shemakes

Shemakes Vision

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Deliverable

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Executive Summary

This Deliverable presents the gender vision and innovation methodology underpinning the shemakes.eu opportunity ecosystem.

Throughout history, women have made significant contributions to economic, political and social change using their spinning, weaving, sewing and other textiles skills - from producing the sails that adorned King Canute's fleet in the 11th century to innovating with cutting edge technologies today; from using textiles skills to challenge the societies in which they lived to creating or joining movements today where women can use textiles skills and interest to work towards social and industry change – pushing the creative and technological boundaries of the textiles and clothing sector. And yet, not only is the importance of women's historic textiles skills not generally recognised, work organisation in the mainstream textiles and clothing sector is one where roles that require these traditional skills tend to be held by women and attract very low financial and reputational rewards whereas roles with power and prestige and corresponding remuneration are more likely to be held by men.

In contrast, the shemakes.eu vision for its opportunity ecosystem is one where women's equality in the textiles and clothing sector is promoted by empowering women and girls to take up different kinds of roles. By valuing the traditional textiles skills women have historically held, and the creativity and innovation that comes from honing these skills, and adding to this knowledge and experience that of cutting edge technologies, women are ready to shape a new and more equal place for themselves in the textiles and clothing sector, transforming the roles they hold and the gender projections on them. The Shemakes ecosystem itself is an embodiment of this vision, designing a work system aimed at women and girls where the construction of tasks that Shemakes participants work on (e.g. collaborative learning / experimentation among women) and how they relate to these tasks and the ecosystem itself are in synch (e.g. through networking the women who participate in shemakes.eu and creating safe spaces for experimentation and innovation). This is based on a clear understanding that gender differences are the result of social learning and patriarchal structures. Therefore, aligning task and sentient systems in the Shemakes ecosystem in this manner creates the conditions for greater gender equality in the textile and clothing sector more widely. Five corresponding values underpin all of this: equal, collaborative, welcoming difference, empowering, inspiring.

This vision then sits behind the shemakes.eu innovation methodology. The innovation process in the project is oriented towards understanding the current state of women and gender equality in the textile and clothing industry, how this issue is addressed and in which directions, and how aware they are of these inequalities. Against this background,

we present Shemakes as a complex and non-linear ecosystem which has been co-constructed through various iterations. Inspired by the approach of Granstrand & Holgersson, 2020 and Pascual, 2021) the complex and non-linear ecosystem has been mapped out as a set of concepts, values, and interrelationships between and within ecosystem actors, artefacts, and activities. In doing so, we show the unique characteristics of Shemakes as an ecosystem focused on women in the textile and clothing sector, most notably its value creation through networks of co-creative collaboration. Because complex systems are characterised (among others) by self-organisation and constantly evolve, we argue that the shemakes.eu innovation methodology needs to mirror these dynamics. Therefore, Pascual's innovation ecosystem canvas, supplemented by two additional categories to address the complexities of the shemakes.eu ecosystem offers a useful framework to understand and develop the Shemakes innovation methodology as a process which evolves as the ecosystem itself changes and takes shape.

It is envisaged that both the gender vision and the innovation methodology presented in this deliverable will be useful artifacts to facilitate an engagement with the complex shemakes.eu change process - shaping it and being shaped by it.

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1.Introduction

This Deliverable brings together work from the first two tasks of WP1 Opportunity Ecosystem. The purpose of WP1 is to define and develop a sustainable shemakes.eu Opportunity Ecosystem capable of bridging the gender gap.

To this end, Task 1.1 Gender Vision aims to create a shared vision among shemakes.eu partners of the gender equality change that the project seeks to achieve which can guide project activities as they are being implemented. Task 1.2 Innovation Methodology aims to define the Shemakes innovation ecosystem itself, as well as the set of methods and processes with which shemakes.eu seeks to create this change. These tasks are then followed by activities that focus on Network Development (Task 1.3) and Network Sustainability (Task 1.4).

This Deliverable D1.1 brings together the results of the activities implemented in Tasks 1.1 and 1.2 to set out the Shemakes gender and innovation visions. These are detailed in Annex 1. It is structured as follows:

- Following on from this introduction, **Chapter 2** provides a brief and high-level narrative linking women's roles in textiles and clothing with social and technological change and sets the scene for the subsequent chapters.

- **Chapter 3** sets out the shemakes.eu gender vision. It outlines the approach, methodology and process developed for creating the gender vision for shemakes.eu. It summarises the key points from the discussions that took place with a focus on identifying the narrative thread that ran through the workshops as well as key changes in thinking. The final section of this chapter then presents a concise representation of the shemakes.eu gender vision which reflects the conceptual thinking behind the work as well as shemakes.eu partners' work during the gender vision workshops.

- **Chapter 4** brings together information from the preceding chapters with the primary research activities implemented to scope out the shemakes.eu innovation methodology strategy framed in the innovation ecosystem. Following the literature framework, the implementation and intersection of innovation processes are described in the project's first nine months, such as lessons learned and reflections for the future.

- **Chapter 5** concludes this Deliverable by offering a concise summary of the key messages articulated in the body of this report, bringing together the key components of the gender vision and innovation methodology.

2. Women's relationship with Textiles and Clothing

This chapter provides a brief and high-level narrative of some of the overarching issues that have shaped women's roles in the textiles and clothing sector over time. Linking textiles skills, social change, and technological development, it speaks to the themes that shemakes.eu works with – textiles and clothing, technology, skills, innovation, and leadership – in the effort to work towards gender equality in textiles and clothing industry. In doing so it aims to set the scene for the subsequent two chapters in this deliverable.

2.1 Women's challenges for social change in the textile sector

Textiles and clothing are in women's socio-cultural DNA. Their spinning, weaving and sewing skills have been practiced and honed over centuries and have made critical contributions to economies, politics and societies over time intertwined with industrial revolution. For example, a recent New York Times article illustrates the substantial work that went into spinning the wool for King Canute's fleet of 11th century ships (the equivalent of 10 000 work years) and argues that until the renaissance "European art represented the idea of "industry" not with smokestacks but with spinning women. Everyone understood that their never-ending labour was essential" [Postrel March 2021].

Figure 1. The maison of Iris van Herpen, Haute Couture (The Maison of Iris van Herpen, 2021).

Today, female textile and clothing designers are working on the intersection between biology, design, art, and digital fabrication innovating with new aesthetics and interventions[1] in the field of T&C design.

And yet, this critical role women's textiles skills have had over time has struggled to be recognised. Most women educated in science and technology, where they confirm their talents for "upstream research" (e.g. working for advanced digital projects in MIT labs, Adafruit etc.) are still "part" of the team instead of leading it. Most women who have clear operational skills, as they know how to cut, sew, knit or embroider, are less considered because of the repetitiveness of their tasks in large-scale industries. Only when a "highly technical" problem is solved, are they considered as skilled workforce (and paid as such e.g. for the development of a zero-waste prototype program).

"Picturing historical women as producers requires a change of attitude. Even today, after decades of feminist influence, we too often assume that making important things is a male domain. Women stereotypically decorate and consume. They engage with people. They don't manufacture essential goods" [Postrel March 2021].

No doubt this is the result of numerous factors, but two socio-economic trends will have had an influence and are relevant in the context of Shemakes:

- First, the influence of technological progress itself. The power loom and the sewing machine were the most relevant and impactful technological inventions for women's lives. They improved their working conditions, and the sewing machine, once available for domestic use, also became a means for creative expression, labour independence and made it possible for the end user to move from design to production. These innovations had a disruptive impact on the modernisation of the world, contributing to the birth of the textile and clothing industry globally. Yet, as Postrel [March 2021] argues, there was a shadow side to this industrialisation of textiles and clothing: "Textile abundance erased our memories of women's historic contributions to one of humanity's most important endeavours. It turned industry into entertainment. "In the West," Dr. Harlow wrote, "the production of textiles has moved from being a fundamental, indeed essential, part of the industrial economy to a predominantly female craft activity".
- Second, and linked to / following on from the above point, a collective societal 'de-valuing' of women's textiles skills (such as sewing and embroidery) happened through an association of these skills with the domestic sphere to which women

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[1] Design Interventions in several contexts (service, experiences, organization design), refer to the development of the steps (prototype) that provoke real world action and intervene in human behaviour. In few works it expresses the fact to take action and transform a concept or idea.

were confined over many centuries and the inequalities they faced in their public and private lives. This has embedded still deeply held stereotypes about sewing etc as 'women's work' in western societies which have repercussions until today that extend - arguably - to work organisation in the textiles and clothing sector in Europe and globally with its systemic undervaluing of these manual textiles. For example, 70% of employees in the European textiles and clothing sector are women (*EURATEX*, 2020) and they work mostly as sewing machinists which tends to be a very low paid occupation. Men, on the other hand, tend to work the heavy machinery and are found in higher paid management roles or are heading up multinational fashion conglomerates.[2]

2.2 Women's fights for change

At the same time, however, there has been a radical dimension in the way women have used their textiles and clothing skills to work towards political and social change. For example, incarcerated suffragettes embroidered cloth with the names of fellow women inmates who had died during a hunger strike (School of Stitched Textiles, 2019) and first wave feminists in the 1970s practiced craft also as a way to re-claim women's knowledge (Syfret 2016). Today's 'craftivism' ("the amalgamation of craft and activism"), linked to the anti-globalisation movement, continues along this trajectory with "(wo)men (…) getting together, making things, and trying to resist the controlling power of capitalist domination" (Syfret 2016). Beyond this, women are using their talents to create social movements, for example Fashion Revolution ("the world's largest fashion activism movement, mobilising citizens, industry and policymakers"[3]), which reflects on the climate crisis and the demeaning work in fashion to try to improve labour conditions and reduce the socio-environmental impact in the future. In fact, according to the BoF/ McKinsey & Company report *The State of Fashion 2019,* "younger generations' passion for social and environmental causes has reached critical mass, causing brands to become more fundamentally purpose driven to attract both consumers and talent". Many women are involved in this movement as *advocates of change,* influencing the working conditions of those making clothes in extreme poverty or unfair conditions (*Exploitation or Emancipation?*, 2015).

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[2] Shemakes.eu theory of change workshop, deliverable D5.1 Evaluation Plan
[3] https://www.fashionrevolution.org/about/

Gender gaps and strategies of textiles in the Maker Movement

Gender gaps and strategies in the Maker Movement FabLabs aspire to be inclusive co-working spaces for people from various cultural and professional backgrounds, age groups and genders (Marić, 2018). Thus, the Maker Movement, developed in such labs, has a significant potential to improve gender equality, as younger generations bring social change to FabLabs and break stereotypes around implementing practices (Eckhardt et al., 2021). Despite expanding to many territories and activating technological democratisation, there are still stereotypes and cultural biases in the maker environment. Although maker spaces promote equal access, studies show that the maker movement is characterised by gender disparity due to stereotypes of the male bias towards technology and the lack of female role models (Loose, 2020). Loose´s thesis argues that women makers show greater participation and sensitivity towards sustainable practices. Several women leaders in the FabLab environment have presented diverse initiatives through science and sustainable awareness with hands-on bio-fabrication, circular economy, and sustainable industry 4.0 activities. The last decade has seen an increase in the participation of women in the maker movement, especially in the field of wearables, with the introduction of tools of interaction such as Lilypad (Buechley et al., 2008), Limor Fried's electronics hobbyist company Adafruit industrie ('Limor Fried', 2021) to Kobakant's open resources "How to Get What you Want" (Satomi & Petner-Wilson, 2021), making the access of Wearables and tutorials for open source hardware and software more inclusive and easy to get started with. The importance of combining textile craft skills such as sewing, embroidering, knitting and weaving with embedded electronics provides an inclusive understanding to other fields such as engineering and computer science. In recent years, the participation of women in STEAM (Science, Technology, Engineering, the Arts and Mathematics) areas, biotechnology, and textiles has increased through a more diverse offer with programmes such as Fabricademy (Pistofidou & Raspanti, 2021), Poderosas (Robles, 2021)[4], and Fab Woman (Barriga, 2021)[5], all which have promoted diversity and called on women to pursue their interests in creative areas of design and fashion as well as the implementation of new digital manufacturing technologies. The maker environment also provides an outlet for women to pursue questions of sustainable practice with several women leaders in the FabLab environment presenting diverse initiatives through science and sustainable awareness with hands-on bio-fabrication, circular economy, and sustainable industry 4.0 activities (Loose, 2020).

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[4] Poderosas is an educational program led by FabLab Leon, focused on K-12s girls to empower more girls in using technologies through learning by doing.
[5] Fab Woman is a network of women working in FabLabs on different content around sustainability, fashion, Industry 4.0 led by the Latinoamerican FabLabs FABLAT.

Some of these ideas for change are put into practise via the emerging generation of young women who create smaller SMEs, more interconnected and more distributed (Covid 19 has shown how collectively, ateliers would link with others to support the urgent production of textile masks) and who proudly belong to a business community that fights for a better textile and clothing sector.

This chapter has aimed to provide a first introduction to some of the broad social factors that have shaped women's challenges and fights for the recognition of their skills in textiles and clothing. We have done this from an empowerment perspective, taking inspiration from some of the female scholars and writers quoted above who are increasingly shining a light on the importance of women's textiles work and skills for politics, society, the arts, and other domains. What emerges from this is a story of conflicting trends, where social and economic oppression sit alongside social and political activism – all interlinked with technological progress. In doing so, it has both pointed to the complexity of change Shemakes seeks to achieve and provided some historical framing for the gender vision and innovation methodologies that will be developed in the next chapters.

Chapter 3 explains this gender vision in detail and further exploration of factors that support tangible innovation ecosystems for women in textile and clothing to generate better status (and better pay) are to be found in Chapter 4 in greater depth.

3. The Shemakes Gender Vision

Against the backdrop of the preceding chapter, this section develops the shemakes.eu gender vision consisting of the combination of three elements: a set of short and simple statements speaking to the changed reality shemakes.eu is looking to create for women and girls in the EU; features of an alternative work system that supports gender equality; and the values that underpin it.

The vision, in line with the practice of visioning processes, is relatively short, as it ultimately is a shared and chosen guideline for actions to all members of the Consortium (see references in 3.1). It is the result of a co-creation process with shemakes.eu partners which took place over the course of three carefully designed gender vision workshops and built on a number of preceding activities (see Annex 1).

In order to demonstrate the knowledge, experience and insight that has fed into the gender vision, this chapter progresses as follows:

- It first discusses the approach and methodology chosen for developing the shemakes.eu gender vision

- It then provides a high-level summary of the discussion threads that ran through the gender vision workshops implemented with shemakes.eu partners in order to present the richness of the discussions as a context for the key messages and words the gender vision needs to have

- The final section then presents the shemakes.eu gender vision

The chapter finishes by providing some concluding reflections and pointing towards issues that require ongoing attention.

3.1 Approach and process for developing the vision

The gender visioning task as an organisational development activity

Already in the DOA, the development of the shemakes.eu gender vision was conceptualised as an organisational development activity. Organisational development is a practice which draws on social sciences to use a number of techniques to intervene in groups and organisations to create change. The paragraphs below explain in more detail why this was a suitable approach for the development of the shemakes.eu gender vision.

Shemakes.eu as an organisation

An organisation can be defined as "a group of people who work together in an organized way for a shared purpose (…)."[6] In the case of shemakes.eu this group of people consists of more than a dozen people from eight EU member states who have come together for a period of two years (the contract period of the grant) to work towards improving gender equality in the textile and clothing sector.

Because of the time-bound nature of this collaboration, shemakes.eu can more accurately be defined as a temporary organisation (Janowicz et al 2008). Temporary organisations are units with a "pre-defined termination point" and take many forms, including, as is the case in shemakes.eu, people from several organisations working together "on specific projects without becoming employees of a distinct separate firm."[7]

As is the case in many temporary organisations (Whitley 2006) the task shemakes.eu seeks to accomplish is complex: creating a transnational opportunity ecosystem to promote gender equality in the textile and clothing sector. This not only involves collaboration between project partners to develop and advance a set of – interrelated - activities that will contribute to the overarching objective of greater gender equality in textiles and clothing (set out in the DOA). It also involves attracting participants (women, girls, and communities) to participate in activities, additional organisations (labs) to be included in the shemakes.eu opportunity ecosystem itself to contribute to its organisational growth and changing wider perceptions about the role of women and girls in innovation, textiles, and clothing.

Arguably in this context, creating a shared understanding of the overarching change goal helps both project actors implement activities in a way that supports project aims and supports external stakeholders engage with and join the change effort. The explicit articulation of a vision can be a tool to achieve this. According to O'Brien and Meadows, "(…) a vision is something that is consciously chosen by an individual or group of individuals to represent their preferred path or destination, which they can work towards achieving" (2007, p 558). Kouzes and Posner (1996) go beyond this by arguing that a vision statement should have the power to attract others. They write that: "(the) vision of an organization acts as its magnetic north. It possesses the extraordinary ability to attract human energy. It invites and draws others to it by the force of its own appeal." Visioning as

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[6] https://dictionary.cambridge.org/dictionary/english/organization (accessed: 7th September 2021)

[7] Whitley (2006) quoted in: Janowicz, M., Bakker, R. M., & Kenis, P. N. (2008). Temporary organizations: the state of the art and distinct approaches toward "temporariness" Paper presented at PMI® Research Conference: Defining the Future of Project Management, Warsaw, Poland. Newtown Square, PA: Project Management Institute.

a process then is used "to define and help achieve a desirable future (by creating) images that can help to guide change in an organisation" (ODI 2009).

The socio-technical foundations of the shemakes.eu workshops

Supporting change in an organisation is the focus of organisational development, which is the "systemwide application and transfer of behavioural science knowledge to the planned development, improvement, and reinforcement of the strategies, structure, and processes that lead to organization effectiveness" (Cummings and Worley 2005). Applying classic Tavistock Institute thinking, organisations are seen as open systems where parts and processes of organisational systems interrelate with each other and their external environment (Miller and RIce 1967).

This interconnectedness means paying attention to unconscious processes (known as system psychodynamics) that will show up in any transformational change through a complex interplay of human emotions, identity, defensive and hierarchical behaviours (Damasio 1994). These will be present as responses to the change that shemakes.eu is aiming to create as an intervention in the wider EU textile and clothing sector, and in the visioning work as a key intervention in the project to make explicit the vision for change.

The visioning work was therefore conceptualised and practiced as an intervention into the shemakes.eu project, designed to allow some of these dynamics to emerge to then inform the articulation of the shemakes.eu vision. A useful framework which pays attention to both the 'rational' and the 'emotional' sides of organisations is the concept of socio-technical systems. This allows for the coexistence of tasks, aims, and purposes with several different but connected processes that enable the organisation to exist and survive in dynamic relation to its context.

This is illustrated in the figure below where we need to see the three corners of the triangle being in constant interaction with each other. By paying attention to how these aspects are discussed we can attempt to reflect these dynamic interactions in an organisational vision.

The nature of the boundaries of an organisational system and the extent to which these are managed and controlled.

Leadership, management, structures where relationship with the external environment is containing to its 'contents' so it supports innovation; play and transformation with flexible boundaries – neither too hard nor too soft.
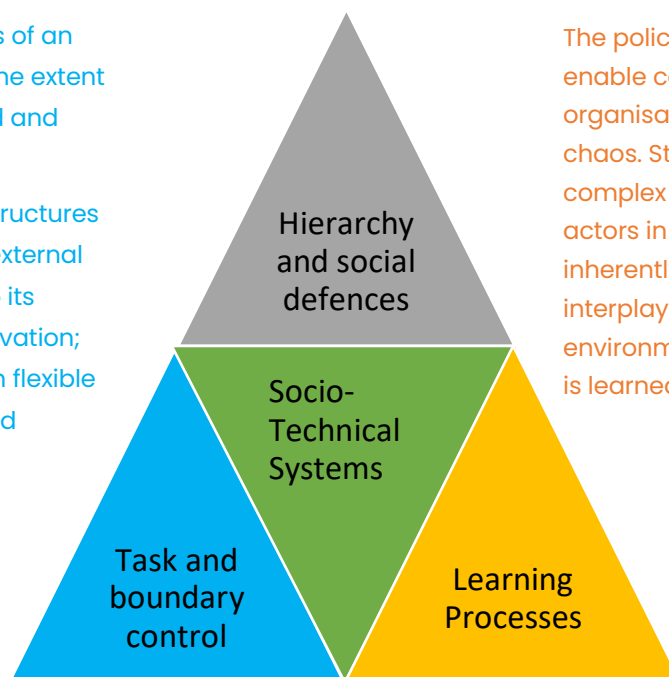
The policies, practices, behaviours that enable continuous adaptation and for an organisation to safely live at the edge of chaos. Stacey's (2001) organisations as complex responsive processes. Roles of actors in these organisations are inherently transformative and an evolving interplay between person, system and environment/context and where resilience is learned (Long, 2016)

Hierarchy and social defences

Socio-Technical Systems

Task and boundary control

Learning Processes

Figure 2. Socio-technical approach to organisational change

Workshop design

The above considerations - and also incorporating the 'established' visioning practice of looking at past, present and future as part of visioning activities - led to the design of three shemakes.eu gender vision workshops. These were designed as co-created, conversational, and iterative sessions moving from individual life stories and motivations of the attendees to how this was expressed in the shemakes.eu vision. Importantly, the assumption was that this process would also give real-time data about the shemakes.eu socio-technical system and through this offer some 'data' about the dynamics and responses the change shemakes.eu is looking to create is likely to evoke more widely and hence will need to be worked with as part of project implementation. The workshops took place over two days, lasted between 2.5 and 3 hours each with participants meeting online (zoom).

First workshop: The Past (2.5 hours)

The diversity that is characteristic of the shemakes.eu project system (gender, age, organisational background, professional expertise, country context to name but a few of the obvious differences) made it likely that views about gender and gender equality were likely to differ. In order to work with this likely divergence, it needed to first have a chance to emerge before creating the space for identifying the common ground.

This first workshop was therefore about exploring participants' personal experiences with gender and gender equality in their work and personal lives before starting on

shemakes.eu, and connecting these experiences to four major theories of gender formation (biological explanations; social learning and cognitive approaches; feminist theory; and new perspective on gender -e.g. intersectionality and privilege theory). This was to support a process of individual and collective sense-making of the perspectives on gender formation that exist in the project.

The focus of this workshop was on divergence, encouraging a wide-ranging exploration and discussion on gender without requiring participants to develop a common position. As well as working with conscious knowledge, this workshop created opportunities for unconscious relationships with gender to emerge from group behaviour, by encouraging self-selection into thematic groups as well as the use of images, poetry and other artefacts to sum up key findings from the discussion.

Second workshop: The Present (2.5 hours)

The open system nature of shemakes.eu made it necessary to connect the internal aspects of the project, most notably in the form of the different work packages and the conceptualisations of gender embedded and enacted there. It also meant connecting the shemakes.eu project and its goals to the external political, entrepreneurial, and social environment in order to work through reinforcing or potentially limiting factors which might inform the gender vision.

This workshop therefore had two objectives: to apply the sense-making, outputs and discussions on gender from the first workshop to the shemakes.eu opportunity ecosystem as it is at the moment (i.e. connect the internal parts of the shemakes.eu project including linking the gender vision to the innovation methodology); to explore the link between the shemakes.eu gender vision and the Shemakes innovation methodology (make explicit the relationship between Shemakes and the external environment).

This block moved from divergence towards convergence – defining the gender issues shemakes.eu is looking to address better / differently by re-connecting to the work done in the previous workshop.

Third workshop: The future (3 hours)

The purpose of this last workshop was for workshop participants to co-create the outlines of the shemakes.eu gender vision and discuss what ways of working are needed so that the shemakes.eu ecosystem as an emergent organisation, and its component parts, can 'live' it.

The high-level design of each of the workshops was similar across all three workshops: setting the scene activities to frame the discussions on the day; a block of small and large group work, to work through the key questions the workshop sought to address; closing whole group reflections. The logic within and between workshops followed a double

diamond approach of moving from divergence to convergence in an iterative process served as the leitmotif for the development of the shemakes.eu gender vision.[8]
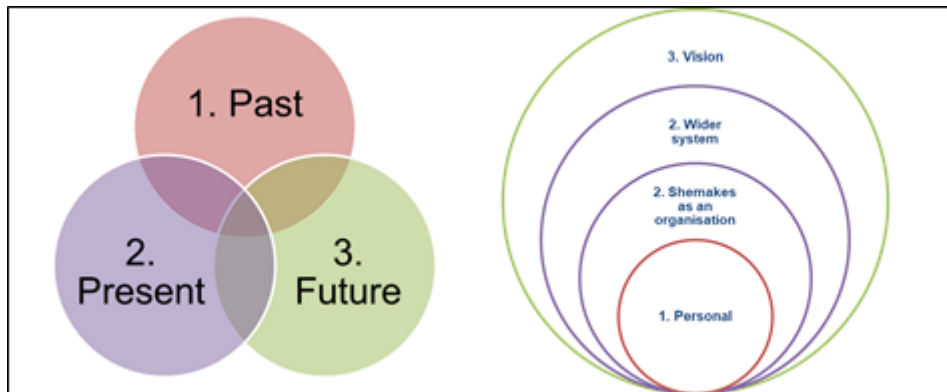
Figure 3. Approach to creating the shemakes.eu gender vision

Long internal agendas were produced which outlined activities, timings, and facilitator roles. These were reviewed and adjusted after each workshop to feed in learning from the experience of delivering these workshops into the design. Before workshops 1 and 2, participants were sent a variety of background material (academic articles, blogs, videos) to support an engagement with some of the key topics the workshops sought to explore and touched upon. The outline workshop agendas are included in Annex 2 of this deliverable.

3.2 Key themes emerging from the workshop discussions

This section summarises the key themes that emerged from the discussions during the three gender visioning workshops. The themes that emerged are captured in the mind map overleaf.

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[8] This draws on the idea of the double diamond approach developed by the Design Council: https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond

Social learning theory

Swap gender roles - man mending his clothes etc.

Give women/girls confidence to step up

Create positive role models for young girls

Revalue, reframe, reposition both textiles and women's roles within the sector

Focus attention on girls and teach while young - prevents conscious/unconscious reproduction of gender roles

Like the 'wheelie' suitcase - women's influence in textiles and innovation has been invisibilised

Rebalance gendered roles in sector and tackle bias

Show them how broad the sector is, let them be curious and discover its diversity

Find positives in traditions but change the negative - resistance shows we are doing something

As well as promoting high-end skills and innovation, we also need to value women's handicraft heritage in the sector - textiles as tradition

Sustainability

Blend different approaches

Modern feminism

Ensure this does not exclude people with disabilities (e.g. gender neutral language)

Diversity

Inclusive/neutral language, terminology, vocabulary

Emphasis on embracing difference and being inclusive - gender as many shades/textures/colours

Enlarge scope of what textiles is - textiles as technology (heart surgery, aeroplanes)

Also reflect diverse experiences of women in textile sector/gender experiences around world

Role of men ?

Is there a way to include men without excluding/silencing women?

How do we change their minds if they aren't included? Vs.

Mixed groups do not give women/girls a voice

How can we introduce men to the topic? "Focus on women, but men can join" isn't working

Men are also affected by gender norms

Boys are already incentivised to do technology workshops; girls less likely to attend mixed-gender classes

Awareness-raising classes?

But project is called *SHE*makes, not HEmakes

Perhaps focus 1st round on girls and then include boys?

Girls need safe spaces to gain confidence

Naming workshops just for girls 'poderosas' empowers girls and gets more attending, but annoys the boys (used to being 'poderosos')

Can these be united/reconciled?

Will changing everyday activities snowball and change culture? Slow vs. fast change, dialectics (does action change ideas or vice versa?)

Individual vs. collective change ?

Work on changing the social tissue/fabric, remaking and creating - structural change

Inspiration from #MeToo, social movements, radicalism, workplace action

Do we empower individual women, encourage individual role models? Vs.

Do we aim for sector-wide changes that will affect women on factory floor and women in the office?

Caroline Moser: Need to change the curricula, not just individual behaviour (2012)

Inspired by unconscious/conscious bias, gradual change coming from within rather than outside

Work on changing individual behaviour amongst small groups of people

Possible actions suggested during workshops

- Look at EU Parliament and UNICEF's gender neutral language guidelines
- Create 2 stages of the project implementation; the first focused on girls and the second mixed
- Think more about the theory behind feminism
- Develop tools/guidelines to help instigate collectibe action
- Look at the TCBL network guidelines for inspiration
- Create shared document/platform to discuss final vision
- Create material (print & online) to combat gender roles
- Turn ideas into action!

Unresolved issues/questions after final session

- How do we turn ideas into action?
- How do we create a standardised plan and make it replicable?
- How to actively work against entrenched stereotypes?
- How do we better link theory to practice?
- Is the emphasis too heavily placed on labs?
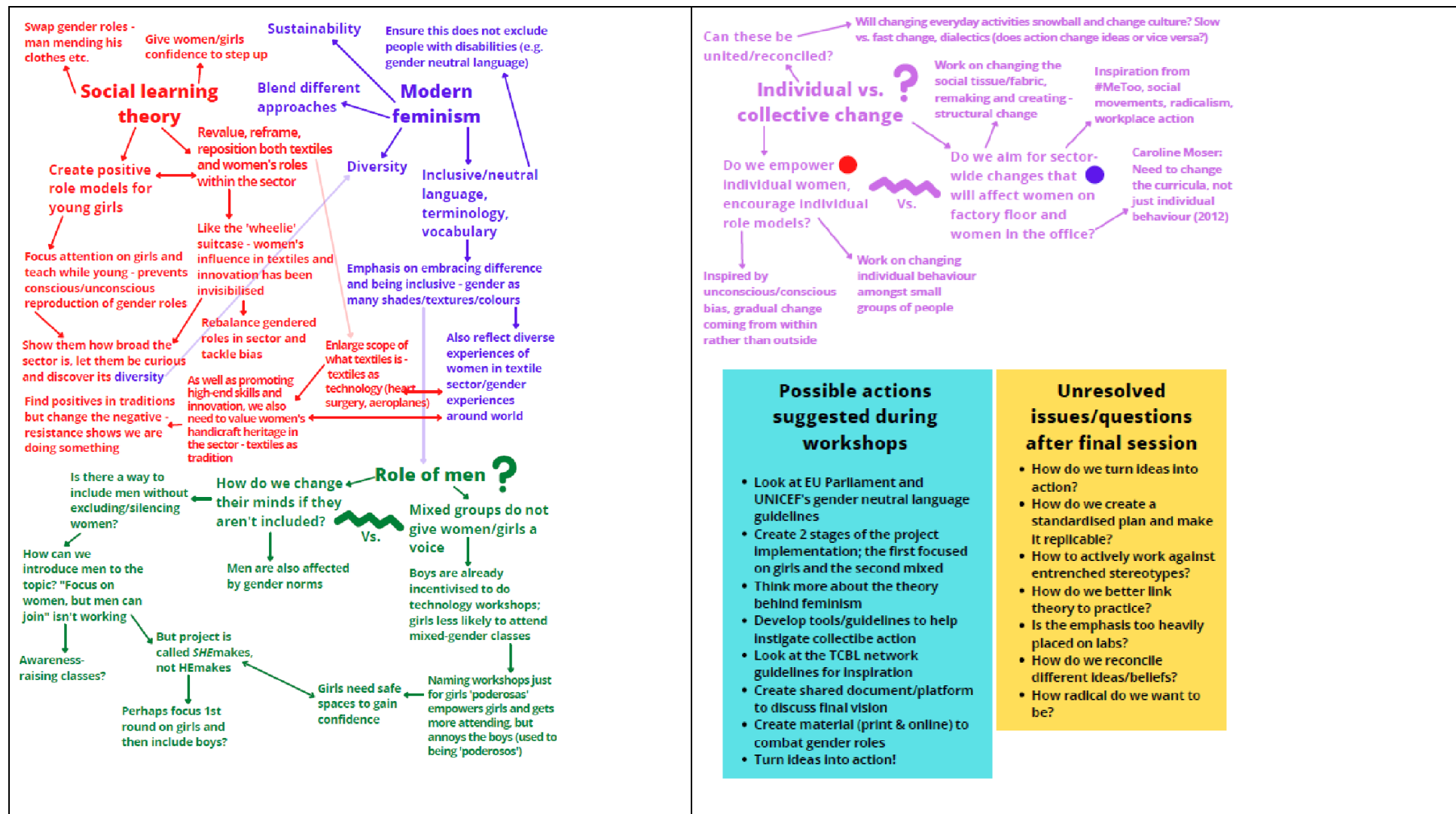- How do we reconcile different ideas/beliefs?
- How radical do we want to be?

Figure 4. Mind map illustrating key themes from the discussion of the three shemakes.eu gender workshops.

The gender theoretical backing of the shemakes.eu gender vision

In workshop 1, participants were tasked with locating their own personal gender/gender equality stories within a broader gender theoretical framework. To this end, workshop participants were introduced to four theoretical perspectives on gender formation, through the invitation to read or view information on these before the workshop and through a presentation during the workshop (MIller 2016):

- **Biological explanations**: the idea that differences between men and women are due to our biological make-up (e.g. chromosomes or hormones);

- **Social learning and cognitive explanations**: gender roles are learnt through social interactions starting in childhood. Social learning theories argue that we internalise roles imposed on us externally and that how we are treated determines how we behave (socialisation). Cognitive theories argue that we subconsciously learn a 'gender script' during childhood which dictates our behaviour.

- **Feminist theories** focus on the role of the system in (re-)producing gender roles, and in particular the role of power relations. Patriarchy, for instance, is the idea that society is dominated by men which benefits men but discriminates against women.

- **New perspectives on gender** covered some of the newer thinking on gender formation such as intersectionality (the idea that different oppressions linked to our identities can overlap) and privilege theory (the idea that we can gain certain privileges based on our identities).

During the workshop, four breakout rooms, one for each of the above theoretical perspectives, were available and participants were invited to self-select into one of these rooms to discuss their experiences in the light of the theoretical perspective. Participants chose to explore two of the above perspectives: social learning and cognitive explanations; new perspectives on gender.

Social learning and shemakes.eu

Social learning theory relates to the idea that our childhood interactions influence how we learn gender roles. Unlike the biological perspective which views sex as determining gendered behaviour, social learning theory regards sex as characteristics that are biologically defined, while gender is based on socially constructed features. This opens the possibility that gender roles are not innate but learned during childhood. Through the process of socialisation, which refers to the way people are treated determining how they behave, children internalise gender

roles that are imposed on them externally. An example of social learning posed by one group during the first workshop involved using an image of a little girl in a princess dress with a male parent figure also in a dress, contrasting this with an image of a girl in a builder's costume. These images were accompanied by text explaining that role models are very important for girls. In other words, girls' role models – often parent figures – introduce them to gender roles and teach them to either confirm or reject them.

Figure 5. Challenging conventional depictions of gender - image collected during the Shemakes gender visioning workshops.

The social learning aspect wove through the discussion in the subsequent visioning workshops with discussions raising ideas/points for example about the importance of shemakes.eu creating safe spaces for collaboration between women and girls ("sometimes for mixed activities girls get less engaged") and mentors or business angels as well as wider challenges such as the conscious and unconscious reproduction of gender roles in society. This, however, took place against the background of significant wrestling by the group with the idea of creating women only spaces with questions being raised about the 'wisdom' of excluding men and whether mixed environments are actually 'safer' places than single gender ones. This spoke to an awareness that creating gender equality is relational and therefore excluding men in this process might be problematic ("how to prioritise women (and) also provoke change in men?"). It was noticeable that by the end of the workshop series views had, however, aligned towards the preferred need and desirability to create female dominant spaces to support shemakes.eu goals, also based on the experience of workshop participants that women and girls engage differently in

female dominant spaces (if only because stereotypes affect group work from a very early stage, as shown later).

New perspectives on gender

Some of the newer perspectives on gender (sometimes also named 'modern feminism') also resonated with workshop participants. One of these is inclusive terminology, which the group emphasised as important in recognising difference and celebrating a diverse array of genders as opposed to the simplistic male/female binary ("shemakes.eu can have a pluralist view"). This vocabulary expands the concept of gender to include gender nonconforming, non-binary, transgender, gender fluid and a-gender people, as well as intersex people. This was picked up in subsequent workshops where awareness about the need to create a positive language around gender in current shemakes.eu activities was raised and led to words and imagery stressing inclusivity in the final workshop which focused on the gender vision.
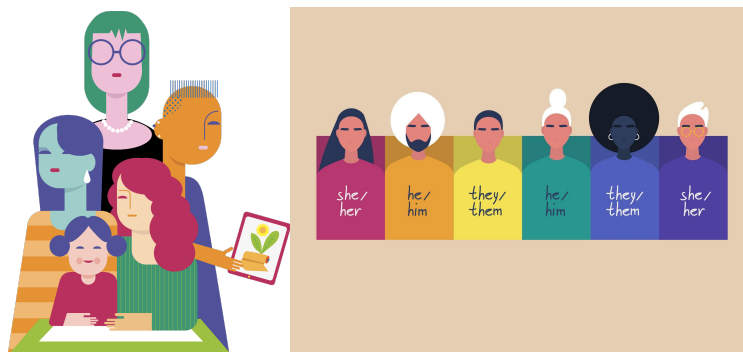

Figure 6. Inclusivity images used during the gender vision workshop.

Another one of the newer perspectives on gender includes the idea of intersectionality which highlights the intersections of overlapping identities and oppression (for example, the overlap of race and gender means that a black woman may experience a form of sexism that is combined with racism and vice versa). There was some recognition of the relevance of intersectionality for biases towards women as well as the biases they themselves internalise, but insufficient time during the workshop to discuss this further. Moreover, contemporary feminism is often linked to issues of sustainability and climate change, and the group recognised that the worsening environmental crisis should tie into a gender vision relevant for the modern age.

Many feminists today also subscribe to the idea of **privilege theory** and the patriarchy. Privilege theory can be seen as a step on from intersectionality and is

based on the idea that not only do overlapping identities lead to specific experiences of oppression, but these same identities also lead to certain privileges. For example, privilege theory posits that a white, heterosexual man experiences the privilege of not experiencing racism, sexism, or homophobia. This links to the term 'patriarchy', which is not a new concept but one that has been regaining popularity in recent years. Generally, patriarchy refers to the idea that society is dominated by men, which benefits all men and discriminates against all women. Not all the participants fully aligned themselves with either privilege theory or patriarchy, but the ideas within these perspectives proved popular when framing arguments and group debates often took place against a backdrop loosely woven around the idea of patriarchy.

Reflections and implications

- The interest in exploring social learning theories of gender formation is very much in line with the design of shemakes.eu as articulated in the DoA – the focus on individual skills building as a way towards equality. This speaks to a philosophical congruence between the task and its theoretical understanding by project partners and, as a result, needs to be expressed in the shemakes.eu vision itself.
- The political dimension of the change shemakes.eu seeks to achieve played out in the interest in some of the ideas newer perspectives on gender have to offer, in particular the ideas of gender fluidity and intersectionality with discussions also reflecting on how to understand and work with fundamental structural inequalities in political/power systems, as most obviously articulated through critical theory (e.g. Foucault). These were reflected in the inclusion of shemakes.eu values of inclusivity and diversity in the final workshop. At the same time, the workshop discussions offered some insight into the challenges of practically working with these ideas – for example with gender (and perhaps power) roles inversed and a culture of actively inviting the often silent male participants into discussions slowly emerging (speaking to the wider challenges and 'costs' of inversing gender roles in a work system) and a noting of the relative privilege of the people participating in the workshops themselves.

Linking up internally and externally

In workshop 2 the explorations moved outwards, towards examining the construction of gender in the shemakes.eu task system and the project's relationship with its 'external' environment. This more systemic focus allowed workshop discussions to

grapple with some of the complexities and politics of working towards gender equality.

Key themes

One of those discussions focused on the role of men in the project. Conflicting ideas arose, with some arguing that shemakes.eu should indeed focus solely on women (especially considering the project's name) – speaking to the presence of ideas of patriarchy in the shemakes.eu system. Others, following the idea of diversity and inclusion, felt that men are also affected by gender norms and that it would be counter-productive to exclude them if we are to change their mindsets about gender. However, some participants recounted their experiences of providing textile workshops for groups of girls and boys, in which they had found that girls were less likely to attend, achieve, or experiment when they were in a mixed-gender group. While the girls created wooden hearts and the boys built rockets in these sessions, in the girls-only classes they were much more imaginative and gained the confidence to work on typically masculine projects. This idea that women need safe spaces in order to shake off gender expectations therefore gained ground and was one of the key words (albeit with a question mark) written in workshop 3 as contribution to the vision. Some thoughts about working with the idea of bringing men into the shemakes.eu change process included running sessions that would raise awareness among men about how to be conscious of gender bias or focusing an initial round of workshops on women and then including men later on.

The wider discussion of factors external to shemakes.eu supporting or obstructing change (represented overleaf in the form of a "forcefield analysis"[9]) led to an exploration of the difference between individual change and collective change. Some stressed the importance of providing positive gender role models through shemakes.eu that would empower individual women, as well as working to change individual behaviour amongst small groups of people (showing again the strong presence of social learning explanations of gender in the project) in a context where some women in powerful positions replicate 'male' behaviours in leadership roles and where conscious and unconscious reproductions of gender roles in society can potentially counteract the positive change that comes from a generally greater awareness about gender.

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[9] A forcefield analysis depicts the forces supporting change and those resisting change. To create change, we need to either strengthen the forces supporting change, or weakening the factors resisting change. See also: Connelli, M (2020) Forcefield Analysis - Kurt Lewing (available at: https://www.change-management-coach.com/force-field-analysis.html)

An alternative view involved working towards sector-wide changes that would affect women both on the factory floor and in the office. There was a sense of the beneficial nature of cooperative structures, organisational networks, and gender sensitive organisational cultures to support gender equality as well as the potentially important role of digital technologies. This idea of structural change ties in more closely with strong feminist movements fighting for collective action.

> "*You must put fibres together in order to create a material; Idea of social fabric. Useful analogy for what we are doing. Connecting the past and the future - textiles are currently exploring future technologies. Don't forget the past in the future we envision for shemakes.eu*"
>
> This quote gives an embodied sense of the shemakes.eu vision which gives a visceral sense of women's role in the history and culture of the textiles industry and the emergent change where women (and others) will become the innovators of the future. A future that has political implications where women will be *different* innovators from the innovators of the past who might have been viewed as masculine, colonial and/or industrial.

One participant quoted Caroline Moser's work, which highlights the need to change the curricula, not simply individual behaviour. Some participants felt that younger generations of women are forgetting the rights hard won by their predecessors, and it is important shemakes.eu continues the tradition of collective struggle.

These conversations then evolved into debates around rapid and gradual change, and whether small changes to everyday activities will lead to knock-on effects that change culture, or vice versa. A comment was made that this is, in essence, a discussion about dialectics, and whether acting upon the world changes the ideas in people's heads or whether it is ideas that change the material world.
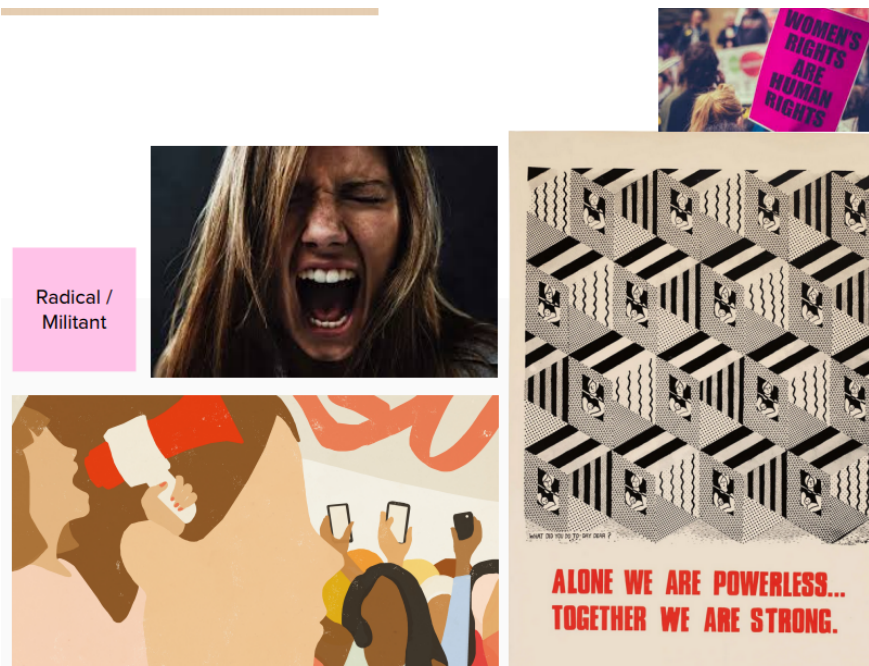
Figure 7. Individual and / or collective change? Images collated during gender vision workshop[10]

Reflections and implications

Even though discussions focused on exploring supporting / resisting factors in society and business (with breakout room on politics / institutions staying empty), moving the discussions from the individual to the system allowed thoughts on the political nature of the change shemakes.eu is looking to create, also represented in the inclusion of the above image and the words radical/militant in the final visioning workshops. Consequently, both aspects of individual and structural collective change need to be spoken to in the vision to represent the nature of the change shemakes.eu is looking to create holistically.

In discussing both factors supporting and resisting change, opportunities were created to move from a 'deficit model' (whereby, as presented in the 1st chapter, the contribution of women is still underrated despite their skills) to also thinking in empowerment terms about the circumstances that can support the change shemakes.eu seeks to achieve. Presenting the results as a force field analysis on the one hand offers the shemakes.eu partnership a framework making explicit where and how to intervene in order to create change (i.e. in the factors supporting

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[10] Image "Alone we are powerless" reproduced from: https://collections.vam.ac.uk/item/O106318/alone-we-are-powerlesstogether-we-poster-see-red-womens/ ; image "women's rights are human rights" reproduced from: https://www.bl.uk/events/study-afternoon-global-womens-rights#

change) but also means that the gender vision will benefit from speaking to the factors identified as supporting change
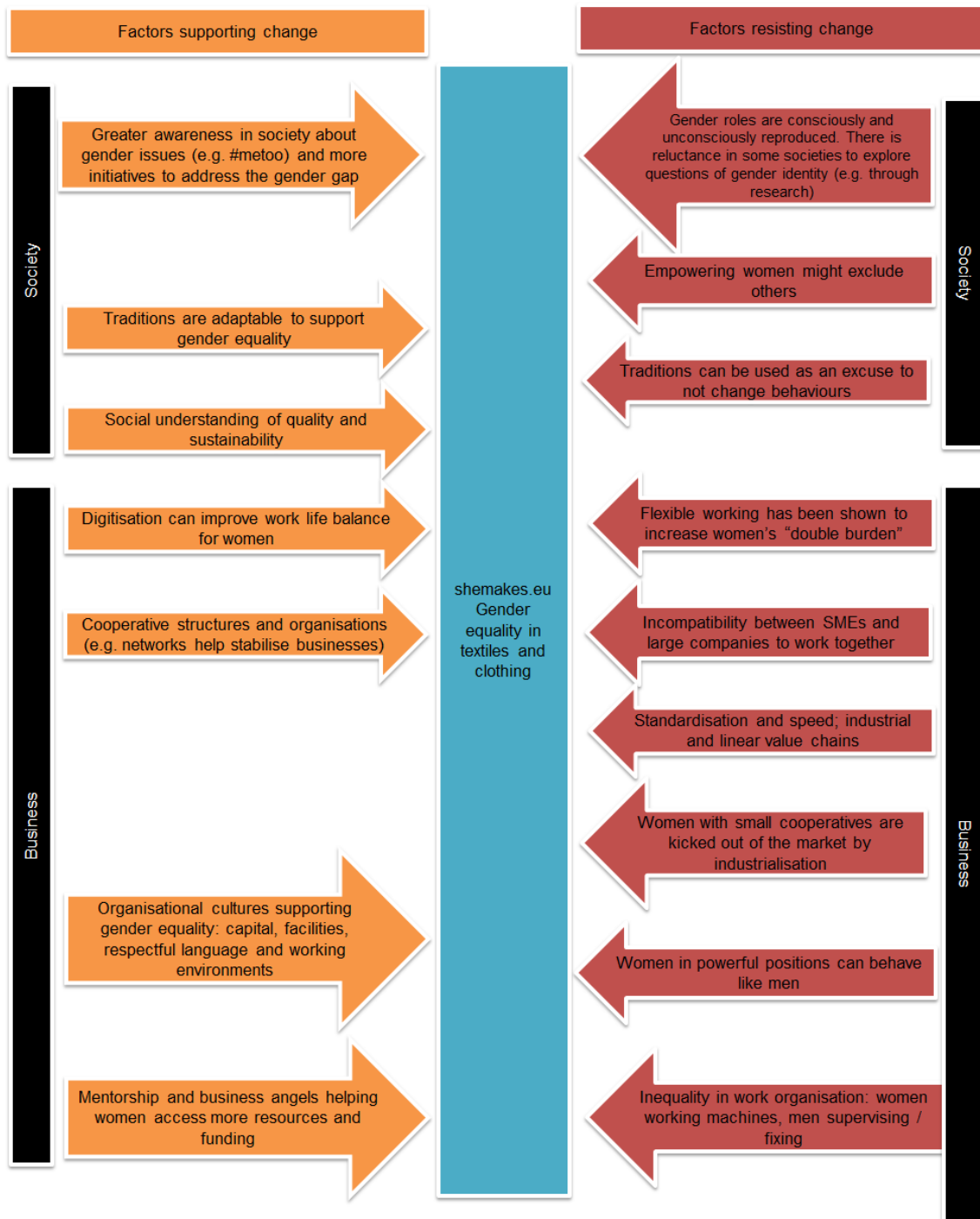

Figure 8. Factors supporting and obstructing the change shemakes.eu seeks to create.

Building the gender vision for shemakes.eu

Work in the third workshop was designed to create the core components of the shemakes.eu gender vision and picked up several of the themes explored in previous sessions.

Social learning theory was seen as a useful tool to support the provision of alternative, positive role models for girls through shemakes.eu. It was argued that focusing attention on younger generations would prevent the reproduction of gender roles and show them how broad the textile sector is, opening up to tech-based as much as to social innovation. It was hoped that, by giving girls the opportunity to be curious and explore the sector, they would gain confidence and discover its diversity – for example, textiles being used for technology such as heart surgery and designing aeroplanes. Reversing gender roles was also raised as a potential tactic to show both boys and girls that textile is not innately gendered. Examples included showing male role models mending their own clothes or more generally taking on equal housework and childcare responsibilities.
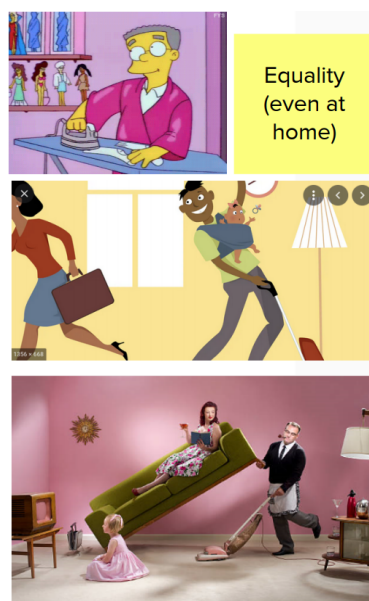

Figure 9. Inversing gender roles.[11]

Emphasis was also placed on revaluing, reframing, and repositioning both textiles as a sector and women's roles within it. Inspired by the history of the wheelie suitcase – invented by women (yet ignored) decades before its 'official' invention by a man in

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[11] Images: Smithers ironing (https://gifer.com/en/7b1f);

1970 – the group agreed that women's influence in textiles innovation has been 'invisibilised'.[12] To tackle this bias, it was suggested that gender roles in the sector are rebalanced so that women have more power in the workplace. Instead of disregarding traditionally feminine roles, there were also discussions about recognising women's contributions to textiles as high value skills that have shaped the sector and influenced its heritage. Handicrafts and weaving were both used as examples in this regard. This brought into relief a tension between textiles as tradition and textiles as technology.

https://www.bbc.co.uk/news/health-32076070

Figure 10. Textiles tradition and technology.

Regarding the newer perspectives on gender that were discussed, the emphasis on embracing difference was expressed in the language of textiles; the gender spectrum was described as being various shades, textures and colours. The idea of diversity was also incorporated into the world of textiles, able to reflect the vast range of experiences of different women working in the sector around the world. Concern was expressed from some participants that the group consisted of people in relatively comfortable positions compared to underpaid women working on the factory floor (picking up the point on intersectionality), which led to discussions about how shemakes.eu could reach marginalised women who would most likely reap the most benefits from the project. While these debates were not resolved,

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[12] Mystery of the wheelie suitcase: how gender stereotypes held back the history of invention https://www.theguardian.com/lifeandstyle/2021/jun/24/mystery-of-wheelie-suitcase-how-gender-stereotypes-held-back-history-of-invention?CMP=Share_iOSApp_Other

there was a drive towards including as many people as possible in the project's gender vision.

Reflections and implications

We could see the nature of the discussions from previous workshops reflected in the words and images collated by workshop participants as they were working together to create the outlines of the shemakes.eu gender vision. Imagery collated was rich in speaking to history, technology, making, innovation, diversity, inclusion and change – pointing towards a vision that weaves together different components, e.g. audience, key words, visual, take away.

The visuals collated by the two groups were striking in their different focus – one group highlighting making and speaking to the importance of history, the other group's imagery clearly representing the social aspects of gender equality, both in the home and in society more generally (represented, for instance, by focus on inclusivity and portrayal of female activism). This speaks to the partnership's ability to collectively hold the whole of the change shemakes.eu seeks to create in mind.

At the same time, the inclusion of the image of a pink stiletto wordle containing messages speaking to women's strengths shows the difficulty of using images that portrait meaning of women's equality in a universal manner (is a stiletto a signifier of female strength or a symbol of oppression?). This perhaps speaks to the need for conversational spaces to continue to engage with some of the tensions and paradoxes the work on shemakes.eu will evoke.

3.3 Articulating the Shemakes gender vision

Some work was undertaken following the gender workshop series to craft the words, images and phrases generated by the visioning work into a 'coherent' vision which represented the essence of partners' discussions and also spoke to the conceptual foundations underpinning the visioning work. The aspiration was to be both simple [13], whilst not hiding the complexity and nuance of the discussions: the co-created vision and its language needed to reflect both the task of shemakes.eu and the political and emotional dimensions of the work, making it an embodied and holistic vision weaving together the 'fibres of past and future'. The format in which the vision

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[13] This is in line with visioning good practice that tends to emphasise the creation of memorable one or two-line statements (see, for example, here: https://www.businessnewsdaily.com/3882-vision-statement.html)

is presented below draws inspiration from Sibbet (2007)[14] but tailors the format to suit shemakes.eu needs.

Figure 11. Shemakes gender vision.

[14] Sibbet, D (2007) "Strategic Visioning: bringing Insight into Action" in: Holman, P, Devane, T and Cady, S (edts) The Change Handbook. The Definitive Resource on Today's Best Methods for Engaging Whole Systems, San Francisco: Berrett-Koehler Publishers, inc, pp. 386-392

Accompanying tools

The visioning workshop and the work that has fed into it has produced several tools that can be used during project implementation to support the shemakes.eu change effort. This includes, most notably:

- The shemakes.eu theory of change which, by articulating activities, outputs and the results that will be achieved from them acts as a kind of road map for the project towards its high-level impacts which can be seen as sitting underneath the vision.

- The forcefield analysis can be used to actively work with the political nature of the change shemakes.eu seeks to achieve.

- The innovation methodology chapter of this Deliverable has produced a number of values and statements relating to the shemakes.eu innovation methodology which complement the visioning work and can be seen as an articulation of concrete steps towards the change shemakes.eu seeks to create.

- Finally, the United Nations has produced guidance on gender inclusive language in English, French and Spanish which can be consulted when writing for shemakes.eu. The toolbox can be found here: https://www.un.org/en/gender-inclusive-language/toolbox.shtml

3.4 Concluding summary

This chapter has presented the shemakes.eu gender vision as well as the process for developing it. We have described the approach and methodology for developing the gender vision, re-presented the key themes emerging from the workshop discussions as well as some reflections on them, distilled the words and images produced in the workshop into a multi-dimensional gender vision for the Shemakes opportunity ecosystem. This vision relates the goal of gender equality to the Shemakes work system and the textile and clothing sector more widely. In doing so, it creates a vision for a work system that is based on and promotes gender equality.

Inevitably, some questions remained unresolved at the end of the workshops. These included: how to turn the ideas that were discussed into tangible actions; how to create a standardised plan for shemakes.eu that can be replicated; how to successfully work to change entrenched stereotypes, how to better link theory to practice; how to potentially move the emphasis away from the labs to focus on

more diverse experiences; how to reconcile the differences of opinion expressed in the workshops, and how radical the project should be.

Some of the tools included in this chapter can support shemakes.eu partners work with these questions as they continue to develop the learning paths and innovation services. At the same time, these questions (as well as some of the reflections included in the sections above) speak to the need to find ongoing conversational spaces to work through these challenges, also getting feedback from the extended network of the Shemakes new transfer labs. As shemakes.eu partners, we are part of the system we are trying to change, and as such can expect the project to provoke change in ourselves too. We would expect this to generate some emotional responses (including discomfort or even shame). Building in mechanisms by which the partnership can notice these and use them as data for the wider system is likely to have a positive effect on the change process overall.

4.Shemakes.eu innovation methodology

Following on from the previous chapter, Chapter 4 presents the innovation methodology as a driver of ecosystem development.[15] It focuses on understanding the factors that bring women into innovation contexts by integrating the two reference networks of Fabricademy and Textile & Clothing Business Labs (TCBL) and projecting them towards the specific mission of bridging the gender gap pursued by the shemakes.eu opportunity ecosystem.

As mentioned in the DoA, the shemakes.eu methodology was primarily designed as an iterative process starting with giving importance to equity for women, leading to innovative Lab activities and engagement (multifaceted innovation) that would finally increase the value of skills to further mitigate the gender equity gap.

Within the project's scope so far, we realised that this innovation methodology could be challenged as we followed several steps of literature review, ecosystem mapping and methodology development. The next section provides more detail on the process and activities implemented to define the shemakes.eu innovation methodology.

As this process is ongoing by nature, the conclusions that we draw at the end of this chapter should be further tested in real-life conditions with the extended network of future labs.

4.1 Approach and process for developing the innovation methodology

The design of the shemakes.eu innovation methodology took place with the help of three carefully sequenced and yet interlinked activities: a literature review of innovation ecosystems, mapping of the Shemakes ecosystem and framing an innovation ecosystem canvas. These activities are described in more detail in the paragraphs below.

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[15] Contribution by *Innovation ecosystem for women makers through textiles labs and the shemakes.eu approach,* published in the proceedings of the Fab 16 Research Papers Stream, Hogeschool Rotterdam, Rotterdam, The Netherlands, pp. 221–239 (Cabrera et al., 2021). https://zenodo.org/record/5169852#.YTY8854zbzc

Literature review of innovation ecosystems for women

The literature research sought to connect and understand how innovation ecosystems for women are created, in order to transfer and apply this knowledge to the Shemakes ecosystem development. The literature review also covered some aspects of the context and levels of the innovation (institutional, organisational, and personal). Further, this review intended to understand the roots of possible lack of innovation for women in textile labour, disparities in salaries or alternatively practices of women's initiatives in the maker scenarios to already contribute to change, as addressed in the previous gender vision chapter.

Mapping the Shemakes ecosystem

In parallel to conducting the literature review, we carried out two sets of mapping exercises.

First, with a co-creative process,[16] we started by defining the whole ecosystem of opportunities,[17] explaining what values and input came from the two existing ecosystems that weave together in shemakes.eu labs (TCBL and Fabricademy)[18] and actors that interact in the ecosystem. Both ecosystems provide a vertical innovation process, meaning that the Shemakes ecosystem, by bringing together their innovative components, deepens their impact on bridging the gender gap. The first aim was therefore to identify these aspects and look at the overall factors that bring innovation to the ecosystem.

Second, we set out to understand how the findings from the literature review are reflected in the innovation dynamics of Shemakes. An extensive mapping of Shemakes activities and actors was carried out to understand how the interaction processes were triggered by existing activities, new actors and dynamics that were beginning to be woven into the first layer of the mapping as an exercise of Shemakes innovation ecosystem analysis.

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[16] Brainstorming I, Opportunity Ecosystem: Target topics and value systems https://app.mural.co/t/matrixgmbhcokg0728/m/matrixgmbhcokg0728/1610104795768/d29ea23eb23413ca060a3d4081072c07fb11a940?sender=conferencing10443
[17] Innovation Ecosystem mapping https://app.mural.co/t/matrixgmbhcokg0728/m/matrixgmbhcokg0728/1620388253638/b4fb76e0bec9636cd452258a8f3d324c586d4cd7?sender=conferencing10443
[18] Miro co-creation board section *Defining Shemakes together.* This activity will try to map out current visions and practices of the two ecosystems and find common paths targeted to the three age groups of the project https://miro.com/app/board/o9J_IZkaKfs=/

This two-layered mapping led us to understand that the Shemakes innovation process takes place around the whole ecosystem. Therefore, there **will not be an innovation methodology as an exact formula or recipe**, but as a set of all the activities, actors and interactions that move and generate innovations throughout the project.

Framing an innovation ecosystem canvas

To understand how the different elements of shemakes.eu (activities, actors, and their interactions) are connected to each other and how the innovation transfer processes could be distributed in the second stage of the project, we used Pascual's innovation ecosystem and community canvas. This practical tool helps to systematically map and develop a non-linear ecosystem, and in doing so, creates a methodological approach to the overall innovation processes in shemakes.eu. We adapted the model by adding a stage that looks at the future development of the ecosystem.

The stages of the innovation ecosystem canvas are as follows:

- The **context** refers to the project's environment, background and foundation of the general situation of Shemakes.
- The **starting** phase defines how to help the ecosystem or the respective target and interest groups, e.g., what knowledge may be added to an ecosystem, what kind of support is needed, and which actors are required.
- In the **preparation** phase, it is important to understand that the activities bringing people together are key, as well as the ecosystem's purpose and value creation. It is also necessary to ensure a solid information flow within the system.
- The **Intervention & definition** phase targets the ecosystem's needs, the issues and problems that are to be solved. This means asking about the solutions needed to overcome these obstacles, as well as the tools and methods required to enable the solutions, with the goal to develop the values into the activities.
- The **bonding** phase is about the system's 'social glue': the community's values, vision, and mission (e.g., manifesto). Finally, people within the ecosystem must be provided with the education, training, and knowledge to innovate. This can facilitate content about innovation, open innovation, and co-creation, but it also requires hands-on topics and workshops.
- Finally, **maturity** includes a future perspective, the question of how to develop the shemakes.eu ecosystem in the future, and beyond the project timeline.

In the following chapters, we describe the literature research and exploration of individual needs and requirements within Shemakes, as well as the ecosystem mapping. These steps and results are merged in Pascual's Canvas, which is described in detail in the last chapter. In the conclusion, we offer an outlook on the future completion of this framework and the path towards ecosystem development.

4.2 Literature review of innovation ecosystems for women

There are many perspectives on gender, as presented in Chapter 3, some of which are very new and emerging in a world characterised by humanity's changing crises and developments. Indeed, United Nations Sustainable Development Goal 5 is gender equality (*Gender equality and women's empowerment | Department of Economic and Social Affairs*, 2021), where inclusion and diversity in a global entrepreneurial context can play a fundamental role in increasing gender equity. Two of the most critical elements are to build an understanding as a woman and as a contributor to change in the world, and to generate an innovation ecosystem that can bridge the gap and prevent it from growing. Although many efforts have been made to achieve gender equality, there are still many unsolved issues, particularly the integration of women and young people to become future innovators and the provision of the support they need to succeed.

In past crises, inequity has been perpetuated. In theory, innovation plays a key role in addressing and solving societal challenges to guarantee that this inequity is diminishing. *In the current landscape, it is not clear whether innovation contributes to reducing the gender gap or whether we need to reduce the gender gap to have a more innovative ecosystem*[19]. Most innovation can become a driver to reduce the gender gap, but this depends on how innovation is developed and owned, and the degree to which it contributes to the goals of the twin transitions "digital and sustainable," where there is still a minority of women (Gabriel & Carvalho, 2021).

Therefore, to integrate a gendered innovation ecosystem, it is important to understand the meaning of innovation and the varied dimensions of a gendered innovation ecosystem that support / hinder the progress of women innovators in the textile sector.

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[19] Extract Deliverable 4.1 Reputation Launch Advisory Board

In this deliverable, this review aims to explore issues and factors that are going to be further prioritized and integrated in the final Shemakes innovation ecosystem.

Defining innovation ecosystems

An ecosystem in natural sciences defines *a collection of different species that coexist and relate to collaborate, together*. In innovation, an ecosystem represents the interaction of the context, actors, relationships, and tools of all the elements that make this atmosphere optimal for generating an innovation environment.

An ecosystem is alive and changing, it describes its complexity in building the actors' pathways, strategies and dependencies between themselves and other ecosystems to generate their growth.

Over the last 15 years, the terms innovation and innovation ecosystem have been widely adopted, based on an initial understanding by Joseph Schumpeter, understood within a business and strategic context, often overlooking other inherent dimensions such as the political and institutional elements (Granstrand, 2020).

To better represent the terms' polysemy, we use the following definition of innovation ecosystems by Granstrand et al. (2020 p. 1) within the scope of this work: "**An innovation ecosystem is the evolving set of actors, activities, institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors.**"

Innovation ecosystems and gender

Here, we explore how varied factors of innovation ecosystems can support / hinder opportunities and desires of women to become innovators.

Equal access to resources

Citing Brush et al., when talking about entrepreneurial/skill-based ecosystems, there is an implicit assumption that all actors have the same access to resources, participation and support, and the same chances of success (e.g., business creation).

However, in practice, this is not always the case. Studies like the Global Women's Entrepreneurship Report (2021) or Elam & Terjesen, (2010)'s work on patterns of male and female business creation indicate that in many aspects of the entrepreneurial/skill-based ecosystems, women are at a disadvantage, for instance in case of equity, start-ups and growth capital, but also access to childcare, family support and the like.

A central requirement of an inclusive innovation ecosystem is equal access to the ecosystem's resources; this lays the foundation for equal chances for success for all actors (Brush et al., 2019). This is not the case at present, as exemplary numbers show that only 2.3% of venture capital is received by women-led start-ups;[20] according to the Global Entrepreneurship Monitor (GEM),[21] in only six out of 43 countries does female entrepreneurial activity exceed male entrepreneurial activity, and none of those six are located in Europe or North America; and less than 30% of the world's researchers are women.[22] Thus, many innovation ecosystems seem to be opportunity ecosystems to a different degree for women and men.

Five M factors

The work of Brush et al. (2019), Hughes and Yang (2020) and Petruzzella et al. (2020) on (gendered) innovation ecosystems - can be combined with Mattila's work on network activities as success factors -.

These authors show that the gender dimension in innovation ecosystems is often considered transversal. In particular, Brush et al. (2019) referred to the women's environment as one of five influences on success. She coined a "5M" framework for this, consisting of *"Money, Management, Markets, Motherhood* (family context) and the *Macro/Meso environment"* (considerations beyond the market).

- **Money, management and market** are self-explanatory as necessary requirements for entrepreneurial success, management targets, and human and organisational capital.
- **Motherhood** describes the influence of the female innovator's family and household environment (assumed to have a larger impact on women than men). Family-related roles are often perceived by society as female, making entrepreneurship less desirable for women. Thus, Brush et al. (2019) voted for recognising gender explicitly within the discussion and framing of entrepreneurship ecosystems.
- **Macro/Meso environment** includes social and cultural influences beyond pure market forces, such as normative expectations and public representations of female innovators. For example, behaviour characteristics that are associated with masculinity (ambitious, bold, risk-taking) are also associated with male

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entrepreneurship. High-growth entrepreneurship can support the perception of a successful entrepreneur being male.

This work, as well as the GEM's conceptual framework,[23] show that the reason for a different degree of male and female activity within an innovation ecosystem could lie in direct and indirect social, cultural, and material ecosystem attributes: childcare, family support, wage parity, hostile work environments in the technology sector, and stereotypical gendered expectations are only a few relevant factors.

Access to a community as a key

Isenberg and the World Economic Forum (2013) identify seven components: markets, culture, education and training, regulatory framework and infrastructure, funding and finance, and human capital. For them, the community and regional efforts are fundamental to creating a vibrant ecosystem. Isenberg Onyemah (2016) argued that there "is no single formula, but it is a bottom-up process that seeks value-added: engaging people, activating stakeholders, creating a platform and scaling up programmes that lead to more and more businesses that grow faster"(Brush et al., 2019 p. 395).

Social, cultural and business aspects

Based on the references above, we started to define three sets of components to qualify a gendered innovation ecosystem.

- **Social aspects** of innovation ecosystems include network activities and relations between the community (target group) and ecosystem actors (mainly using quadruple innovation helix: industrial, institutional, scientific and socio-technological interactions).
- **Cultural aspects** include, the culture of an ecosystem, its narratives and visibility, its education and training opportunities.
- **Business categories** include infrastructural and financial support and opportunities, for business organic or external development.

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[23] GEM Global Entrepreneurship Monitor (gemconsortium.org)

Gender and entrepreneurship

Here, we focus on how the wider structural factors can shape these opportunities / obstacles to become female entrepreneurs and why they are important to outline / be worked upon at a societal scale.

The literature based on Brush et al. (2019) highlights three levels - the institutional, organisational and individual levels - as well as interactions between them.

The institutional level

The institutional level refers to setting constraining and enabling boundaries for individual behaviours and actions by influencing the nature of an innovation ecosystem. Institutions have a historical legacy through the concept of leadership as well as men in positions of power in entrepreneurial environments. This construct is related to male figures (Scott, 2013). Thus regulatory,[24] normative and cultural-cognitive institutions exercise influence, both directly and indirectly. These institutions have gender biases, emerging from social constructs and acceptance between women, and have great potential to influence change to a more inclusive scenario. They can foster and support the growth and desirability of gender action and invite the concept of collaboration into their philosophy.

The organisational level

Starting from Chapter 3, gender vision, which describes Shemakes as an organisation, we can understand that gender is a constitutive element of organisational logic, manifested through the underlying assumptions and practices that shape most labour organisations.

The references tell us about three perspectives:

- First, through advantage and disadvantage, exploitation and control, or action and emotion, meaning and identity are linked, playing a role in distinguishing between masculine and feminine, in areas like the participation of leaders, pay relations and the values that women leaders bring to this context. It is therefore essential to consider what factors can change the relationship between value, wages and the meaning of fair power and leadership.
- Second, how the gender image shapes organisations and occupations refers to the relationship between media production and role model creation. In the

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[24] Regulatory institutions refer to any rules which directly influence the costs of setting up a business, conducting business activity, closing a venture and any policies that impact the desirability and feasibility of entrepreneurship (Brush et al., 2019).

current environment, it is fundamental to transform and adapt language and how gender image is promoted. Organisations can foster more participation and diversity in their actions.

- Third, cognitive meaning and gender symbols in the organisation are seen as an emergent field of interest. For example, today's women-centred accelerators are having some success because they provide female mentors and role models.

The individual level

In most frameworks, the entrepreneur is a central actor in entrepreneurial ecosystems, but it is nevertheless described as the 'ecosystem' and not the 'ego-system'. The individual level suggests that individual perceptions of gender identity and roles are related to a person's knowledge, initiatives, and behaviours towards connections with the components of the innovation ecosystem.

In a sense, how social cognitive and positive aspects of gender affect an entrepreneur's identity are explored at this level. Role models, as Bush et al. (2019) described at an individual level, can evoke good practices in the ecosystem. Through their voice, they can promote social norms, rules or standards that dictate different interests, responsibilities or opportunities that are not necessarily tied to the leader's or director's social construct. This fact is relevant when considering who leads and guides this ecosystem. Role models are essential as guides to diffuse and expand good practices and thus create an enabling and trusting environment for the community.

Relationships, communication, and collaboration between levels

This level focuses on qualifications, knowledge, and cultural exchange of individuals, and fosters new ideas, insights and cross-fertilisation of knowledge, understanding how users in interaction with the ecosystem can create new opportunities and market needs.

While the network purpose, as well as the number of collaborations, naturally have an impact on the system's diversity, there are several other factors to consider regarding the characteristics of the relationships within the system. Collaboration ties can be formal or informal: **formal** ties contribute to the exchange of knowledge and the like; and **informal ties** are vital when implementing innovations, as new and innovative thoughts often occur in spontaneous communication and exchange. Informal communication also provides a relaxed environment to foster creativity.

Summarising conclusions

The literature review in this chapter outlined the necessity to align on gendered innovation ecosystem.

The definition of innovation ecosystem that looks most adapted to the Shemakes project in its current stage is:

> **The evolving set of actors, activities, institutions, and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors.** (Granstrand & Holgersson, 2020 p.1)

The factors that make this innovation ecosystem supportive (or not) to women encompassed different sets of factors. Among those, one was about the five transversal ecosystem components from the female and individual needs perspective - management, money, market, motherhood and macro/meso environment; another one was embedded in social, cultural, and business elements. A last one was specifically covering the entrepreneurial perspective. Here, ecosystems are shaped on institutional, organisational, and individual levels, which are permeated by human relations, communication, and collaboration as influences on an ecosystem's success.

4.3 Mapping the shemakes.eu innovation ecosystem

Against the background of the literature review in section 4.2, this section is about the reality of the current Shemakes innovation ecosystem. We wanted to explore the innovation practices that were already in place and, as suggested earlier, were conscious of the movement of that ecosystem, by nature, constantly changing.

Our approach was to start with the following questions.

- How do Fabricademy and TCBL innovation ecosystems work?
- How can we promote the integration these existing ecosystems?
- What in the intervention structure of Learning paths, Innovation services and Role models best reflects this innovation ecosystem?

We first present the two existing innovation ecosystems in shemakes.eu (Fabricademy and TCBL, that are the key community pillars in this project), then describe the values, actors and activities and the practices that illustrate and enrich this new innovation ecosystem.

The Fabricademy and TCBL ecosystems

Fabricademy

Fabricademy is a transdisciplinary course that focuses on the development of new technologies at the intersection of textiles, biotechnology and digital fabrication. Fabricademy was born in 2016 as a collaboration between the different networks (TCBL network, Waag, Fabtextiles, later extended to the FabLab network globally), expanding peer-based educational networks in the belief that current, future and emerging scenarios for the textile and fashion industry require hybrid multidisciplinary profiles with digital competencies. For five years now, the Fabricademy programme has provided several examples of how to reinterpret digital manufacturing in areas such as human interaction, materiality, eco-design, bio-design, performance, smart textiles, health technology, arts and new fashion expressions, among others. As a result of this initiative, connections with industrial and research ecosystems have been initiated through Fabricademy's digitisation and sustainability practices. The focus areas of this programme are shown in greater detail in Figure 5. as a programme that mainly functions within the Fab Lab network.

Fabricademy brings gender diversity and inclusion to the maker movement: a total of 116 women & 29 men have attended the programme in 45 locations, with ages ranging from 17 to 65 and 35 different nationalities. One of the goals of the Fab Lab network has been to break the stereotypes that technology is made by men and create a more comfortable entry point for tech explorations by women.

Fabricademy, together with the Fab Labs and maker space movement, presents an innovative approach to involve more women in STEAM education through a diverse offering of related topics around digitalisation, sustainability, and new applications in visionary contexts. They are not entirely related to textiles and fashion, but in this case, use fashion and textiles as the media to address and understand technological and societal challenges that can be addressed through the course of their activities.

As seen in the above description, innovation is at the core of Fabricademy, mainly through alternative education that helps democratizing research and technology to help apply those to textile and clothing innovation.

TCBL (Textile & Clothing Business Labs)

Complementing the effort to explore new perspectives on the T&C sector, TCBL is a value-based innovation community built up during a four-year Horizon 2020 project of the same name. Its multi-faceted business ecosystem comprises sector

enterprises, innovation labs, service providers, and advisors working together to transform the textiles and clothing industry. The common objective is to build alternative, circular and sustainable paths to counter overproduction and diminishing value.

TCBL Labs

Conceptualised within a collaborative bottom-up network of laboratories and businesses, the TCBL lab model has three levels: a set of common principles, the individual lab essence characterisation, and the set of lab activities. This framework is open to a wide variety of lab types, from materials research centres to social sewing factories.

Innovation in the network

This process is being driven by a network of over 50 TCBL labs that freely experiment with the implications of potential innovations and their concrete impacts on business operations. A broad range of structures, from materials research laboratories to design collaboratives and social community centres, explore innovation potentials from varying mixes of three perspectives—design, making and place. They engage with other labs, the local communities and T&C businesses—TCBL Associates—through concrete projects.

Innovation projects

In turn, TCBL Associates capture these innovation potentials and apply them in concrete actions—innovation projects—that accompany their shift towards more innovative and competitive business models. This process is supported by federated knowledge, learning and business services that are aggregated through the TCBL Open Platform.

An integrated overview of the shemakes.eu innovative values, activities, and role models

After this general overview of the TCBL and Fabricademy actors, we mapped the values that come from both ecosystems and are embedded in the partners' activities and role models.

We identified the relationships of innovation, science and technology practices and linked references, advice, and support from nearby projects on applying best

practices to the shemakes.eu integrated ecosystem (Annexe 4[25]). This is not at an institutional level but reflects the thoughts and influences of EU projects on the current European Commission approach (mandate).

Innovation in values

What characterizes all Shemakes practices are the three Shemakes axes: **inspirations, skills-values** and **networks, that were produced in co-creation with Shemakes partners.**

As outlined in the figure below, these axes are good guidance to further select and implement the shemakes.eu innovation activities.

What is then important to reach out to future female innovators is:

- **Really exploring cross-cutting issues:** Inviting reflection on social conditions and the effects that practices have, and different disciplines that address transversal problematics.
- **Sustainability:** Encouraging practices of longevity, efficiency and circularity.
- **Open access**: Sharing practices and thus aligning with the ultimate goal of Fab Labs and open networks—the democratisation of manufacturing.
- **Learning by doing**: Understanding the value of learning in hands-on practices. Picturing the learning processes, by making, have a timeline that can be experiential and lead to shorter or longer processes. Efforts can be successful, but they can also be frustrating. What is important is to overcome them and try again individually and with the help of the community.
- **Engaged and collaborative:** Encouraging the joint development of changemakers and team objectives to achieve goals.
- **Entrepreneurial**: Fostering practices in industrial contexts by introducing techniques and methods in the lab that can be scaled or transformed at an industrial level. Presenting projects and activities, e.g., visits can provide a picture of future scenarios in the industry. Approaching industry is fundamental to reflect (as individuals and as a collective) on how to transform the practices in the textile and fashion sector.
- **Connected and communicated:** Allowing interaction and connection between participants and members through the networks of the labs and the future network of Shemakes who share common interests.

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[25] Table 1: Synthesis of the gender gaps and potential of change framed through the Shemakes project and existing related practices
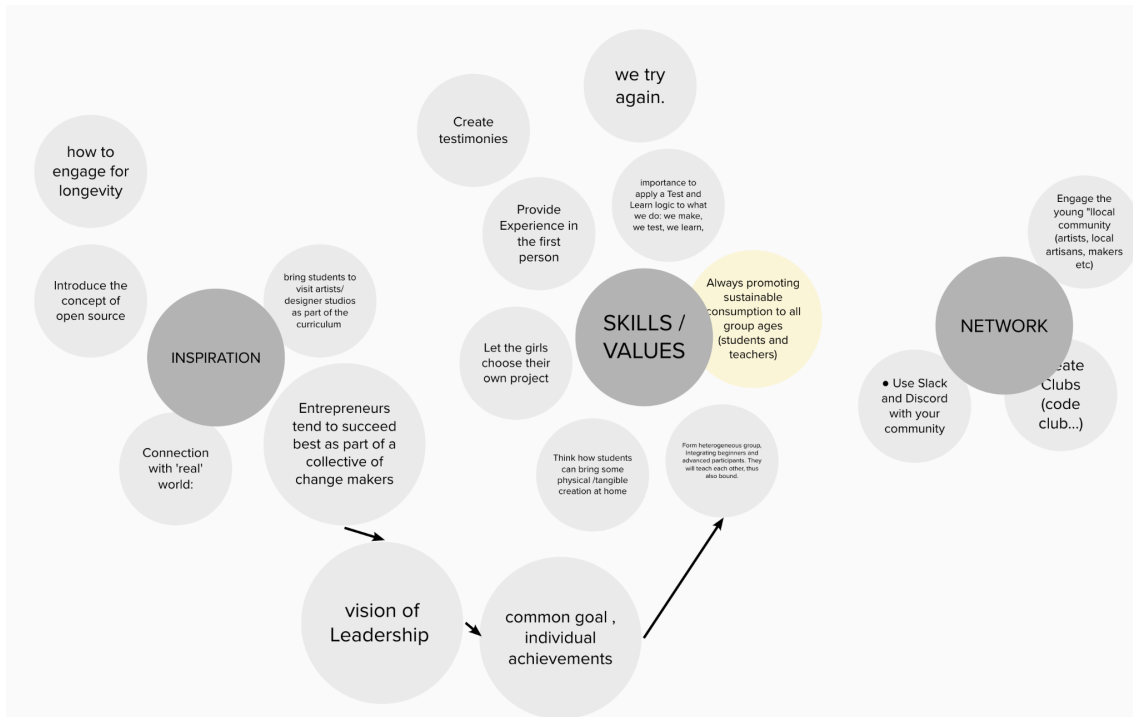
Figure 12. Overview of influences and values to foster in further practices of Shemakes.

Innovation in Learning Paths activities

As mentioned in the DoA, the learning paths address the needs for innovation via activities that are proposed and conducted in varied distributed formats. Three groups, respectively Girls and teens (8-18), Young women (18-25) or Adult women (25+) can discover a large range of tech-based activities, which applied to the textile and clothing sector, helps resetting their minds towards a better future.

In these learning paths, methods are made to answer to three questions: who to innovate with? why? and how?

In the first nine months, the lab partners identified **the relevant actors to cooperate with**, outside their well-known ecosystem, e.g., with institutional, higher education, alternative education, entrepreneurship training stakeholders. This was strategic for the development of the project's activities. Due to the spectrum of labs brought together in shemakes.eu (IAAC, makesense, WAAG, REDU, Onl'fait, LEON), the ecosystem has a strong profile in education and training offers for women.

On the why front, one of the critical elements of innovation in the labs is framed at an experimental and practical level of **responsible research innovation** (RRI). RRI embraces and influences the challenges of science and innovation in humanity and

the world. It makes a special call for commitment and action to contribute to science by and for society.

Among the **methods** of the learning paths, some are transversally useful, whatever the target group and grouped as follows.

Methods for trans-and interdisciplinary learning-s:

- **Hybrid, distributed learning:** Providing learning in different formats without geographical borders. This approach also provides for the creation of replicable structures that can be realised locally in the labs for local and global dissemination, enabling a decentralised innovation process.
- **Gradual learning:** Encouraging the accomplishment of projects that each participant has to undertake in small goals. This approach aims to motivate and enable the participant to build a complex system through completion of small tasks.
- **Graded learning responsibility:** Encouraging reflection with the help of commitment to their team—I can do it, you can do it, we can do it.

Methods for empowerment and development of entrepreneurial mindset include:

- **Agile innovation:** Applying innovation frameworks such as design thinking and problem solving to transform ideas into design and further develop manufacturing processes.
- **Peer-to-peer mentoring**: Understanding the value of equality and collaboration between experts and participants.
- **Sharing knowledge**: Emphasising the importance of sharing as part of the added value, focussing in particular on documentation and promotion, and using open-source tools. This makes the extensive knowledge shared between labs available for dissemination, replication, and contribution to the growth of the Shemakes ecosystem.

Constant reflection on the integration of digital and tradition

- Invitation to be ecologically aware of a digital and caring landscape.
- Where the implementation of traditional techniques tends to disappear, the lab's role enables reflection on the use and adaptation of conventional tools and how they can be reinterpreted and integrated into digital systems, as well as how digital fabrication contributes to the legacy of the preservation of textile traditions.

Innovation in Services to the Shemakes community

As described in the DoA, the service to the Shemakes community is three-pronged: it fosters the community engagement to support Shemakes labs in their transformation of the gendered innovation ecosystems in the textile industry; it provokes distributed scientific research and development on all issues that are needs and concerns of women in that sector; it supports business development skills.

The first innovation services were sketched to support the Learning Paths on their tech-based agenda, namely Industry 4.0 and wearability innovation narratives.

What appeared strategic was to further explore the possible obstacles for young women and women in their innovation work path. Here, the needs to improve entrepreneurial and strategic skills and an interest in personal growth issues were formulated. Sustainability also naturally came into play, mirroring the contemporary entrepreneurship in textile and clothing, particularly with women leaders.

As shown in the figure below, such entrepreneurship skills development also required a specific innovation ecosystem, with the following characteristics:

- **Enabling environment** as a place with the resources, culture, and accessibility to enable a certain type of activity to take place.
- **Community engagement** through diversity and shared vision as an invitation for acceptance and participation of different scientific, social, and cultural perspectives.
- **The maturity of the ecosystem** through experimental development and empowering research chains towards connecting industry and societal impact, as well as engaging in responsible innovation research.
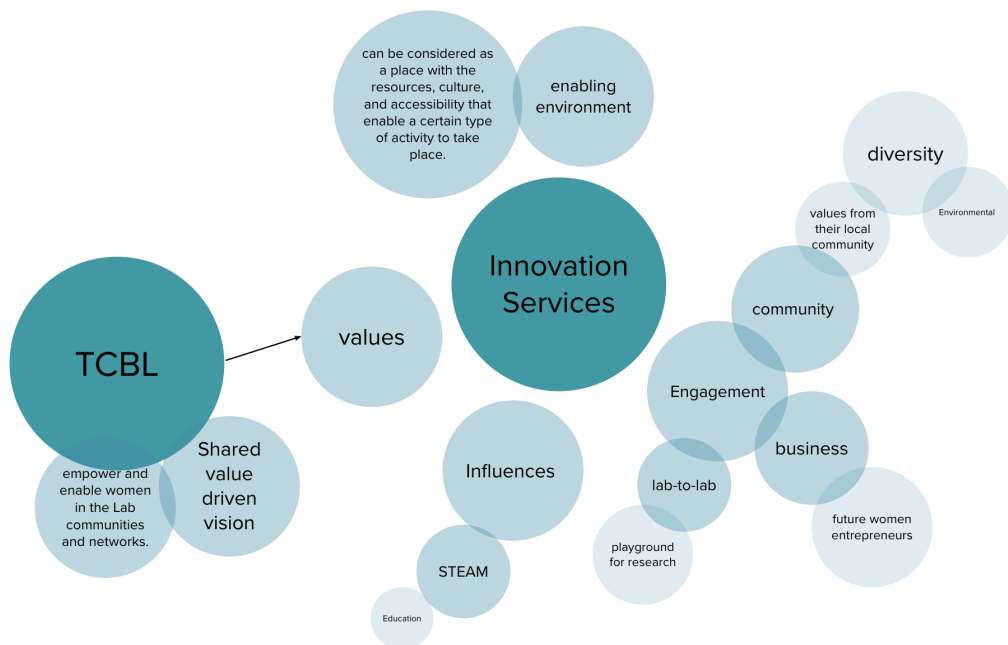
Figure 13. Overview of the innovation ecosystem mapping: Innovation services

Innovation in Role models

Since shemakes.eu aims to create an inclusive, diverse, and participatory ecosystem, there was a need to get inspiring people to embody the Shemakes vision, connected with the tech-based alternative and agile education (in Learning paths) or engagement and contribution to Shemakes (in Innovation services).

The first role models to be designed were Gurus, senior people that in the labs could organise and conduct activities for the targets and imagine services for them. They were described in terms of needs and motivations to be gurus as much as emotionally intelligent to contribute to this sentient system in which Shemakes evolves.

As shown in Annex 5, the profile of these role models was designed following three major types of variables

- **Needs and fears:** Role models demonstrate their ability to identify and understand the gaps and challenges that women experience, as Brush et al (2019). described in their 5M context. These challenges are reflected in the gurus' profiles in factors such as:

- childcare, time management and balancing work and the urgency of quick results, which contrasts with the immediacy required by our current rhythm.
- Language barriers reflect geographic barriers.
- Awareness of global issues, reliance on sufficient resources, people having the same ideological goals and how these relate to work practices are included in 'How to merge sustainability and economic viability'.

Fears and needs also speak of needing *courage* to face them and seeking this courage through the tools of the Shemakes vision, especially within sentient system building and the tools generated through the enabling environment, to develop the skills and strengths to face these challenges.

- **Motivations:** Role models create synergies in the Shemakes ecosystem, help build a new generation of women and a diverse context open to different perspectives, along with tools that integrate various narratives of sustainability, technology, science, and innovation. Motivations speak to *emotional intelligence* throughout all Shemakes processes: managing expectations, overcoming frustrations, celebrating confidence, being open to diverse voices (Pascual, 2021) and ultimately enabling Shemakes actors to be engaged in the continuation of the ecosystem.

- **Advice: Role models talk** about the stories already traversed by women who have achieved paths we want to follow through Shemakes, with guidance across age, demographics and through technological-scientific challenges up to innovation as the ultimate goal. Advice also means diversity of women:
  - across cultural and demographic challenges
  - including new generations to identify and reflect through current opportunities and challenges
  - able to catalyse the debate individually as well as call for change collectively, e.g. through social media.

Advice should provide support on what to do and not to do. It is a space where there are no taboos about facing realities. It enables a zone where we talk about what is possible. It fosters the growth of participants as Shemakes leaders, from the coaches (gurus) to the tiny talent seeds (ambassadors). The development of new generations through these guidelines enables paths of trust and networking as the interweaving that supports Shemakes.

Summarising conclusions

In this chapter, we explored the Shemakes gendered innovation ecosystem from the perspectives of the "reality" and "the practices". This was done thanks to collaborative ways between partners.

As summarised in Table 1, we first highlighted that the Shemakes innovation ecosystem was integrating the values and principles of both existing ecosystems, without excluding any of them. In addition, we highlighted that there were specific aspects in Shemakes, that were the bases for values and goals specific to our objective to extract a gendered innovation ecosystem from the reality and practice.

Table 1. Shemakes values and statements.

Fabricademy values	TCBL principles	Shemakes value creation
Hybrid learning: Combining online and community engagement learning and hands-on training by international experts.	**Curiosity**: Creative exploration of new paths, roles, social constructs and business models.	Approaching gender through **Collaboration**.
Novel career paths: Working at the intersection of digital fabrication, bio design and textiles.	**Viability**: Things should stand on their own feet but can do so by equally increasing the prosperity of businesses and the wellbeing of communities.	Disrupting the textile industry through **innovation**. Empowering women in innovation ecosystems through **inspiration, skill and networks**.
Learning by doing: Expanding the practices of FabLabs with textile labs and bio labs.	**Durability**: Commitment to the environment, towards circular economy and zero km.	Importance of **"situated,"** **"distributed"** knowledge, places and formats.
International network: Exchanging knowledge with a community of like-minded individuals.	**Multiplicity**: Value of different cultures, traditions and opinions. Roles for both professionals and amateurs, different labour specialisations.	Building **new narratives** and curriculum for sustainable futures.
Open source: Promoting open-source culture, sharing and collaborating.	**Openness**: Trusting others by sharing resources and information. Respect and protection of privacy, authorship and IP. Dignity of the individual and power of social knowledge.	Value **craft, spaces, creativity, territorial tradition,** and **practices**.

A second step consisted in going through the learning paths and innovation services methodologies, to add practice - led methods to make this ecosystem alive. Role models were also invited in the analysis, as key inspiration tools for future women innovators, who want to engage with Shemakes labs and communities.

As a follow-up, we are currently setting up a guiding schema named "[shemakes innovation ecosystem sketch](#)."
This schema aims to provide guidance to locate ourselves, explore the connections of the ecosystem, map current innovation activities, qualify interactions between partners (inside and outside their communities) and give a summary situation of innovation qualities of the ecosystem in different respects. This mapping also aims to reflect on how the elements are growing in the ecosystem.
As a sketch of an evolving systematic structure, it is still in some rough stage and should evolve in the course of the project to provide future support and deliver suitable strategies and tools for:

- involving stakeholders to promote gender synergies between research, technology, social innovation and entrepreneurship
- Addressing the individual needs to innovate, share and contribute to the community.

Finally, the development and integration of the shemakes.eu innovation ecosystem is strongly interconnected with the shared vision development that was developed in earlier chapters (as both approaches were practice - based), It will further link with the theory of change that is the base for the impact results of the Shemakes ecosystem (with WP5, at the end of the project) with communication and dissemination as an essential part of the visibility, dynamics and role models (with WP6) and theshemakes.eu network long-term sustainability (with WP1).

4.4 Innovation Ecosystem Canvas

We have mentioned that Isenberg's argument of ecosystem building as a bottom-up process holds value for Shemakes because it illustrates the practice-led innovation processes and interactions between actors, values and activities and because such processes and interactions evolve and generate innovation in the project.

In this context, the Shemakes journey is a useful perspective to elaborate on the Shemakes innovation strategy. Starting from Pascual's innovation ecosystem and

community canvas (Annex 4), we can describe this journey through six phases: context, starting, preparation, definition, bonding and maturity (see Chapter 4.1).

Below the figure overleaf, we - describe the phases of the innovation ecosystem canvas in detail.
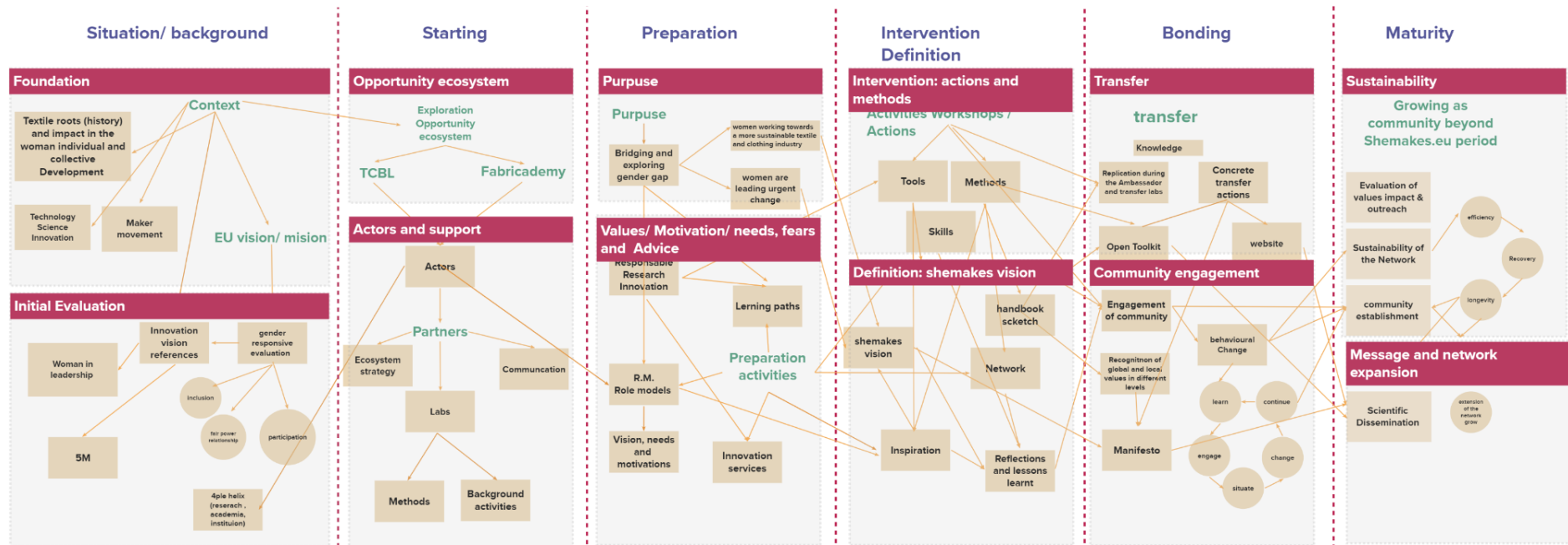
Figure 14. Extraction from innovation ecosystem canvas into Shemakes methodology

Context: project environment, background, and foundation

The Shemakes context includes requirements emerging from the project's aim to create a gendered opportunity ecosystem, put emphasis on women and entrepreneurship, and explored some theoretical models as described in Brush's 5M model or possible success factors from literature research (see Section 4.1, references around Brush et al.(2019). The project's background consists of the challenges raised by the intersection of the women's textile skills, social change, and technology (see broad social issues in Chapter 2) with a fundamental role for the women's collective and individual situation; the way science, technology, and innovation interconnect in the current situation of women in making; and the implications of gender in the maker movement. This foundation is contextualised in the EU (vision/mission) approach. As the shemakes.eu methodology centralises Gender Responsive Evaluation at its core, four principles are incorporated: salaries/value equality, inclusion, participation, and fair power relations[26].

Figure 15 represents the interactions of the context in which Shemakes is situated.
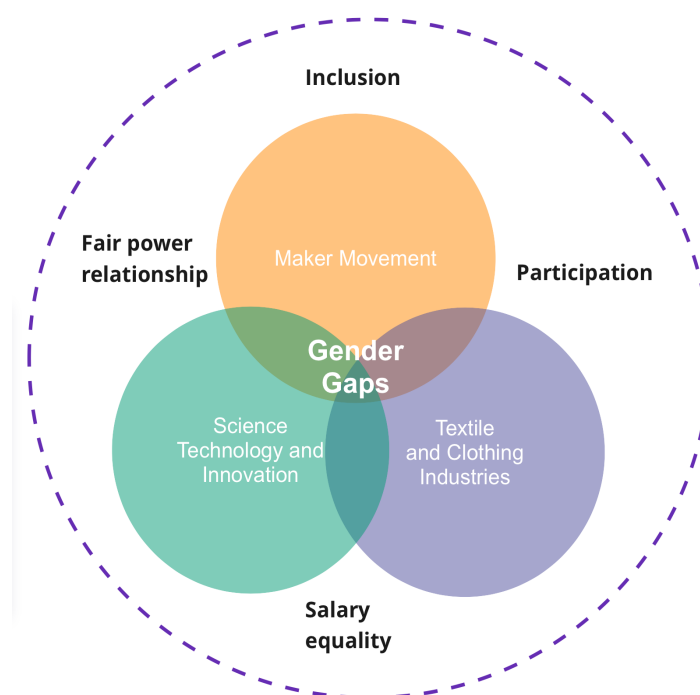
Figure 15. Context and situation for Shemakes.

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[26] The following information is based on gender responsive evaluation addressed on the Deliverable 5.1 Evaluation and Assessment

Start phase: knowledge from TCBL, Fabricademy and Labs ecosystems, support and actors

The start phase focuses on understanding the existing ecosystems and building upon the experiences and wishes of the Shemakes partners, primarily based on the labs' expertise. This creative phase identified the strengths of each lab associated with the TCBL or Fabricademy network and matched their knowledge with each other, such as the expertise provided by each innovation ecosystem, how partners could support each other and how labs would select and interact with external actors - e.g. universities, higher or alternative education, creative institutions, entrepreneurship support bodes, local ecosystems etc. (described in Section 4.3).

Preparation phase: partner ecosystems and Shemakes activities, purposes and information flow

Referring to the Fabricademy and TCBL ecosystems, the merged ecosystems have good development of diverse activities, which are already implemented and thriving. The purpose is basically provided by the project's setup: bridging and exploring the gender gap. However, the purpose might be adjusted and expanded during the process of gender vision development and implementation. In practice, the preparation phase starts with planning internal activities (gender vision, project meetings, communication templates, impact criteria etc) and selecting external stakeholders aligned with Shemakes targets. All these have a common goal: innovation ecosystem supporting women working towards a more sustainable textile and clothing industry.

Fabricademy proposed 4 research areas from their current list of courses: *sustainability, wearability, industry 4.0 and innovation narratives.* TCBL proposed engagement activities that would support and complement the learning paths targets. As was clear in the project, the two approaches were meant to be complementary. In addition, WP2 Learning Paths, WP3 Innovation Services and WP5 Impact provided guidelines to structure the activities, such as the activity canvas, evaluation table and further co-creation tools as the website ideation to convey Shemakes vision.

Intervention phase: methods, tools and Shemakes setup activities/ actions

This phase aims to put the values, skills, and expertise of the ecosystem into action. That is why we use the term *intervention* to apply all previous findings in the Shemakes activities.

The project foresees three forms of intervention, mainly framed in the WP2, 3 and 4, to support functional and structural changes in the existing ecosystems, moving them towards more responsible practices in terms of gender by:

- Engaging girls & teens, young and adult women
- Equipping them with more skills
- Being part of a diverse innovation ecosystem and boosting their career

with the final goal to have greater empowerment, starting with more equal salaries and better working conditions, to lead change in the T&C sector.

The interventions are built on the existing practices and supported by co-creation tools and peer-learning exchanges among the stakeholders. In this part, tools and methods contained in the toolkit are developed as working guides in the learning paths and innovation services. The open toolkit - is based on the experience of setup from the six lab partners. However, the guides are designed to be tested and improved when they are used in the next round of activities by gurus and ambassadors.

This process begins to define the tools we want to transfer to labs and networks through open-source dissemination. Further steps are the identification and selection of the leaders who can help the project's continuity.

Bonding phase: values, engagement and community transfer

The bonding phase speaks about the values, results and transfer that will remain for the project's second stage. This stage is defined in the transfer of knowledge and values that will be routed in the development of Shemakes, such as:

- **Inspiration:** The opening of Shemakes voices and feedback rounds from the advisory board.
- **Skills:** The transfer of knowledge from gurus and WP2 and 3 activities to ambassadors.

- **Network**: The initiation of community engagement through e.g re-wool research line (followed in WP3) and how to build a community that benefits from collaboration.

To build the Shemakes network, it is relevant to foster community engagement through a behavioural change approach.

- Enabling is at four levels: environment level, community level, interpersonal level, and individual level.
- This behavioural change model proposes a perspective from awareness to action and forward. It starts with a catalyst/stimulus that can be external or internal to the community (Avis, 2021). This catalyst leads to dialogue within the community, which leads to collective action and the resolution of a common problem. The five steps of this model – learn, engage, situate, change, and continue (Fig. 16) – could be useful in mapping behavioural change in Shemakes.
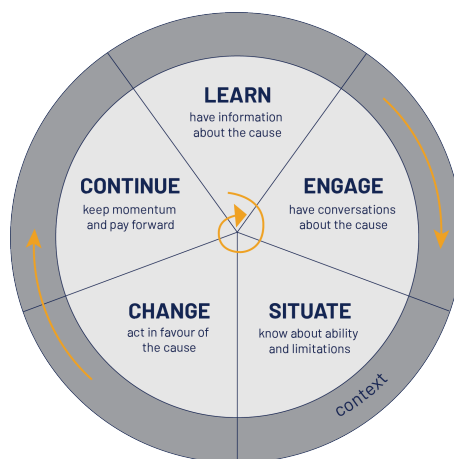
Figure 16. Behavioral change model (WAAG model)

The above steps are fundamental in the change process to ensure that learning and education processes are iterative and vibrant. Thus, they resonate in local, regional contexts and ultimately in a global community.

For the purpose of the Shemakes innovation ecosystem, this model is considered to picture next steps that can be applied in future scenarios of activities of shemakes.eu. However, its theory will not be explored in depth. This is expected to be addressed later by the network's sustainability and innovation services approach.

In addition, the synthetic representation of Figure 11 can become a manifesto of the Shemakes vision and used as a dissemination tool to consolidate and engage the

group reflections, call for change in the overall thinking and interests of the project, and engage in future dialogues with an already adopted position.

Maturity phase: establishment of a Shemakes innovation weave

The maturity phase involves the sustainability of the values, objectives, and establishment of the Shemakes community, and beyond that to see that the change creates new dynamics of interaction between the Shemakes actors. Some fundamental actions will be taken during the project. The following points summarise some of the steps that can already be considered in the development of the innovation maturity phase:

- The iterative process of Shemakes activities needs to be evaluated, and changes and reflections made around them.
- Networking and engagement, through activities and workshops, should invite active, voluntary participation, both local and global, of local and virtual hybrid formats.
- Awareness of exchanges between the global and local community, as well as the strategies to develop close relations between labs, should continue after the transfer process of visiting ambassadors.
- Feedback and a culture of reciprocity should be created, with value collaboration and open innovation.
- Responsible use should be made of the Shemakes website resources, printed resources, and handbook as a reference for the practices of each lab.
- Finally, the official scientific dissemination of the results will allow more communities to implement the philosophy and continue the work, such as the dissemination of developments in scientific publications and the creative presentation of policy briefs, which can generate an impact at scientific, economic, and governmental levels.

Building on the experiences of the previous phases, the following section describes three layers of reflections (gender reflections, inside the Shemakes context and beyond) for bonding, maturing and weaving of the Shemakes community. First, these reflections were conceived from a co-creation between partners to promote the sustainability of textile and clothing labs and beyond. Second, this section expands on these lessons to encourage women innovators in new fields of entrepreneurship. Finally, this discussion expands on these reflections to promote best practice, specifically in the lab context. Labs are the primary environment where

all physical, virtual and hybrid interactions take place. Beyond the labs, we must understand how the ecosystem can grow and create sustainable ecosystems. As is defined in natural science, this ecosystem should be capable of recovering in damage, with circularity, efficiency, and longevity.

4.5 Conclusions and further perspectives

After exploring innovation ecosystems and the experiences in shemakes.eu, we can already see a growing environment pictured through the innovative ecosystem for women to reduce the gender gap. shemakes.eu emphasises empowering future female innovators for a sustainable fashion industry through inspiration, skills and networks of different ages that enable the engagement of women and girls. The project is still ongoing and demonstrates the intersection of different innovation entry points and will thus further develop these findings and adapt its strategies through evaluation and reflection.

A Shemakes innovation ecosystem has been co-constructed through various iterations. Inspired by the approach of (Granstrand & Holgersson, 2020), the Shemakes ecosystem has been mapped out as a set of concepts, values, and interrelationships between and within ecosystem actors, artefacts, and activities. For this purpose, we draw on the Shemakes journey to illustrate a methodological process that visualises the development of the Shemakes innovation ecosystem from a meta level. This ecosystem should enable the collaboration, further development, and sustainability of the Shemakes community.

We have presented the different aspects and dimensions of innovation in technological, scientific, and social innovation as well as in open innovation. We have described the factors that affect and make this environment optimal for the growth of the shemakes.eu innovation ecosystem. Furthermore, we have situated the relationships between textiles, technology and maker movement, the actors, and gaps and how to take this into account to make the atmosphere more inclusive.

By investigating the link between women, technology, and textiles, we show how, not surprisingly, women and the textile world are closely connected as this interplay is part of the social and cultural fabric of the history and constructs of industrial and political development. However, today's textile perspectives can offer an attractive and innovative environment for women innovators from the textile industry to different scientific and practical fields, such as STEAM, circular economy, industry 4.0, smart textiles, and entrepreneurship.

Labs are the spaces in which shemakes.eu has its core interactions. They are the environment where actors, communities, and activities work together. Our approach, as presented, builds on the principles of Research and Responsible Innovation to promote an environment of social, scientific, and institutional dimensions. This approach is built through knowledge generated individually and in the community, the generation of local and global values, and the continuous feedback of knowledge that allows for the generation of more stable and lasting networks.

As a complex and non-linear ecosystem, shemakes.eu generates value in networks of co-creative collaboration. We aim to integrate all relevant types and dimensions of innovation and thus to build on the key actors in the framework of the quadruple helix (industrial, institutional, scientific and socio-technological interactions). This approach underlines the importance of actively integrating the public sphere and the role of society as a major actor in national systems of radical change, thus covering a broad scope of innovation. Nevertheless, there is not a single formula for achieving an innovation methodology. For this purpose, the ecosystem is alive and is constantly changing and therefore, an Innovation ecosystem canvas is illustrated to provide an overview of the Shemakes journey.

We expect the innovation ecosystem to grow and have a broad resonance in all the project's dimensions. Beyond the internal process, we hope the following reflections on gender will further develop the maturity and sustainability of Shemakes in its values, methods and community as suggested by a biological ecosystem that is efficient, long-lived and allows circularity and collaboration for growth.

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Document information

Statement of Originality

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

Acknowledgement

Annex 1: Activities implemented in Tasks 1.1 and 1.2

Activities implemented to create the shemakes.eu gender vision (Task 1.1)

Developing **the shemakes.eu gender vision** was an iterative process which built on successive activities implemented within the framework of WP1 and WP5. These activities included:

- Participation in a **first brainstorming workshop on the shemakes.eu opportunity ecosystem** organised by the T1.2 lead in January 2021 which focused on articulating partners' views and ideas on: shemakes.eu target group; the shemakes.eu value system; and the topics shemakes.eu wants to address (business co-organisation; renewed knowledge and skills; renewed philosophy with forward mindsets). This work served as background and context for the gender visioning work as well as having a 'triangulation' function in developing the vision.

- Running a **theory of change workshop** with shemakes.eu partners in February 2021 co-creating the outcomes and impacts the project is looking to achieve, and the inputs, activities and outputs that will be implemented to achieve these. This led to the creation of a theory of change map which represents the roadmap for the project's envisaged change journey. The primary purpose of the theory of change work was to inform evaluation activities, though in advancing the work for the gender vision it became clear that the theory of change had value for this as well, most notably in identifying gender related changes the project is seeking to address. These outcomes were used to support the co-creation work in the shemakes.eu gender workshops.

- Two sets of **background research** activities. This included: a review of a small number of grey, practitioner and academic literature on visioning and temporary organisations to conceptualise the shemakes.eu gender vision workshops as well as the presentation of the vision itself; a short review of literature on theories of gender used as content for the first workshop; a review of shemakes.eu deliverables produced by mid-2021 from a gender perspective to understand how gender was being discussed to date to serve as background information for detailed workshop design and implementation.

Activities implemented to design the shemakes.eu innovation methodology (Task 1.2)

The innovation methodology started with elaborating the strategic workshop canvas for the Kick-off meeting, understanding, and framing the questions or needs of the shemakes.eu partners and understanding **what objectives the innovation methodology for the consortium should meet.**

At the same time, - extensive research on projects in the textile and fashion industry and gender initiatives was carried out. A literature review, mainly in the innovation ecosystems, was created.

In addition, we researched how women in leading roles were brought into entrepreneurial innovation and what was their point of view on innovation.

Co-creative sessions with the labs were held, in order to start defining gurus, which together with WP4, are key innovators to be referred to in the labs. We extracted information about their **Profile Map** to understand their frustrations, fears, motivations and opportunities for entrepreneurship and improvements in the innovation ecosystems.

At M3 of the project, a new phase on **mapping the innovation ecosystem** was initiated, understanding its meaning and vision through each work package, reinterpreting this process into opportunities for change, and proposing an ecosystem towards an innovation methodology.

Accompanying the co-creation process of the gender vision Workshop initiated by TIG, we explored gender from the innovation side, where participants agreed on the relevance of **gendered Innovation** and what it also means for the project.

Finally, together with MATRIX, IAAC, ONLF, and TCBL, the first **scientific paper** was published: *Innovation Ecosystem for women makers, through textiles labs and the shemakes.eu approach* by Adriana Cabrera, Anastasia Pistofidou, Marion Real, Shannon Sykes, Anna Czeschik, Jesse Marsh. The paper presented a comprehensive overview of the interdependencies of the innovation ecosystem and how it develops in the context of shemakes.eu.

Annex 2: Gender visioning workshop agendas

1. The past (30th June 2021, 15hrs – 17:30 hrs CEST)

Timings	Activities
30 minutes	**Entering the workshop series: setting the scene and ways of working** o Presentation on the shemakes.eu gender visioning task and ways of working o Explanation of the first task
45 minutes	**Small group work: sharing our personal stories of our experiences as women / men innovators / leaders / workers from a gender perspective.** (30 minutes) Small group work and production of an artefact on three questions: o As a female / male innovator, leader / educator / worker (in the fashion and textiles sector or elsewhere), what are my personal experiences of gender differences and equalities? o How do gender considerations influence how I work (e.g. the kinds of roles I take up or don't take up)? o **Large group work: stepping back and reflecting in the large group: what do we see through those artifacts, individually and collectively?** (15 minutes)
5 minutes	Break, cameras can be turned off.
60 minutes	**Why am I having these experiences? Using gender theories to make sense of our implicit and explicit understanding of gender in the T+C sector** ● Presentation outlining key points from four gender theories ● Small group work, one on each of the theories

	• Large group discussion (thoughts, feedback, implications for sheamkes.eu)
10 minutes	**Closing reflections**

2. The present (2nd July, 11hrs – 14hrs CEST)

Timings	Activities
30 minutes	**Setting the scene for the next block** • Welcome back and reflections / thoughts on Wednesday's workshop • Connecting with the previous session • Sharing reflections
60 minutes	**Small group work in two groups:** • Gender vision and Innovation methodology • Articulating gender in shemakes.eu work packages **Questions for the smaller group work on shemakes.eu activities:** • What idea(s) about gender equality / difference are we articulating in our work at the moment (implicitly or explicitly)? Why? • What are we not talking about, and why? • What do we want to change / adjust to reflect our discussions and help us achieve the change we want to achieve? **Large group feedback and discussion**
15 minutes	Break (camera switched off)
30 minutes 60 minutes	**Structures that support and obstruct (the politics of change)** **Intro to the task** **Small group discussion in four breakout groups:** • What in **politics / institutions** is supportive of shemakes.eu envisaged outcomes and impacts? What is contradictory? • What in **society** is supportive of shemakes.eu envisaged outcomes and impacts? What is contradictory?

	● What in **research** is supportive of shemakes.eu envisaged outcomes and impacts? What is contradictory? ● What in **business** is supportive of shemakes.eu envisaged outcomes and impacts? What is contradictory? **Large group discussion** ● Feeding back two key messages, one on supporting and one on contradicting shemakes.eu objectives ● Discussion:
15 minutes	**Closing reflections**

3. The Future (2nd July, 15hrs – 17:30 hrs CEST)

Timings	Activities
15 minutes	**Setting the scene** Presentation – outlining the task for the session, ways of working
60 minutes	**Building the shemakes.eu gender vision** Work in two groups: ● Who's the audience? What do we want them to take away / feel / do ?? ● What format for the vision? ● What key words, phrases or images come to mind when you think about the shemakes.eu gender vision? ● What key messages about the shemakes.eu opportunity ecosystem do we want to convey?
5 minutes	Break
60 minutes	**Sharing the outputs**
10 minutes	**Closing reflections and next steps**

Annex 3: Pascual's Innovation and Community Ecosystem Canvas

This is the original canvas from Jara Pascual's *Innovation and Collaboration in the Digital Era: The role of emotional intelligence for innovation leadership and collaborative innovation* (Pascual 2021) upon which the Innovation Canvas of section 4.4 is based.

Ecosystem and Community Canvas for Innovation and Collaboration

STARTING PHASE	PREPARATION PHASE	DEFINITION PHASE	BONDING PHASE
Knowledge	**Activities**	**Needs**	**Values**
WHICH KIND OF KNOWLEDGE DO YOU BRING TO THE COMMUNITY AND ECOSYSTEM?	YOU NEED TO SCHEDULE ACTIVITIES TO BRING PEOPLE TOGETHER. THE OBJECTIVE IS TO SHARE INFORMATION AND KNOWLEDGE.	DEFINE NEEDS AND ISSUES YOUR ECOSYSTEM AND YOUR COMMUNITY IS FACING.	TRANSPARENCY. INNOVATION. COLLABORATION. RESPECT. DIVERSITY.
Support	**Purpose**	**Solutions**	**Manifesto**
HOW CAN YOU HELP YOUR COMMUNITY AND ECOSYSTEM?	WHAT IS YOUR ECOSYSTEM AND COMMUNITY THEME AND PURPOSE? WHAT IS THE VALUE CREATION YOU ARE CREATING WITH YOUR ECOSYSTEM AND COMMUNITY? WHICH PROBLEMS YOU ARE SOLVING?.	WHAT KIND OF SOLUTIONS DO YOU NEED TO BRING TO THE ECOSYSTEM AND COMMUNITY?	CREATE YOUR OWN MANIFESTO FOR THE ECOSYSTEM, INCLUDING MISSION AND VISION. CHOOSE YOUR SDG (SUSTAINABLE DEVELOPMENT GOALS) AND COMMUNICATE IT.
Actors	**Information Flow**	**Tools**	**Education**
MAKE A LIST OF ACTORS YOU WANT TO ADD INTO YOUR COMMUNITY AND ECOSYSTEM: CORPORATES. ACADEMICS. INVESTORS. CONSULTANTS. STARTUPS. UNIVERSITIES. POLICY MAKERS	LIST THE INFORMATION AND THE FORMAT YOU WANT TO SHARE: NEWS. EVENTS. SHOWCASE EXPERTISE. CURATE COLLABORATIONS.	CREATE GROUPS IN SOCIAL MEDIA CHANNELS OR COLLABWITH CHANNELS.	WHAT DO YOU HAVE TO EDUCATE YOUR ECOSYSTEM WITH? INNOVATION. COLLABORATION. OPEN MINDEDNESS.

Ref: Jara Pascual, Innovation & Collaboration in the Digital Era

Annex 4: Change potentials, gender gaps, and good practice

The following table summarises the change potentials and gender gaps in three key settings for Shemakes – textile and clothing industries; science, technology, and innovation environments; and maker spaces – and lists examples of good practice for each.

Table 2. Change potentials and gender gaps in key Shemakes settings.

Settings	Change potentials	Gender Gaps	Examples of good practice
T&C Industries	Historical industrial sector under strong pressure to innovate and high potential to be transformed by disruptive digital technologies and sustainability challenges.	Gender pay gap and stereotypes	Fashion Revolution (Women 2021), L´Oreal Unesco (For Women in Science, 2021) , Gender Smart prize, (2021), E4FT (Fashion-TechHigher Education, 2021)
STI Environ-ments	Raising awareness, fostering collaborative innovation and pushing for more inclusivity and participation of citizens in RRI at the EU level.	Lack of girls and women in technological field from education to industries	Global sustainable Goal(2021) Hypatia(2021), (2021), Siscode (2021), Equal4Europe, Global Digital Women, DISCO, Genderplusnet
Maker Spaces	Glocal community-driven spaces centered around different kinds of making, open source culture and the democratisation of technologies.	Over-representation of men and lack of role-models in labs. Higher sensibility to sustainable practices for women Lack of inclusivity policies in makerspaces	Fab charter(Fab Foundation – The Fab Charter, 2021) Generative interventions for equity Inclusive Atlas of the Future(AoF, 2021) manifesto from Pop-Machina project(Pop Machina, 2021) Fab Care Statement (FabCare, 2021.) (Manifesto, 2021) E-textiles and wearables communities, (HOW TO GET WHAT YOU WANT, 2021) Attraction of fashion designers for digital fabrication tools.

Settings	Change potentials	Gender Gaps	Examples of good practice
			Marketing and media fashion come with digital tools and radically new approaches to fashion production.

Annex 5: Role model variables

The role models developed in Deliverable 4.1 Reputation: Launch have provided additional insights onto the work of this deliverable. Based on the profile analysis of the key leading figures in Shemakes (i.e. Advisors and Gurus), the following issues are raised:

- Child care
- Balancing personal and professional life
- Insecurity and lack of self-confidence
- Less self-doubt
- Recognition and respect by society
- More humanity in cooperation
- Soft skill improvement
- Only female teams, viewer male leaders
- Gender neutral jobs
- No payment gap
- Communication
- Community work
- Natural leadership talent to get people involved
- Emotional and financial support
- Understand problems from the inside
- How to merge sustainability and economic viability
- How to be continuously informed about the latest trends
- Sharpen vision
- More knowledge in entrepreneurship
- Locally sourcing and making
- Waste reduction
- Find funding
- Less (?) EU reglementation
- English

The main fears expressed are as follows:

- To fail

- Urge to deliver

- Lack of time

- Not resonating with same age group ideas

- people lack awareness of social and environmental issues

- lack of support for projects

- Double occupation (full-time job plus additional engagements)

While the strongest motivational factors include:

- to help others

- learn & discover

- see projects thriving

- contribute to a better world

- bond to and understand other people

- being resilient to change

- training the next generation