D6.4 – FITMAN Technical / Business Indicators for Virtual Factory V3

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VERSION HISTORY

VERSION	DATE	NOTES AND COMMENTS
0.1	**15/03/2014**	**FINAL CONTENT WITH FIRST LIST OF BPI'S**
0.2	**31/03/2014**	**PRE-FINAL VERSION OF THE DELIVERABLE WITH FINAL**
0.8	**07/04/2014**	**PRE-FINAL VERSION WITH COMMENTS FROM VLAB**
1.0	**15/04/2014**	**PRE-FINAL VERSION WITH COMMENTS FROM VTT**
2.0	**24/04/2014**	**FINAL VERSION INCLUDING COMMENTS FROM TXT**

DELIVERABLE PEER REVIEW SUMMARY

ID	Comments	Addressed (✓) Answered (A)
1	Describe why it is not possible to have common BIs. (RR#3, cross trial assessment) The summary table at the end of Chapter 3 is a step in this direction. Please synchronize with D4.4 and D5.4 and Guy.	done
2	The document could benefit from having and overall picture of assessment,(for example D4.4 Figure 1 Business Performance Indicators, Technical Indicators and Verification Tests.)	done
3	All tables and figures are missing numbering and Captions	done
4	No reference is made to Self-certification	done
5	The lists of used software elements are missing from all trials.	Yes, because the decomposition of software is not related to each decision variable. So it is then difficult to relate directly each software to each objective and each BPI
6	User community definition missing, all trials.	The user community is quite the same for all trials: business users and BP owners, but this is difficult to put names that can change in the future.
7		

Table of Contents

Executive Summary

This deliverable aims to present the pragmatic method used and the final list of Business Performance Indicators (BPI's) that are defined and validated by the three virtual trials: APR, TANET and COMPLUS. For TANET, the trial concerns the SME cluster. This deliverable aims also to answer to review recommendations, to demonstrate that BPI's concerns FITMAN results success and that there is a harmonisation in the method and framework to define BPI's in each trial. It also aims at presenting the continuous validation of trials during the BPI's identification process and explanation on the BPI's selection.

This document is organized in three sections intended to address two general objectives. The part 1 is dedicated to introduce the document and remind T6.4 objectives.

The part 2 reminds slightly the method "simplified ECOGRAI" to determine the business PI's and the V&V method to determine the technical indicators. This part aims also to demonstrate that the Business PI's are all defined using the same methodology and then the same framework. Finally this section presents the continuous validation process with trials.

Part 3 has the content assigned to this Deliverable D6.4 that will be devoted to the control of the experimentation metrics to be employed for FITMAN impact assessment. This BPI's aims to measure first the adoption of the FITMAN results by the trials and also the benefits that the trials get from the FITMAN results implementation.

Introduction to the document

The improvement of performances is a relatively difficult task in the sense that the system must be appropriately designed but also correctly controlled.
The objective of FITMAN being to develop and to implement Generic and Specific Enablers in different trials in order to improve business scenario performance, it is necessary to define performance indicators to measure this performance before and after the SE/GE implementation. This performance can be measured at the business level with business indicators as well as the technical level using technical indicators.
Both kinds of indicators have been chosen in FITMAN project. The methodology to define Business Performance Indicators and technical indicators is defined in WP2.
WP6.4 aims at testing this methodology in the VF Trials.
So, the objective of this deliverable is to remind the methodology that was applied to define the first list of trial Business PI's (BPI's), then to present the methodology that was chosen to validate these Business PI's and then to present the final list of Business PI's validated by the trials and related to objectives and decision variables inside each business scenario or each business processes.
D6.4 is providing contribution to:

- T2.5 Continuous adaptation and support of the V&V package in the trials
- T7.1 Synthesis of Use Case Trials Experiences
- T8.1 FITMAN Use Case Trials comparative evaluation
- T8.2 FITMAN Expanded Trials Proposition,
- T8.3 FITMAN SMEs Innovation Preparation,
- T8.4 FITMAN Support to Phase III Expansion of Use Cases

However, this deliverable, even if it contains reminders about technical indicators, does not aim to present the current value of these technical indicators. These AS IS values will be presented in D7.1 after the implementation of FITMAN results in the trials, and at the same time than the measurement of the TO BE value of the BPI's.

So, in a first part, the methodology to defined BPI's and technical PI's will be reminded from a theoretical point of view (simplified ECOGRAI method) than from a practical point of view, insisting on the various steps that led to obtain the final list of BPI's applying the method in several loops with trials. This part aims also to demonstrate that a common methodology and a common framework of principles was used in all the factory trials and in particular in these three Virtual Factory trials.

In a second part, for each trial, after a very short reminder of the context of the trial, of the business scenario and the business processes, the objectives of each scenario/processes will be given and then the final list of BPI's will be presented linked to the objectives and the decision variables/action variables. Finally, for each BPI, the AS IS (i.e. current) value is given as well as the target value.
For each trial a synthetic table of all BPI's is given, indicating if the BPI is more related to a productivity, a cost, a lead-time or a quality performance topic.

1. Introduction and objectives of the task 6.4

This section describes the contents of D6.4 – *FITMAN Technical / Business Indicators for Virtual Factory,* from its definition: This deliverable instantiates the performance measuring system for the three Virtual Factory Trials. The objective of this document is mainly to demonstrate also what was the approached followed in WP6.4 for the three trials in order first to define the final list of Business Performance Indicators (BPI's), then why these BPI's were selected and how they will be implemented. This D6.4 reflects the very practical work done by academic partners with trial owners based on the theoretical work done in WP2.

At the introduction are established the objectives of the document relating them with the objectives of WP4 and WP5 envisaging the establishment of the performance measuring system for the Smart and Digital Factory. The Methodological approach established the guidelines on how the work reported in this deliverable will establish the choices of business and technological indicators for each trial and how the document will present the application of the Ecograi methodology for the Virtual Factory. Finally it is presented the comment of IVlab on these Business PI's and the work which must be done in the future to implement these indicators and collect the AS IS measures.

The objective of Task 6.4, as from the Description of Work is, "*on the basis of the general methodology developed in WP2, to derive a set of indicators relevant to Virtual Factory experiments that will be, constantly measured and used to benchmark the different Trials. In this perspective,Virtual Factory trials are characterised by some peculiar characteristics (namely heterogeneity, cultural diversity, worldwide collaboration) which require specific indicators to be considered. Collaboration matrices, Interoperability indices and use of Semantic Reconciliation domain ontologies will be part of this indicators system. ECOGRAI system will be used to model decisions in such a dispersed business environment and to govern the overall functioning of the supply chain, value network and business ecosystem*".

In other words, the objectives of this task to is validate the Business and Technical PI's that are defined using simplified ECOGRAI Method to measure the adoption by the virtual trial of the GE and SE that are developed in the project and planned to be implemented in these trials. Two kinds of PI's are defines: business PI's specific to each trial and technical PI's, identical to all GE and SE.

2. Methodologies for Business and technical PI's definition and continuous validation with trials owners

In this section the main concepts associated with each trial are described in two sections dedicated to Business and/or Detailed Performance Indicators and Technical Indicators.

The concepts described in this chapter rely on the results provided by WP2. In fact it is based on the related information in deliverable D2.3 Chapter 3, D2.4 Chapter 3 and Chapter 5. However, this section is clearly limited to reminders because D6.4 does not aim to come back on the theory but to apply it with trials.
The objective is to have a common methodology and a common framework to define Business Performance Indicators (BPI's) even if the trials will have different BPI's.

Indeed, the definition of BPI's depends on the objectives of each trial, in particular if these objectives are defined at the strategic, tactical or operational level of decision. For the Virtual Factory Trials, most of the objectives are operational.
Then, the difference is due also to the dynamic of the controlled system.
Finally, the BPI's depends also on the type of performance improvement that is targeted:

- Productivity
- Cost
- Leadtime
- Quality

So, at the end of the documents, the VF BPI's will be classified according to these four kinds of performance.

The information available in deliverables already published is not repeated, but the concept and the instantiation process is expressed.

The Business Indicators are used to evaluate in detail the implementation of the trial. In chapter 2.1 of this document you will receive a more detailed description of the PIs.

To evaluate the trials furthermore, it is necessary to get the Technical Indicators. The Technical Indicators are the same for each trial. In chapter 2.2 of this document you will find a more detailed description of the Technical Indicators.

With the help of the Business and Technical Indicators described above, the performance in the trial can be rated in various development stages.

2.1. Definition of Concepts connected with Business Performance Indicators

In this section the concept to create the Business Performance Indicators will be described. The Business Indicators will display the successful implementation of the trials from the end user perspective. The support of the confidentiality issue of most of the end users is provided by the mapping of the units of the values to anonymized units or percentages. This will still lead to show the improvement but without giving the specific numbers of the company. So for example the daily person cost cannot be identified but its dimension.

The general process for the assessment of the trials is drafted below:

- Represent the current process (time, cost, …)
- Choose the GEs/SEs/TSCs
- Represent the expected success with GEs/SEs/TSCs (time, cost, …)
- Implementation of the system
- Represent the real success (time, cost, …)

- Evaluation

The evaluation includes:

- Intuitively applicable use of the measurement system (end-user)
- Benefits from the GEs/SEs/TSCs (positive/negative/comments)
  - complexity
  - granularity
    e.g. “The SE is too complex and we need only a part of it”

2.2. Methodological Approach for Business Performance Indicators: a common framework and a common structured approach

2.2.1. Methodological Approach for Indicators

The methodological approach for the instantiation includes three main elements: the Business Indicators, the Technical Indicators and the Verification tests.
Technical indicators (which cover from P5 to T1 steps of the FITMAN Methodology developed in D2.1 [1]) aims at measuring technical performances of the software components and of the entire solution, in order to understand if the product is built and works in the right way. A reduced number of 8 indicators has been selected among a wider list: five of them are non-functional and more qualitative users opinions, three of them are functional and evaluated at each software component level); these indicators are replicated for all the trials. Business Indicators (which cover the T2 step of the FITMAN Methodology [1]) have been identified at Business Scenario level through the ECOGRAI process [3], according to the trials objectives. For each business indicator, the trials are required to report the current value, the target value they want to achieve and the values after the solution implementation. In order to perform P1-P5 steps of the FITMAN Methodology [1], the software components are evaluated through the Verification tests.

The Business Indicators and the functional technical indicators are addressed to the Trial Owner; the non-functional technical indicators require the crowd engagement, therefore all the trial team members; the software components developers are responsible to evaluate their components with recommended or alternative techniques, and report results through a self-certification.

The methodological approach for the instantiation is represented in the following scheme:

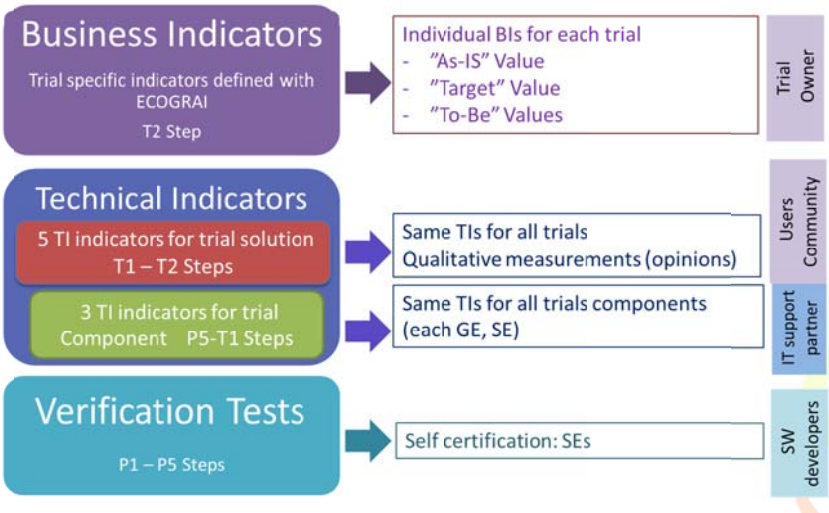

Figure 1 Business Performance Indicators, Technical Indicators and Verification Tests

In the next paragraph, each of the three adopted techniques represented in the picture is described.

2.2.2. A common framework for BPI's with principles

The objective of a performance indicator system is to see what's happen in the controlled system in order to make the right decisions at the right time.

Why we are engaged to define different performance indicators for each trial but with possible Cross-trial assessment methodologies and procedures?

We remind the definition for Business Performance Indicators (BPI): They are quantified data which measure the performance of a system under the influence of actions (decisions) in the reaching of the objectives. It means we must take in consideration the dynamic of evolution of the controlled system.

In our case we must underline that the **Manufacturing system** is a Technical, Economic and Social system (it is a part of an enterprise). So the Social aspect (presence of human) and partially the Economic aspect introduce more or less "Fuzzy situations".

So, the BPIs must be defined according the **structure of the Enterprise** and also the **type of Manufacturing. It is obvious that all the trials have not the same objective in the implementation of FITMAN results.**

If we consider the **structure of the enterprise** on a management point of view, the type of BPIs depends on the considered level of management: strategic (long term), tactical (medium term), operational (short term).
At strategic level the PIs could be generic: there is no influence on the type of manufacturing because this level takes in consideration the global enterprise. The performances are economic, social, financial,…… It is the reason why the BSC (Balanced Score Card) proposes generic KPIs (KEY because these PIs concern all the enterprise);

At tactical the influence of the type of manufacturing begins to be "visible" because the BPI's are linked to the resources implementation.

At operational, it is obvious that the influence of the Type of manufacturing is very important (we see the physical/controlled system). The BPIs depends on the type of Manufacturing and Products.

In FITMAN BPI's are mainly at the operational level with some influence of the" tactical".

But the nature of the objectives has also an influence on the type of BPIs. Usually these objectives concern time (to save time", cost (to decrease the cost), productivity (linked with the number of element produced) and quality which could be quantitative or qualitative.

The variety of BPIs plus the complexity to define them don't allow to obtain the same BPI's for each trial but the method and the spirit of trial owners is the same when defining BPI's.

However, this is possible to classify the various BPI's according to domain performance as cost, quality, leadtime or productivity and this is what is done at the end of the document.
So, our methodology could clustering similar BPIs so that cross-trial assessment shall be made possible and effective, in the view of expanding our trials to other manufacturing sectors and/or application domains, under the condition to choose similar Business Process or at least similar objectives in the implementation of FITMAN results.

The figure below shows these principles and related results of various WP's:

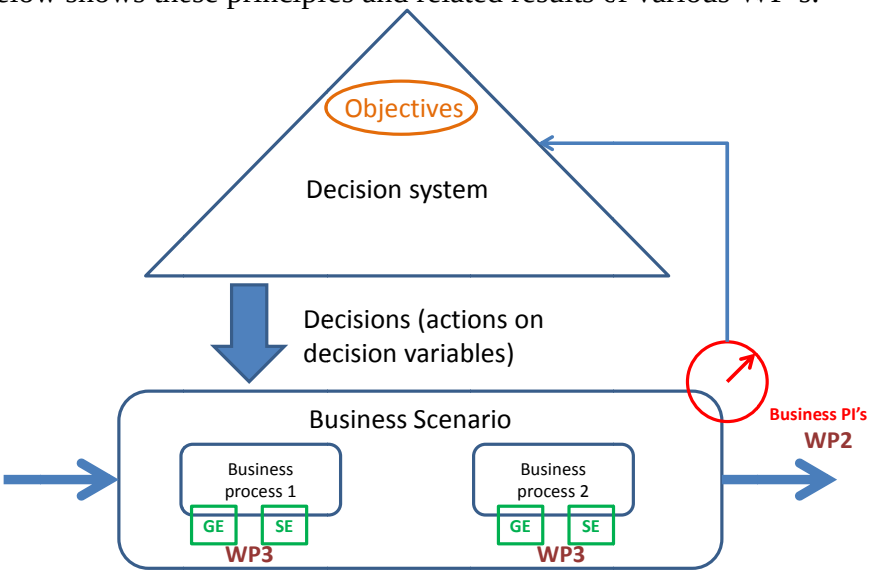

Figure 2 ECOGRAI Methodological approach

For FITMAN Virtual Factory Trials Business Indicators collection we used a simplified version of ECOGRAI with only three phases in order to facilitate the application and to be in line with the size of the use cases and the duration of the project.

First Phase: Description of the system in which the Business Performance Indicators (BPIs) will be defined.
It is impossible to determine Performance Indicators for any kinds of activities, if we don't know in which conditions these activities are performed. So it is necessary to describe the system where these PIs will be determined.
For that we use System Modelling but in a very light application, dedicated only to the cartography of business scenario and business processes.

Second Phase: According to the Objectives of the system the owner of the system determines the potential actions to reach them (called Decision Variables (DV) or Action Variables (AV)). **In general, these action variables are the FITMAN results that will be implemented in the business process or business scenario**.

Third Phase: the Performance Indicators indicate or characterize the reaching of the Objectives by using the DV/AV.

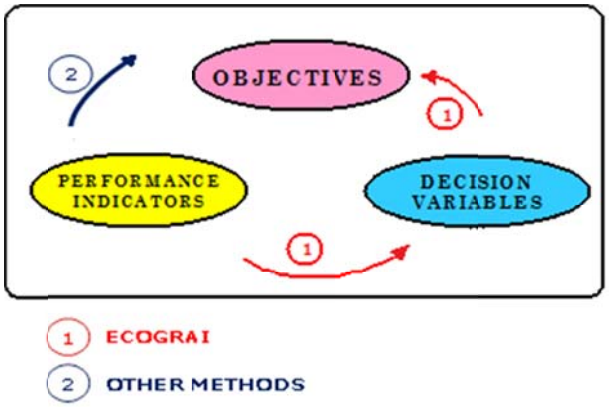

Figure 2 ECOGRAI Method

Usually a PI is defined directly in the frame of the Objective (see Arrow 2). In ECOGRAI, the PI is defined in the frame of the Decision/Action Variable in order to evaluate the reaching of the Objective.
As final notes of the methodological approach for Business Performance Indicators we have to remember:

- As Objectives have been identified the Business Requirements defined in D1.1
- As DV/AV has been identified the overall adoption of the specific Trial Integrated Solution based on FITMAN Architecture

2.2.3. Methodological Approach for Technical Indicators

Consistently with WP2 outcomes (D2.1 e D2.2) a set of Technical Indicators has been defined and instantiated both at Software Component and at Trial level.
The main role of WP6.4 was to ensure the interaction with the different VF Trial Support Partners in order to guarantee the endorsement and the agreement on all the reported Technical Indicators defined in WP2.
The complete list includes eight Technical Indicators, i.e. three specific for the evaluation of the single GEs/SEs and five for the evaluation of the whole Trial Integrated Solution.
The 3 Technical Indicators and their specific meaning derived directly from the IT V&V Criteria identified in D2.1 are:

- Openness: “A measure of defining the level of openness” (D2.2), where openness is “Ensuring that specific people groups may access the software for free with specified rights (depending on the level of openness)” (D2.1);
- Interoperability Maturity: “A measure of how mature in terms of interoperability the software is” (D2.2), where interoperability is “The capability of the software to interact with other systems” (D2.1);
- Ease of application: A measure of the applicability of the software in the particular environment in terms of amount of work and extra actions or means.

The other five Indicators require the personal evaluation of each of the participant to the VF Trial Integrated Solution, i.e. Trial Support Partner (research centres), Trial Owner and the members of the Trial Team.
They are:

- Fulfilment of requirements: The capability of the software product to fulfil in a satisfying way the requirements established by the Trial;
- Learnability: “The capability of the software product to enable the user to learn its applications” (D2.1);
- Understandability: “The capability of the software product to enable the user to understand whether the software is suitable, and how it can be used for particular tasks and conditions of use” (D2.1);
- User’s attraction level: “The capability of the software product to be liked by the user” (D2.1);
- Efficiency: “The capability of the software product to provide appropriate performance, relative to the amount of resources used, under stated conditions” (D2.1).

These AS IS values will be measured in the task 7.1 and then will be reported in D7.1.

2.2.4. Methodological Approach for Self-certification

Consistently again with WP2 (D2.1 and D2.3) outcomes, a Self-certification approach will be supporting the Steps P1-P5 of the FITMAN V&V Methodology. Self-certification represents the Verification/Validation of each Software Component directly by the Development Team which has been in charge to develop it.

The approach will hence address the first five Steps of the Methodology, i.e. Code Verification, Model Verification, Backlog Verification, Release Verification and Product Validation.

By means of Self-certification, the different Development Teams will be able to certify the correct definition of the Software Components, guided by specific procedures.
In particular, for each of the first five Steps a Recommended V&V Technique will be proposed, together with proper V&V Success Conditions.

As fully explained in D2.3, all the first five Steps will be involved for SEs, while only P4 and P5 for GEs. This is because their development has been already addressed in previous FI-WARE project.

2.3. The common structured approach for all the WP6 VF trials to get the "voice of the VF trials" and to enable continuous validation

The objective of this part is to report how the BPI's were defined by the VF trials in WP6.4 with the support of academic partners as "keepers of the method", as indicated in the figure 3 below.
First of all, it is necessary to mention that most of the VF trials were not familiar with performance indicators because they are most of them SME's, as APR, or TANET or COMPLUS.
So, the first step was to train them to the methodology and to the interest to define BPI's that will allow demonstrating the benefits of FITMAN results implementation in their business.
Then, based on the definition of their business scenario (BS) and business processes (BP), the decision was made to not impose them to define BPI's at the business scenario or at the business process level. They were free to choose the level to which they think the evaluation is the most relevant.
As mentioned previously, **the accurate definition of the objectives of each BS/BP** was the first essential step to lead to a good definition of the BPI's.
This definition of objectives was done in conjunction with academic partners in order to guide them and to allow them to think about "**what business benefits they except from the FITMAN results implementation**".
In this sense, because BS/BP are different, the objectives are different from one VF trail to another.
For instance, in the case of APR, the FITMAN results must allow them reducing the leadtime to do business with their suppliers and their customer and to improve the quality of their quotes and orders.
In the case of TANET, the expectations are more in terms of service level improvement for their SME's inside the cluster.
In the case of COMPLUS, this was to obtain a better coordination and transparency in the communication with their suppliers and customers.
Then, we help them to define clearly how the FITMAN results will have an impact on these objectives achievement. Indeed, some results are more related to one specific BS/BP than another. This was also to help them to think about the future BPI's.
So, based on these objectives and decision variables, a first set of BPI's were proposed by the trial owners and the academic partners.
This first set of BPI's was then discussed in the various trials in order to verify their relevancy according to the enterprise strategy, the dynamic of the physical system (workshop) and the possibility of the trial to collect the required information.
In parallel, academic partners, and in particular IVlab, have verified that this first set of BPI's was coherent with the proposed method.

Based on this verification and the work done in the trials, a second set of BPI's was proposed with slight modifications.
For instance, for APR, the first set of BPI's was very huge with more than 30 indicators but after a first loop in the trial, they decided to limit to 11 BPI's only focussing on those really related to their main objectives in order to limit the time spent to collect information and to build the BPI's on the floor.
For TANET, in the second phase, the BPI's have been clarified according to the objectives of the SME's cluster that was to offer new services and to improve their reactivity in the answer to offers.
For COMPLUS, the first set BPI's was also reduced in order to focus on those related to reactivity improvement and improvement of their information system with avoiding errors and increasing transparency. So, from 11, the BPI's were reduced to the eight most important.
Finally, a training session was organised in Lyon, to have the feedback of all the trials and to ensure the feasibility of BPI's implementation. So, during this training session, discussion was about how to measure each BPI's and who will be in charge of this evaluation work.
For instance, in APR, this was decided that Arnaud Louvel, with the help of University of Lyon 2, will be in charge to collect the BPI's value and to evaluate the actions to carry out to reach the objectives.
In TANET, University of Coventry and Control 2K will be in charge to evaluate the results and to advice SME's Cluster in the actions to carry out.
In COMPLUS, IPK will be in charge to evaluate the results of the measurement and to advice the company in the actions to set up.
Operationally, the applied structured approach is detailed below:

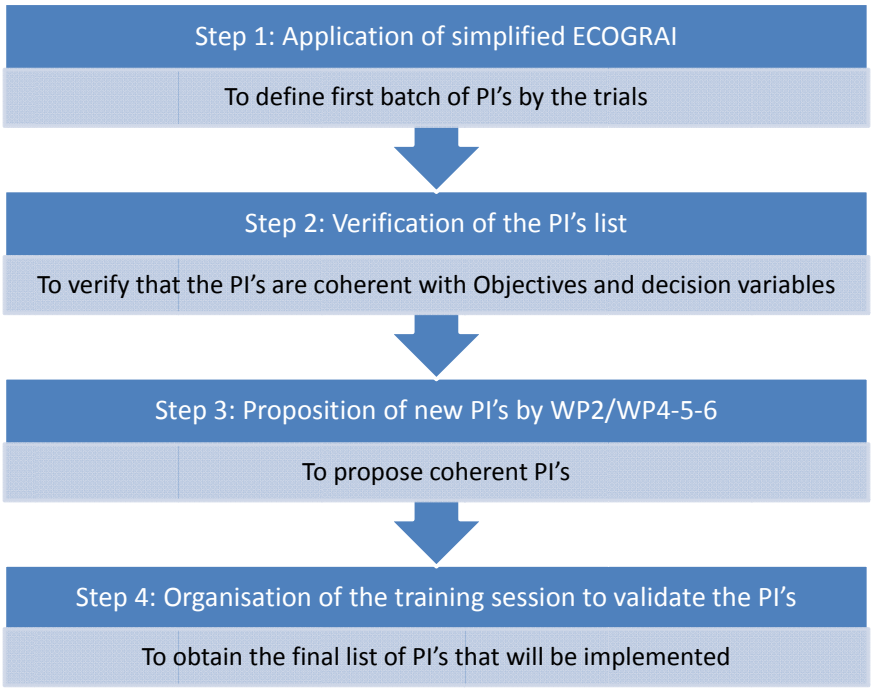

Figure 3 The four steps of the BPI's definition and validation

3. FITMAN VIRTUAL FACTORY TRIALS BUSINESS INDICATORS

The objective of this part is first to present the final list of BPI's that are validated by each of the three VF trials: APR, TANET (SME Cluster) and COMPLUS.
So, for each trial, we will remind the various scenarios, then the related objectives and then the table including Objective-Decision Variable-Indicator.
In each table, the AS IS value of the indicator and the target value will be given.

At the end of the document, a table will be given summarizing the VF Trials by category: productivity, cost, leadtime and quality.

3.1. APR Trial

3.1.1. Reminder of APR Trial BS and BP

APR (Applications Plastiques du Rhône) is a family business divided into 7 departments: research, sales, purchasing, plastic transforming, quality control, shipping, finance. Its main business activities are machining, trade, plastic boiler making, thermoforming, molding by casting and usin'jection. Within FITMAN, the Trial APR is a part of Virtual factory with the aim of enhancing the relation with its customers, suppliers and producers.
We remind that the main objectives of APR in FITMAN are to improve the relationships and reactivity with suppliers and customers and to set up an approach to analyse the reasons of non-successes in the quotes.
The various Business Processes addressed in FITMAN are detailed below:

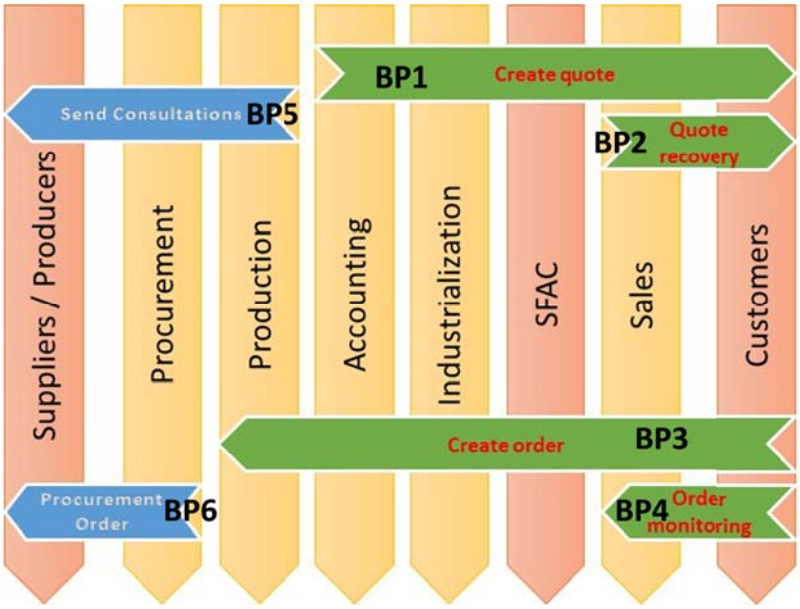

Figure 4 APR business processes

3.1.2. Final list of APR Trial BPI's

So, based on the various Business Processes the following part present for each BP:

- The objectives of the BP,
- The AV/DV related to the objectives
- The Business PI's
- The AS IS value (current value) of the BPI
- The Target (expected value) at the end of the AV/DV implementation

In order to show the common framework, all the BP will be presented with the same table.

BP1: Create a Quote

Objectives	Improve the leadtime of answer to the quote		To decrease the number of unsuccessful quotes due to high price	
Decision variables	To use the APR FITMAN platform		To use the APR FITMAN platform	
Performance Indicator	Ratio: Time limit for responding of quotes (current/new product) after / before the **DV/AV** implementation during a period*		Ratio: % Number of unsuccessful quotes due to high price/Total number of quotes processed after / before the **DV/AV** implementation during a period*	
	AS IS	**Target value**	**AS IS**	**Target value**
	Current (2 day) new (4 days	Current (1 day) new (2days)	60%	30%

Figure 5 BPI's for APR BP1

***Business Indicators template:**	
Indicator Name	*Time limit for responding to quotes demand (current/new product) after / before the **DV/AV** implementation during a period**
Purpose:	*To measure the leadtime to answer to a quote demand from a customer and to verify where is the lost time*
Format :	*integer*
Information needed (Source of data)	*The quote manager*
Calculation Processing (Formula)	*Time between the Date of reception confirmed by the customer and the Date of customer quote request*
Required evolution (Target)	*Between 1 and 2 days depending if this is a classic or a new quote to do*
The owner (Who measures)	*The quote manager*
Period	*After each quote*
Actions to react depending on the value of the PI	*To modify the activities in the quote process and improve the communication between quote actors*
Description mode	

**Business Indicators template:	
Indicator Name	*% of the unsuccessful quotes due to high price after / before the **DV/AV** implementation during a period**
Purpose:	*To verify if the company is well positioned in terms of price in the quotes*
Format :	*integer*
Information needed (Source of data)	*The quote manager and commercial department*
Calculation Processing (Formula)	*Number of unsuccessful quotes due to high price/Total number of quotes processed*
Required evolution (Target)	*From 60% to 30%*
The owner (Who measures)	*The quote manager*
Period	*After each quote*
Actions to react depending on the value of the PI	*To trace the decisions to perform the quotes and to try to reduce production cost*
Description mode	

BP2: Quote recovery

Objectives	optimize the time for analysis and control of customer recovery		Reduce customer recovery lead time	
Decision variables	To use the APR FITMAN platform		To use the APR FITMAN platform	
Performance Indicator	Ratio: % of time for analysis and control of customer recovery after / before the **DV/AV** implementation during a period*		Ratio: Average customer recovery lead time after / before the **DV/AV** implementation during a period*	
	AS IS	**Target value**	**AS IS**	**Target value**
	10%	40%	7-14 days	7 days

Figure 6 BPI's for APR BP2

**Business Indicators template:	
Indicator Name	*% of time for analysis and control of customer recovery after / before the **DV/AV** implementation during a period**
Purpose:	*To improve the analysis of the customer recovery in order to define action plan to avoid future recovery*
Format :	*%*
Information needed (Source of data)	*The quality department*
Calculation Processing (Formula)	*Total time for analysis and control of customer recovery by the collaborators / Total processing time of customer recovery by the collaborators*
Required evolution (Target)	*To 40%*
The owner (Who measures)	*Quality Manager*
Period	*Every 2 months*
Actions to react depending on the value of the PI	*To give time to the collaborators for the analysis and the action plan definition for the customer recovery*
Description mode	

**Business Indicators template:	
Indicator Name	*Average time of customer recovery after / before the **DV/AV** implementation during a period**
Purpose:	*To reduce the time to process a recovery*
Format :	*integer*
Information needed (Source of data)	*Quality manager and commercial manager*
Calculation Processing (Formula)	*Time between the Date of customer recovery by the sales management and the Sending date of commercial proposal*
Required evolution (Target)	*Up to 7 days*
The owner (Who measures)	*Quality manager and commercial manager*
Period	*Each two months depending on the number of the recovery and their urgency*
Actions to react depending on the value of the PI	*To formalise the recovery processing procedure and to avoid lost time in the process*
Description mode	

BP3: Create order

Objectives	Reduce the leadtime of the acknowledgement of receipt		Increase the time part for analysis and control of orders	
Decision variables	To use the APR FITMAN platform		To use the APR FITMAN platform	
Performance Indicator	Ratio: Average time to confirm the order with acknowledgement of receipt (with/ without quote) after / before the **DV/AV** implementation during a period*		Ratio: % of time for analysis and control of orders after / before the **DV/AV** implementation during a period*	
	AS IS	**Target value**	**AS IS**	**Target value**
	4 days	48h	20%	50%

Figure 7 BPI's for APR BP3

Business Indicators template:	
Indicator Name	*Average time to confirm the order with acknowledgement of receipt (with/ without quote) after / before the **DV/AV** implementation during a period**
Purpose:	*To improve the interaction with the customer and show the reactivity of the enterprise*
Format :	*integer*
Information needed (Source of data)	*From the commercial department*
Calculation Processing (Formula)	*Time between the date order **acknowledgment** to the client (client confirmation) and date of sending the order confirmation*
Required evolution (Target)	*Up to 48h*
The owner (Who measures)	*Commercial department*
Period	*Every two months depending on the dynamic of the system*
Actions to react depending on the value of the PI	*To formalise the order confirmation procedure and to avoid lost time in the process*
Description mode	

Business Indicators template:	
Indicator Name	*% of time for analysis and control of orders after / before the **DV/AV** implementation during a period**
Purpose:	*To improve the analysis of the customer orders in order to define action plan to avoid lost time in the order processing*
Format :	*%*
Information needed (Source of data)	*The commercial department*
Calculation Processing (Formula)	*% Total time for analysis and control of orders by the collaborators / Total processing time of customer orders by the collaborators*
Required evolution (Target)	*From 20% to 50%*
The owner (Who measures)	*Commercial Manager*
Period	*Every 2 months*
Actions to react depending on the value of the PI	*To give time to the commercials for the analysis and the action plan definition for the customer order*
Description mode	

BP4: Order tracking

Objectives	Optimize the production time		Decrease the Number of products received back due to faults	
Decision variables	To use the APR FITMAN platform		To use the APR FITMAN platform	
Performance Indicator	Ratio: Customer service rate after / before the **DV/AV** implementation during a period*		Ratio: Number of products received back due to faults after / before the **DV/AV** implementation during a period*	
	AS IS	**Target value**	**AS IS**	**Target value**
	93%	96%	10	7

Figure 8 BPI's for APR BP4

**Business Indicators template:	
Indicator Name	*% Customer service rate after / before the **DV/AV** implementation during a period**
Purpose:	*To increase the service rate to the customer*
Format :	*%*
Information needed (Source of data)	*Production and Commercial managers*
Calculation Processing (Formula)	*% Number of orders not delivered out delay/Total number of orders delivered*
Required evolution (Target)	*From 93% to 96%*
The owner (Who measures)	*Production and Commercial managers*
Period	*Every six months depending on the dynamic of the process*
Actions to react depending on the value of the PI	*To decrease the leadtime of activities and to increase the polycompetence of workers*
Description mode	

**Business Indicators template:	
Indicator Name	*Number of products received back due to faults after / before the **DV/AV** implementation during a period**
Purpose:	*To improve the quality and trace the quality problems*
Format :	*integer*
Information needed (Source of data)	*Quality manager*
Calculation Processing (Formula)	
Required evolution (Target)	*From 10 to 7 every month*
The owner (Who measures)	*Quality manager*
Period	*Every two months*
Actions to react depending on the value of the PI	*To set up quality action plan*
Description mode	

BP5: Procurement order consultations

Objectives	Decrease of the internal stock out rate		Decrease of the external stock out rate	
Decision variables	To use the APR FITMAN platform		To use the APR FITMAN platform	
Performance Indicator	Ratio: Internal Stock out rate after / before the **DV/AV** implementation during a period*		Ratio: External Stock out rate after / before the **DV/AV** implementation during a period*	
	AS IS	**Target value**	**AS IS**	**Target value**
	20%	5%	5%	1%

Figure 9 BPI's for APR BP5

Business Indicators template:	
Indicator Name	*% Internal Stockout rate after / before the **DV/AV** implementation during a period**
Purpose:	*To master the stock management*
Format :	*%*
Information needed (Source of data)	*Inventory manager*
Calculation Processing (Formula)	*number of external disruptions/ internal stock per year*
Required evolution (Target)	*From 20% to 5%*
The owner (Who measures)	*Inventory manager*
Period	*Every two months*
Actions to react depending on the value of the PI	*To improve the demand forecast*
Description mode	

Business Indicators template:	
Indicator Name	*% External Stockout rate after / before the **DV/AV** implementation during a period**
Purpose:	*To master the stock management*
Format :	*%*
Information needed (Source of data)	*Inventory manager*
Calculation Processing (Formula)	*number of external disruptions/external stock per year*
Required evolution (Target)	*From 5% to 1%*
The owner (Who measures)	*Inventory manager*
Period	*Every two months*
Actions to react depending on the value of the PI	*To improve the demand forecast*
Description mode	

BP6: Procurement order and strategic investment

Objectives	Increase the parts of orders realized within a negotiated market	
Decision variables	To use the APR FITMAN platform	
Performance Indicator	Ratio: Value of stock at the end of last period after / before the **DV/AV** implementation during a period*	
	AS IS	**Target**
	230 K€	180 K€

Figure 10 BPI's for APR BP6

***Business Indicators template:*	
Indicator Name	*Value of stock at the end of last period after / before the **DV/AV** implementation during a period**
Purpose:	*To master the stock management*
Format :	*integer*
Information needed (Source of data)	*Inventory manager*
Calculation Processing (Formula)	*Value of stock at the end of last period in terms of material costs only*
Required evolution (Target)	*From 230k€ to 180k€*
The owner (Who measures)	*Inventory manager*
Period	*Every two months*
Actions to react depending on the value of the PI	*To improve the demand forcast*
Description mode	

So, the table below summarizes the last list of BPI's define for APR trial with indicating in the last column if the indicator is more related to Productivity (P), Cost (C), Lead-time (LT), or Quality (Q).

Business Scenario	Business Process	Business indicator name	As-Is value	Target value	Type of BPI (P, C, LT, Q)
BS_1	BP_1	Time limit for responding to quotes demand (current/new product) after / before the **DV/AV** implementation during a period*	Current (2 days) New (4 days)	Current (1 day) New (2 days)	LT
		% of the unsuccessful quotes due to high price after / before the **DV/AV** implementation during a period*	60%	30%	C
	BP_2	% of time for analysis and control of customer recovery after / before the **DV/AV** implementation during a period*	10%	40%	LT
		Average time of customer recovery after / before the **DV/AV** implementation during a period*	7-14 days	7 days	LT
	BP_3	Average time to confirm the order with acknowledgement of receipt (with/ without quote) after / before the **DV/AV** implementation during a period*	4 days	48h	LT
		% of time for analysis and control of orders after / before the **DV/AV** implementation during a period*	20%	50%	LT
	BP_4	% Customer service rate after / before the **DV/AV** implementation during a period*	93%	96%	P
		Number of products received back due to faults after / before the **DV/AV** implementation during a period*	10	7	Q
BS_2	BP_5	% Internal Stockout rate after / before the **DV/AV** implementation during a period*	20%	5%	C
		% External Stockout rate after / before the **DV/AV** implementation during a period*	5%	1%	C
	BP_6	Value of stock at the end of last period after / before the **DV/AV** implementation during a period*	230 K euros	180 K euros	C

Figure 11 Synthesis table for APR BPI's

3.2. TANET Trial

3.2.1. Reminder of TANET Trial BS and BP

SMECluster is a service provided by Sematronix which facilitates the clustering of companies to fulfil tender opportunities

By utilising the services of SMECluster, member companies are able to access more frequent business opportunities, and those that are more accurately matched to their capabilities.

So, the objectives of SMEcluster in FITMAN is to improve the reactivity of SME's in anwers of the calls and to create new opportunities.

Business Scenarios:

BS1: Import of Tender Opportunities

Historically, tenders are manually entered into SMECluster by a facilitator. This is a time-consuming process, and if SMECluster is to be made accessible to a greater community of facilitators, may reduce uptake. Therefore this scenario will make use of GE's and SE's to automate the importing of tenders, and their creation in the SMECluster system.

Additionally, it is intended to draw tender opportunities from a greater variety of sources, including from RSS feeds, SOAP-enabled systems, and web-scraping, in order than facilitators have a greater variety of tenders to fulfil.

BS2: Improvement of facilitator role

The facilitator is currently required to use their knowledge of the business area, along with their knowledge of member companies appropriate to the tender, to create clusters capable of fulfilling the requirements of the tender. This role is not expected to change, as this knowledge exceeds the expectations of what the system may achieve. However, the use of GE/SE semantic ontology to mark tenders and services, and to create clusters based on matches between, will be performed in an automated manner and given a predictive score, and the facilitator will select an appropriate cluster based on their expert knowledge, making changes if necessary.

3.2.2. Final list of TANET Trial BPI's

So, based on the various Business Processes the following part present for each BP:

- The objectives of the BP,
- The AV/DV related to the objectives
- The Business PI's
- The AS IS value (current value) of the BPI
- The Target (expected value) at the end of the AV/DV implementation

In order to show the common framework, all the BP will be presented with the same table.

BS1: Import of Tender Opportunities

Objectives	To increase the number of business opportunities	
Decision variables	To use the TANET FITMAN platform	
Performance Indicator	Ratio: Tenders accrued monthly after / before the **DV/AV** implementation during a period*	
	AS IS	**Target**
	0-3	15-20

Figure 12 BPI's for TANET BS1

***Business Indicators template:*	
Indicator Name	Tenders accrued monthly
Purpose:	The more tenders accrued, the more clusters can be created which increases productivity
Format :	Integer
Information needed (Source of data)	Data gathered from Sematronix facilitator
Calculation Processing (Formula)	
Required evolution (Target)	15-20. Based on current UK government tender release rate, tenders applicable to Sematronix processes. Increased tenders mean more business for Sematronix and this defines the increased value in absorbing more in a time frame.
The owner (Who measures)	Sematronix
Period	Monthly
Actions to react depending on the value of the PI	None planned
Description mode	

Objectives	To reduce the time to integrate the new business opportunity sources	
Decision variables	To expand the platform's usability and open it to more facilitators	
Performance Indicator	Ratio: Number of Active Facilitators after / before the **DV/AV** implementation during a period*	
	AS IS	**Target**
	1	3

Figure 13 BPI's for TANET BS1

***Business Indicators template:**	
Indicator Name	# of Active Facilitators
Purpose:	Having more active facilitators means that Sematronix can negotiate more clusters in the same time frame, directly increasing its productivity.
Format :	Integer
Information needed (Source of data)	Number of facilitators registered on Sematronix SMECluster system
Calculation Processing (Formula)	
Required evolution (Target)	3 – current facilitator plus two additional interested parties identified. More facilitators can create and manage more clusters and so provide more business
The owner (Who measures)	Sematronix
Period	Once, 6 months after implementation of DV.
Actions to react depending on the value of the PI	None planned
Description mode	

Objectives	To increase the number of services offered for tender matching on the platform	
Decision variables	To use the TANET FITMAN platform	
Performance Indicator	Ratio: Number of Registered service providers after / before the **DV/AV** implementation during a period*	
	AS IS	**Target**
	23	80-115

Figure 14 BPI's for TANET BS1

**Business Indicators template:	
Indicator Name	# of Registered service providers
Purpose:	More service providers on the SMECluster system can complete a greater number and wider variety of tenders, increasing the strategic target of SMECluster
Format :	Integer
Information needed (Source of data)	Sematronix database of service providers
Calculation Processing (Formula)	
Required evolution (Target)	80-115. Over 1000 local businesses, many of which fit Sematronix's target business profile. Any business is in theory a target, but in short term businesses with interest in VF strategies have been identified
The owner (Who measures)	Sematronix
Period	Once, 24 months after DV implementation.
Actions to react depending on the value of the PI	
Description mode	

BS2: Improvement of facilitator role

Objectives	To reduce the time taken in an end-to-end clustering operation	
Decision variables	To use the TANET FITMAN platform	
Performance Indicator	Ratio: End-to-end clustering time (hours) after / before the **DV/AV** implementation during a period*	
	AS IS	**Target**
	6	2

Figure 15 BPI's for TANET BS2

***Business Indicators template:**	
Indicator Name	End-to-end clustering time
Purpose:	The less time taken to complete a cluster, the greater the number of clusters can be completed in the same time frame
Format :	Integer
Information needed (Source of data)	Interview with Sematronix managers
Calculation Processing (Formula)	
Required evolution (Target)	1.5 hours. It is believed that with automation, creation of clusters can be completed in minutes. Adding this to the amount of time required to contact SMECluster members and receive a response, this is a strong estimate.
The owner (Who measures)	Sematronix
Period	Once, monthly
Actions to react depending on the value of the PI	None planned
Description mode	

Objectives	To decrease the time taken to enter a new tender into the system	
Decision variables	To use the TANET FITMAN platform	
Performance Indicator	Ratio: Automated tender input time (minutes) after / before the **DV/AV** implementation during a period*	
	AS IS	**Target**
	30	1

Figure 16 BPI's for TANET BS2

**Business Indicators template:	
Indicator Name	Automated tender input time
Purpose:	The time taken to input tenders is time that cannot be spent on other operations such as negotiating and completing tenders.
Format :	Integer
Information needed (Source of data)	Interview with Sematronix facilitator
Calculation Processing (Formula)	
Required evolution (Target)	< 1 minute. Use of FI technology to automate creation of tenders and semantic annotation should make tender input time negligible. Automated tender input frees up facilitator time for more valuable processes, and increases the likelihood of new facilitators showing interest.
The owner (Who measures)	Sematronix
Period	Once, monthly
Actions to react depending on the value of the PI	
Description mode	

The table below shows the synthesis of the BPI's for the TANET Scenarios:

Business indicator name	Related to scenario nr	As is value defined (x)	Target value defined (x)	Type of BPI (P, C, LT, Q)
1 Tenders accrued monthly	1	0-3	15-20	P
2 # of Active facilitators	1	1	3	P
3 # of Registered service providers	1	23	80-115	P
4 End-to-end clustering (hours)	1	6	2	LT
5 Automation of tender input (minutes per tender)	1	30	<1	LT

Figure 17 Synthesis table for TANET BPI's

3.3. COMPLUS Trial

3.3.1. Reminder of COMPLUS Trial BS and BP

This Trial aims to improve the control components of light systems for locations and plants in terms of software and hardware with the aim of developing the concept and the platform for a collaborative Front-Loading, for a network of SMEs for production of special LED Lights and LED Lighting Systems.
So, their main objectives in FITMAN project are to improve the reactivity of the network and to secure and improve their information system.

1St Business Scenario: Transparency and consistency of ITs and documents
This Scenario includes two business processes:

- Document Sharing
- Sharing best Practices in reference processes and ITs

2nd Business Scenario: Network Transparency for more efficient Suppler Search
This Scenario includes two business processes:

- Information Entry for Network Configuration
- Supplier Search

3.3.2. Final list of COMPLUS Trial BPI's

So, based on the various Business Processes the following part present for each BP:

- The objectives of the BP,
- The AV/DV related to the objectives
- The Business PI's
- The AS IS value (current value) of the BPI
- The Target (expected value) at the end of the AV/DV implementation

In order to show the common framework, all the BP will be presented with the same table.

BS1: Transparency and consistency of ITs and documents

Business Scenario	Transparency and consistency of ITs and documents			
Business process	Document Sharing		Sharing best Practices in reference processes and ITs	
Operational objectives	Providing a platform for document sharing		Providing a platform for sharing best practices in reference processes and ITs	
Decision variables	To use the LED Trial to provide the service		To use the LED Trial to provide the service	
Performance Indicator	Ratio: Decrease of mistakes and errors after / before the **DV/AV** implementation during a period*		Ratio: Number of standardized IT landscape, after / before the **DV/AV** implementation during a period*	
	AS IS	**Target value**	**AS IS**	**Target value**
		20% less	0	3

Figure 18 BPI's for COMPLUS BS1

***Business Indicators template:**	
Indicator Name	*Decrease of mistakes and errors after / before the implementation during a period*
Purpose:	*This indicator should provide a mean to measure the impact of implementing a solution for document sharing*
Format :	*Percentage*
Information needed (Source of data)	*Effort and tools for document sharing and number of mistakes due to versioning and non-consistent documents*
Calculation Processing (Formula)	*Directly available from the Network Manager*
Required evolution (Target)	*Decrease of making errors and mistakes up to 20%*
The owner (Who measures)	*Network Manager*
Period	*Continuously and every time when there is a need for document sharing and versioning control*
Actions to react depending on the value of the PI	*The Solution will evolve as the amount of information and documents is being enriched.*
Description mode	

**Business Indicators template:	
Indicator Name	*Number of standardised IT landscape, after / before the implementation during a period*
Purpose:	*This indicator should provide a mean to measure the impact of implementing a solution for sharing the best practices and IT Solutions to lead to more standardised IT and Process landscape in the LED network.*
Format :	*Integer (0/ n.a)*
Information needed (Source of data)	*Reference Business Processes and IT Systems in use*
Calculation Processing (Formula)	*Directly available from the Network Manager*
Required evolution (Target)	*Increase of Reference Business Processes and IT systems*
The owner (Who measures)	*Network Manager, IT Manager*
Period	*Continuously and every time when a new supplier enters the network and is looking for an information regarding best practice business process or IT system*
Actions to react depending on the value of the PI	*The Solution will evolve as the amount of information and documents is being enriched.*
Description mode	

Figure 19 BPI's for COMPLUS BS1

BS2: Network Transparency for more efficient Suppler Search

Business Scenario	Network Transparency for more efficient Suppler Search			
Business process	Information Entry for Network Configuration		Supplier Search	
Operational objectives	To provide a service that allows transparent and visual Network Configuration		To provide a service that allows more efficient supplier search	
Decision variables	To use the LED Trial for providing the services		To use the LED Trial for providing the services	
Performance Indicator	Ratio: Average time for configuration and data entry of LED Network after / before the **DV/AV** implementation during a period*		Ratio : Average development time for searching of the supplier in the LED Network after / before the **DV/AV** implementation during a period*	
	Ratio: Level of Transparency of the Network according to the trial requirements after / before the **DV/AV** implementation during a period* 1- no transparency 5- full transparency			
	AS IS	**Target value**	**AS IS**	**Target value**
	n/a	1 hour	1-3 months	< 1 month
	AS IS	**Target value**		
	1	4		

Figure 20 BPI's for COMPLUS BS2

**Business Indicators template:	
Indicator Name	*Average Time for configuration and data entry of LED Network before and after the solution*
Purpose:	*The should provide a mean to measure the impact of the solution to transparently configure the supply network including stakeholders, products and dependencies*
Format :	*Integer*
Information needed (Source of data)	*Effort and tools for transparency of LED Network*
Calculation Processing (Formula)	*Directly available from the Network Manager*
Required evolution (Target)	*1 hour. This improvement will have an impact to the decrease the time-to-market in the early design phase of the product*
The owner (Who measures)	*Network Manager*
Period	*Every time there is a new stakeholder or a product in the network*
Actions to react depending on the value of the PI	*The Solution will evolve as the amount of information and data is being enriched.*
Description mode	

Figure 21 BPI's for COMPLUS BS2

**Business Indicators template:	
Indicator Name	*Level of transparency of the network according to the trial requirements*
Purpose:	*This indicator should provide a mean to meassure the impact of the solution to achieve transparency beyond the 1st tier supplier*
Format :	*Integer (1/5)*
Information needed (Source of data)	*Effort and tools for achieving the transparency of LED Network*
Calculation Processing (Formula)	*Directly available from the Network Manager*
Required evolution (Target)	*4 – this value shows an significant improvement of the network transparency*
The owner (Who measures)	*Network Manager*
Period	*Continuously and every time there is a new stakeholder or a product in the network*
Actions to react depending on the value of the PI	*The Solution will evolve as the amount of information and data is being enriched.*
Description mode	

Figure 22 BPI's for COMPLUS BS2

**Business Indicators template:	
Indicator Name	*Average time for searching of the supplier in the LED Network before and after the solution*
Purpose:	*This indicator should provide a mean to measure the impact of the solution to search for suppliers within the network beyond the tier 1 suppliers*
Format :	*Integer*
Information needed (Source of data)	*Effort and tools for searching of suppliers within the LED Network*
Calculation Processing (Formula)	*Directly available from the Network Manager*
Required evolution (Target)	*Decrease to less than 1 hour*
The owner (Who measures)	*Network Manager*
Period	*Continuously and every time when there is a need to search for a supplier in the network*
Actions to react depending on the value of the PI	*The Solution will evolve as the amount of information and data is being enriched.*
Description mode	

The table below summarise the various indicators with their type.

Business Scenario	Business Process	Business indicator name	As-Is value	Target value	Type of BPI (P, C, LT, Q)
BS_1	BP_1	Ratio: Decrease of mistakes and errors after / before the **DV/AV** implementation during a period*		20% less	Q
	BP_2	Ratio: Number of standardized IT landscape, after / before the **DV/AV** implementation during a period*	0	3	P
BS_2	BP_3	Ratio: Average time for configuration and data entry of LED Network after / before the **DV/AV** implementation during a period*	n/a	1 hour	LT
		Ratio: Level of Transparency of the Network according to the trial requirements after / before the **DV/AV** implementation during a period*	1	4	P
	BP_4	Ratio : Average development time for searching of the supplier in the LED Network after / before the **DV/AV** implementation during a period*	1-3 months	<1month	LT

Figure 23 Synthesis table of COMPLUS BPI's

3.4. Synthesis of BPI's Trial

In order to demonstrate that the number of BPI's is different from company to another depending on the size and on the strategy of the company, a synthesis table is proposed.
So, the table below shows a synthesis of all the BPI's that are defined for the three VF Trials and their type.

	Productivity	Lead Time	Cost	Quality	Total
Virtual Trials	APR: 1	APR: 5	APR: 4	APR: 1	**11**
	TANET: 3	TANET: 2	TANET: 0	TANET: 0	**5**
	COMPLUS: 2	COMPLUS: 2	COMPLUS: 0	COMPLUS: 1	**5**
Total	**6**	**9**	**4**	**2**	**21**

Figure 24 Synthesis table of Virtual Trial BPI's

One can see that almost half of BPI's are related to leadtime in the sense that the main objective of interoperability between Business Processes through IT system modifications aims to be more efficient and then to reduce BP lead time.
But we can also observe that the other performance criteria are also covered. Of course, the quality criteria is not evident to address using FITMAN results but for some BP, this was clearly identified.

4. CONCLUSIONS & NEXT STEPS OF IMPLEMENTATION

This deliverable aims at presenting the concrete results of simplified ECOGRAI application to the Virtual Factory trials in order to get the final set of BPI's that will be monitored in order to measure the adoption and the benefits of the FITMAN results in the business scenario and business processes considered in each Virtual Factory trial.
This task was very pragmatic with taking into account the knowledge of trial in performance measurement, their objectives in the FITMAN project and their own strategy.
This task was carried out by academic partners (Lyon2 with APR, IPK with COMPLUS, Coventry and control 2K with SME's cluster) coordinated by University of Bordeaux and under their continuous validation and the one of IVlab as keepers of the method.

This deliverable aimed also to propose answers to the review recommendations.
The first recommendation concerned "Objective targets and definition of success". In order to answer to this recommendation, we asked the trials to define the targets they expect after the implementation of FITMAN results.

The second recommendation concerned "Cross-trial assessment methodologies". This deliverable shows also that common principles and framework, through the same methodology, are applied to all the FITMAN trials but that cross-trial assessment is limited because their BS/BP are different as well as their objectives in the project and the FITMAN results that they are going to implement. The different dynamic of the controlled system is also a reason of the difference in the BPI's.
However, this cross evaluation will be performed in particular with comparing the AS IS and the TO BE values on one hand and the TO BE with the target values. Common conclusions will be drawn for the three Virtual Factory trials.

The last recommendation concerned the evidence and confirmation that a suitable level of trials' data will be made available with avoiding data confidentiality problems. In order to answer, we proposed only ratio of performance in order to avoid confidentiality problems.

The obtaining of the final list of BPI's was an iterative process because this allowed also for the trials to think about the expected results that they want to achieve in detail in the implementation of the FITMAN results, in liaison with their respective strategy.

Several next steps could be envisaged. Some of them will be reported in the next version of D6.4 at M14 and others in D7.1 at M21.
The first one concerns the finalization of the BPI's implementation in conjunction with the trial owners and the owners of the business scenario and process in the trials. Even if most of the data are available, the BPI's are not completely implemented. This implementation will be finished at M14 and reported in the second version of D6.4.

The second one concerns the modelling of the trials business process and decision system in order to indicate clearly the steps of the process involved in the performance improvement and the decisions related to the performance evaluation.

The third step concerns the measure of the future (TO BE) performance that will be reported in D7.1 as well as the value of technical indicators that will be only measurable after the FITMAN results implementation. These data collected during the Trial implementation and measurement period will be extremely important as an input for WP7 "Lessons learned, recommendations, best practices", which will use the main findings of WP2 "Verification and

Validation Method" in order to merge together and analyze the final results of the Trials experimentation developed in WP4 and provided in the present document.

5. ANNEX I: REFERENCES

- FITMAN "Deliverable D2.1 - FITMAN V&V Generic Method and Criteria Identification", 2013.
- FITMAN "Deliverable D2.2 - FITMAN V&V Business and Technical Indicators Definition", 2013.
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