



## Methodology Pack

# WP1-D1: Methodology Pack

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Methodology pack – version 0.3/ April 2020

Page 1/93

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610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

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## INTRODUCTION - FOREWORD

The present report, named Methodology Pack, constitutes the first deliverable of the WINTeX project. This project will be accomplished by the joint work of 13 Tunisian and European partners with the aim of helping to connect Tunisian higher education institutions with the textile industry through two main pillars: the innovation textiles' centers and the Academia Textile Industry Council. The expertise acquired from European partners is crucial for setting up these centers, training their staff and ensuring their efficiency and their role as engines of innovation and technology transfer in the Tunisian textile sector.

The Methodology Pack is part of the first phase of the project, which is the preparation phase constituting WP1-preparation (WP1).

This first deliverable is part of the first WP of the WINTeX project (WP1-preparation) and aims to draw the guidelines for the progress of the Preparation work spanning the period January-December 2020. Thus, this document presents the methodological approach and the tools (i.e. survey, templates for collecting data, guidelines for the FG, template for the collection of best practices) that partners will use to carry out the research activities. This will include three components: desk research, field research through survey and field research through FG.

As lead organization for WP1-preparation, ISET piloted the drafting of the Methodology Pack report with the collaboration of the following partners:

- USF: proposal for a discussion guide within the FGs in terms of interview management method as well as discussion topics. A preliminary list of the nominative composition of the FGs' participants was also discussed and agreed. USF also proposed contributions concerning the documentary research, the production of the conclusions report as well as other suggestions related to the methodological specifications notably at the level of the national report, expectations and demands concerning the EU best practices and success stories.
- ATCTex, assisted by ISMM and CRNS: proposal of standard questionnaires according to the templates produced by ISET and which will be sent to researchers, academic and industrial experts. They also provided the questionnaire methodology to be adopted.
- CEDECS: proposal of the first draft of Methodology Pack with USF and CRE.THI.DEV collaboration. CEDECS also enriched the discussions that took place during two video conferences with the aim of framing the work and taking stock of the progress of this pack.
- TUIASI and CRE.THI.DEV: proposal of the methodology, the timelines, the guidelines and the completes for collecting data for European best practices (deliverable D1.3).

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

This report has been structured around 3 main chapters. The first one recalls the general context of the project as well as the specifications of the WP and the Methodology Pack provided in the Application Form.

The second chapter explains the methodological approach according to which the work will take place at the level of national report, desk research as well as field research which will be accomplished by means of questionnaires and approved by FGs. The methodology for formulating the recommendations was also detailed. There is also a breakdown of tasks between the different partners with timelines to be scrupulously observed.

The third chapter presents the common tools specifications to be adopted with the aim of harmonizing the results of the Tunisian report, successfully managing the discussion within the FGs and identifying EU best practices and success stories to be transferred to Tunisia including other funded projects related to capacity building on other sectors. Several guidelines, templates and grids for data collecting were then proposed.



610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

3.1	Common tools needed to harmonize the results of Tunisia	41
3.1.1	Templates for the field research surveys and grids for collecting data	41
3.1.1.1	Main recommendations in the context of the questionnaire and the application of the delphi approach	41
3.1.1.2	Questionnaire settings	42
3.1.1.3	The template of the Tunisia Research report containing	45
3.2	Guidelines for the FGs	48
3.2.1	FG setting	48
3.2.2	FG guideline	50
3.3	Tools of the European Survey	51
3.3.1	Guidelines on the focus of the cases to be collected	51
3.3.2	Templates for case collection and reporting	54
3.3.2.1	Template for collection	54
3.3.2.2	Template for reporting	55
4.	Annex	58
4.1.	Annex1: Template for field research (Questionnaires body)	58
4.2.	Annex2: Proposal List of EU cases	69
4.2.1	Proposal list from TUIASI	69
4.2.2	Proposal list from CEDECS	74
4.2.3	Proposal list from CRE.THI.DEV	75
4.3.	Annex 3: Contribution of CEDECS on delphi methodology	77
4.3.1.	The context: Few words about CLEVERTEX project (FP6-2003-NMP-TI3-main)	77
4.3.2.	Methodology justification	77
4.3.3.	Introduction to delphi methodology	78
4.3.4.	Methodology applied for CLEVERTEX survey	82
4.3.5.	CLEVERTEX survey organization and design	83

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

## Abbreviations and Acronyms

Abbreviation/acronym	Full name
ANPR	National Agency for the Promotion of Scientific Research
APII	Industry and Innovation Promotion Agency
ATCTex	Tunisian Association of Textile researchers
BIO	Business and Industrial Organization
CETTEX	Textile Technical Center
CRE.THI.DEV	Creative Thinking Development
CRNS	Sfax Numeric Research Center
DGRS	General direction of scientific research
DGVR	Directorate General for Research Development
EACEA	Education, Audiovisual and Culture Executive Agency
EC	European Commission
EU	European Union
FG	FG
GA	Grant Agreement
HEI	Higher Education Institution
ICT	Information and Communication Technologies
ISSET	High Institute of Technological studies of Ksar Hellal
ISMM	Higher Fashion Institute of Monastir
LESTE	Laboratory of energy and thermal systems study
LGTex	Textile Engineering Laboratory
LIMA	Laboratory of Interface and advanced materials
MHESR	Ministry of higher education and scientific research
MIPME	Ministry of Industry and Small and Medium Enterprises

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

MOBIDOC	doctoral student mobility
MPTex	Textile Materials and Processes Research Unit
PC	Project Coordinator
PIRD	Innovative research and development project
PJEC	Young teacher-researcher project
PNRI	National research and innovation project
PostDOC	Post-doctoral research
PRF	Federated research project
SME	Small and Medium Enterprises
TUIASI	Gheorghe Asachi Technical University of Iași
UNIWA	University of West Attica
USF	University of Sfax
VRR	Exploitation of research results
WP	WP

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

## 1. BACKGROUND AND FRAMEWORK OF THIS METHODOLOGY PACK

### 1.1 The WINTeX project

Textiles and Clothing is one of the main export sectors of Tunisia and the second largest manufacturing sector but faces losses of jobs and companies since decades because of fierce international competition. It needs to improve its competitiveness and compensate with innovation and better valorized know-how its higher costs than other countries and its deficiencies on raw materials and textile upstream in general to organize a migration from subcontracting business models to co-contracting and brand named and innovative finished products with higher added value, often involving the mastery of sophisticated and modern production techniques. For this, producers must take steps to strengthen competitiveness, more rationality and social responsibility on the part of the consumer, and a stable and investment-friendly ecosystem on the part of the state.

Textile products based on better safety, sustainability and wellbeing are a potential market for companies in the Tunisian sector. They have a higher value-added and the market is expanding with rapid growth following global demand. This activity can provoke spillover effects on other sectors of the manufacturing industry (automobiles, aeronautics ...), which can go as far as the formation of clusters. However, this rise of the sector requires the development and strengthening of the value chain of the textile and clothing industries sector through access to the production of raw materials and high-tech products.

WINTeX project aims to facilitate the provision of Tunisian students, researchers and industrials in textile field with competencies and skills needed by these markets. Several higher education and training institutions specializing in the field of textiles and clothing should allow this competitive advantage, but still need support to do so.

The support of Erasmus + program received by WINTeX is expected to help 3 Tunisian Universities to get, with the help of EU Partners, expertise, exchange ideas and experience, financial support, capacity building and to brainstorm ideas to help textile clothing sector in order to better shape training courses and specialized education in textile field and encourage close interactions of authorities with the concerned companies, with two objectives:

- The short-term objective is to define roadmaps to guide future innovations of textile and fashion businesses, and to allow ideas to better fit industrial constraints and address current market needs.
- The long-term objective is to offer mentoring services to all partners and to give help to companies interested in developing new sustainable technologies and textile products, aligning social modernization and culture preservation.

Thanks to WINTeX it is expected to develop a more professional and complete approach that will federate experts of several disciplines to support the best projects and allow their transfer within a textile company

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

partner of the project. The new training model will be disseminated and promoted through this project network and during related competitions after the end of the project.

Practically the project aims the fostering of enterprise-university collaboration in Tunisia by the establishment of three innovation textiles' centers at each participating HEIs, which will boost the collaboration among textile SMEs and participating HEIs and will become focal points for industry encounters providing support and guidance to HEIs' students for embracing innovation and entrepreneurship in the textile sector. They will provide services for innovation development, matching industry needs with research results, promoting cooperation between researchers and industry, developing and promoting of new products and opening of new markets, providing support to researchers and to business owners to commercialize their innovative ideas. They will integrate green technologies and Key Enabling Technologies in the textile sector with particular emphasis at each of the institutions in each to not overlap services and provide better and more comprehensive support to local SME needs.

The establishment of an Academia Textile Industry Council will also play a crucial role in establishing long-term cooperation between HEIs and industry of the textile and clothing sectors in Tunisia that will become the grounds for the implementation of the innovation triangle in Tunisia for the textile and clothing sectors.

## 1.2 Specifications of the WINTeX WP1-preparation

According to the Application Form, the aims of the WP1- preparation are:

- Assess the importance of the innovation in the textile sector for the economies of Tunisia and collaboration between universities and companies in the textile sector.
- Assess training needs for experts in innovation textiles' centers in Tunisia.
- Assess the most favorite pedagogical approach for experts in the innovation textiles' centers.
- Identify EU best practices and success stories to be transferred to target Tunisia including other funded projects related to capacity building on other sectors.

The expected deliverables are:

- D1.1 Methodology Pack (M3)
- D1.2 Tunisia Research reports (M8)
- D1.3 EU Best practices and success experiences database (M9)
- D1.4 Recommendations (M11)

The indicators that will be used to evaluate the quantity and quality of the work are:

### Quantity

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

- 40 questionnaires on the primary target group (staff of the textile centers, universities or other centers in Tunisia) collected and analyzed.
- 40 questionnaires from experts (companies, trainers, BIOs, advanced textile and innovation experts) collected and analyzed.
- 20 participants for the FGs.
- Time -tasks and deliverable are performed according to the planning.
- 10 best practices collected and analyzed.
- 10 EU funded projects on capacity building contacted and analyzed.

### Quality

- Quality of cooperation among partners and of achieved results.
- Budget (activities are carried out within the allocated budget).

According to the Application Form, the activities will be implemented, with different objectives, both in Tunisia and Europe.

In Tunisia, ISET will coordinate the WP and the different tasks related to the methodology pack and the national report. The other two universities, ISMM and USF will actively contribute to the national report. Other local partners (namely ATCTex, CRNS and MFCPole) will provide these two organizations with contacts for market related data and field research,

In Europe, TUIASI supported by UNIWA and CRE.THI.DEV will be involved in the activity with the objectives of identifying and analyzing best practices and success stories which can be transferred to target countries. This study will include the analysis of other projects funded in relation to capacity building to learn from other successful experiences. Other EC partners will also participate providing national inputs for the best practice identification and contacting with coordinators of ongoing and finalized capacity building activities in the region.

### 1.3 Specifications of the Methodology Pack provided in the application form

The Methodology pack is aimed at defining a consensus between the partners on how the activities of the WP1-preparation WP of WINTeX project will be implemented to produce the expected results.

It is set in the application form that the Methodology Pack is one of the first Milestones of the project (M1.1) and it is due in M3 (15-04-2020). It is an electronic document produced by ISET, with the active support of USF and ISMM. It must provide the methodological approach (guidelines and requirements) for the implementation of WP1-preparation activities and should include:

- a. The detailed plan for what needs to be done (research activities) and how to approach them

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

- methodology for conducting the desk and field research
- timelines
- standardized templates for reporting and compiling the results
- b. A presentation of the common tools needed to harmonize the results for conducting the research such as:
  - Templates for the field research surveys and grids for collecting data
  - The template of the Tunisia Research report containing
    - macroeconomic information on the textile sector, the identification of key stakeholders
    - the needs of the sector both from industry perspective and from university point of view
    - a strength-opportunity-weakness-threats analysis (SWOT) for the textile sector
    - references to experiences ongoing, such as projects or national initiatives not detected during the proposal stage, with the aim of finding synergies
  - Guidelines for the FGs
  - Templates for the collection of at least 10 best practices and 10 success stories (successful EU funded project experiences in capacity building from different sectors) across Europe with high potential for being transferrable to Tunisia which will feed an electronic database and should cover the following topics:
    - Existing innovative textiles' centers or other centers implemented from different sectors
    - Collaboration among universities, BIOs and companies for sector development
    - Innovation and entrepreneurship led by HEIs and business collaboration

## 2. METHODOLOGY APPROACH - TIMEPLAN

The different tasks of the working package preparation of the WINTeX project must be conducted with taking into account the conceptual methodological diagram presented below (Figure 1). In this diagram, it's identified for each research field the methodological tools and the deliverable associated.

This diagram clearly explains the work strategies followed. This work was organized taking into account a main idea: "how to strengthen the value chain in the textile and clothing sector?" and with the exploitation of the sector assets, which are: diversification, geographic rapprochement of partners, know-how and human potential.

The work revolves around the essential points:

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

- The macroeconomic perimeter of the textile-clothing sector
- Development and innovation and their relationship with knowledge: relationship between business and university
- Best European practices in innovation and their applications in Tunisia.

In another way, this diagram specifies the breakdown of the different tasks to be accomplished by the Tunisian partners for the WP1-preparation.

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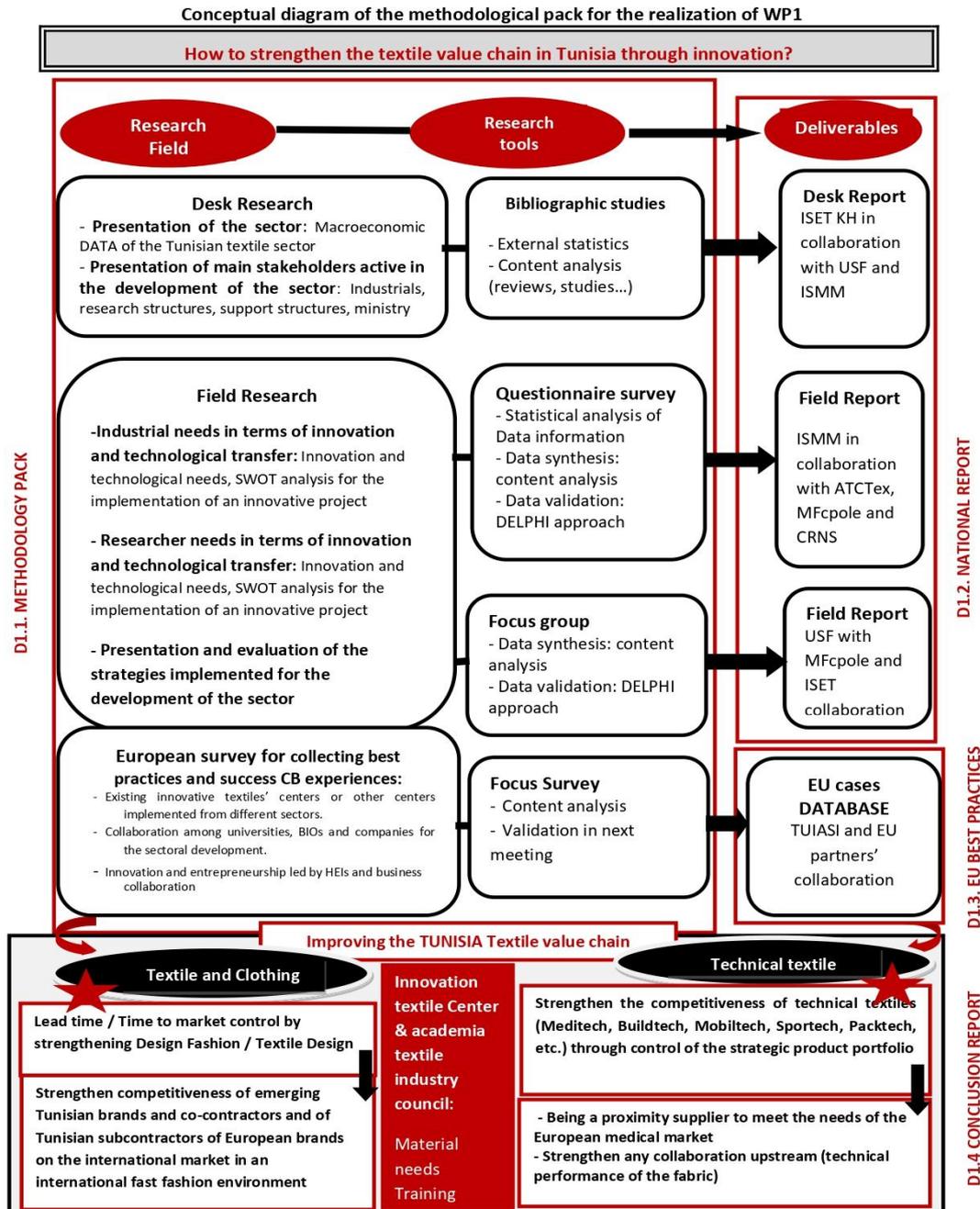


Figure 1. Conceptual diagram

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

We then proceed to propose the methodologies to be adopted in the context of this work.

## 2.1 Methodology for the Tunisian report

This study is based on two complementary components:

- Desk research
- Field research

The desk research regroups studies concerning Tunisian sector's macroeconomic scope and its national and international positioning. It also presents the sector innovation sphere. Finally, it presents the strategies implemented by different textile innovation stakeholders.

The desk and field research will start at the same time. Desk research can provide information to adjust field research.

Our strategy is based on the collection of data from the two resources, then a work of framing and refinement will be carried out. In a second period, field research will be restarted and readjusted.

We intend to cover in this Research report related to textile sectors (questions for the textile centers and universities - questions for experts - themes of FGs) the main needs, main strategies and how re-inventing the textile sector in Tunisia for more innovation, creativity, added value, design textile clothing strategies for more sustainability. This should include:

- How moving towards more circular textile clothing sector
- How moving from only contracting textile clothing industry to more co-contracting and why not to the finished product
- How to move from mass production to mass customization production
- How to integrate the design process in the industrial process?
- How to use the new technologies to innovate in new textile products and applications for more functional textile, functional garments, functional underwear

The national report will be prepared on the basis of the template developed by the WP leader on deliverable 1.1. It will include macroeconomic information from the textile sector, the identification of the main stakeholders, and the needs of the sector from both an industry and an academic point of view, a strength-opportunity-weakness-threats analysis (SWOT) for the textile sector. It will also include other ongoing experiences, such as national projects or initiatives not detected at the proposal stage, with the aim of finding synergies. All partners in Tunisia will actively contribute to the preparation of this report.

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

Desk research objective is to collect data on the sector by analyzing relevant reports and strategic documents. Study reports produced by national or international structures are used and analyzed in order to diagnose the textile sector in Tunisia. Full details on the methodological approach, as well as models for data collection are detailed in a specific section. This documentary research will provide an overview of the textile sector in Tunisia by highlighting these main strengths-weaknesses / opportunities-threats through a SWOT analysis.

The desk research on the textile sector must provide answers on the following subjects:

- Macroeconomic data on the textile sector in Tunisia
- The main stakeholders in the sector
- The needs of the sector from an industrial point of view and from an academic point of view
- The different sector development strategies that have been put in place

Field research takes the form of questionnaires and FGs to understand the learning needs, the relevant skills of people working in textile centers and the most relevant training methods. Primary target groups and experts will be involved in the activity.

This field research is based on the delphi approach which will make it possible to seek a consensus on a subject of study in order to prospect the future directions of the sector and these learning and skill needs to lead innovation projects. It is an iterative suite of questionnaires sent to target groups (researchers, academic staff, trainers, innovation experts, BIOs, manufacturers, etc.) on specific subjects in order to generate ideas and identify the expectations and needs of the various stakeholders for development and innovation in the textile sector.

Two target groups are identified:

- Researchers and academic experts (Minimum 40 questionnaires) (the Methodological Template is detailed in the section reserved for field research)
- Experts (Minimum 40 questionnaires): Industrial experts: entrepreneur, investor, BIOs

At the mid and end of the delphi process, the selected ideas are analyzed and validated by FG representing the main stockholders. In the first time, the FG will validate and analyze the output of desk research and possible exploitation in the following rounds of questionnaires. A template for the FG is prepared and detailed in the section reserved for field research.

The analysis reports of the desk research and those of the field research will feed the textile research report in Tunisia (Deliverable D1.2).

The writing of a research report on the Tunisian textile sector will be carried out following the Template proposed in this methodology pack. The outcomes of the first round of FG and the draft of the desk research report will be presented in the next WINTeX meeting is lasi.

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The following graphic summarizes the methodological process conducted in this study.

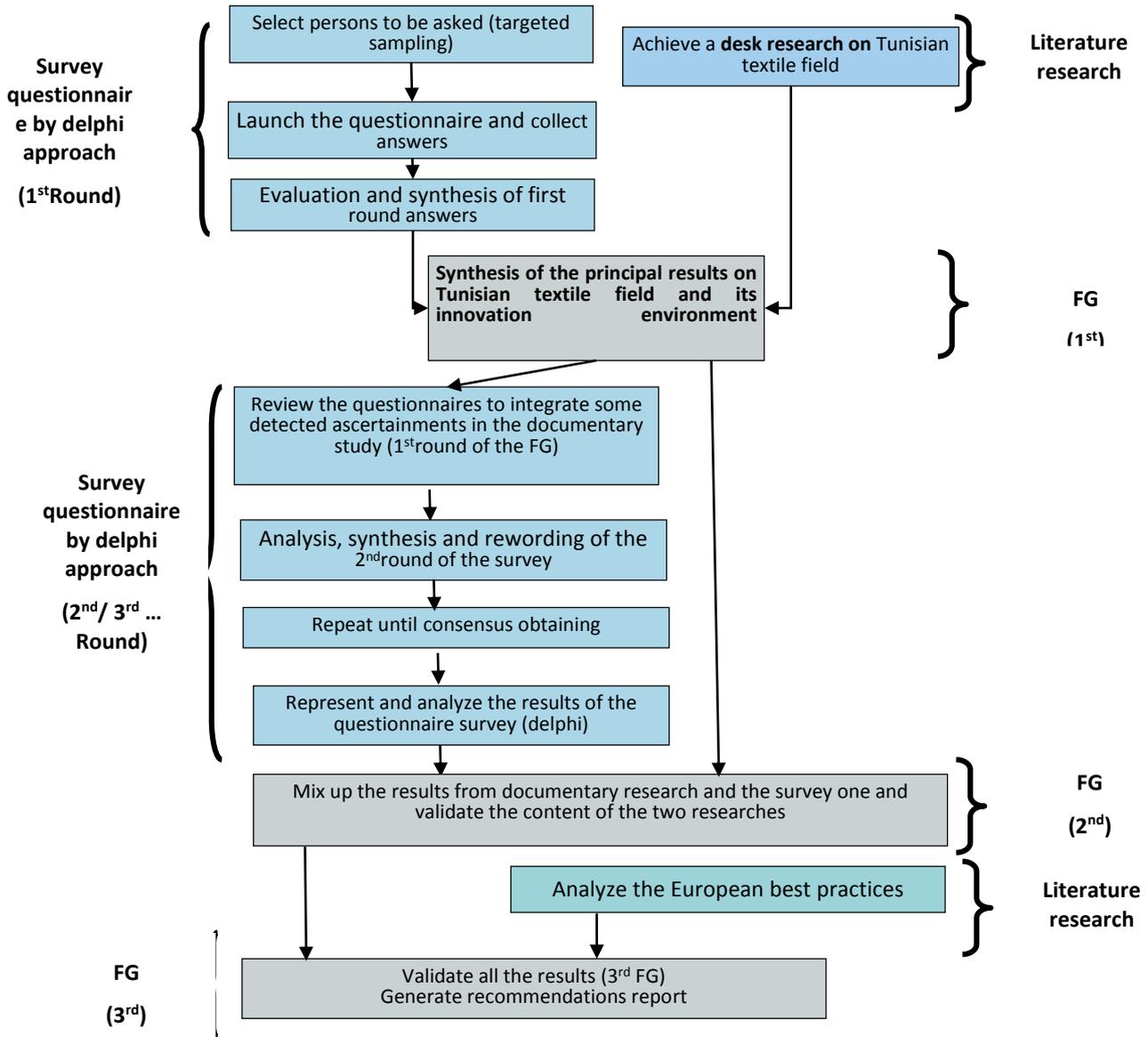


Figure 2. Methodological steps

For more details, table 1 presents the main topics of the Tunisia research report, its dimensions and methodology applied for desk research and field research.

Table 1. Tunisia national report work-plan

Topics	Useful information/ Research information	Methodology			
		Data gathering	Data analysis	Synthesis and validation	Target population(field research)
Macroeconomic DATA of the Tunisian textile sector	<ul style="list-style-type: none"> <li>• <b>Presentation of the sector:</b> <ul style="list-style-type: none"> <li>- Number of companies by sector of activity</li> <li>- Evolution of business turnover</li> <li>- Destinations (country of export)</li> <li>- Evolution of imports for the textile sector</li> <li>- Evolution of exports: by type of product</li> <li>- Origin of raw materials</li> </ul> </li> <li>• <b>Main stakeholders active in the development of the sector</b> <ul style="list-style-type: none"> <li>- Industrial (number of structures with research and development department, innovation field, qualification of persons responsible for R&amp;D, frequency of innovation)</li> </ul> </li> </ul>	Desk research <ul style="list-style-type: none"> <li>▪ to be carried out by ISET KH in collaboration with USF and ISMM)</li> <li>▪ To be carried out by ISET KH, USF and ISMM</li> </ul>	<ul style="list-style-type: none"> <li>▪ Content analysis</li> <li>▪ Statistical analysis</li> </ul>		<ul style="list-style-type: none"> <li>▪ BIOs</li> <li>▪ Ministry of Industry</li> <li>▪ support structure</li> <li>▪ Ministry of high education and scientific research</li> </ul>

	<ul style="list-style-type: none"> <li>- Research structures (number of textile and para-textile structures, field of applied research, number of scientific researches in applied research, number of patents held, number of national and international projects engaged in R&amp;D and technology transfer)</li> <li>- Support structures (nature and extent of each, number of R&amp;D projects)</li> <li>- Ministry of Industry (programs and strategies implemented, number of upgrading projects undertaken)</li> <li>- Ministry of Higher Education and Scientific Research (programs and strategies implemented for applied research)</li> </ul>				
Main needs of the sector	<ul style="list-style-type: none"> <li>• <b>Industrial needs in terms of innovation and technological transfer:</b> <ul style="list-style-type: none"> <li>- Process (ecological, sustainable process),</li> <li>- Product (design, materials, functionality),</li> <li>- Marketing strategy</li> <li>- Managerial innovation strategy</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ External statistics: (desk research by ISE, USF and ISMM)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Content Analysis</li> <li>▪ Descriptive statistical analysis</li> </ul>	FG	<ul style="list-style-type: none"> <li>▪ Textiles companies</li> <li>▪ BIOs, support structure</li> </ul>

	<ul style="list-style-type: none"> <li>- Skill requirements: prospecting for specific skills, training in management techniques and innovation</li> <li>• <b>SWOT analysis for the implementation of an innovative project by the manufacturer</b></li> <li>- Internal strength elements</li> <li>- Internal weakness elements</li> <li>- Opportunities available in the external environment</li> <li>- Threats present in the external environment</li> </ul>	<p>collaboration )</p> <ul style="list-style-type: none"> <li>▪ Questionnaire (approach delphi)</li> <li>▪ (ISMM and MFCPôle collaboration )</li> </ul>			
	<ul style="list-style-type: none"> <li>• <b>Researcher needs in terms of innovation and technological transfer</b></li> <li>- Integration of new niches with high innovative potential (products, process, management)</li> <li>- Access to funding resources for research projects</li> <li>- Development of new innovative processes</li> </ul>	<ul style="list-style-type: none"> <li>▪ External statistics (desk research by ISE, USF and ISMM collaboration )</li> </ul>	<ul style="list-style-type: none"> <li>▪ Content Analysis</li> <li>▪ Descriptive statistical analysis</li> </ul>	<p>FG</p>	<ul style="list-style-type: none"> <li>▪ Support structure</li> <li>▪ BIOs</li> <li>▪ Textile companies</li> </ul>

	<ul style="list-style-type: none"> <li>- Industrialization of developed prototypes (FABLAB)</li> <li>- Promotion of research work and dissemination to manufacturers</li> <li>- Managerial innovation strategy (example: Implementation of a multidisciplinary collaborative research strategy responding to the emerging needs of the sector)</li> <li>- Skill requirements: prospecting for specific skills, training in management techniques and innovation</li> </ul> <ul style="list-style-type: none"> <li>• <b>SWOT analysis for the implementation of an innovative project from the researcher's point of view</b></li> </ul> <ul style="list-style-type: none"> <li>- Internal strength elements</li> <li>- Internal weakness elements</li> <li>- Opportunities available in the external environment</li> <li>- Threats present in the external environment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Questionnaire (approach delphi)</li> <li>▪ ISMM, ATCTex and CRNS collaboration</li> </ul>			
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<p>Strategies having been applied for the development of innovation</p>	<ul style="list-style-type: none"> <li>• <b>Presentation and evaluation of the strategies implemented for the development of the sector:</b> <ul style="list-style-type: none"> <li>- Strengthening of the competitiveness of the clothing industry (with a strong dominance on the market) and transition from subcontracting to co-contracting and to the finished product</li> <li>- Reinforcement of the creation of Fashion and the development of models</li> <li>- Creation of teaching paths in fashion design and model (fundamental, professional and co-constructed)</li> <li>- Implementation of a management system allowing lead to market (development of small series, logistics management, implementation of marketing plan, etc.)</li> <li>- Managing the value chain and integration of upstream and downstream activities of the clothing business (sourcing,</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ External statistics (desk research by ISE, USF and ISMM collaboration )</li> <li>▪ Questionnaire (approach delphi)</li> <li>▪ (ISMM, ATCTex, CRNS and MFcpole collaboration )</li> </ul>	<ul style="list-style-type: none"> <li>▪ Content Analysis</li> <li>▪ Descriptive statistical analysis</li> <li>▪ SWOT analysis</li> </ul>	<p>FG</p>	<ul style="list-style-type: none"> <li>▪ Support structure BIOs</li> <li>▪ Textile companies HEI</li> <li>▪ Research structures</li> </ul>
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	<p>development models, prospecting markets and sale of finished products)</p> <ul style="list-style-type: none"> <li>- Development of ecological manufacturing processes (dyeing, washing, laser printing, etc.)</li> <li>- Diversification of sectors and Development of new ones with higher added value, in particular technical textiles</li> <li>- Establishment of BIO and technical textile lab</li> <li>- Integration of teaching modules in technical textiles</li> <li>- Prospecting suitable markets</li> <li>- Development of research and study in the field</li> </ul>				
How re-inventing textile sector?	The development of the sector will go through the implementation of innovation and technology transfer strategies, the fruit of better University / Industry collaboration, allowing better management of the textile value chain	<ul style="list-style-type: none"> <li>▪ Questionnaire (approach delphi)</li> <li>▪ Reports written on the basis of</li> </ul>	<ul style="list-style-type: none"> <li>▪ Approach delphi</li> <li>▪ Comparative analysis</li> <li>▪ (Benchmarking)</li> </ul>	FG	<ul style="list-style-type: none"> <li>▪ All stakeholders: Textile companies</li> <li>▪ Support structure</li> <li>▪ BIOs</li> <li>▪ Research structure</li> </ul>

	<p>with a view to high added value and sustainability of the sector, especially by:</p> <ul style="list-style-type: none"> <li>- Controlling the cost of sourcing the raw material (especially materials for technical use) by exploiting internal resources and collaborating with our European partners</li> <li>- Adopting certified clean and ecological manufacturing processes for sustainable development of the sector</li> <li>- Adopting management approaches that are part of a circular economy</li> <li>- Exploiting renewable and recoverable energy resources in manufacturing</li> <li>- Exploiting advanced techniques (nanotechnology) for the development of innovative products with high added value</li> </ul> <p>These recommendations for new strategies to be implemented in the sector are based on an analysis of existing strategies, in particular the elements of strengths / weaknesses and</p>	<p>desk studies and field studies carried out as part of this WINTeX project</p> <ul style="list-style-type: none"> <li>▪ Reference studies and success story developed within the European framework</li> </ul>			
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	<p>opportunities / threats in regard to the needs of the sector.</p> <p>New strategies should take into account the following:</p> <ul style="list-style-type: none"> <li>- The elements to be reinforced and those to be alleviated in the previous strategies aiming at the development of the textile industry (both common and technical) with a view to control the value chain upstream and downstream</li> <li>- New opportunities to seize on the market</li> <li>- Possible threats on the market</li> </ul> <p>These strategies will then make it possible to detect the needs of innovation centers in training (technical and educational) and equipment in order to meet the aforementioned needs.</p>				
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### 2.1.1 Methodology for the Desk Research

The desk research methodology should be a systematic approach which consists in identifying, recovering and processing various elements (Statistical information, figures, bibliography, texts, etc.) on the textile sector macroeconomic scope and especially the steps taken towards innovation.

Therefore, the role of knowledge and the obligation to integrate it into the industrial act of the textile sector should be stressed.

The information's identification is an essential step in any knowledge synthesis and literature review in the textile clothing and para-textile fields.

This approach must be as relevant as possible and aim to be exhaustive.

#### 2.1.1.1 Research objectives

To better understand study objectives, the WWWHW method can be used. This method is based on six questions.

#### **What? What is done? The aspects sought**

The main qualitative methodological approach that will be used in the textile clothing sector capacity building needs in Higher Education to weave the bridge between academia and industry consisted of research through data collection. This involved the summary, collation and synthesis of the existing research publications and reports, as: sector reports, communications and studies at international, national and local levels, statistical data, publications (textbooks, articles), case studies, good practices etc.

The desk research leads to the following results:

- analysis of the current situation of the textile clothing sector in the partner countries (and in the neighboring regions)
- Analysis of the new skills textile clothing based on the Tunisian and international sector reports

For the implementation of the desk research, partners involved with this task:

- Will carry out a background and context analysis based on actual statistical data and future trends of textile clothing and connected industries in Tunisia

- Will identify reports and papers dealing with skills anticipation and training needs in the textile clothing industry and connected ones and higher education
- Will identify best practices about innovation and effective management systems in textile clothing industries and about the successful experiences of cooperation between HEIs, SMEs, research centers and training centers for textile products' development

### Who? With what is it done?

This desk study is a sector study dealing with the textile field, taking into account all the actors in the value chain. It concerns companies, policy-makers, investors, support structures and academic structures operating in this sector.

### Where? The study is limited to a specific geographic area

The desk research is carried out on the Tunisian textile sector. In further analysis the EU neighboring countries, especially the EU partners, will be studied good practices to exploit it in the textile sector in Tunisia.

### When? the concerning period

Desk research is based on studies, surveys and research conducted over the past decade. The documents published during the period from 2010 to 2020 are considered.

### How? Which approach should be considered (economic, historical ...)?

The desk research focused mainly on a qualitative analysis of the textile clothing sector, recording trends and aspects of the industry using statistical data.

The inventory of searched sources is included in the report as "References". Partners mainly focused on their national sources; however, partners have also obtained findings from International/Tunisian sources which are relevant for the project, which they also put in their respective National Reports.

### Why? What is the importance of the subject in the context?

This study will take into account the global economic changes but also the financial difficulties of Tunisia. It will identify the needs of the sector and their development trends and innovation to meet the increased needs of consumers in terms of means of health protection, comfort and customized products.



- The Industry Promotion Agency (National Industrial Strategy for 2016, 2016; The Textile and Clothing Industries in Tunisia, 2014);
- Entrepreneurs Arab Institute (The Competitiveness Report, 2016);
- The Economic Analysis Council (Economic recovery plan 2019-2020, 2018);
- The Tunisian Federation of Textile & Clothing (Textile & clothing recovery plan (2019-2023): Sectoral Pact of Private Public Partnership, 2019);
- The Textile Technical Center (Textile & clothing sector in Tunisia: Opportunities and challenges, 2012);
- International Trade Center (Analysis of the input supply and accessories component in the textile and clothing sector in Tunisia, 2015)
- The European Apparel and Textile Confederation (Study on Innovation and Technology in the European and Mediterranean Textile and Clothing Industry, 2014)
- Aitex and Trumenti per l'innovazione (Comparative report of the 4 countries involved (Spain, Italy, Tunisia and Egypt), 2014)
- EURATEX (Study on T/C Economics, Markets and Competition in the EU-MED area (Economic Intelligence), 2014)
- Tunisian Institute of Strategic Studies (The foundations of growth and economic development: National initiative 4.0: 10 action plans for industrial and technological acceleration in 2025, 2016);

This list of references can be extended by contributions of partners.

### 2.1.1.3 Assessment and sorting references

References proposed by both Tunisian and European partners are evaluated according to the inclusion / exclusion criteria: (any irrelevant study is excluded). The selected references must meet the following criteria:

- Credibility of information: author and reference
- Accuracy of information: verifiability (avoid information that is disputed or likely to be contested, preferably work on official documents)
- Purpose of the information: objective or subjective information
- Information freshness: publication and update dates.

#### 2.1.1.4 Prioritization of collected information

For each reference studied, a summary is prepared based on the template proposed in the methodology. The information is then listed as follows:

##### **Presentation of the Tunisian textile sector**

###### **A. Overview**

- A.1. Industries
- A.2. Economic tissue
- A.3. Business and economic performances
- A.4. Environmental nuisance due to the textile sector

###### **B. Trends in the sector**

- B1. The preponderance of clothing activity
- B2. The emergence of low-cost countries and the departure of European prime contractors
- B3. The expansion of the informal market and its impact on the clothing business
- B4. The emergence of Tunisian mass-market clothing brands
- B5. The development of technical textiles
- B6. Co-contracting development

###### **C. Economic perimeter of the global clothing textile sector and positioning of Tunisia**

- C1. Global economic trends: sustainable development, circular economy
- C2. Global consumption trends: fast fashion, consumer ethics, and customization of the offer
- C3. Tunisia's positioning in the world textile market

**C3.1.** Image development as a supplier of small series and full package

**C3.2.** Reinforcement of the environmental image (wastes recycling and discharge treatment)

**C3.3.** Towards the development of a technical textile manufacturer image

**D. Tunisian textile sector diagnosis (SWOT analysis)**

**Support for innovation in the Tunisian textile sector**

**A. Typology of innovation support structures**

Research, teaching, governmental, non-governmental structures, MFCPole, cluster, API, financing structures, BIOs, ...

**B. Strategies and programs implemented for the development of innovation**

Education / training programs, funding programs, support programs, ...

**C. Diagnosis of the innovation environment in Tunisia (SWOT)**

**D. Needs analysis for innovation development**

**D1.** Skill needs

**D2.** Raw materials requirements

**2.1.1.5 Conclusion**

Bring out the key ideas to be discussed later in the FG.

**2.1.2 Methodology for the field research**

**2.1.2.1 Methodology for questionnaire survey**

The survey will be addressed to the relevant stakeholders such as companies, BIOs, policy-makers, training centers, investment and development agencies, investors, business associations, researchers among others.

These surveys should be organized in parallel with the desk research to feed an intermediary report on the status and needs of the sector and its stakeholders in Tunisia to be presented and discussed in Iasi. Their final reporting should be available at the end July.

Three types of questions could be included:

- Questions for complementing the collection of data and facts documented by the published reports used in the desk research.
- Questions for identifying the specific needs of the stakeholders to be covered.
- Questions for consensus making on forecasts on the expected evolution of the textile sector in Tunisia and the possible contribution of WINTEX with the specific solutions to the identified needs.

Indeed, the textile is a multidisciplinary sector; it is an activity which requires skills in materials, chemistry (organic, polymers, mineral), physics, mechanics, management, supply-chain, etc. Often, the research themes differ from one structure to another depending on the vocation (discipline).

Several research structures work on textile applications or materials without being classified as a specialty laboratory. For this reason, and based on the requirements of the delphi method, it is proposed that questionnaires will not be only limited to researchers working in laboratories and establishments specialized in the textile field, but also integrate other research structures working on products and techniques intended for textile and para-textile applications.

The industrial population targeted in the questionnaire is carried out according to several criteria such as geographic cartography (Greater Tunis, North, Cap-Bon, Sahel, center and South regions), the business activity (clothing, technical textiles, etc.) as well as to the nature of the company management (subcontractor, co-contracting and brand bearer).

The figure 3 shows the sampling composition to be adopted in questionnaires.

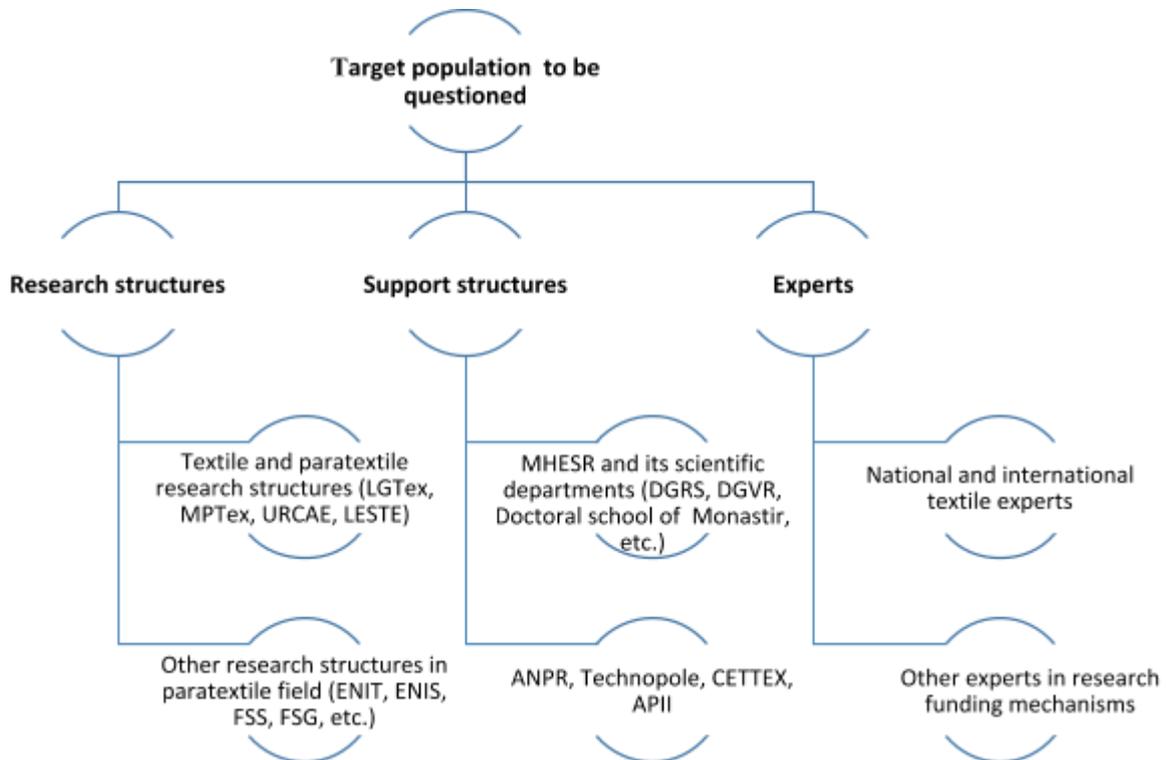


Figure 3: Inventory of the target population to be questioned

Based on the delphi method, a call upon is done by the judgment of a group of specialists and intervening in the field of textile research, a real panel of experts. These experts are specialists in the field studied, professionals, researchers, etc. whose identifications remain anonymous (Figure 3).

Several successive questionnaires are addressed to various experts by adopting the delphi method. The delphi method steps are:

- Carry out a preliminary questionnaire to gather a first glimpse of the opinions of the various questioned persons concerning the themes. The aim is to encourage the people interviewed to express themselves openly and freely.
- The responses are then processed, divided into three groups and then presented in the form of a distribution. Each part is associated with a summary of the main arguments used by the group to justify its assessments.
- The results accompanied by their arguments were sent for experts. Based on this new information, they are asked to review their first assessments and answer the second questionnaire.

- These steps are iterated (usually three to four questionnaires, figure 4) until the dispersion of responses becomes minimal. The goal is to reach a consensus, on the subjects investigated.

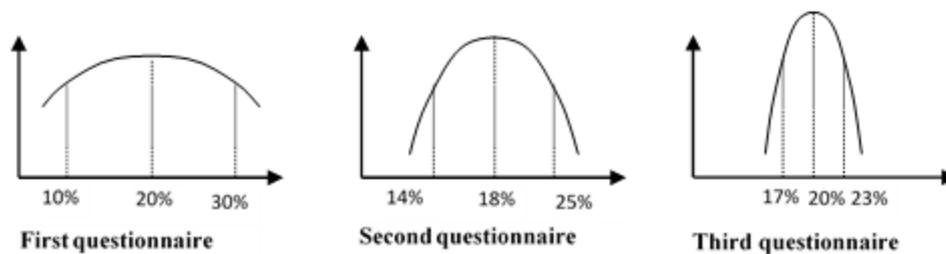


Figure 4. Principle of the delphi method: minimization of the distribution variation following the different questionnaires

### 2.1.2.2 Methodology for Focus Groups

The FG discussion (FG) is an approach that will be used for collecting the input of groups in relation with the textile sector needs in Tunisia.

In this case, the specific type FG used is the “Expert group”, which consist of several people who have particularly good and broad expertise (knowledge and experience) about the research topic and hence, about the needs of the Tunisian textile sector. These experts can be textile teaching staff, technical staff, students, trainees, companies, BIOs, policy-makers, training centers, investment and development agencies, investors, business associations and/or researchers.

In preparation working package of the WINTEX project, the FGs aim to understand textile sector issues in a particular technical, educational, social, cultural, economic, ecological and political context, it will be applied to four different phases of the scientific study, each with varying function, role and aim:

- 1. Exploration:** At the beginning of the investigation, the researcher may perform an FG to learn more about a given topic or field and to distil important preliminary issues regarding the study theme.
- 2. Monitoring:** An FG may be performed in the midst of on-going research activities to control or supervise the corresponding processes and dynamics and to understand them better.
- 3. Evaluation:** At the end or during the phasing-out stage of the survey, an FG with the main target group can be performed to verify, disprove, modify or differentiate the study’s provisional finding.
- 4. Gathering and assessing outcomes:** Some time after the completion of an investigation or intervention, an FG may be performed to generate new findings about potential changes or processes needed in the textile sector in Tunisia.

The FGs should be organized in three rounds:

- a first round could validate some of the first results of the desk research, the questionnaires and the collection of EU cases before their presentation in Iasi
- a second round could be used for a final evaluation and to a first definition of the answers and solutions WINTEX should develop to face the identified needs
- a third round could be used to validate the possibilities of transferring the EU cases and best practices and feed the EU cases and best practices

## 2.2 Methodology for UE Best practices

The database will contain the 10 best practices and the 10 projects on capacity building agreed upon by the partners. TUIASI will link all information contained in the case description together and upload it on the project's site.

For purposes of further documentation, the database will additionally include a list of other cases contained in the initial list of proposals, with their short description. This will offer the Tunisian partners a documentation tool for extended information.

## 2.3 Methodology for recommendations report

The conclusions report should be produced by compiling and analyzing the key findings and recommendations coming from desk and field research activities and included in the national report and comparing them to the EU best practices identified. It should also include a deep analysis of the learning from the EU best practices in relation with the status and needs of each partner in Tunisia, in view of highlighting main potentials of transfer for improving their implementation.

A FG is carried out for this comparative analysis from the Tunisia research report (D1.2) and the EU Best practices and success experiences database (D1.3) in order to emerge recommendations concerning the knowledge fields that should be reinforced, especially:

- Research and innovation
- Technological knowledge
- Quality knowledge
- Non-technological skills
- Environmental knowledge

Thereby, it can be closed with reach recommendations and a consensus concerning:

- Establishment of “academia textile industry council” and the textile innovation centers
- Determining the skills anticipation and training needs in the textile clothing industry (expert) and adopted ones with higher education (education approach).

**This report contains:**

1. The project details
  - Project acronym: WINTEX
  - Project title
  - Start date
  - Frame and context
  - Objectives
2. Deliverable details:
  - Title
  - WP No
  - Deliverable No
  - Partner in charge of deliverable
3. Reminder of strategic needs of the sector in terms of innovation reported on Tunisia research report (D1.2).
  - The orientation of the textile sector in terms of innovation for the improvement of the textile clothing value chain in a fast fashion environment, with strong orientation towards customized products and migration from subcontracting to co-contracting and to the finished products.
  - The orientation of the textile sector in terms of innovation for the reinforcement of technical textiles through the diversification and control of the strategic product portfolio taking into account:
    - to reinvent our vision of technical textiles in the new post-Corona economic plans
    - to use the new technologies to innovate in new textile products and applications for more functional textile, functional garments, functional underwear,
  - To optimize the performance of medical and paramedical textiles and facilitate access to them within our countries in order to strengthen our means of defense in the event of pandemics.
  - Strengthening of Tunisia-EU strategic rapprochement as an alternative to the Asian market

- Integrating the design process in the industrial approach and moving towards sustainability and circular economy.
4. Benchmarking between the results of the national report and EU cases Database was carried out to provide answers to the following thematic:
- How to implement an efficient and effective use of knowledge for the generation of economic value in textile garment sector in Tunisia
  - How to build specific competences (technical, managerial, etc.) appropriate to each textile innovation center

## 2.4 Timelines - responsibilities split – PERT – Critical paths

WP1-preparation activities are planned according to the following timelines.

Table 2. Timelines of WP1-preparation activities

Activity	Participants	Timelines								
		M4 (April)	M5	M6	M7	M8	M9	M10	M11	
Desk research( D1.2)	ISET-USF-ISMM									
Field research(D1.2) (Survey)	ATCTex-MFcpole- CRNS									
Field research (D1.2)(FG)	USF-ISET-ISMM- ATCTex-MFcpole									
Tunisia National Report (D1.2)	ISET-others Tunisian Partners									
UE Best practices and success stories Database (D1.3)	TUIASI- UNIWA and CRE.THI.DEV									
Conclusion report (D1.4)	ISET									

### 2.4.1 For the desk research

Steps of carrying out the desk research will be distributed and planned as presented in the table below.

Table 3: Timelines - responsibilities split – PERT – Critical paths

Step	Responsible	Deadlines
Assessment and sorting references	All Tunisian partners	15-05-2020
Presentation of the Tunisian textile sector	ISET- CRNS	30-05-2020
Support for innovation in the Tunisian textile sector	Mfcpôle-ATCtex-ISMM	30-05-2020
Reading of European practices in terms of innovation and gateways proposal to implementation in Tunisia	USF	30-05-2020
Conclusions and recommendations	ISET	20-06-2020

### 2.4.2 For the field research

Field research activities are planned according to the following timelines.

Table 4: Timelines - responsibilities split – PERT – Critical paths

Step	Responsible	Deadlines (approximate)
Select persons to be asked (targeted sampling)	ATCTex- CRNS MFcpole-	30-04-2020
<b>Survey questionnaire by delphi approach (1<sup>st</sup>Round):</b> Launch the questionnaire and collect answers	ATCTex- CRNS MFcpole-	30-05-2020
Evaluation and synthesis of first round answers	ATCTex- CRNS MFcpole-	15-06-2020
<b>1<sup>st</sup> FG</b> Synthesis of the principal results on Tunisian textile field and its innovation environment	USF-ISET-ISMM- ATCTex-MFcpole	20-06-2020
Review the questionnaires to integrate some detected ascertainments in the documentary study (1 <sup>st</sup> round of the FG)	ATCTex- CRNS MFcpole-	30-06-2020
<b>Survey questionnaire by delphi approach (2<sup>nd</sup>/ 3<sup>rd</sup> ... Round)</b> Analysis, synthesis and rewording of the next round of the survey....	ATCTex- CRNS MFcpole-	15-08-2020
Represent et analyze the results of the questionnaire survey (delphi)	ATCTex- CRNS MFcpole-	20-08-2020

<p><b>2nd FG</b></p> <p>Mix up the results from documentary research and the survey one and validate the content of the two researches</p>	USF-ISET-ISMM-ATCTex-MFcpole	30-08-2020
<p><b>3<sup>rd</sup> FG</b></p> <p>Validate all the results</p>	USF-ISET-ISMM-ATCTex-MFcpole	15-10-2020

### 2.4.3 For the EU cases

The deliverable D1.3 Best practices and success experiences database will be created in the following stages.

Table 5. Timelines -responsibilities split – PERT – Critical paths for EU cases

	Stage	Participants	Deadline	Results
1	Collection of proposals on best practices and success stories	TUIASI, AEI, UNIWA, CRETHIDEV, CIAPE, CEDECS	14.06.2020	List of projects/best practices with general information and short description
2	Selection of proposals to be included in the database	All partners	2nd project meeting (Iasi)	List of selected projects/best practices to be transferred
3	Collection of selected cases	TUIASI, AEI, UNIWA, CRETHIDEV, CIAPE, CEDECS	14.09.2020	10 projects and 10 best practices (description)
4	Creation of database	TUIASI	14.10.2020	Database with 10 projects and 10 best practices

## 3. COMMON TOOLS SPECIFICATION

The different parts of this chapter of the report should be:

### 3.1 Common tools needed to harmonize the results of Tunisia

#### 3.1.1 Templates for the field research surveys and grids for collecting data

##### 3.1.1.1 Main recommendations in the context of the questionnaire and the application of the delphi approach

###### Form recommendations:

In this case, many directives are considered:

- Ensure anonymity between participants in order to allow them to express themselves freely and avoid any influence based on the personality or status of certain respondents.
- Proceed iteratively by allowing the respondent, at each iteration, to refine his point of view as the study progresses.
- Collect the results at the end of each round and inform the participants of their colleagues' responses in order to provide them with the opportunity to clarify or modify their points of view.
- Repeat, as much as necessary, the questioning through successive iterations until reaching a consensus and bring out all the relevant arguments (**at the end of this process, the points of view will converge for certain proposals and diverge for others**).

###### Substance recommendations:

- Design the initial questionnaire
- Formulate a first list of proposals for which the degree of agreement of the experts will be tested on Likert scales (completely disagree / completely dissatisfied, disagree / dissatisfied, neutral, agree / satisfied, all strongly agree / completely satisfied)
- Adopt a maximum of 20 proposals
- Opt for affirmative proposals (fairly affirmative with strong words<sup>1</sup>) to generate a reactive opinion, example for an industrialist "Scientific research is essential for the development of the company" and prospective proposals (written in future time terms) allowing the respondent to position themselves in future visions or strategies
- Pre-test the questionnaire (with 2 respondents) to make sure that there is no bias linked to the non-understanding of the questions.

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<sup>1</sup>Such as insufficient, essential, obliges, never, decisive, etc.

- Select the experts according to their experience and familiarity with the subject of the study and the information-seeking objectives mentioned in the methodological pack
- Adopt an iterative process:
  - First round: ask respondents how much they agree with the proposals and ask them to comment on their answers
  - Second round: indicate to each respondent, for each proposition, the median and the histogram of the responses to the agreement (appears in red the personal positioning of the respondent) and ask him to confirm or modify his first chord notes
  - Third round: repeat the process if necessary, in order to reach the greatest consensus on the proposals and to deepen the points of divergence.

### 3.1.1.2. Questionnaire settings

#### *Survey setting for researchers and academics in Textile-Clothing sector*

Table 6. Questionnaire for researchers and academics

<b>Questionnaire objectives</b>	<ol style="list-style-type: none"> <li><b>1. Collect data information</b> on the activity of the expert and / or expert structure</li> <li><b>2. Collect expert judgments</b> through a series of questionnaires iteratively on the following themes:           <ul style="list-style-type: none"> <li>▪ Appreciation of the current state (research conditions, applied research, knowledge of project funding methods)</li> <li>▪ Give the opinion of researchers and academics on research and research conditions</li> <li>▪ Identify the expectations of researchers and academics</li> </ul> </li> </ol>
<b>Sampling population<sup>2</sup></b>	<ul style="list-style-type: none"> <li>▪ 68 questionnaires for researchers and academics working in research laboratories known for their activities in the textile field.</li> <li>▪ 20 questionnaires for researchers and academics working on textile applications, products or processes without being in textile laboratories (from art school, mechanical engineer, chemistry, etc.)</li> </ul>

<sup>2</sup>Companies, BIOs, policy-makers, training centers, investment and development agencies, investors, business associations, researchers, etc.

	<ul style="list-style-type: none"> <li>10 questionnaires for textile and para-textile research structures and support structures contributing to textile R&amp;D.</li> <li>2 questionnaires for expert (auditors or scientists, nationally or internationally) known for their knowledge and studies in textile research and innovation.</li> </ul>		
Sampling mode <sup>3</sup>	<p>The sampling criteria must guarantee the representativeness of the different stakeholders:</p> <ul style="list-style-type: none"> <li>Different grade (PhD student, unemployed doctor Assistant, Associate professor, professor)</li> <li>the different specialties (manufacturing of textile fabrics, finishing, of clothing, management)</li> <li>Diploma (textile and non-textile diploma but working on textile fields, or textile researchers working on para-textile fields)</li> <li>Several establishments (Laboratories and school)</li> <li>Age (young researcher, 5-10 year of research, more than 20 years of research)</li> </ul>		
Number of questionnaires to be completed <sup>4</sup>	<ul style="list-style-type: none"> <li>80 questionnaires for researchers and academics</li> <li>20 questionnaires for research structures and support structures</li> </ul>		
Sample considered	<b>Company / Institution</b>	<b>Name of respondent</b>	<b>Position held</b>
Method of administration of the questionnaire <sup>5</sup>	<p>Delphi method</p> <p>The questionnaire is divided into three parts:</p> <ul style="list-style-type: none"> <li>Presentation of the skills of the researchers and their appreciation for applied research</li> <li>The state of scientific research</li> <li>Needs to innovate</li> </ul>		

<sup>3</sup> By convenience, field of activity, etc.

<sup>4</sup> A minimum of 40 questionnaires should be distributed to each target group.

<sup>5</sup> Direct face to face, by email, etc.



<b>Number of questionnaires to be completed<sup>8</sup></b>	40 à 50		
<b>Sample considered</b>	<b>For example Company</b> <ul style="list-style-type: none"> <li>● Aymen Mode (KASTELO)</li> <li>● BACOVET</li> <li>● SARTEX, DEMCO</li> </ul>	<b>For example Name of respondent</b> <ul style="list-style-type: none"> <li>● Med *****</li> <li>● Sami *****</li> <li>● Rchid *****</li> <li>● Jalloul *****</li> </ul>	<b>For example Position held</b> <ul style="list-style-type: none"> <li>● Manager</li> <li>● Manager</li> <li>● Director,</li> <li>● Director</li> </ul>
<b>Method of administration of the questionnaire<sup>9</sup></b>	Online, handmade paper or face to face		
<b>Method of questionnaire analysis</b>	<p>The analysis of Survey of the Textile-Clothing Industry Manufacturers data concerns the two points:</p> <ul style="list-style-type: none"> <li>- State of the sector in R&amp;I</li> <li>- The expectations of the industry. and EER</li> </ul> <p>Analysis with <b>qualitative analysis and delphi approach</b> for seeking consensus on the results of surveys should begin immediately after Survey of the Textile-Clothing Industry Manufacturers closure, and for each company question, summarize the “big ideas” or “themes” that were recap</p>		

### 3.1.1.3. The template of the Tunisia Research report containing

Tunisian textile sector research report should provide answers on:

- Macroeconomic information on the textile sector
- Identification of key stakeholders

<sup>8</sup>A minimum of 40 questionnaires should be distributed to each target group.

<sup>9</sup> Direct face to face, by email, etc.

- Sector needs from an industrial perspective
- Sector needs from university point of view
- A strength-opportunity-weakness-threats analysis (SWOT) for the textile sector
- References to experiences ongoing, such as projects or national initiatives, with the aim of finding synergies

The proposed contents of this deliverable (D1.2) are presented below:

Contents
Abbreviations and Acronyms
Preamble
<b>1. Reminder of the study objectives</b>
1.1 General framework and objectives of the study
1.2 Study methodology
<b>2. Macroeconomic on the textile sector</b>
2.1 International context
2.2 National context
2.2.1 Textile industrial tissue
2.2.1.1 Economic activity
2.2.1.2 Evolution of the activity sector
2.2.1.3 Innovation potential of companies
2.2.1.4 Support structures for innovation: description and offer of programs
2.2.2 Contribution of competence centers in the textile sector innovation
2.2.2.1 HEIs
2.2.2.2 Textiles and clothing sectoral centers in
2.2.3 State of the art regarding technology transfer in textiles
<b>3. Main needs of the textile sector in terms of innovation</b>
3.1 Strategic vision of industrialists
3.1.1 Industrial needs in terms of innovation and technology transfer

- 3.1.1.1. needs
- 3.1.1.2 Marketing needs
- 3.1.1.3 Need for innovation and technology transfer
- 3.1.1.4 Skill requirements
- 3.1.1.5 Material supply requirements
- 3.1.2 Diagnosis of the innovation environment by industrialists
- 3.2 Strategic vision of research and innovation structures
  - 3.2.1 Needs of research structures in terms of innovation and technology transfer
  - 3.2.2 Diagnosis of the innovation environment by research structures
- 3.3 Synthesis and reconciliation of needs and strategic visions
- 4. Strategies implemented for the development of innovation**
- 4.1 Presentation of strategies
- 4.2 Strategy evaluation
- 4.3 Main lessons learned from the strategies implemented
- 5. Towards the implementation of new innovation strategies**
- 5.1 Objectives of innovation strategies
- 5.2 Towards the establishment of innovation centers
- 5.3 needs for setting up innovation centers and academia council
- 6. Synergy with** Erreur ! Signet non défini.
- 7. Synthesis and conclusions**
- 8. Bibliographic references**
- 9. Annex**

## 3.2 Guidelines for the FGs

### 3.2.1. FG setting

Table 8. FG setting

<b>Interview objectives</b>	Collecting the input of groups in relation with the textile sector needs in Tunisia		
<b>Criteria for choosing participants</b>	<p>Having particularly good and broad expert knowledge and experience of the research topic on textile sector needs in Tunisia.</p> <p>They can be textile staff teaching, technical staff, students, trainees, companies, BIOs, policy-makers, training centers, investment and development agencies, investors, business associations, textile researchers</p>		
<b>Number of participants per FG<sup>10</sup></b>	6 à 10		
<b>Average interview time <sup>11</sup></b>	1 h à 2h		
<b>Qualification of participants</b>	<b>Structure (affiliation)</b>	<b>Participant</b>	<b>function</b>
		--	-
<b>Place and mode of interview within the FG<sup>12</sup></b>	Face to Face or online		
<b>Moderator<sup>13</sup></b>	<p>Moderator to be designed from the research team, that need to be comfortable in front of groups or has the ability to encourage group interaction,</p> <p>Or an external person that has experience in facilitating groups in textile field. A good facilitator has the ability to guide discussion and allow the participants to express their views on the topic</p>		

<sup>10</sup>6 to 10 persons.

<sup>11</sup>1h to 2 h.

<sup>12</sup>Face to face (specify location) / remote (specify means)

<sup>13</sup>To be designated later (qualified moderator whose selection criteria will have to be finalized).

<p><b>Method for analyzing the verbatim collected<sup>14</sup></b></p>	<p>The formal analysis of focus-group data should include a summary of:</p> <ul style="list-style-type: none"> <li>the most important themes;</li> <li>the most noteworthy quotes</li> <li>any unexpected findings.</li> </ul> <p>Analysis should begin immediately after FG closure, and for each FG question, summarize the “big ideas” or “themes” that were discussed.</p> <p><b>Data reduction</b> is the key to the analytical stage; <b>summarize</b> a one to two hours’ discussion into manageable concepts that will facilitate report development. A <b>concept map</b> is an example of how FG data can be summarized.</p> <ul style="list-style-type: none"> <li>- <b>qualitative analysis techniques</b> that can be used to analyze FG data include grounded theory analysis (which is necessarily subjective and, to ensure objectivity, a reliability check ) and a <b>content analysis</b> : enables a systematic coding of data by organizing the information into categories to discover patterns undetectable by merely listening to the tapes or reading the transcripts</li> <li>- <b>Delphi approach</b> for seeking consensus on the results of the FG: sending of the flagship ideas collected during the FG to the various participants for approval (iterative process until reaching the saturation effect)</li> </ul> <p>Once all the data are analyzed, the researcher needs to <b>consolidate the results</b> into a coherent <b>report for dissemination</b>.</p> <p>The report should capture participant information such as gender, age and education level in addition to key quotes from participants to emphasis points.</p> <p>The findings should be shared with the participants of the study through a process called member checking, respondent validation, or participant validation to validate the results thereby increasing the credibility of the report or study.</p>
--	---

<sup>14</sup> Content analysis (structuring in the form of flagship ideas that emerge from reading the different verbatims), no statistics.

### 3.2.2. FG guideline

This methodology brief outlines a five-stage process for conducting FGs and reporting on the results. The five stages are:

#### Study Purpose

#### Methodology

- Conceptualization
- Logistics
- Facilitation
- Preparation
- Pre-Session

#### Session

#### Analysis

#### Reporting

Because it focuses on group interaction and allows for data to be generated collectively, this method performs particularly well in identifying the following topics (among many others):

Q1. How do you name, understand, experience and textile sector in Tunisia, its weakness and causes, strength, causes?

Q2. How do you perceive and understand the link between opportunities and risks in textile sector in Tunisia?

Q3. How do you act on it?

Q4. How do you distinguish your role in the textile sector?

Q5. What is yours experience of interaction with textile professionals?

Q6. What are the specific needs of particular sub-sector of textile industry in Tunisia?

Q7. What are specific vulnerabilities of the textile sector dealing with competitiveness?

Q8. Which resources, capabilities and skills can be developed regarding the new perspectives of the textile sector in Tunisia?

### 3.3 Tools of the European Survey

#### 3.3.1 Guidelines on the focus of the cases to be collected

As stated in the project, 10 best practices and 10 EU funded projects on capacity building will be collected and analyzed.

The cases describing best practices and success stories will be structured based on the three topics of presented in the WP1-reparation WP.

- Existing innovative textiles’ centers or other centers implemented from different sectors.
- Collaboration among universities, BIOs and companies for the sector development.
- Innovation and entrepreneurship led by HEIs and business collaboration.

#### **Stage 1. Collection of proposals on best practices and success stories**

The selection of useful information for the WINTEX project from the proposals of best practices and success stories presented in the tables 13 and 14 is based on the proposed structure for case collection, proposed cases for projects and other possible best practices. This information also considered the requirements made by the Tunisian partners.

Table 9. Best practices

Topic	Useful information	Proposed sources for collection of information
1. Existing innovative textiles centers or other centers implemented from different sectors	<p>Services offered by EU centers</p> <p>Activity on research topics (also related to Industry 4.0, smart/functional textiles, nanotechnologies)</p> <p>Organization of the centers (departments, number and</p>	<p>EU research and innovation centers for textiles and fashion</p> <p>EU research and innovation centers from other sectors</p> <p>Studies</p>



	<p>Methodologies and tools for entrepreneurial training</p> <p>New business models in textiles and fashion, related to sustainability, circular economy / co-creation</p> <p>Structures and tools to support start-ups and spin-offs ventures</p> <p>Tools for crowd sourcing and crowd funding, co-creation</p> <p>Existing/under development innovation and entrepreneurial training programs in HEIs</p>	<p>Web search/Businesses</p> <p>Start-ups, spin-offs</p> <p>Relevant studies/reports</p>
--	---	--

Table 10. Successful EU funded project experiences in capacity building from different sectors

Topic	Useful information	Proposed sources for collection of information
1. Existing innovative textiles centers or other centers implemented from different sectors	<p>Capacity building projects – objectives, results</p> <p>Organization of implemented centers, research activity, structures for knowledge / technological transfer toward industry</p> <p>Information on sustainability and exploitation issues from completed relevant projects</p>	<p>ERASMUS CBHE are most useful projects, as a source of information on the same subject, starting with the ones included in the project descriptions</p>
2. Collaboration among universities, BIOs and companies for the sector development	<p>Project objectives</p> <p>Expected/achieved results</p> <p>Structure of implemented CB programs</p>	<p>EU funded projects, like ERASMUS+ (Sector Skills Alliances, Strategic Partnerships and Knowledge Alliances), Horizon 2020, Interreg Europe, Projects funded by EU national agencies, etc.</p>

	Activities for the implementation of relevant EU funded projects	
3. Innovation and entrepreneurship led by HEIs and business collaboration	Project objectives Expected/achieved results Information on sustainability and exploitation issues from completed relevant projects	EU funded projects Reports

*Note: The cases considered for the topics can be enlarged. Also, the useful information listed in the table is general. Other information considered relevant may be added.*

In its first stage, the initial collection of proposals of best practices and success stories will be organized according to the template presented below (see Templates for collection and reporting). The short description will present the reason for its selection. Please note that proposals should be made for all three topics.

### **Stage 2. Selection of proposals to be included in the database**

TUIASI will collect all proposals and create the initial list. The list will be transmitted to all partners for study and discussed at the 2nd project meeting in Iasi. The 10 cases for best practices and 10 projects for capacity building will be selected during the meeting. The selection will consider cases for all three topics.

### **Stage 3. Collection of selected cases**

After the proposals are selected, each case will be presented in detail, according to the template for reporting (see Templates for collection and reporting). The selection will consider the significance of the case in relation to the three topics and the potential for transfer during the implementation of the project.

Each case presentation should not exceed 1 page. The distribution of case presentations will be discussed among the EU partners involved in this task.

## **3.3.2 Templates for case collection and reporting**

### **3.3.2.1. Template for collection**

In the initial stage, the proposals for best practices and success experiences will be organized in a document with the following template. An example is offered for each collection template.



**D1.3. EU Best practices and success experiences database**  
**Stage 3. Collection of selected best practices**  
 Partner: .....

- Table 12. Template for best practices

<b>Topic</b>	
<b>Best practice</b>	
<b>Web site</b>	
<b>Funding source (if any)</b>	
<b>Leader/promoter</b>	
<b>Partners (if any)</b>	
<b>Contact data (if available)</b>	
<b>Objectives/ Subjects of interest</b>	
<b>Main results/ Services offered</b>	
<b>Useful information</b>	

- Template for successful EU funded project experiences in capacity building from different sectors

**D1.3. EU Best practices and success experiences database**  
**Stage 3. Collection of selected successful stories (projects on capacity building)**  
 Partner: .....

- Table 13. Template for successful EU funded project experiences in capacity building from different sectors

<b>Topic</b>	
<b>Project name</b>	
<b>ID</b>	
<b>Web site</b>	



# WINTEX

Weaving innovation among academia and industry in the Tunisian textile sector

610373-EPP-1-2019-1-ES-EPPKA2-CBHE-JP

 <http://WINTEXproject.eu/>  
 [info@WINTEXproject.eu](mailto:info@WINTEXproject.eu)  
 WINTEX Project  
 @ Project WINTEX

Funding source	
Leader	
Partners	
Duration	
Objective/s	
Main results	
Useful information	



## 4. Annex

### 4.1. Annex1: Template for field research (Questionnaires body)

#### Survey for researchers and academic staff in the Textile-Clothing sector

Dear Colleague,

To carry out the activities and the research axes of the WINTeX center and in order to better define the main needs in the textile field in Tunisia, we thank you for agreeing to give us a few minutes to fill out this sheet.

It will allow us to establish a new strategy to reinvent the textile sector in Tunisia, taking into account your comments and suggestions.

Table 14. Researchers Questionnaire Body

<b>Who are you?</b>	
<b>Name &amp; surname:</b> ..... <b>Research unit/laboratory:</b> ..... <b>Situation:</b> <input type="checkbox"/> Ph Student <input type="checkbox"/> unemployed doctor <input type="checkbox"/> Assistant <input type="checkbox"/> Associate professor <input type="checkbox"/> Professor <b>Specialty (diploma):</b> <input type="checkbox"/> textile engineer <input type="checkbox"/> other: ..... <b>Address:</b> ..... <b>Email:</b> ..... <b>Phone number:</b> .....	
<b>Introduction context</b>	<b>Researchers and teachers in textile field</b>
<b>Specification of sub-objective: General information</b>	<b>Q1: Your fields research</b> <input type="checkbox"/> Raw Material <input type="checkbox"/> Spinning <input type="checkbox"/> Weaving <input type="checkbox"/> Knitting <input type="checkbox"/> Finishing <input type="checkbox"/> Clothing <input type="checkbox"/> Metrology <input type="checkbox"/> Management <input type="checkbox"/> Other: ..... <b>Q2: If you are an university teacher, what subjects do you teach</b> <input type="checkbox"/> Raw Material <input type="checkbox"/> Spinning <input type="checkbox"/> Weaving <input type="checkbox"/> Knitting <input type="checkbox"/> Finishing <input type="checkbox"/> Clothing <input type="checkbox"/> Metrology <input type="checkbox"/> Management

Other: .....

**Q3: The Research project idea was proposed by**

An industrialist

Your university supervisor

Your own idea

**Q4: Are you receiving funding for your research project?**

Yes

No

**If yes, what is the type of funding that you have obtained?**

VRR

PNRI

PIRD

MOBIDOC

PJEC

PRF

Others: .....

**Q5: Did you do an internship abroad during your thesis years**

No

Yes

**If yes, - The name of the host laboratory .....**

- The country .....

- Duration of the traineeship .....

self-financing  Tunisian scholarship  International scholarship

**Q6: What type of research project are you doing?**

Fundamental research

Applied research (solve an industrial general subject)  
 Applied research for Tunisian companies  
**Name of company:** .....

**Q7. Your research results are/will be used for**

New product/design    Improve an existing state    Solve a problem  
 Other: .....

**Q8: You tried to apply an idea and / or research results obtained which directly affect industrial innovation**

Yes  
 No

**If yes, we invite you to fill in the table below**

Proposed project Idea/ Research	
<input type="checkbox"/> New added value <input type="checkbox"/> New product <input type="checkbox"/> Process optimization <input type="checkbox"/> waste recycling <input type="checkbox"/> Product reuse <input type="checkbox"/> Management solution <input type="checkbox"/> Technological solution <input type="checkbox"/> Other: .....	<b>Industrial opinion</b> <input type="checkbox"/> Very satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> unsatisfied <b>Results of the project</b> <input type="checkbox"/> Goal achieved <input type="checkbox"/> Not as accepted <input type="checkbox"/> Failure

**If no, what are the constraints that you have encountered?**

You think that your idea has no added value  
 You think that companies will not be interested in the idea  
 You have not found the contacts or how to present the project  
 You did not find companies encouraged by the idea

Other: .....

**Q9: Have you carried out expert assessments with industrialists to solve an innovation problem or to develop and implement a new process?**

<input type="checkbox"/> YES	<input type="checkbox"/> NO
<p><b>If Yes,</b></p> <p><b>The initiative is launched by</b></p> <p><input type="checkbox"/> You</p> <p><input type="checkbox"/> The company</p> <p><input type="checkbox"/> Intermediate</p> <p><b>describe your experience</b></p> <p><input type="checkbox"/> Very satisfied</p> <p><input type="checkbox"/> Satisfied</p> <p><input type="checkbox"/> unsatisfied</p>	<p><b>If No,</b></p> <p><input type="checkbox"/> No real benefits this type of action</p> <p><input type="checkbox"/> I have other occupations</p> <p><input type="checkbox"/> I not had opportunities</p>

**Q10: Did you encounter any difficulties during your research work?**

- Financial problem
- Unavailability of raw material or product
- Know-how type
- Available technology
- Legislative problem
- Personal occupations
- Professional occupations
- Others: .....

<p><b>2<sup>nd</sup> sub-objective:</b></p> <p><b>The state of scientific research</b></p>	<p><b>Q11: You consider that textile research is applied research</b></p> <p><input type="checkbox"/> Totally agree</p> <p><input type="checkbox"/> Partially agree</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Is fundamental research than applied research</p> <p><input type="checkbox"/> Could not go to the industrialization stage</p> <p><b>Q12: Research topics for the past 10 years</b></p> <p><input type="checkbox"/> More and more applied research</p> <p><input type="checkbox"/> No progress</p> <p><input type="checkbox"/> No ideas</p> <p><input type="checkbox"/> Other: .....</p> <p><b>Q13: Equipment in your research laboratories</b></p> <p><input type="checkbox"/> There is advanced equipment (New technologies)</p> <p><input type="checkbox"/> Basic equipment for classical research</p> <p><input type="checkbox"/> No tools for innovative research</p> <p><b>Q14: Equipment in your institute / university</b></p> <p><input type="checkbox"/> There is advanced equipment (New technologies)</p> <p><input type="checkbox"/> Existing but restricted for some researchers</p> <p><input type="checkbox"/> Not exceptional equipment</p> <p><input type="checkbox"/> Other:.....</p> <p><b>Q15: Do you know the national programs for funding research projects (PNRI, PIRD, VRR, PostDoc, MOBIDOC, etc.)</b></p> <p><input type="checkbox"/> No idea</p> <p><input type="checkbox"/> Yes, but I'm not benefit from these programs</p> <p><input type="checkbox"/> I benefited from some program (for example: .....)</p>
--	---

<p><b>3<sup>rd</sup> sub-objective:</b></p> <p><b>Needs to innovate</b></p>	<p><b>Q16: Research topic: List 3 research topic that you think are innovative</b></p> <p>- .....</p> <p>- .....</p> <p>- .....</p> <p><b>Q17: List 3 technology needed to innovate</b></p> <p>- .....</p> <p>- .....</p> <p>- .....</p> <p><b>Q18: Name 3 textile or paratextile industries of the future</b></p> <p>- .....</p> <p>- .....</p> <p>- .....</p> <p><b>Q19: Training courses: propose training subjects to succeed in innovative textile projects</b></p> <p>- .....</p> <p>- .....</p> <p>- .....</p> <p><b>Q20: Please specify your recommendations and your proposals below</b></p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
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*We would to thank you for your collaboration*

*Survey for the Textile-Clothing Industry Manufacturers*

Dear Manufacturers

As part of the WINTEX project, we are asking for your expertise to shed light on the current state of the textile-clothing sector, the main challenges to be met for its modernization and its future prospects.

We would like to thank you in advance for your interest in this survey.

Table 15. Manufacturers' questionnaire body

<b>Who we are?</b>	
<b>Name &amp; surname:</b> ..... <b>Enterprise:</b> ..... <b>type of products worked (specialty)</b> ..... <b>Position:</b> ..... <b>Address:</b> ..... <b>Email:</b> ..... <b>Phone number:</b> .....	
<b>Introduction context</b>	<b>Textile-Clothing Industry Manufacturers</b>
<b>Specification of sub-objectives</b>	<p><b>1<sup>st</sup> sub-objective: General information</b></p> <p><b>Q1: You are a textile company</b>  <input type="checkbox"/> Confection    <input type="checkbox"/> technical textiles    <input type="checkbox"/> usual textile (Weaving, Knitting, Spinning...etc)  <input type="checkbox"/> Other: .....</p> <p><b>Q2: Type of company</b>  <input type="checkbox"/> Subcontractor    <input type="checkbox"/> Co-contracting    <input type="checkbox"/> You have your own brand  <input type="checkbox"/> Other: .....</p> <p><b>Q3: Do you have a Research and Development department within your company?</b>  <input type="checkbox"/> Yes  <input type="checkbox"/> No</p>

**Q4: Have you encountered difficulties during your work within your company?**

Material type  
 Raw material type  
 Know-how type  
 Others .....

**Q5: have you carried out applied research in your company?**

Yes  
 No

**If yes, it is the researcher who makes the relationship or you?**

The researcher  
 The company

**Q6: Have you hear by these structures**

VRR  
 PNRI  
 PIRD  
 MOBIDOC  
 PRF  
 NO

**Q7: Did you do an internship abroad during your work years**

No  
 Yes

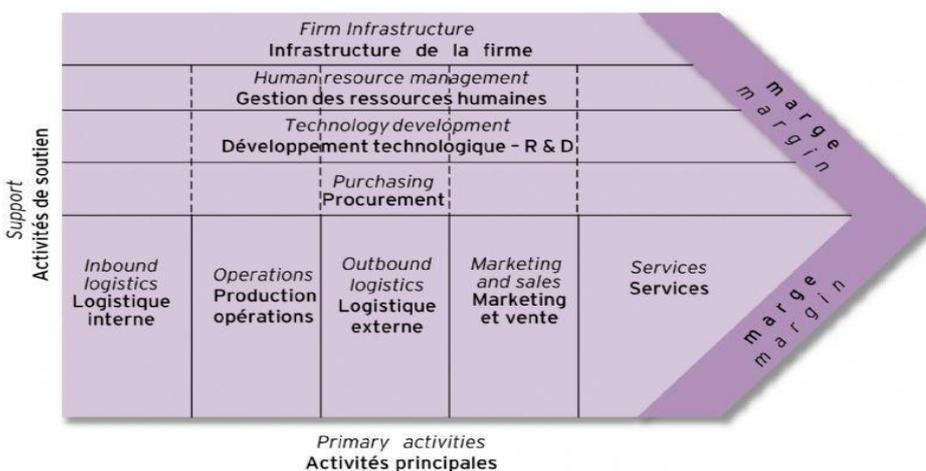
**If yes, - The name of the host laboratory .....**

- The country .....

- Duration of the traineeship .....

self-financing     Tunisian scholarship     International scholarship

**Q8: Where are you in the value chain, you can use percentages in main activities and support activities?**



**Support**  
Activités de soutien

**Primary activities**  
Activités principales

- Logistics
- Operations
- Marketing
- Purchasing
- Technology development
- Human resource management
- NO

---

**2<sup>nd</sup> sub-objective:**  
**The state of innovation**

**Q9: You consider that textile research is applied research**

- Totally agree
- Partially agree
- No
- Is fundamental research than applied research
- Could not go to the industrialization stage

**Q10: Do you make innovation in your company?**

<p>3<sup>rd</sup> sub-objective: <b>Opinion</b></p>	<p> <input type="checkbox"/> No  <input type="checkbox"/> Yes         </p> <p><b>If yes, - The name of the innovation part</b></p> <p> <input type="checkbox"/> Material type  <input type="checkbox"/> Raw material type  <input type="checkbox"/> Process  <input type="checkbox"/> Management  <input type="checkbox"/> Others.....         </p> <p><b>Q11: What do you need to innovate</b></p> <p> <input type="checkbox"/> The knowledge  <input type="checkbox"/> The knowledge  <input type="checkbox"/> Tools  <input type="checkbox"/> Others.....         </p> <p><b>Q12: Equipment in your Company</b></p> <p> <input type="checkbox"/> There is advanced equipment (New technologies)  <input type="checkbox"/> Existing but restricted for some innovation works  <input type="checkbox"/> Not exceptional equipment  <input type="checkbox"/> Other:         </p>
	<p><b>Q13 In your opinion, what are the main needs facing the sector?</b></p> <p> <input type="checkbox"/> Human resources  <input type="checkbox"/> Human competence  <input type="checkbox"/> Financial resources  <input type="checkbox"/> Technical equipment  <input type="checkbox"/> Others         </p> <p><b>Q14 How do you envisage the future of the sector in view of the health crisis</b></p>

**(Covid-19) plaguing the world?**

.....  
 .....

**Q15 What are the opportunities available to Tunisian textile-clothing industry?**

.....  
 .....

**Q16 Do you think that Tunisian government gives enough support to help companies to achieve their transition to circular economy?**

Yes

No

**If yes, what types of support are available?**

Technical

Financial

Legal

Others

**Q17 If no, what other types of supports do you suggest?**

.....  
 .....

**Q18 In your opinion, is tunisian textile-clothing industry innovative?**

Yes

No

**If yes, explain how?**

.....  
 .....

<b>Company data sheet</b>	<p><b>If no, what are the actions to be taken to promote innovation within it ?</b></p> <p>.....</p> <p>.....</p> <p>Field of activity:</p> <p>Size of the company (turnover, balance sheet, employees, etc.):</p>
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*We would like to thank you for your collaboration.*

## 4.2. Annex2: Proposal List of EU cases

### 4.2.1 Proposal list from TUIASI

Table 16. Proposal list from TUIASI

N o .	Topic	Best practice / Project	Name	Web site (if available)	Short description
1	Existing innovative textiles centers	Project	Creating Theory to Practice Centres for Innovation and Employment  586347-EPP-1-2017-1-XK-EPPKA2-CBHE-JP	<a href="https://t2p-centers.com/">https://t2p-centers.com/</a>	This project aims to meet the above-mentioned objectives by establishing "Theory to Practice" Centers (T2P) in higher education institutions in all communities in Kosovo, in cooperation with partners from local industry and international higher education and vocational institutions. The purpose of T2Ps will be to provide a forum for innovation, knowledge exchange between researchers (theory) and enterprise (practice), capacity building and the creation of new tools addressing all key-stakeholders relevant for local development and employment.

2	Innovation and entrepreneurship led by HEIs and business collaboration	Project	<p>Fostering entrepreneurship in science, technology, engineering and math</p> <p>586203-EPP-1-2017-1-DE-EPPKA2-CBHE-JP</p>	<p><a href="https://festem.ps/about.html">https://festem.ps/about.html</a></p>	<p>FESTEM is a project designed to enhance the outcomes of Science, Technology, Engineering and Math (STEM) in the formal education system in the Palestinian Territories to meet the needs of the labour market, with a view to meeting the current and emerging needs of the territory's start-ups ecosystem. The project will introduce an innovative pathway that meets the multidisciplinary needs of the two domains, STEM education and entrepreneurship, developed based on existing best practices implemented within the EU partner universities.</p>
3	Innovation and entrepreneurship led by HEIs and business collaboration	Project	<p>Strengthening of relations between higher education and the wider economic and social environment</p> <p>586418-EPP-1-2017-1-MA-EPPKA2-CBHE-JP</p>	<p><a href="https://yabda-project.eu/site/">https://yabda-project.eu/site/</a></p>	<p>Yabda project aims to build the capacity necessary in ten Maghreb Universities for matching the high research and development potential of the region with soaring youth unemployment rates.</p> <p>The project aim is to address entrepreneurial and innovation challenges in the areas where partner countries display competitive advantage: ie. green technology, energy and sustainable development; to build a high calibre network of future entrepreneurs and thinkers that connects with the local/regional and international market ecosystem with a multiplier effect in the Maghreb region.</p>
4	Innovation and	Project	<p>Reconnecting universities and</p>		<p>The Know Hub project will reconnect universities and enterprises in the</p>

	entrepreneurship led by HEIs and business collaboration		enterprises to unleash regional innovation and entrepreneurial activity  610093-EPP-1-2019-1-AEPPKA2-CBHE-JP		<p>Western Balkans to support the development of innovation and entrepreneurial ecosystem through knowledge transfer. This will be achieved through setting-up of Commercialization Hubs at partner universities. The Hubs will join knowledge, resources and infrastructure from different university units and centers serving as a one-stop-shop for cooperation with industry. Each Hub's placement, strategy, business plan and portfolio of instruments will be tailor-made to the needs and capacities of the universities from the project.</p> <p>The Hubs and the Partner Country Universities (PCUs) will develop capacities in Rapid Prototyping and Lean Manufacturing. The project will also develop the Innovation and Entrepreneurship (I&amp;E) capacities at the PCUs.</p> <p><i>Note: the project just started, but the information is useful</i></p>
5	Existing innovative textiles centers	Best practice	RESearchcenters of Excellence in the Textile sector  (2014 - 2020 Interreg Europe)	<a href="https://www.interreg-europe.eu/RESET/">https://www.interreg-europe.eu/RESET/</a>	RESET aims to change the way European Structural Fund policies and programmes are implemented in the partners' regions. Its key objective is to improve regional policies and promote a more sustainable approach to production in the textile and clothing sector. This includes the creation, management and enhancement of the Research and Development and Innovation infrastructures required to develop greener and more sustainable textile

					<p>and clothing products and processes which will differ these regions from their competitors.</p> <p>RESET addresses 6 key themes: Recycling in textile and waste disposal; Water consumption and energy saving, sustainable company organisations ; New sustainable chemistry, including reduction of chemical substances; Smart textiles and new ways of production; Eco-creativity, natural fibres, short value chains; New materials and new applications</p>
6	Innovation and entrepreneurship led by HEIs and business collaboration	Best practice	The next step for one digital language in the fashion supply chain – eBIZ4.0 (COSME)	<a href="http://ebiz-tcf.eu/">http://ebiz-tcf.eu/</a>	<p>eBIZ 4.0 is a new action aiming to digitally connect at least 100 fashion companies across Europe. This action will deliver IT solutions combining the benefits of the eBIZ digital language with RFID or NFC technologies.</p> <p>Thanks to this combination, the eBIZ 4.0 solution will enable SMEs to increase the traceability of products, improve the time to market and warehouse management and to reduce data exchange barriers with external providers by shortening the distances along the supply chain.</p>
7	Innovation and entrepreneurship led by HEIs and business	Best practice	Global Textiles and Clothing Programme (GTEX)	<a href="http://www.intracem.org/projects/Global-Textiles-and-Clothing-">http://www.intracem.org/projects/Global-Textiles-and-Clothing-</a>	<p>The Global Textiles and Clothing Programme (GTEX) promotes Textile and Clothing exports from countries in Central Asia, the Middle East and North Africa. The aim is to stimulate employment and income generation along the value chain.</p>

	collaboration			<a href="#">Programme-GTEX/#Po</a>	This is achieved through the improvement of the business environment/TISI ecosystem and of the competitiveness in the T&C sector.
8	Innovation and entrepreneurship led by HEIs and business collaboration	Best practice	Crowdsourcing in fashion	<a href="https://lookbook.nu/">https://lookbook.nu/</a> <a href="https://apparel.designcrowd.com/crowdsourcing">https://apparel.designcrowd.com/crowdsourcing</a>	<p>Founded in 2008, LOOKBOOK.nu is the original, user-generated &amp; community-curated gallery showcasing do-it-yourself fashion photography from everyday people, everywhere. Users upload images of themselves and their favourite outfits, providing links to where viewers can find such products and their price point. Additionally, members can vote on their favourite looks, add commentary and provide feedback to participating brands.</p> <p>Designcrowd through Apparel Designcrowd is a site offering crowdsourcing for a large range of products/services, including fashion (T-shirts, apparel, bags, prints)</p>
9	Innovation and entrepreneurship led by HEIs and business collaboration	Best practice	Start-up Fashion	<a href="https://startupfashion.com/">https://startupfashion.com/</a>	It is a site that offers resources, guidance and support for designers to open their own business
10	Innovation and entrepreneurship led by	Best practice	Crowdfunding for fashion	<a href="https://beforethelabel.com/">https://beforethelabel.com/</a>	Before the Label is a way for the public to decide what styles get made and which don't. The site allows people to back a project by an up-

	HEIs and business collaboration			<a href="https://www.weargustin.com/store">https://www.weargustin.com/store</a>	<p>and-coming designer and pre-buy the exact product they want.</p> <p>Gustin: it isn't a marketplace of designers, it's a menswear label, with a twist. Instead of producing new shirts and jeans and hoping consumers will buy, each design is crowdfunded, and if significant support is earned by the community, those products get produced and shipped.</p>
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#### 4.2.2 Proposal list from CEDECS

Information and lessons can be provided from the following projects:

- TCBL (Textile and Clothing Business Labs – an H2020 project, considered as a success story, terminated in June 2019 which continues on a commercial basis): [tubl.eu](http://tubl.eu) – The project which continues as a network of experts on sustainable business models development in Textile & Clothing and technical solutions able to respond to responsible consumers demands for more traceable, ecologically cleaner and socially responsible production processes and products.
- Netkite – a CBC ENPI MED project, terminated in 2015, which coached 100 students of different South Mediterranean Universities in transforming their Business Ideas in Start Ups
- Texmedin - an INTERREG MED project terminated in May 2013, which worked in building bridges between T&C Industries, Students in T&C related studies, T&C Museums and Local Authorities in view of enhancing local Textile and Clothing Clusters.
- PASSAGE – a FP7 project, considered as a success story, terminated in 2012, which developed methodologies and tools for valorising, preserving and transmitting know-how applicable in Textile and Clothing; the project’s results include courses and documentation on captured know-how.
- PROSUMER – a FP7 project terminated in 2012 Networking European Technology Platforms addressing Designbased Consumer Goods Industries and Related Research and Technology Fields which explored consumer trends where price alone is not a competitive advantage anymore while Macroeconomic as well as innovation drivers in EU create an attractive environment for the development of the Consumer Goods sector.

- CLEVERTEX – a FP7 project terminated in 2012 which proposed the development of a strategic Master Plan for the transformation of the traditional textile and clothing into a knowledge driven industrial sector through the deployment of the research results and active research in intelligent textiles, a field ranging from materials science, textile engineering, chemistry, electronics and informatics by a highly qualified workforce.

### 4.2.3 Proposal list from CRE.THI.DEV

Information and lessons can be provided from the following projects. Although, some of them are not in the field of textile (but in similar sectors as these of leather and footwear), ideas and material can be derived and elaborated in order to be included and further enhanced in favor of WINTeX

- Invent – a CBC ENPI MED project, terminated in 2018, which worked on developing the capacities of Jordanian Universities Staff to commercialize Jordanian Universities R&D results, including through the creation of spin offs with some of their students.
- Creative Wear, an INTERREG MED project, terminated in May 2019, which worked in using the creativity of artists for innovating in textile and clothing industries (or promoting innovative products coming from this industry).
- DESTEX, an ongoing ERASMUS+ strategic partnership project that seeks to bring Innovation in the Industrial and Creative Design in Advanced Textile. Although the tools to be developed, necessary for skills enhancement, in higher education in relation to innovation target European countries, many elements can also be used for Tunisia.
- LEAMAN an ERASMUS+ project that created a framework that will result in better qualified professionals in the European leather and leather associated industries and developed a MOOC for the manager in an Efficient and Innovative Leather Company”. Ideas and material from the Project can be derived and elaborated.
- Knowledge4Foot, an ERASMUS+ project aimed to contribute to the excellence in tertiary level of training and education for product design and development engineering and management by linking the three areas of education, research and business-oriented innovation in order to demonstrate good practices of cooperation and to bridge the worlds of education and work.
- TECLO’s aim was to modernize EU’s higher education systems in the field of textiles and clothing (T&C) through: A better anticipation of skill needs, based on the development of sustainable partnerships between education and employment. A Massive Online Learning Course (MOOC), has been developed in 8 different EU languages, educating the future T&C

Managers for export, marketing, innovation, sustainability and entrepreneurship-oriented companies.

- LEATHUB - Establishment of Leather Hubs in Russia And Mongolia, an ongoing project aiming to bridge the gap between the leather industry and the universities by enhancing the collaboration at a research and development base in schemas where industry will be the innovation seeker.
- FOSTEX - Fostering innovation in the Jordanian and Moroccan textile industry, an ongoing ERASMUS+ Project that aims to fill the gap in the area of specialized services for the textile sector, establishing 4 textile innovation centers in Jordan and Morocco.
- DESINNO - Design and Innovation Capacity Building in India, an ongoing ERASMUS+ Project that seeks to provide the infrastructure for the development of design education by establishing three Design & Innovation Centers in Indian Universities, where the systematic collaboration of academia with industry will be fostered.
- TEXSTRA-Textile Strategy for Innovative Higher Education, an ERASMUS+ ongoing project that will develop the tools necessary for skills enhancement, targeted to higher education, in relation to research and innovation.
- INNOLEA - Innovation for the Leather Industry in Jordan and Egypt an ongoing ERASMUS+ project that aims to fill an apparent gap in the area of specialized services for the leather sector with the establishment of four leather centers in local Universities, two in Jordan and two in Egypt, utilizing the experience and expertise of EU partners in the area of services for the leather sector.
- BOOST4Shoes -Boosting cross-border online sales of SHOES, and ongoing ERASMUS+ project that will develop the European Footwear Sector through development of the Online Sales Manager profile, a professional capable of devising e-Commerce strategies for increasing revenues from cross-border sales through utilization of the Internet as a sales channel.
- SHOEMAN - Manager for an Efficient and Innovative Footwear Industry, an ERASMUS+ ongoing project that aims to provide the instruments for the reengineering of the footwear sector and offer to the existing and aspiring managers of the sector the most up-to-date and according to the anticipations of required skills and training needs, knowledge and information.



Quantitative forecasting can be used when:

- 1) There is information about the past,
- 2) When this information can be expressed as data
- 3) When there is an assumption that the future will be a continuation of the past and the present.

Otherwise qualitative methods must be used. Delphi is one of the best-known qualitative methods.

The choice of delphi method is pertinent when:

- The individuals needed to contribute to the examination of a broad or complex problem have no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise
- More individuals are needed than can effectively interact in a face-to-face exchange or the efficiency of face to face meeting can be increased by a supplemental group's communication process
- Time and cost constraint make frequent group meetings infeasible
- The problem does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis.
- Disagreements among individuals are so severe that the communication process must be refereed and/or anonymity assured
- The heterogeneity for the participants must be preserved to assure validity of the results

CLEVERTEX context is typically corresponding to the above described situations justifying the selection of this method as the reference method for CLEVERTEX survey. The methodology adopted to undertake this survey is inspired by the delphi method also based on the view that, in CLEVERTEX, we have to take benefit from the expertise of people accessible by the partners in our different countries, for it is not only an effective means to assemble distributed knowledge into a workable reference framework, but also we need to involve them in our future work and network.

#### 4.3.3. Introduction to delphi methodology

Named after the Greek oracle at delphi to whom the Greeks visited for information about their future, the delphi technique is the best known qualitative, structured and indirect interaction futures method in use today.

Delphi technique had its main genesis in earlier work to overcome some shortcomings of human judgment for planning purposes.

Basically, it is founded on two observations:

- Predictions made by a group of people are more likely to be right than predictions made by the same individuals working alone
- Face-to-face meetings have several problems such as being dominated by one or a few individuals, falling into a rut of pursuing a single train of thought for long periods of time, exerting considerable pressure on participants to conform and regularly becoming overburdened with periphery information

The formulation of the delphi technique was a response to these two observations.

delphi has four basic features:

- structured questioning (use of questionnaires)
- iteration (rounds enabling participants to reconsider their responses)
- controlled feedback (by feeding back to the panel members the responses of the whole group as well as their own response for their reconsideration; this means that all the responses of the panel are taken into account).
- anonymity of responses (questionnaires ideally giving group members the freedom to express their opinions without feeling pressured by the wider group).

In all cases delphi methodology is composed of the following steps:

- 1) The subject of the study is circulated to the participants in an unstructured manner to enable them to comment on the issues in question.
- 2) This material is then synthesized by the monitoring team and distributed to the participants in a questionnaire format; the questionnaire is drawn up to ascertain the opinions of the experts and to try to elicit points of convergence and divergence.
- 3) The questionnaires are distributed in successive steps, each time with the information from previous questionnaires that has been interpreted and reformulated by the coordinating team.
- 4) A verification stage where feedback is provided to experts including conclusions and statistical material to be discussed in order to reach a consensus at a group level.

The first round of questionnaires to the panel can be presented as an inventory or it can be prepared by the monitoring team (researching, interviewing key people, pre-testing the questionnaire, pre-defining scenarios to be tested etc.).

Some studies have interspersed the rounds with personal interviews with panel members, sometimes panel members have been brought together in a meeting to discuss the results of the delphi survey and to come to a final conclusion. Others use structured group conferences such computer conferencing and communication for some rounds. The number of rounds can vary from two to ten.



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In many delphi studies, statistical aggregation of the group response is also a common feature. This means that where consensus is required at the end of the process, it is taken to be the median response of the panel and the spread of the interquartile range as the degree of consensus.

Another version of gaining consensus is for the respondents to make a self-appraisal as to their competence in giving their responses. The answers from those who grade their competency level high are then used as the median, rather than the group as a whole. Combinations are possible.

From its creation by Olaf Helmer and Norman Dalkey at RAND Corporation to face strategic military questions (1953) until today, the technique has been largely adopted by scientists, politicians and business strategists and has been the subject of numerous books and articles.

Its use extended in private corporations, think tanks, government, education and academia, in US but also in Europe and Japan, especially these last ten years.



Three types of delphi have been developed since their first applications, which are briefly described below.

### **The Conventional delphi**

The first experiment using a delphi style technique was carried out in 1948 in the hope of improving betting scores at horse races...

However, it was Helmer and Dalkey at the RAND corporation in 1953, who really advanced the technique to increase the accuracy of forecasts.

The Conventional delphi has two main functions: forecasting and estimating unknown parameters.

It is used to determine consensus on forecasting dates and developments in many areas - but particularly in the area of long-term change in the fields of science and technology. By estimating unknown parameters, respondents make their own estimates regarding the expected levels of an activity relative to present levels.

### **The Policy delphi**

It does not aim for consensus but seeks to generate the strongest possible opposing views on the resolution of an issue and to table as many opinions as possible. The objective is for it to act as a forum for ideas and to expose the range of positions advocated and the pros and cons of each position (Bjil 1992)

### **The Decision delphi**

It is utilized to reach decisions amongst a diverse group of people with different investments in the solution. The subject of the decision, for which the delphi is used as a resolution mechanism, is usually harshly contested and complex and thus the structured group communication process is deemed effective.

According the literature, there is a consensus that delphi is suited for problems that are difficult to solve with conventional techniques. For example, problems that do not have objective empirical data required for the application of statistical or mathematical models, as the open questions with which CLEVERTEX deals. The delphi technique is a method for structuring communication in a process that allows a group of individuals to deal with a complex problem and reach conclusions. The main criticism about delphi is that often it is used for reaching rapidly a consensus at any cost (include the use of manipulation techniques) on pre-set conclusions. Aware of this, we believe that while we shall seek consensus, we shall not try to reach it at any cost, because we expect that lots can be learned also from documented differences of points of view.

#### 4.3.4. Methodology applied for CLEVERTEX survey

CLEVERTEX survey has been inspired by and adapted from the Conventional delphi method, involving the use of a series of questionnaires designed by a monitor group and then sent to respondent groups of experts. The results have been collected, summarized and assessed by the monitoring team. The survey identified and selected the convergence of opinions between two groups of experts:

- Scientific experts, knowing the technologies involved in the production of smart textiles
- Industrial experts, knowing the textile industry and its main client sectors

The consultation was based on a set of 18 questionnaires (including an initial questionnaire on experts' profile), which have been designed by the survey coordinator and modified according to the feedback received from the partners in a special meeting organized for this purpose. A version of the final questionnaires, in excel version, has been tested with project participants at the end of which the online version of the questionnaires has been specified in a new meeting organized to approve the design proposed by the software developers.

Experts have after that been individually invited by e-mail to participate to the survey. Questionnaires have been distributed to the experts in two rounds out of which a total of 130 filled questionnaires have been collected.

Out an initial sample of 210 experts identified by CLEVERTEX partners, 60 provided their detailed profile and 52 participated with answers to the questionnaires submitted to them.

A first category namely the "techno-experts" provided information in terms of scientific relevance, feasibility and position of the EU research while a second category of experts namely the "sectoral-experts" provided their opinion in terms of business relevance, acceptance criteria and socio-economic expected impacts. The first group had as mission to stress what is scientifically and technically feasible while the industry group had been used to provide a more global view of the innovation process and awareness on essential technological and non-technological aspects of innovation. In a first-round experts have been asked to give their profile and to rate their level of expertise in the different topics covered by the survey. They were also asked to answer a first questionnaire on their global views of the potential future and impact of smart textiles. They provided their answer either using excel templates, or directly by connecting to the private area opened for them in the CLEVERTEX delphi Survey site.

Based on their dominating expertise, in a second round, experts have been assigned one general questionnaire on industrial perspectives (Industry experts) or two general questionnaires on scientific perspectives of smart textiles (Scientific experts). Additionally, based on their specialty, experts were assigned some of the 15 specialized questionnaires, built on scenarios identified in the State of the Art deliverable of the project.

The allocation of the questionnaires has been managed using the online tools provided to the survey Coordinator on the CLEVERTEX delphi Survey site. This flexible tool allowed a progressive adjustment of the requests, according to the questionnaires received, in order to progressively reduce the number of questionnaires for each expert to avoid to overload them. Almost all experts who have participated to this second round provided their answers on line.

A statistical analysis of the answers to the questionnaires has been performed for each group of experts and a consolidation has been carried out in order to identify the consensus and the contradictions between them.

#### 4.3.5. CLEVERTEX survey organization and design

In this section the results of the design stage are presented.

##### Overview of the survey organization

The questionnaires of this study have been designed by Athanase CONTARGYRIS of IFTH, in charge of the coordination of the delphi study. The State of the Art Study, delivered by University of Gent in 2006, served as the basis for building these questionnaires, as explained below. A first version of the questionnaires has been presented to the partners in a meeting on October 31<sup>st</sup>, 2006, in Lille. The questionnaires have been circulated to all partners after that meeting for feedback and a meeting on December 6<sup>th</sup>, 2006, in Brussels allowed to agree on a final version, which has been circulated on January 31<sup>st</sup>, 2007.

The partners have been invited, by the mail sending the final version of the questionnaires to them, to complete the questionnaires in relation with their expertise in order to test them.

After this test, some questionnaires have been split in smaller ones in order to make each questionnaire lighter for the experts and it has been decided, to facilitate the administration of the matches between the profiles of the experts and the questionnaires they will be asked to answer, to put these questionnaires online on a website. The initial design of that site has been presented in a meeting held on March 22<sup>nd</sup>, 2007 in Lille, during which the planning of the delphi survey was re-scheduled.

Meanwhile, between February, 2007 and May 2007, CLEVERTEX partners have proposed their lists of experts for the delphi study and on June 4<sup>th</sup>, 2007, most of the experts basic profiles having been introduced and checked on the online database, the experts have been invited, by mail, to complete their profiles and to answer to the first questionnaire of the study on their views of the potential impact of Intelligent Textiles development. A total of 61 profiles and 44 valid filled questionnaires have been collected during this phase.

On the basis of the answers received the second round, asking the experts to answer to additional questionnaires, in line with their fields of expertise, has been launched on July 26, through a mail sent to all of them and inviting them to connect to the site to answer.

Reminders have been sent to experts on Monday September 3<sup>rd</sup> and a last call for contribution has been sent on September 10<sup>th</sup>. During the project meeting held in September 14<sup>th</sup> it has been decided that all partners will help with a final collection of answers and to fix as last deadline for receiving answers October 15<sup>th</sup>. Until October 10<sup>th</sup>, 83 questionnaires have been collected for this second round.

### **Initial questionnaire sent to all experts**

This questionnaire aimed at verifying some hypothesis on which CLEVERTEX project was built and to see up to what level there was a consensus on them within the panel. Additionally, a purpose was to identify when some of the potential impacts of the development of intelligent textiles can be expected.

DO YOU EXPECT INTELLIGENT TEXTILES TO	<i>Radically</i>	<i>Significantly</i>	<i>Moderately</i>	<i>Marginally</i>	<i>Not at all</i>
<b>(please indicate in the appropriate column the year when this could happen)</b>					
<i>Example of answer</i>		<b>2020</b>	<b>2015</b>	<b>2010</b>	
Improve the quality of existing textiles Improve the functionalities offered by textiles Increase the market share of mass-customized final products made using textiles Offer completely new application fields (and markets) for textiles Offer completely new possibilities of creation for fashion					
Provide new high-end value-added niches and new business opportunities					
for EU equipment suppliers of textile industry for existing EU textile industries in textiles for clothing industry in interior textiles in technical textiles for EU clothing industries for clothing for sports and extreme sports for industrial clothing and protective clothing for clothing for hygiene & healthcare for clothing for rescue workers for other EU sectors for new EU start-ups					
Improve the competitiveness					



- Materials allowing Encapsulation and grafting of advanced properties (ex microencapsulation)
- Advanced polymers (ex Shape Memory Polymers, Piezoelectric, Stimuli sensitive, Colour change polymers)
- Other advanced materials (Metallic, Ceramic, like Shape Memory Alloys)
- Others

The following 8 application sectors and sub-sectors have been proposed for each of them:

1. Textiles for clothing (in general)
  - o for sports and extreme sports
  - o for industrial workers including protective clothing (including for rescue workers)
2. Interior Textiles
3. Technical Textiles (in general)
  - o hygiene & health care protective textiles
  - o transport textiles (automotive, railway...)
  - o textiles for construction

For each question the following grid was used:

TYPES OF INTELLIGENT TEXTILES (Textiles incorporating...)	POSSIBLE APPLICATION FIELDS							
	Textiles for clothing (in general)	for sports and extreme sports	for industrial workers including protective clothing (including for rescue workers)	Interior Textiles	Technical Textiles (in general)	hygiene & health care protective textiles,	(auto-motive, railway...)	transport textiles for construction
Conductive materials and lighting fibers								
Electronic components, sensors and actuators								
Materials generating energy and power supply								
Materials allowing Encapsulation and grafting of advanced properties (ex micro-encapsulation)								



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Advanced polymers (ex Shape Memory Polymers, Piezoelectric, Stimuli sensitive, Colour change polymers)								
Other advanced materials (Metallic, Ceramic, like Shape Memory Alloys)								
Others								
For others, please specify:								

The following 3 questions have been asked to the experts, for each of the 7 types of intelligent textiles used in the above grid:

**1. to forecast which sectors or sub-sectors (8), will be interested in them**

As illustrated in the following example:

TYPES OF INTELLIGENT TEXTILES (Textiles incorporating...)	POSSIBLE APPLICATION FIELDS							
	Textiles for clothing (in general)	Textiles for sports and extreme sports	Textiles for industrial workers including protective clothing (including for rescue workers)	Interior Textiles	Technical Textiles (in general)	hygiene & health care protective textiles,	transport textiles (automotive, railway...)	textiles for construction
<i>Conductive materials and lighting fibers</i>	X	X			X		X	

**2. in what year, in which sector or sub-sector intelligent textiles will represent more than 10% of textiles used**

As illustrated in the following example:

TYPES OF INTELLIGENT TEXTILES (Textiles incorporating...)	POSSIBLE APPLICATION FIELDS							
	Textiles for clothing (in general)	Textiles for sports and extreme sports	Textiles for industrial workers including protective clothing (including for rescue workers)	Interior Textiles	Technical Textiles (in general)	hygiene & health care protective textiles,	transport textiles (automotive, railway...)	textiles for construction
<i>Conductive materials and lighting fibers</i>		X	2010		2020		2010	

**3. what is their forecast of the split (%) of sales of intelligent textiles between the 8 sectors and in what year they expect that this deployment will happen**

As illustrated in the following example:

TYPES OF INTELLIGENT TEXTILES (Textiles incorporating...)	POSSIBLE APPLICATION FIELDS								HORIZON (year) of your market shares forecast
	Textiles for clothing (in general)	for sports and extreme sports	for industrial workers including protective clothing (including for rescue workers)	Interior Textiles	Technical Textiles (in general)	hygiene & health care protective textiles,	transport textiles (automotive, railway...)	textiles for construction	
<b>Conductive materials and lighting fibers</b>	<b>10%</b>	<b>10%</b>		<b>40%</b>	<b>50%</b>		<b>30%</b>		<b>2010</b>

**Specialized questionnaires**

These Questionnaires asked Experts to forecast the perspectives of use of 85 relevant cases (applications or functionalities) offered by intelligent textiles identified in **the State of the Art Study** of CLEVERTEX.

In order to keep each questionnaire at a reasonable length, the 85 relevant cases have been split according to their relevance for a specific sector or sub-sector, limiting the cases/sector (or sub-sector) to less than 25 maximums.

Accordingly, a set of 7 questionnaires has been designed for industry experts, according to their expertise, splitting the cases as follows:

Branch Experts answered, according to their expertise, to the following questionnaires	Number of cases	Specialized experts answered, according to their expertise, to the following questionnaires	Number of cases
Clothing industry experts were asked to answer to questionnaire:		Specialized experts in textiles for industrial and rescue workers clothing - including protective clothing, were asked to answer to questionnaire:	
<b>Clothing.Industry</b> <b>Applications concerned</b>	<b>20</b>	<b>SpClothingProtect.Industry</b> <b>Applications concerned</b>	<b>4</b>
Interior textile industry experts were asked to answer to questionnaire:			
<b>InteriorTextile.Industry</b> <b>Applications concerned</b>	<b>23</b>		
Tehcnical textile industry experts were asked to answer to questionnaire:		Specialized experts in hygiene & health care protective textiles and clothes + Experts in Health Care, were asked to answer to questionnaire:	
<b>TechTextGl.Industry</b> <b>Applications concerned</b>	<b>25</b>	<b>SpTechTextHealth.Industry</b> <b>Applications concerned</b>	<b>8 *</b>
		Specialized experts in Textiles for Transports, were asked to answer to questionnaire:	

	<b>SpTechTextAuto.Industry</b>	
	<b>Applications concerned</b>	<b>3</b>
	Specialized experts in Textiles for Building, were asked to answer to questionnaire:	
	<b>SpTechTextBuilding</b>	
	<b>Applications concerned</b>	<b>2</b>

The detailed list of the 85 cases submitted to experts' appraisal is provided in Annex I – Intelligent textile cases submitted to Industry experts.