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**Research Report**

## Stakeholder Engagement and Integration into the Framework

IPACSO - Innovation Framework for ICT Security Deliverable, No. 4.2 B

*Suggested Citation:* Jentzsch, Nicola (2015) : Stakeholder Engagement and Integration into the Framework, IPACSO - Innovation Framework for ICT Security Deliverable, No. 4.2 B, Waterford Institute of Technology (WIT), Waterford, <http://ipacso.eu/downloads/category/9-ipacso-project-public-deliverables.html?download=26:state-of-the-art-in-cyber-security-economics-stakeholder-engagement-integration-d42b>

This Version is available at:

<https://hdl.handle.net/10419/126225>

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## Deliverable D4.2 B

### Stakeholder Engagement and Integration into the Framework

Project Acronym: IPACSO

Document Author: Dr. Nicola Jentsch (DIW Berlin)

Project Full Title: Innovation Framework for Privacy and Cyber Security Market Opportunities

Grant agreement number: 609892



## Document Control Sheet

Project Number	<b>609892</b>	
Project Acronym	<b>IPACSO</b>	
Work-package:	<b>4</b>	
Last Version:	<b>January 2015</b>	
Issue Dates:		
Version		

## Classification

This report is:

Draft	
Final	X
Confidential	
Restricted	
Public	X

Partners Owning	DIW Berlin
Author	Dr. Nicola Jentsch (DIW Berlin, Germany)
Reviewer	Zeta Dooly (November 2014)

## Notes

This report is a project internal service document accompanying the original output D4.2 on horizontal and vertical market analysis.

This document does not reflect the opinion of DIW Berlin.

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### Executive Summary

This document is an IPACSO service document for the European Commission. It's main purpose is to outline the contribution and integration of work package 4 into the IPACSO framework. Moreover, it explains stakeholder engagement and the economic incentivization techniques for enabling the adoption of the IPACSO framework. Due to the fact that such incentivization is not directly related to a market and incentives analysis, it was set aside in order to obtain an extra document (deliverable), which is also explicitly mentioned in the IPACSO Description of Work.

## Overview of IPACSO Project

Innovation drives new product realisation and development. Significant opportunities exist for innovation in the privacy and cyber security (PAC) technology space, yet complex market, regulatory, policy, commercial, and economic considerations create several barriers to transforming research outputs into market-centric product and service applications.

In response, Innovation Framework for Privacy and Cyber Security Market Opportunities (IPACSO) will develop a structured knowledge and decision-support innovation framework for identifying, assessing and exploiting market opportunities in the privacy and cyber security technology space. IPACSO will support security innovators, policy makers and research spectrum stakeholders in identifying, assessing and exploiting new ideas and research assets using innovation and market assessment best-practice and guidelines and bringing them to market. Particular emphases will be placed on providing better support for more advanced forms of innovation, particularly radical innovation that has the highest risk but provides the most significant opportunity for disruptive commercial impacts.

IPACSO is an EU-funded Co-Ordination and Support Action (CSA) project aimed at supporting Privacy and Cyber Security innovations in Europe. The key aim is to support ICT Security innovators with State of the Art innovation methodologies and best practices that improve their overall innovation process. IPACSO's main focus is on adapting existing innovation methodologies available in other domains and optimizing these approaches for the PACS market domains. Ultimately, IPACSO aims to combine innovation support modules based on established methods, with new innovation support approaches geared towards the specific needs of the European PACS marketplace where relevant. Market information of high-relevance will also be included in the project, supporting improved awareness amongst target PACS innovators.

Achieving project impact objectives can be challenging for ICT security research projects due to multiple factors and “pain points” described in our reports. We propose that PACS innovators increase the impact of their project results through the adoption & utilisation of the knowledge and methodologies found in the IPACSO innovation framework which addresses the following main goals:

- Assessment of the existing innovation processes used in the PACS domain via in-depth stakeholder engagement.
- Identification of a set of innovation framework requirements, interleaving improved innovation practices and case study scenarios, that support PACS domain concerns.
- Assessment of the existing economic barriers to innovation and identification of the appropriate economic incentives needed to increase security product and service adoption.
- Development of an appropriate knowledgebase and decision support approach that is transferrable to PACS technologies exploiting potential market opportunities.
- Development of effective training, exploitation and dissemination of the resultant IPACSO framework to target stakeholder groups, both during and beyond the project lifecycle.

IPACSO project activities are also aimed to lead towards a structured understanding of concerns considered in the context of wider ICT factors such as Cloud Computing, Big Data, emerging Internets

of Services (IoS), Internet of Things (IoT) among other macro trends. In order to fulfil project goals, the work plan is structured in a number of deliverables spread across the following Work Packages:

- **WP1 Project Management:** covers project management and co-ordination activities throughout IPACSO's project duration.
- **WP2 Market Analysis (focus in this document):** delivers a commercial assessment of the PACS domain, identifying the key barriers to effective innovation in bringing PACS technologies to market, supporting innovation framework requirements development and subsequent contributing to the development of the IPACSO framework. This deliverable (D2.2) forms part of this analysis as will be explained in further detail in the following section.
- **WP3 Framework Requirements:** will identify a set of innovation requirements necessary to develop an appropriate and responsive framework for supporting innovation needs around PACS products and services, using analysis of existing state of the art, and stakeholder engagement as a guide. Engagement with IPACSO's Innovation Advisory Board (IAB) members will form a core part of this effort.
- **WP4 Economic Incentives:** will assess current economic incentives and disincentives that influence PACS adoption at present, identifying how such economic factors can be modified to support better PACS innovation, and be reflected accordingly in IPACSO.
- **WP5 Framework Development:** will develop the core knowledgebase and decision-support modules that will form IPACSO, taking relevant findings from WP2, WP3 and WP4 as input.
- **WP6 Training, Exploitation and Dissemination:** will address and implement the training programme used to support adoption and learning around IPACSO, will support outreach and awareness around project activities, and will put a plan in place to support future use of IPACSO outputs.

From an outreach perspective, innovators that work alongside IPACSO will be able to increase their understanding of existing methodologies, best practices, market considerations, economic incentives and share key opinions alongside other peer experts in the PACS domain. Privacy and cyber security innovators who will be reaching out to IPACSO and align with the IPACSO Innovation Framework, will have a valuable set of tools at their disposal designed to help them break barriers to bringing security products to the market and collaborate with other innovators and business support organizations.

## Purpose of Deliverable (WP4, D4.2)

This deliverable forms part of IPACSO WP4 activities which are concerned with the analysis of current economic incentives by a state of the art assessment of cyber-economics (D4.1) and engagement with relevant stakeholders, to produce economic incentives templates that will feed directly into WP5, contributing to the innovation framework (D4.2 and D4.3).

More specific objectives are to:

- Identification and assessment of currently available PACS economics research issues, the basic economic incentives and mechanisms for adoption of privacy and security by relevant stakeholders (industry, consumers);
- Identification of the main PACS economic problems and barriers that currently exist for a market-mandated adoption of privacy and security technologies and procedures;
- Stakeholder analysis and cost-benefit analysis into the adoption of economic incentives to promote integration;
- Engagement with the IPACSO Innovation Advisory Board (multinationals, SME's, research spectrum, regulation/policy makers), assessing the key stakeholder segments in the security chain and their relationship with security;
- Successfully develop economic guidelines on adoption of privacy and security technologies and feed into the overall IPACSO Innovation framework development in WP5, to support the overall innovation framework;
- Utilize the Innovation Advisory Board (IAB) to gain feedback on the outputs coming from T4.3 – economic incentives guidelines, for further guidance and feedback.

These goals are to be achieved in a step-wise process involving the three tasks, 4.1, 4.2 and 4.3. In particular during the course of the project, it became clear that the IPACSO's knowledge base needs to include information that helps to direct efforts in Europe towards more successful cyber-security and privacy innovations.

**Deliverable 4.2 (“Horizontal and Vertical Analysis of Privacy and Cyber-Security Markets”)** provides an in-depth discussion of economic incentives, stakeholder engagement and market opportunities in privacy and cyber-security.

Deliverable 4.2 combines activities from T4.2 and D5.1 in particular, but also considers IPACSO outcomes from broader project perspective.

Key aspects of this D4.2 are:

- Core analysis of horizontal and vertical relations in privacy and cyber-security markets and economic incentives at the firm as well as the industry level
- Engagement and assessment of stakeholders in the privacy and security chain and their relation to privacy and cyber-security in the ICT sector
- Discussion of innovation value chain connecting inputs and outputs in the production of privacy and cyber-security goods and services as well as their relation to economic incentives

- Provide a broad assessment of the costs and benefits derived from the stakeholder interviews of the adoption of key incentive schemes to further privacy and cyber-security markets.

The overarching aim of the D4.2 analysis is to provide specific knowledge and less generalities regarding privacy and cyber-security markets and to further **market knowledge of PACS innovators**, and to feed into the priorities within the proposed IPACSO framework.

**Other WP4 Activities** – WP4 activities supported the development of the Framework Requirements in WP3 by channelling economic knowledge into the Framework. Moreover, there is an extra document available on the integration of WP4 task 4.1 activities into WP5. Further, other activities of the WP4 leader included the review and commentary on NIS outputs, in particular the review and input to the NIS Platform WG3 Business Cases and Innovation Paths report.

**Linkage of WP4 with WP3/WP5 IPACSO outputs** – Activities in WP4 are complementary and to some extent interacting with the market analysis in WP3 and WP5. However, there is little overlap, as at the broader level the perspective differs (e.g. broad focus compared to specialized focus) and in other cases the scope differs (e.g. WP4 particularly includes privacy markets). WP4 in addition provides applied tools for the analysis of horizontal and vertical relations. The author included content provided in WP5 by transforming it into a template.

While WP3 is concerned with assessing the general innovation state of the art, and to what extent existing best practice can be leveraged into the PACS domain. WP4 (D4.2) provides an analysis of the **Privacy and Cyber-Security Innovation Value Chain** and case studies of procedures and incentive schemes applied in the PACS domain.

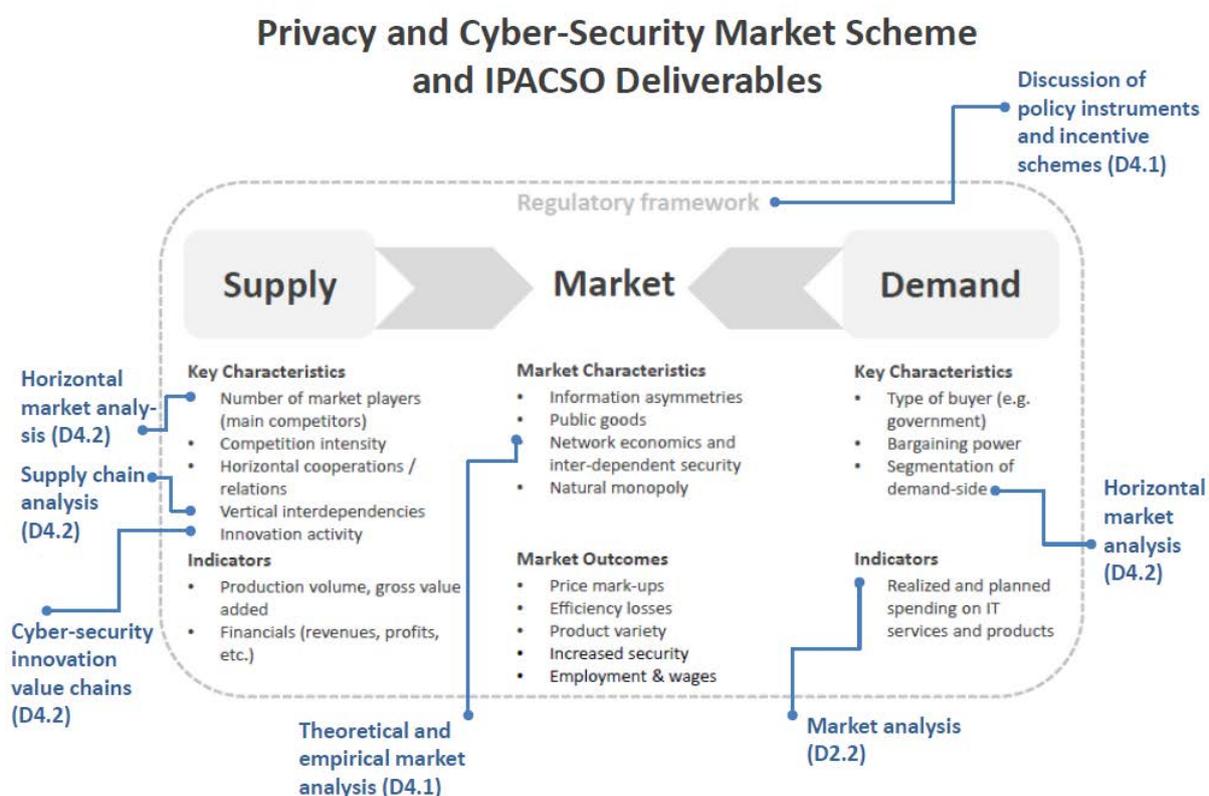
**Linkage with WP2** – Parts of the original content of WP4 was provided at an early stage to the IPACSO team and the editor of WP2 and was used in Section 3 the deliverable D2.2.

**D4.2 linkage to original IPACSO DoW text** – The D4.2 deliverable broadly follows the original objectives outlined in T4.1, T4.2 in the IPACSO Description of Work (DoW).

In particular, the analysis included desk top research, scanning and classification of the current relevant literature. The academic perspective (including analysis of economic experiments) employed in D4.1 is complementary to the work conducted in other areas of the IPACSO project, and complements templates such as Nine Forces and PESTLE analysis. During course of research it proved very important to obtain clarity about the market under scrutiny (i.e. privacy and cyber-security markets) as well as the horizontal and vertical relations. The stakeholder interviews were focused on those including the innovation process. Less important, however, where cost-benefit analyses for the reason that stakeholders either did not feel confident to do such analyses or that no cost estimates could be provided as no literatures existed in this field (e.g. a research study on costs/benefits of tax credits for cyber-security investments). However, what could be provided in that respect was a general assessment by stakeholders of the importance and usefulness of these measures as well as the preference of/by stakeholders of specific incentive schemes.

**WP4 Research Approach** – The analyses conducted in D4.1 and D4.2 are based upon an intensive scan of the literature spanning from studies on identity theft and cyber- crime costs to the analysis of economic experiments on privacy. Moreover, given the development of the project and the direction of the project leadership, specific original plans proved to be unnecessary (such as conducting an experiment on a specific question with respect to innovation adoption). The desk research aside, there were also extensive discussions with stakeholders in the main industries surveyed. This enabled a tailored proposition of models of horizontal and vertical analyses. Interaction with the IAB Board in particular proved to be valuable for the development of the **Privacy and Cyber-Security Innovation Value Chain**. This report benefited greatly from the stakeholder’s sharing of information.

The following scheme outlines in brief the relation of the two deliverables D4.1 and D4.2 to the developed Privacy and Cyber-Security Market Scheme. It enables the reader to see what is covered in the different deliverables and to what deliverable he/she needs to turn in order to find the information of interest.



## I. Introduction

During the course of the IPACSO project it became clear that the incentive-focused approach proposed in the IPACSO Description of Work (DOW) must be implemented at two levels: the level of the framework adoption as well as within the framework as integrated component of the framework.

**Figure 1 Overview of IPACSO Framework**

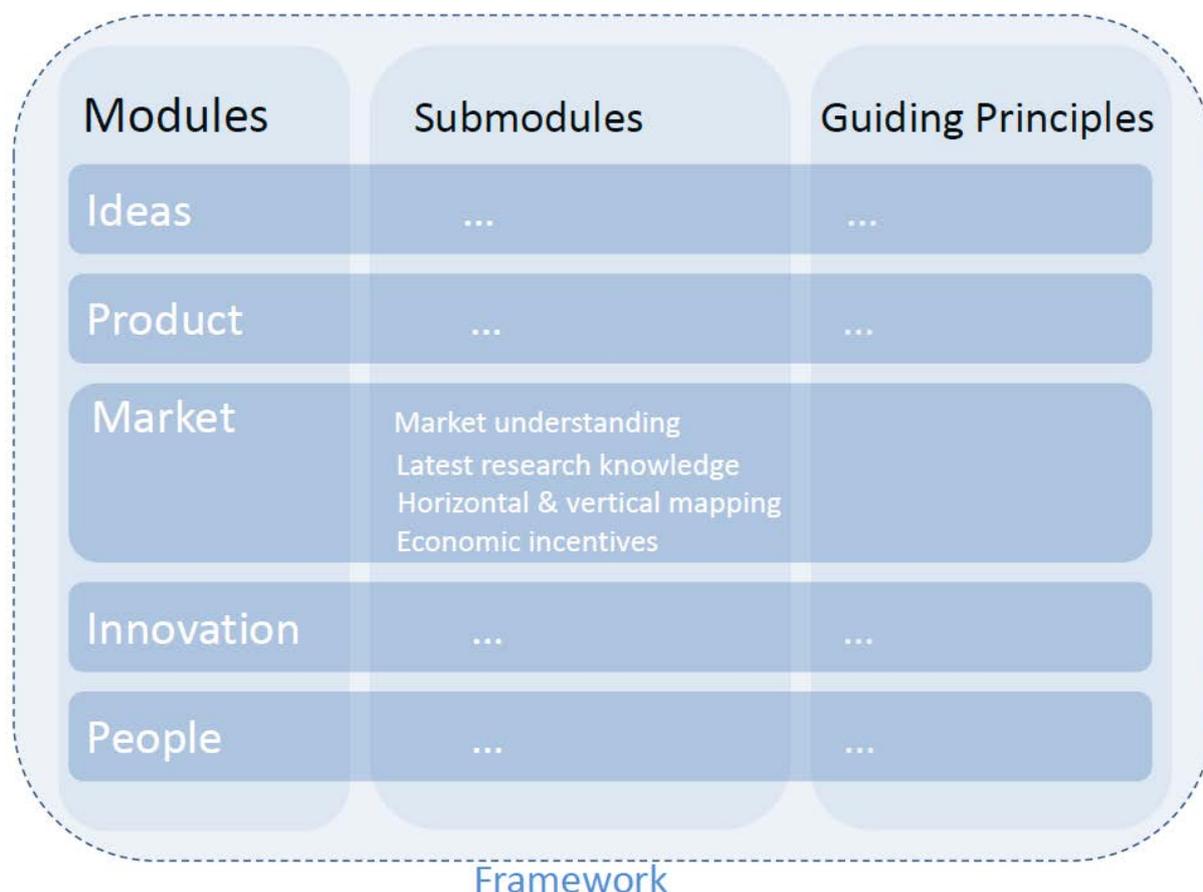


Figure 1 shows the framework and the different components. “Two levels” means that market players can be incentivized for the adoption of the IPACSO framework. Moreover, they may also incentives to innovate or to adopt greater precautions by investing more in cyber-security products and services.<sup>1</sup> Unfortunately, the DOW is not clear in this respect. This document therefore summarizes:

- the instruments for incentivization of PACs adoption (D4.1) as well as
- the instruments for IPACSO framework adoption (D4.1 and D4.2).

<sup>1</sup> For example, instead of choosing a call center in India, Symantec could have processed payment card information of its clients in Europe, potentially at a higher price (see [http://news.bbc.co.uk/2/hi/uk\\_news/7953401.stm](http://news.bbc.co.uk/2/hi/uk_news/7953401.stm))

## II. Economic Incentives to Adopt Privacy and Cyber-Security

There are a number of policy instruments that can impact on economic incentives of market players by changing their cost-benefit trade-offs. These have been discussed in detail in the IPACSO Deliverable 4.1. Therefore, greater detail is not necessary here. However, in order to give an overview of incentive structures that have been reviewed, the output created in D4.1 needs to be referenced here.

**Table 1 Incentivization Schemes**

Character	Instrument
<b>Mandatory</b>	
	Adjustment of liability of firms for duty of care / diligence
	Data breach notifications
	Install and clarify property rights to personal data
<b>Mandatory or voluntary</b>	
	Trust marks and technical security seals
	Information sharing of incidence information
	Promotion of cyber insurance
	Care and diligence standards
<b>Voluntary</b>	
	Privacy by design and security by design
	Increased tax credit for cyber security investments
	Accelerated cost recovery reductions on cyber security investments
	Funding of research projects at firms
<b>Other measures</b>	
	Establish personal data as economic resource, which is an object of negotiation among transaction partners
	Increase consumer education with regard to data protection/privacy, increase awareness of risks
	Educational measure to create risk awareness among firms

Source: The author.

The relationship with the IPACSO project is that the greater the incentives to adopt privacy and cyber-security technologies, the greater the demand from the downstream industries for such products as well as for updates and other innovations of such products.

**By 2014, there is an extensive literature on the effectiveness and usefulness of many of the above measures and the Deliverable D4.1 provides the interested person with an overview.**

### III. Economic Incentives to Adopt the IPACSO Framework

European policymakers can support the uptake of the IPACSO-framework with a number of incentive-setting mechanisms (so-called incentivization) that may activate innovation capacity in the PACs industry through the up-take of this framework. As stated in the IPACSO Deliverable 4.1, an economic incentive provides a motivation for an action that renders a (positive) payoff for the actor. Payoffs are typically outcomes of cost-benefit trade-offs. A rational actor seeks the optimal choice by maximizing payoff. Payoffs come in different forms:

- Monetary payoffs increase the economic wealth of the player;
- Non-monetary payoffs can increase the knowledge, reputation or popularity of the player (indirectly expected to contribute positively to future wealth).

Any actions to improve the adoption of the IPACSO framework should incorporate one of the above incentives or both in different combinations.

#### 3.1.1 DIRECT FINANCIAL SUPPORT

The European Commission could consider to direct financial and non-financial support to firms that have adopted the IPACSO framework. Such grants can occur in different forms.

- The first form is to integrate the application of IPACSO procedures by firms **into public procurement competitions as evaluation criteria**. This way, companies would have an incentive to start to use the IPACSO framework more actively;
- The second form is to provide **innovation grants (awards) to start-ups of companies** that have made most of their use of the IPACSO framework. Such grants can take the form of innovation awards, for example, as the IPACSO AWARD;
- A third form is to provide **research grants to firms** that actively participate in the IPACSO uptake and community exchange, by showing how IPACSO has improved their innovation processes; and finally
- **Directed credits** at competitive pricing are as well a direct financial support for the industry;
- **Tax exemptions** seem to not being a recommendable avenue, as the framework is too broad to prove whether it has been implemented in a specific innovation process or by a particular innovative firm.

#### 3.1.2 KNOWLEDGE SHARING IN THE IPACSO COMMUNITY

The second incentive of firms to adopt the IPACSO framework would be **beneficial knowledge spillovers as non-monetary reward for joining the IPACSO Community**. The European Commission could enable the adoption of the framework by creating a social network mechanism (within the NIS platform) that allows peer-to-peer sharing of innovation knowledge over a platform that could and should be associated with the NIS platform. The platform would enable firms to identify themselves with IPACSO and to have dedicated employees that share knowledge over the platform, such as key

factors that start-ups need to be aware of when entering a market, best practices in market analysis and accessible sources of funding.

In this community, national authorities could provide a road-map of contact points, which cyber-security and privacy innovators need to contact in order to roll-out their products if this is necessary.

Moreover, the network would enable to share with the communities ideas that failed. This way, unnecessary replication of efforts is avoided.

Groups could find themselves together and work on joint developments. For example, there is currently a disjoint community of privacy innovators in Europe. Brining these together could lead to valuable exchange among these innovators.

### **3.1.3 TIME SAVINGS**

Ideally, the IPACSO framework adoption is incentive by becoming a great reference source for privacy and cyber-security innovators. This way it would have the greatest impact. For example, take the case of a cyber-security innovator trying to decided follow through on an idea.

The European Commission should consider ways in which special expedited procedures in security clearances are provided to organizations that have proven to utilize IPACSO.

Other incentives could include the prioritized approval of applications or requests for clarifications of IPACSO users at national Data Protection Authorities or other relevant authorities. These could be channeled through the network and answer questions of many participants there at the same time.

**By 2014, there is very little literature on framework adoption.**

## IV. Economic Incentive Integration into the IPACSO Framework

By providing a knowledge resource of information to PACs innovators, the IPACSO framework at this stage already incorporates economic incentives to adopt it. However, it must become more popular and known in Europe as a knowledge resource. Firms can save on funds by utilizing the different resources entitled “ideas”, “products”, “market”, “innovation” and “people”.

In order to better understand the business as well as the market forces in the environment, entrepreneurs and would-be entrepreneurs operate in, it is suggest conducting a self-analysis involving the kind of horizontal and vertical analysis proposed herein.

**Horizontal mapping** will help to understand the operational environment, the competitive landscape as well as specific trends that an innovator has to pay attention to. For this realization, the innovator can use the **Economic Incentive Template for Horizontal Market Analysis** as well as the **Economic Incentive Template for the Operating Environment**.

**Vertical mapping** is equally important in order to understand vertical relations and incentives inherent in these relations. An analysis of this kind can shed light on important dependencies for inputs, for example, that might endanger the business model of the innovator, once access to those are capped.

**Table 2 IPACSO Market Module**

IPACSO Module	Explanation (references only within Work Package 4)	Guiding Principle
MARKET	Use the document D4.2 for horizontal analysis of your market	Understand the economics and the problems in the market
MARKET	Use the document D4.1 to understand the basic forces better that are at work in your market	Understand the forces at work in your market
MARKET	Use document 4.1 & 4.2 to understand the markets your clients operate in as well as their value chain positions	Understand the economic incentives of your clients
MARKET	Use document D4.2 for the vertical analysis	Understand your own position in the value chain
MARKET	Use document D4.2 for the vertical analysis	Understand your PACS innovation value chain

With this output, the different levels of perspective on incentives are summarized.