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MANUSQUARE

MANUfacturing eco**S**ystem of **QUA**lified **R**esources **E**xchange

D6.5
Validation process definition

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LIST OF ABBREVIATIONS

Acronym	Description
CRM	Customer Relationship Manager
DoA	Description of Action
DP	Digital platform
EDM	Ecosystem Data Manager
ERP	Enterprise Resource Planning
GUI	Graphical user interfaces
KPI	Key performance indicator
RFP	Request for proposal
RFQ	Request for quotation
SUS	System usability scale
WP	Work package

1 EXECUTIVE SUMMARY

This deliverable outlines the validation process to be undertaken in the upcoming months of the MANU-SQUARE project. The logic implemented for this validation process not only focuses on the demonstrator use-cases outlined in the Description of Action, but also in state-of-the-art literature in the implementation and growth of digital platform ecosystems, as a means of ensuring the future of MANU-SQUARE.

In this sense, the deliverable starts with a more generic, comprehensive, overview of relevant metrics that focus on the three stages of evolution of digital platforms: short, medium and long-term metrics. Although these three stages will have impact on the MANU-SQUARE platform at different time frames, it is important that all of them be considered from the start so that their importance is not diminished. These three stages are further divided into three main metrics each: resilience, scalability and composability for short-term growth; stickiness, platform synergy and plasticity as medium-term metrics; and envelopment, durability and mutation for a long-time frame. Further sections concretize these metrics into relevant indicators for the project and, during the next months, more indicators will be developed for the metrics that become relevant for the growth of the platform beyond the project's end date.

The following section of the deliverable focuses on the demonstrators and with what can be considered the functional validation of the platform. For both the demonstrators, and corresponding three scenarios, the services that were defined in D5.1 are put into perspective and key performance indicators and success criteria are outlined, as well as other key missing questions that still need to be tackled for both technical and business process development.

Finally, a schedule of the activities of the coming months is presented, outlining the iterative process that will characterize the validation process: finish the development and integration of a specific service; followed by workshops with the industrial and dissemination partners for feedback and user interface testing; followed by a new round of industrial partner testing and developer intervention. This process will happen in parallel for the three main services of the platform, in a way that keeps all the partners involved in some part of the process. This process will culminate in the launch of the platform at the European level and in D4.6 that will not only report on all these activities but also lay out the growth planning of the platform for what comes after the end of the project.

2 INTRODUCTION

Digital platforms such as MANU-SQAURE present a new blueprint for how the market is arranged and how value is generated from products to services. The transition of platforms for the industrial sector hasn't been without challenges, however. The high dependence on network externalities and its multi-sided nature (Eisenmann *et al.*, 2006), move digital platforms away from traditional linear supply-chains, that follow a more straightforward and predictable set of principles, that companies have grown accustomed to dealing with. The breaking down of this *pipeline* mentality is also relevant in the definition of metrics and measured for DPs. While a manager of a pipeline modelled business is more concerned with the flow of value from one end of the pipeline to the other, a platform centred business model implies the creation, sharing, and delivery of value throughout the ecosystem (Parker, Alstyne, & Choudary, 2016).

Due to their complexity, the implementation of these new socio-technical constructs should be thought of as more analogous to a process that to an event. Where in an event, the results can be traced back to a specific act or circumstance, a process has more to do with a cumulative, long-term set of efforts. As with any continuous effort, it is essential to keep track of your direction to know where you are headed and to guide your path.

Work Package 6 has the overarching goal of the actual demonstration of the MANU-SQUARE platform with two demonstrator pilots, as well as with the community scenarios and the overall business models. D6.5 is the first deliverable of this block of work that aims at laying out the ground work of defining the platform success criteria, the methods of evaluation and KPIs that best fit the different use case scenarios of the platform.

2.1 Aim and scope of the task

This report focuses on setting down the guidelines for the validation of the MANU-SQUARE platform. The validation will take place from month 26 up to month 36 of the project. In this sense, and with the added complexity posed by DPs, this planning has been divided into two distinct types of metrics: evolution metrics and the more commonly used in software development projects, metrics of implementation performance.

Evolution should not be confused with maintenance (Kamel, 1987), and as such, performance metrics that focus heavily on discrete endpoints are heavily targeted at how well a project has done in the past rather than how the platform has evolved to improve in its key added-value features and functionalities. In other words, these performance metrics focus more on efficiency and reliability as opposed to capability to evolve.

Although performance metrics, such as the *accuracy of the matchmaking mechanisms* or the *number of generated innovative results* are crucial for the release of the platform, and in the scope of this deliverable, a large focus is devoted to the more novel side of evolution metrics. In this sense, the two demonstrators of the platform defined in the Description of Action (DoA) will function as the testbeds for the core functionalities of the MANU-SQUARE platform, where success criteria will be defined, measured and evaluated. On the other hand, this focus on evolution will be applied more readily to the overall ecosystem of the platform, such as in the case of the business model.

2.2 Relations with other tasks

The work of Task 6.5 results from the combination of the efforts of all the previous tasks for the conceptual, business and technological development of the MANU-SQUARE platform.

From WP1, T6.5 gets the conceptual development of the platform. T1.2 & T1.4 have analysed and summarized requirements of the platform, by describing both the envisioned functionalities and how they should be implemented. T1.3 meanwhile delivered a detailed description of both the demonstration scenarios with as-is and to-be business processes and started, foundationally, the work that this deliverable has picked up by defining early validation scenarios.

WP4 encompasses the bulk of the technical development of the platform (aggregating the work of WP2 & WP3). From this WP we gather the inner workings of the platform and its logic.

WP5 develops the multi-sided, service-oriented business model that supports the commercial use of the MANU-SQUARE platform. The validation of this strategic element is a crucial component of WP6. Notably, WP5's T5.2 has already presented an early business model validation framework mainly based on performance metrics.

This deliverable serves as fundamental input for D6.6 that, expected by the end of the project, reports on the final results achieved with the validation of the MANU-SQUARE platform. Along these 10 months, the task will put into action the set of activities here defined in order to feed WP7 (T7.1 & T7.2) with recommendations for the improvement of individual tools and the overall business model of the platform.

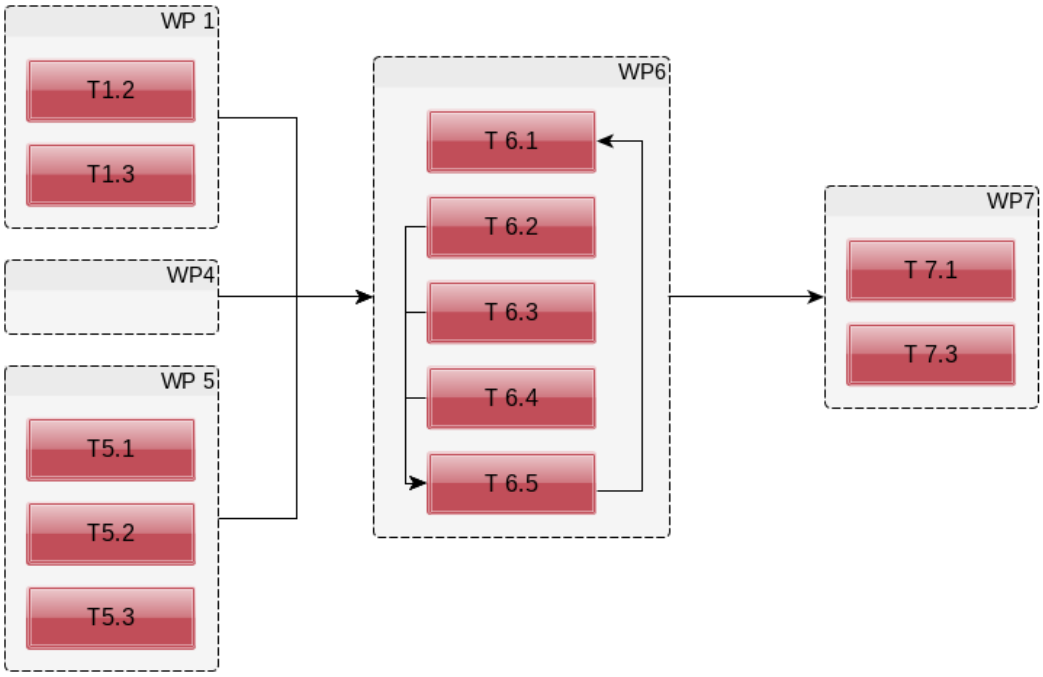

Figure 1 Relationships between T6.5 and other tasks

2.3 Outline

The document is structured as follows:

- § 3 describes the roles that metrics play in the development of DPs, as well as the principles adopted for the choice of metrics. This chapter also details conceptual fundamentals of the short, medium and long-term metrics adopted for the MANU-SQUARE platform;
- § 4 develops the validation process of the demonstration scenarios at the industrial partner for the manufacturing technologies industry. These are mainly focused on performance metrics;
- § 5 develops the cross-sectorial MANU-SQUARE demonstration scenario, involving the industrial partners from the textile & cosmetics industry. These are mainly focused on performance metrics;
- § 6 establishes the validation process of the remaining components of the MANU-SQUARE ecosystem. These employ the evolution metrics previously conceptualized to expand on the validation framework defined in previous tasks of WPs 1 and 5;
- § 7 contains some concluding remarks.

3 VALIDATION METRICS FOR DIGITAL PLATFORMS

The principles presented in these chapter result from a survey of the state-of-the-art regarding the definition of validation metrics for DPs. It serves as the guideline for the definition of the concrete measures presented in the later chapters for the demonstration scenarios of the MANU-SQAURE platform.

3.1 Roles and principles of metrics

The motto that DPs must be evolvable to survive in the long run (de Reuver, Sorensen, & Basole, 2018), although real, is in practice not very helpful for platform owners as what evolution or innovation is may be hard to define. Transparency is, therefore, crucial for the development of a validation strategy of any platform. In this sense, authors point to three crucial roles of metrics for the evolution: (1) assist in the steering of evolution of the platform, in a way that enhances the competitiveness of the developed ecosystem; (2) they help to focus platform owners on what is crucial and what is superfluous in the complex process of platform development and ecosystem building; and (3) they guide the management of trade-offs among design choices in the constant evolution process of the platform.

First, steering the evolution of any system is critical to its survival. Focusing on the right metrics takes centre stage in this process, as an obsession with translating a metric into a quantifiable measure can result in measuring the wrong things (Tiwana, 2013). Rather than maximizing what is being measured, defining what measures are in accordance with the planning of the platform should take priority. The ease of measuring is another pit that should be taken into account, as pretending that a property does not exist, if it is hard to quantify, can lead to faulty mental models and dysfunctional dynamics (Meadows, 2008), while measuring something just because of its readily availability can lead to an overload of unnecessary information.

The defined metrics also need to help the consortium in focusing on what is crucial, in amplifying the meaningful signals and filtering out the noise as pointed out by Tiwana (2013). In its analogy, the author describes the signal as the indicator of the evolutionary health of a platform, and noise as information other than the meaningful signals. Taking signal for noise may lead to failures in timely investments on key technologies or markets that later turn out to be disruptive for the segment of the platform's business. The overvaluation of noise may lead the platform owners into dead ends. In projects such as MANU-SQUARE, where the market uncertainty is relatively high, this problem becomes exacerbated. It is, therefore, crucial that the adopted metrics are designed to be efficient and agile enough to quickly steer not only the development of the technical components that make-up the functionalities of the MANU-SQUARE platform, but also the business processes and the overall business model. Altogether these should be able to cope with both technical and market unpredictability.

A third function of the defined metrics is to manage the unavoidable trade-offs that occur throughout the entire lifecycle of the platform. What makes these trade-offs hard to manage is that they often span big timeframes, not becoming immediately apparent to platform owners. The defined measures should, then, focus on different time intervals to help recognize the long-term consequence of the choices that are made.

Based on these goals, three guiding principles have been adopted for the choice of metrics: (1) they provide an outsiders vantage point on the entire development process of the platform; (2) they try to strike a balance between being short- and long-focus oriented; and (3) the cost of measuring them does not outweigh the value we intend to learn from them.

The development process of a platform is an on-going process, mostly inward, throughout much of its lifecycle. With this perspective, it becomes easy to forget that most of the value is not derived from the platform itself, but from how users make use of its ecosystem. An outside-in approach is a constant reminder that a platform lives or dies with its ecosystem (Tiwana, 2013). This means that not only dissemination and communication activities are fundamental to the evolution of a platform, but so is also the development of technological tools that enable the creation of applications around the main platform. In the end, ecosystems attract users, not platforms.

Evolution in complex systems occurs over long timeframes (de Weck *et al.*, 2011). This means that to accurately track and have an impact on the evolution of the platform, metrics of evolution must span shorter and longer time scales. To achieve this, authors take different approaches, with some focusing on the different lifecycle stages of a platform (Parker, Alstyne, & Choudary, 2016), while not totally abandoning the lifecycle metaphor, opt for dividing metrics into short, medium and long-term time spans (Tiwana, 2013). For the MANU-SQUARE project, we opted to focus on the three timeframes described by Tiwana (2013) for the design of metrics to put in place. This choice rested on the fact that the adoption of DPs for the industrial sector is still in its early stages which carries a lot of uncertainties for the entire development process of the platform. By focusing on these three distinct periods of time we hope to be more flexible in adapting the market needs by avoiding subconsciously force-fitting solutions.

The third guiding principle for choosing metrics of evolution is directly related to the cost of tracking metrics. The basic principle is that what we get from measuring something should outweigh the cost/effort of measuring it. In practice this means that, taking all the previous principles as a given, the platform owners should seek to automate as much as possible the data-gathering and processing for assembling the defined metrics into formats that are easily digestible for decision-makers. Another important point related to this principle is the distinction between what should be public and private metrics. While keeping metrics private is important for competitive advantages and a myriad of other reasons, having a core of public metrics is also relevant to not only signal to users and potential users the health of the ecosystem but to also provide third-party application developers with relevant data they can use in their own work.

In the following sections we lay out the three emergent bundles of evolution metrics adopted for the validation of the MANU-SQUARE platform. Emergent properties, unlike measures such as the number of bugs, lines of code or man-months of work, because of their intrinsic nature cannot be measured directly, but are instead measured by the effects and consequences they generate (Tiwana, 2013). Table 1 summarises all the evolution metrics into three groups; short-term, medium-term and long-terms metrics.

Metric	Short description
Short-term	
Resilience	The aptness of the platform to offer functionality in the event of failure of some component of the ecosystem.
Scalability	The capacity of the platform to keep its functional and financial performance under different (higher or lower) levels of adoption.
Composability	The flexibility of the platform's components to be altered without affecting and needing intervention in other components of the ecosystem.
Medium-term	
Stickiness	The capacity of the platform to incentivise persistent usage of the platform over a stretched period of time.
Platform synergy	The degree to which third-party applications or even platforms, are integrated into the platform
Plasticity	The capacity for the components of the platform to deliver functionalities not initially predicted to end-users.
Long-term	
Envelopment	Overtaking of the functionality of other platforms with an overlapping user base.
Durability	The capacity of the platform/component of a platform to be competitive in the market it operates over time.
Mutation	The capacity of the platform/component to generate new services based on the original platform.

Table 1 Summary of considered metrics for the MANU-SQUARE platform

3.2 Short-term metrics

Short-term metrics revolve around **resiliency**, **scalability** and **composability**.

de Weck *et al.* (2011) defines **resilience** as the degree to which the subsystem is internally immune to uncontrollable external factors that are difficult for the subsystem's developer to directly control. In other words, it refers to the capacity of the platform to keep an acceptable level of functionality and usefulness in the event of a failure in a component of its ecosystem. When it comes to the implementation and deployment of DPs and digital communities this becomes an important short-term operational metric, especially when complemented by other measures such as reliability and stability. In a complex, modular platform identical to MANU-SQUARE, wherein the short-term all of the services are self-contained, we can also interpret this as the capacity of the platform to still provide functionality when some of the services are unavailable.

Some simple examples of internal checks that can be performed are: "Does the Matchmaking Mechanism remain operational if the reputation component is non-responsive?"; "Does the project creation workflow remain available if the Semantic Infrastructure is down?"; "How long does the Idea Manager take to recover after a crash in the Ecosystem Data Manager (EDM)?".

Another consequence of this metric is that the platform should be designed to not just avoid failure in its constituent components, but also to be able to bounce back from these, most likely, unavoidable incidents and return to normal functioning. On a platform-wide scale, resilience to failure is something that is difficult to achieve, and that requires intensive testing and adaptation. We then foresee this as being a critical and ongoing focus of the validation process of the MANU-SQUARE platform, that will result in a specific set of final recommendations for tool developers (part of D6.6).

Scalability is another crucial short-term operational metric, that gets a special meaning in the setting of DPs. For common software projects, scalability usually implies the capacity of the program to scale upwards to support more of something, this being more users, more integrations, more data. Here the capacity to scale down also has an important role in the evolution of the platform: scalability must capture the subsystem's capacity to expand or contract, upward or downward (Parnas, 1979).

In the game of network externalities it is also important to think of scalability in both a technical and a financial sense. In the general sense, technical scalability is more dependent on the architecture of the platform itself and how the interplay of systems is able to provide all its functionalities with a high and a low number of users, data, etc. while scalability in terms of financial performance is more commonly associated with the government and business model of the platform (Tiwana, 2013).

For the MANU-SQUARE reality, both of these sides of the metric will play a role in the validation process: technical components will be tested, in their integrated form, on the features described in D1.2 and the business model developed in the tasks of WP5 will be validated with both the 2 industrial partners of the consortium and the community-driven scenarios.

Finally, in the early stages of development, it is crucial to keep platforms malleable so that they can easily adapt to emergent changes in their use cases. In this sense, **composability** refers to the capacity of the constituent components of a platform to suffer internal changes, these being updates, upgrades, or even architectural modifications, without disrupting the entire platform ecosystem. Tiwana (2013) refers to the opposite of this feature as brittleness, wherein a change inside a subsystem breaks its ability to interoperate with other subsystems. A metric such as this is ever more relevant in modular-based platform architectures, such as the one employed by MANU-SQUARE, as well as in a view of the platform as an ecosystem, where a set of applications rely on the various functionalities provided by the central platform.

Unlike the other two short-term metrics presented, composability can also be thought of as a strategic metric, mainly due to three reasons.

1. Not only the breaking of functionality implies costs for the platform owner, but also the implementation of new features. Although maintenance costs often remain a second thought in software development projects (de Weck *et al.*, 2011), only about 25% of post-release maintenance expenses come from bug fixes and about 75% of maintenance expenses over the lifetimes of typical systems come from functionality-enhancing changes (Eick *et al.*, 2001).
2. A platform that is more *composable* becomes much better equipped to integrate outside innovations within its architecture. Software-based platforms have the unique ability to quickly adapt to business and technological changes. Although this can be thought of as an innate capacity of these systems, its practicality is highly dependent on how the development process is handled and the choices that are made throughout the platform's lifecycle.
3. Another key aspect of the composability metric, is that it helps to understand how the platform will be able to handle the asymmetric evolution of the different components of a platform's ecosystem. It is expected that different systems will evolve at different rates, by virtue of outside pressures or mere speed of development. Taking MANU-SQUARE as an example, if a single change in the Reputation Mechanisms requires an overall change in all the other components, the implementation of new features becomes even more cost-ineffective and time-consuming.

When it comes to measuring composability the measuring of effort (such as person-hours/months) required to integrate a component into the platform, is a good starting point.

3.3 Medium-term metrics

The medium-term metrics considered are **stickiness**, **platform synergy** and **plasticity**, which is influenced by composability.

Stickiness is directly related to a platform's capacity to keep users *using* the platform and its functionalities. For many platforms this correlates to the capacity of a platform to get a user's attention and to sustain it. For platforms geared towards the industrial segment, this becomes an interesting challenge. For certain the emphasis still remains on active use of the platform, but the need for sustained attention is instead replaced by an added importance on the persistent usage of the platform over longer periods of time. From a practical standpoint, this means that for DPs in this field, measures such as "hours of use per week" take a back seat to "number of user sessions per week", or "time to handle notifications", always keeping in mind that these are metrics of evolution, meant to track changes over time.

Schilling (2000) presents the idea of synergistic specificity as the degree to which a subsystem and another subsystem are made for each other. The concept of **platform synergy** as defined by Tiwana (2013) draws on this conceptualization and extends it to reach the specificities of DPs. In these authors argument, this property is a constant juggle between synergy and the specificity of the applications of a determined platform: in a practical sense, the degree to which an application increases how it uniquely exploits its evolving native capabilities. They further point out that an increase in synergy between a platform and its applications can be considered a double-edged sword, potentially increasing an application's performance and integration with a platform on the one hand and potentially increasing its lock-in with the platform on the other hand.

From the MANU-SQUARE perspective, platform synergy, although not very much considered up until this point, may become in a medium-term time frame an important avenue for value generation. The integration of the platform with Enterprise Resource Planning (ERP) systems and even Customer Relationship Manager (CRM) systems are some of the more logical synergies between platforms that, after the initial hurdle of the *chicken or the egg* problem, can expedite the growth of the platform.

Plasticity is another metric proposed by Tiwana (2013). The author defines it as referring to the degree to which new releases of a subsystem deliver new functionalities to its primary users that it was not originally designed to deliver, further linking it to the level of innovation that a platform is able to generate. The importance put by the author in this

metric is made even more relevant when thought of in combination with recent literature in the field of DPs, that points to a high degree of unknowns in the successful design and implementation of these socio-technical systems (de Reuver, Sørensen, & Basole, 2018).

In this uncertain environment, the capacity to morph and meet new needs and possibilities that did not exist at the initial time of creation to better fit changes in the environment (de Weck *et al.*, 2011) is, therefore, an important capacity of DPs. One way to measure plasticity is to measure the average of new features introduced by the platform over the number of releases of its lifetime.

3.4 Long-term metrics

For long-term metrics **envelopment**, **durability** and **mutation** will be considered.

DPs that become dominant in a given sector of the market often become hard to displace, as alluded to before, much because of the network externalities that a large platform is able to generate. This network effect creates such large incentives to keep users in its ecosystem that often technically superior platforms are not enough to overtake these incumbents. Ecosystems attract users, not platforms by themselves. **Envelopment** is one way that new emergent platforms are able to get ahead in this business of giants. At its core, envelopment can be characterized as the expansion of a platform's functionalities into the functionalities offered by other solutions that have substantially overlapping customer bases (Eisenmann *et al.*, 2011; Evans and Schmalensee, 2007). Envelopment is a powerful way for new entrants in a platform market to overcome the competitive blocking caused by rivals' existing network effects as it does not require revolutionary new functionality to displace a dominant solution (Eisenmann *et al.*, 2011), and instead tries to take the network effects of a platform against itself. The enveloping trend is most prominent as product and service markets transition into platform markets (Tiwana, 2013), with a clear example of this phenomenon being how *Netflix* enveloped rent and on-demand entertainment services.

Adner (2012) further presents carryover as the basis for breaking the network externalities problem of dominant platforms. With carryover, the author suggests that a platform simply has to replicate its existing network of users in the space of the enveloped solution. Google effectively demonstrates this process by adding enveloped services to its existing userbase: the launch of *Google Drive* in 2012 effectively enveloped *Dropbox*'s business by simply adding the new service to users accounts who originally signed-up for a *Gmail* e-mail account.

Thinking of envelopment on a long time-frame is essential to not only exploit growth opportunities but also to defend against envelopment threats that might appear. Measuring envelopment is an involved process that requires platform owners to pay constant attention to their platform's market even for simple raw counts of successful envelopment moves by the platform or any of its functionalities. Another way of measuring successful envelopment moves is the rate of new users of a platform that actively use the enveloped functionality after its launch.

Durability is directly influenced by the stickiness metric and can be characterized as the competitive persistence of a platform's advantages and uniqueness over time (Barnett and Hansen, 1996; Pil and Cohen, 2006; Tiwana *et al.*, 2010). Durability is an important long-term metric as it allows for a more granular vision of the health of a platform ecosystem when compared to the resilience measure. An industrial platform that, at launch, has a community of 50 active organizations and after 3 years has 100 active organizations is more durable than a platform that started with 100 and after the 3 years only sees 50 active organizations.

In this sense, durability can be measured by the percentage of early adopters who remain active after a defined period of time, or even by the number of third-party integrations with the platform that remain actively developed and updated.

Mutation refers to the unanticipated, serendipitous creation of a spinoff platform or app that inherits some properties of the parent subsystem but with a completely different function than its parent (Tiwana *et al.*, 2010). In other words, and unlike envelopment, mutation leads to the creation of a new, derivative system. Not unlike the carryover effect

previously mentioned, mutation is a way to generate new services/platform that does not directly compete with the original platform but instead diversifies it, while at the same time conserves some features of the original platform (Meadows, 2008).

4 MANUFACTURING SECTOR DEMONSTRATOR

This chapter presents the validation scenario for the identified demonstration scenarios of the industrial partner from the manufacturing technologies industry.

4.1 Demonstration scenario 1 - New product development: development of a turnkey AGV solution

The first demonstration scenario sees JPM as a customer in the MANU-SQUARE platform intending to develop a new automated guided vehicle (AGV) for the food processing industry, that should ultimately be delivered to clients as a turnkey solution.

With this scenario and with JPM's input, we'll be able to evaluate MANU-SQUARE's impact throughout its entire product development process but also to gather important data as to how a global provider of industrial equipment conducts this entire process and what it deems crucial for its success. The main pain-points identified by JPM for the complete process defined in this scenario in an as-is situation were:

- time-consuming supplier validation process;
- the high volume of, sometimes not standard, documentation that needs to be transacted;
- traceability and accountability of the transacted documentation;
- lack of precise information on suppliers' capabilities for the *Evaluation, Negotiation & Deal* step of the process, leading to long decision times;
- the trustworthiness of the available information on suppliers' capabilities.

4.1.1 Validation process & success criteria

The definition of success criteria for the first demonstration scenario of the manufacturing sector takes as a base the work developed in T1.3. Table 2 recalls the early success criteria for the validation of this demonstrator developed in T1.3 alongside JPM. These performance metrics focus on the main pain-points presented by the organization in its procurement for Request for Quotation (RFQ) process (also detailed in T1.3). Furthermore, these contribute to the achievement of two MANU-SQUARE target impacts defined in the DoA:

- Increasing responsiveness of collaborative value networks, through effective mechanisms for demand-supply matching. This impact targets the following measurable goal: "–30% time-to-market for new product-service thanks to the acceleration and the implementation of first-time-right solutions promoted by the platform" [MG2.2 in the DoA];
- Reducing the time-to-market, by reducing the time spent for the RFQ process steps and procurement lead time. This impact targets the following measurable goal: "+10% new product-service concepts brought to the market thanks to the platform support provided from conception to production" [MG2.1 in the DoA].

Success criteria	Description	Target	Approach to assess
Increasing accuracy of the matchmaking functionality	This criterion targets improvement of the results obtained from the procurement for RFQ process. Due to the incomplete information about the suppliers, and the variability of skills and needs from JPM, acquiring new suppliers is a task that is time and resource-consuming.	90% accuracy of the supplier validation	Based on the simulations of the match-making algorithm accuracy
Making the steps of the RFQ process platform-driven	This criterion targets maximizing the usage of the MANU-SQUARE platform for performing the RFQ process steps, including the document sharing management.	The entire RFQ process	Utilization of the MANU-SQUARE RFQ management functionality for performing the complete RFQ process

Reducing the procurement process lead time	This criterion targets reducing the procurement process lead time, shortening the time spent for acquiring a new supplier to the JPM network. The acquirement process includes searching and finding capable suppliers, managing the RFQ process, and validating the certifications, reputation, and financial status of the information.	Less than 2 weeks to go through the steps for validating and integrating the supplier (from current 3-4 weeks)	Lead time from the launch of an RFQ (request for supplier with the matchmaking algorithm) in MANU-SQUARE until a deal is Reached

Table 2 Success criteria for testing and validation of the demonstration scenario 1 defined in T1.3

Taking these as stepping stones, the work of the next months will involve close collaboration with JPM in order to not only set up the required instruments for measuring these key performance indicators (KPI)s but to also follow along the entire to-be process designed in T1.3 and validate it against the processes implemented in the platform's MVP.

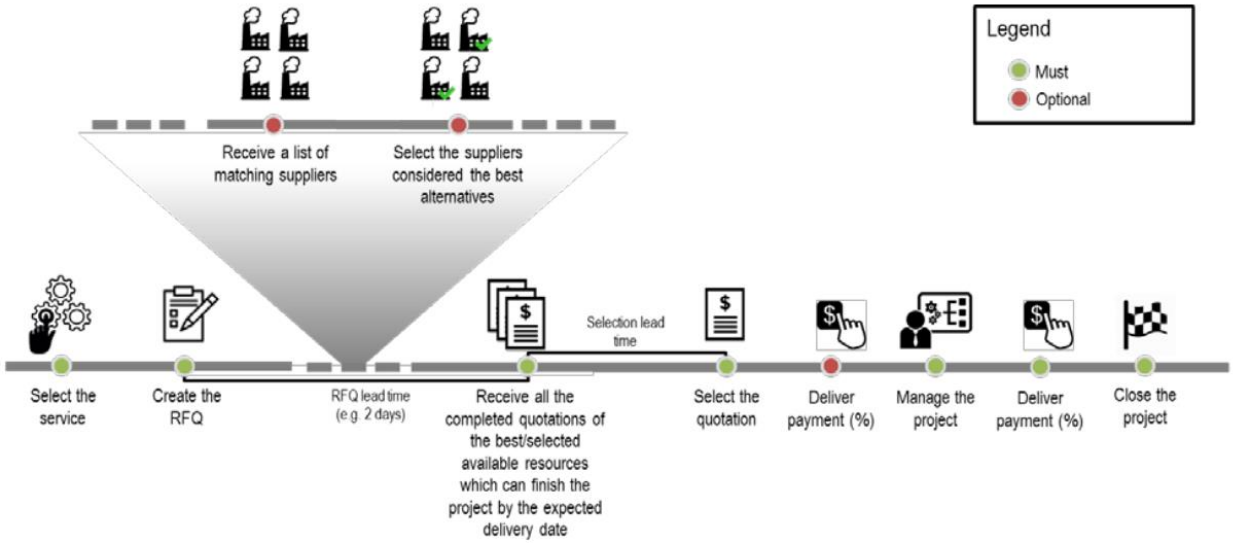

Figure 2 Resource sharing service from the customer's perspective

Figure 2 outlines the service correspondent to this demonstration scenario. Through this we will be able to validate the following sub-services:

- the searching of suppliers from the platform's supplier pool;
- the matching of qualified suppliers;
- the request for quotation creation process;
- the document sharing mechanisms;
- the tracing and tracking of the activities.

For the evaluation of all these sub-services additional success criteria from those defined in T1.3 are required. These are presented in Table 3. Accordingly, it is important to note that the validation of the entire suite of sub-services will be conducted bilaterally with JPM. This means that for these, not only the objective indicators defined as success criteria will be taken into account, but more subjective approaches will be employed. For these, basic usability testing strategies will be employed in order to ascertain:

1. ease of use (how easily JPM can use the different functionalities of the platform);
2. ease of learning (how easily JPM can learn to use the platform);
3. levels of satisfaction (general opinion about the different sub-systems and their use).

For these, test scenarios will be developed with different user typologies within JPM, following standard industry practices. The JPM users that will participate in this testing are meant to represent the different typologies of users that will normally be interacting with the platform.

Success criteria	Description	Target	Approach to assess
Change in the utilization of the platform	Stickiness measuring proxy. From the customer's perspective, users need to be engaged in checking the process of a project and in keeping the platform updated with current needs. The stabilization of weekly platform use is then essential.	Stabilize the weekly use of the platform.	Measurement of the time spent per user/organization on the MANU-SQUARE platform.

Table 3 Additional success criteria for testing and validation of the demonstration scenario 1

For the testing of the usability elements, the System Usability Scale (SUS)[1] will be employed due to its simplicity and its effectiveness even on a small scale of users. In the SUS, users are asked to rank 10 questions according to a scale that ranges from *Strongly Agree* to *Strongly disagree* that will later be evaluated in accordance with the system's methodology. The 10 statements are:

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

Furthermore, this validation process requires the presence of multiple users with descriptive profiles on the platform so that when JPM creates its AVG project and searches for potential suppliers, good matches can be performed and returned. For this process, the involvement of the early adopters already gathered from the dissemination activities, and with complete profiles/capacities descriptions on the platforms, will be a crucial component of the validation process of the demonstrators. The early success criteria presented in Table 2 were designed with a *Plan B* approach in mind, where the accuracy of the matchmaking algorithm is based on simulations (early, heuristic based data, has been developed by SINTEF and according to the prevalence of early adopters on the platform, it will be improved upon and leveraged for the validation process). With the development of the MANU-SQUARE ecosystem has had over the previous months we foresee that real-world tests will be possible, however. Thus the activities of WP6 will go hand in hand with dissemination activities of WP7 not just for the validation of the community scenarios and business model, but for all the demonstrators as well, in order to keep the growth of the ecosystem constant.

In summary, the process for validation of the demonstration scenario 1 of the manufacturing sector is:

- iteration on the early defined success criteria supported by JPM;
- setting up of measuring instruments for all the defined success criteria;
- evaluation of the different tools involved in the demonstrator using the SUS framework;
- analysis of results and development of follow-up recommendations for relevant tools and business model.

The fine-tuning required for the successful adoption of tools like the matchmaking algorithm and the reputation mechanism will rely heavily on the output of this demonstration scenario.

[1] https://www.usability.gov

4.2 Demonstration scenario 2 - Market coverage extension: retrofitting business

This second demonstrator is expected to show how the MANU-SQUARE platform, is able to support JPM in satisfying complex customized high-value manufacturing orders in a short time by making it able to identify adequate available capability and consequently set up an adaptive extended product-service business model, covering the whole value chain. JPM here becomes one of the companies populating the database of MANU-SQUARE service providers, thus offering their services and available production capacity for retrofitting activities of already installed manufacturing equipment around Europe. This scenario will provide another point of view as to how JPM establishes connections with its customer and suppliers and how the platform can become attractive to businesses which have available unused capacity.

The main pain-point brought up from this perspective were:

- the current limited capacity for sales prospecting available to JPM;
- the inability to JPM to describe and advertise its capabilities in a required manner, due to intellectually properties and industrials secrets protection;
- the high volume of documentation (bill of materials, CAD files, etc.) that needs to be kept up-to-date and that arrives through various channels.

4.2.1 Validation process & success criteria

T1.3 also defines an initial set of early validation criteria for the second demonstration scenario, as shown in Table 4. These performance metrics, despite being concerned with the further platformization of the RFQ process, should also focus the underutilization of capacity and the reduction of time-to-market goals. Similarly to the first demonstration scenario, the second case contributes to three MANU-SQUARE target impacts defined in the (DoA):

- Increasing the number of innovative business solutions, through expanding the market opportunities and business inquiries. This impact targets the following measurable goal: "+10% new product-service concepts brought to the market thanks to the platform support provided from conception to production" [MG2.1 in the DoA].
- Increasing capacity utilization [MG1.2], through addressing the unused capacity for retrofitting resources (e.g. machines, space). This impact targets the following measurable goal: "+20% reuse of unused manufacturing capacity achieved through the trade opportunity granted by the platform" [MG1.2 in the DoA];
- Reducing time-to-market, by reducing the time spent for the RFQ process steps. This impact targets the following measurable goal: "–30% time needed for the RFQ process thanks to the characterised information availability allowing to pre-screen the offer factually" [MG1.1 in the DoA].

Success criteria	Description	Target	Approach to assess
Making the steps of the RFQ process platform-driven	This criterion targets maximizing the usage of the MANU-SQUARE platform for performing the RFQ process steps, including the document sharing management.	The entire RFQ process	Utilization of the MANU-SQUARE RFQ management functionality for performing the complete RFQ process
Increasing the number of business queries	This criterion targets increasing the number of business queries from the customers for retrofitting and refurbishing business.	15% increase in the number of business queries from the market.	Percentage increase of the business queries thanks to the use of the MANU-SQUARE platform.

Table 4 Success criteria for testing and validation of the demonstration scenario 2 defined in T1.3

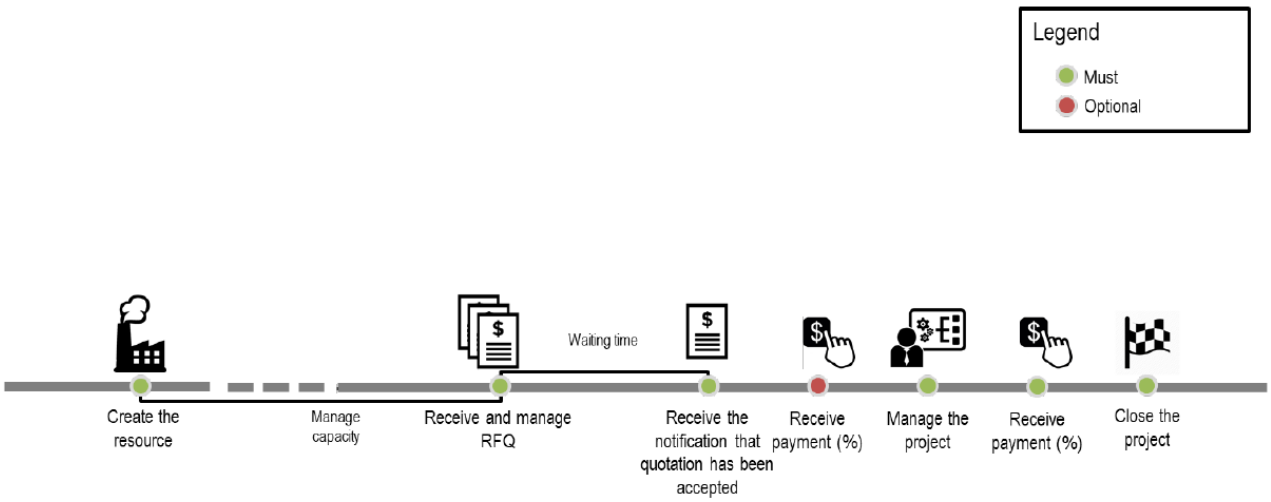

Figure 3 Resource sharing service from the supplier's perspective

Figure 3 outlines the service correspondent to this demonstration scenario. Through this we will be able to validate the following services:

- the profile and resources update process;
- the assessment of the inquiries process;
- the managing of projects;
- the document management mechanisms.

For the evaluation of all these sub-services additional success criteria from those defined in T1.3 are required. These are presented in Table 5. The validation process of the demonstration scenario 2 will follow a similar methodology to the one previously presented for scenario 1, bilaterally with JPM, and the same usability testing based on SUS. In this case, JPM will describe its capabilities and capacities using the platform's tools in order to start being contemplated by the matchmaking algorithm for the searches of other users. For this scenario, the presence of other users on the platform creating RFQs is also essential. Similarly to scenario 1, we expect the early adopters of the platform to be sufficient to create the necessary amount of projects for the validation of the platform. If necessary, however, a simulated test can be constructed and put into practice in collaboration with JPM and other partners to validate the customer perspective validation scenario.

Success criteria	Description	Target	Approach to assess
Updating the platform with available capacity	Keeping the platform aware of the available production capacity is an essential process of the MANU-SQUARE platform.	Keeping the platform updated with current available production capacity	Utilization of the MANU-SQUARE capacity description functionality once every week

Table 5 Additional success criteria for testing and validation of the demonstration scenario 2

In summary, the process for validation of the demonstration scenario 2 of the manufacturing sector is:

1. Iteration over the early defined success criteria supported by JPM;
2. Guided process of capacity description on the platform;
3. Setting up of measuring instruments for all the defined success criteria;
4. Evaluation of the different tools involved in the demonstrator using the SUS framework;
5. Analysis of results and development of follow-up recommendations for relevant tools and business model.

5 SILK AND COSMETICS DEMONSTRATOR

This chapter presents the validation scenario for the cross-sectorial textile and cosmetics industry.

5.1 Cross-sectorial demonstration scenario - New product development and waste utilization

The demonstration scenarios in textile & cosmetics industry are embedded in TRUDEL and SANITARS, in a multi-sectorial way. SANITARS currently produces cleansing wipes distributed through large retailers all around Europe. The company has already implemented a differentiation strategy starting from its foundation: no synthetic fibres but just cotton-based products in order to assure a better environmental and safety profile than low-cost competitors. In the last few years two phenomena further changed the market context: on the one hand economic downturn facilitated the diffusion of low-cost (synthetic) products, and, on the other hand, Far-East manufacturers started producing also cotton-based cleansing wipes (with lower costs than their European competitors).

SANITARS aims at developing a new product addressing the above-mentioned market emerging needs, thus supporting further differentiation potential from low-cost (also cotton-made) solutions. Initial investigations performed off-line allowed to identify a potential innovation manager (I-HUB) providing the knowledge for product and process (re-)design and a provider of an interesting bio-compatible and green material (sericin, coming from silk yarns processing) able to functionalize SANITARS non-woven fabrics. Sericin is a by-product/waste of production processes of TRUDEL. In this respect, this case also demonstrates a waste utilization scenario for TRUDEL.

This cross-sectorial business process is mainly concerned with the ideation and innovation processes of the companies. Currently, this process is unstructured. The actors of the value chain, their roles, and the process steps are not clearly defined yet.

The process starts with TRUDEL producing sericin as a by-product, which is then stabilized by a technical service provider and certified. SANITARS's cotton pad products are then assembled with sericin for development of a new product, usually involving another subcontractor for the required capacity and technological capability. The innovation manager (I-HUB) supports the whole process in designing it, building the contacts, supervising, and providing the required know-how.

5.1.1 Validation process & success criteria

The early validation scenarios defined for this demonstrator defined in T1.3 are shown in Table 6. The performance measures employed are expected to show MANU-SQUARE's capability of generating innovative ideas for new product development, configuring the corresponding value chain, and acquiring the required value chain actors, while at the same time integrating innovation managers. This demonstration scenario will further contribute to the achievement of the following MANU-SQUARE target impacts listed in the DoA:

- Increasing the number of new textile-cosmetics products designed, developed and prototyped within the MANU-SQUARE ecosystem. This impact targets the following measurable goal: "+10% new product-service concepts brought to the market thanks to the platform support provided from conception to production" [MG2.1 in the DoA].
- Increasing the number of new (external) manufacturers, distributors, suppliers involved in the new textile-cosmetics value networks. This impact targets the following measurable goal: "–30% time needed for the RFQ process thanks to the characterised information availability allowing to pre-screen the offer factually" [MG1.1 in the DoA].
- Reducing the time required to the innovation manager for establishing the novel value network. This impact targets the following measurable goal: "–30% time-to-market for new product-service thanks to the acceleration and the implementation of first-time-right solutions promoted by the platform" [MG2.2 in the DoA].

Success criteria	Description	Target	Approach to assess		
			TRUDEL	SANITARS	Innovation manager
Increasing the number of innovation opportunities targeting textile & cosmetics products	Increasing the number of innovation opportunities relating to the stabilization of the sericin, the design and development of new cosmetic complex, and the application to the wet wipes	Increase by 5% the received innovation opportunities	Number of innovation opportunities involving functionalized sericin in dry or liquid form	Number of new product opportunities that are pursuable	Number of delivered technical consultancies and analysis for innovative products
Facilitating the establishment of the innovation value chain	Defining and structuring the innovation value chain network, including the innovation manager, as well as increasing the number of potential value chain actors that can be accessed	At least 3 new value networks, involving TRUDEL and/or SANITARS	Searching and finding new potential qualified sub-contractors/partners (stabilization) in a larger pool	Searching, assessing, and acquiring new sub-contractors (assembly); Opening new markets	Number of new innovation value chains designed
Increasing the effectiveness of the innovation process	Increasing the effectiveness of the innovation process in terms of success rate of the innovation opportunities	At least 2 innovation opportunities successfully developed from design to prototype	A percentage of the innovation opportunities are worth evaluating (50% is the goal)	Number of new products with innovative functions; Profit margin increase; New business opportunities (new companies investing in new production facilities)	Number of successful innovations managed
Increasing number of generated innovative results	Creating new innovative results	Create at least one innovative result	Number of innovative results generated through the platform	Number of innovative results generated through the platform (patent at least related to cotton pads)	Number of innovative results supported through the platform, as well as the scientific and technical publications

Table 6 Success criteria for testing and validation of the cross-sectorial demonstration scenario defined in T1.3

The validation process of the demonstration scenario in the silk and cosmetics sectors in some ways stands close to the validation of the previous demonstrator and in other ways will stray from it, this is greatly due to the work carried out in other work packages.

On the one hand, the usability testing elements described in the previous demonstration cases will also be employed for the participants in the silk and cosmetics demonstrator. Given that this makes use of the innovation component of the platform and leverages other flows, interfaces and some other functionalities of the platform's tools, this testing is still essential. On the other hand, however, D5.1 provided insights into some open technical and business questions that touch the innovation management service that this scenario is demonstrating. It will then fall in the scope of WP6, with D4.6, to provide answers to these questions so that tools and business processes/model, can be adequately shaped. These open issues regarding this demonstration scenario are presented in Table 7 from the customer perspective, and in Table 8 from the supplier's point of view.

Process	Open question
Create RFP	● Which are the most relevant parameters to be included in an RFP (e.g. quotation lead time, project lead time, characteristics of the innovation managers, past projects, etc...)? ● What is the most relevant information that the customer has to provide to ensure that the search results match with its expectations? ● Which are the parameters relevant for the Innovation Managers ranking? How do customers prefer to weigh them? ● How do customers expect the structure of the proposal to be created (pre-defined format, selection of the required fields, customizable)? ● How do customers expect the platform to support the creation of an RFP (online form or upload files)?
Receive all the completed quotations of the best/selected available resources which can finish the project by the expected delivery date	● How long are customers willing to wait for receiving project proposals? ● Which is the optimal number of proposals that customers want to receive?
Select the best proposal	● How many days do customers require to select the best proposals?
Deliver payment (%)	● What kind of payment/incentives would customers offer to the Innovation Manager (money payment, IPR sharing, revenue sharing, % of organisation sharing)? ● How do customers expect to manage project agreements? (digital contract, physical contract, etc.) ● When do customers expect to deliver the complete payment? (e.g. 30 days after project completion)
Manage the project	● Which functionalities/tools do customers expect to support project management (GANTT, task manager, project status, document sharing, etc.)?
End the project	● How do customers expect to assess the obtained results to update the Innovation Manager's reputation?

Table 7 Open questions presented in D5.1 from a customer's perspective

Process	Open question
Profile creation	● Which are the most relevant parameters to characterize the Innovation Manager's profile? ● What is the most relevant information that an Innovation Manager needs/wants to provide to ensure that the search results are optimized?
Receive RFP	● Which structure should an RFP have (pre-defined online format, file)? ● What information does an Innovation Manager expect to find in an RFP? ● What is the minimum number of RFPs that an Innovation Manager wants to receive every week? ● What is the maximum number of RFPs that an Innovation Manager wants to receive every week?
Receive payment (%)	● How do you expect to manage payments? (within the platform, independently, etc.) ● How do you expect to manage project agreements? (digital contract, physical contract, etc.) ● Are you willing to pay the first percentage before project-begin? (the left-over percentages will remain on the platform until the end of the project to manage any issues/claims) ● When do you expect to deliver the complete payment? (e.g. 30 days after order completion)
Manage the project	● Which functionalities/tools do you expect to support the project management (GANT, task manager, project status, document sharing, etc.)
End the project	● How do you expect to assess the customer to update his/her reputation?

Table 8 Open questions presented in D5.1 from the supplier's perspective

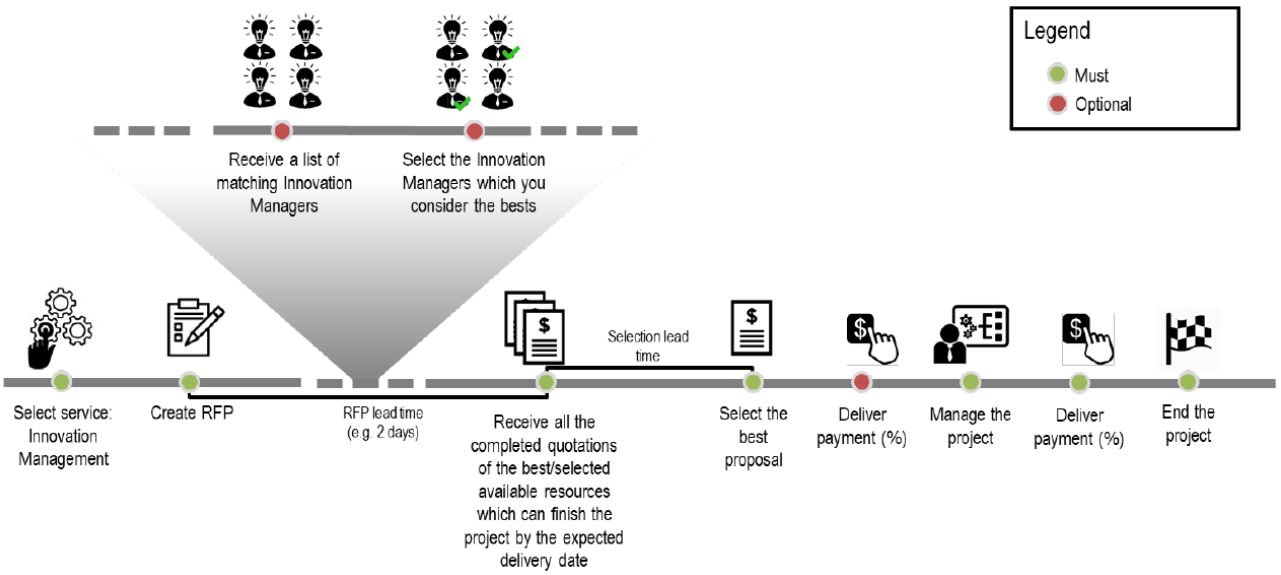

Figure 4 Innovation management service from a customer's perspective

Figure 4 outlines the service correspondent to this demonstration scenario. Through this we will be able to validate the components of the platforms that revolve around the idea management tool with the following services:

- the request for proposal (RFP) creation process;
- the searching of Innovation Managers from the platform's pool;
- the management of an RFP;
- the setting-up of an innovation project;
- the managing and closing of an innovation project.

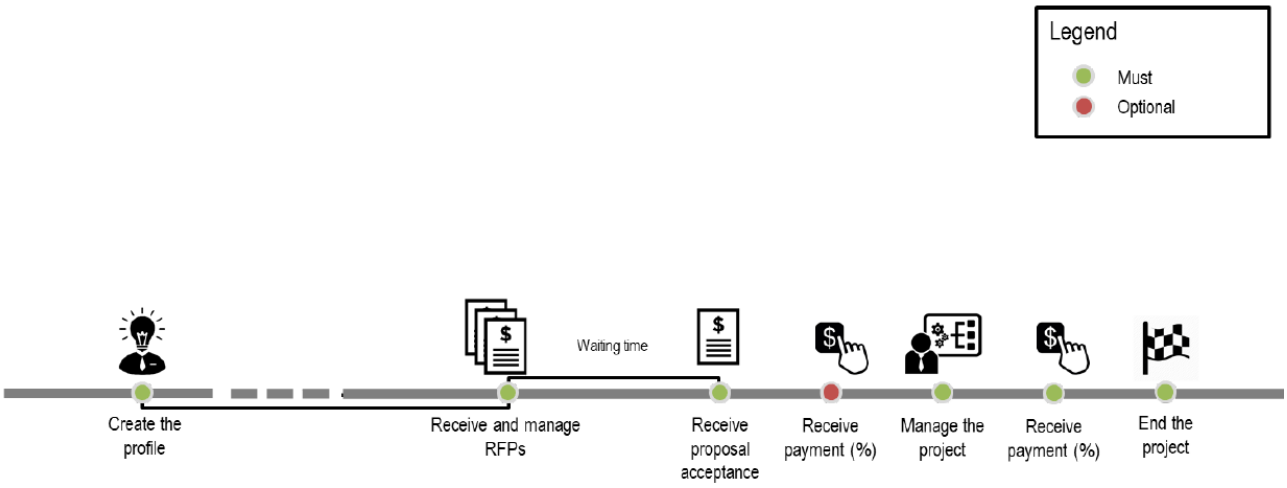

Figure 5 Innovation Management service from a supplier's perspective

Figure 5 outlines the service correspondent to this demonstration scenario. Through this we will be able to validate the following services:

- the creation of a complete and effective profile;
- the setting-up of an innovation project;
- the managing and closing of an innovation project.

In summary, the process for validation of the demonstration scenario is:

1. Iteration over the early defined success criteria supported by all the involved partners;
2. Setting up of measuring instruments for all the defined success criteria;
3. Evaluation of the different tools involved in the demonstrator using the SUS framework;
4. Analysis of results and development of follow-up recommendations for relevant tools and business model.

6 MANU-SQUARE ECOSYSTEM DEVELOPMENT

This chapter presents the validation scenarios for the wider ecosystem of the MANU-SQUARE platform.

6.1 Business Model & Growth

The initial indicators defined to keep track of the evolution of the platform were part of D5.2. These were composed of 4 categories: (1) usage metrics; (2) transaction metrics; (3) business metrics; (4) user satisfaction metrics. These represent a mix between traditional performance indicators and evolution indicators and are presented in Table 9 through Table 12.

On par with deliverable D5.3, due at month 30, WP6 will contribute to the development of the platform business model. For this, the monitoring of the measures and indicators described below will be kept throughout the following months, as well as the bilateral discussions with all the consortium partners, with special focus on the demonstration partners.

For this process the work developed in T6.4 with the community demonstrators, led by CSEM, will be essential. These will not only, as before mentioned, fuel the other demonstrators with the community and network externalities required for the full realization of the MANU-SQUARE potential, but will also serve as validation for the remaining business processes and model, required for the continuous growth of the platform.

Metric and Acronym		Description	Indicator
Monthly Active Users	MAU	Count of the unique users who have visited the site at least once during a certain month.	Tot. no. of unique access/month [no.]
Bounce rate	BR	Measures the percentage of visitors who enter the platform and leave right away rather than staying to engage in some way with the platform.	Tot.no. bounces/tot.no. of accesses [%]
Time spent on site	TSS	Average time spent by users in the website.	∑ (time spent by single users)/(Tot. no. accesses-tot. no. bounces) [min]
Users demographics	UD	% of users per each European country	No. accesses from country X/Tot. no. accesses ∀ country X [%]

Table 9 Metrics and indicators to be monitored for the usage category defined in T5.2

Metric and Acronym		Description	Indicator
Producers liquidity	PL	Percentage of producers replying to at least one RFQ per month. The overall value can be further split per producer type (company offering resources, innovation managers or startup & innovators)	No. producers replying to at least one RFQ per month /Tot. no. producers subscribed to the platform [%]
Consumers liquidity	CL	Percentage of consumers finalizing at least one RFQ per month. The overall value can be further split per consumer type (company looking for resources, company looking for innovation support or startup & innovators	No. consumers elaborating at least one RFQ per month /Tot. no. consumers subscribed to the platform [%]
Returning producers ratio	RPR	It measures how many quotations (Q) are elaborated by returning producers. The overall value can be split per type	No. of Qs elaborated by not new producers /tot.no. of Qs

		of quotation (resource request or innovation support request).	[%]
Returning consumers ratio	RCR	It measures how many RFQs are requested by returning consumers. The overall value can be split per type of quotation (resource request or innovation support request).	No. of RFQs elaborated by not new consumers /tot.no. of RFQs
Fulfilment ratio	FR	It measures the percentage of RFQs that are translated into actual orders. This metric calculates the average number of RFQs needed to get an order in a month period.	No. placed orders in one month/no. of RFQs completed in one month [%]
By-product Exchange	BE	It is a measure of the economic value generated through the platform coming from a circular economy principle: the reuse of by-products.	Yearly total invoiced amount related to by-product exchange [€/year]
Requests for Sustainability Assessment	RSA	The sustainability assessment module integrated into the platform can be activated upon request during the RFQ process. This metric counts how many times the sustainability assessment is selected by users to calculate the environmental impact of the transactions.	No. of sustainability assessment carried out per year [no./year]

Table 10 Metrics and indicators to be monitored for the transaction category defined in T5.2

Metric and Acronym		Description	Indicator
Gross Transactions Volume	GTV	It considers the total invoiced amount of transactions generated through the platform during a specific time period. It can be split per type of provided service (resource selling or innovation support).	Total invoiced amount per month [€/month]
Consumer Acquisition Cost	CAC	It is the price paid to acquire a new consumer. This should tend to zero when network effects allow to attract new users without the platform owner doing anything.	Tot. money spent per year to acquire new consumers /no. new consumers per that year [€/consumer]
Producer Acquisition Cost	PAC	It is the price paid to acquire a new producer. This should tend to zero when network effects allow to attract new users without the platform owner doing anything.	Tot. money spent per year to acquire new producers /no. new producers per that year [€/producer]
Consumer Lifetime Value	CLV	This is the average total amount of revenue the platform expects to get from each consumer accessing the platform.	Expected tot. revenue from consumers/tot.no. consumers [€/consumer]
Producer Lifetime Value	PLV	This is the average total amount of revenue the platform expects to get from each producer accessing the platform.	Expected tot. revenue from producers/tot.no. producers [€/producers]

Table 11 Metrics and indicators to be monitored for the business category defined in T5.2

Metric and Acronym		Description	Indicator
Net Promoter Score	NPS	A score is given to the following question: “how likely is it that you would	Scale out of 10 (1= not at all likely; 10= extremely

		recommend the MANU-SQUARE platform to a peer or to your industrial contacts?"	likely)

Table 12 Metric to be monitored for the user satisfaction category defined in T5.2

From the metrics presented in § 3, the work developed for the MANU-SQUARE project will focus on short and medium-term metrics. Although some long-term measuring proxies are still referred, we consider that, given the short 10 month period of implementation of this validation and evolution plan, short and medium-term metrics will be more impactful in the development of the project (both during this 10-month period where more fundamental adjustments can be made to technical components and to the business model, and for the following period after the end of the project). In this sense, Table 13 presents the indicators chosen as measurement proxies of the metrics previously outlined.

As also previously mentioned, these indicators were developed with the intention of measuring the growth and development of the platform. This means that all of these are to be measured and evaluated over some relevant period that can span from weeks to months depending on the indicator.

Metric	Measure	Description	Indicator
Resilience	Failure recovery time	Time for the platform to recover, after the failure of a tool	∑ (platform time spent with non-working tool/total number tool failures)
Scalability	Average projects by user	The average number of projects created by the users of the platform. (Downward scaling metric)	No. of projects created / no. of users [%]
Latency	Platform latency evolution	Latency in the tools of the platform with each increase of 10 users. (Upward scaling metric)	∑ (average time for matchmaking calculation/ total number of users)
Composability	Effort per change	The average required effort for a change in a platform tool	∑ (person-hours spent on changes to the platform/total number of changes)
Stickiness	Change in hours per user session over time	Measures the change in hours per end-user session over time. (Not to be confused with "Time spent on site")	∑ (time spent by single users)/(Tot.no.accesses-tot.no.bounces)
Stickiness	Change in number of sessions	The shift in the average number of user sessions per week over time	Tot.no.accesses-tot.no.bounces
Platform synergy	Platform integrations	Change in the number of third-party platform integrations	Tot. no. of integrations [no.]
Plasticity	Features per release	Count of major features added to the platform's tools per release	Tot. no. of new feature/Tot. No. of releases [no.]
Durability	Active users over time	Change in the percentage of a platform's initial adopters who remain, active users,	Tot. no. of unique access/month [no.]
Durability	Number of tools feature releases	Number of major feature releases for the platform's tools	Tot. no. of new features [no.]

Table 13 Metrics and measures for evolution

Ultimately, and with deliverable D4.6 and the analysis of the data provided by these indicators, a set of recommendations will be developed for improving all the individual technical components of the platform as well as the implemented business processes and business model, as well as achieve the milestone MS5 defined in the DoA.

6.2 Activity scheduling

For the planning of the validation activities, we are adopting an iterative process with the technical developers of the platform. This process is meant to provide developers with not only bug reports but also with relevant comments on the functionalities, in order to keep the platform as close to industry-ready as possible. This format will also help to better track the ongoing work of platform development and to be able to incrementally validate the different services and interface elements as they become available to early adopters and industrial partners.

For each of the main services of the platform, physical meetings with the industrial partners are being planned in order to better discuss all the relevant components of the process (The account creation process and the validation of the fields of an RFQ creation process are some examples of the kinds of elements that will be tested). At the time of this deliverable, this process has already started, and meetings with JPM have begun.

This initial testing process will result in a set of recommendations and improvements, specific to the service being tested, for implementation in the platform. This will bring the developers back into the forefront for the implementation of these features/recommendations, followed by a new iteration with the industrial partners for the validation of the newly implemented changes. This iterative process was though to run in parallel so that all the partners are always engaged in some part of the process for a specific service. It is also important to note that, through all these weeks, the demonstrators will be using the platform on their own and providing feedback with the tools created for T4.6. This means that, even after the iterative process has reached its end for a specific service, users are still able to provide feedback to developers in a structured manner.

The community scenarios task of the WP starts mid-way through the year after all the services have been implemented and just after the initial validation round of the innovation management service. These will leverage all the work done previously for the validation of all the services on the early adopters of the platform. Similar to the process of the service validation, these will also feed a developer iteration for the improvement of the platform.

On the admin front of the WP and parallel to this process, status checkpoint are defined every two weeks for the ongoing tracking of the activities with all the relevant partners. This process will culminate in D4.6 that will also report on all of these activities.

7 CONCLUSION

This report serves as the main groundwork for the validation of the MANU-SQUARE platform. The two industrial sectors, manufacturing technologies industry and textile & cosmetics industry, will serve as keystone components for the testing and improvement of the platform. Along with the remaining early adopters of the platform JPM, TRUDEL and I-COTON will play an important role in feeding the developers of the platform with data capable of fostering insights for growth. For this, and due to the complexity of multi-sided digital platforms acting as ecosystem generators, great focus was put through the deliverable in developing not only performance metrics that are common to software development projects but also growth metrics that aim at having a significant impact on the evolution of the platform.

The outputs of this task will guide the work from month 24 to month 36. The involvement of the industrial partners in the project will ramp up into using the platform and integrating it into their business processes. This requires constant engagement with these partners for the measuring of the defined success criteria, as well as to perform the usability testing of the platform. All this work will culminate in D4.6 due at the end of the project, month 36, that will not only present the actual measurements of all the metrics but the recommendations that through the months have been done to the technical tools of the platform, as well as to the business processes and model.

The work presented on this deliverable also highlights the importance of the user ecosystem for the future of MANU-SQUARE. In this sense, a great focus will be put into supporting the dissemination and communication activities, not only as a data point for the validation of the platform but also as a means of growing the user-base.

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