suitable for building scenarios conditional on parallel changes in technology, globalisation and skills. It also allows studying which tasks are going to be performed by humans and which by machines (automation). The model also allows for regional differences by accounting for regionally differentiated production structures. The model is calibrated using data for the EU countries, including data for (i) wage distributions, (ii) vacancies posted by firms, (iii) mobility of workers, (iv) regional aggregates, (v) firm characteristics, and (vi) trade. All variables are used with regional (NUTS1), sectoral (NACE 1digit) and occupational (ISCO 1digit) granularity.

The two models will be back-cast to test their efficiency to predict real employment and skills changes that have occurred in the past, and especially during the economic crisis at the end of the 2000s, in order to grasp what happens during an economic downturn. This analysis provides valuable information for the future, given that an economic downturn is expected for the coming years as a result the current health crisis.

2.4.4. Case studies

Case studies are based on semi-structured interviews (Task 3.7, Task 4.5) and aim to explore concrete uses of different technologies in various globalising contexts and changes in work forces, skill levels or working conditions. Manufacturing, business services (especially business process outsourcing) and financial services are covered in selected countries that play an important role in these sectors. The findings of WPs 2, 3 and 5 will be used to narrow down specific subsectors and technology uses and strengthen complementarity between quantitative and qualitative research. Interviews focused on good practices are conducted with representatives of social partners, industry associations and sector experts. Next, companies with innovative and favourable practices that shape the impacts of technology and globalisation are identified in collaboration with UNTANGLED's stakeholder community and Advisory Board. Interviews with both managers and worker representatives are conducted to understand the prerequisites, histories, impacts and transferability of these practices. This final selection of interviewees as well as the number of interviews to be conducted will be discussed and agreed by the consortium when the related tasks are taken up. Interview and reporting guidelines are developed by the ZSI in consultation with the participating partners and stakeholders (Holtgrewe *et al.*, 2015); the interviews will be conducted by country partners. Conceptual details



regarding the approach to be adopted in the UNTANGLED project are documented in Section 3 of this deliverable.

The countries covered include Austria (ZSI), Belgium (KU Leuven), Germany (RWI), Ireland (ESRI), Italy (UNIPG), Luxemburg (LISER), Poland (IBS), China (IPLE-CASS) and South Africa (UCT). Case studies will address sectoral developments through desk research and interviews with national social partner and industry association representatives, as wells as company-level initiatives through interviews with management and worker representatives. For each case study, 2-4 expert interviews (40-50 overall), will be conducted, depending on the case's previous documentation and complexity. These interviews will be summarised and analysed, resulting in 13 brief case study reports prepared according to a common guideline to ensure comparability, as well as an integrated comparative report. We anticipate achieving a minimum of 39 interviews overall - the exact number of interviews will be determined via saturation. We plan to undertake 13 case studies of companies or sector organisations from three different sectors (manufacturing, business services and financial services) in several countries. In addition to the three identified sectors we also want to conduct case studies on workplace innovation initiatives taken by companies or sector organisations. The planned 13 case studies will cover the following countries and sectors:

- manufacturing industry: Belgium, Germany, Italy and China;
- business services: Poland, Ireland and South Africa;
- financial services: Luxembourg, Austria and China;
- workplace innovation: Belgium, Austria and South Africa.

2.4.5. Methods related to the construction of data and indicators

Throughout UNTANGLED, various sets of indicators are created. The most important ones are presented in the next section.

Occupation and worker level tasks (Tasks 3.1, 5.2, 5.5, WP6)

To quantify the task content of occupations and exposure to the de-routinisation of labour markets, we use three methodologies and data sets: (i) Acemoglu and Autor (2011) metrics, obtained by merging O*NET data on occupation level tasks with EU-LFS data, using the cross-walks developed by Hardy *et al.* (2018); (ii) the Lewandowski *et al.* (2019) method to calculate country-specific job task contents based on PIAAC; and (iii) the Eurofound (2016) methodology on EWCS data. All these task measures are based on secondary data and are to be matched with existing EU surveys (LFS, SES, SILC) and used throughout the project.



Skills (Tasks 3.4, 5.3, WP6)

AI and data mining methods are used in WP3 to discover new patterns of skill demand from large sets of information from online job vacancies data. We use AI algorithms (e.g. classification, prediction, regression, clustering, information filtering) to measure skill similarities (in terms of lexicon variation) across occupations, as well as the evolution of skill demand in occupations. We mainly use text classification algorithms (e.g. ontology- or machine-learning-based), complemented with visual paradigms to represent outcomes. Our approach complements Cedefop's project aimed at setting up a system to analyse online vacancies for the EU27 with a focus on skills/technical change.

Regional indicators (Tasks 4.6, 4.7, WP6)

We construct regional indicators regarding 4.0 technology adoption (e.g. robots, online sales) for different sectors in all European regions. We also measure the dynamics and structure of regional economies. We mainly use data from Eurostat (regional aggregated economic, employment and urban indicators) and OECD PIAAC (available at national level, the tasks aim to estimate at the regional level).

Managerial and organisational capabilities, innovation and technology investments (Tasks 4.2, 5.1, WP6)

We use data on patent applications to build a company level indicator reflecting in-house investment in technological knowledge and managerial capabilities. We capture general dynamic capabilities (Teece, 2010; 2016) measured by the implementation of quality (ISO 9000) and environmental (ISO 14000) standards, managerial attention to new products or emerging technologies (Helfat & Martin, 2015) measured by word counts in the annual reports of firms; managerial skills and experience measured by education and tenure; and firm-level patent applications (OECD EPO Regpat).

Training Investments (Task 5.4, WP6)

We construct firm-level measures of vocational training for various EU countries, based on continuing vocational training survey (CVTS) data, expressed as the share of these expenses on total labour cost or as a proportion of training hours on total hours worked, distinguishing by the skills required, e.g. IT, management and foreign language.



Table 1. Data sources to be used in UNTANGLED

Name	Countries	Period	Provider	WP
International Federation of Robotics – IFR	EU (except Cyprus and Luxembourg) + some non-EU countries	1993-2018	IFR	WP3, WP4, WP5, WP6
Occupational Information Network – O*NET	US	2002- present	O*NET	WP3, WP5, WP6
EU – KLEMS Growth and Productivity Accounts	EU + some non-EU countries	1995-2017	EU-KLEMS, wiiw	WP3, WP4
Continuing vocational training survey – CVTS	EU	2005, 2010, 2015	Eurostat	WP5
Orbis Europe database	EU + some non-EU countries	2010-2019	Bureau Van Dijk	WP4, WP5, WP6
ISO certification	EU + some non-EU countries	2019	Orbis Europe database Firms' website	WP5
EPO Regpat database	EU	1978-2020	OECD	WP4, WP5, WP6
European Working Conditions Survey – EWCS	EU + some non-EU countries	2005, 2010, 2015, 2020	Eurofound	WP5
Labour Force Survey – LFS	EU + some non-EU countries	1995- present	Eurostat	WP3, WP4, WP5, WP6
Structure of Earnings Survey – SES	EU + some non-EU countries	2002, 2006, 2010, 2014, 2018	Eurostat	WP3, WP4, WP5, WP6
European Statistics on Accidents at Work – ESAW	EU + some non-EU countries	1993- present	Eurostat	WP5
Statistics on Income and Living conditions – EU- SILC	EU + some non-EU countries	2003- present	Eurostat	WP3, WP4, WP5
European skills and jobs survey – ESJS	EU	2014	Cedefop	WP3, WP5
Survey of Adult Skills – PIAAC	39 OECD countries	2011-2012, 2014-2015, 2021-2022	OECD	WP3, WP4, WP5
International Trade Statistics – COMTRADE	EU + some non-EU countries	2008-2015	United Nations	WP3, WP4, WP5, WP6
Annual detailed enterprise statistics	EU + some non-EU countries	2009-2017	Eurostat	WP5, WP6



Name	Countries	Period	Provider	WP
Demographic forecasts	EU + global coverage (UN)	2015-2070	Eurostat and UN	WP3, WP4, WP6
Employment protection legislation database – EPL	52 OECD countries + 38 other countries	2008-2013	OECD	WP3, WP5
Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts	55 countries	1960-2018	AIAS	WP3, WP5
Regional aggregate indicators and urban data	EU	1990-2017	Eurostat	WP6
European Value Study – EVS	EU + some non-EU countries	1981-2017	Data Archive for the Social Sciences (DAS) at GESIS	WP6
ESPON data on regional multimodal accessibility	EU + some non-EU countries	2001-2006	ESPON projects	WP6
Quality of Government indicators	EU	2010, 2013, 2017	University of Gothenburg	WP6
Community Innovation Survey – CIS	EU + some non-EU countries	1998-2014	Eurostat	WP6
World Input-Output Database – WIOD	EU + some non-EU countries	2000-2014	WIOD	WP3, WP4, WP5
Regional input-output tables	EU	2010	JRC + Thissen <i>et</i> al. (2019)	WP6
Data on trade disputes	Worldwide	1995- present	WTO	WP5, WP6
Eurostat's Job Vacancy database	EU + some non-EU countries	2001- present	Eurostat	WP6
Online job vacancies OJV data – Skills panorama	EU	2018- present	Cedefop	WP3, WP6
Online job vacancies OJV data –- sectoral and regional data	Belgium, France, Germany, Luxembourg	2018- present	Burning Glass technologies	WP3, WP6
European Company Survey – ECS	EU + some non-EU countries	2004, 2009, 2013,2019	Eurofound	WP5
Annual Regional Database of the European Commission – ARDECO	EU + some non-EU countries	1985-2021	European Commission, Joint Research Centre	WP4
Digital Economy and Society Index – DESI	EU	2014-2019	European Commission	WP3, WP6



2.5. Glossary

<u>COMPETITIVENESS</u> - Competitiveness is a measure of the comparative advantage or disadvantage of <u>enterprises</u>, industries, regions, countries or supranational economies like the <u>European</u> <u>Union (EU)</u> in selling its products in international markets. It refers to the ability to generate relatively high income and employment levels on a sustainable basis while competing internationally. [Source: <u>Eurostat (2021)</u>].

<u>DATA PROTECTION</u> - Data protection refers to limits on the processing and use of personal data. This includes data about employees, such as personal health records, and data created or used by employees in emails or internet use. [Source: <u>EurWork Glossary (2019)</u>].

<u>DEMOGRAPHIC CHANGE</u> - Demographic change describes the changes in population size and structure caused by changes in birth rates, death rates, and by migration. Demographic change in the Western developed countries of today is marked by low birth rates below population replacement and by rising life expectancy. [Source: <u>Max Planch Institute Glossary (2021)</u>].

<u>DIGITISATION</u> - Digitisation is a component of digitalisation, the integration of digital technologies into everyday life by the digitisation of everything that can be digitised. Digitisation refers to processes that transform elements of the physical word into bytes. [Source: <u>EurWork</u> <u>Glossary (2018)</u>].

<u>DIGITAL TRANSFORMATION</u> - Digital transformation is the use of digital technologies and data as well as interconnection that results in new or changes to existing activities. Digital transformation refers to the economic and societal effects of digitisation and digitalisation. [Source: <u>OECD (2020)</u>].

<u>DISCRIMINATION</u> - Discrimination may be defined as different treatment of individuals or groups based on arbitrary ascriptive or acquired criteria such as sex, race, religion, age, marital or parental status, disability, sexual orientation, political opinions, socio-economic background, and trade union membership and activities. [Source: <u>EurWork Glossary (2018)]</u>.

<u>DISCRIMINATION ON THE GROUNDS OF AGE</u> - Age discrimination refers to the less favourable treatment of an individual or group due to conditions or requirements relating to age which cannot be shown to be justifiable. [Source: <u>EurWork Glossary (2019)]</u>.

DISCRIMINATION ON THE GROUNDS OF RACIAL OR ETHNIC ORIGINS- Discrimination on the grounds of racial or ethnic origins is outlawed by Council Directive 2000/43/EC of 29 June 2000. The Directive implements the principle of equal treatment between persons irrespective of racial or ethnic origin. Article 2 defines the concept of discrimination and states that it encompasses



direct and indirect discrimination, harassment and instructions to discriminate. [Source: <u>EurWork Glossary (2019)]</u>.

<u>DISCRIMINATION ON THE GROUNDS OF RELIGION OR BELIEF</u> - Religion or belief discrimination refers to differential treatment of individuals or groups based on their system of belief or worship. [Source: <u>EurWork Glossary (2019)</u>].

<u>DISCRIMINATION ON THE GROUNDS OF SEXUAL ORIENTATION</u> - Discrimination with respect to sexual orientation refers to different treatment on the basis of an individual or group's sexual preference.

<u>DISPLACED WORKERS</u> - Displaced workers are workers who permanently lost a stable job in the last few years and who are currently unemployed, out of the labour force or re-employed. The analysis of displaced workers relies on flow analysis concerned with what happens to these workers after displacement from their job. Do they find another job or not, and if so, under what conditions? These studies are based on longitudinal or retrospective follow-up surveys. [Source: <u>OECD Glossary (2018)]</u>.

<u>EUROPEAN LABOUR MARKET</u> - The term 'European labour market' is used to describe the demographic profile of the labour force as well as the systems of regulation, at EU level, concerned primarily with the free movement of workers but additionally with other forms of regulation that shape Europe's labour market. [Source: <u>EurWork Glossary (2018)</u>].

<u>EQUAL OPPORTUNITIES</u> - Equal opportunities refers to an equal distribution, among individuals, of opportunities for education, training, employment, career development and the exercise of power without their being disadvantaged on the basis of their sex, race, language, religion, economic or family situation, and so forth. [Source: <u>EurWork Glossary (2018)]</u>.

<u>GENDER EQUALITY</u> - Gender equality refers to equality between women and men with respect to their treatment, opportunities, and economic and social achievements. The concept is often viewed in relation to the workplace and labour organisations. [Source: <u>EurWork Glossary</u> (2018)].

<u>GLOBAL VALUE CHAINS</u> - Global value chains refers to the phenomenon where the different stages of the production process are located across different countries. Globalisation motivates companies to restructure their operations internationally through outsourcing and offshoring of activities. [Source: <u>OECD (2021)</u>].

<u>GLOBALISATION</u> - Globalisation refers to the phenomenon of the opening up of economies and borders. It results from the increase in trade and capital movements, the movement of people



and ideas and the spread of information, knowledge and technology. [Source: <u>EUR-Lex Glossary</u> (2021)].

<u>ICT CAPITAL</u> - Physical capital stock consists of equipment related to information and communications technology. [Source: Own definition].

INCOME INEQUALITY - Income inequality refers to how unevenly income is distributed throughout a society. The less equal the distribution, the higher the income inequality. [Source: Own definition].

INTANGIBLE CAPITAL - Assets which are not of a physical nature. Examples include brand recognition, patents and trademarks. [Source: Own definition].

<u>JOB LOSS</u> - Job loss refers to the disappearance of jobs because of fundamental structural economic changes as distinct from transient fluctuations in demand. These structural changes include technological innovation, changes in the pattern of international trade, shifts in the location of activities, and changes in the structure of employment and organisation within enterprises. [Source: <u>OECD Glossary (2018)</u>].

JOB POLARISATION - Job polarisation refers to a situation where the share of occupations requiring medium skills is shrinking while the share of occupations requiring high skills and low skills is increasing. [Source: Own definition].

<u>MIGRATION</u> - Movement of individuals who leave their region of residence to live in another region. Movement of individuals from one EU country to another EU country is also called (intra-)EU mobility. [Source: <u>Max Planck Institute Glossary (2021)</u> and own elaboration]

<u>OFFSHORING</u> (OPPOSITE OF RESHORING) - THE PRACTICE OF MOVING A BUSINESS OR PART OF A BUSINESS TO A DIFFERENT COUNTRY. [Source: Own definition].

<u>RESHORING</u> (OPPOSITE OF OFFSHORING) - The <u>practice</u> of <u>moving</u> a <u>business</u> or <u>part</u> of a <u>business</u> that was <u>based</u> in a different <u>country</u> back to <u>its original country</u>. [Source: <u>Cambridge Dictionary</u> (2021)].

<u>SKILLS</u> – ABILITY TO APPLY KNOWLEDGE AND USE KNOW-HOW TO COMPLETE TASKS AND SOLVE PROBLEMS. [Source: <u>CEDEFOP (2008)</u>].

<u>SKILLS MISMATCH</u> – Situation of imbalance in which the level or type of skills available does not correspond to labour market needs. [Source: <u>CEDEFOP (2021)</u>].

<u>SOCIAL PARTNERS</u> - Social partners is a term generally used in Europe to refer to representatives of management and labour (employer organisations and trade unions), and in some contexts



public authorities that engage in social dialogue. The term 'European social partners' specifically refers to those organisations at EU level that are engaged in European social dialogue, provided for under Articles 154 and 155 of the Treaty on the Functioning of the European Union (TFEU). [Source: <u>EUROFOUND (2022)</u>].

<u>SOCIAL PROTECTION</u> - Social protection systems are highly developed in the European Union. They protect people against the risks of inadequate incomes associated with unemployment, ill health and invalidity, parental responsibilities, old age or following the loss of a spouse or parent. The ability of workers to sustain these risks and provide this support depends to a great extent on their employment context, and whether, and to what extent, individual capacity or collective solidarity at work can provide social protection. [Source: <u>EurWork Glossary (2019)</u>].

<u>SOCIAL SECURITY</u> - Social security refers to the public or state system of welfare and protection against social risks. In the workplace context, employers may administer measures to afford financial protection for employees after events such as invalidity, death (of family members), unemployment, industrial accidents and occupational diseases. [Source: <u>EurWork Glossary</u> (2018)].

<u>TECHNOLOGICAL TRANSFORMATION</u> - Fundamental overhaul of organisations' use of resources, both human and capital resources, facilitated by recent and future innovations primarily in robotics and digital (and networked) technologies, as well as innovations in management. Digital transformation is the prime enabler of technological transformation. [Source: Own <u>description</u>].

<u>THE UNEMPLOYED</u> - The unemployed comprise all persons above a specified age who during the reference period were:

- without work, that is, were not in paid employment or self-employment;
- currently available for work, that is, were available for paid employment or selfemployment; and
- seeking work, that is, had taken specific steps in a specified recent period to seek paid employment or self-employment.

The specific steps may include registration at a public or private employment exchange; application to employers; checking at worksites, farms, factory gates, market or other assembly places; placing or answering newspaper advertisements; seeking assistance of friends or relatives; looking for land, building, machinery or equipment to establish own enterprise; arranging for financial resources; applying for permits and licences, etc. [Source: <u>OECD Glossary (2018)]</u>.



<u>UNEMPLOYMENT RATES</u> - Eurostat produces harmonised unemployment rates for individual EU member states, the euro area and the EU, based on the International Labour Organisation (ILO) recommended definition and using the results of a harmonised source, the European Union Labour Force Survey (LFS). Unemployment rates represent unemployed persons as a percentage of the labour force (the total number of people employed plus unemployed). [Formerly known as comparable unemployment rates (CURs)].

<u>WAGE INEQUALITY</u> (see also income inequality) - Wage inequality refers to how unequally wages are distributed in a society. The more unequally wages are distributed, the higher the wage inequality. [Source: Own definition].

<u>WORK</u> - Work is any activity which contributes to the production of goods or services within the production boundary. [Source: <u>OECD Glossary (2018)]</u>.

<u>WORK EXPERIENCE</u> - Work experience refers to the past work experience of the person classified as unemployed. It establishes whether the person worked before or is seeking or available for work for the first time. [Source: <u>OECD Glossary (2018)</u>].

<u>WORKING CONDITIONS</u> - Working conditions refers to the working environment and aspects of an employee's terms and conditions of employment. This covers such matters as: the organisation of work and work activities; training, skills and employability; health, safety and well-being; and working time and work-life balance. [Source: <u>EurWork Glossary (2019)]</u>.

<u>WORKPLACE INNOVATION</u> - Workplace innovations are strategically induced and participatory adopted changes in an organisation's practice of managing, organising and deploying human and non-human resources that lead to simultaneously improved organisational performance and improved quality of working life. [Source: <u>Pot, Dhondt, and Oeij (2012)]</u>.

3. Qualitative research

3.1. Introduction

Qualitative research in UNTANGLED complements the quantitative analysis with examples of the interplay between technological change, globalisation and demographic change in the experience of stakeholders, social partners, managers and workers. It consists in the field research of Tasks 3.7 and 4.5, in which expert interviews are conducted. The stakeholder engagement in WP8 also has a research aspect to it, whereby we integrate stakeholder input and comments into UNTANGLED research and monitor the uptake of such inputs in the project. Hence, participants in UNTANGLED's qualitative research are experts or stakeholders, and the categories may



overlap. Procedures for their recruitment, information and consent have been documented in D10.5, and draft documents for information and consent in D 10.1.

3.2. Data protection and privacy in general³

In all activities, only data that are relevant and limited to the purposes of the project are gathered, processed and stored, complying with the data minimisation principle. The number of case studies and interviews will balance the need of acquiring sufficient information on the one hand and the data minimisation principle on the other. Yet, personal data must inevitably be used to contact and inform both interviewees and stakeholders, and also for administrative purposes (e.g. organising workshops, maintaining lists of participants). Some personal data are also needed to ensure the representation of diverse groups in interviews and stakeholder engagement. Where these need to be stored, they will be kept separate from interview data and other data generated in the research process.

All data used in the project will be stored on password-protected servers of the respective institutes using these data. Further, there will be physical access control as well as data access control and up-to-date firewalls and virus scanners. The data access control ensures that the data can only be accessed by the institutes' data managers and by those researchers who are directly involved with the respective task and have signed individual confidentiality agreements as necessary. For those (potential) respondents or stakeholders who decline involvement, personal data will be deleted. Data subjects will, at any time, have the right to access their data and have them removed, without any repercussions or questions.

While interviews may also entail participants' professional opinions, feedback or input, no personal views will be registered. All data on individuals and firms will be pseudonymised immediately after data collection of the qualitative interviews, and only anonymous interview transcripts will be analysed. Interview transcripts and records (also including filenames) will be coded to avoid that information collected can be linked to specific individuals. The interview data are pseudonymised by adding a random pseudo ID to each interview immediately during transcription. Further, transcripts are stored without any hints on gender and age. Access to these data will be closely monitored and will only be available to authorised researchers who have provided sufficient institutional support and traceability of the use they make of the data. Data are stored on a secured server, which can only be accessed via user identification and password.

³ Deliverable D10.5.



In order to minimise contact data use in the project, the initial contact with potential stakeholders at the national level is made by each consortium partner who is likely to have already established contacts. Hence, the stakeholder community database developed in WP8 by ZSI will only contain those stakeholders who have been informed and have agreed to being involved. The online surveys of participants of events conducted in a lightweight way to gather feedback will not cover personal details of the interviewees and will only be analysed after having been completely anonymised.

Throughout non-public workshops the Chatham House Rule⁴ is applied unless participants or the purpose of the workshop (for example, a declaration to be co-created and signed or a public panel discussion) require a different procedure. For dedicated statements by participants intended for publication, e.g. video interviews of participants, the purpose is made clear and consent obtained prior to the recording and publication. For photographs of meetings and workshops, a possibility to opt out is provided.

3.3. Tasks 3.7 and 4.5 Case study and field research

3.3.1. Recruitment and selection procedures

Task 4.5 entails 13 comparative case studies in three strategically chosen (sub-)sectors (manufacturing, business services and financial services). They will be investigated in 3-4 countries per sector. Countries and sectors are chosen on the grounds that the respective subsectors are central to the national labour market and have varying skill levels and gender compositions. In addition to the three identified sectors, the project will also conduct case studies of workplace innovation initiatives taken by companies or sector organisations. The actual areas of research will be further specified to ensure comparability and relevance to the project, and information and consent templates will be adapted as necessary. Besides desk research on selected cases, interviews (40-50 overall) with experts, national social partner and industry association representatives and company-level initiatives are foreseen, as well as with management and worker representatives.

Interviewees will thus come from companies or sector organisations that are able to further deepen our understanding of the results of WPs 4, 5 and 7, representing 'typical', 'avant-garde' or 'contrasting' examples of intersections between technology, globalisation and demographic

⁴ <u>https://www.chathamhouse.org/about-us/chatham-house-rule</u>: 'When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.'



change. Hence, they will be selected, first, according to their function in the organisation and their expertise. Second, we aim to ensure that the diverse groups who are present in the field and affected by the trends are represented among the respondents, with particular attention paid to vulnerable groups such as the low-skilled or precariously employed. This will entail an initial process of identifying the best and available interviewees, sometimes asking for further recommendations.

However, it is possible that holders of senior (expert) positions in the company or sector organisation will be over-represented and will also be targeted in the first instance. As the sectors and technologies involved are dynamic, however, we shall pay attention to the age and gender distribution of the expertise involved, and the ways in which it may be changing (for example, banks and fintech start-ups) or may vary by country and institutional environment. Workplace innovation cases will be selected in ways that respond to critical developments AND address particularly vulnerable groups, such as young or older workers, immigrants, the low-skilled, or people with discontinuous careers.

3.3.2. Informed consent

For the interviews conducted in Task 4.5, potential participants receive the UNTANGLED information brochure provided by WP9 and a copy of the information letter (D10.1) in the national language, adapted to the case study and research context in question. The information letter outlines the purpose of the project and of the interview, voluntary participation and the possibility to withdraw, anonymity and confidentiality, and the research process including data analysis and publication. Contact data of the local research team, the task leader and the project coordinator are provided, as well as those of the KU Leuven Ethics Committee should any complaints arise.

The informed consent form covers the respondent's understanding of the information received and the provisions taken by the project, and agreement to participate. Before signing, respondents will be encouraged to ask the researcher/interviewer any questions they might still have or ask for further information as needed.



Information Letter Template for interview partners for the UNTANGLED project⁵ Title of project: UNTANGLED

Co-ordinator: Prof. Dr. Monique Ramioul, Dr. Karolien Lenaerts, KU Leuven Researcher conducting the interview: [name, institutional affiliation]

Invitation to participate

Dear ...

The research team of [research facility] would like to invite you to take part in the research of the European H2020 research project UNTANGLED. It is up to you to decide whether to take part. Please take the time to read this information sheet and discuss it with others if you wish. Ask the researcher if there is anything that is not clear or if you would like more information.

1. What is the goal of the UNTANGLED project?

UNTANGLED aims to fill knowledge gaps about the three key megatrends of technological change, globalisation and demographic changes and the socioeconomic challenges and opportunities they pose for the EU. These trends impact not only the economy at large and the labour market but also the social structure and social inequality. As such they influence people's own job situations, working conditions and perspectives. We look at these challenges and opportunities through the perspective of economics and social sciences and aim to get a more comprehensive picture using various forms of statistical analysis of existing datasets and interviews in sectors and companies where these trends are experienced in real life. We also adopt a comparative perspective, covering the EU as well as developments in Africa, China and Latin America with partners from these regions. The results will feed into scenarios and extensive discussions and consultations with policymakers, representatives of business, employers' associations, trade unions and civil society organisations. They will also be presented to the general public on the website www.projectuntangled.eu and through local events. If you are interested, the research team will be pleased to keep you posted.

2. What is the goal of this interview?

We want to gain a deeper insight into the experiences and perceptions of employers' organisations, trade unions, managers and workers regarding the impact of technological change, globalisation and demographic trends and analyse their strategies to address them. To this end we are conducting a case study of your [company | workplace | sector | initiative]. We have read publicly available documents on the subject and would like to ask you personally and a number of other people who can provide insights (such as other managers, workers, works councillors, union or employer associations' representatives). We will then put all these insights together and try to build the 'story' of the case, compare it with similar or different 'cases' in other countries and figure out what the research project can learn from it. In sum, giving your time and sharing your experience will help us to better understand how trends that appear very abstract affect people's direct work situations and what policy can do to ensure that these effects are positive.

3. How is this interview done?

If you agree to participate, one of our team's researchers will set up an appointment with you, and he or she will interview you. We expect interviews take between 45 minutes and one hour. We will ask you to sign a consent form and give you a copy of it, and you will have the opportunity to ask questions and discuss any further concerns with your interviewer before you agree. The interview will be recorded if you agree, and a transcript produced by the researcher; in case you do not agree to a recording, the researcher will take notes and transcribe these for data analysis.

4. Are there any risks or discomforts involved in participation?

We do not anticipate any risk or discomfort from participating in this interview. If you feel uncomfortable or do not want to answer individual questions, just say so, and the interviewer will skip them.



- 5. What happens if I do not want to participate or continue? Basically, we will not do the interview and delete your personal data. There are no negative consequences for you. Your participation is entirely voluntary, and you can withdraw it at any time during the interview or at any time up to one month after the interview. You do not have to give a reason. If you wish to withdraw from the research, please contact [researcher's name and email address | phone no].
- 6. What happens after the interview?

The transcript of the interview will be analysed by one or two members of our research team. Before this is done, your interviewer will have removed all personal data and references that may identify you in their transcript and assigned a pseudonym to you and the [company | organisation] you work in. Access to the anonymous interview transcript will be limited to [name of the researcher] and those colleagues who carry out the data analysis. Any summary content or direct quotations from the interview that are published will be anonymised so that you cannot be identified, and we shall take care to ensure that other information in the interview that could identify you is not revealed. Generally, the focus of any publications from this research will be on the case or the collection of cases within a sector, not on individual views.

- 7. Will my participation in the project's activities remain confidential? All answers will be anonymised. This means that any information that could be used to identify you will not be included. The contact data we have used to get in touch with you will be kept separately from the interview data in password-protected files. Personal data can only be consulted by the researchers associated with the case study, and only for the purpose of contacting you. These data will be stored on secure servers at [the research facility] and will at no time be accessible to researchers who are not directly participating in the research. When the data are no longer needed or the project ends, the data will be deleted.
- 8. Who are the people responsible for this project? This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004776. The project is coordinated by Prof. Dr. Monique Ramioul and Dr. Karolien Lenaerts of KU Leuven. The case study in which you will be involved will be conducted by the research team of [research facility], and the case studies in general are coordinated by Dr. habil. Ursula Holtgrewe, ZSI.
- 9. Whom should I contact for further questions?

If you have any questions after reading this information letter, please contact the research team at [the research facility], or the task leader or project coordinator. For any complaints or other concerns regarding ethical aspects of the project you can also contact the Ethics Committee of KU Leuven, which is not actively participating in the project: smec@kuleuven.

Thank you very much for your interest and participation!

Dr. habil. Ursula Holtgrewe
Task Leader of the case studies
ZSI – Centre for Social Innovation
holtgrewe@zsi.at
+43-1-495 04 42 58



Consent Form for interviewees taking part in the UNTANGLED project⁶

By signing this document, you agree to participate in an interview with a researcher from [research facility] involved in the UNTANGLED project. You will receive a copy of this document for your records. The [research facility] will keep the signed copy for the project documentation. Please make sure that we have answered any questions you may have about the study and that you understand what we are asking you to do. You can always contact the researcher you talked to or the task or project co-ordinator if you think of a question later.

Specifically, by your signature, you approve the following:

- o the interview will be recorded and a transcript will be produced
- o OR notes will be taken and summarised (please tick)
- o the actual recording will be destroyed upon transcription
- o the transcript of the interview will be analysed by members of the research team of [research facility]
- o access to the interview transcript will be limited to (name of the researcher) and the colleagues involved in the data analysis
- o any summary interview content or direct quotations from the interview that are published will be anonymised so that you cannot be identified, and we shall take care to ensure that other information in the interview that could identify you is not revealed
- o any variation of the conditions above will only occur with your further explicit approval.

By signing this form, I agree that:

- o I am voluntarily taking part in this project
- o I understand that I do not have to take part, and I can stop the interview or skip questions I do not want to answer at any time
- o The transcribed interview or extracts from it may be used as described above
- o I have read the information sheet
- o I don't expect to receive any benefit or payment for my participation
- o I can request a copy of the transcript of my interview and may make edits I feel necessary to ensure confidentiality
- o I have been able to ask any questions I might have, and I understand that I am free to contact the researcher with any questions I may have in the future.

Name of Participant Date, Signature

Name of Researcher

Date, Signature

3.4. Reporting guidelines for UNTANGLED Task 4.5 case studies

3.4.1. Introductory remarks

Each case study should be summarised in a short report of approximately 15 pages (using the UNTANGLED template). The case studies, sorted by sectors, will form the basis of the synthesis report. A meaningful synthesis of what will certainly be very rich material will only be possible if the cases are presented in a standardised way and comprehensive information is given under each heading. At this stage we suggest a structure for the description of the case studies that is

⁶ Deliverable 10.1.



based on UNTANGLED's trends and impacts. It can also be used in devising interview guidelines and coding individual interviews or research materials. Please give some (short) verbatim quotations from the interviews to convey the 'flavour' of the case and to illustrate the respondents' views on important points of the case study. These should not take the place of description and analysis but rather add value by bringing particular characteristics of the case or the situation into focus.

Figure 4. Trends and impacts



3.4.2. Guidelines

The following headlines are the suggested guidelines for your report; the text suggests the questions to be answered.

THE 'STORY OF THE CASE'

An overview of why it is interesting. Best written last. This section gives a brief overview of the key findings and its 'fit' into UNTANGLED.

What is the case, what is its context?

A sector, a subsector, a company.

Brief basic characteristics:

• the sector/company involved;



- its overall structure;
- the number of workers in the company/sector;
- in the case of a company: the function/units investigated within the company;
- the market position and position of companies within the sector (customers/clients, possible value chains, competition), expanding, shrinking, regional, global reach, etc.

History and influences shaping the case: mergers and acquisitions, FDI, dedicated policies related to the case, company restructuring, social partnership, etc. What is happening, where and how did it start, how did it develop, what influenced developments, what came out of it.

How does it fit into the triangle of technological change/globalisation/ demographic change?

Key impacts and the ways in which these are being addressed or shaped

This should address the key impacts along the lines of inequality, employment or skills that the case refers to, also ways in which these impacts are addressed (or not).

Methodology: Short information on how the case study was conducted

Data sources, how many interviews and with whom, ...

Including: organisations/companies/units covered by the research, data sources, number of interviews, number of male/female respondents, position of respondents, number of visits, etc.

Any field research, also participation in sector events, conferences etc. – if you can get observational data, even if it is just a tour of the premises, do it and take useful notes, including atmosphere, etc!

Case study findings

Please present, under the following headings, not only the current state of affairs but also the development of the current situation: growth, mergers, restructuring, strategies, changes and continuities.

The company/the sector/subsector

- Company: legal and ownership structures, company boundaries, geographical structure, history and changes in the company (restructuring, expansion, mergers and acquisitions), location decisions.
- Markets, clients, competition.



- Employment structure and workforce composition (gender, ethnicity, age, skills), wage level (also in the regional context).
- Forms and practices of workers' representation: formal, informal, information and consultation, issues of negotiations, collective agreements.
- Impact of national and European regulation (market, industrial relations, employment conditions) and problems of enforcement.
- Influence on regulations and national/European institutions.

Globalisation

- Location in global value chains where appropriate: including contractual relations (between the companies) and power relations (main power resources of companies and units, forms of governance of the value chain).
- Location decisions, changes in division of labour.
- Regional embeddedness or not.

Technology use

- Technological focus of the case present and future.
- Uses of technology.
- Innovation pathways: incremental, disruptive .
- Complementary innovations: process, forms of work, social innovations.

Demographic change

- Labour markets global/local.
- Staff shortages and responses.
- Recruitment strategies, turnover.

Interrelated changes

Intersections between tech change | globalisation | demographic change that matter in the case, influence and impact on another (a summarised version goes into Section 2.2)

Impacts

Also keep 3.5 in mind when asking for 'impacts' – how are these impacts explained by the trends observed, what contributes to what?



Skills

- Changes of skills: deskilling, upskilling, polarisation.
- Skills gaps and shortages.
- Case-specific vulnerable groups and ways to address vulnerabilities (retraining, lifelong learning, how and for whom?); also use of public support schemes.
- Role of regional education and training structures, universities, networks etc.

Employment

- Expansion, shrinkage by functions, skill levels.
- Employment in the region (where appropriate).
- Atypical employment (part-time, fixed-term, zero-hours, internships, platform work), posting of workers.
- Presence of formal/informal segmentations, division of labour (age, gender, ethnicity).
- Labour market transitions (older workers, parents returning to work, entry positions) – mind company- and sector-specific and national/EU frameworks!

Job quality

It may be worthwhile to connect these dimensions with the case's labour market situation. In the event of staff shortages or mismatches in the labour market, ask what could be done to address these!

- Flexibility and security.
- Organisation of working hours, temporal flexibility (including changes).
- Work organisation (teamwork, project work, remote collaboration and coordination, discretion, responsibility, job crafting, monitoring, supervision and control – how, with or without tech support, role of customer contact).
- Health aspects: physical, mental, emotional stress and strain.
- Wages and payment system (presence of collective agreements, minimum wages, pay-scale grouping – how? Elements of performance-based pay, wage development over time), benefits (especially, collectively agreed or sector-/company-specific).
- Careers and perspectives within company/sector, also external labour markets, role of HRM.



Inequality

- Upgrading/downgrading/polarisation of income, perspectives, employee groups, dual labour markets, etc.
- Equalities along the lines of gender, ethnicity, age/seniority.
- Regional inequalities (difficult on the case-study level, maybe pick up on location decisions?).
- Relative position of company/sector in the national context, with regard to income, also prestige.

Conclusions

What's new, what's surprising, what does the case stand for, what's to be learned from it?

Also (to be refined with stakeholders and partners as UNTANGLED advances, so tentative conclusions are welcome): how does it relate to UNTANGLED's macro, meso and micro findings? Any discoveries the cases may help to explain or challenge?

3.5. WP8 Stakeholder engagement

3.5.1. Recruitment and selection procedures

For stakeholder representatives, we aim for a gender- and age-balanced composition from the start, also by bringing in representatives of new or specialised organisations and initiatives outside the established fields of social partnership, business or academia, such as start-up companies, women's business and tech networks or migrant and social entrepreneurs. Considering the technological focus of the project and the overall under-representation of women in many technological fields, we aim for a gender composition of the expert pool and workshop participants in between the actual distribution in the field or sector and 50:50 representation. The same applies to panels in public discussions, experts in dissemination activities, etc.

With the support of the Advisory Board, researchers involved in WP8 will gather contacts and build a community of stakeholders along these lines, drawing on each partner's contacts in the fields of technological transformation, globalisation, work and employment, education and training, development and deployment of digital technologies, economic shocks and resilience, regional development etc., and on additional desk research to explore their levels of influence and interest in participating in UNTANGLED. In order to facilitate stakeholder recruitment with current data protection practices, an information letter and informed consent form are produced (see below and D10.1), targeting possible stakeholders. These are to be forwarded by all



consortium partners to their respective contacts. Participation will be voluntary and not linked to any kind of condition, remuneration or advantage.

To ensure an equitable representation of diverse views in the UNTANGLED events, we will apply various stakeholder-tailored policy co-creation models (such as dilemma-based decision-making, design thinking, etc.) in the design of events. The organisation of dialogical research requires specific methodological rules to guarantee a 'genuine' triangulation of standpoints and avoid biases caused by imbalances in power and communication skills. Participative qualitative research methods need to be adapted to the particular setting and stakeholders. The following principles will be adhered to: adaptation of analytical instruments and language; intercultural and gender- and age-sensitive, etc. approaches, including training of all participants for a better mutual understanding; continuity and feedback at all research stages; dialogical and reflexive approaches; joint (voluntary) involvement of all parties until the end of the research, including joint formulation/approval of the conclusions; and recognition of individuals' contribution if they desire.

3.5.2. Informed consent

Stakeholder representatives are nominated and first contacted by all consortium partners. For information, they receive the UNTANGLED brochure and a formal letter of invitation to participate, signed by the UNTANGLED coordinator and the work package leader responsible for the stakeholder engagement work package (WP8). We assume that stakeholders can be informed and communicate in English. Hence, no translation into national languages will be necessary for the project-wide stakeholder community. However, if necessary or desirable, events or consultations can be conducted in other languages and documents used and adapted accordingly.

The information letter (D10.1) covers the purpose of the UNTANGLED project and the role of stakeholder engagement, the reasons for inviting a particular person, an explanation of the target group of stakeholders, the varied activities and contributions expected of stakeholders, voluntary involvement and the rules for public and non-public events. Contact data of the local research team, the work package leader and project coordinator are provided as well as those of the KU Leuven Ethics Committee in case of any complaints.



Information Letter: Invitation to join the UNTANGLED stakeholder community⁷

Madam,

Sir,

We would like to introduce you to the new European research project UNTANGLED and cordially invite you to participate in its activities and become part of the community of stakeholders and practitioners who conduct an ongoing dialogue with the project's research. The project is funded by the European Commission's Horizon 2020 Research Programme under grant agreement No 101004776, which runs from February 2021 to January 2024. In the following section we explain the purpose of the research and the roles and options we are offering for your participation. Before deciding how you would like to be involved (or not), we would ask you to read this information carefully. If you have any further questions, please do not hesitate to contact us.

1. What are the goals of UNTANGLED?

UNTANGLED aims to fill knowledge gaps about the three key megatrends of technological change, globalisation and demographic changes, as well as the socioeconomic challenges and opportunities they pose for the EU. These trends have impacts on the economy at large, the labour market, and also the social structure and social inequality. The project looks at these challenges and opportunities through the perspective of economics and social sciences and aims to obtain a more comprehensive picture using quantitative and qualitative methods. We also adopt a comparative perspective, covering the EU as well as developments in Africa, China and Latin America with partners from these regions. The results will feed into scenarios for possible future developments and the impact of various policy interventions. In order to develop hypotheses and ensure the relevance of the scenarios, UNTANGLED is developing a diverse community of stakeholders who will help to refine research questions, validate analyses, provide feedback and clarify the implications of the results for policy, labour markets, business, social equality and inclusion. These stakeholder consultations will help to develop concrete policy proposals aimed at shared prosperity.

2. Why we are asking you

Our consortium partner [research partner] has recommended you as a person and representative of an organisation who is knowledgeable in your respective field and interested in all or some of the subjects addressed by UNTANGLED. We are also hoping that you will enjoy the engagement with European and global research and the international exchange with other participants from varied parts of society.

In all, we are looking for so-called stakeholders from policy, international organisations, companies that develop or implement new technologies, including consultancies, social partners from manufacturing, services and the public sector, as well as other labour market actors such as labour market services, representatives of civil society, professional and engineering associations and their think tanks, social innovation, academia and various disciplines beyond those covered by the consortium.

We are also aiming for some diversity in the age, gender and experience of participants (which means that you are welcome to circulate this invitation to junior or senior colleagues, colleagues with international careers and experience, or colleagues from under-represented genders in your context).

3. What do we expect you to do?

Basically, we hope that you will attend both live and virtual events and contribute to their discussions. We may ask you in advance to provide specific inputs – of course, offers of inputs, such as examples of your organisations' initiatives, will be welcome too. In connection with events, we may conduct short video interviews with participants who agree to this, but you would receive information in advance and could always say no.

⁷ Deliverable 10.1



You are also invited to contribute to the stakeholder and expert forum we are setting up to prepare and follow up events, discuss specific research results or again, showcase relevant examples.

The UNTANGLED activities on offer involve the following

- 1. A series of expert workshops and webinars with inputs from the UNTANGLED research itself and from related European and national projects. For now, the schedule is as follows:
 - An introductory webinar on the project at large is scheduled for June 2021 and will also provide an opportunity to ask questions on this information;
 - Global trends and variations: technological transformations, globalisation, demographics varieties by regime, region, sector: disruption or reiteration? (01/2022) (wiiw, Vienna, Austria);
 - Employment: number and quality of changing and emerging jobs: where and how? (10/2022) (Esch-sur-Alzette, Luxemburg; LISER);
 - ° Skill changes and the value of skills (12/2022) (Warsaw, Poland; IBS);
 - Inequalities: old and new inequalities and how to address them (02/2023) (Milan, Italy; POLIMI);
 - [°] Data and knowledge sources: what to measure, what to gather, what to sense: how to put the evidence to work? (07/2022) (Vienna, Austria; ZSI);
 - [°] Policy measures and stakeholder strategies: how to attain shared prosperity and improve outcomes for all? (05/2023) (Leuven, Belgium; KU Leuven).
- 2. An 'open virtual expert café' (four times a year from 10/2021) with two researchers from the project and an opportunity to ask questions, require information or advice, briefly present an initiative, or brainstorm on an issue of interest;
- 3. An invitation-only forum hosted in a subdomain of UNTANGLED's project website, where stakeholders are invited to comment on upcoming topics, provide input to the research work packages, discuss and co-develop policy, etc.
- 4. Does participation entail any obligations?

Your participation in the project's activities would be entirely voluntary, and you would confirm this in our initial survey and consent form [insert link provided by ZSI for the stakeholder survey]. Much as we would like to have some regular attendants at our events, you are of course free to pick and choose.

At each event in which you take part you will be asked to sign a more specific consent form. By signing this form (or clicking on the respective 'Agree' button in case of an online version), you are giving us permission to document your comments and input them for the purposes of the project. In the case of photo or video documentation, you may disallow us to use your pictures. You may also withdraw your consent at any time, and you do not need to provide a reason for doing so.

- What are the possible disadvantages of your participation? There are no anticipated disadvantages to participating – we are doing our best to make it worthwhile.
- 6. How public is your participation in the project's activities going to be? Your personal contact data are only used to organise and administer events. These data will be stored on secure servers and will at no time be made accessible to staff who are not directly participating in the project.

In the case of public events, your name and affiliation will be made public. Of course, we welcome any publicity for those events by your organisation.



For non-public events such as the project workshops, we generally suggest the Chatham House Rule: participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed. The same applies to contributions to the invitation-only online forum. You may, however, decide whether you would like your contribution (what you have said or written as part of your participation) to be associated with your name in reports, publications and other project outputs, so that anything you have contributed to the project can be recognised.

7. Who are the people responsible for this project? This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004776. The project is coordinated by Prof. Dr. Monique Ramioul and Dr. Karolien Lengerts of KUL leuven, and the specific tasks of

Prof. Dr. Monique Ramioul and Dr. Karolien Lenaerts of KU Leuven, and the specific tasks of stakeholder involvement are coordinated by Dr. habil. Ursula Holtgrewe at ZSI. If you have any questions, you are welcome to contact us.

For any complaints or other concerns regarding ethical aspects of the project, you can also contact the Ethics Committee of KU Leuven, which monitors the project's adherence to ethical standards: smec@kuleuven.

We hope this finds your interest and look forward to your contributions and hopefully, to meeting you in person.

Prof. Dr. Monique Ramioul	Dr. habil. Ursula Holtgrewe
Project Coordinator, KU Leuven	Leader of Work Package 8
monique.ramioul@kuleuven.be	holtgrewe@zsi.at

The informed consent form covers the respondent's understanding of the information received,

the provisions taken by the project and the agreement to participate. Before signing, respondents will be encouraged to ask the researcher/ interviewer any questions they might still have and require further information as needed.

Informed stakeholder consent form

- I have had sufficient time to review the information letter accompanying this informed consent.
- I understand the project's activities and my possibilities of involvement and have been informed of the advantages and disadvantages associated with my participation.
- I understand that my participation is voluntary. I have the right to discontinue my participation at any time. I do not need to give a reason for doing so and I know that no negative consequences will result.
- I understand who will get access to my personal data, how they will be stored and processed, and what may happen to them at the end of the research project.
- I agree that my inputs to the project's activities may be used (anonymously) for project documentation and to validate and specify research results and conclusions, including policy recommendations. My name will not be published in this process unless explicitly allowed; anonymity and confidentiality of the data are guaranteed at every stage of the research.
- I also agree to uphold other participants' anonymity and confidentiality in the case of non-public events in line with the Chatham House Rule.
- I know that separate terms of consent for specific events and activities, such as interviews, audio, video or other forms of data collection, will be explained and provided to me if necessary.
- I agree that the input I provide as an expert is stored in a secure manner for further analysis of the stakeholder involvement process within UNTANGLED.
- I am informed about whom I can contact if I have any questions concerning the study and/or the processing of my personal data. I have also been made aware of where I can turn to if I have a complaint.



I have read and understood the above information and have received answers to all my questions regarding my participation. I agree to participate.

Name of Participant	Date, Signature
Name of Researcher	Date, Signature

During the recruitment of stakeholders the initial consent form will be provided in combination with a brief survey⁸ of stakeholders' field of activity, areas of interest and preferred ways of getting involved to better target events. For particular events, format-specific consent forms (for example, covering photo or video documentation) will be provided.

3.5.3. Gathering stakeholder feedback and monitoring uptake of input

Stakeholder events conducted by UNTANGLED will be documented in ways that offer as much insight as possible without burdening organisers or stakeholders with documentation. Comments and discussion flows are summarised on the website and the partners responsible for the event make careful notes of the input. Participants will receive a lightweight feedback survey (to be developed in time for the first event) on learnings and takeaways for their practice and context, and event organisers and contributors will also be surveyed after each event to report learnings and inputs they can take up in their research.

⁸ <u>https://survey.zsi.at/index.php/566899?lang=en</u>



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