



D22.2

*Analysis of intangible asset management in
manufacturing for service-based innovation
ecosystems*

M15 – V2.0

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	DATE	NOTES AND COMMENTS
01	30/10/2012	INITIAL DELIVERABLE DEFINITION
02	9/12/2012	DRAFT VERSION
03	23/01/2013	PRESENTATION OF THE CONCEPT IN FRONT OF THE SP1 AND SP2 CONSORTIUM
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DELIVERABLE PEER REVIEW SUMMARY

ID	Comments	Addressed (✓) Answered (A)
1.	Executive summary is vague. It should focus on presenting the main achievements of the deliverable, not explaining concepts	✓
2.	Section 2: What is the previous version of the deliverable? Is it D22.1? Not clear. Please indicate explicitly.	✓
3.	Section 2: It would be relevant to describe here the link and added values of this deliverable and previous one	✓
4.	Section 3.3: I think it should say more on interactions with MDSEA, not just present MDSEA	✓
5.	The deliverable mainly presents business model as IaaS. The management aspect of intangible assets as service (indicated in the title of the deliverable) is not visible (except in the appendix). I think the procedure for identification and extraction should be first addressed in the main part of the deliverable	✓
6.	In the Introduction must introduce the content of each section	✓
7.	I am not sure that Business model of a company is a suitable intangible asset for MSE. Is it a IaaS ? Also companies may not will to virtualize and publish their Business models. Maybe part of information in a Business Model can be restructured and virtualized as IaaS, not take it as it is.	A

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Executive summary

The current deliverable D22.2 at M15 is a continuity of the previous one, D22.1 at M6. Both are entitled Analysis of Intangible Assets Management in Manufacturing for service-based innovation ecosystem. In the first iteration the main challenges of managing IA were presented, as also the challenge to transfer IA, such as skills and competences, to higher levels, to an ecosystem or even a FI level. Therefore the questions are how to transfer them and how to manage them on the enterprise and ecosystem level.

This deliverable therefore focuses on providing a management framework for IA that can be applicable on the ME or MSE level. It allows MEs to more structurally exploit their IA as also to the MSE to take those information into account when designing the governance process. If MEs manipulate their IA within the MSE, they can transfer them to a higher level, as also at the same time getting access to other MEs IA. Based on the IA management framework it has been concluded that the knowledge sharing process is catalysed when dealing on the ecosystem level. Furthermore the knowledge creation process for MSE members can be incomparably faster than for standalone MEs, as MEs do not create knowledge only from their IA assets (e.g. explicit, embedded and tacit knowledge), but also from the other partners. The processes are continuously on-going creating a continuous IA asset creation flow. Also the learning curve for MEs as part of the MSE is much steeper regarding the lessons learned from mistakes or failures; namely a ME can learn from other MEs mistakes. Consequently, when a ME is part of a MSE, the processes of manipulation (identify, handle, share ...) are eased and catalysed. After continuing the benchmark between managing IA on the enterprise and ecosystem level, it has been concluded that the manipulation processes of IA could be transferred to a higher level, hence decreasing costs of IA management to MSE partners and potentially creating an additional revenue stream for the MSE itself.

In order to enable MEs to manage their IA on higher levels, a dedicated procedure to identify the relevant IA of MEs and their MSEs was designed. It comprises a model, guidelines and rules. The model was developed based on a network model, business canvas model, whereas the questionnaires included in the model related to the model were developed taking into account the IA MSEE ontology. The model with case with corresponding questions has been developed for four use-cases. The identified relevant IA of Indesit and its MSE have been presented in the deliverable. The results of the other use-cases will be directly used to populate their ontologies, link them with USDL and enable the MEs to offer them as a service (this will be part of the deliverable marked as prototype).

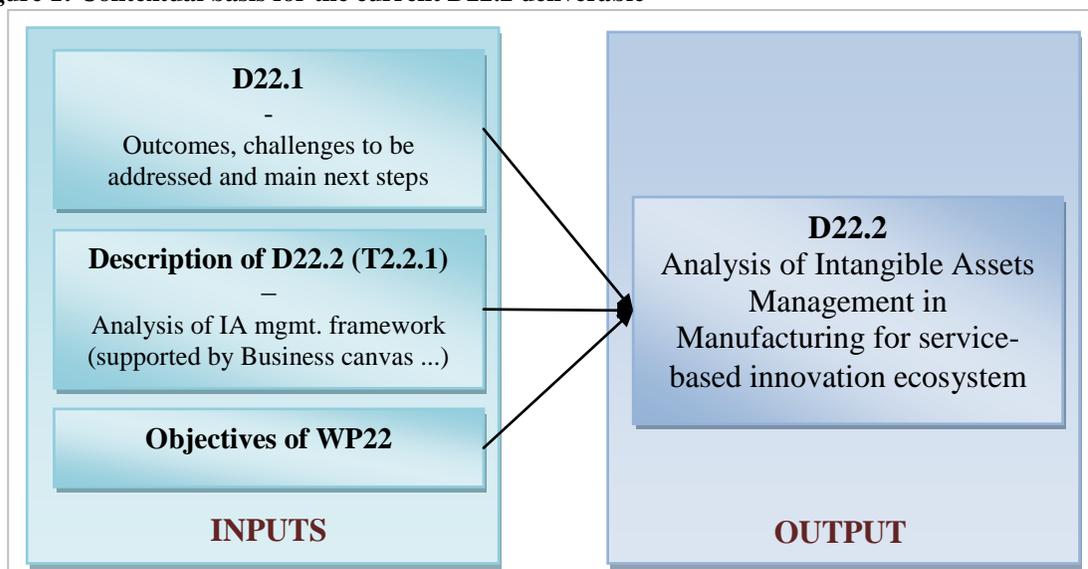
Introduction

The main objective of this work package is to support the management process of intangible assets (hereinafter: IA). It should also enable the optimization of exploitation of IA through a process of performance management in order to achieve short term goals and enable long term growth. Deriving from it, the main objective of this deliverable is to enable the management of IA on the ecosystem level. Depicting what are the benefits of managing IA on such level, how does it affect the main process of IA management and also to offer concrete guidelines to be followed when managing IA?

As the field of managing IA is very wide and depends on the specific goals of each ME, a dedicated procedure, that comprises a model and dedicated rules, has been designed in order to help MEs and MSEs identify and capture their key IA.

There will be **there main sources of inputs** that are represented in the figure bellow and afterwards explained. Only in such manner it will be seen that this deliverable continues logically the work of the previous one, fulfil the required task and most importantly adds value in line with the objectives of WP22.

Figure 1: Contextual basis for the current D22.2 deliverable



The first category of inputs is the deliverable **D22.1** concluding on the following **main next steps**:

1. to challenge our assumptions and discoveries against real world use cases.
2. a deeper analysis of interactions and cross references with other WPs, such as WP2.3 (i.e. tangible asset management) and SP1 should be further analysed;
3. expected results in future steps are the definition models and tools to properly exploit intangible assets within an ecosystem, by creating/adding new value in combination with tangible asset management.

Secondly, the **description of the current deliverable D22.2** (T2.2.1) was reviewed where its main task is:

1. the comparison of all types of IA Management frameworks for their applicability in manufacturing ecosystems.
2. Methods such are the Business canvas and value chain approaches should be used.

Thirdly, in order to keep the work aligned with the entire WP, the **objectives of WP22** were reviewed, which are:

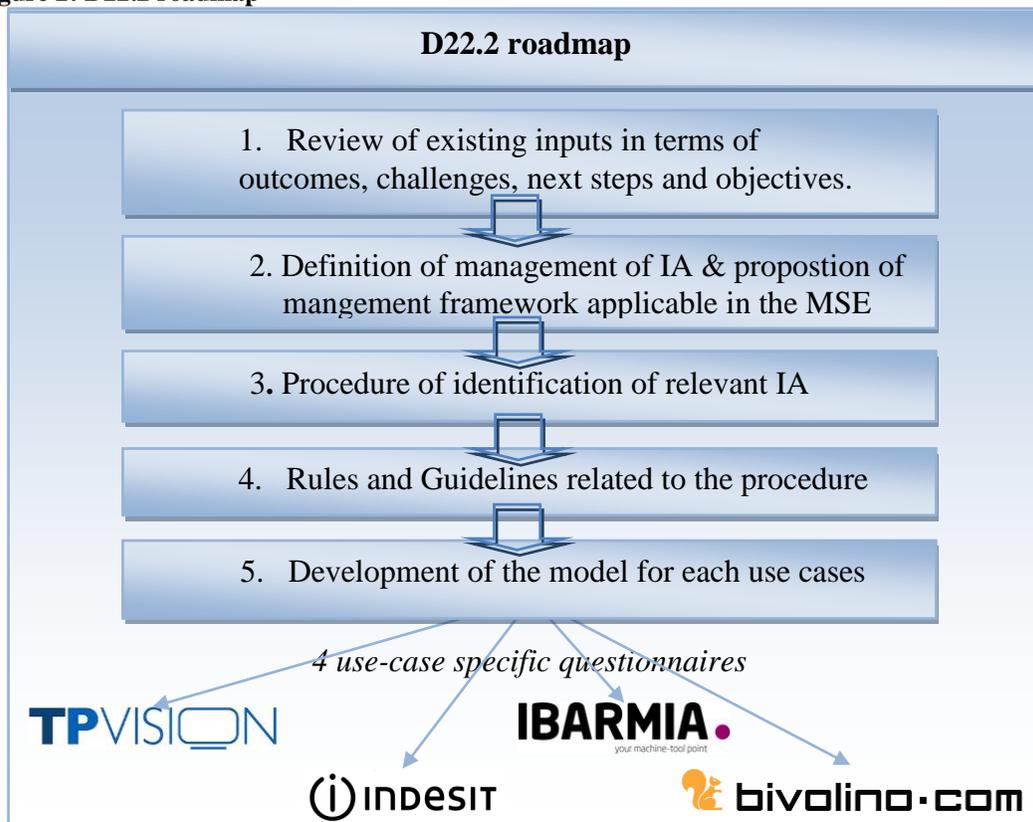
1. to develop a framework and related tools enabling service driven management of IA in a manufacturing ecosystem;
2. to identify from the framework several IA allowing systematic monitoring of performance and risk in the enterprises' value creation system and being an important building block for the management system;
3. support the strategic management process that permit quick and efficient exchange of knowledge;
4. optimize the exploitation of IA through a process of performance management.

Based on the presented 3 categories of inputs, the D22.2 will:

1. show the relevance of IA in the servitization cycles to raise awareness;
2. propose an IA management framework for MEs on the MSE level that takes into account the strategical, tactical and operational processes;
3. show what does it mean to manage IA on the MSE level and why it is meaningful;
4. design a procedure of identification of key IA on the ME and MSE level with corresponding guidelines and rules.
5. Based on this model a questionnaire for each use-case will be designed in order to identify their relevant IA that can then be integrated into the MSE.

The main steps are depicted in the figure below and are more detailed afterwards.

Figure 2: D22.2 roadmap



The deliverable is designed as follow. As a starting point the main issues in dealing with IA are shortly presented as part of the previous iteration this deliverable (D22.1). Afterwards the role IA from the servitization cycle's perspective is presented, followed by the definition of IA management and the challenges of integration of IA management

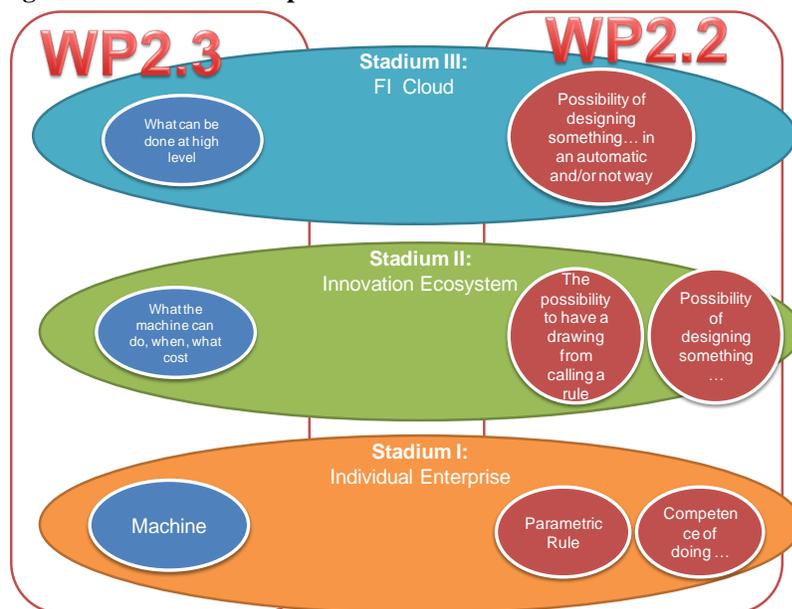
systems. The following section proposes a framework for managing IA in the MSE environment. It is based on an integral knowledge management framework. Besides depicting the main management processes of IA, the section shows the main differences when managing IA on the ecosystem level in comparison to the enterprise level. The section five is concluded with showing how the continuous knowledge creation can flow on the MSE level among MEs. The sixth section focuses on one of the most relevant tasks of IA management; namely the identification of the relevant IA of a ME and its MSE. Therefore this section designs a procedures for identification of IA that comprises a model with guidelines and corresponding rules. In the seventh section the procedure with the model is applied to each use case. The developed models and related questionnaires can be found in the appendix. The identified relevant IA of a ME and its MSE are presented for the use case of Indesit. Namely the identified IA of the other use cases will be virtualized and thus their populated ontology will be linked with USDL. Consequently all the use-cases will be able to offer their relevant IA as a service on the higher level.

1. Short summary of the previous version of the deliverable

The current deliverable D22.2 at M15 is continuity of the previous one, D22.1 at M6. Both are entitled Analysis of Intangible Assets Management in Manufacturing for service-based innovation ecosystem.

First a MSEE roadmap was composed in order to classify and clarify the use and interrelations among tangible and intangible assets, hence positioning **Intangible assets as a Service (IAaaS)** in the MSEE roadmap. Namely first the positioning of the concept had to be made. How can IA be exposed and dealt with so to be transferable to higher levels, such as the manufacturing ecosystem level? Those are questions that had to be answered or at least partially. However in order to do so, it has to be clear how do they fit into the concept of manufacturing ecosystem. The main frameworks for IA classification were a presented.

Figure 3: MSEE Roadmap



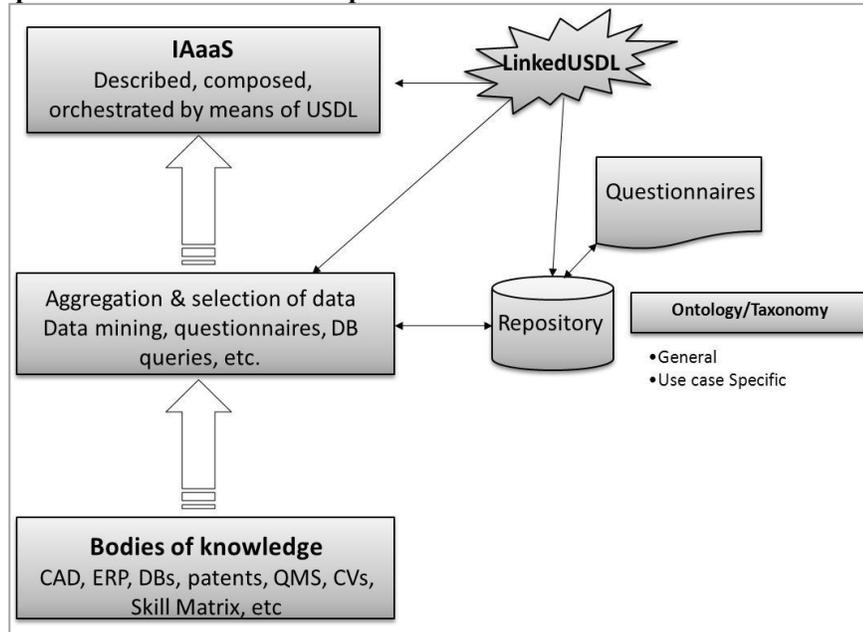
Source: MSEE, D22.3

It was established that in order to actualized IaaS and use it effectively, the **virtualization** process of intangible assets had to be prior well **designed** and afterwards established. The structure was predefined including USDL (Unified Service Description Language), which is a service network language (Barros & Oberle, 2012), being identified as the most suitable one.

In the following figure the concept of the virtual enterprise is depicted from the intangible (and tangible) assets point of view. This figure also indicates the technical process of the transition from **role to competences** and how are those composed together and forming together new innovative services, IA as a Service. This transition is key for the efficient knowledge flow among partakers in the ecosystem. As such resources and competences mapping has been researched with the goal to map them successfully on the ecosystem level.

Technically speaking, this is possible because of LinkedUSDL, which represents the service and is linked (*therefore Linked USDL*) with the ontology of IA and hence together forming a new service.

Figure 4: Conceptualization of a virtual enterprise



Source: MSEE, D22.3

The column of activities from Bodies of Knowledge to IAaaS is referred to as the virtualization process, which is key and one of the first steps in knowledge management on the ecosystem level.

In order to increase productivity and maximize compatibility in terms of governance issues between different service providers (e. g. in a virtual enterprise) and other discrepancies, a **framework for service system modelling** had been taken into account, called Model Driven Service Engineering Architecture (MDSEA).

Among others, it has been concluded that further investigation is necessary, to verify intangible assets management models and their protocols.

To synthesize, the deliverable D22.1 analysed the needs and challenges of IA management on an ecosystem level (how to offer IA as a Service, how to identify, capture and expose them and how to transfer them onto a higher level, the ecosystem level). The most relevant IA management frameworks were presented, however many of them were too abstract for application or did not deal with the specific of: manufacturing field, the ecosystem level and the introduction of service engineering into the framework and lastly to be able to offer and manage IA as a service.

2. IA and servitization

IA and especially knowledge, which represents an important part of it, are in fact linked to the value creation process, which is servitization. The goal of this linkage is to offer the end-user a concrete point of view on the extreme value of IA, especially in the servitization process which is extremely knowledge intensive. On the other hand, the servitization process is shown from the IA point of view, as only when IA are directly linked to the servitization process, a ME or a VME clearly manage its IA.

As servitization is a customer oriented process, which puts him in the centre, Gerbert et al (2002) identification of three different types of knowledge related to the customer was taken into account:

- Knowledge for (e.g. customer) – this is the knowledge that the customers can gain in order to satisfy their knowledge needs – this is the type of knowledge that is offered through the servitization process (e.g. Indesit collects data about usage statistics about their WM in order to design and offer some practical advices about the usage of the WM).
- Knowledge about (e.g. customer) – customer better, to understand their motivations, and to address them better; those essential information are usually collected by the marketing department with market research and other tools (e.g. CRM, market intelligence used to extract new information about customers).
- Knowledge from (e.g. customer) - this is key when creating a value proposition; This type of knowledge is also acquired during the servitization cycle.

Those three types of knowledge are used to represent two servitization cycles of one ME (e.g. the classical servitization has two cycles, which can be of course repeated continuously). The use case that corresponds best is Indesit. It starts its servitization cycle with a certain amount of knowledge ABOUT customers and decides to collect a certain type of information during product usage (e.g. collection of information regarding the usage of washing machines). Those information are then collected by an ME (e.g. Indesit), which increases its knowledge base ABOUT customers. This knowledge is then used to offer knowledge FOR customers as a new service to customers (e.g. personalized advices regarding usage of the washing machine for optimal energy and detergent consumption). In the second servitization cycle the information are being collected FROM the usage of the product-service bundle usage (e.g. info from the washing machine and from the application that feeds advices to the customers), which generates new knowledge ABOUT customers and a new service is again created or the previous one improved. Of course the improvement of the product is also taking place, although this is a matter of tangible asset.

Figure 5: The value of IA in the 1st servitization cycle

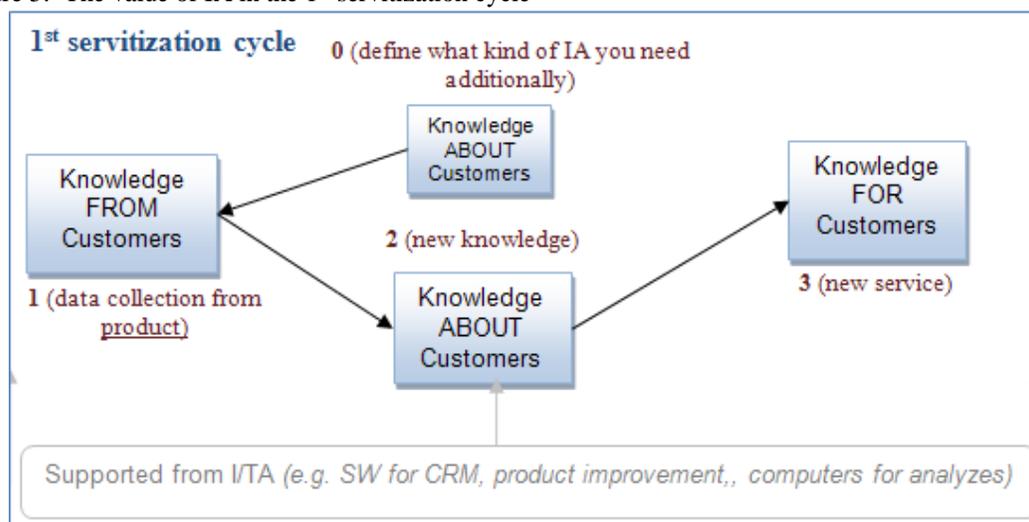
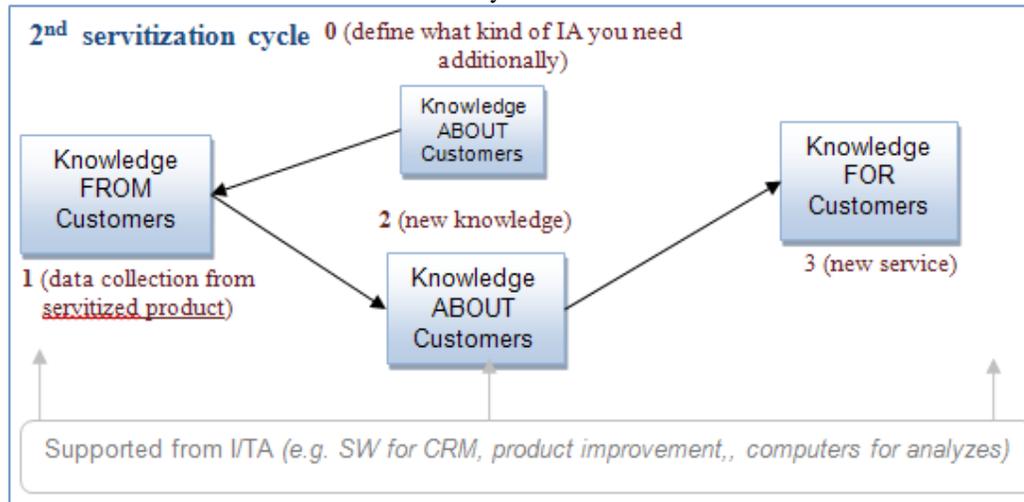


Figure 6: The value of IA in the 2nd servitization cycle



As the IA ontology with the virtualization procedure contributes in making tacit and embedded knowledge explicit. Therefore the sharing of explicit knowledge is key. An important guideline in terms of IA management on the MSE are the following from Bukowitz and Williams (1999) presented the key criteria for knowledge sharing, which should be taken into account when managing with IA on the ecosystem level:

- articulation: The ability of the user to define what he needs,
- awareness: Awareness of the knowledge available. The provider is encouraged to make use of directories, maps, corporate yellow pages, etc,
- access: Access to the knowledge,
- completeness: Access to both centrally managed and self-published knowledge.

The MSE has the following effects on IA management:

- It spurs the sharing of tacit knowledge, as the MSE can be for instance in form of informal network.
- As the MSE is non-hierarchical its knowledge sharing spans roles or functions.

3. IA management framework

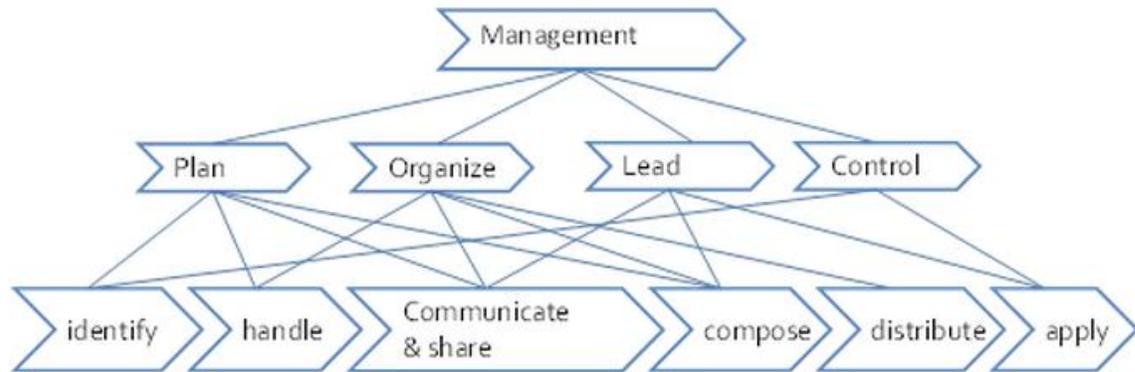
This section firstly presents how management of IA is defined, knowledge management systems and integration steps for such systems and critical factors for successful integration.

In order to identify and define the proper management system for IA, first there is a need to define what is meant by management of IA and what is key to support this process. The figure depicts two main levels of management in relation to IA:

- the management activities defined by the management literature, which is comprised from planning, organizing, leading and controlling;
- the manipulation activities of IA, which are: identify, handle, communicate and share, compose, distribute and apply.

The bottom level of manipulation activities is of course need in order that the higher level management activities can be performed.

Figure 7: Management of IA



Source: MSEE, D23.2

There exists quite a lot of definition regarding manipulation of knowledge, but all researchers in the field of knowledge management agree that this is very wide field and boundaries have to be set clearly, otherwise the management system of knowledge and also IA becomes too complex to control and create value from it.

3.1. Knowledge management system in MSEE

A management framework for IA is of course not management per se, but is of course closely related to the management system. Some of the management systems for knowledge on the market are: content management systems, simulation tools, intranet, groupware systems, semantic networks. The MSE could be seen as knowledge management system that is modular, as the MSEE platform consist of multiple tools, which are used to extract, create, capture and share different kind of information, such as for instance:

- the innovation platform is management system for new ideas in relations to servitization;
- the maturity models create knowledge about the maturity of the processes to design services;
- the SLMToolBox captures and represents the knowledge about a new service;
- the MSE repository of I/TA that can be used to share and offer them as a service;
- etc.

Such system gathers essential modules needed to create added value through the process of servitization of manufacturing enterprises.

3.2. Integration of a IA management system

Any system that is integrated into an enterprise and has a certain level of influence needs to be integrated with care. Namely the integration is not only being done on the technological level, but also on the cultural, strategical level ... therefore a framework in which to pursue the integration is proposes. Based on Wong and Aspinwal (2004) perspective's a knowledge KM implementation framework is important and should include the following:

- a) to improve the awareness and understanding of the knowledge domain,
- b) to provide a more holistic view of knowledge management,
- c) to facilitate the communication of knowledge management across an organization.

The proposed integration framework is from Mentzas (2001):

- plan:

- awareness about the importance and benefits of knowledge management;
- Plan – determine the vision, scope and feasibility of the knowledge management initiative;
- execute:
 - develop;
 - operate - roll out a company-wide KM implementation;
- evaluate:
 - measurement - the effectiveness of the knowledge management;
- training.

The IA integration is also closely related to WP24 that deals with change management of an enterprise. As such it is recommended to take into account the needed step to integrate a culture of knowledge management with all the needed step to gain added value from its management.

3.3. Successful Knowledge Management

Heisig (2009) analysed 160 knowledge management frameworks regarding the description of the success factors shows that in 74 per cent success-critical context factors are explicitly mentioned. Based on the analysis four categories were constructed for considering context factors which are critical for the success of knowledge management:

1. Human-oriented factors: culture – people (skills, human resources, motivation) – leadership.
2. Organisation: process and structure.
3. Technology: infrastructure and applications.
4. Management process: strategy, goals and measurement.

The success of knowledge management integration is also a managerial process. This is why among others the linkage between the classical management and the manipulation of IA has been created.

4. Proposed model for IA management

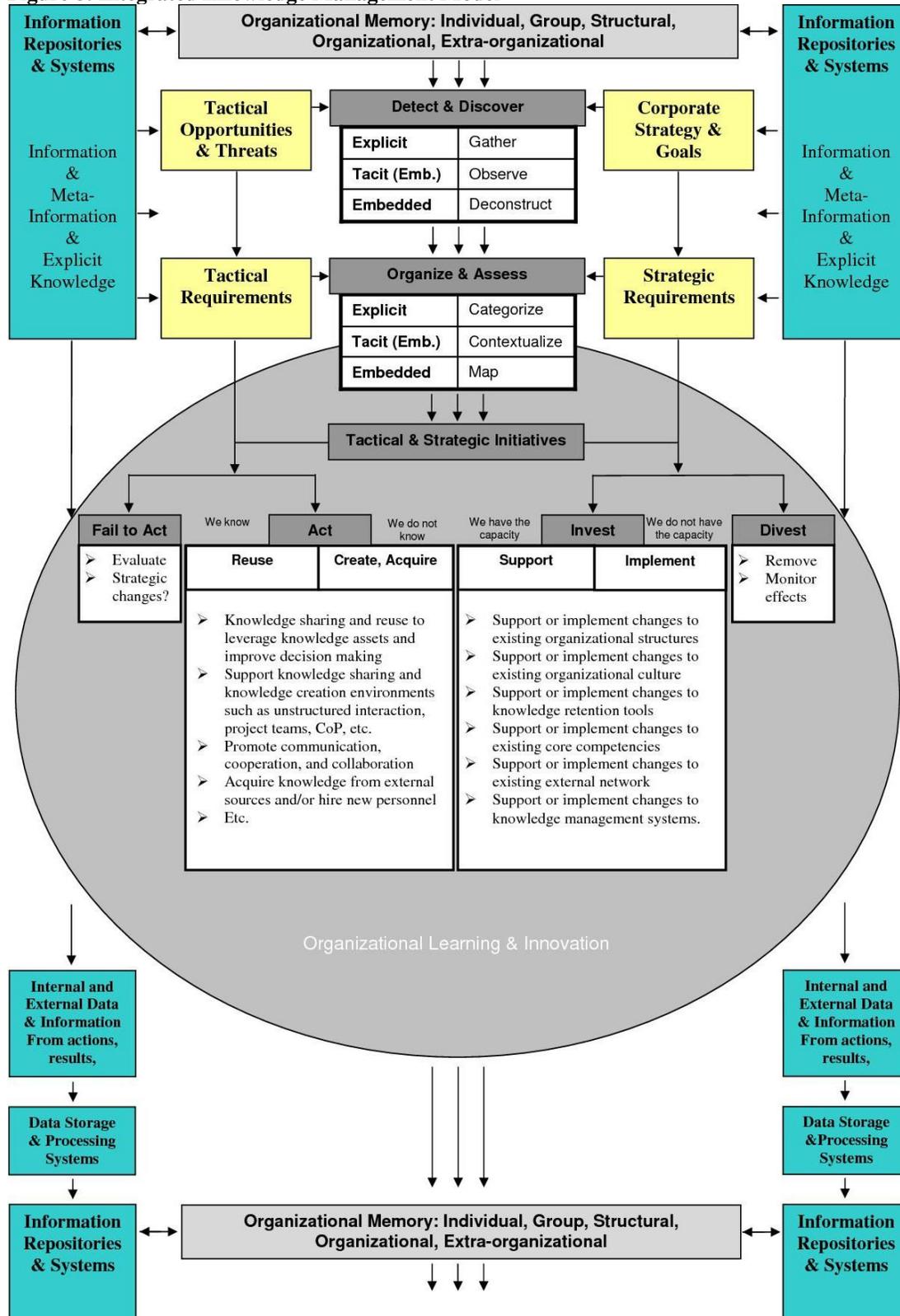
When choosing IA management frameworks, some requirements have been set. First the framework should give answer to what are the main processes on different levels (strategical, tactical, operational). Then it must be applicable on the ecosystem level. This section presents an integrated knowledge management model that will be analysed for its applicability in IA management on the enterprise and ecosystem level. As IA are represented by many definitions, a framework for knowledge management has been chosen as basis for managing IA. This was due to the fact that an important part of IA is constituted from knowledge.

The presented model is created by Frost A. (2013), which draws upon elements presented by Bukowitz & Williams (1999), Gamble & Blackwell, (2001), Botha et al. It also includes the concept of organizational memory and attempts to link process and strategy, while offering specific initiatives at different stages. The model also outlines the relationship of information and information management systems.

The model will be used to represent the management of IA. The presented model deals with such process on an enterprise level, therefore afterwards the effects of managing IA through this model on the MSE level are presented. Frost describes the model as follows. The dark grey elements represent knowledge management initiatives; the yellow boxes

represent corporate strategy, while the teal boxes depict data and information systems and repositories. The process is initiated from the tactical and strategic considerations, illustrating the way knowledge management strategy goes hand in hand with corporate strategy. The non-bolded elements in the grey oval indicate the knowledge related processes that go on within the organization as it operates, and which management affects/enhances through its initiatives. It can be seen from the model that the first main step of managing IA is the Detect and Discover stage. As it is the basis of managing IA and the framework does not propose an operational concrete procedure, this deliverable in the following main section designs a detailed procedure composed from a model and corresponding guidelines to identify IA on the ME or MSE level.

Figure 8: Integrated Knowledge Management Model



Source: Frost, 2013

The integrated knowledge management model is sequential, offering a simplified view for ease of understanding. The steps taken from Frost (2013) and adapted to IA are as follows:

- **Detect & Discover:** search for existing IA as well as the hidden ones.
- **Organize & Assess:** IA are categorized, evaluated, and made easier to access, at this point integrated into the ontology and exposed to a higher level.

Therefore when exposing to an ecosystem level, there is much more chance for IA reuse than on the ME level, as such increasing the potential exploitation of existing IA.

- Tactical initiatives:
 - **Act - Reuse:** if the ME can use existing IA to meet a tactical opportunity or threat, the role of KM is to identify this knowledge and enable it to be used. IA reuse is closely linked with IA sharing, as indicated in the previous point.
 - **Act – Create/acquire:** A ME can acquire IA if the right processes are in place; such are partially offered by the MSE. IA creation has however a longer cycle.
 - **Failure to act or wrongly act:** this is basically lesson learned, which are recorded and analysed.
- Strategic Initiatives:
 - **Invest:** Support or implement - it could include creating a network for IA sharing, integrating an IT system for IA management, influencing the culture in the ME or MSE ... As emphasized by Frost (2003) all initiatives here do fall into the field of managing knowledge.
 - **Divest:** When knowledge assets become obsolete they need to be removed. KM is responsible for maintaining relevant knowledge assets.

The differentiation between tactical and strategic initiatives should not be seen as categorical, and in reality projects and initiatives will often have mixed goals. The integrated knowledge management model itself should be seen as continuously looping, with new or modified knowledge and information being fed into organizational memory and information repositories each time. The main differences when dealing with IA on the ecosystem level comparing with the enterprise level are the following:

Strategical:

a) *Invest into what affects KM (e.g. invest in network, IA retention, maintaining value of IA, integration of new IT system for IA)*

ME level - The ME makes all the investment. KM at this level is closely linked to change management, a knowledge that mostly MEs do not hold.

MSE level - If the ME is part of the MSE, all members benefit from the MSE management system. Risk is more dispersed. Cost per enterprise for managing IA should be lower. However there is a need for common rules for strategical investment of MEs into the MSE.

Tactical:

a) *Act – Reuse*

ME level - If the ME has no IA management system, the identification of IA can be unreliable and it is performed mostly from MEs own database on an unstructured way. Knowledge sharing is active mostly on the intra-organizational level and less on the network level. Competences, network, ICT tools for IA management of IA are needed, however MEs usually do not hold them usually.

MSE level - However on the MSE, this goes as follows. Identification is performed through the entire MSE, which comprises multiple MEs. It is also performed in a more structured way. This increases the potential to identify the relevant knowledge to achieve a tactical goal. IA sharing is intra-organizational and inter-organizational on the MSE level.

b) *Act – Create or acquire*

ME level - IA creation can be a long procedure. Its acquisition can be faster, but more expensive. MEs have a smaller repository to choose from and risk more when buying the IA outside, as trust and liabilities are not well defined.

MSE level -The MSE offers tools to identify IA, therefore increasing the possibility to reuse ones existing knowledge. If there exists a need to acquire IA when a ME is part of a MSE, the acquired IA should be more reliable, higher quality due to the risk alleviation mechanism (KPIs, trust and liabilities, procedures of MSE governance related to IA ...), which are key when prompting the sharing and flow of IA among MEs. As such the MSE stimulates the IA sharing and spurs the continuous IA creation (from tacit to explicit and back again to tacit), by offering tools and procedures to capture and codify the IA.

c) *Failure to act:*

ME level - In the event that a firm fails to act there is still a lesson to be learned. Management must evaluate if this is something that needs to be addressed in the future. This decision is fed back into the loop, affecting future strategic choices.

MSE level - A ME learns from the mistake of other MEs, which is very important and can create great indirect value. This can decrease the risk of mistakes and especially the learning curve of MEs in the MSE is much steeper than the curve of individual MEs.

Operational:

a) *Basic handling, sharing and distribution operations*

ME level - Its performed on the ME level with their own tools. If a ME wants to perform basic operational IA related tasks, it has to acquire tools and competences, which can be very expensive.

MSE level – those tasks are transferred to the MSE level. Therefore those activities could be outsourced from each ME to the MSE. Those activities could represent an additional revenue stream for the MSE.

Does this mean that on an ecosystem level, where trust and liabilities are clearly defined, the need for an enterprise level of KM becomes obsolete? Namely, except the potential lack of trust towards the MSE, there is no reason to manage, invest and bear the risk alone of an individual IA management system.

Also according to Frost (2013) an organization in order to keep its competitive advantage needs to identify new sources of knowledge. This means that in relation to MSEE, the MSE must continuously search for new sources of knowledge and its partners. The main steps in doing so are:

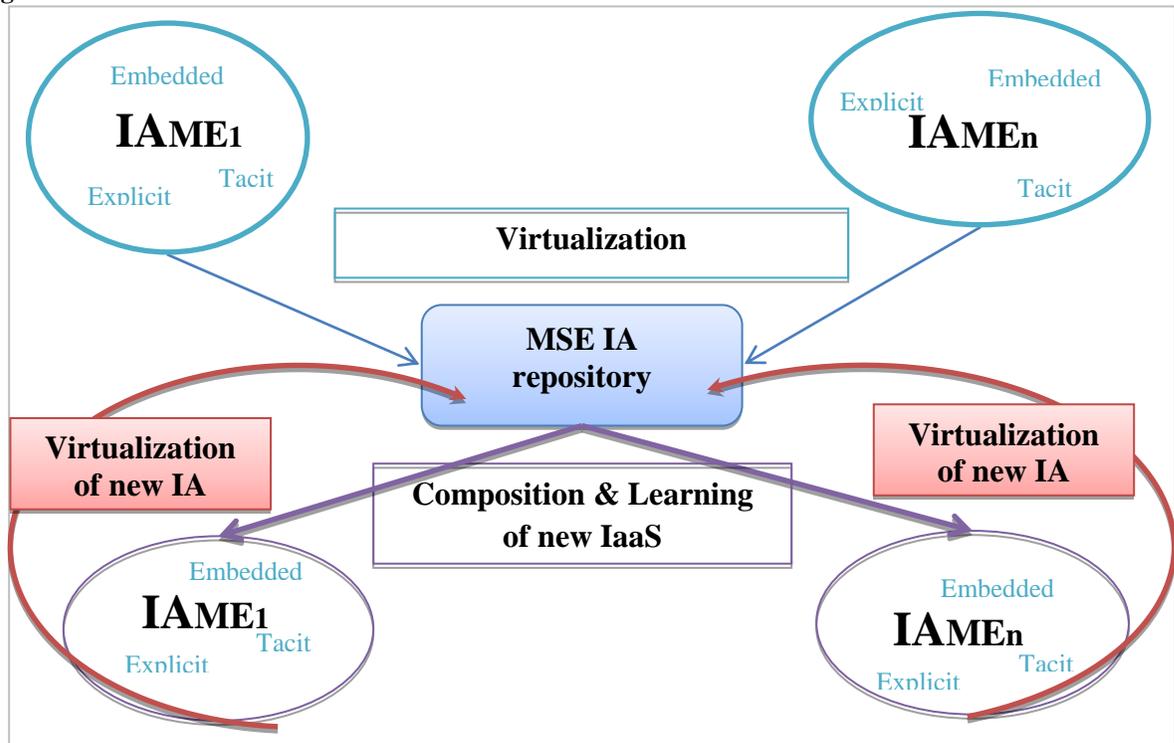
- Identification of potential partner/target
- Evaluation of potential partner
- Establishing the relationship: integration of MSE
- Knowledge transferal/integration: afterwards the knowledge management can begin; also some common IT tools (e.g. MSEE tools) can be adopted by the new partner.

IA creation on the MSE level

Below is presented the flow and loop of IA creation on the ecosystem level. The MSE acts as a catalyst in IA creation. Namely each ME virtualizes its IA into the MSE repository (*light blue*). When doing so it codifies to a certain extent its existing IA (explicit, tacit, embedded) into explicit IA. In the second step MEs exploit IA from the MSE repository by composing new services. This is also the process of learning as the same ME that virtualized its IA, is now utilizing also IA from other MEs and gaining new knowledge (*violet process in the figure*). After creating new IA and learning, the process of virtualization can recommence (*red colours on the figure*). Consequently the IA

creation loop is closed. The benefit for MEs is that they can learn, exploit IA from all the MSE partners and not just theirs, therefore dramatically speeding up their learning, sharing and creation process of IA.

Figure 9: IA flow on the MSE level



5. Procedure for identification of relevant IA

In order to support the procedure for identification of relevant IA, certain assumptions were made. Those were:

- Manufacturing enterprises are creating new P-S bundles within and with an ecosystem; therefore the value creation process has to be observed with a theory that supports network analysis.
- The procedure and model should create links with existing findings in MSEE.
- The procedure has to be dynamic.
- It has to enable the distinction among product and service related activities and resources.
- It has to be simple and create direct value to the use-cases.

The procedure for identification of relevant IA is composed from:

- A model for identification of relevant IA including a questionnaire,
- Guidelines for the procedure,
- Rules.

Deriving from those assumptions, the following main concepts were used to build the procedure and model:

- Value network analysis,
- business canvas model (WP53),
- existing ontology of intangible assets (WP22).

5.1. Short overview of the main concepts

Below are presented some main concept upon which the procedure for identification is based.

5.1.1. Value network analysis

A model on the ecosystem level among enterprises has been sought in order to help them dynamically identify their relevant I/TA in relation to their current or projected business.

The response to this is given partially by the Value Network Analysis (VNA), which has been to analyse intangible asset growth and utilization (Lev & Daum, 1997). Also the same authors have demonstrated that VNA is a useful method for describing intangible value conversion at a macro level. This research was an evaluation study for the European Commission to better understand the impact of research networks on Intellectual Capital formation and competitiveness in regions. At the levels of organization, network, and region, value network patterns were linked to specific patterns or ‘thumbprints’ of anticipated Intellectual Capital formation.

The VNA deals foremost with the analysing the value creation process through the network, therefore it is based on activities through the network, making the approach ideal for to be used in a MSE. According to Allee (2000) the VNA is oriented toward a complex adaptive system view of value creation and not on a value chain system, which is more in line with the structure of the MSE. VNA has also been applied to Boeing with the goal to design new business opportunities (Allee, 2011).

5.1.2. Business canvas model

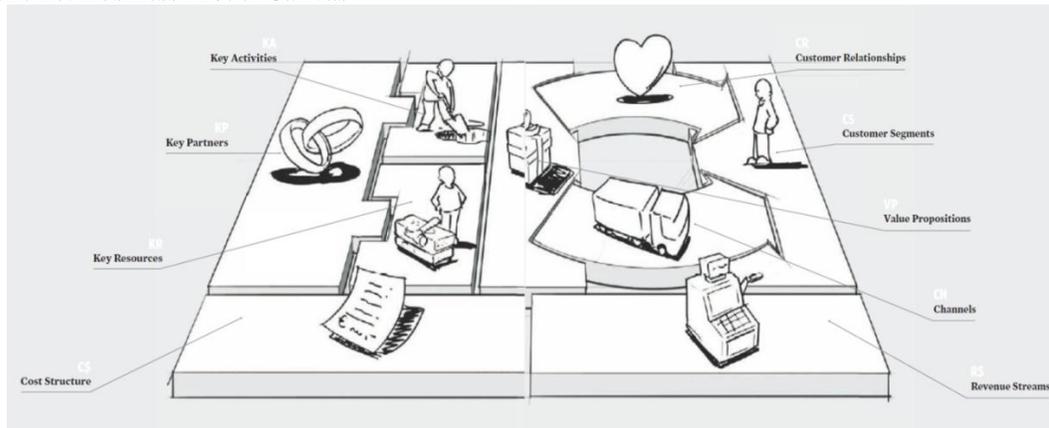
According to the deliverable D53.2 (DITF & BIBA, 2012) the following regarding business canvas model was identified.

Osterwalder/Pigneur (2009) invented ‘... a handbook for visionaries, game changers, and challengers striving for outmoded Business Models and design tomorrow’s enterprises.’ Within this handbook they presented a Business Model, being defined as follows: ‘A Business Model describes the rationale of how an organization creates, delivers, and captures value. The nine blocks of the business model cover according to Osterwalder/Pigneur (2009) the four main areas of business: customer, offer, infrastructure, and financial viability. The nine building blocks are:

- **Value Proposition** (it seeks to solve customer problems and satisfy customer needs with value propositions)
- **Customers** (corresponds to *Link with the Market* in the Industrial Model)
 - Customer Segments (customers a company serves)
 - Channels (value propositions are delivered to customers through communications, distributions, and sales channels)
 - Customer Relationship (Customer relationships are established and maintained with each Customer Segment)
- **Infrastructure** (corresponds to *Structure of Firm, Wage Relationship and Organization of Production* in the Industrial Model)
 - Key Resources (Assets required to offer and deliver the previously described elements ...)
 - Key Activities (... by performing of a number of key activities)

- Key Relationships (some activities are outsourced and some resources are acquired outside the enterprise)
- **Finances** (corresponds to *Access to Finance* in the Industrial Model)
 - Cost Structure (The business elements result in the cost structure)
 - Revenue Streams (Revenue Streams result from value propositions successfully offered to customers)
-

Figure 10: Business Model Canvas



Source: (Osterwalder & Pigneur, 2009)

In general the Canvas model could not be seen only as Business Model but as well as innovation or implementation approach and furthermore here its categories or elements will be used as classification for Business Models and the definitions of Business Models.

5.2. Model development

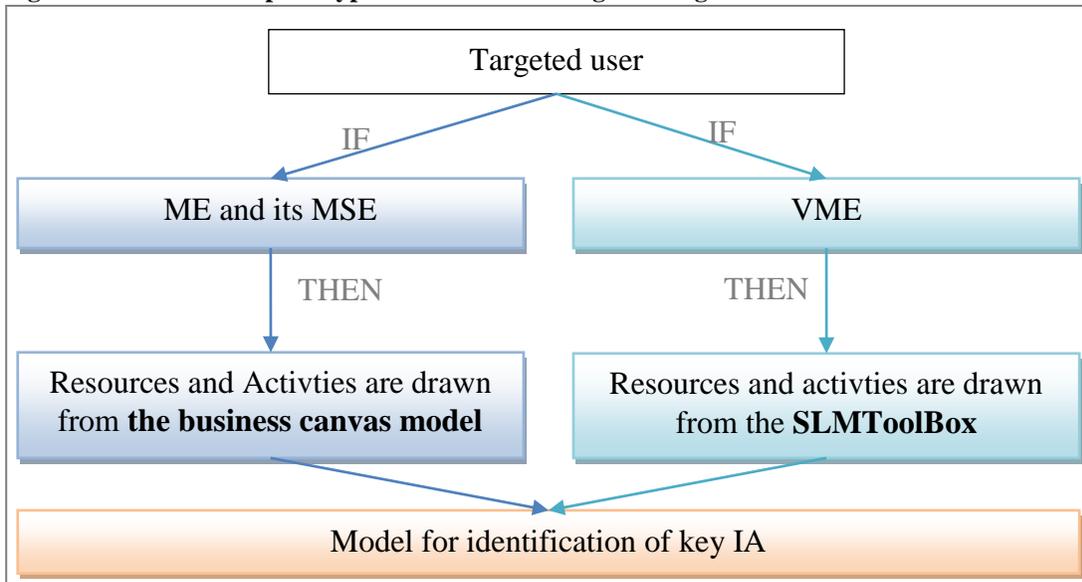
The previous version of this deliverable (D22.1) represents the results achieved in first iteration step towards the final goal, which is the analysis of Intangible Assets Management in Manufacturing for service-based innovation ecosystems, in order to develop Intangible Assets in Manufacturing Service (IAMS) for retrieval, filtering and managing of information. However in order to manage multiple assets arising from multiple owners on an ecosystem efficiently, a dedicated procedure for identification and extraction has to be developed.

Procedure for development of the model for identification of IA:

- a) Model development:
 - a. define basic assumptions, boundaries;
 - b. business canvas model as basis;
 - c. regrouping it according to three main classifications: value proposition, resources and activities;
 - d. introduction of P+S and P2S elements into the model (those are derived from dedicated business canvases);
 - e. the development of questions for identification of IA (the questions are focused in identified IA that have already existing instances, however the procedure allows and also prompt the discovery of new IA, thus in parallel the IA ontology);
 - f. to each question specific attributes are defined that arise in the IA ontology, in such way the instances are obtained and the attributes value.
- b) Definition of rules for evoking specific questions with predefined set of attributes.
- c) Guidelines for usage of the model.

The procedure in question can benefit to two types of users. One is the ME and its MSE and the other one is the VME. The focus of this deliverable is on the first type of user.

Figure 11: Decision map for type of model for strategic management of IA



The SLMToolBox is not only convenient because of the availability of the data, but also because of its quality and high level of structuration. Namely the MDSEA is service driven and provides rigorous methods for capturing and integrating requirements, design, analysis, and verification along the SLM as well as facilitating the maintenance, assessment, and communication across the SLM (MSEE, D11.1). Those capabilities are very important as the project deals with a manufacturing service ecosystem. However in this deliverable, only the option regarding the ME and its MSE will be addressed, because VMEs are not the focus.

5.3. Model conceptualization

Main assumptions of the model:

1. be modular and enable to supplement it with additional categories or constraints linked directly to each IA or IAaaS, for instance: value, costs, perceived relevance, level of utilization in a moment and number of times used, quality, risk of loss etc. (categories depend on the need of the end user of the model);
2. be coherent with the joint virtualization procedure for IA and TA;
3. leverage between trying to achieve the highest level of automation versus not reducing the level of extracted and exposed quality of information (IA), which in this case is a crucial factor.
4. The models are designed like ontologies that continuously evolve with their use.

Boundaries of the model:

- In a MSE there is always a so called driver that leads the MSE.
- The driver has good knowledge about its MSE partners.
- Every MSE driver is capable of mapping its business model and hence get a reliable personalized model.
- Key IA are those that are linked to a specific activity stated in the business canvas.
- The more is relevant the business activity for a ME or MSE, consequently the more is relevant also the IA in question.

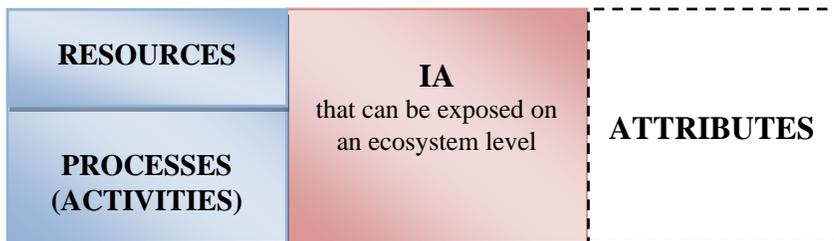
- Must be coherent with the joint virtualization procedure for IA and TA.
- The identification of key IA can be performed for two main types of users.
- The model must be designed so that it can continuously evolve with its usage.
- ME and its MSE and also for the VME. Regardless of the user, the functionalities are the same.

The procedure and its model has to leverage between trying to achieve the highest level of automation versus not reducing the level of extracted and exposed quality of information (IA), which in this case is a crucial factor.

The following figure describes the composition of the proposed model. The main point is to link together three main categories:

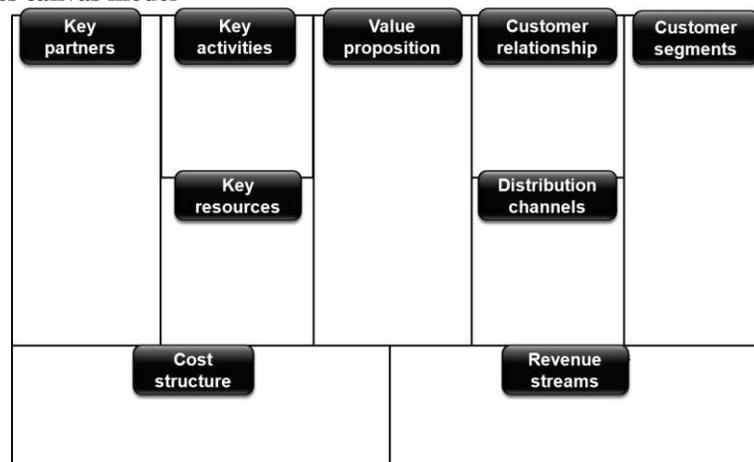
- resources and processes are linked to
- IA with their own attributes

Figure 12: Proposition of a model for strategic management of IA on the MSE level



The basis for the categories Resources and Processes (activities) is taken from the business canvas model.

Figure 13: Business canvas model



It was discovered that the elements from the business model needed to create and deliver added value to customers could be classified in three main categories:

- resources (e.g. customer relationship, key partners ...),
- activities (e.g. R&D, marketing, service design ...),
- value proposition (e.g. what is offered, to whom and what kind of cost and profit structure does it enables).

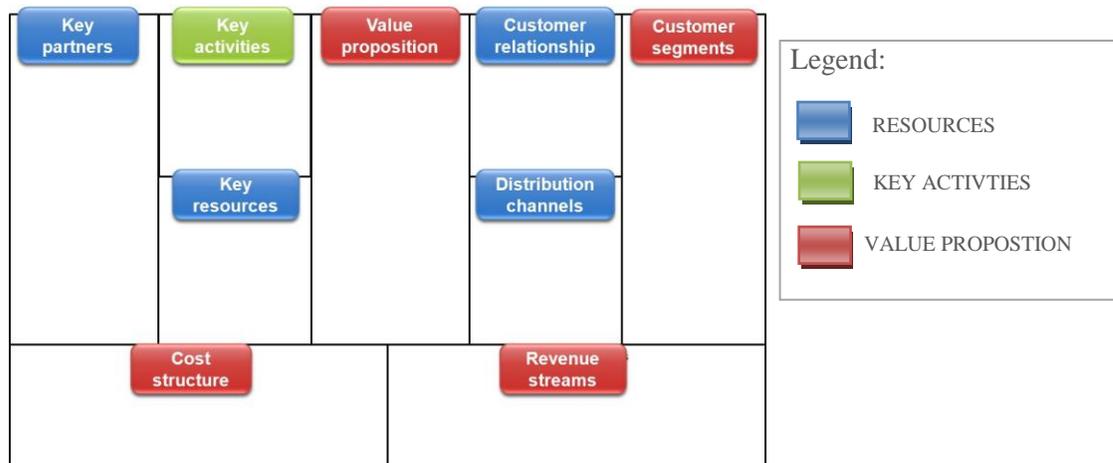
The relationships among them are depicted in the following figure. Their combination shows the value creation process of a ME or VME.

Figure 14: Value creation process of a ME or VME



According to those three identified categories the elements from the business model were classified. The classification of those categories resulted in a taxonomy of the business model and consequently of the value creation process.

Figure 15: Taxonomy of the value creation process based on the business canvas model



5.4. Model proposition based on the business canvas

Hereunder three types of model as part of the procedure for identification key IA are presented.

In the deliverable D53.2 (DITF & BIBA, 2012) 3 types of generalizable models can be found. Those are for MEs:

- a) with a mainly product oriented strategy,
- b) with a product+service strategy,
- c) with a product2service strategy.

Model for identification based on the product oriented business model

The next figure shows an additional level of detail of the classification of the business canvas based on the product oriented business model. To each of the three categories generic elements arising from the business model of MEs were connected. The elements are derived from the actual modelling of individual business models for all 4 use cases. Based on that, the set of **generalized elements** of a product oriented business model of MEs could be extracted.

Figure 16: Model for identification of key IA with a product driven emphasis

Business model with a product driven emphasis			Questions for IA
Value Proposition	Products generating income		
	Customer segments		
	Revenue streams		
	Cost structure		
Resources	Key partners		
	Key resources		
	Distribution channels		
	Customer relationships		
Key activities	R&D		
	Design of the product		
	Manufacturing of product		
	Marketing activities		
	Sale services		
	Logistics		
	After-sale services		

At this point the business model is in such form that is ready to be linked with IA.

The presented model represents a **generalizable** model for MEs with “**classical**” **product oriented strategies**. Continuing the model development, the next figure depicts the models for identification of key IA for service oriented business models.

Model for identification based on the P+S driven business model

Based on the P+S scenario, it can be stated that mainly a strategy of differentiation will be followed, enabled by enterprise collaboration. Applied to the Business Model Canvas, a P+S scenario will require the following adaptations to the building blocks (see **Error! Reference source not found.** below):

Figure 17: Model for identification of key IA with a P+S driven emphasis

Business model with P+S driven emphasis			Questions for IA
Value Proposition	Product-service bundle	Customized offer Physical functionalities Associated services	
	Customer segments	Fragmentation of customer segments	
	Revenue streams	Sale of physical product Service subscription	
	Cost structure	Production costs Service provision	
Resources	Key partners	Suppliers Service providers	
	Key resources	Production facilities Service Know-how	
	Distribution channels	Delivery of P+S Use of online channels	
	Customer relationships	Seller-buyer Provider-user	
Key activities	R&D		
	Design of the product		
	Manufacturing of product		
	Marketing activities		
	Sale services		
	Logistics		
	After-sale services		
	Identification of partners from the MSE		
Creation of a VME			

Model for identification based on the P2S driven business model

Based on the P2S scenario, it can be stated that mainly a Blue Ocean strategy will be followed, enabled by co-creation with the customer. Applied to the Business Model Canvas, a P2S scenario will require the following adaptations to the building blocks (see figure below):

Figure 18: Model for identification of key IA with a P2S driven emphasis

Business model with P2S driven emphasis			Questions for IA
Value Proposition	Product-service bundle	Functionality of the P-S bundle Availability of the P-S bundle Results of P-S bundle application	
	Customer segments	Individual customers	
	Revenue streams	Profit share in VME Service subscription	
	Cost structure	Integrated realisation of product and service	
Resources	Key partners	Suppliers Service providers Customers	
	Key resources	Customer requirements Service Know-how	
	Distribution channels	Offline and online provision	
	Customer relationships	Co-creator Provider-user	
Key activities	R&D		
	Design of the product		
	Manufacturing of product		
	Marketing activities		
	Sale services		
	Logistics		
	After-sale services		
	Identification of partners from the MSE		
Creation of a VME			

The main difference among the three types of business models is mainly in their resources needed. Key activities differ in a more detailed level, at the main level only two categories have been added.

5.5. Development of questions and rules for identification of IA

The questions are focused on identifying specific IA that derive from the MSEE ontology and are key to the respondents. However questions also prompt the discovery of new IA, which are not yet part of the ontology. Such procedure gives an opportunity to evolve the ontology in parallel.

To each question specific attributes are defined that arise from the IA ontology. As such instances are obtained as also the attributes' values. Specific questions are then linked to specific resource, activity or element from the value proposition.

If the procedure would want to be automated, then the linkage among them should be made automatic (like a relational database). This procedure can be automated to some extent by linking the existing elements identified through the business canvas model for different models (product, P+S and P2S) to their related questions and sets of attributes. Of course the procedure is developed in the spirit of the ontology and made to always evolve. Therefore when a new set of characteristics is discovered by the user, a generic set of attributes and question can appear, that however later on would need to be adapted to the specific characteristic.

5.6. Guidelines for applying the procedure for identification of key IA

Hereunder are presented guidelines for usage of the procedure of identification of relevant IA:

1. Define goal of the entity in question.
2. Define boundaries (unit of observation):
 - a. of the driver of the MSE
The criteria to define the boundary is the following – after defining the goal of the MSE’s driver, map the minimal resources and activities needed to offer such service (e.g. if Indesit decides to co-create new services related to their program of washing machines, the boundary is then the unit of washing machines and its related activities like R&D, marketing ...)
 - b. of the MSE members
Only the MSE members that appear in the mapped activities of the MSE driver or are related to its resources are being mapped.
3. Populate the dedicated business canvas model for the targeted environment.
If the MSE is chosen as the targeted user, answer the questions as if the MSE partners (the MSE) are part of your enterprise (e.g. when asked to list the key R&D activities, list also the one from your major partners, if you believe that they are relevant)
4. Answer questions and for each of them specify the requirements in the column on the right (those serve to obtain the value of attributes related to the instances).
5. For each identified IA, specify:
 - a) if it is related to a product or service related activities
 - b) owner
6. The IA that are identified can then be extracted and the IA ontology populated.

Consequently, the identified relevant IA are those that can be found in the resources and business processes deemed relevant enough to be modelled with the business canvas model. As such the ME or MSE knows which IA to virtualize, manage and especially monitor.

5.7. Proposals for possible further elaboration of the model

A category to the model in question that could be added is a Monitoring one, that includes some indicators like level of utilization of assets, risk of absence of such asset, its impact etc. Basically, specific KPIs could be developed.

The model could show also activities and resources linked to products and services or to both of them at the same time, showing the relevance of servitization for the MEs, MSE or VMEs and the crucial interdependencies among products and services. For a basic example please refer to the Indesit model where activities and resources written in blue are those which are linked to services in the ME.

6. Model development for use-cases

Due to the availability of information regarding the business model for each use-case, it was decided to prepare this model to be applied to each of the 4 use-cases and to prepare use-case specific questions to identify and extract the IA.

In order to identify and later on extract information from end-users who do not master the concept of IA, a simple, clear and structured approach had to be undertaken. Therefore end-user will not receive the tables with instances and attributes to fill in, but will answer to the use-case specific questions from which later on IA will be identified and extracted.

6.1. Model for use-cases

Indesit's model for identification of relevant IA is based can be found in Appendix 1. The third column of the model reveals Indesit's elements as part of their business model. The last two columns represent IA on two levels of details: the general view that user can easily understand and the second more detailed view for which a detailed knowledge about the assets is needed (attributes). Indesit's **questionnaire** for identification that will receive the end-user can be found in Appendix 2. The questionnaire for other use cases has not been added in the appendix, as only the form differs from the model and therefore would only enlarge needlessly the Appendix.

Ibarmia's model for identification of relevant IA and corresponding questions for their identification and extraction can be found in Appendix 3.

TPVision's model (with questions) for identification of relevant IA and corresponding questions for their identification and extraction can be found in Appendix 4.

Bivolino's model (with questions) for identification of relevant IA and corresponding questions for their identification and extraction can be found in Appendix 5.

6.2. Example of identified relevant IA of Indesit and its ecosystem

Hereinafter are presented some of the identified relevant IA from Indesit and its ecosystem.

The identified IA from the other use-cases will be presented in the next deliverable (marked as prototype), which will encompass the populated ontology with key IA and also USDL. As such, it will enable them to expose their assets as a service.

KEY RESOURECES / Main Partners:

- Electric/electronic components suppliers.
the relationship with them is STRATEGIC and of medium to long term.
- Mechanical components suppliers.
the relationship with them is STRATEGIC and of medium to long term.
- Bio-/Chemical substances suppliers.
the relationship with them is TACTICAL but of long term.
- Assembly services suppliers.
The pre-assembly (not assembly) is referred to semi-finished products and in this case it is done in Indesit. If assembly is about electronic components, the relationship with the suppliers is STRATEGIC.
- Designers of electric/electronic components.
The relationship with them is STRATEGIC and of medium to long term.
- Designers of mechanical components.
The relationship with them is STRATEGIC and of medium to long term.
- Designers of Bio-/chemical components
The relationship with them is TACTICAL but of long term.
- software/Mobile apps developers.

The relationship with them is STRATEGIC.

Relationships with partners are classified as one of the key resources. From this it can be derived with whom in the MSE the relationship of the driver is relevant, the level of relevance and of course its longitude.

KEY RESOURCES / Brand:

- Indesit - *the sale of the WM products, this product is supported by some services like warranty, technical support and call centre assistance;*
- Hotpoint

Both brands are sold in Europe and also in Russia and Turkey.

The difference between them is related the strategic positioning and the customer needs.

KEY RESOURCES / Software:

- data gathering, recording and storing

Data collected when the customer has a failure and he need of a technical support; in this case the technician can download data from the machine. The connected WM is under development.

CUTOMER RELATIONSHIPS / Assistance:

- Maintenance services suppliers.

The relationship with the maintenance services suppliers is STRATEGIC. The network of maintenance services is diversified depending on the country and its market structure.

- Installation services suppliers.

NON-STRATEGIC relationship. The competence of the installation depends on the country where the WM is sold. For example, in Italy the installation is done by retailer; in UK the installation is directly done by Indesit.

KEY ACTIVITIES / R&D:

- Knowledge about washing performance,
- Knowledge about water consumption,
- Knowledge about energy efficiency.

KEY ACTIVITIES / Design of the product:

- knowledge about marketing (analysis and customers),
- knowledge about R&D: investigation about new materials and new technologies,
- knowledge about IDEA GENERATION function: overview on various issues interesting for Indesit through the definition of workgroup and the using of specific technics (for example brainstorming, ...).

KEY ACTIVITIES / Manufacturing of product:

Knowledge about (in forms of procedures and competencies):

- assembly lines,
- plastic moulding;
- welding lines,
- tool usage.

KEY ACTIVITIES / Sale services:

- knowledge about control system of the budget ,
- knowledge about promotions and incentives.

KEY ACTIVITIES / Logistics:

- knowledge about control and monitoring system storage.

If Indesit desires to enhance a business results and knows which activities have to be linked to this result, it can easily invest more time and effort in the corresponding identified IA. If the IA are not owned, they can be then acquired through the MSE.

Also it can be seen that Indesit has quite a large ecosystem (taking into account that only the relevant ones are linked to the washing machine unit). However it does not have specific service oriented activities, except warranty, which only confirms the early classification of Indesit in the level of servitization. This is a sample how relatively key IA can be identified. Of course the extraction and possible additional specific information could be collected (e.g. explicit name of partners); however in this demonstrative scenario additional level of detail would not add much additional value.

7. Conclusion

As written in the previous iteration of the deliverable, expected results in future steps are the definition models and tools to properly exploit intangible assets within an ecosystem, by creating/adding new value in combination with tangible assets management. Linking IA to the business canvas is certainly a way to enhance the possibility to more efficient exploitation.

A framework for management of IA has been proposed. The framework derives from the field of knowledge management. It has been analysed in order to benchmark its usage on the ME and MSE level regarding the possibility to manage IA. It has been seen that MEs have a lot benefit when using the tools and competencies offered by the MSE. Managing IA on the MSE level brings such synergies as increased knowledge sharing, continuous IA creation (if MSE partners virtualize their newly created IA), steep learning curve and of course easier and safer IA acquisition. All this could make MEs as MSE partners more competitive as they are more responsive when managing IA. The question if MEs should not transfer their manipulation of IA to the MSE level was also seriously raised; hence MEs could lower costs of IA management, increase reliability and trust and exploitation. Consequently MEs could more focus on defining their own IA exploitation strategy, then on manipulation operations.

With the aim of helping MEs and their MSEs optimize the exploitation of IA, a procedure for identification of relevant IA has been designed. Namely a ME or MSE have to know which are their key IA and how they are related to different parts of their value creation process. Only afterwards, entities can manage them appropriately. The procedure in question is comprised from a model, guidelines and rules. For each use-case a specific questionnaire, as part of the model, has been prepared. The results from Indesit are presented in the deliverable as a sort of show case, otherwise the collected information will be virtualized into the ontologies and linked with USDL, to be later on exposed to higher levels and offered as a service (in the prototype deliverable).

The next step is to conclude the virtualization procedure of IA and validate it entirely on use cases. An alignment with the WP dealing with tangible assets is crucial.

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Glossary

Nbr.	Abbreviation	Meaning
1	USDL	Unified Service Description Language
2	IaaS	Intangible assets as a Service
3	BSM	Business service model
4	TSM	Technology independent model
5	TIM	Technology specific model
6	FoF	Factories of the future
7	KM	knowledge management
8	IA	Intangible Assets
9	I/TA	Intangible and tangible assets
10	ME	Manufacturing Enterprise
11	VME	Virtual Manufacturing Enterprise
12	MSE	Manufacturing Service Ecosystem

Appendices

Appendix 1 – Indesit use-case

Business model of a ME (AS-IS)		I/TA (questions)	I/TA (detailed – attributes)
1. Value Proposition	1.1 Product or service bundle	<ul style="list-style-type: none"> - WM for different needs (customer segments) - With spare parts and manual - With 5 years warranty and assistance 	
	1.2 Customer segments	Families	
		Single persons	
	1.3 Revenue streams	Retail payments	
		Direct selling	
1.4 Cost structure	R&D and overheads		
	Production / Economies of scale		
2. Resources (I/TA)	2.1 Key partners	<p>Suppliers for components and assembly:</p> <p>Electric/electronic components. Mechanical components. Bio-/Chemical substances.</p>	<p>Please tell us which relationships you have with:</p> <ul style="list-style-type: none"> -Electric/electronic components suppliers. -Mechanical components suppliers. -Bio-/Chemical substances suppliers. -Assembly services suppliers. <p>Please specify for <i>each</i> answer, if applicable:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p> <p>Types of components supplied (incl.: real-world example, typical characteristics to describe the component, e.g. weight, price,</p>

		Assembly services.		length):
		Designers: Designers of electric/electronic components. Designers of mechanical components. Designers of bio-/chemical components. Software/Mobile apps development.	Please tell us which relationships you have with: -Designers of electric/electronic components. -Designers of mechanical components. -Designers of Bio-/chemical components -Software/Mobile apps developers.	Please specify for every answer, if it is possible: Duration: Importance (strategic/non-strategic): Types of design service provided (incl.: real-world example, typical characteristics to describe the component, e.g. duration, price, person-month ...):
		2.2 Key resources Brand: Trademarks.	Please tell us, which important trademarks you have. Tell us, which (intermediate) products or services are associated with the respective trademarks:	Please specify for every answer, if it is possible that the trademark is in somehow legally protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
	Software	Please tell us which important	Please specify for every software, if it is	

			<p>software you have. In particular about:</p> <ul style="list-style-type: none"> -domestic appliances control (e.g. calcium deposition, level of soap in the vessel ...) -data gathering, recording and storing -sending data (e.g. from customers to Indesit facilities) -communication with mobile devices (e.g. smartphones...) 	<p>possible:</p> <p>Main functions:</p> <p>For each software, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	2.3 Distribution partners	Wholesalers	Please tell us which relationships you have with wholesalers.	<p>Please specify for every answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p>
		Retailers	Please tell us which relationships you have with retailers.	<p>Please specify for every answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p>
	2.4 Customer relationships	Buyer-seller relationship	Please tell us, how you interact with (potential) customers?	

		<p>Assistance:</p> <p>Maintenance services. Installation services.</p>	<p>Please tell us which relationships you have with:</p> <p>-Maintenance services suppliers. -Installation services suppliers.</p>	<p>Please specify for every answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p> <p>Which components/services are maintained by them? How to specify these components by means of attributes and characteristics?:</p>
3. Key activities	R&D	<p>Basic research</p> <p>Applied research</p> <p>Experimental research</p> <p>Testing</p>	<p>Please tell us, which kind of research do you perform and on which parts of the product you focus (e.g. in applied research the focus is on: water consumption and energy efficiency of a washing machine).</p> <p>How to characterize the product-parts by means of specific attribute sets; please provide real-world examples, if possible.</p>	<p>Please specify for every answer if there is something legally protected. If the answer is yes, please specify:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Design of the product		<p>Where did your idea for a new product/Service come from?</p> <p>Please tell us, which components and/or appliances you are designing.</p>	<p>Please keep in mind to always provide exemplary characteristics/attributes to describe the components/appliances of interest, e.g. height, turns per minute, water consumption, ...</p> <p>Please specify for every answer if the final</p>

			<p>Please tell us, which components and/or appliances you are testing.</p> <p>Please tell us, for which components and/or appliances you are writing specifications.</p> <p>Do you collect and integrate the lesson learned? If yes, about what?</p>	<p>output of the process (e.g. drawings) is in some way legally protected or not. If the answer is yes, please specify:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Manufacturing of product	<p>Manufacturing processes</p> <p>Electronic processes</p> <p>Assembly processes</p>	<p>What kinds of structured methods or competencies do you have about manufacturing and assembly processes?</p> <p>Which machineries, tools, and materials are needed to manufacture your product/to provide your service? Please follow all the value chain and list all essential tangible resources/ingredients necessary in manufacturing.</p>	<p>Please keep in mind to always provide exemplary characteristics/attributes to describe the competencies/materials of interest, e.g. CVs, height, turns per minute, ...</p> <p>Please specify for every answer:</p> <p>Need (and potential) for IT support (e.g. software) (yes/no – eventually how):</p> <p>For every answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p>

				Cost of the legal protection:
	Marketing activities	Data collection from customers (from WMs and other channels) Analysis of data (customer segments, habits ...) and feeding into R&D Advertising	<p>What kinds of structured methods or competencies you have about data gathering, recording and storing (about data coming from machines: e.g. working conditions, appliances status ...)?</p> <p>- // - about statistical methods or procedures for monitoring of domestic appliances?</p> <p>- // - about data analysis (e.g. customer segments, habits,...)?</p> <p>- // - about pricing of products or services?</p> <p>- // - about the definition of warranties for domestic appliances?</p> <p>- // - about advertisement (e.g. promotions, direct marketing,...)?</p>	<p>Please specify for every answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>for every answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Sale services	Definition of terms of sale for end customers and retailers Management of the retail network Direct sale activities	<p>What kinds of structured methods or competencies you have about management of the retail network?</p> <p>- // - about direct sales activities?</p>	<p>Please specify for every answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>For every answer, specify also if it is in some way legally protected. If the answer</p>

				<p>is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Logistics	<p>Inbound of product inputs (raw material, half products, manufacturing and R&D machines ...)</p> <p>Outbound of final product</p>	<p>What kinds of structured methods or competencies you have about raw material management and in general about inbound logistics?</p> <p>- // - in general about outbound logistics?</p> <p>Which materials, tools, and machineries/vehicles are related to logistics (and not yet listed above)?</p>	<p>Please specify for every answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>For every answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	After-sale services	Maintenance	<p>What kinds of structured methods or competencies you have about the maintenance or installation of domestic appliances?</p> <p>Which materials/substrates, spare</p>	<p>Please specify for every answer:</p> <p>Need for IT resources (e.g. software) (yes/no):</p> <p>For every answer, specify also if it is in</p>

			<p>parts, tools, and machineries are related to after-sales services and maintenance processes (and not yet listed above)?</p>	<p>some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
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Appendix 2 – Indesit: questionnaire for identification of key assets



Questionnaire for identification and extraction of key Intangible and Tangible Assets for **INDESIT**

Contributing to:	WP22 (Intangible Assets – David Opresnik, PoliMi) WP23 (Tangible Assets – Manuel Hirsch, DITF)
Date provided:	29/01/2013
Date completed:	14/02/2013

SHORT DESCRIPTION:

Each presented question is directly linked to a specific key business activity or resource derived from the business model of your enterprise described in D53.1 using the Business Canvas approach. Hence it covers different aspects of the value creation process (e.g. value proposition, key partners ...). Following those aspects, different kind of resources with economic value (intangible and tangible assets) have to be identified, extracted and integrated into a management model.

VALUE FOR MANUFACTURING ENTERPRISE:

The model in which the intangible and tangible assets will be integrated into will help your enterprise to:

- help assess how well are your assets utilized;
- manage and exploit more efficiently and dynamically your key assets in direct relation to your business model.

One of the main goals of the management model and consequently of intangible and tangible assets is to help your enterprise or ecosystem transition assets into value.

QUESTIONS

NOTE: When answering those questions, please answer them from the ecosystem (MSE) point of view; e.g. as you take into account your internal resources such as marketing, take also into account your partners such as: communication device provider and detergent suppliers.

RESOURCES
KEY PARTNERS / Suppliers for components and assembly
<p>Please tell us which relationships you have with:</p> <ul style="list-style-type: none"> -Electric/electronic components suppliers. -Mechanical components suppliers. - Bio-/Chemical substances suppliers. -Assembly services suppliers.
<p>Please specify above for <i>each</i> answer, if applicable:</p> <ul style="list-style-type: none"> - Duration - Importance (strategic/non-strategic) - Types of components supplied (incl.: real-world example, typical characteristics to describe the component, e.g. weight, price, length)
KEY PARTNERS / Suppliers for components and assembly
<p>Please tell us which relationships you have with:</p> <ul style="list-style-type: none"> -Designers of electric/electronic components. -Designers of mechanical components.

- Designers of Bio-/chemical components

-Software/Mobile apps developers.

Please specify above for *each* answer, if it is possible:

- Duration
- Importance (strategic/non-strategic)
- Types of design service provided (incl.: real-world example, typical characteristics to describe the component, e.g. duration, price, person-month ...)

KEY RESOURCES / Brand

Please tell us, which important trademarks you have.

Tell us, which (intermediate) products or services are associated with the respective trademarks:

Please specify for *each* answer, if it is possible that the trademark is in somehow legally protected. If the answer is yes, please add:

- From when
- Where (country)
- Till when
- Cost of the legal protection

KEY RESOURCES / Software

Please tell us which important software you have. In particular about:

- domestic appliances control (e.g. calcium deposition, level of soap in the vessel,...)
- data gathering, recording and storing
- sending data (e.g. from customers to Indesit facilities)
- communication with mobile devices (e.g. smartphones ...)

Please specify for every software, if it is possible:

Main functions:

For each software, specify also if it is in some way legally protected. If the answer is yes, please add:

From when:

Where (country):

Till when:

- Cost of the legal protection:

DISTRIBUTION PARTNERS / Wholesalers

Please tell us which relationships you have with wholesalers.

<p>Please specify for <i>each</i> answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p> <p>-</p>
<p>DISTRIBUTION PARTNERS / Retailers</p>
<p>Please tell us which relationships you have with retailers.</p>
<p>Please specify for <i>each</i> answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p>
<p>CUSTOMER RELATIONSHIPS / Buyer-seller relationship</p>
<p>Please tell us which relationships you have with retailers.</p>
<p>/</p>
<p>CUSTOMER RELATIONSHIPS / Assistance (Maintenance services, installation services)</p>
<p>Please tell us which relationships you have with:</p> <ul style="list-style-type: none"> -Maintenance services suppliers. -Installation services suppliers.
<p>Please specify for <i>each</i> answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p> <p>Which components/services are maintained by them? How to specify these components by means of attributes and characteristics?:</p>
<p>KEY ACTIVITIES</p>
<p>KEY ACTIVITIES / R&D</p>
<p>Please tell us, which kind of research do you perform and on which parts of the product you focus (e.g. in applied research the focus is on: water consumption and energy efficiency of a washing machine).</p> <p>How to characterize the procurement of parts by means of specific attribute sets; please provide real-world examples, if possible.</p>
<p>Please specify for every answer if there is something legally protected. If the answer is yes, please specify:</p> <p>From when:</p>

Where (country):

Till when:

Cost of the legal protection:

KEY ACTIVITIES / Design of the product

Where did your idea for a new product/Service come from?

Please tell us, which components and/or appliances you are designing.

Please tell us, which components and/or appliances you are testing.

Please tell us, for which components and/or appliances you are writing specifications.

Do you collect and integrate the lesson learned? If yes, about what?

Please keep in mind to always provide exemplary characteristics/attributes to describe the components/appliances of interest, e.g. height, turns per minute, water consumption, ...

Please specify for every answer if the final output of the process (e.g. drawings) is in some way legally protected or not. If the answer is yes, please specify:

From when:

Where (country):

Till when:

Cost of the legal protection:

KEY ACTIVITIES / Manufacturing of product

What kinds of structured methods or competencies do you have about manufacturing and assembly processes?

Which machineries, tools, and materials are needed to manufacture your product/to provide your service? Please follow all the value chain and list ***all essential tangible*** resources/ingredients necessary in manufacturing.

Please keep in mind to always provide exemplary characteristics/attributes to describe the competencies/materials of interest, e.g. CVs, height, turns per minute, ...

Please specify for every answer:

Need (and potential) for IT support (e.g. software) (yes/no – eventually how):

For every answer, specify also if it is in some way legally protected. If the answer is yes, please add:

From when:

Where (country):

Till when:

KEY ACTIVITIES / Marketing activities

What kinds of structured methods or competencies you have about data gathering, recording and storing (about data coming from machines: e.g. working conditions, appliances status ...)?

“ “ about statistical methods or procedures for monitoring of domestic appliances?

“ “ about data analysis (e.g. customer segments, habits,...)?

“ “ about pricing of products or services?

“ “ about the definition of warranties for domestic appliances?

“ “ about advertisement (e.g. promotions, direct marketing,...)?

Please specify for every answer:

How much the method or competence is used (often, not very often):

For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:

From when:

Where (country):

Till when:

Cost of the legal protection:

KEY ACTIVITIES / Sale services

What kinds of structured methods or competencies you have about management of the retail network?

“ “ about direct sales activities?

Please specify for *each* answer:

How much the method or competence is used (often, not very often):

For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:

From when:

Where (country):

<p>Till when:</p> <p>Cost of the legal protection:</p>
<p>KEY ACTIVITIES / Logistics</p>
<p>What kinds of structured methods or competencies you have about raw material management and in general about inbound logistics?</p> <p>“ “ in general about outbound logistics?</p> <p>Which materials, tools, and machineries/vehicles are related to logistics (and not yet listed above)?</p>
<p>Please specify for every answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
<p>KEY ACTIVITIES / After-sale services</p>
<p>What kinds of structured methods or competencies you have about the maintenance or installation of domestic appliances?</p> <p>Which materials/substrates, spare parts, tools, and machineries are related to after-sales services and maintenance processes (and not yet listed above)?</p>
<p>Please specify for every answer:</p> <p>Need for IT resources (e.g. software) (yes/no):</p> <p>For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>

Appendix 3 – Ibarria's use case

NOTE: When answering those questions, please answer them from the ecosystem (MSE) point of view. For instance as you take into account your internal resources such as Marketing, take also into account your key partners (at least 3-4) such as: part supplier, logistic partners ...

Please write your answer in the column Questions and check for each question the related requirements. If you believe that some important characteristics of the asset is not covered by the requirements, please add it freely.

Current Business Model of a ME comprising its MSE partners		Questions	Requirements related to the questions	
4. Value Proposition	1.1 Product or service bundle	Customized and highly specialized machine tools	What are the key human and technical resources needed to provide the feature of customization of tools? <i>Just list the main resources.</i>	/
		Training machines	What kinds of structured methods or competencies you have about training on machines?	Please specify for each answer: How much the method or competence is used (often, not very often):
	1.1 Customer segments	B2C: Families Single persons Young couples ...	Please tell us, if you have relationships with the following B2C customers?	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
		B2B: Multinational companies Industrial SMEs	Please tell us which relationships you have with the following customers: -Multinational companies. -Industrial SMEs.	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
		1.2 Revenue streams	Maintenance services	Please state the maintenance processes and resources that are used in order to offer the maintenance service?

				Importance (strategic/non-strategic):
		Direct selling – selling of machines	Please state if you have a dedicated procedure and resource in order to support the selling of machines?	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
	1.3 Cost structure	R&D and overheads	/	/
		Production Economies of scale	/	/
		Design	/	/
	Logistics	Please state the processes and resources that are used in relation to logistics? Is there any specific knowledge link to this?	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):	
5. Resources (I/TA)	2.1 Key partners	Suppliers components for and assembly: Machine components Research centres Training centres	Please tell us which relationships you have with: -Machines components suppliers. -Research centres. -Training on machines centres.	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic): Types of components supplied (incl.: real-world example, typical characteristics to describe the component, e.g. weight, price, length):
	2.2 Key	Manufacturing	What kinds of structured methods or	Please keep in mind to always provide

	resources	processes	<p>competencies you have about manufacturing and assembly processes?</p> <p>Which machineries, tools, and materials are needed to manufacture your product/to provide your service? Please follow all the value chain and list <i>all essential tangible</i> resources/ingredients necessary in manufacturing.</p>	<p>exemplary characteristics/attributes to describe the competencies/materials of interest, e.g. CVs, height, turns per minute, ...</p> <p>Please specify for each answer:</p> <p>Need for IT resources (e.g. software) (yes/no):</p> <p>For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
		Technical design department	<p>What kinds of structured methods or competencies you have about the technical design of customized and highly specialized machine tools?</p>	<p>Please specify for each answer:</p> <p>How much the method or competence is used (often, not very often):</p>
	Software	<p>Please tell us which important software you have. In particular about:</p> <ul style="list-style-type: none"> -machines technical assistance -remote control of machines -design of machines (e.g. CAD) 	<p>Please specify for each software, if it is possible:</p> <p>Main functions:</p> <p>For each software, specify also if it is in some way legally protected. If the answer</p>	

6. Key activities	2.3 Distribution channels		-production of machines (e.g. CAM) -quality control of machines and/or components production -supply chain management	is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
		Direct sale commercial physical visits	Please tell us which relationships you have with direct sale vendors.	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
	2.4 Customer relationships	Retailers	Please tell us which relationships you have with retailers.	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
		Buyer-seller relationship	Do you have dedicated procedures or resources to develop and maintain relationships with your buyers?	Please specify for each answer, if it is possible: Importance (strategic/non-strategic):
		Friendship	Is Friendship relevant for the customer relationships and how do you develop and maintain it and by whom is it done?	Please specify for each answer, if it is possible: Importance (strategic/non-strategic):
		R&D	Basic research	Please tell me which kind of research do you perform and to which parts of the product you focus.

		Applied research Experimental research Testing	How to characterize the product-parts by means of specific attribute sets; please provide real-world examples, if possible.	From when: Where (country): Till when: Cost of the legal protection:
	Design of the product	Design of the machine.	<p>Please tell me which components and/or machines you are designing.</p> <p>Please tell me which components and/or machines you are testing.</p> <p>Please tell me for which components and/or machines you are writing specifications.</p> <p>Do you collect and integrate the lesson learned? If yes, about what?</p>	<p>Please keep in mind to always provide exemplary characteristics/attributes to describe the components/appliances of interest, e.g. height, turns per minute, water consumption, ...</p> <p>Please specify for each answer if the final output of the process (e.g. drawings) is in some way legally protected or not. If the answer is yes, please specify:</p> <p>From when: Where (country): Till when: Cost of the legal protection:</p>
	Manufacturing and assembly of product	Manufacturing processes of the machine Electronic processes Assembly processes	<i>N.B. Already requested above (2.2)</i>	

		of the machine		
	Marketing activities	<p>Data collection from customers (from WMs and other channels)</p> <p>Analysis of data (customer segments, habits ...) and feeding into R&D</p> <p>Advertising</p> <p>Promotion</p> <p>PR</p>	<p>What kinds of structured methods or competencies you have about data gathering, recording and storing (about data coming from machines: e.g. working conditions, appliances status,...)?</p> <p>“ “ about statistical methods or procedures for monitoring of machines?</p> <p>“ “ about data analysis (e.g. customer segments, habits,...)?</p> <p>“ “ about pricing of products or services?</p> <p>“ “ about the definition of warranties for machines?</p> <p>“ “ about advertisement (e.g. promotions, direct marketing,...)?</p>	<p>Please specify for each answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Sale services	<p>Definition of terms of sale for end customers and retailers</p> <p>Management of the retail network</p> <p>Direct sale activities</p>	<p>What kinds of structured methods or competencies you have about management of the retail network?</p> <p>“ “ about direct sales activities?</p>	<p>Please specify for each answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>for each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p>

	Logistics	Inbound of product inputs (raw material, half products, manufacturing and R&D machines ...)	What kinds of structured methods or competencies you have about raw material management and in general about inbound logistics?	Cost of the legal protection: Please specify for each answer: How much the method or competence is used (often, not very often): For each answer, specify also if it is in some way legally protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
		Outbound of final product	“ “ in general about outbound logistics? Which materials, tools, and machineries/vehicles are related to logistics (and not yet listed above)?	
	After-sale services	Maintenance	Please tell us what kinds of structured methods or competencies you have about:	Cost of the legal protection: Please specify for each answer:
		Warranty related services Support in product usage Customer training	-Maintenance or installation of machines. -Warranties establishment. -Support n product usage. -Customer training on machines. Which materials/substrates, spare parts, tools, and machineries are related to after-sales services and maintenance processes (and not yet listed above)?	Need for IT resources (e.g. software) (yes/no): for each answer, specify also if it is in some way legally protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:

If you believe that some relevant assets have not been evoked through this questionnaire, please list them below.

Appendix 4 – TPVision's use case

Current Business Model of a ME comprising its MSE partners		Questions	Requirements related to the questions	
7. Value Proposition	1.1 Product or service bundle	Design and picture quality.	What kinds of structured methods or competencies you have about design and picture quality for Smart TV? Please specify for each answer: How much the method or competence is used (often, not very often):	
		Customization of devices for hotels.	What kinds of structured methods or competencies you have about customization of devices for hotels? What kind of devices are customized and which tools/machines are used for customization (please specify dedicated characteristics/attributes per object)? Please specify for each answer: How much the method, object or competence is used (often, not very often):	
		Smart TV capabilities & User Interface.	/	
	1.2 Customer segments	B2C: Families Tech freaks Gamers	How (procedure, technique, technology) do you collect information about your customer segments?	How much the method, object or competence is used (often, not very often):
		B2B:	How (procedure, technique, technology) do you	

		Hotels...	collect information about your customer segments?	How much the method, object or competence is used (often, not very often):
		Product	Device sales	Please specify for each answer, if it is possible: Importance (strategic/non-strategic): Customer segments:
		Services	Premium services	Please specify for each answer, if it is possible: Importance (strategic/non-strategic): Customer segments:
	1.4 Cost structure	R&D and overheads	/	/
		Production Economies of scale	/	/
		Design	/	/
		Service related	Portal maintenance	Please specify for each answer, if it is possible: Importance (strategic/non-strategic): Who offers this service?
8. Resources (I/TA)	2.1 Key partners	Suppliers for components and assembly	Trident and Sharp for chipset panels Please tell us which relationships you have with: -Electric/electronic components suppliers. -Mechanical components suppliers. -Assembly services suppliers.	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic): Types of components supplied (incl.: real-

a. Key resources				world example, typical characteristics to describe the component, e.g. weight, price, length):
		Designers:	Please tell us which relationships you have with: -Designers of electric/electronic components. -Designers of mechanical components. -Software developers. -Mobile apps developers.	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
		Suppliers of services	<p style="color: red;">IBM as portal provider</p> <p>Please tell us which relationships you have with suppliers of whatever kind of services (e.g. portal providers).</p> <p style="color: red;">Opera for browser technology</p>	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
	a. Key resources	Brand	Please tell us which important trademarks you have and some of the products that are related?	Please specify for each answer, if it is possible, if the trademark is in some way legally protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
		Patents	Tell us, which (intermediate) products, parts or services are associated with relevant patents:	
		Software	Please tell us which important software you have. In particular about:	Please specify for each software, if it is possible:

2.3 Distribution channels			- services for the end-users (e.g. for implementation of video on demand, games, social media,...).	<p>Main functions:</p> <p>for each software, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>	
	2.3 Distribution channels	Direct sale		Please tell us which relationships you have with direct sale vendors.	<p>Please specify for each answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p>
		Wholesalers		Please tell us which relationships you have with wholesalers.	<p>Please specify for each answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p>
		Retailers		Please tell us which relationships you have with retailers.	<p>Please specify for each answer, if it is possible:</p> <p>Duration:</p> <p>Importance (strategic/non-strategic):</p>
		Web & TV		Smart TV portal	
2.4 Customer	Buyer-seller relationship		Do you have dedicated procedures to develop and maintain relationships with your buyers?	Please specify for each answer, if it is possible:	

	relationships			Importance (strategic/non-strategic):
		Assistance: Maintenance services. Installation services.	Please tell us which relationships you have with: -Maintenance services suppliers. -Installation services suppliers.	Please specify for each answer, if it is possible: Duration: Importance (strategic/non-strategic):
		Technology driven	Portal services	
9. Key activities	R&D	Basic research	R&D for panel, chipset etc. Please tell us which kind of research do you perform and to which parts/aspects of the product you focus (e.g. panel or chipset improvement, development of customized smart devices for hotels, design of portals for apps development).	Please specify for each answer if there is something legally protected. If the answer is yes, please specify: From when: Where (country): Till when: Cost of the legal protection:
		Applied research		
		Experimental research	How to characterize the product-parts by means of specific attribute sets; please provide real-world examples, if possible.	
			Portal for apps development. Already requested above.	
	Testing	Portal app validation		
	Design of the product	Design of devices	Please tell me which components and/or appliances you are designing.	Please keep in mind to always provide exemplary characteristics/attributes to

			<p>Please tell me which components and/or appliances you are testing.</p> <p>Please tell me for which components and/or appliances you are writing specifications.</p> <p>Do you collect and integrate the lesson learned? If yes, about what?</p>	<p>describe the components/appliances of interest, e.g. height, turns per minute, water consumption, ...</p> <p>Please specify for each answer if the final output of the process (e.g. drawings) is in some way legally protected or not. If the answer is yes, please specify:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Manufacturing and assembly of product	Manufacturing processes	<p>What kinds of structured methods or competencies you have about manufacturing and assembly processes?</p> <p>Which machineries, tools, and materials are needed to manufacture your product/to provide your service? Please follow all the value chain and list all essential tangible resources/ingredients necessary in manufacturing.</p>	<p>Please keep in mind to always provide exemplary characteristics/attributes to describe the competencies/materials of interest, e.g. CVs, height, turns per minute, ...</p> <p>Please specify for each answer:</p> <p>Need for IT resources (e.g. software) (yes/no):</p> <p>For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p>

				Where (country): Till when: Cost of the legal protection:
		Electronic processes	<i>Already requested above (i.e. manufacturing processes)</i>	
		Assembly processes	<i>Already requested above</i>	
	Marketing activities	Data collection from customers Analysis of data (customer segments, habits ...) and feeding into R&D Advertising Promotion PR	<p>What kinds of structured methods or competencies you have about data gathering, recording and storing (about data coming from Smart TV: e.g. requests of the user, identification of breakdowns ...)?</p> <p>“ “ about statistical methods or procedures for monitoring of Smart TV?</p> <p>“ “ about data analysis (e.g. customer segments, habits,...)?</p> <p>“ “ about pricing of products or services?</p> <p>“ “ about the definition of warranties for Smart TV?</p> <p>“ “ about advertisement (e.g. promotions, direct marketing,...)?</p>	<p>Please specify for each answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
		Sale services	Definition of terms of sale for end customers and	What kinds of structured methods or competencies you have about the definition of terms of sale for end customers and retailers?

		retailers		<p>used (often, not very often):</p> <p>for each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
		Management of the retail network	“ “ about the management of the retail network?	<p>Please specify for each answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>for each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
		Direct sale activities	“ “ about direct sales activities?	<p>Please specify for each answer:</p> <p>How much the method or competence is used (often, not very often):</p>

				<p>for each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Logistics	<p>Inbound of product inputs (raw material, half products, manufacturing and R&D machines ...)</p> <p>Outbound of final product</p>	<p>What kinds of structured methods or competencies you have about raw material management and in general about inbound logistics?</p> <p>“ “ in general about outbound logistics?</p> <p>Which materials, tools, and machineries/vehicles are related to logistics (and not yet listed above)?</p>	<p>Please specify for each answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>For each answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	After-sale services	<p>Maintenance</p> <p>Warranty related services</p> <p>Support in</p>	<p>Please tell us what kinds of structured methods or competencies you have about:</p> <p>-Maintenance or installation of Smart TV.</p> <p>-Warranties establishment.</p>	<p>Please specify for each answer:</p> <p>Need for IT resources (e.g. software) (yes/no):</p> <p>for each answer, specify also if it is in</p>

		<p>product usage</p> <p>Customer training</p> <p>Portal service</p>	<p>-Support in product usage.</p> <p>-Customer training on Smart TV.</p> <p>Which materials/substrates, spare parts, tools, and machineries are related to after-sales services and maintenance processes (and not yet listed above)?</p>	<p>some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
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Appendix 5 – Bivolino’s use case

LEGEND:
 Black – classical activities and resources.
 Blue – linked to a convergence into a service oriented model
 GREY – elements from generalized model that do not come into hand in this model.
 RED – already identified assets (during prototyping in 2012)

10. Value Proposition	1.1 Product or service bundle	Made To Order and Made to Measure garments	<p>What kinds of structured methods or competencies you have about make to order and made to measure garments?</p> <p>-Services for manufacturing plant about installation of just-in-time MASS CUSTOMISATION production schemes : pricing for this is fix setup pricing + yearly updates</p>	<p>Please specify for every answer:</p> <p>How much the method or competence is used (often, not very often): often</p>
		Biometrics body measurement algorithm	<p>What kinds of structured methods or competencies you have about biometric body measurement?</p>	<p>Please specify for every answer:</p> <p>Need for IT resources (e.g. software) (yes/no): yes</p>

			<p>-Patented biometric sizing technology(LINOSOSFT) – patent Bijvoet Michel Made to Order – see footer link on website www.bivolino.com - made-to-measure service</p>	<p>for every answer, specify also if it is in some way legally protected. If the answer is yes, please add: yes</p> <p>From when: na</p> <p>Where (country): na</p> <p>Till when: na</p> <p>Cost of the legal protection: na</p>
	1.2 Customer segments	B2C:		
		End-consumers		
			Families Single persons Young couples	
	1.2 Customer segments	B2B:		
		E-tailors SME Large enterprises Service enterprises ...		
1.3 Revenue streams		Retail payments		
		Direct selling of garments		
		Product		
		Services	“Fashion rooms of e-tailors”	

	1.4 Cost structure	R&D overheads and	Software development	
		Production Economies of scale		
		Marketing		
		Logistics		
11. Resources (I/TA)	2.1 Key partners	Manufacturers and Suppliers for components - clothing	<p>Please tell us which relationships you have with:</p> <p>-clothing manufacturers and suppliers.</p> <p>-We work with 2 SEDEX aggregated manufacturing companies</p>	<p>Please specify for every answer, if it is possible:</p> <p>Duration: 6 years</p> <p>Importance (strategic/non-strategic): strategic</p>
		Customers (B2B)	<p>Please tell us which relationships you have with customers (B2B).</p> <p>-Customer services contract with M&S , OTTO-group (Baur) , WEFASHION for white label mass customization apparel solutions</p>	<p>Please specify for every answer, if it is possible:</p> <p>Duration: 6 years</p> <p>Importance (strategic/non-strategic): strategic</p>
		Suppliers of services	<p>Please tell us which relationships you have with services suppliers.</p> <p>-We do work with an external maintenance company BKM for all our internal IT architecture</p>	<p>Please specify for every answer, if it is possible:</p> <p>Duration: na</p> <p>Importance (strategic/non-strategic): na</p>
	a. Key resources			
		Brand	Please tell us which important trademarks	Please specify for every answer, if it is possible, if the

2.3 Distribution channels		you have.	trademark is in some way legally protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
	Patents		
	Software	<p>Please tell us which important software you have. In particular about:</p> <ul style="list-style-type: none"> -automatic configuration of shirts. -Driven by an database (fabrics , styleoptions) with rules ‘BIVOSOFT ‘ -creation of Avatars. -quick body measurement. -production engineering (e.g. CAM, CAE). -tracking and tracing of shirts. 	<p>Please specify for every software, if it is possible:</p> <p>Main functions: automatic configuration of fabrics, automatic configurations of style options</p> <p>for every software, specify also if it is in some way legally protected. If the answer is yes, please add: na</p> <p>From when: na</p> <p>Where (country): na</p> <p>Till when: na</p> <p>Cost of the legal protection: na</p>
	Direct sale	Please tell us which relationships you have with direct sale vendors.	Please specify for every answer, if it is possible: Duration: Importance (strategic/non-strategic):
	Wholesalers	Please tell us which relationships you have	Please specify for every answer, if it is possible:

12. Key activities			with wholesalers.	Duration:
				Importance (strategic/non-strategic):
	2.4 Customer relationships	Retailers	Please tell us which relationships you have with retailers.	Please specify for every answer, if it is possible:
				Duration:
				Importance (strategic/non-strategic):
		Buyer-seller relationship	????	
Assistance:	Please tell us which relationships you have with:	Please specify for every answer, if it is possible:		
Maintenance and installation services	-Maintenance services customers. -Installation services customers.	Duration:		
		Importance (strategic/non-strategic):		
12. Key activities	R&D	Basic research	Please tell us which kind of research do you perform (e.g. development of SW for shirts configuration, development of body measurement methods).	Please specify for every answer if there is something legally protected. If the answer is yes, please specify: no
		Applied research	-We also are building onsite recommendation (bestsellers and ‘ people who like , also like ‘) in the basket page (plan 2013)	From when:
		Experimental research		Where (country):
				Till when:
				Cost of the legal protection:

	Testing			
	Design of the product	Design products of	<p>Please tell me which products you are designing.</p> <p>Please tell me which products you are testing.</p> <p>Please tell me for which products you are writing specifications.</p> <p>Do you collect and integrate the lesson learned? If yes, about what?</p>	<p>Please specify for every answer if the final output of the process (e.g. drawings) is in some way legally protected or not. If the answer is yes, please specify:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	Manufacturing and assembly of product	Manufacturing processes	<p>What kinds of structured methods or competencies you have about manufacturing processes?</p>	<p>Please specify for every answer:</p> <p>Need for IT resources (e.g. software) (yes/no):</p> <p>For every answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>

		Electronic processes		
		Assembly processes		
	Marketing activities	Data collection from customers	What kinds of structured methods or competencies you have about data gathering, recording and storing from customers?	Please specify for every answer: How much the method or competence is used (often, not very often): often
		Analysis of data (customer segments, habits ...) and feeding into R&D Advertising Promotion PR	<p>“ “ about data analysis (e.g. customer segments, habits,...)?</p> <p>“ “ about pricing of products or services?</p> <p>-Bivolino sells shirts starting 49€ , but with increases in function of chosen styleoptions</p> <p>“ “ about advertisement (e.g. promotions, direct marketing,...)?</p>	<p>For every answer, specify also if it is in some way legally protected. If the answer is yes, please add: no</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
Sale services	Definition of terms of sale for end customers and retailers	What kinds of structured methods or competencies you have about definition of terms of sale for end customers and retailers?	<p>Please specify for every answer:</p> <p>How much the method or competence is used (often, not very often):</p> <p>for every answer, specify also if it is in some way legally</p>	

				protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
		Management of the retail network	What kinds of structured methods or competencies you have about management of the retail network?	Please specify for every answer: How much the method or competence is used (often, not very often): For every answer, specify also if it is in some way legally protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
		Direct sale activities	What kinds of structured methods or competencies you have about direct sale activities?	Please specify for every answer: How much the method or competence is used (often, not very often): for every answer, specify also if it is in some way legally

Logistics			protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
	Inbound of product inputs (raw material, half products, manufacturing and R&D machines ...)	What kinds of structured methods or competencies you have about raw material management and in general about inbound logistics?	Please specify for every answer: How much the method or competence is used (often, not very often): For every answer, specify also if it is in some way legally protected. If the answer is yes, please add: From when: Where (country): Till when: Cost of the legal protection:
	Outbound of final product	What kinds of structured methods or competencies you have about raw material management and in general about outbound logistics? -Services to implement reversed digital	Please specify for every answer: How much the method or competence is used (often, not very often): often for every answer, specify also if it is in some way legally protected. If the answer is yes, please add: no

			supply chain incorporating the customer	<p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>
	After-sale services	<p>Maintenance</p> <p>Warranty related services</p> <p>Support in product usage</p> <p>Customer training</p>	<p>Please tell us what kinds of structured methods or competencies you have about:</p> <p>-Maintenance or installation of machines. -Warranties establishment. -Support in product usage. -Customer training on machines.</p>	<p>Please specify for every answer:</p> <p>Need for IT resources (e.g. software) (yes/no):</p> <p>For every answer, specify also if it is in some way legally protected. If the answer is yes, please add:</p> <p>From when:</p> <p>Where (country):</p> <p>Till when:</p> <p>Cost of the legal protection:</p>