



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

HELLENIC REPUBLIC

MINISTRY OF INTERIOR AND ADMINISTRATIVE RECONSTRUCTION

SUBPROJECT 3 «ACTIONS TO IMPROVE QUALITY OF TRAINING PROGRAMMES »

of the act «CONTINUING TRAINING ACTIONS 2014-2018»

Code: IIS 5000245

PROGRAMME TITLE:

Interoperability Maturity Assessment for Public Services

TRAINING MATERIAL

Training material code:

Certification Programme code: 519



SUBPROJECT 3 «ACTIONS TO IMPROVE QUALITY OF TRAINING PROGRAMMES »

PROGRAMME TITLE:

Interoperability Maturity Assessment for Public Services

WORKING GROUP

Members

Coordinator:

Anastasia Papastylianou apapas@ekdd.gr

National Centre for Public Administration and Local Government

Authors:

1) **Antonis Stasis** - a.stasis@ydmmed.gov.gr

Head of Directorate of the Ministry of Interior and Administrative Reconstruction

2) **Konstantinos Rantos** krantos@teiemt.gr

Assistant Professor, Department of Informatics, TEI of Eastern Macedonia and Thrace

3) **Thodoris Papadopoulos** thodoris@thodoris.net

General Secretariat of Coordination

Evaluators:

1) **Merkos Margaritopoulos** - mermar@ekdd.gr

Head of Thessaloniki Regional Training Institute

2) **Efthimios Tambouris** - tambouris@uom.gr

Associate Professor, University of Macedonia, Thessaloniki, Greece.

Interoperability Maturity Assessment For Public Services

CONTENTS

1	IMM QUESTIONNAIRE BY EXAMPLE.....	6
1.1	Service Consumption (Section C of the IMM questionnaire).....	6

LIST OF FIGURES

Figure 1:	Section C answering flow for each consumed service.....	8
-----------	---	---

LIST OF TABLES

Table 1:	Manual or Digital consumption for the Business Registration service	12
Table 2:	Manual or Digital consumption for the e-Fee service	13
Table 3:	Question C3 valid answers, contributions and next steps.....	14
Table 4:	Consumed services status for the Business Registration Public Service.....	15
Table 5:	Consumed services status for the e-Fee Public Service.....	16
Table 6:	Business Registration service – interaction mode	20
Table 7:	e-Fee service – interaction mode	21
Table 8:	Business Registration Service – protocol types	23
Table 9:	e-Fee service – protocol types	23
Table 10:	Business Registration Service – network infrastructure	26
Table 11:	e-Fee service – network infrastructure	26
Table 12:	Business Registration Service – exception handling	30
Table 13:	e-Fee service –exception handling.....	31
Table 14:	Business Registration Service – certification procedure	33
Table 15:	e-Fee service – certification procedure	34

Table 16: Business Registration Service – specification process	36
Table 17: e-Fee service – specification process	37

1 IMM QUESTIONNAIRE BY EXAMPLE

The objectives of this section are to assist trainees to:

- Describe the main elements of the interoperability checklist.
- Identify the causes that hinder the interoperability maturity of electronic public services
- Identify and refer to the supporting material provided by the European Commission
- Describe the structure of the questionnaire
- Recognise the maturity levels and what they mean in terms of availability, utilization and architecture
- Describe the provided recommendations for improving the maturity level of the assessed electronic public services

1.1 Service Consumption (Section C of the IMM questionnaire)

This section of the questionnaire addresses the Consumption of reusable machine-to-machine services from other public administrations and businesses. This can include the consumption of functionalities, base registry information and security services for example.

The service consumption section of the IMM questionnaire has two different versions depending on whether the assessment is conducted based on the IMM FULL questionnaire or the IMM Lite questionnaire. In the IMM Full version the person conducting the assessment has to answer a series of questions for each service being digitally consumed

separately, while in the Lite version the same questions are only answered once for all the services being consumed. The Full version gives a deeper insight on the service being assessed while the Lite version is considered more user friendly.

The analysis provided in this section is based on the Full questionnaire for the Business Registration service and on both the Full and Lite versions for the e-Fee service.

Note that depending on the answers provided in the first 3 questions of this section, the rest of this section's questions might not have to be answered. Figure 1 presents the logic in answering the questions in Section C.

In the following sections, the analysis provided in shadowed text box refers to the Lite version of the IMM Questionnaire.

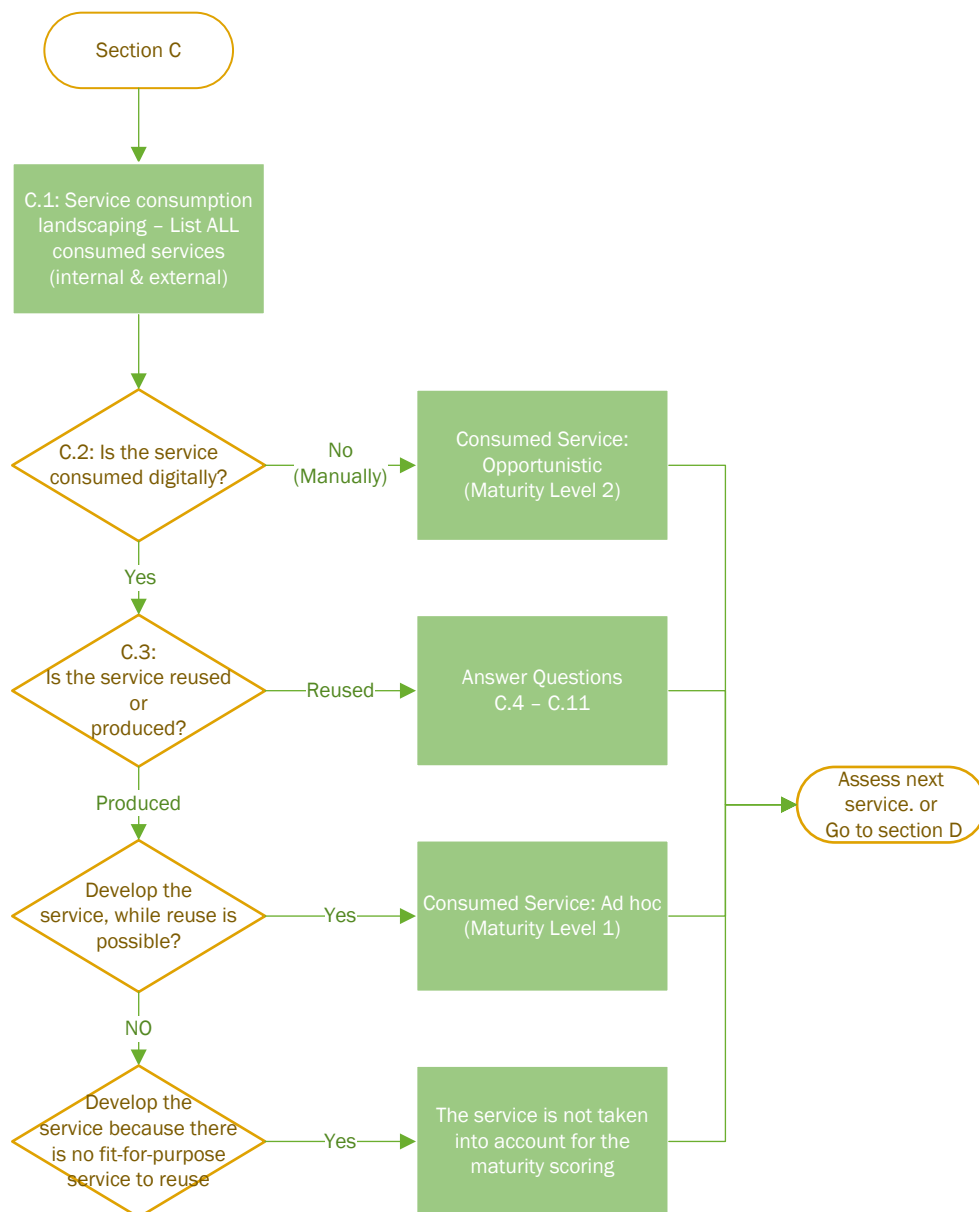


Figure 1: Section C answering flow for each consumed service

1.1.1 Question C1: Landscaping Service Consumption

Please list the services which the public service has to consume in order to work.

First, indicate for the below generic services if these are required (note that this is an indicative list)

Second, add specific services which are specific to the public service and required by it in order to work.

The expected answer is a set of services chosen from an indicative list of Generic services or specific services that are required by the public service to function.

This set of services must contain

- both services that are consumed from within the administration (internally) and from a third party (externally),
- both manually and digitally consumed services.

The provided, yet not exhaustive, list of Generic services includes the following:

- Authentication Service
- eSignature Service
- ePayment Service
- Messaging Service
- Audio-visual Service
- Data Transformation Service
- Data Validation Service
- Machine Translation Service
- Data Exchange Service

- Business Analytics Service
- Business Reporting Service
- Forms Management Service
- Records Management Service
- Document Management Service
- Content Management Service
- Access Management Service
- Logging Service
- Audit Service
- Metadata Management Service
- Networking Service
- Hosting Service
- Storage Service
- Base registry information source

Business Registration Service

The Business Registration consumes the following services (these are easily derived from the corresponding service description – Section **Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.**).

1. e-Payment Service
2. Authentication Service

3. Base registry information source (Tax clearance)
4. Base registry information source (Insurance clearance)
5. Base registry information source (Legal Person Tax Registration)
6. Base registry information source (Legal person Social Security Registration)
7. Base registry information source (Registration in local chamber)
8. Base registry information source (Check the Company Name Availability)

e-Fee Service

The e-Fee service consumes the following services (see also Section **Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.**).

1. e-Payment Service (for payments made using credit/debit cards)
2. Authentication service (for authenticated users)
3. Access Management Service (for the management of electronic identities)
4. Tax Registry (for obtaining registered and authenticated user information)
5. Data from Banks (for obtaining information about paid fees)
6. Data from other Public Organizations (for obtaining the status of the issued e-fee token)

1.1.2 Question C2: Manual or digital consumption of services

How do you currently consume the service (manually versus digitally)?

For the Full version of the IMM this question seeks to filter consumed services so that the ones being manually consumed are not being assessed. A service that is manually consumed is evaluated as opportunistic (maturity level 2).

Question C2 is answered for each consumed service separately. The following valid answers result in either concluding the assessment of the specific service or further processing by answering C3.

- Consumed manually (assessment concludes for this service; the maturity level is

For the Lite version of the IMM C2 is answered for the aggregate of the services being consumed and the question is re-phrased to “How does the public service currently consume the services (manually versus digitally)?”. The following are valid answers for the Lite version of C2.

- Fully manually
- Mainly manually, some digitally
- Mix of manual and digital consumption

opportunistic – level 2)

- Consumed digitally (question C3 has to be answered)

Business Registration Service

The answer is provided in Table 1.

Table 1: Manual or Digital consumption for the Business Registration service

CONSUMED SERVICE

MANUALLY OR DIGITALLY

1. e-Payment Service	Digitally
2. Authentication Service	Digitally
3. Base registry information source (Tax clearance)	Digitally
4. Base registry information source (Insurance clearance)	Digitally
5. Base registry information source (Legal Person Tax Registration)	Digitally
6. Base registry information source (Legal person Social Security Registration)	Digitally
7. Base registry information source (Registration in local chamber)	Digitally
8. Base registry information source (Check the Company Name Availability)	Digitally

e-Fee Service

The answer is provided in Table 2.

Table 2: Manual or Digital consumption for the e-Fee service

CONSUMED SERVICE	MANUALLY OR DIGITALLY
1. e-Payment Service	Digitally
2. Authentication service	Digitally
3. Access Management Service	Digitally
4. Tax Registry	Digitally

For the Lite version of the IMM the answer to C2 for the e-Fee Public Service should be “Fully Digitally” which is considered the most advanced one among the possible answers

5. Data from Banks	Digitally
6. Data from other Public Organizations	Digitally

1.1.3 Question C3: Reusing or producing of services (Technical interoperability – weight: varies depending on the answer)

Does the public service reuse or self-produce consumed services? (Reuse of relevant existing services vs Self Production of services)?

This question addresses the main concern regarding the reusability of digitally consumed services. Producing a service, while it is already available externally for reuse is considered less interoperable as it implies that the public service has “reinvented the wheel”. C3 is only answered for digitally consumed services, while the contribution of this answer to the maturity scoring is either derived from the answer provided in this question or from the answers provided in questions C4-C11 as listed in Table 3.

Table 3: Question C3 valid answers, contributions and next steps.

ANSWER	MATURITY SCORING	NEXT STEP
Self-produce the service, while relevant services are available for reuse	Ad-hoc	Assess next consumed service or go to section D.
Self-produce the service, because there is no fit-for-purpose service to reuse	This service is not taken into account for the maturity scoring of the public service	Assess next consumed service or go to section D.
Reuse of an existing service	Deduced from C4-C11	Answer questions C4-C11

For the Lite version of the IMM, C3 is answered for the aggregate of the services being consumed and the question is re-phrased to “Does the public service reuse or self-produce consumed services?”. The following are valid answers for the Lite version of C3.

- Most consumed services are self produced, while relevant services are available for reuse
- A selection of consumed services are reused
- (Nearly) all consumed services are reused

Business Registration Service

The answer to C3 for the services the Business Registration Public Service consumes, is provided in Table 4. In the same table, the required next action is also defined for each consumed service, based on its status.

Table 4: Consumed services status for the Business Registration Public Service

CONSUMED SERVICE	MANUALLY OR DIGITALLY	REUSE OR PRODUCE	NEXT STEP
1. e-Payment Service	Digitally	Reuse of an existing service	Answer questions C4-C11
2. Authentication Service	Digitally	Reuse of an existing service	Answer questions C4-C11
3. Base registry information source (Tax clearance)	Digitally	Reuse of an existing service	Answer questions C4-C11
4. Base registry	Digitally	Reuse of an	Answer questions C4-C11

information source (Insurance clearance)		existing service	
5. Base registry information source (Legal Person Tax Registration)	Digitally	Reuse of an existing service	Answer questions C4-C11
6. Base registry information source (Legal person Social Security Registration)	Digitally	Reuse of an existing service	Answer questions C4-C11
7. Base registry information source (Registration in local chamber)	Digitally	Reuse of an existing service	Answer questions C4-C11
8. Base registry information source (Check the Company Name Availability)	Digitally	Reuse of an existing service	Answer questions C4-C11

e-Fee Service

The answers to C3 for the services consumed by the e-Fee Public Service is provided in

Table 5: Consumed services status for the e-Fee Public Service

CONSUMED SERVICE	MANUALLY OR DIGITALLY	REUSE OR PRODUCE	NEXT STEP
1. e-Payment Service	Digitally	Reuse of an existing service	Answer questions C4-C11
2. Authentication service	Digitally	Reuse of an existing service	Answer questions C4-C11
3. Access Management Service	Digitally	Self-produce the service, because there is no fit-for- purpose service to reuse	Assess next consumed service (this one is not taken into account)

4. Tax Registry	Digitally	Reuse of an existing service	Answer questions C4-C11
5. Data from Banks	Digitally	Reuse of an existing service	Answer questions C4-C11
6. Data from other Public Organizations	Digitally	Reuse of an existing service	Answer questions C4-C11

For the Lite version of the IMM C3 is answered for the aggregate of the services being consumed and the answer should be “(Nearly) all consumed services are reused”

1.1.4 Question C4: Processing mode (Technical interoperability – weight: 10%)

What is the processing mode of the consumed service?

This question attempts to distinguish the consumed services between those that are processed in batches and those that are real-time processed.

The maturity levels that can be achieved are the following:

- **Opportunistic:** Batch processing while real-time could be an option
- **Essential:** Batch processing only due to legal, technical or other constraints
- **Sustainable:** Both processing modes are supported
- **Seamless:** Fully real-time processing

For the Lite version of the IMM C4 refers to the aggregate of the services being consumed and the question is re-phrased to “What is the processing mode of the consumed services?”. The following are valid answers for the Lite version of C4.

- Mainly batch whilst real-time processing could be implemented
- Mainly batch, due to legal, technical or other constraints
- Both processing modes are supported
- Fully real-time processing

Business Registration Service

The Business Registration Service is considered a very mature example for the processing mode of consumed services as all of them are fully real-time processed. This includes getting all required information from base registries as well as e-payments. The maturity score for all these services is 5, i.e. the maximum value. The e-payment service includes real-time payment with a credit card.

e-Fee Service

The status for the e-Fee Public Service is not considered equally mature as only three consumed services are processed real-time. Communication with banks is accomplished using both batched and real-time modes, depending on the type of payment chosen by the citizen, while data from other organizations are batch processed whilst real-time could be an option.

For the Lite version of the IMM the most suitable answer to C4 for the e-Fee Public Service should be “Both processing modes are supported”

1.1.5 Question C5: Push-pull mechanisms (Technical interoperability – weight: 10%)

What is the interaction mode with the consumed service?

This question addresses the two services interaction to have access to the most accurate and updated information. Push consumption refers to the public service receiving automatic updates (e.g. of data) or triggers (for executing a process for example). Pull consumption refers to the public service having to request updates or triggers. Push consumption or having both mechanisms in place are considered more mature as these demonstrate that the public service seamlessly interconnects with the services it is consuming.

The maturity levels that can be achieved are the following:

- Opportunistic: Pull only, whilst push could be added
- Essential: Pull only, due to legal, or other constraints
- Sustainable: Push only whilst pull could be added
- Seamless: Push only due to legal or other constraints
- Seamless: Both mechanisms (push and pull) are being used

For the Lite version of the IMM C5 refers to the aggregate of the services being consumed and the question is re-phrased to “What is the typical interaction mode with the consumed services?”. The following are valid answers for the Lite version of C5.

- Mainly pull, whilst push could be added
- Mainly pull, due to legal or other constraints
- Mainly push, whilst pull could be added
- Mainly push due to legal or other constraints

Business Registration Service

The Business Registration Service utilizes both push and pull techniques for the e-payment service, and either pull or push for the rest of the services. For some services only push method is implemented due to legal or other constraints, which makes them equally mature to the e-payment service. More specifically, the techniques being utilized for the corresponding consumed services are listed in Table 6

Table 6: Business Registration service – interaction mode

CONSUMED SERVICE	INTERACTION MODE	MATURITY SCORE
1. e-Payment Service	Both mechanisms (push and pull) are being used	5
2. Authentication Service	Pull only, due to legal, or other constraints	3
3. Base registry information source (Tax clearance)	Pull only, due to legal, or other constraints	3
4. Base registry information source (Insurance clearance)	Pull only, due to legal, or other constraints	3
5. Base registry information source (Legal Person Tax Registration)	Push only due to legal or other constraints	5
6. Base registry information source (Legal person Social Security Registration)	Push only due to legal or other constraints	5
7. Base registry information source (Registration in local chamber)	Push only due to legal or other constraints	5
8. Base registry information source (Check the Company Name Availability)	Pull only, due to legal, or other constraints	3

Considering the above, one can claim that the Business Registration Service reaches a very good maturity score with regards to the interaction mode with the consumed services.

e-Fee Service

The e-Fee service also uses both push and pull methods for the aggregate of the consumed services, yet only the exchange with the banks service supports both of them. Similarly to the Business Registration Service, the e-Fee service performs well on the interaction mode mechanisms, as shown in Table 7.

Table 7: e-Fee service – interaction mode

CONSUMED SERVICE	INTERACTION MODE	MATURITY SCORE
1. e-Payment Service	Pull only, due to legal, or other constraints	3
2. Authentication service	Pull only, due to legal, or other constraints	3
3. Access Management Service	-	-
4. Tax Registry	Push only due to legal or other constraints	5
5. Data from Banks	Both mechanisms (push and pull) are being used	5
6. Data from other Public Organizations	Push only due to legal or other constraints	5

Note that for some of the above interaction modes pull or push is not applicable, hence the chosen answer is push (or pull respectively) “due to legal, or other constraints”. An example is the Authentication Service which is only called by the e-Fee service whenever there is a need to authenticate a user. In this case the push method is not applicable.

For the Lite version of the IMM C5 is answered for the aggregate of the services being consumed and the answer to C5 for the e-Fee Public Service should be “Mainly push due to legal or other constraints”.

1.1.6 Question C6: Common protocol usage (Technical interoperability – weight 20%)

What type of protocol specification is being used for exchanging information?

The aim of this question is to identify whether existing protocol specifications are used, an approach that implies higher interoperability.

There are only two maturity levels for this question which are related to either conforming or not to existing protocol specifications:

- **Essential:** Proprietary protocol specification
- **Seamless:** Common protocol specification

For the Lite version of the IMM C6 refers to the aggregate of the services being consumed and the question is re-phrased to “What type of protocol specifications are being used for exchanging structured information between the public service and consumed services?”. The following are valid answers for the Lite version of C6.

- Fully proprietary protocol specifications
- Mainly proprietary protocol specifications, some common protocol specifications
- Balanced mix between proprietary and common protocol specifications
- Mainly common protocol specifications, some proprietary protocol specifications
- Fully common protocol specifications

Business Registration Service

The Business Registration Service uses common protocol specifications only for two of the consumed services, i.e. e-payment and authentication services, as shown in Table 8.

Table 8: Business Registration Service – protocol types

CONSUMED SERVICE	TYPE OF PROTOCOL	MATURITY SCORE
1. e-Payment Service	Common specification protocol	5
2. Authentication Service	Common specification protocol	5
3. Base registry information source (Tax clearance)	Proprietary specification protocol	1
4. Base registry information source (Insurance clearance)	Proprietary specification protocol	1
5. Base registry information source (Legal Person Tax Registration)	Proprietary specification protocol	1
6. Base registry information source (Legal person Social Security Registration)	Proprietary specification protocol	1
7. Base registry information source (Registration in local chamber)	Proprietary specification protocol	1
8. Base registry information source (Check the Company Name Availability)	Proprietary specification protocol	1

e-Fee Service

The e-Fee service can be considered as a mature public service with regards to the protocols being used as for all the consumed services it adopts common protocol specifications (e.g. SOAP messages).

Table 9: e-Fee service – protocol types

CONSUMED SERVICE	TYPE OF PROTOCOL	MATURITY SCORE
1. e-Payment Service	Common protocol	5

	specification	
2. Authentication service	Common protocol specification	5
3. Access Management Service	-	-
4. Tax Registry	Common protocol specification	5
5. Data from Banks	Common protocol specification	5
6. Data from other Public Organizations	Common protocol specification	5

Examples of the above are the OAuth2.0 protocol for the Authentication Service, and the REST protocol for obtaining data from banks regarding the payment status of e-Fees.

For the Lite version of the IMM C6 is answered for the aggregate of the services being consumed and the answer to C6 for the e-Fee Public Service should be “Fully common

1.1.7 Question C7: Reuse of network infrastructure (Technical interoperability – weight: 10%)

Is the service consumed via an existing network infrastructure or a dedicated, private network?

The question aims to bring into light the use of existing private or public network infrastructures for the communications needs. Reuse of existing network infrastructure rather than using a private network indicates higher interoperability.

There are four maturity levels that reflect the answers given to this question, as listed below:

- **Opportunistic:** The service is consumed via a new dedicate private network whilst it could leverage on an existing network infrastructure or the Internet

- **Essential:** The service is consumed via a new dedicated private network due to security or other specific concerns
- **Sustainable:** The service is consumed via an existing private network (e.g. sTesta)
- **Seamless:** The service is consumed using the publicly available Internet

For the Lite version of the IMM C7 refers to the aggregate of the services being consumed and the question is re-phrased to “Are services typically consumed via an existing network infrastructure or a dedicated private network?”. The following are valid answers for the Lite version of C7.

- The services are mainly consumed via a dedicated private network whilst they could leverage on an existing network infrastructure or the Internet
- The services are mainly consumed via a dedicated private network due to security or other specific concerns
- The services are mainly consumed via an existing dedicated private network
- The services are mainly consumed using the publicly available Internet

Business Registration Service

The Business Registration Service for some services utilizes the public network while for the rest of them communications take place over an existing private network, as shown in Table 10.

Table 10: Business Registration Service – network infrastructure

CONSUMED SERVICE	NETWORK INFRASTRUCTURE	MATURITY SCORE
1. e-Payment Service	The service is consumed using the publicly available Internet	5
2. Authentication Service	The service is consumed using the publicly available Internet	5
3. Base registry information source (Tax clearance)	The service is consumed via an existing private network (e.g. sTesta)	4
4. Base registry information source (Insurance clearance)	The service is consumed via an existing private network (e.g. sTesta)	4
5. Base registry information source (Legal Person Tax Registration)	The service is consumed via an existing private network (e.g. sTesta)	4
6. Base registry information source (Legal person Social Security Registration)	The service is consumed via an existing private network (e.g. sTesta)	4
7. Base registry information source (Registration in local chamber)	The service is consumed via an existing private network (e.g. sTesta)	4
8. Base registry information source (Check the Company Name Availability)	The service is consumed using the publicly available Internet	5

e-Fee Service

The e-Fee service for two of the consumed services had to introduce new private networks which is not considered the best practice with regards to reusing existing network infrastructures. However, for the rest of the services performs better as shown in Table 11.

Table 11: e-Fee service - – network infrastructure

CONSUMED SERVICE	NETWORK INFRASTRUCTURE	MATURITY SCORE
1. e-Payment Service	The service is consumed using the publicly	5

	available Internet	
2. Authentication service	The service is consumed via an existing private network (e.g. sTesta)	4
3. Access Management Service	-	-
4. Tax Registry	The service is consumed via a new dedicated private network due to security or other specific concerns	3
5. Data from Banks	The service is consumed via a new dedicated private network due to security or other specific concerns	3
6. Data from other Public Organizations	The service is consumed via an existing private network (e.g. sTesta)	4

For the Lite version of the IMM C7 is answered for the aggregate of the services being consumed and the answer to C7 for the e-Fee Public Service should be “The services are mainly consumed via a dedicated private network whilst they could leverage on an existing network infrastructure or the Internet”.

1.1.8 Question C8: Semantic alignment (Semantic interoperability – weight: 20%)

To what extent are semantic standards and specifications used for data modelling of the data exchange between the public service and consumed services?

This question focuses on the use of existing standards that promote semantic interoperability. Use of existing semantic standards and specifications (e.g. data models standards, standardised XML schemata, metadata standards, standardised reference data (e.g. code lists)) is considered more interoperable than developing proprietary standards.

There are three distinct maturity levels for the semantic alignment based on the following answers:

- **Opportunistic:** The data models have been created for the public service without using any existing semantic standards or specifications
- **Essential:** Some proprietary semantic standards and specifications are used for creation of the data model
- **Seamless:** The whole development of the data models are based on existing (open) semantic standards and specifications

For the Lite version of the IMM C8 refers to the aggregate of the services being consumed although the question and possible answers remain the same with the Full version.

Business Registration Service

The Business Registration Service achieves the highest maturity score for the semantic alignment as existing semantic standards were adopted for the data models used for all the consumed services. This gives the highest score for all consumed services, which is 5 (based on the answer “The whole development of the data models are based on existing (open) semantic standards and specifications”).

e-Fee Service

The e-Fee service achieves an equally high score, i.e. seamless, for all consumed services, as for these consumed services existing standards and specifications are also adopted.

For the Lite version of the IMM although C8 refers to the aggregate of the consumed services the answer is the same as that given for all the services for the Full version, i.e. “The whole development of the data models are based on existing (open) semantic standards and specifications”.

1.1.9 Question C9: Exception handling (Semantic interoperability – weight: 10%)

How are exceptions resolved?

This question raises the issue of the ability to efficiently handle unexpected responses received during service consumption. Received information may be inconsistent with internal information. Initiated transactions may lead to an unexpected response. The way in which these exceptions are handled determine the level of interoperability.

There are three maturity levels for the exception handling, as listed below:

- **Opportunistic:** Fully manually
- **Essential:** Semi-automated
- **Seamless:** Fully automated

Business Registration Service

With regards to the Business Registration Service half of the consumed services do not implement automated exception handling mechanisms, and as a result, these have to be manually handled by the interested parties. There is only one consumed service that appears to be highly mature, as shown in Table 12.

Table 12: Business Registration Service – exception handling

CONSUMED SERVICE	EXCEPTION HANDLING	MATURITY SCORE
1. e-Payment Service	Fully automated	5
2. Authentication Service	Semi-automated	3
3. Base registry information source (Tax clearance)	Semi-automated	3
4. Base registry information source (Insurance clearance)	Semi-automated	3
5. Base registry information source (Legal Person Tax Registration)	Fully manually	2
6. Base registry information source (Legal person Social Security Registration)	Fully manually	2
7. Base registry information source (Registration in local chamber)	Fully manually	2
8. Base registry information source (Check the Company Name Availability)	Fully manually	2

For the Lite version of the IMM C9 refers to the aggregate of the services being consumed and the question is re-phrased to “Received information may be inconsistent with internal information. Initiated transactions may lead to an unexpected response for example. How are such exceptions typically resolved?”. The following are valid answers for the Lite version of C9 (note that these are identical to the Full version, yet they are presented here for completeness).

- Fully manually
- In a semi automated way
- Fully automated

e-Fee Service

The performance of the e-Fee service seems to be more mature compared to the Business Registration service, with three of the consumed service adopting a fully automated exception handling while only one of them handles exceptions manually, as shown in Table 13.

Table 13: e-Fee service –exception handling

CONSUMED SERVICE	EXCPECTION HANDLING	MATURITY SCORE
1. e-Payment Service	Semi-automated	3
2. Authentication service	Fully automated	5
3. Access Management Service	-	-
4. Tax Registry	Fully automated	5
5. Data from Banks	Fully automated	5
6. Data from other Public Organizations	Fully manually	2

For the Lite version of the IMM C9 is answered for the aggregate of the services being consumed and the answer to C9 for the e-Fee Public Service should be “In a semi automated way “.

1.1.10 Question C10: Certification (Organisational interoperability – weight: 10%)

Has the public service followed the certification procedure to consume the service?

This question addresses the important issue of formally certifying a public service before making use of it. A public service which applies for formal certification when available is considered more interoperable. Certification is a formal procedure to verify if a constituency meets the prerequisites to connect to a service. Certification may examine areas like: security, governance, technological and semantic interoperability and availability.

There are three maturity levels for this interoperability area, which reflect the following answers:

- **Opportunistic:** No, while a certification procedure is available
- **Essential:** No, there is no certification procedure available
- **Seamless:** Yes

Business Registration Service

With regards to the Business Registration Service a certification procedure has been followed only for one of the consumed services, i.e. the e-payment, while for the rest of consumed services there is no appropriate procedure available, hence the lack of any certification.

Table 14: Business Registration Service – certification procedure

CONSUMED SERVICE	CERTIFICATION PROCEDURE	MATURITY SCORE
1. e-Payment Service	Yes	5
2. Authentication Service	No, there is no certification procedure available	3
3. Base registry information source (Tax clearance)	No, there is no certification procedure available	3
4. Base registry information source	No, there is no certification	3

(Insurance clearance)	procedure available	
5. Base registry information source (Legal Person Tax Registration)	No, there is no certification procedure available	3
6. Base registry information source (Legal person Social Security Registration)	No, there is no certification procedure available	3
7. Base registry information source (Registration in local chamber)	No, there is no certification procedure available	3
8. Base registry information source (Check the Company Name Availability)	No, there is no certification procedure available	3

e-Fee Service

The e-Fee service has followed certification procedures for those services that certification was available.

Table 15: e-Fee service – certification procedure

CONSUMED SERVICE	CERTIFICATION PROCEDURE	MATURITY SCORE
1. e-Payment Service	No, there is no certification procedure available	3
2. Authentication service	No, there is no certification procedure available	3
3. Access Management Service	-	-
4. Tax Registry	Yes	5
5. Data from Banks	Yes	5
6. Data from other Public Organizations	No, there is no certification procedure available	3

For the Tax Registry and Data from Banks services, the organization providing the services has established sound procedures against which a consumer, such as the e-Fee service, is being evaluated and certified for compliance with them.

For the Lite version of the IMM C10 is answered for the aggregate of the services being consumed and the answer to C10 for the e-Fee Public Service should be “Sometimes, certification procedures have been followed for some consumed services”.

1.1.11 Question C11: Specification process (Organisational interoperability – weight: 10%)

Has the public service been involved in establishing the specifications of the consumed functional service?

This question attempts to identify whether an open process has been followed for the establishment of specifications. An open process to establish specifications is likely to yield more interoperable results.

The following are valid maturity levels corresponding to the listed answers:

- **Opportunistic:** No, although this would have been possible
- **Essential:** No, this was not possible
- **Seamless:** Yes

For the Lite version of the IMM C11 refers to the aggregate of the services being consumed and the question is re-phrased to “Has the public service been involved in establishing the specifications of the consumed services?”. The following are valid answers for the Lite version of C11.

- Mostly No, although this would have been possible
- Mostly No, this was not possible
- Sometimes, the public service has been involved in the specification process of some consumed services

Business Registration Service

The Business Registration Service has only been involved in establishing the specifications of the e-Payment service, while there was no involvement at all for the rest of the consumed services, as shown in Table 16.

Table 16: Business Registration Service – specification process

CONSUMED SERVICE	SPECIFICATION PROCESS	MATURITY SCORE
1. e-Payment Service	Yes	5
2. Authentication Service	No, this was not possible	3
3. Base registry information source (Tax clearance)	No, this was not possible	3
4. Base registry information source (Insurance clearance)	No, this was not possible	3
5. Base registry information source (Legal Person Tax Registration)	No, this was not possible	3
6. Base registry information source (Legal person Social Security Registration)	No, this was not possible	3
7. Base registry information source	No, this was not possible	3

(Registration in local chamber)

- | | | |
|---|---------------------------|---|
| 8. Base registry information source (Check the Company Name Availability) | No, this was not possible | 3 |
|---|---------------------------|---|

e-Fee Service

The e-Fee service had a more active involvement and participated in the establishment of the specifications of three consumed services.

Table 17: e-Fee service – specification process

CONSUMED SERVICE	SPECIFICATION PROCESS	MATURITY SCORE
1. e-Payment Service	No, this was not possible	3
2. Authentication service	No, this was not possible	3
3. Access Management Service	-	-
4. Tax Registry	Yes	5
5. Data from Banks	Yes	5
6. Data from other Public Organizations	Yes	3

For the Lite version of the IMM C11 is answered for the aggregate of the services being consumed and the answer to C11 for the e-Fee Public Service should be “Mostly Yes, the public services has always been involved in establishing specifications”.