



# Sustainable business model for textile' innovation center ISET KH

WP 4 – D 4.8: Sustainable business model for textile'  
innovation center ISET KH, Tunisia

Lassaad GHALI  
Nesrine Boussaada Ep Taieb  
Imed Ben Marzoug  
(ISET KH)

December 2022

Responsible partner for deliverable:	ISET KH
Contributing partners:	Imed BEN MARZOUG, Nesrine Boussaada Ep Taieb, Lassaad GHALI
Target Group(s):	Institutions
Distribution level:	Partnership
Total number of pages:	15
Version:	01
Reviewed by:	
Status:	Final

#### Version control

Number	Date	Description
00	12/12/2022	First draft
01	24/07/2023	revised

All rights are reserved. Reproduction and adaptation are prohibited.

Copyright © WINTEX Consortium, 2019-2021

## Contents

Contents	3
Abbreviations and Acronyms	4
1. Objective	5
2. Equipment of the ISET KH Textile Innovation Center	5
3. Key services	6
4. Services description	6
4.1 Expertise in diagnosing areas of innovation	6
4.2 Assistance in optimizing textile processes	7
4.3 Development of prototypes of innovative textile products and launch follow-up	7
5. Identification of value chain components	8
6. Services to be in-house or outsourced	8
7. Definition of the business model of in-house services	9
8. Quality and performance indicators	12
9. Outline of the Center's Business Model	12

## 1. Abbreviations and Acronyms

Abbreviation/acronym	Full name
CETTEX	Textile technical center
LGTex	Textile engineering Laboratory
FTTH	Tunisian clothing textile federation
CIT ISETKH	Textile innovation center of ISETKH

## 1. Objective

The main mission of the center is to promote technology transfer by supporting companies in their innovation and performance improvement efforts, through expertise, assistance and supervision services for the development of new products or processes or the improvement of existing ones; with a view to better added value on the national and international market.

The center makes it possible to put at the service of the industry, the know-how of academics and researchers in the field of textile clothing, by accelerating the lever of innovation. More specifically, the center makes it possible to bring companies to be more competitive and efficient in their markets while drawing on the valorization of the results of scientific research of academics.

Taking into account the collaboration established between ISET KH and its LGTex component on the one hand and textile companies in the region on the other hand, the strategic orientation of the ISET innovation center of Ksar Hellal is the following axes:

- Expertise in diagnosing areas of innovation
- Assistance in the optimization of textile processes
- Development of prototypes of innovative textile products and launch follow-up

These actions concern all processes ranging from fiber processing, complex structures to creation and development. Prototyping will focus primarily on technical textiles and sustainable textiles. Process optimization is ensured through the study of sources of waste and process performance indicators. These two points are evaluated and improved according to a precise planning.

## 2. Equipment of the ISET KH Textile Innovation Center

ISET KH's textile innovation center has the following equipment acquired as part of the Wintex project:

- Electrospinning pilot line
- A multifunctional embroidery machines
- A 3D printer
- A manual hot press
- A device for measuring fastness in hot pressing

- A device for measuring the recovery of knitted fabric after stretching

Other equipment from ISET and LGTex are made available to the center for exploitation. These include, mainly:

- The dry nonwoven line (card, needle-machine)
- Plasma processing machine

### 3. Key services

The key services of ISET KH Textile Innovation Center revolve on:

- Expertise in diagnosing areas of innovation: The expertise and study concern the diagnostic part and the preparation of the project and a schedule of realization with stages and deadlines well identified.
- Assistance in process optimization: Technical assistance concerns the monitoring and supervision of the different stages of R&D projects and the evaluation of the expected results for each stage according to the deadlines implemented.
- Development of prototyping of innovative textile products and launch follow-up: The development and evaluation of the performance of innovative textile products/processes concerns the creation and elaboration of prototypes and the evaluation of the results obtained either on the products or processes studied.

### 4. Services description

#### 4.1 Expertise in diagnosing areas of innovation

The first service concerns the expertise of research and development needs through a field study conducted by a group of highly qualified researchers who touch the different sub-sectors. Indeed, a multidisciplinary team of experts is formed to succeed in the mission of study and expertise in R&D (manufacturing, technical textile, finishing, innovation management,). Also, the innovation center works in collaboration and in a complementary way with the innovation centers located in Monastir and Sfax, for more synergy of skills.

Diagnostic visits are carried out to detect and formulate research projects dealing with innovative axes and high added value. The diagnosis will focus mainly on the technical aspect and focuses on the development of product and process innovation. Indeed, the national report on the sector has shown that on the one hand this aspect is highly sought after by industrialists and on the other hand it is neglected by competitors offering similar services to the innovation center of ISET KH.

The diagnosis will pave the way for the development of activities 2 and 3 of the center, bringing greater added value to the innovation center. It will also facilitate the launch of new research topics with doctoral

students, which can benefit the center from scholarships and state subsidies awarded as part of these projects. The diagnosis is also considered as a gateway to the company to make the exchanges of services profitable, in particular by providing the center with consumables granted to client companies and maintenance services delivered by their staff.

The promotion of this service will be carried out by professional and social networks (linkedin, Fc, twitter...), ISET KH website and the textile-industry academia council as well as the contact network of center staff with partners.

In addition, collaborations are carried out with a large number of textile companies as well as the CETTEX (technical center of textiles), the MFCpole cluster and FTTH.

#### 4.2 Assistance in optimizing textile processes

Technical assistance concerns innovative products and changes to different processes. It covers the idea and its formulation, action planning, laboratory-level testing, pilot testing and industrialization. Indeed, after the expertise, the identification of the lines of research, the preparation of the file and the writing of the report, a planning of the actions and a follow-up work of the various actions are carried out. A supervisory action is then provided by the CIT ISET KH experts. A multidisciplinary team of experts is formed to succeed the technical assistance mission of R&D projects (manufacturing, technical textiles, finishing, innovation management, clothing, sustainability, etc.). This service can also reach startups and new entrepreneurs.

The promotion of this service will be carried out by professional and social networks (linkedin, Fc, twitter...), ISET KH website and the textile-industry platform Academia Council as well as the contact network with industrial partners.

#### 4.3 Development of prototypes of innovative textile products and launch follow-up

The customer can ask CIT ISET KH directly or following an expertise (key service 1), the development of new products and processes (depending on the equipment available at ISET KH). These products and/or processes are evaluated to identify and measure new performance. This service allows, on the one hand, to develop and/or elaborate innovative textile products. On the other hand, improve and optimize existing processes or develop new processes using new equipment and techniques. This service can thus also reach start-ups and new entrepreneurs.

A multidisciplinary team of researchers is made available to the IC to succeed in the mission of development and evaluation of innovative textile products or processes

Through the projects concluded, a reinforcement of the CIT's equipment park can be envisaged, the purchase of consumables (material, spare parts, etc.), the maintenance of the center's equipment as well as the hiring of ISET researchers and new graduates in companies.

The promotion of this service will be carried out by professional and social networks (linkedin, Fc, twitter...), ISET KH website and the academia council textile-industry platform as well as the contact network with industrial partners.

### 5. Identification of value chain components

The innovation center can intervene at all levels of the value chain, at the beginning, during the process or at the end of its implementation, depending on the intervention carried out.

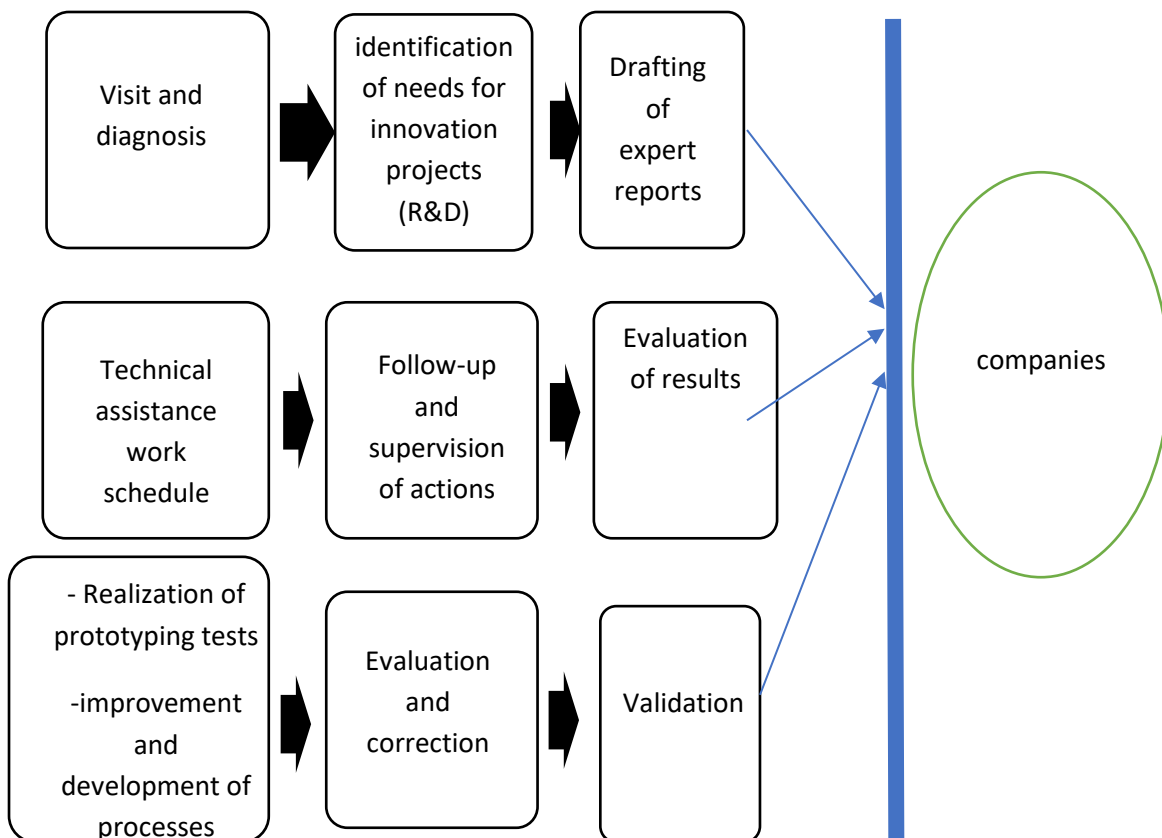


Figure 1. steps of CIT Services of ISET

### 6. Services to be in-house or outsourced.

After identifying the positioning of the Innovation Center, it will be possible to decide whether the service will be internalized or outsourced (from a matrix and with ratings from 1 to 5).



Table 1. Table of criteria for internalization or outsourced services

Text or number	Criteria (*)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Expertise in diagnosing areas of innovation	5	2	3	4	1	5	5	5	3
Process optimization assistance	4	5	3	4	2	5	5	5	5
Development of innovative product prototypes and launch follow-up	5	3	5	5	5	4	5	5	5

What criteria (\*) to consider in the matrix?

- (1) Value added associated with activity: High value-added activity vs. low value-added activity
- (2) Frequency of activity: Current activity vs. one-time activity: Table on the level of use between activity and objectives
- (3) Level of quality desired by the market
- (4) Use or availability of internal resources
- (5) Existence of comparable supply on the market
- (6) Coherence between the proposed service and the overall strategy of the Innovation Center
- (7) Importance of service to the company
- (8) Billable vs. non-billable service
- (9) Shared services vs custom vs mix

## 7. Definition of the business model of in-house services

Our activity is a very specific activity. It is a question of stimulating innovation action in the textile sector, more previously, it is a question of dealing with the practical aspect of innovation-development action within the enterprise.

Starting from the idea in correspondence with the company's activity to the industrialization and performance evaluation aspect, the activity will be divided into three axes:

- Expertise in diagnosing innovation areas

- Textile process optimization assistance
- Development of textile innovative product prototypes and launch follow-up

With a set of well experimented and high skills experts sweeping all textile sub-sectors, the center provides an appropriate and effective diagnostic action. Thus, in a short time, the experts describe the needs of the company in innovation, the constraints, the necessary resources ..., giving the company ecological solutions with a mastery of the energy aspect.

Moving on to a rigorous follow-up to reduce costs, treatment time and water and energy losses. This monitoring makes it possible to eliminate any kind of waste. This action is specific according to the company, its processes and products. The experts through a detailed diagnosis make it possible to evaluate the process performance indicators, to apply the proposed solutions according to a well-planned action plan without disrupting the daily work.

The last activity concerns the prototyping of innovative products. Going through all the operations of the sample with laboratory tests, then at pilot scale and finally industrialization. This action helps the company to focus on production without wasting a lot of money or effort at the development level. A huge saving in time and personnel, research and development with the contribution of specific researchers for this action will be recorded.

Our offers will be specific for each customer, namely:

- Companies operating in the nonwoven sector have the advantage of developing their samples on our line, the samples are evaluated by a complete characterization. The company receives a valid prototype according to the best performance.
- Finishing companies can have a valid recipe for the desired treatment (stain repellent, anti-microbial, fireproof...) with ecological products with the shortest processing time and minimal energy consumption.
- All clothing companies are followed to have the best quality in the shortest time by introducing technical textiles and new technology.

Support for the introduction of innovation is provided with many experts and with an exhaustive list of materials: 3D printer, plasma machine, nonwoven line, control equipment on all types of structure, electrospinning unit, thermo-press, embroidery machine, creep and relaxation of knitwear, air and water permeability, dynamometer... These actions are led by a team of researchers, led by the LGTex laboratory director, administratively supported by administrative staff and technicians. The reception and administrative processing of applications are ensured by the secretariat of the laboratory. Technicians and researchers provide characterization development and testing.

With a wide variety of partners, the textile research laboratory with its various components including the innovation center has forged several partnerships namely:

- A good internal relationship with the various components of ISET KH (administration, departments, associations...): these different components make it possible to facilitate tasks for the innovation center in terms of promotion, subsidies, direct contact with companies. These components can provide, if necessary, expertise in the various mechanical fields, textile waste treatment, marketing, etc. They can intervene in the level of characterization tests, the development of test benches, participation in projects, etc.
- The textile research laboratory and the innovation center can benefit from the various subsidy lines granted by the Ministry of Higher Education and the Ministry of Industry.
- With the establishment of agreements with the textile technical center "Cettex", TTS laboratory, training centers, IS2M, ISAM Sfax and other laboratories and institutes the center benefits from existing equipment and some expertise.
- The innovation center (CIT-ISET KH) in collaboration with the LGTex laboratory are in direct and continuous relationship with the textile clothing federation and the MFCpole which are the possible representatives of textile companies and which can ensure the innovation center a permanent relationship with companies. Through the knowledge of the current needs of companies and the knowledge of the offers produced by the innovation center, the two representatives can build relationships between the center and its customers through promotional acts throughout their activities. The two representatives can present to the innovation center the current problems of the different companies to solve them.

The various partners participate with the center financially through grants, participation in projects, access to funding lines or through promotional acts.

The promotion of the center is also ensured through the platform "Textile Community" through the website of the wintex project ([www.wintexproject.eu](http://www.wintexproject.eu)), that of ISET KH. The different distribution channels are used: brochures, catalogues, open days and social networks.

The exchange with customers is considered as a privileged channel, the choice of research areas being made in collaboration with customers. Monitoring is always continuous even after launch and industrialization to evaluate the performance of new products. Each period a questionnaire is launched to reassess customer satisfaction. A follow-up and analysis of customer complaints will be ensured. Also, an annual evaluation of the effectiveness of distribution channels is carried out and adjusted according to customer needs and new developments in the market.

In addition, customers are required to pay for diagnostic actions and characterization tests. They provide maintenance operations for the center's hardware and the material needed for development and prototyping. The experts are also required to formulate national and international collaborative projects, considered as sources of certain subsidies and a path to improve existing equipment. The lines of funding granted by the Ministry of Higher Education and Industry are likewise considered as sources of income for

the center. They are used to finance part of the work of researchers and to help companies to move to the production of finished product through an appropriate innovation and development action.

## 8. Quality and performance indicators

Like any action, innovation hub services are evaluated by a set of performance indicators:

- Customer satisfaction: A questionnaire is launched after each action. Also, a satisfaction survey with the center's services is launched and analyzed annually to make a new decision.
- Number of projects completed per year: This indicator indicates the importance of the activities carried out.
- Diagnostic report: this indicator indicates the number of diagnostic reports made by the center.
- Number of patents and publications per project: This indicator indicates the importance of project-based research results.
- Number of solutions selected and implemented by companies: This indicator indicates the effectiveness of the solutions proposed by the center.
- Percentage of sales of new products: In collaboration with our customers, this monitoring indicates the effectiveness of innovation idea choices.

## 9. Outline of the Center's Business Model

The following table presents the outline of the combined Business model of the CIT ISET KH.

Table 2. Business Model Canvas: ISET KH Key Center Services

Key Partners	Key activities	Offer (value proposition)	Customer Relationship	Customer Segments
<ul style="list-style-type: none"> <li>• FTTH promotion and publicize the center.</li> <li>• Technopole Monastir-Elfajja promotion and make known the center.</li> <li>• Cettex (textile testing services)</li> <li>• TTS (Textile Testing Services)</li> <li>• Rectorate Monastir subsidy</li> <li>• ENIM expertise</li> </ul>	<ul style="list-style-type: none"> <li>• Expertise in diagnosing areas of innovation</li> <li>• Process optimization assistance</li> <li>• Development of innovative product</li> </ul>	<ul style="list-style-type: none"> <li>• Studies for the diagnosis of accessible areas of innovation, niches of buoyant markets and technical and managerial strengths and weaknesses of the company</li> <li>• Implementation and monitoring of plans to optimize the company's</li> </ul>	<ul style="list-style-type: none"> <li>• Prospecting and promotion of the center's services</li> <li>• Provision of expertise and technical and managerial assistance</li> <li>• Provision of service development of new product functionalities</li> </ul>	<ul style="list-style-type: none"> <li>• Finishing companies</li> <li>• Nonwoven enterprises</li> <li>• Companies in spinning and technical wire</li> <li>• Companies in clothing production</li> </ul>

<ul style="list-style-type: none"> <li>• IS2M Innovation Center expertise and access to the center's services</li> <li>• ISAM Sfax innovation center expertise and access to the center's services</li> <li>• The Agency for the Promotion of Industry and Innovation – API (Ministry of Industry) promotion of the center and technological watch on promising areas of innovation</li> </ul>	<p style="text-align: center;">prototypes and launch follow-up</p>	<p style="text-align: center;">functional processes (finishing, dyeing, tailoring, weaving, non-woven)</p> <ul style="list-style-type: none"> <li>• Prototype development of nonwoven products</li> <li>• Prototype development of spinning products</li> <li>• Development of new functionalities on existing products by surface treatment (yarn, non-woven, fabric, knitting)</li> </ul>	<p style="text-align: center;">by surface treatments</p> <ul style="list-style-type: none"> <li>• Product sale /prototype sale</li> <li>• Sale of prototype wire with technical functionality</li> <li>• Loyalty</li> </ul>	
--	--	---	---	--

	<p>Key Resources</p> <ul style="list-style-type: none"> <li>● Technical experts</li> <li>● Center Secretary</li> <li>● Technicians</li> <li>● Raw materials</li> <li>● Chemicals</li> <li>● LGTex Center and Laboratory Testing and Prototyping Machines</li> </ul>		
--	---	--	--

Cost structure	Sources of income
<ul style="list-style-type: none"> <li>● Cost related to the maintenance of machines and equipment</li> <li>● ·Cost of raw material incurred to do development and prototyping</li> <li>● Salary of permanent administrative staff (secretary)</li> <li>● ·Costs of experts incurred by the center (man/day payment)</li> <li>● ·Technician costs incurred by the center (Hourly payment</li> </ul>	<ul style="list-style-type: none"> <li>● Sale of prototyping</li> <li>● Expertise and technical and managerial assistance services</li> <li>● Characterization and Testing Services</li> <li>● Services for adding technical functionality to products</li> <li>● State subsidies</li> </ul>