

1 Generalities

1.1 Aim

The PSS characterisation tool analyses a commercial offer in the Product-Service System (PSS) perspective. Integrating different aspects of the initial offer, the tool highlights differences between the initial business model and PSS characteristics as they are described in PSS literature. A special attention is paid on environmental characteristics. Automatic analysis performed by the tool is structured by a questionnaire covering seven different sections (products; services; organisation; client interface; strategy; market; environment). In this way it is possible to explore how close the offer comes to commonly accepted PSS features. The tool does not pretend to discern what is a good PSS or not, but rather it raises interrogations for practitioners that wish to improve the PSS qualities of the offer or to explore the possibility of moving the offer to PSS models.

1.2 Accessing the tool

The tool was developed by Orange with the cooperation of the Laboratory G-SCOP of the University of Grenoble Alpes and is available in free access on the [web-site](#). It has been designed for use by industry and PSS students and practitioners.

1.3 Storage and confidentiality

The tool is stored on Orange Labs' informatics servers. A case study is only accessible by the authors of the case.

2 How to use the tool?

This section details the main elements of the PSS tool and its structure.

2.1 Introduction

A brief overview of the different steps to use the tool is presented here:

1. Registration.
Open a new account.
2. Do a survey.
Add a new survey:  Fill out the contextual information of the offer and choose the template "PSS".
To restudy a survey: click on the survey name to open.
3. Answer the questionnaire.
Each section is subdivided into different sub-sections. For each section, click on the sub-sections and answer the questions.
When a section or a sub-section is completed, it is marked by the icon 
To get more information about the questions: 
4. Interpretation of the results.
When all the sections are filled up, the icon  appears and enables the user to access results. A list of thematic axes is proposed by the tool. The results can be visualised in the form of a radar chart or a table. A score (0 to 1) is assigned for each thematic axe and following a threshold value. Suggestions or comments about possible evolutions of the offer are provided by the tool. These can be viewed directly in the table, or by passing the computer mouse over each point in the radar chart. It is then up to the practitioner to interpret these general comments for the case under study and decide how that can help improve or take better advantage of the offer.

2.2 Sections

The analysis is structured into 7 sections:

- **Products** – physical products can be included in the offer (sold with the offer), or provided by the customer (not included in the offer). The tool distinguishes between products and networks or infrastructures.
- **Services** – services can be application domain services (the fundamental reasons for the offer) or supporting services. These later can be sales and formation or technical.
- **Organisation** – internal organisation and business skills within the providing company, the supply chain and partners, as well as the operating requirements are analysed.
- **Client Interface** – relations between the customers and the provider and provider interventions during operation.
- **Strategy** – contacts and strategies of evolution of the offer.
- **Market** – target market and acceptability

- **Environment** – the supply policy and environmental policy of the provider, together with product characteristics and other life cycle considerations.

Each section covers a set of sub-sections.

2.3 Questions

Questions are multiple-choice or single choice. Sometimes an answer is necessary; sometimes there may be no relevant answer for the case studied. Each question is defined by its label, description, help text, the answer choices and whether it is “multiple” choices or if “none” (no answer) is accepted.

The questions can be found in the annex of this document.

When the answer is not evident, then it is up to the user to decide whether to take a strict view or a more open interpretation. This may affect the suggestions proposed by the analysis done by the tool so that the user should interpret the results in this light.

2.4 Formulae

During analysis the tool calculates 118 formulae derived from the responses to the questions.

These formulae are transparent to the user and serve in the automatic analysis. They are accessible in the tool to the administrators only. Each formula is defined but a label, the formula description and the formula itself.

The formulae can be found in the annex of this document.

2.5 Characteristics

The analysis derives different parameters of the offer, called “characteristics”. The characteristics are given a score between 0 and 1. Le higher the score the closer the offer studied is assumed to be to PSS features in literature and for the environment. A threshold is assigned to each characteristic. Following the analysis, if the offer has a score above or below the threshold, different suggestions will be delivered to the user.

The complete list of characteristics available is transparent to the user and serves as a base for displaying results of the analysis.

The list of characteristics available is given in the annex; each characteristic corresponds to a formula (see annex for the expression of the formulae).

Table 1 - Repartition of the characteristics inside each category

| Category | Characteristics |
|----------|--|
| Products | 0 ; 1 ; 2 ; 3 ; 4 ; 5 ; 6 ; 7 ; 8 ; 9 ; 115 |
| Services | 10 ; 11 ; 12 ; 13 ; 14 ; 15 ; 16 ; 17 ; 18 ; 19 ; 20 ; 21 ; 22 ; 23 ; 24 ; 25 ; 26 ; 27 ; 28 ; 29 ; 30 ; 31 ; 32 ; 33 ; 34 ; 35 ; 36 ; 37 ; 38 ; 39 ; 40 ; 41 ; 42 ; 43 ; 44 ; 45 ; 46 ; 47 ; 48 ; 49 ; 50 ; 51 ; 97 ; 98 ; 99 ; 100 ; 101 ; 102 ; 103 |

| | |
|------------------|---|
| Organisation | 52 ; 53 ; 54 ; 55 ; 56 ; 57 ; 58 ; 104 ; 106 ; 107 |
| Client Interface | 59 ; 60 ; 61 ; 62 ; 63 ; 64 ; 105 |
| Strategy | 65 ; 66 ; 67 ; 68 ; 92 ; 93 ; 94 ; 95 ; 96 |
| Marketing | 69 ; 70 ; 71 ; 72 ; 73 ; 74 |
| Environment | 75 ; 76 ; 77 ; 78 ; 79 ; 80 ; 81 ; 82 ; 83 ; 84 ; 85 ; 86 ; 87 ; 88 ; 89 ; 90 ; 91 |

2.6 Thematic Axes

The results of the analysis are available in different thematic axes. After completing a survey, the user can choose between available thematic axes to visualise scores and suggestions proposed by the tool.

The thematic axes available are:

| Thematic Axe | Description |
|-------------------------------------|--|
| Potential / Risk – Products | The potential takes into account: Included Products (0); Infrastructures; Product Design; and Sharing. |
| Potential / Risk – Services | The potential takes into account: Service Intensive; Domain Service; Outsourcing / Knowledge Services. |
| Potential / Risk – Organisation | The potential takes into account: Infrastructures (8); Operational Performance; Supply Chain; Service Culture; and Internal Service Organisation. |
| Potential / Risk – Strategy | The potential takes into account: Adaptability of the offer, Innovation and Contract. |
| Potential / Risk - Client Interface | The potential takes into account: Client contact; Frequency of interventions; and Intervention needs. |
| Potential / Risk – Market | The potential takes into account: Acceptability to share and PSS market. |
| Potential / Risk – Environment | The potential takes into account: Environment control (88); Lifespan; Use phase; and End-of-life. |
| Potential / Risk | The overall potential takes into account the potentials / risks of: Products; Services; Organisation; Client Interface; Strategy; Market; Environment. |

3 ANNEX

3.1 Glossary

A brief explanation of the notions used as labels for the formulae is given below (the numeration corresponds to the formula number, but the terms have been regrouped by sections with a supplementary section concerning risks).

3.1.1 Products

0 - Included Products – Physical objects, or products, included in the offer, i.e. supplied in the offer. They can be distinguished from:

- Supporting Products (not included in the offer – provided by the customer)
- Networks and Infrastructures.

1 - IP share – At least one product included in the offer (IP) can be shared with other users. Sharing is taken, here, to cover leasing, renting and pooling as well.

2 - IP personal – At least one product is included in the offer (IP) is used by only one person.

3 - Expert user – An expert may be preferred to run the physical product of the offer as he is a trained professional.

4 - Supporting Products – Physical objects not included in the offer (e.g. physical Interfaces, remote control means, consumables...).

5 - SP share – At least one supporting product not included in the offer (SP) can be shared with other users. Sharing is taken, here, to cover leasing, renting and pooling as well. Even though they are not included in the offer, it is possible to share them with other users.

6 - SP personal – At least one supporting product not included in the offer (SP) is used by only one person.

7 - Can be shared – The overall potential of sharing products compared to personal products that are difficult to share (the term covers both included and supporting products)

8 - Infrastructures – PSS may rely on networks or infrastructures that provide the backbone for services in different offers. Here the term implies that the providing company actually manages a physical network or infrastructure to facilitate its services, as opposed to simple use of infrastructures as a client (e.g. a truck transporter only uses the road infrastructure whereas train transport may actually run the rails).

9 - Physical Products – Determines the presence of physical products in the offer. They may be included in the offer (0), supporting products (4) provided by the customer, or they can be physical infrastructures or networks (8).

115 - Product Design - Design characteristics of the products are highlighted in PSS literature: Remanufacturing; Remanufactured; Monitoring and Actuation (57); Performance Measure; Robustness (80); No rapid obsolescence due to Technical Innovation.

3.1.2 Services

To appreciate the potential of the services proposed by the PSS offer, a classification proposed by Gaiardelli et al. (2014), has been used. Gaiardelli proposed a classification along two axes according to the nature of the customer interactions (referred in the tool as G relations) and the types of PSS (G score in the tool) (see Figure 1). The tool uses this figure to ponder the different services provided.

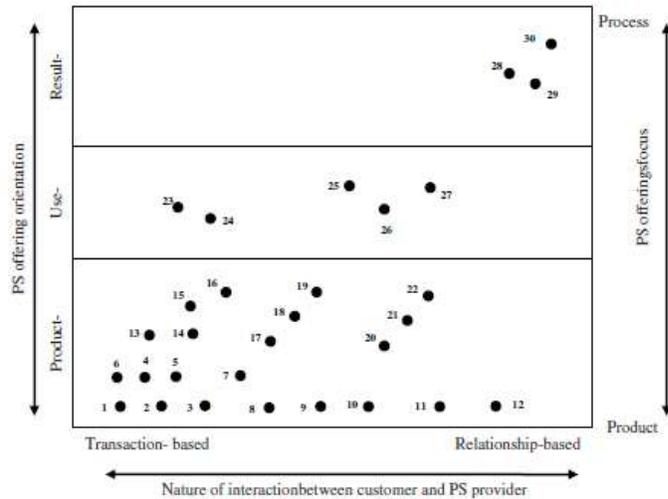


Figure 1 –The PS offering classification model: types representation (Gaiardelli et al., 2014)

| | |
|----|---|
| 1 | Home delivery |
| 2 | Product installation/startup, commissioning |
| 3 | Spare parts and consumables delivery |
| 4 | Updates/upgrades |
| 5 | Remanufacturing, Refurbishing, cleaning, safe keeping |
| 6 | Recycling and takeback |
| 7 | Financial services |
| 8 | Inspection and diagnosis |
| 9 | Repair and maintenance |
| 10 | Extended warranty |
| 11 | Preventive maintenance |
| 12 | Full maintenance contract |
| 13 | Documentation |
| 14 | Help Desk - hotline on product |
| 15 | Help Desk - hotline on process |
| 16 | Help Desk - hotline on business |
| 17 | Product-oriented training |
| 18 | Process-oriented training |
| 19 | Business-oriented training |
| 20 | Product-oriented consultancy |
| 21 | Process-oriented consultancy |
| 22 | Business-oriented consultancy |
| 23 | Leasing |
| 24 | Short term renting |
| 25 | Long term renting |
| 26 | Sharing |
| 27 | Pooling |

10 - Domain Service – Services provided by the firm and in relation with its core activity. Domain services are usually related to the provider activities as opposed to support which are there to support the implementation of the offer.

11 - Outsourcing / Knowledge Services –For services that directly intervene in the knowledge or know-how of the client (the provider directly intervenes in client activities providing know-how and knowledge that will relieve the client of a part of his management or operational activities). Or if it is outsourcing services (provided to relieve the client of a part of his activities).

97 - Domain Score – Gaiardelli score for the type of PSS with Domain services. The score takes into account Domain services and the type of contract, as well as Knowledge / Outsourcing services.

98 - Domain relation – Gaiardelli score for the customer interactions possible with Domain services. The score takes into account Domain services and the type of contract, as well as Knowledge / Outsourcing services.

99 - G Domain score – Constant representing the maximum possible value of Domain score.

100 - G Domain relation – Constant representing the maximum possible value of Domain relation.

12 - Sale –Financial services that are provided with the offer. They cover financial services and extended guarantees.

13 - Sale Score – Gaiardelli score for the type of PSS with Sale services.

14 - Sale Relation – Gaiardelli score for the customer interactions possible with Sale services.

15 – G sale score – Constant representing the maximum possible value of Sale score.

16 - G sale relation – Constant representing the maximum possible value of Sale relation.

17 - After Sale Service – After-sale services, for use (e.g. updating and upgrading the offer, spare parts) and end-of-life phases (e.g. reuse, recovery, remanufacturing and recycling).

18 - After-Sale Score – Gaiardelli score for the type of PSS with After-sale services.

- 19 - After-Sale Relation** – Gaiardelli score for the customer interactions possible with After-sale services.
- 20 - G After-Sale score** – Constant representing the maximum possible value of After-sale score.
- 21 - G After-Sale relation** – Constant representing the maximum possible value of After-sale relation.
- 22 - Customer Support Service** – Customer support services cover expert assistance, formation, hot-line services and user notices, so that the offer can be used more efficiently.
- 23 - Support Score** – Gaiardelli score for the type of PSS with support services.
- 24 - Support Relation** – Gaiardelli score for the customer interactions possible with support services.
- 25 - G Support score** – Constant representing the maximum possible value of support score.
- 26 - G Support relation** – Constant representing the maximum possible value of support relation.
- 27 - Delivery Services** – Delivery services cover physical installation and home delivery.
- 28 - Delivery Score** – Gaiardelli score for the type of PSS with Delivery services.
- 29 - Delivery Relation** – Gaiardelli score for the customer interactions possible with Delivery services.
- 30 - G Delivery score** – Constant representing the maximum possible value of Delivery score.
- 31 - G Delivery relation** – Constant representing the maximum possible value of Delivery relation.
- 32 - Run Service** – Services provided by the company and needed for the client to run (operate) the offer.
- 33 - Run Score** – Gaiardelli score for the type of PSS with Run services.
- 34 - Run Relation** – Gaiardelli score for the customer interactions possible with Run services.
- 35 - G Run score** – Constant representing the maximum possible value of Run score.
- 36 - G Run relation** – Constant representing the maximum possible value of Run relation.
- 37 - Repair Service** – Diagnostic and repair services provided during operation.
- 38 - Repair Score** – Gaiardelli score for the type of PSS with Diagnostic and repair services.
- 39 - Repair Relation** – Gaiardelli score for the customer interactions possible with Diagnostic and repair services.
- 40 - G Repair score** – Constant representing the maximum possible value of Diagnostic and repair score.
- 41 - G Repair relation** – Constant representing the maximum possible value of Diagnostic and repair relation.
- 42 - Maintenance Services** – Maintenance services provided during operation.
- 43 - Maintain Score** – Gaiardelli score for the type of PSS with Maintenance services.
- 44 - Maintain Relation** – Gaiardelli score for the customer interactions possible with Maintenance services.
- 45 - G Maintien score** – Constant representing the maximum possible value of Maintenance score.
- 46 - G Maintien relation** – Constant representing the maximum possible value of Maintenance relation.
- 47 - Technical Services** – Regroups After-Sale (17), Delivery (27), Operating (32), Repair (37) and Maintenance (42) services.
- 48 - Services** – The offer provides services (10, 11, 12, 17, 27, 32, 37, ou 42).
- 49 - Product + Service** – System with products (9) and services (48).

50 - Dematerialisation – The offer provides services (48) based on an infrastructure (8) without sales of product (0).

51 - Pure Service – The offer provides at least one service (48) and no product at all (9).

106 - Service Intensive – Gaiardelli score for the type of PSS with the different services included in the offer.

102 - Service relation score – Gaiardelli score for the customer interactions possible with the different services included in the offer.

101 - Gaiardelli Service relation – Constant representing the maximum possible value of Service Intensive score.

103 - Gaiardelli Service Score – Constant representing the maximum possible value of Service relation.

3.1.3 Organisation

52 - Service Experience – Services are already provided in other offers proposed by the company.

53 - Service Departments – The company possess an internal organisation facilitating or coordinating services in its different offers (departments, or their equivalent, are necessary for a large company, an identified person can be enough for a small company)

104 - Internal Service Organisation – Internal service organisation in the company is consistent with the PSS model. It depends on: Domain Service (10); Outsourcing / Knowledge Services (11); Customer Support Service (22); and Technical Services (47); and Service Departments (53).

107 - Service Culture – The company already develops different aspects of the culture of service in terms of: Service Experience (52); Service Departments (53); Service Intensive (106).

54 - Supply Chain Relations – The state of relations between the company and its partners (strong relations mean that the partners and the company are linked together to provide the offer.).

55 - Supply Chain Identification – Vision of the supply chain as seen by the company (a good identification of the actors of the supply chain facilitates design of the offer).

56 - Supply Chain – Covers supply chain relations (54) and identification (55).

57 - Monitoring and Actuation – The offer may be remote monitored or controlled at distance.

58 - Responsiveness – The company must reply rapidly to new client demands.

3.1.4 Client Interface

59 - Frequency of interventions – Frequency of interventions of the provider in the customer's company during the operation of the offer.

60 - Client relations – Levels of interactions with the customer available during the different lifecycle phases. Human relationship is opposed to on-line or hot-line (telephone platform).

61 - Follow-through – Depending on the nature of the offer, the provider need to help the customer (e.g. define customers' needs, adjust equipment, use equipment, ...)

62 - Performance and Satisfaction – Systems to measure customer satisfaction and the performance of the offer.

63 - Operational Performance – Evaluation of the follow-up of the performance of the offer during the operational phase. Covers: Monitoring and Actuation (57); Performance Measure (62); Follow-through (61).

64 - Intervention needs – Evaluation of the necessity to intervene during the operational phase. Depends on: Responsiveness (58), Follow-through of the offer (61); and client satisfaction (62).

105 - Client contact – Customer contact helps to build close client relations (60) through strong services (102) and according to client satisfaction (62).

3.1.5 Strategy

65 - Adaptability – Adaptability of the offer to change with new customer needs. A modular organisation of the offer means that the products and services can be interchanged easily, according to customer needs. Upgrading and updating allow new versions of the offer to become available without changing the offer.

66 - Innovation – Drivers of innovation: e.g. technical innovation; service innovation; or market innovation.

67 - Contract term – Contract duration of the offer, depending on the field of application. The terms suggested are an indication for most offers. For example in the aviation sector, long term means 20 or 30 years.

68 - Payment – Type of payment of the offer. This term covers the definition from Tukker (2004), as well as other types of payment:

- Pay per result: the client and provider in principle agree on a result, there is no predetermined product involved
- Pay per use: the product stays in ownership with the provider, is made available in a different form – the most important here is the function of the product
- Subscription: providing unlimited use during a certain period) we define 3 types of payment
- Product Sale: the business model is mainly geared towards sales of products, but some extra services may be added
- Advertising revenues: the PSS is (partially) free for use and expenses are covered by another third party source (e.g. advertising, ...)

92 - Contract – The contract period (67) and the type of contract (68) are considered here.

93 - Contract Score – Coefficient used in the Gaiardelli score for the type of PSS with Domain services.

94 - Contract Relation – Coefficient used in the Gaiardelli score for the customer interactions possible with Domain services.

95 - G Contract score – Constant representing the maximum possible value of Contract score.

96 - G Contract relation – Constant representing the maximum possible value of Contract relation.

3.1.6 Market

69 - Target Market – defines the degree of identification of the target market and the types: B2B (Business to Business); B2C (Business to Customer); B2G (Business to Government); Competitive; Large; Niche.

70 - Move to PSS – The incidence of moving the offer to PSS on its' products, services, target market, profits

71 - Loss of Property – The importance of ownership of the products for some customers.

72 - Product distribution – The way that the offer is provided to the customers (pooled, rented, leased or sold).

73 - PSS market – The understanding of the target market by the provider (69) and the conditions for converting to a PSS model (70).

74 - Acceptable to share – Acceptability of a possible loss of property (71); the current means of distribution (72: sale, leasing, pooling ...) as well as the presence of personal objects (included or supporting) in the offer (1; 6).

3.1.7 Environment

75 - Materials – The degree of control by the company on the raw materials needed to manufacture the products.

76 - Energy – The degree of control by the company on the use of renewable energy supplies to produce and run the offering.

77 - Purchase – Sustainable purchasing policy in the provider's company.

78 - Chart – Environmental chart in the provider's company.

79 - Ecodesign – The degree of control by the company on the use of eco-design methods.

80 - Robust – An estimation of the robustness of product design.

81 - Not worn – The products in the offer are not worn.

82 - Not fashion – The products in the offer are not fashion products.

83 - Use to the End – Product lifetimes of products in the offer compared to service provision time and obsolescence

84 - Train for Environment – Training clients may help them to use the offer better and cause less environmental impacts.

85 - Flow management – Different flows can be managed to reduce environmental impacts of the offer.

86 - Reverse logistics – Possible alternatives for the end-of-life phase of the products.

87 - Hazardous Substances – Hazardous substances used in products in the offer: e.g. Remanufacturing; Reuse; Tack-back; ...

88 - Environmental Control – The capacity the company has of improving the environmental impact of the offer depends on its capacity to control the materials (75) and energy (76) used in the offer, as well as purchasing policy (77). It also depends on the implication of the company in environmental (78) and ecodesign (79) policies.

89 - Lifespan – The potential lifecycle of the products is determined by product characteristics: robustness (80), portable (81) and fashion (82) objects, as well as service provision time (83).

90 - Use phase – Management of the use phase: control of flows (85); monitoring equipment (57); training of the user (84); follow-through (61) and sharing products (7).

91 - End-of-life – Reverse Logistics (86) and handling hazardous substances (87).

3.1.8 Risks

108 - Potential / Risk – Products – The potential / risk involved with the products of the offer is estimated, based on the responses to the survey questions, the potential takes into account: Included Products (0); Infrastructures (8); Product Design (115); and Sharing (7).

116 - Potential / Risk – Services – The potential / risk involved with the services of the offer is estimated, based on the responses to the survey questions, the potential takes into account: Service Intensive (106); Domain Service (10); Outsourcing / Knowledge Services (11).

109 - Potential / Risk – Organisation – The potential / risk involved with the organisation of the offer is estimated, based on the responses to the survey questions, the potential takes

into account: Infrastructures (8); Operational Performance (63); Supply Chain (56); Service Culture (107); and Internal Service Organisation (104).

111 - Potential / Risk – Strategy – The potential / risk involved with the strategy of the offer is estimated, based on the responses to the survey questions, the potential takes into account: Adaptability (65) of the offer, Innovation (66) and Contract (92).

110 - Potential / Risk - Client Interface – The potential / risk involved with the client interface of the offer is estimated, based on the responses to the survey questions, the potential takes into account: Client contact (105); Frequency of interventions (59); and Intervention needs (64).

112 - Potential / Risk – Market – The potential / risk involved with the target market of the offer is estimated, based on the responses to the survey questions, the potential takes into account: Acceptability to share (74) and PSS market (73).

113 - Potential / Risk – Environment – The potential / risk concerning the environment of the offer is estimated, based on the responses to the survey questions, the potential takes into account: Environment control (88); Lifespan (89); Use phase (90); and End-of-life (91).

114 - Potential / Risk – The overall potential / risk of the offer is the aggregation of the potentials / risks of each section: Product (108); Services (116); Organisation (109); Client Interface (110); Strategy (111); Market (112); Environment (113).

3.2 Questions

0.1.0 Physical objects not included in the offer but needed to run the offer

Does the offer need physical objects not included in the offer to run? (Such supporting products can be physical Interfaces, remote control means, consumables ...)

SC-NN

Supporting Products are not included in the offer and can be distinguished from

- Included in the offer (provided by the offer)
- Networks and Infrastructures

S9 Important for the offer

S10 Not important for the offer

S11 Not important at all

0.1.1 Sharing physical objects not provided in the offer

Can different users use the supporting products (not included in the offer)?

MC-NE

Objects can be used by one user but can also be shared with other users.

Sharing is taken, here, to cover leasing, renting and pooling as well.

Even though they are not included in the offer, it is possible to share them with other users (if the conditions are right)

S12 Shared by users, one after another

S13 Shared by different users simultaneously

S14 Only one user at a time

0.2.0 A physical network or infrastructure is used in the offer

Does the providing company manage a physical network or infrastructure to facilitate its offers?

MC-NE

PSS sometimes rely on networks or infrastructures that provide the backbone for services in different offers.

They are normally characteristic of the domain.

Here we include only networks or infrastructures that are controlled by the providing company.

S15 Telecom Network

S16 Transport Network

S17 Electricity Network

- S18 Water Network**
- S19 Building Complex**
- S20 Other**

1.0.0 Provider Domain Services

Does the company provide services in a special application field (constituting the major activity of the company)?

MC-NE

Domain services are usually related to the provider activities as opposed to support which are there to support the implementation of the offer

- S21 Telecoms**
- S22 Transportation**
- S23 Construction**
- S24 Road Works**
- S25 Computer**
- S26 Services for people**
- S27 Other Services**

1.0.1 Outsourcing and Knowledge Intensive Services

Does the offer provide services that directly intervene in the knowledge or know-how of the client? Or does it provide outsourcing services?

MC-NE

Outsourcing services are services provided to relieve the client of a part of his activities. Similarly, providing knowledge services means that the provider directly intervenes in client activities providing know-how and knowledge that will relieve the client of a part of his management or operational activities.

- S28 The offer contributes to knowledge or know-how specific to the client's business**
- S29 The offer supports one of the client's principle business activities**
- S30 The offer facilitates decision-making within the client's business activities**

1.1.0 Sales Services

What kind of financial services are provided with the offer?

Sale services cover financial services and extended guarantees.

MC-NE

- S31 Extended Guarantee**
- S32 Financial Services**

1.1.1 After-sale Services

What after-sale services are provided in the offer for the use and disposal phases?

After-Sale services cover usage phase services such as updating and upgrading the offer, spare parts and disposal phase recovery, remanufacturing and recycling.

MC-NE

- S33 End-of-Life Recovery / Recycling**
- S34 Remanufacturing**
- S35 Updating products or services with a newer, more recent, version**
- S36 Providing spare parts or consumables**

1.1.2 Training and Formation

What kinds of services are provided so that the offer can be used more efficiently?

MC-NE

Customer support services cover expert assistance, formation, hot-line services and user notices.

- S37 Expertise**
- S38 Customer Formation**
- S39 Hot line**
- S40 User Notice**

1.2.0 Delivery Services:

What services are provided by the offer during delivery?

MC-NE

Delivery covers installation and home delivery.

Software Applications often require installation of pilots or drivers.

Here, we do not include them when they are straightforward to install by the client.

S41 Installation Service

S42 Home Delivery

1.2.1 Operation:

How are services provided by the offer during operation (to run the products)?

Support from the provider is needed to run the offer

MC-NE

S43 Company agent

S44 Remote Operation

1.2.2 Diagnostic and Repair:

What diagnostic and repair services are provided by the offer during operation?

MC-NE

S45 Repair Service

S46 Diagnostic

1.2.3 Maintenance Services:

What maintenance services are provided by the offer during operation?

SC-NE

S47 Maintenance

S48 Preventive Maintenance

S49 Global Maintenance

2.0.0 The company provides other offers with services

Are services already provided in other offers proposed by the company?

SC - NE

The company has already the experience and know-how of providing services. In other offers provided by the company, services are already proposed.

The company already has a service culture.

S50 The company provides many services

S51 The company provides some services

S52 The company provides only a few services

2.0.1 The company is structured to facilitate services

Does the company possess an internal organisation to facilitate or coordinate services in its different offers?

MC - NE

Take into consideration the size of the company. A small company would not necessarily need a department, but at least someone specialised in that field.

S53 Customer Service Department

S54 Technical Service Department

S55 Commercial Service Department

S56 After Sales Department

S57 Client Formation Service Department

S58 Other relevant Service Departments

2.1.0 Relations between the company and its partners

Are relations between the company and its partners important?

MC - NE

Strong relations mean that the partners and the company are linked together to provide the offer.

S59 Strong relations before the installation of the offer BAB5

S60 Strong relations during operation BAB6

S61 Strong relations during the end of life phase BAB7

2.1.1 Identification of the supply chain

Does the company have a clear vision of its supply chain?

SC - NE

A good understanding and identification of the actors of the supply chain facilitates design of the offer.

S62 Supply chain is very well identified

S63 Only the immediate supply chain partners are identified

2.2.0 Remote Monitoring and Control

Is remote monitoring or control available in the offer?

MC – NE

S64 *Sensors with on-site monitoring*

S65 *Sensors with remote monitoring*

S66 *Control by Actuators*

S67 *Installing Sensors or Actuators is Possible*

2.2.1 Responsiveness of the Company

Is the rapidity of the company's reply to new client demands important?

SC - NN

S68 *Primordial*

S69 *Important*

S70 *Not so important*

S71 *Not important*

3.0.0 Contractual interventions of the company with the customer

How often does the company intervene in customer premises during operation of the offer?

MC – NE

S72 *Fixed frequency: at least once a year*

S73 *Fixed frequency: less than once a year*

S74 *Depending on remote monitoring indications*

S75 *Contractual interventions could be proposed*

3.0.1 Human relations between the company and the customers

What levels of interactions with the customer are available during the different life-cycle phases?

MC - NE

Human relationship is opposed to on-line or hot-line (telephone platform).

Strong human relations means that for example a technician actually goes to the site of operation and meets the customer

S76 *Strong human relationships during the installation of the offer*

S77 *Strong human relationships during the use phase*

S78 *Strong human relationships during the end of life phase*

S79 *Hotline interactions during operation*

S80 *On-line services or other impersonal interactions during operation*

3.1.0 Definition of the Offer and Follow-Up

Does the nature of the offer require that the provider has to help the customer?

MC – NE

S81 *Preliminary study to define customer needs*

S82 *The company must follow-up use and adjust equipment periodically*

S83 *There is a complex object to use in the offer*

3.1.1 Customer Feedback

How can the company follow customer satisfaction and performance of the offer?

MC – NE

S84 *System for measuring the performance of the offer*

S85 *System for measuring customer satisfaction*

4.0.0 The offer can be adapted to client needs

Is the offer adaptable to changing customer needs?

MC -NE

A modular organisation of the offer means that the products and services can be interchanged easily, according to customer needs.

Upgrading and updating allow new versions of the offer to become available without changing the offer

S86 *The offer can be upgraded or updated to satisfy customer needs*

S87 *The products of the offer can be changed according to customer needs*

S88 *The services of the offer can be changed according to customer needs*

4.0.1 Innovation of the offer

What are the drivers of innovation?

The drivers of innovation can be technical innovation, service innovation or market innovation. The benefits of technical innovation can be pondered in highly dynamic or competitive markets.

MC - NE

S89 *Opening new markets*

S90 *Service Innovation*

S91 *Technical innovation*

S92 *Technical innovation is tempered by high competition*

S93 *Technical innovation is tempered by fast evolution*

4.1.0 The contract term

What is the contract term of the offer?

SC - NN

The duration of the contract depends on the field of application. The durations are given as an indication for most offers. For example in the aviation sector, long term means 20 or 30 years.

S94 *No specified limit (automatic renewal)*

S95 *Long term (over 3 years)*

S96 *Medium term (1 to 3 years)*

S97 *Short-term (less than 1 year)*

S98 *Ends after sale*

4.1.1 The type of contract

What kind of payment is used in the offer?

MC - NN

Pay per result: the client and provider in principle agree on a result, and there is no predetermined product involved

Pay per use: The product stays in ownership with the provider, and is made available in a different form, and sometimes shared by a number of users

Sale: the business model is mainly geared towards sales of products, but some extra services may be added

S99 *Pay per result (no predetermined product)*

S100 *Pay per use (what the customer actually uses)*

S101 *Subscription (unlimited use during a certain period)*

S102 *Product sale (+ some extra services)*

S103 *Advertising revenues (use)*

5.0.0 Target Market Characteristics

What is the context of the offer and the market, as understood by the company?

MC - NE

Notions of large and niche markets should be relative to the type of product. In professional sectors the large markets are obviously smaller than mass consumer markets.

B2B = Business to Business

B2C = Business to Customer

B2G = Business to Government

S104 *B2B / B2C / B2G / other*

S105 *Well-identified target market*

S106 *Possible opening to other markets*

S107 *Competitive market*

S108 *Large Market*

S109 *Niche Market*

5.0.1 Incidence of converting to PSS

Which of the following consequences could be expected if the offer was to be converted to a PSS model?

MC - NE

S110 *Products in the offer must be redefined*

S111 *Services in the offer must be redefined*

S112 *The target market must be redefined*

S113 *There are obvious economic benefits for the company*

S114 *There are obvious economic benefits for the client*

5.1.0 The loss of property of the products

For the customer, the loss of the ownership of the products will be ...?

SC - NE

If there are multiple replies, consider the most relevant product in the offer.

S115 *Already the case*

S116 *Not a problem*

S117 *Conceivable*

S118 *Hardly acceptable*

S119 *Unacceptable*

5.1.1 Current distribution of the products

How do the products in the offer get to the customers?

SC - NE

If there are multiple replies, consider only the most relevant product in the offer.

S120 *Pooled*

S121 *Rented*

S122 *Leased*

S123 *Sold*

6.0.0 Use of sustainable primary materials

Are the materials used in the products and components of the offer are under the control of the company?

SC - NE

Consider the supply chain

S124 *Fully*

S125 *Partially*

S126 *Not under control of the company*

6.0.1 Use of renewable energy

Does the company use renewable energy supplies to manufacture the products and components of the offering?

SC - NE

Renewable energy comes from resources which are naturally replenished in a human timescale such as sunlight, wind, rain, tides, waves and geothermal heat.

S127 *Fully*

S128 *Partially*

S129 *Not under control of the company*

6.0.2 Sustainable purchasing policy

Does the company have a sustainable purchasing policy?

SC - NE

S130 *Fully applied*

S131 *Partially applied*

S132 *Not applied*

6.1.0 Respect of an environment chart

Does the company possess an environmental chart?

SC - NN

In small companies it is not necessary to possess a chart, in that case take the question to cover environmental politic of the company.

S133 *Chart applied*

S134 *Chart partially applied*

S135 *No chart*

6.1.1 Design practice that respects the environment

Does design of the product respect the environment (ecodesign)?

SC - NE

S136 *Fully*

S137 *Partially*

S138 *Not under control of the company*

6.2.0 Product Robustness

Is the product design robust?

MC - NE

Multiple answers are possible if different products exist in the offer.

Modular conception of products refers to products that have modular parts that can be easily removed and replaced on-site when they dysfunction, so that repair can be done later

in the appropriate workshop.

S139 *Products are modular for easy reparability*

S140 *Products are robust enough for leasing, pooling or sharing*

S141 *Products require frequent interventions (adjustment, maintenance,*

repair)

6.2.1 Usage

Do the products in the offer get worn or can they be considered as fashion products?

MC – NE

Multiple answers are possible if different products exist in the offer.

Between portative items and items carried or worn by the client, there is a difference in the degree of usage. Carrying an item continuously makes the product fragile.

Fashion items means that a product of the offer will become out-dated because new more fashionable design or styles, although it is still physically operational.

S142 *Products occasionally carried or worn by the client*

S143 *Products often carried or worn by the client*

S144 *Portative items*

S145 *Fashion items*

6.3.0 Provision Time

How does service provision time compare with the normal product lifetime?

MC – NN

Expected service provision time can be longer or shorter than the lifetime of the products in the offer.

Rapid obsolescence due to Technical Innovation means that a product of the offer will become out-dated because of newer, more performing models, although it is still physically operational.

S146 *Service Provision Time is generally longer than product lifetime*

S147 *Service Provision Time is generally shorter than product lifetime*

S148 *Rapid obsolescence is expected due to Innovation*

6.3.1 Training clients to improve environmental impacts

Is it reasonable to train the clients so that they use the offer better and cause less environmental impacts?

SC – NE

S149 *Yes*

6.3.2 Managing flows to improve environmental impacts

Can these different flows be optimised to reduce environmental impacts?

MC – NE

It is possible to manage flows more professionally on the customer side during the operation of the offer in order to reduce their impacts.

S150 *Consumables*

S151 *Energy*

S152 *Transportation*

S153 *Information*

S154 *Other*

6.4.0 End-of-life alternatives of the products in the offer

What happens to the products when they are discarded or no longer usable in the offer?

MC – NE

Multiple answers are possible if different products exist in the offer

S155 *Taken back at end-of life*

S156 *Recycled*

S157 *Reused*

S158 *Remanufactured*

6.4.1 Hazardous substances used in products in the offer

Are hazardous substances present in the products of the offer?

MC – NE

S159 *Accumulator / battery*

S160 *Electronic card*

S161 *Flat Screen*

S162 Other hazardous substances / pollutants

The capacity the company has of improving the environmental impact of the offer depends on its capacity to control the materials and energy used in the offer, as well as purchasing policy. It also depends on the implication of the company in environmental and ecodesign policies.

3.3 Formulae

number; label; formula

f(0); Included Products; $1 \text{ if } s(0) == 1 \text{ else } 2*(s(1) + s(2))/10$
f(1); IP share; $s(4) \text{ or } s(5) \text{ if } s(0) == 1 \text{ else } 1$
f(2); IP personal; $s(3)$
f(3); expert user; $1 \text{ if } s(6) == 1 \text{ else } 0.7 \text{ if } s(7) == 1 \text{ else } 0.5 \text{ if } s(8) == 1 \text{ else } 0$
f(4); Supporting Products; $1 \text{ if } s(9) == 1 \text{ else } 0.5 \text{ if } s(10) == 1 \text{ else } 0$
f(5); SP share; $s(12) \text{ or } s(13)$
f(6); SP personal; $s(14)$
f(7); Can be Shared; $(f(1) / (f(1) + f(2))) * (f(5) / (f(5) + f(6))) \text{ if } (f(1) + f(2)) > 0 \text{ and } (f(5) + f(6)) > 0 \text{ else } 0$
f(8); Infrastructures; $s(15) \text{ or } s(16) \text{ or } s(17) \text{ or } s(18) \text{ or } s(19) \text{ or } s(20)$;
f(9); Physical Products; $f(0) \text{ or } f(8)$;
f(10); Domain Service; $s(21) \text{ or } s(22) \text{ or } s(23) \text{ or } s(24) \text{ or } s(25) \text{ or } s(26) \text{ or } s(27)$;
f(11); Outsourcing / Knowledge Services; $s(28) \text{ or } s(29) \text{ or } s(30)$;
f(12); Sale; $s(31) \text{ or } s(32)$;
f(13); Sale Score; $(s(31) + 2 * s(32)) / 20$;
f(14); Sale Relation; $(6 * s(31) + 4 * s(32)) / 20$;
f(15); G sale score; **3/20**;
f(16); G sale relation; **10/20**
f(17); After Sale Service; $s(33) \text{ or } s(34) \text{ or } s(35) \text{ or } s(36)$;
f(18); After-Sale Score; $(2 * s(33) + 2 * s(34) + 2 * s(35) + s(36)) / 40$
f(19); After-Sale Relation; $(s(33) + 3 * s(34) + 2 * s(35) + 3 * s(36)) / 40$
f(20); G After-Sale score; **7/40**
f(21); G After-Sale relation; **9/40**
f(22); Customer Support Service; $s(37) \text{ or } s(38) \text{ or } s(39) \text{ or } s(40)$;
f(23); Support Score; $(6 * s(37) + 5 * s(38) + 4 * s(39) + 3 * s(40)) / 40$
f(24); Support Relation; $(6 * s(37) + 4 * s(38) + 3 * s(39) + 2 * s(40)) / 40$
f(25); G Support score; **18/40**
f(26); G Support relation; **15/40**
f(27); Delivery Services; $s(41) \text{ or } s(42)$;
f(28); Delivery Score; $(s(41) + s(42)) / 20$
f(29); Delivery Relation; $(2 * s(41) + s(42)) / 30$
f(30); G Delivery score; **2/20**
f(31); G Delivery relation; **3/30**
f(32); Run Service; $s(43) \text{ or } s(44)$;
f(33); Run Score; $(10 * s(43) + 10 * s(44)) / 20$;
f(34); Run Relation; $(10 * s(43) + 6 * s(44)) / 20$;
f(35); G Run score; **20/20**;
f(36); G Run relation; **16/20**
f(37); Repair Service; $(s(45) + s(46)) / 2$
f(38); Repair Score; $(s(45) + s(46)) / 20$;
f(39); Repair Relation; $(5 * s(45) + 4 * s(46)) / 20$
f(40); G Repair score; **2/20**
f(41); G Repair relation; **9/20**
f(42); Maintenance Services; $s(47) \text{ or } s(48) \text{ or } s(49)$;
f(43); Maintain Score; $(s(47) + s(48) + s(49)) / 10$
f(44); Maintain Relation; $(5*s(47) + 7*s(48) + 8*s(49)) / 10$
f(45); G Maintien score; **1/10**
f(46); G Maintien relation; **8/10**
f(47); Technical Services; $(f(17) + f(27) + f(32) + f(37) + f(42)) / 5$;
f(48); Services; $f(10) \text{ or } f(11) \text{ or } f(12) \text{ or } f(17) \text{ or } f(22) \text{ or } f(27) \text{ or } f(32) \text{ or } f(37) \text{ or } f(42)$;
f(49); Product + Service; $1 \text{ if } (f(0) > 0 \text{ and } f(48) == 1) \text{ else } 0$;
f(50); Dematerialisation; $1 \text{ if } (f(48) \text{ and } (\text{not } f(0)) \text{ and } (\text{not } f(4))) \text{ else } 0$;
f(51); Pure Service; $1 \text{ if } (f(0) == 0 \text{ and } f(48) == 1) \text{ else } 0$;
f(52); Service Experience; $(5 * s(50) + 3 * s(51) + s(52)) / 5$
f(53); Service Departments; $(s(53) + s(54) + s(55) + s(56) + s(57) + s(58)) / (6 + s(58))$)
f(54); No Partner Difficulties; $1 - (s(59) + s(60) + s(61)) / 3$
f(55); Supply Chain Identification; $(s(62) + 0.5 * s(63) + 1 - (s(124) + s(127) + s(136)))/3$ / 2
f(56); Supply Chain; $(f(54) + f(55)) / 2$;
f(57); Monitoring and Actuation; $((s(64) \text{ or } s(65)) + s(65) + 2 * s(66) + (s(67) \text{ or } s(66) \text{ or } s(65) \text{ or } s(64))) / 5$
f(58); Responsiveness; $(5 * s(68) + 3 * s(69) + s(70)) / 5$

f(59); Frequency of interventions; $((s(72) \text{ or } s(73)) + s(72) + 2 * s(74) + (s(75) \text{ or } s(74) \text{ or } s(73) \text{ or } s(72))) / 5$;
f(60); Client relations; $(s(76) + s(77) + s(78) + 0.5 * s(79) + 0.25 * s(80)) / 3.75$
f(61); Follow-through; $(s(81) + s(82) + s(83)) / 3$
f(62); Performance and Satisfaction; $(s(84) + s(85)) / 2$
f(63); Operational Performance; $(f(57) + s(84) + (s(81) + s(82))/2) / 3$
f(64); Intervention needs; $(4 * f(58) + 4 * f(61) + 2 * s(85)) / 10$;
f(65); Adaptability; $(s(86) + s(87) + s(88)) / 3$;
f(66); Innovation; $(s(89) + s(90) + (s(91) \text{ or } s(92) \text{ or } s(93)) - 0.5 * (s(92) \text{ or } s(93)) - 0.25 * (s(92) \text{ and } s(93))) / 3$;
f(67); Contract term; $s(97) * 0.2 + s(96) * 0.6 + s(95) * 1 + s(94) * 0.8 + s(31) * s(98) * 0.2$;
f(68); Payment; $1 / (1 + (s(100\text{bis}) \text{ or } s(101\text{bis}))) / (1 + s(101))$ if $s(99)$ else $0.8 / (1 + (s(100\text{bis}) \text{ or } s(101\text{bis}))) / (1 + s(101))$ if $s(100)$ else $0.2 / (1 + s(101))$ if $(s(100\text{bis}) \text{ or } s(101\text{bis}))$ else 0
f(69); Target Market; $(s(102) + s(103) + s(104) + s(105) + (s(107) \text{ and } (\text{not } s(106)))) / (2 + s(104) + s(105) + (s(107) \text{ and } (\text{not } s(106))))$;
f(70); Move to PSS; $(1 - s(108) + 1 - s(109) + 1 - s(110) + s(111) + s(112)) / 5$;
f(71); Loss of Property; $(s(116) + s(115) * 3 + s(114) * 4 + s(113) * 5) / 5$;
f(72); Product distribution; $f(1) * s(121) * 0.5 + s(118) + 0.8 * s(119) + 0.2 * s(120)$
f(73); PSS market; $(f(69) + f(70)) / 2$;
f(74); Acceptable to share; $(6 * f(71) + 6 * f(72) + 3 * (1 - f(1)) + 1 - f(6)) / 16$;
f(75); materials; $s(123) * 0.4 + s(122)$;
f(76); energy; $s(126) * 0.4 + s(125)$;
f(77); purchase; $s(129) * 0.4 + s(128)$;
f(78); chart; $s(132) * 0.4 + s(131)$;
f(79); ecoconception; $s(135) * 0.4 + s(134)$
f(80); robust; $(s(137) + s(138) + 1 - s(139))/3$;
f(81); Not worn; 1 if $(\text{not } s(142))$ else 0.5 if $(s(142) \text{ and } (\text{not } s(141)))$ and $(\text{not } s(140))$ else 0.2 if $(s(142) \text{ and } (\text{not } s(141)))$ and $s(140)$ else 0;
f(82); not fashion; $1 - s(143)$;
f(83); maximum use; $1 - (s(145) + s(146)) / 2$;
f(84); Train for Environment; $(2 * s(147) + s(83)) / 3$;
f(85); Flow management; $(s(148) + s(149) + s(150) + s(151) + s(152)) / (4 + s(152))$;
f(86); Reverse logistics; $(2 * s(153) + s(154) + 2 * s(155) + 2 * s(156)) / 7$;
f(87); Hazardous Substances; $(s(157) + s(158) + s(159) + s(160)) / (3 + s(160))$;
f(88); Environmental Control; $(f(75) + f(76) + f(77) + f(78) + f(79)) / 5$;
f(89); lifespan; $(f(80) + f(81) + f(82) + f(83)) / 4$;
f(90); Use phase; $(f(85) + f(84) + f(7) + f(57) + f(61)) / 5$;
f(91); Use phase; $f(86)$ if $(f(87) == 0)$ else $((f(86) + 1 - f(87))/2)$ if $(f(86) > 0.5)$ else $((f(86) + 1 - f(87)) / 4)$;
f(92); Contract; $(f(67) + f(68)) / 2$;
f(93); Contract Score; $((6 * (s(97) + s(96)) + 7 * (s(95) + s(94))) + (10 * s(99) + 9 * (1 - s(99)) * s(100)) + (7 * s(118) + 6 * s(119) + 3 * s(120))) / 30$
f(94); **Contract Relation**; $((3 * s(97) + 4 * s(96) + 5 * (s(95) + s(94))) + (10 * s(99) + 8 * (1 - s(99)) * (s(100) \text{ or } s(100\text{bis}))) + (7 * s(118) + 6 * s(119) + 7 * s(120))) / 30$
f(95); G Contract score; **24/30**
f(96); G Contract relation; **22/30**
f(97); Domain Score; $(0.8 * f(11) + f(10) * f(93)) / 2$;
f(98); **Domain relation**; $(0.9 * f(11) + f(10) * f(94)) / 2$;
f(99); G Domain score; $(0.8 + f(95)) / 2$
f(100); **G Domain relation**; $(0.9 + f(96)) / 2$
f(101); G Service relation; $f(16) + f(21) + f(26) + f(31) + f(36) + f(41) + f(46) + f(100)$
f(102); Service relations; $((f(14) + f(19) + f(24) + f(29) + f(34) + f(39) + f(44) + f(98)) / f(101))$ if $f(101) > 0$ else 0;
f(103); G Service Score; $f(15) + f(20) + f(25) + f(30) + f(35) + f(40) + f(45) + f(99)$
f(104); Internal Service Organisation; $((f(10) + f(11) + f(22)) / 3 + f(47) + f(53)) / 3$
f(105); Client contact; $(2 * f(102) + s(85) + 2 * f(60)) / 5$;
f(106); Service Intensive; $(f(13) + f(18) + f(23) + f(28) + f(33) + f(38) + f(43) + f(97)) / f(103)$;
f(107); Service Culture; $(f(52) + f(53) + f(106)) / 3$;
f(108); Potential / Risk – Products; $(f(0) + f(8) + 2 * f(115) + f(7)) / 5$;
f(109); Potential / Risk – Organisation; $(f(8) * 3 + f(63) * 2 + f(56) * 2 + f(107) * 4 + f(104) * 4) / 15$;
f(110); Potential / Risk – Client Interface; $(f(105) * 2 + f(59) * 1 + f(64) * 2) / 5$;
f(111); Potential / Risk – Strategy; $(f(65) + f(66) + f(92)) / 3$;
f(112); Potential / Risk – Market; $(f(74) + f(73)) / 2$;
f(113); Potential / Risk – Environment; $(f(88) + f(89) + f(90) + f(91)) / 4$;
f(114); Potential / Risk; $(f(108) + f(116) + f(109) + f(110) + f(111) + f(112) + f(113)) / 7$;
f(115); Product Design; $(s(34) + s(156) + f(57) * 2 + s(84) + f(80) * 4 + (1 - s(146)) * 2) / 11$;
f(116); Potential / Risk – Services; $(3 * f(106) + f(10) + f(11)) / 5$;
f(117); No Personal IP; $(1 - f(2))$

3.4 Characteristics

Each characteristic is identified by a number, the formula concerned, the label, the threshold (default=0.5 if not specified) and suggestions if the score is under/over the threshold value.

0. f(0) Included Products

No products are included in the offer.

Products included form the basis of the PSS offering.

1. f(1) IP share

To improve the PSS, reconsider sharing or pooling products that are included in the offer.

Sharing products is a strong point for PSS. Different degrees can be considered, pooling or renting are more favourable. Is it possible to extend the sharing to other products?

2. f(117) No Personal IP

Social and marketing studies will help understand if niche markets can be targeted where sharing the products are more acceptable. Long term customer education could also be a strategy to improve this point.

Sharing products is a strong point for PSS. Different degrees can be considered, pooling or renting are more favourable. Is it possible to extend the sharing to other products?

3. f(4) Supporting Products

No supporting products are included in the offer.

Consider including the supporting products in a PSS offering. Consider niche markets and market and social evolutions.

4. f(7) Can be Shared

To improve the PSS, reconsider the notion of personal products in the context of social and marketing trends of customer needs / behaviour. Consider niche markets.

Sharing products is a strong point for PSS. Different degrees can be considered, pooling or renting are more favourable. Is it possible to extend the sharing to other products?

5. f(8) Infrastructures

Infrastructures and networks can provide a backbone for PSS, offering new opportunities. Could similar offering be regrouped and an infrastructure set up?

Infrastructures and networks are a strong backbone for PSS, offering multiple, new opportunities for services.

6. f(9) Physical Products

Few products are present in the offer.

Products form the basis of the PSS offering. PSS should help to reduce the number of products necessary by intensified (sharing) and better (professionally controlled) usage.

7. f(10) Domain Service

The offer does not seem to be consistent with the principle service application domain of the company.

Domain services are the heart of the PSS offering

8. f(11) Outsourcing / Knowledge Services

Knowledge intensive services show the best potential for developing services and retaining customer fidelity. It is strategically important to try and develop this kind of offer.

Knowledge intensive services are strategically important as they retain the customer and redefine his activities. PSS can help to take good advantage of this position.

9. f(12) Sale

Basic sales services will probably evolve in a PSS model. The burden of the financial investment moves to the provider side in the current financial paradigm.

Basic sales services will probably evolve in a PSS model. The burden of the financial investment moves to the provider side in the current financial paradigm.

10. f(17) After-Sale

Upgrading an offer and supplying spare parts are a means to extend the life of an offer, increasing revenues from a PSS, gaining the loyalty of the customer and improving the overall environmental impacts of the offer. The same goes for remanufacturing. End of life disposal and recycling is facilitated by PSS (legal directives tend to increase). Such services can develop local servicing. It is possible to contract locally installed partners to handle these services.

Upgrading an offer and supplying spare parts are a means to extend the life of an offer, increasing revenues from a PSS, gaining the loyalty of the customer and improving the overall environmental impacts of the offer. The same goes for remanufacturing. End of life disposal and recycling is facilitated by PSS (legal directives tend to increase). Such services can develop local servicing. All these services are facilitated by PSS models.

11. f(22) Customer Support Service

Expert advice services and customer formation should be considered and preferred rather than only hot-line services and user notices. These services can help build customer loyalty and result in more efficient use of the offer. They are very important to influence user behaviour, especially for PSS where the ownership of the products remains with the provider.

Expert advice services and customer formation are a strong point and very much preferred to hot-line services and user notices. These services can help build customer loyalty and result in more efficient use of the offer. They are very important to influence user behaviour, and become a strong lever for PSS where the ownership of the products remains with the provider.

12. f(27) Delivery Services

Deliver services allow a first contact with the customer that can be used to gain his confidence. Delivery services are not always possible, or reasonable for many (small / cheap) products.

Delivery services provide the opportunity to meet the customer and establish a relationship with him.

13. f(32) Run Service

Operation services ensure correct, more professional use of the products in the offer. They can ensure service revenue and improve operation of the offer, extending the lifetime of the products. The close customer contact ensures customer loyalty and satisfaction.

Operating services to run the offer are a good point for close customer relations in a PSS. In addition they secure the correct, professional operation of the products and diminish the negative aspects of uncontrolled customer behaviour.

14. f(37) Repair Service

Repair services ensure that the products in the offer last as long as possible, reducing the cost and the environmental burden of the offer. They can help customer satisfaction and promote a local implantation of the offer.

Idem

15. f(42) Maintenance Services

Maintenance services ensure that the products work better and are more efficient, improving performance and reducing the environmental burden of the offer. They can help customer satisfaction and promote a local implantation of the offer. Regular maintenance can help build strong ties with the customer.

Idem

16. f(47) Technical Services

Technical services ensure that the products work better and are more efficient, improving performance and reducing the environmental burden of the offer. They help customer satisfaction and promote a local implantation of the offer, building strong ties with the customer.

Idem

17. f(49) Product + Service

The offering considered does not, as such, fall under the category of products and services.

The offering contains products and services, PSS business models are applicable. They will help improve the overall efficiency of the offer and can bring important benefits in terms of revenue and competitiveness to the company. They can also help reduce the environmental burden of the offer.

18. f(50) Dematerialisation

The offering is not, as such, a dematerialized offer. To reduce environmental burdens, the offer should be reconsidered in terms of PSS business models.

The offering is already a dematerialized offer.

19. f(51) Pure Service

The offering is not a pure service and PSS is therefore applicable.

The offering is out of the scope of PSS, it is already a pure service. However it could be possible to integrate this service into other relevant offers that are based on products in order to facilitate their conversion to PSS.

20. f(56) Supply Chain

It is very important to identify the supply chain in order to build services and provide an efficient PSS offering. Many services require the implication of more than one partner to be efficient and good relations are necessary to adapt the products and services used in the offer. Control on provision is also essential to ensure availability of the services.

A good knowledge of the supply chain will help build the products and services adapted to PSS. It can be more interesting, financially and environmentally, to adapt the products of the offering to PSS requirements.

21. f(59) Frequency of interventions

The company intervenes very little in customer premises during operation. The opportunity to maintain customer contacts can be lost. They should be developed.

The company often intervenes in customer premises during operation. These interventions can be used to promote better understanding between the customer and the company. This is a strong point for proposing PSS adapted to customer needs.

22. f(60) Client relations

Direct human contacts can ensure better customer satisfaction and can provide the basics for proposing new, better adapted offers. Although hotlines and other impersonal interactions can be very useful, they should not be the only alternative offered to make the best of PSS potential.

Client relations between the provider and the customer are strong in the offer and this should help make the best of PSS potentials.

23. f(63) Operational Performance

Few means of getting customer feedback are present in the offer. This loses the competitive advantages of PSS. Remote monitoring technics, performance measures, preliminary studies and follow-up of the offer should be developed.

Customer feedback is an asset for providing good PSS and improving customer satisfaction. They should help the PSS to be more efficient.

24. f(64) Necessity to Intervene

It is not very necessary to intervene close to the customer to obtain satisfactory performance. Nevertheless, interventions are a way of developing good ties with the customer. Alternative reasons for maintaining good ties should be imagined and proposed.

The offer requires frequent interventions. This means that PSS models are likely to be very useful and present a real advantage compared to product sale.

25. f(65) Adaptability

The offer would benefit from greater adaptability. Products and/or services can be adapted to fit changing customer needs better. The upgradability of the products should be reconsidered and solutions proposed.

The offer is adaptable to changing customer needs. A PSS model will help take full advantage of this strong point.

26. f(66) Innovation

The innovative potential of the offer is weak. Moving to a PSS offer can strengthen this potential with an innovative market approach.

Innovation potential is high in this offer. This will facilitate the move to PSS.

27. f(67) Contract term

Contract term is short. To gain customer loyalty try to develop long term contracts by proposing attractive services that really satisfy customer needs in the long.

Contract term is good. PSS business models will be easier to propose to the customer.

28. f(68) Type of contract

PSS can bring benefits to both the provider and the customer when the customer really knows what he is paying for. Contracts, pay per use and pay per result should be developed.

Contracts are already pay per use or result. This facilitates PSS models. Pay per result contracts are usually more interesting to develop.

29. f(71) Loss of Property

The loss of property hinders the adoption of PSS models. Social and other marketing studies should be engaged to understand how this can evolve in the future. Particular target market groups more open to this type of business model should be identified to introduce PSS gradually.

The loss of property is not a major issue in the offer. This opens the way for PSS models.

30. f(73) PSS market

The target market is not well identified. This will probably hinder the adoption of PSS. This point should be strengthened.

The target market is well identified. Introduction of PSS can be adapted to the market.

31. f(74) Acceptable to share

The acceptability of sharing some of the products in the offer is an issue. PSS can bring more profits and better environmental gains a priori if the products are shared. Social and other marketing studies should be engaged to understand how this can evolve in the future. Particular target market groups more open to this type of business model should be identified to introduce PSS gradually. It is also possible, if there are different products in the offer, to start by sharing certain products only.

Sharing the products is not a problem. The PSS can take advantage of this situation and increase benefits for the provider while reducing the consumption of matter.

32. f(82) not fashion

Fashion objects in the offer are difficult to lease for long times. However, they could be used in particular "double" PSS, where there is a first PSS, in-fashion, more expensive, but the client is assured that when the objects go out of fashion they will be changed; and also a second PSS that is less expensive and reuses the out-of-fashion objects. Sociological and marketing studies could help to determine these issues.

The objects in the offer are not fashion objects. This opens the potential to push their lifetime as long as possible. PSS is a good candidate for this.

33. f(83) Use to the End

Programmed obsolescence is an unsustainable strategy that can bring short and medium term benefits. It is counter-productive in PSS. In PSS, the products remain the property of the producer and it is in his interest (economical and environmental benefits) to keep the product in the use phase as long as possible so that he can reap service benefits as long as possible. That is why service provision time should be longer than the product lifetime.

The products in the offer can be used for as long as possible, they will not become obsolete. The PSS will help the company to reap service benefits for a long time.

34. f(85) Flow management

It is not possible to manage flows during operation in the current state of the offer. This issue should be reconsidered to improve performance and therefore customer satisfaction. Different options can be considered to get feedback on the flows and at the least inform the customer when usage is not optimal

Better management of flows is possible. PSS will favour this process and provide the framework for more optimized use of the different flows.

35. f(88) Environmental Control

The company should engage in a real environmental policy for long term sustainability. Adopting an environmental chart can be a first step. Eco-design of products is important and PSS will encourage this as PSS often align economic and environmental interests. Additionally, the

company should try and increase its influence on the supply chain and the use of raw materials and green energy. The company must realise that its long term interest is in sustainability.

The company has a real environmental engagement. This should naturally push it to PSS so as to strengthen this engagement and reap economic service benefits along with the environmental improvements.

36. f(89) lifespan

In PSS, the products remain the property of the producer and it is in his interest (economical and environmental benefits) to keep the product in use as long as possible so that he can reap service benefits as long as possible with less consumption of raw materials. Efforts must be put on the products to improve their lifespan: more robust products with services that run longer, especially if the objects are worn or carried by the user. If the offer concerns fashionable objects then special attention should be paid to find alternative PSS markets that will accept the out-of-fashion objects.

The products are robust and not harshly used from being constantly carried around. They do not go out of fashion and the service provision time is long enough to run an efficient PSS so as to reap economic and environmental benefits.

37. f(90) Use phase

Control on the use phase seems insufficient in this offer. Possibilities of controlling the flow of materials, energy, information and transport should be re-examined. Monitoring and follow-up of the offer should be considered. Sharing the products may not seem reasonable as such, but it is worth studying this perspective in long term. In the least, user training can help improve environmental effects. To build a PSS, these considerations should be re-examined.

Control of the use phase will help build a good PSS and improve its performance. This will improve customer satisfaction and help extend the use phase, bringing economic and environmental improvements.

38. f(91) End-of-life

Reverse logistics are not in place so that the products of the offer are currently not optimised at their end-of-life. Additionally, hazardous substances may be present and this poses a problem that the company will have to be more and more careful about (new legislations). Additionally, potential value is lost by the company. PSS will help setting up reverse logistics to recover the products very easily. Especially hazardous substances can be treated more efficiently.

There is a good potential with PSS because reverse logistics are set up and hazardous substances can be handled more efficiently when necessary.

39. f(92) Contract

Current contracts should be revised for PSS. Aim at more long term contracts that permit a good relation to be set up and move to pay per result or per usage in order to decouple economic benefits from material consumption in the long term. The terms of the contracts must be made sufficiently interesting to satisfy customers. That will bring more value for the customer and the provider.

Contracts are already close to PSS models. Pushing the PSS further is easy and can bring more mutual benefits for the customer and the provider.

40. f(102) Service relations

Services can help build good customer relationship. However some services are more interesting from this point of view. Applicative and knowledge intensive services should be developed. Customer support and operating services should be strengthened too.

The services provided are good for establishing relations with the customers. This is a strong point for PSS models.

41. f(104) Internal Service Organisation

The internal organisation of the company should integrate the notion of services. Services other than usual sale and financial services can insure stable revenues over longer periods than product sale.

There is a good organisation for services within the company. This should be developed in a PSS perspective.

42. f(105) Client contact

To reap the benefits of services in PSS, the company should develop application services and services that develop close customer ties in the long run. Services should be based on human contacts as much as possible and care should be taken on respecting customer satisfaction.

Client contact is a strong point that will facilitate PSS. A good knowledge of the client will help provide services that really bring value to the customer.

43. f(106) Service Intensive

Services are not fully made use of in the offer. Additional services linked with PSS will ensure more steady value and enable adaptation of the offer to customer changing needs.

The offer provides panoply of services. This is a good entry point for PSS.

44. f(107) Service Culture

The company does not yet possess a service culture. It should organise its activities to provide services and open the spectrum of services offered.

A strong service culture is already present, PSS will be easier to implement.

45. f(108) Potential / Risk – Products

Threshold = 0.7

Products should be improved. PSS rely on products that are included in the offer and often use physical infrastructures as a backbone for different PSS offers. The design of the product must consider more harsh terms of user behaviour and monitoring should be considered to improve performance and extend lifetime. Programmed obsolescence is counter-productive in PSS. If the products are easy to share this will help reap the best benefits for PSS, although this is not always currently possible. Social and market studies can investigate this issue if necessary.

Products ready for PSS. The basic issues are already working. This will help reap benefits that are stable and sustainable.

46. f(109) Potential / Risk – Organisation

Threshold = 0.7

Organisation within the company can be improved. It is important to cultivate services in the company and identify people or structures that deal with service-related issues. The roles of service departments and technical structures within the company probably require clarification. Service experience must be built and diversified at a steady rate and internal competencies adapted appropriately, considering the company's history and particularities. Physical infrastructures can support organisation advantageously. It is necessary to consider operational performance more largely than product technical specifications. Consider the supply chain as part of the necessary organisation.

Structures for the organisation of the company and the offers are ready for PSS.

47. f(110) Potential / Risk – Client Interface

Threshold = 0.7

Client contact is lacking. Human exchanges with the clients should be favoured and services requiring close contacts with the clients developed. For example, regular maintenance services are a good means of developing this aspect. Customer satisfaction is a very important issue. Services that require follow-through and reactivity can be good candidates for PSS.

Client contact is good for PSS.

48. f(111) Potential / Risk – Strategy

Threshold = 0.7

The strategy of the offer should be reviewed because PSS are more successful and create more value with long term vision. Contracts should be made more attractive to encourage long term. The offers should be adaptable in time and especially to changing customer needs. Innovation is important.

The strategy of the offer is good to engage sustainable PSS offers.

49. f(112) Potential / Risk – Market

Threshold = 0.7

The loss of property is a major issue in PSS. Some of the products in the offer, especially those directly included in the offer, may pose problem here and current product sales do not help. It is important to study social and marketing aspects to see how this can evolve in the future, and if there are niche markets or strategies that can be used to initiate the movement. More globally, the concept of the offer should be revised. The products and services redefined to balance market and sustainability.

The market seems ready to accept PSS offers.

50. f(113) Potential / Risk – Environment

Threshold = 0.7

Environmental aspects are low for this offer. There is a difference between product sale and PSS. In product sale there is often divergence between short term economic gains and environmental preoccupations, pushing firms to neglect environmental issues unless they are forced to do so by regulations or customer reactions. PSS are conceived to solve two major issues today: for firms to increase their competitiveness in global markets and reduce environmental pressure. The company should revise its policy and increase the environmental control on its products. Eco-design can naturally improve the gains through services. Increased lifespan of products means bigger and longer service revenues for the same investment in products. A better, more efficient use phase increases the value of the products and services, as well as satisfying customers. End-of-life services not only relieve the customers of a task, but they open the way for retrieved benefits and further gains for the provider through remanufacturing or targeted recycling.

The environmental assessment of the offer is positive. PSS can turn this strong point into a sustainable value asset for the company.

51. f(114) Potential / Risk

Threshold = 0.7

For PSS to be successful and maximise value for the company, the customer and society, it is necessary to revise the different elements: Products; Services; Organisation; Clients; Strategy; Market; Environment. The different elements interact with one another and together will make the PSS.

There is very strong PSS potential for the offer.

52. f(54) No Partner Difficulties

Strong relations with partners or the supply chain may become an issue to change the business model to PSS. It is important to identify the partners that are more open to change.

The company is not tied down to other companies, it is not necessary to have their adhesion to change the business model. PSS could be used as an opportunity to establish close ties with dynamic partners open to change.

53. f(115) Product Design

A product in PSS does not always require the same characteristics as products for sale. In PSS revenue is gained with robust, reliable products. Programmed obsolescence is counter-productive as the products will bring service revenue for shorter periods with more difficulties in repair and maintenance. Performance is directly linked to revenue, it is better to follow performance during use. Remote monitoring and control technics can be a good solution. The lifetime of the product should be made as long as possible; remanufacturing is a prolonged source of revenue.

The product design is adapted to PSS.

54. f(116) Potential / Risk – Services

Threshold = 0.7

The service potential is not properly used. Providing applicative services, knowledge intensive and outsourcing services are a key for strong PSS ensuring regular income and good customer satisfaction. Other services are also important, especially customer formation, operation and maintenance services.

Services are ready for PSS. The basic issues are already working. This will help reap benefits that are stable and sustainable.