D8.8 FITMAN Experiences and Lessons Learned from Phase III Support

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VERSION HISTORY

VERSION	DATE	NOTES AND COMMENTS
0.1	25/06/2015	First version of Table of Contents (ToC).
0.2	26/06/2015	Updated ToC.
0.3	14/08/2015	Updated ToC – added appendices updates on work from T8.1 and T8.2. Added initial content to sections 2, 3, 4 and Appendix A (support policy).
0.4	07/09/2015	Added content to section 5 and 6. Updated appendices after re-organisation of work discuss in Innsbruck GA.
0.5	10/09/2015	Updates to sections 5, 6 and Appendix A.
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0.7	24/09/2015	Various improvements made to the text throughout.
0.8	26/10/2015	Content added for 'Lessons Learnt from Trial Expansions'. Updated appendices. Various improvements made throughout.
1.0	30/10/2015	Updated according to internal review.

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EXECUTIVE SUMMARY

This deliverable reports on the experiences and lessons learned from the support FITMAN has provided to participants in Phase III of the FI-PPP. Phase III is widely known as 'FIWARE', comprising 16 accelerator projects launching multiple open calls for European start-ups, SMEs and Web Entrepreneurs (WEs) to get funding for projects focused on technology adoption of FIWARE GEs and SEs from Phase I and II projects such as FITMAN.

The FITMAN project has got many assets that have been supported; both technical assets such as Specific Enablers (SEs) and non-technical assets such as the Verification & Validation Methodology. The SEs are primarily of interest to the SMEs and WEs (open call winners), while non-technical assets such as the Technology Awareness Creation methodology is of primary interest to the FIWARE accelerators. Moreover, although the FITMAN project focuses on manufacturing, many of the project assets are applicable to any domain. For example, all methodologies are domain agnostic, which is the same for many SEs, such as: 3DScan, Collaborative Asset Management, Collaborative Business Process Management, Unstructured and Social Data Analytics and Secure Event Management.

To provide effective and efficient support, processes for pre- and post-sales support were set up, which are detailed in this deliverable. Pre-sales is here defined as the support FITMAN gives to potential "clients" who are considering using FITMAN assets, and post-sales is defined as clients who are using FITMAN assets such as open call winners using the FITMAN SEs. Pre-sales support was set up with confidentiality as a primary requirement, whilst post-sales support was set up for distributed management and scalability (to be prepared to deal with a potentially large number of support requests).

FITMAN has not only provided support to the direct FIWARE participants, such as the accelerators and their open call participants; wider outreach activities have also been conducted. The Technology Awareness Creation methodology developed in the project has been implemented, leading to disseminating information about FITMAN and opportunities for participation in FIWARE to over 100,000 potentially interested organisations via SME networks across Europe. FITMAN has also offered several webinar series, to raise awareness about the assets and support provided by the FITMAN project, as well as training.

Although the FITMAN project has finished before the end of the Phase III, continued free support is offered. This has been achieved via a FITMAN Exploitation Agreement and joint exploitation vehicle set up in the project, namely the FITMANovation Lab (FML). An FML Portal has been developed, which draws upon the experiences and lessons learnt from providing support to the Phase III during the course of the FITMAN project.

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1 INTRODUCTION

This deliverable reports on the experiences and lessons learned from the support the FITMAN project has provided to participants in Phase III of the FI-PPP. Phase III of the FI-PPP has been widely branded as 'FIWARE', however, both terms are used in this document depending context in order to be clear.

FITMAN has provided support to Phase III consortia (accelerators) as well as the winners of the open calls launched by the accelerators (start-ups, SMEs and web entrepreneurs). The FITMAN project has developed many assets that have been supported; both technical assets such as Specific Enablers (SEs) and non-technical assets such as the Verification & Validation Methodology. All FITMAN assets are discussed in Section 2.

To provide effective and efficient support, we have made a distinction between providing pre- and post-sales support. Pre-sales is here defined as the support FITMAN gives to potential "clients" who are considering using FITMAN assets, and post-sales is defined as clients who are using FITMAN assets (such as the SEs). The two different lines of support has been set up to deal with different types of support queries, as some need to be handled differently. For example, for pre-sales support, it is necessary to ensure confidentiality, whilst for the post-sales support it is important to enable distributed management and scalability (to be prepared to deal with a large number of support requests). More details in Section 3 about the types of typical support queries, and the potential technologies that have been considered for delivering the support.

Section 4 details the support process and technologies used for both pre-sales/non-technical and technical support, including a discussion of support roles and their respective responsibilities.

An assessment of the support the FITMAN project has delivered to Phase III participants is discussed in Section 5. Firstly, this covers the engagement with (potential) Phase III participants via webinars and technology awareness creation efforts. We discuss the support statistics, website traffic and conclude this section with a discussion about the lessons learnt.

Although the FITMAN project has finished before the end of Phase III, the project partners agreed to continue to provide support to Phase III, enabled via the FITMAN Exploitation Agreement and the FITMANovation Lab, which is a joint exploitation vehicle for FITMAN. The support to Phase III participants remains free, and Section 6 discusses how this support is provided.

An expansion of the Whirlpool trial in FITMAN, performed in collaboration with 3DQuality, one of the projects funded in Phase III via FABulous, is reported on in Section 7. Section 8 provides a summary and conclusions.

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2 FITMAN ASSETS

There are many assets in FITMAN that are available to FI-PPP participants, both Phase III accelerator projects and SMEs/Web Entrepreneurs participating in the Phase III Open Call projects. The respective sub-sections below show more detail about both the technical and non-technical assets. Note that, in this document we refer to a non-technical asset as one that is not an item of technology in itself. For example, although the Verification and Validation Methodology addresses technical aspects, it is a methodology – thus, a non-technical asset.

2.1 Technical Assets

The technical assets from FITMAN supported in the FI-PPP Phase III include:

- 3D Printing Data Support Platform.
- 15 Specific Enablers (SEs) – see below for details.

Note that three additional platforms were developed, but as reference architectures: Smart Factory Platform, Virtual Factory Platform and Digital Factory Platform. Post-project, a specific platform focused on 3D Printing has been developed and supported, influenced by the collaboration and interest from the FABulous accelerator project.

Table 1, below, gives an overview of the technical assets and their respective owners in terms of support responsibilities. Note here that some assets have been developed by multiple partners, however, this level of detail is omitted here; only the responsible organisation for supporting the respective asset is listed.

Table 1: Technical assets and support owners.

Source	Asset	Support Owner
WP12 WP13	3D Printing Data Support Platform	FZI[1]
WP3	Collaborative Asset Management (SE4)	ENG
WP3	Collaborative Business Process Management (SE7)	ENG
WP3	Data Interoperability Platform Services (SE8)	TXT
WP3	Metadata and Ontologies Semantic Matching (SE6)	NTUA
WP3	Secure Event Management (SE2)	TXT
WP3	Shopfloor Data Collection (SE1)	Atos + UNINOVA
WP3	Supply Chain & Business Ecosystem Apps (SE5)	TXT
WP3	Unstructured and Social Data Analytics (SE3)	NTUA
WP12	Dynamic CEP (DyCEP) (SE-SF-1)	FZI/NISSA
WP12	Dynamic Visualisation and Interaction (DyVisual) (SE-SF-2)	DFKI
WP13	SEMed (Semantic Mediator front-end & back-end) (SE-DF-1)	BIBA
WP13	C3DWV (Collaborative 3D Web Viewer) (SE-DF-2)	DFKI

[1] FZI is responsible for general support for the 3D Printing Data Support Platform. However, other FITMAN partners are responsible for supporting issues for specific SEs part of this platform.

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Source	Asset	Support Owner
WP13	3D Scan (Storage and Visualisation) (SE-DF-4)	DATAPIXEL
WP14	Advanced Management of Virtualized Assets (MoVA) (SE-VF-1)	DITF
WP14	Generation and Transformation of Virtualized Assets (GeToVa) (SE-VF-2)	STI

2.2 Non-technical Assets

There are many non-technical assets in FITMAN, which have been created in WP1, WP2, WP3, WP8 and WP9. See Table 2, below, for an overview of the assets and associated owners. As with the technical assets, above, note here that some assets have been developed by multiple partners, however, this level of detail is omitted here; only the responsible organisation for supporting the respective asset is listed.

Table 2: Non-technical assets and owners.

Source	Asset	Support Owner
WP1	Use Case Scenarios and Business Requirements	INNOV
WP1	FI-PPP Capacity Building Analysis	ENG
WP2	FITMAN Verification & Validation Method and Criteria	NTUA
WP2	FITMAN Business and Technical Indicators	IVLAB
WP2	FITMAN Verification & Validation Generic Assessment Package	POLIMI
WP2	FITMAN V&V Assessment Package Instantiations per Trial	VTT
WP3	FITMAN Trials Business Cases	INNOV
WP3	Trials Competencies / Capability Gaps and Open Call Specifications	IVLAB
WP8	Methodology for identifying best practices and lessons learned	IT Innov
	Methodology for creating technology awareness	INNOV
	Support for SME service and application development	INNOV
	FITMAN SMEs Innovation Preparation First	INNOV
	Methodology for proactive communication of achievements and innovations generated by SMEs in Phase III	INNOV
WP8	Checklist of Legal Issues	IT Innov
	Checklist of Business Models	IT Innov
	Intermediaries' Best Practices for Phase III	IT Innov
	Lessons learned regarding involvement in the FI-PPP	IT Innov
WP9	Methodology for socio-economic impact assessment of FI-PPP	IT Innov

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Source	Asset	Support Owner
	trials	

It is worth noting here that the key non-technical FITMAN assets that are focused on for continued support beyond the FITMAN project are:

- The verification & validation methodology
- The technology awareness creation methodology
- The socio-economic impact assessment methodology

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3 SUPPORT QUERIES AND TECHNOLOGIES

There are different types of support queries possible, which need to be managed appropriately. Some queries can be classified as pre-sales queries, and others as post-sales. Pre-sales refers to queries from potential clients, before they have started using any services or assets. For example, SMEs/Web Entrepreneurs in the process of bidding to a FIWARE Open Call. Post-sales refers to queries from clients that have become customers, such as successful Open Call bidders.

Within each category, a tiered structure has been adopted in FITMAN to manage the support effectively. Typically, as is best practice suggested from ITIL[2], the first tier should deal with as many support queries as possible. Further tiers are typically used to escalate support tickets to domain experts or where the client needs to be seen in person. An overview with examples of queries for the two support categories and two possible tiers is given below in Table 3. Section 4 will go into further details.

Table 3: FITMAN support categories with example queries for different tiers.

Support category	Tier	Example queries
Pre-sales support	Tier 1	What does FITMAN have to offer? What is the licence of SE …?
	Tier 2	Can SE … be used to deal with data models of type *X*?
Post-sales support	Tier 1	I can't download SE … I can't access SE …
	Tier 2	How do I configure SE … to do *X*? I found a bug with SE ….

There is a diverse range of technologies that can be used for support. Some technologies allow some ***automation*** in the support process, which can greatly help to reduce time needed to provide answers or solutions to customers. Other technologies facilitate ***self-help***, which can reduce the number of support queries and is an important part of support alongside with technologies that allow people to raise issues and receive support.

Another important dimension of support provisioning is confidentiality. Some technologies exploit the self-help by being publicly accessible, such as discussion forums, where anybody can see questions and answers given. However, this is not appropriate for some queries, where the person asking the query may not want to expose that the organisation they work for is doing a particular kind of work, for example.

Table 4, below, gives an overview of support technologies considered in FITMAN.

[2] ITIL is a widely accepted framework for best practice guidance for IT Service Management. http://www.itil-officialsite.com/

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Table 4: Possible technologies for support in FITMAN.

Technology/Type	Purpose	Comments
Website	Self-help	Typically the entry point and first source of information when needing support.
Forum	Self-help and support queries (public)	Well established technology that many are familiar with, though requires a user account to be set up. Good for discussions of problems, and information remains open for others to see if they have a similar issue.
Email	Support queries (confidential)	Well established technology. Quick and easy to use for people to use and facilitates confidential queries (unlike forums).
Trouble ticket system	Automatic management and tracking of support tickets	Could be combined with email, i.e., to automatically create support tickets that can be more easily tracked and managed. Also, can form a knowledge base of known issues and resolutions.
Issue tracker system	Track technical issues	Could be used for software and infrastructure issues, for 2nd tier FITMAN technical support team, for example. Not user friendly to expose directly to customers.
System health checking	Pro-active support	For example, Nagios, to monitor infrastructures and services.
System/software logging	Pre-emptive support	To ensure SEs provide sufficient logging so when issues arise, people could provide log files to help resolve the problems.
Telephone	Live discussion (confidential)	Common commercial support technology, but not suitable in projects like FITMAN due to (international) telephone costs and typically not being able to have somebody present at the end of a phone line during complete business hours – assume that people providing support have other responsibilities too. However, we may consider that telephone is used to discuss issues as part of pre-sales following on from initial email conversation.
Chat	Live discussion	Could be chat function on website, or IRC[3], for example. The former is

[3] IRC is an abbreviation for Internet Relay Chat, a text based application layer protocol for

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Technology/Type	Purpose	Comments
		likely to only be for 1st tier support, whilst the latter could be for 2nd tier technical support. However, does not scale well.
Remote desktop	Live assisted support	Typically used when addressing a technical support issue that require some configuration changes at the customers' end.
Training	Educate, awareness creation, increase uptake of assets	E.g., webinars, which is particularly useful for pre-sales support.

FITMAN has adopted a subset of the technologies listed above in Table 4 according to the requirements for pre- and post-sales support. The following section discusses the support process set up in FITMAN.

communication, based on a server/client model. That is, people can access a server, join chat rooms and communicate with others users on that server via a client.

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4 SUPPORT PROCESS

This section provides details about the processes set up in FITMAN to support participants in the FI-PPP. Within the FI-PPP, there are three target audiences of FITMAN support:

- Phase III accelerators: project consortia running open calls for use case expansions that may build upon FITMAN assets. The accelerators themselves are likely to need more non-technical support, such as 'use case scenarios and business requirements' and methodologies for 'SME engagement and technology awareness'.
- Phase III use case expansions: Web Entrepreneurs (WEs) and SMEs who are likely to require mainly technical support for the SEs they adopt in the Phase III open call projects they are participating in.

In addition to the above, there are also the following classes of external customers that FITMAN will offer support to beyond the end of the project as part of the exploitation and sustainability of the FITMAN services in the FITMANovation Lab (FML):

- Applications Developers
- System Integrators
- Manufacturing Industries

This section focuses on the processes set up for supporting Phase III participants. Support for the FML is further discussed in Section 6, which includes some revisions according to the experiences and lessons learned during the FITMAN project (discussed in Section 5).

For reference, a set of common channels were set up in FITMAN through which support has been offered to all target audiences:

- Website:
  - Non-technical: http://www.fitman-fi.eu/phase-iii-package
  - Technical: http://catalogue.fitman.atosresearch.eu
- Support email: fitman-support@txtgroup.com
- Technical forum: http://catalogue.fitman.atosresearch.eu/forums
- Twitter: https://twitter.com/FitmanFI
- LinkedIn: http://www.linkedin.com/groups?about=&gid=4986259

The following sections focus on the ad hoc support *process* for delivering both pre-sales and post-sales support, focusing on WEs and SMEs in the Phase III use case expansions. Note that the pre-sales and post-sales support processes discussed in the respective sections below do not reflect a part of the support that FITMAN has been continually delivered throughout the project; to educate, increase awareness and uptake of assets. This mainly falls within pre-sales support, as we refer to it in here, and webinars have been held for both Phase III accelerators and open call participants (SMEs and WEs) as well as extensive SME outreach activities, which is discussed further in Section 5.1.

4.1 Pre-sales Support Process

Pre-sales support in FITMAN addresses queries covering, for example, what FITMAN may have to offer to potential clients (in general) and how FITMAN assets could be used. Although pre-sales support may be higher level and business oriented, there may also be a need for further technical expertise to answer some questions, which is considered below when discussing the different support tiers.

One important requirement to consider for the pre-sales support is to provide a *confidential* channel for people to communicate with FITMAN. The channel needs to be confidential in

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the sense that the wider public should not be able to access it and it should only be accessible to a restricted audience within FITMAN as well.

An overview of the pre-sales support process is given below in Figure 1. Two channels for clients to seek support are depicted: the phase 3 package website and email. Support starts at the online information and the support loop should always be closed by updating the online information according to support queries so that other people may find the information or solutions to common problems there instead of having to raise a support ticket. For example, this may be to maintain a FAQ or make information clearer or more easily accessible. The aim of this is to increase the self-help aspects in order to reduce the effort required by FITMAN support agents, which is important for long-term sustainability.

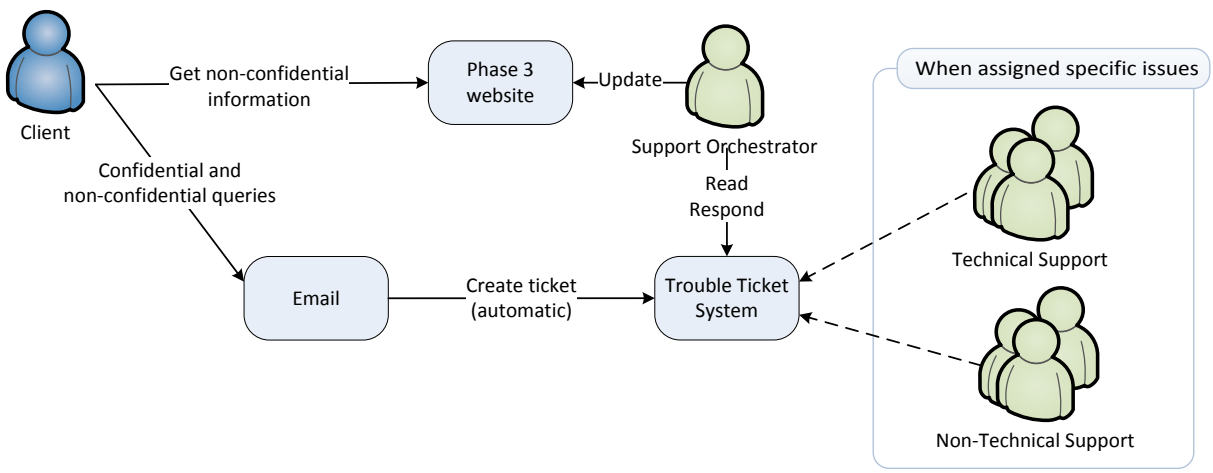

Figure 1: FTIMAN pre-sales support process (not depicted: potential use of telephone support).

A Support Orchestrator is depicted in Figure 1 (1st tier), a role that should be fulfilled by one or more people who are entrusted to deal with confidential enquiries and who has broad knowledge about the FITMAN assets (though not deep). To help manage support queries, a Trouble Ticket System (TTS) has been identified as important in FITMAN, to automatically create support tickets when somebody emails support, which can be escalated to other support agents very easily.

The OTRS Help Desk[4] was chosen in FITMAN. This is a free, open source, and mature software solution. It was also chosen because different support queues can be created and support agents are given access to specific queues according to their roles. Therefore, it was possible to set up queues with the appropriate visibility given the confidentiality requirement.

Support tickets that are created by the TTS are initially treated as confidential; only visible to the Support Orchestrators. A Support Orchestrator may deal with the issues directly themselves as part of front-line support (1st tier). When needed, this person should make use of 2nd tier support, whether for technical or non-technical queries.

Pre-sales support can be structured with two tiers:

Tier 1: Front-line support for general queries via email (managed by the OTRS TTS). This may also include follow-up discussions via telephone where appropriate, but a support phone number is not advertised and is only considered on demand, if the respective support agent wishes to provide support in this way.

[4] http://www.otrs.com/

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Tier 2: Second-line support for detailed queries front-line support cannot answer. E.g., technical queries about SEs, and non-technical questions about applying methods like verification and validation. This could also be confidential queries that may need to be escalated to project management.

As mentioned above, to close the loop and maximise the self-help element of the support, it is important that the Support Orchestrator ensures that the website is updated. The updates may be delegated to 2nd tier support agents if required (and appropriate).

4.2 Post-sales Support Process

The post-sales support in FITMAN needs to cover each of the SEs as well non-technical assets such as the V&V method and methodology for creating technology awareness. While confidentiality is a key issue we need to deal with carefully in pre-sales support, it is less so for technical support. Organisations may be more open to share and collaborate on solutions to issues. Moreover, the visibility of the support tickets internally to FITMAN should not be a problem, i.e., all support agents in FITMAN providing technical support can view all technical support tickets.

The emphasis in post-sales support is having a tiered process that *scales* well and promotes *openness / self-help* where possible (e.g., directing queries to the forum). Figure 2, below, gives an overview of the post-sales support process in FITMAN.

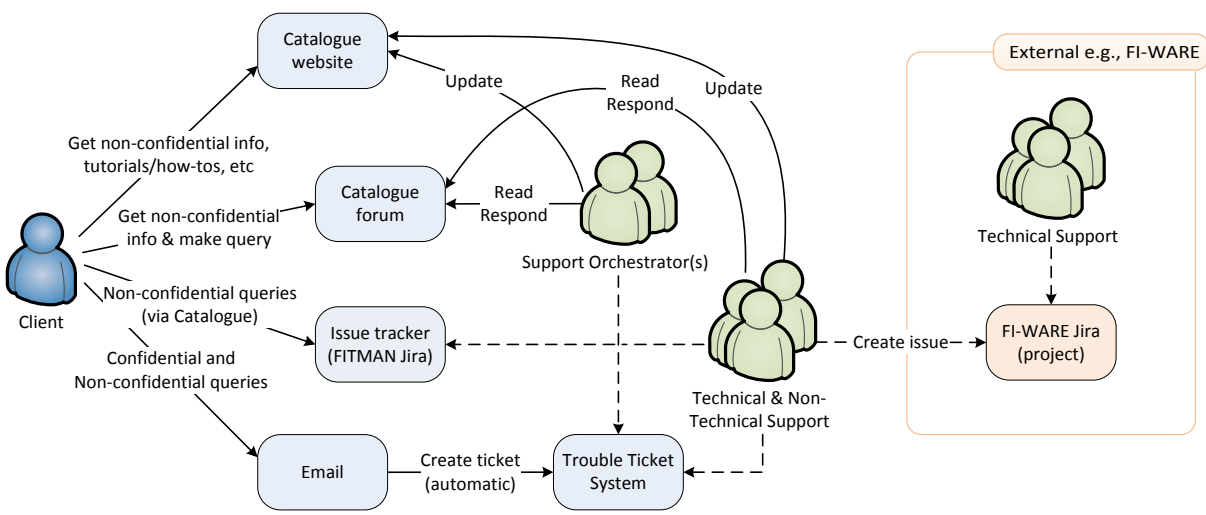

Figure 2: FITMAN post-sales support process (not depicted: potential use of telephone support and remote desktop).

Ideally, clients should be encouraged to seek support via the *self-help* and *collaborative* channels first, i.e., the catalogue website and the forum. As discussed above for the pre-sales support, the aim is to eliminate the time spent on dealing with support tickets about known and resolved issues. Ideally, support via email should only be for issues that the client feel is sensitive to them and would not be appropriate on a forum. However, in reality, people are likely to use email just because it is quick and easy.

We can structure the post-sales support into three tiers:

Tier 1: Front-line support, dealing with general technical queries.
Tier 2: More in-depth technical support, such as the developer(s) of a specific SE or owner of any other asset.

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Tier 3: For anything that goes beyond the FITMAN consortium/assets, e.g., GEs, infrastructure issues, operating system issues, etc.

In terms of dealing with support queries, the same TTS as discussed above for pre-sales support is ideal for managing support queries coming in via email. Support Orchestrators can quickly assign or escalate support tickets to second line technical support agents.

An issue tracker (Jira) is also included for SE issues, such as bugs or feature requests. This was adopted to be in line with support processes used in FIWARE, so that the users of support within the entire FIWARE ecosystem have similar support channels available to them.

The issue tracker in FITMAN has been linked to the FITMAN Catalogue, in which each SE has a link to raise an issue through the web browser without having to log in to another system. However, this support channel (Jira) does not support a dialogue with people very well, unless they are registered users in the system. Although anonymous creation of an issue via the catalogue is possible, they will not receive any notifications about comments on the issue tracker even though they can provide their email address. They would have to manually follow it, or only rely on the person dealing with the issue to manually email them to notify them of the progress, etc.

In ITIL terms, the issue tracker is better suited for 'problem management', in which a problem is the cause of one or more incidents that have been reported by clients. The cause is generally not known at the time a problem 'record' is created, such as a software bug that needs further investigation. This is a case where one or more developers from the second line support tier would need to spend time to investigate and ideally provide a temporary work-around solution to the client if possible while the investigation is taking place, especially if the problem needs a new release for software.

For any FITMAN platforms / SEs deployed on FI-Lab, for example, we need to expect queries that may be infrastructure related. In these cases, issues may be created on the FIWARE Jira, as depicted in Figure 2 above. FI-Lab then becomes third line support.

As with pre-sales support, to close the loop and maximise the self-help element of the support, it is important that the Support Orchestrator(s) ensures that the relevant websites are updated. The updates may be delegated to 2nd tier people if required, which is likely for technical documentation for SEs.

4.3 Support Roles and Responsibilities

Although we have discussed pre- and post-sales support above as two separate processes, they are part of the same support ecosystem and use shared technologies. Given the support requirements and processes discussed above, we have the following support roles:

- Support Orchestrator
- Technical Support Agent
- Non-technical Support Agent
- Confidential Support Agent

The Support Orchestrators are important to ensure that support queries are addressed, and effectively also become front line support to keep things simple (to limit the number of roles). The responsibilities of the different roles are depicted in the diagrams above in Figure 1 and Figure 2, but are repeated here for convenience.

Pre-sales Support Orchestrator responsibilities:

- Manage pre-sales support tickets in the OTRS TTS

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- Perform front-line support (via OTRS TTS)
- Escalate to second line support when needed
- Ensure tickets are addressed and closed appropriately
- Update the information on the phase 3 package website
- Engage with Phase III Accelerators (events, webinars, etc)

Post-sales Support Orchestrator responsibilities:

- Manage post-sales support tickets in the OTRS TTS
- Perform front-line support via:
  - OTRS TTS
  - Catalogue forum
- Escalate to second line support when needed
- Ensure tickets are addressed and closed appropriately
- Escalate to third line support when needed (e.g., FI-WARE)
- Update the catalogue website, or ensure somebody from second line support updates where appropriate

Note that the above distinction of two Support Orchestrator roles, for pre- and post-sales support, does not imply that there must be two individuals doing each role. In fact, both roles could be fulfilled by a single individual.

Front-line (1st tier) support scope:

- Technical:
  - General overview of the FITMAN platform(s), the available SEs and what they can do.
  - Have enough knowledge and experience to answer questions about the licensing arrangements, installation and running of the FITMAN platform(s) and SEs, covering things like technical requirements, but not details such as APIs, configuration, etc. Therefore, the support agent should ideally have installed and used the assets they support.
- Non-technical:
  - General overview of the non-technical assets listed in Section 2.2 on page 9.
  - Have enough knowledge about each of the non-technical assets as to what they offer (can and cannot do), and how they would be applied.

Second-line support should deal with specific queries that front-line support is unable deal with (according to the scope outlined above). However, note that, to achieve scalability in this process, most technical questions for specific SEs should be assigned to the respective SE owner unless the questions are sufficiently simple and high level for a technical front-line support agent to answer.

In case there is a great demand for FITMAN support, most SE questions can be distributed straight to the SE owners in order to scale up.

As discussed in Section 4.1 on page 14, in the OTRS TTS, support tickets can be organised into different queues, to ensure that the pre-sales confidential queries are indeed kept confidential to only selected people in FITMAN, while all the post-sales technical queries can be openly seen by all FITMAN technical support agents. Figure 3, below, depicts a typical workflow for dealing with support queries in the OTRS TTS.

It is the Support Orchestrators' responsibility to assign tickets to the appropriate queue. There are three queues in the OTRS TTS:

- Technical: for FITMAN platform and SE related queries.

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- Non-technical: for all other queries (related to the non-technical assets).
- Confidential: for confidential queries, expected to primarily be pre-sales related, but could be either technical or non-technical.

Note that support tickets should be closed by the person who is the assigned owner of the respective support ticket, however, it is the responsibility of the Support Orchestrator to ensure tickets are addressed and closed appropriately. The best practice for closing tickets according to ITIL is to only do so after the client who raised the issue confirms that the issue is resolved or they are happy with a work-around solution while a software bug is being fixed, for example.

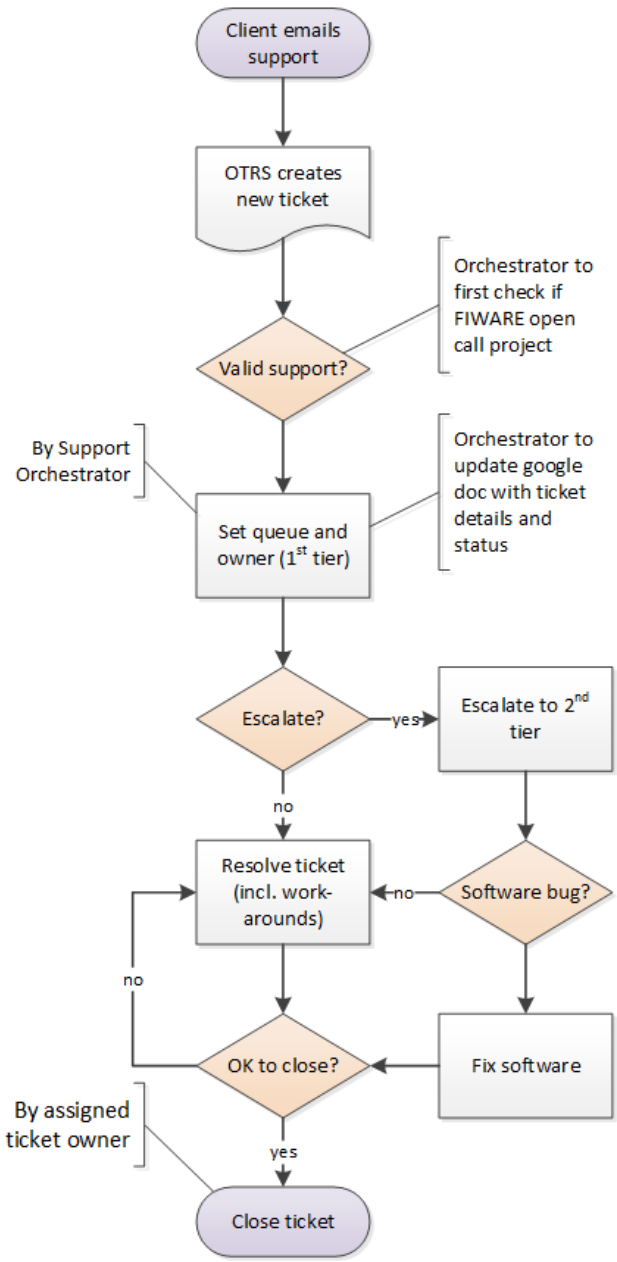

Figure 3: Typical process flow for email support.

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5 ASSESSMENT OF PHASE III SUPPORT

As discussed above, support processes were put in place to support participants in Phase III of the FI-PPP, including the FIWARE accelerators and the participants in their open calls (i.e., the SMEs and WEs). Below, we discuss the engagement FITMAN has made with Phase III participants, assessment of support and lessons learnt.

5.1 Engagement with Phase III Participants

In addition to the ad hoc support offered (via the processes defined above in Section 4), FITMAN has proactively engaged with the other Phase III participants. Section 5.1.1 discusses the engagements within the FIWARE acceleration programme. Wider technology awareness, using the technology awareness creation methodology developed in the programme, is discussed in Section 5.1.2. Results from the FITMAN webinars hosted to inform, train and support Phase III is discussed in Section 5.1.3.

5.1.1 FIWARE Acceleration Programme

FITMAN has engaged with Phase III participants during the course of the project, including consortia bidders to run Phase III accelerators in the first instance. Information was provided to bidders to the acceleration and support actions in Phase III, which has been the most accessed part of the Phase III package on the FITMAN website, as discussed in Section 5.3, below. In particular, FITMAN has engaged actively with the 16 accelerator projects since they started, at events such as ECFI, direct email and webinars, to raise awareness of the information, tools and support available from FITMAN.

In terms of the manufacturing industry that the FITMAN project focuses on, we note that only one accelerator was funded in Phase III having this domain as a centre of gravity: FABulous. Moreover, the overlap is small, as FABulous focuses exclusively on 3D printing. This is a very advanced domain in the Factory of the Future, but not in the core of the FITMAN initiative. Nevertheless, we have had positive interest from several accelerators in addition to FABulous, including CEED Tech, FI-ADOPT, FI-C3, European Pioneers, SOUL-FI, FInish, CreatiFI and FINODEX. This has been via webinars, face-to-face at events such as ECFI and via email exchanges.

A direct, collaborative connection was made with FABulous. FITMAN has participated in events with FABulous, such as ECFI2, LibreCon and FABulous information day (Fensterbank & al., 2015), and have contributed to the FABulous Open Call texts and open call webinars regarding what FITMAN offers in terms of assets and support.

In terms of adoption of technical assets by SMEs and WEs participating in the open calls launched by the accelerators, to date, this has only been via FABulous participants in terms of what we are able to discern via support requests (as discussed below in Section 5.2). Despite the focus on 3D Printing, the proportion of participants in FABulous requiring FITMAN SEs is significant: 55% from the first open call (29/53) and 45% from the second open call (15/33).

Wider engagements with Phase III participants have been performed via the technology awareness methodology created in the project and webinars. This is discussed further below in respective sections.

5.1.2 Technology Awareness

This section presents an overview of the technology awareness creation actions and the main outcomes.

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Based on the methodology developed in D8.3 (Vidal & Achinioti, 2013) and updated in D8.4 (Achinioti, et al., 2014), several FITMAN partners (specifically the ones who contributed in the methodology and the pilot actions linked to it) carried out the technology awareness creation actions in November – December 2014, namely: Innovalia Association (Task leader), IT Innovation, IVLAB, VTT and NTUA. The 5 stages of the methodology and main outcomes are discussed further below.

5.1.2.1 Stage 1: Definition of the overall scope and target groups related to the awareness activities

The overall scope of the activities was to raise technology awareness among potential applicants interested in the calls organised by the 16 FIWARE Accelerators (hereafter referred to also as A16). Given that FITMAN has a specific focus on manufacturing, special focus was given to Accelerators considered the most relevant to this field, namely FABulous, CEED Tech and FInish. The schedule of the actions was in line with the launching of the calls by the majority of the A16, in the period of November – December 2014. The geographical scope of the actions was the 28 EU members and the FP7 Associated countries.

The most important targets set were: FITMAN information to be propagated by 50% of all the organisations contacted; to receive a positive response by 50% of all organisations contacted per different category.

The target group of the actions was set as SMEs, web entrepreneurs and start-ups working within fields related to ICT and manufacturing.

5.1.2.2 Stage 2: Identification of SME networks and detection of possible communication means

The list of identified organisations with available communication channels as presented in D8.3 Annex 7.1 (Vidal & Achinioti, 2013) was the source for identifying and contacting organisations during the implementation of the technology awareness raising actions.

5.1.2.3 Stage 3: Ranking of the networks' potential impact and matching the networks with communication means

Taking into consideration the ranking table as provided in D8.3 Annex 7.2 (Vidal & Achinioti, 2013), the organisations that were finally contacted were the ones who had been highly ranked, having a green and yellow mark. Under exceptional cases, such as in the category Incubators / Accelerators, and given their high relevance to the scope of the activities, organisations ranked with red were also contacted.

The final number of the organisations contacted was 111, allocating 22 per partner, with an exception for VTT who were allocated 23 organisations due to proximity and previous communication with the additional organisation.

5.1.2.4 Stage 4: Establishment of an active dialogue with the interested stakeholders

The overall plan for establishing an active dialogue with the interested organisations was as follows:

1) The organisations were firstly contacted by email by each assigned partner in charge of the organisation batches;
2) In case of positive response, further information was sent to the organisation and a dialogue was started in order to detect the suitable communication channels for the dissemination of FITMAN information;
3) In case of no response, a follow-up email was sent one week after the initial email;
4) In case of no response, a follow-up phone call was carried out one week after the second email.

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5.1.2.5 Stage 5: Continuous monitoring of the activities

The activities were monitored throughout the process and corrective actions were taken when possible. For example, when an organisation had shown interest in the first email but never replied to further communication, a phone call was made. In addition, we were verifying whether the interested organisations have published the FITMAN information in their communication channels as promised (please see Appendix A – Figure 18 for a screenshot from an organisation's social media account). The set targets were continuously monitored and further phone calls were made towards the end of the actions in order to increase the response rate.

5.1.2.6 Main outcomes

The main outcomes from the awareness action is that 36% of the organisations contacted finally propagated FITMAN information to their members. A remarkable number of 116,343 SMEs and WEs was estimated to be reached through these networks. In relation to the success rates per category of organisations, Venture Capitals / Business Angels met and overpassed the target of 50%, with a 67% response rate. In addition, special interested was shown by the Regional Development Agencies (50%) and the National Associations / Federations (46%) as they reached and closely reached respectively the target of 50% of positive response in propagating FITMAN info.

Figure 4 below illustrates the overall technology awareness raised through the actions. Table 5 below explains the technology awareness ranking.

Table 5: Explanation of awareness ranking

Outcome	Description
0: No awareness	Unable to make contact with organisation. No response to emails or phone calls
1: Limited awareness	Organisation responds that the Phase III activities are out of their scope
2a: Some awareness (by contact organisation only)	Organisation is positive during email contact, but does not disseminate the material
2b: Some awareness (by contacted organisation only)	Organisation is positive during phone contact, but does not disseminate the material
3: Broad awareness (by contacted organisation and its network)	Organisation disseminates material to its member organisations and networks.

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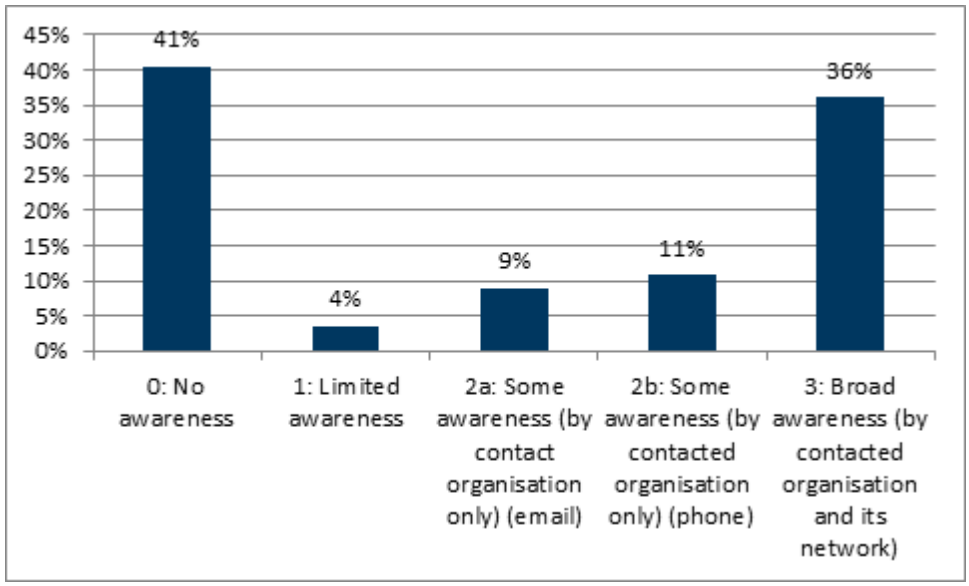

Figure 4: Overall technology awareness raised

Overall, broad awareness was raised among the 36% of the contacted organisations. However, given that no awareness was raised among the 41% of the contacted organisations, further effort should be put in order to possibly identify organisations and categories of organisations that would be more interested in these actions.

5.1.3 Webinar Results

FITMAN have held webinars throughout the project, some of which have been reported on previously (Hooper, et al., 2014), and will not be repeated here. However, we include a complete overview of webinars below in Table 6. The recent webinars hosted by FITMAN are discussed in respective sections below. The webinar materials have been made available online:

- SlideShare: http://www.slideshare.net/FitmanFI
- YouTube: https://www.youtube.com/channel/UCT_zyTfmi2GAbGRQ5SduHyw

At the time of writing (middle of October 2015), the webinar materials have accumulated nearly 4,500 views (for both SlideShare and YouTube).

Table 6: Overview of FITMAN webinars.

Date	Audience	Content
Nov-13	Open to any potential Phase III participants	• An overview of FITMAN and the Phase III information package. • SME engagement methodologies.
Nov-13 – Dec-13	Open to any potential Phase III participants	The FITMAN SEs.
May-14	Phase III accelerators	• An overview of FITMAN and the Phase III information package. • SME engagement methodologies. • Support available to Phase III accelerators.
Nov-14	Phase III accelerators	• An overview of FITMAN, the FI-PPP and the

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Date	Audience	Content
		Phase III information package itself • Practical information about the FITMAN Phase III package services and FITMAN support Help Desk (Contact point for queries, FAQ, social media) • Overview of FITMAN platforms and SEs • Checklists of legal issues and business models in the context of ICT for manufacturing, and links to external resources • Best practices for SME engagement • Methodologies for SME and web entrepreneurs engagement • Methodologies for service / application development support
Nov-14	FABulous Open Call 1 participants	FABulous-hosted webinar, including presentation of FITMAN platforms and SEs.
May-15	FABulous Open Call 2 participants	FABulous-hosted webinar, including presentation of FITMAN platforms and SEs.
Jun-15	Open to any Phase III participants	A series of 7 webinars covering methodologies and a subset of SEs: • Verification & Validation Methodology • SME Engagement Methodology • Socio-economic Analysis Methodology • Collaborative Asset management • Collaborative Business Process management • DynamicCEP • Unstructured and Social Data Analytics
Sep-15	Open to any Phase III participants	A series of 10 webinars, covering the final subset of SEs not included in the Jun-15 webinar series: • 3DScan • Data Interoperability Platform Services • Supply Chain & Business Ecosystem Apps • Secure Event Management • Advanced Management of Virtualized Assets • Shopfloor Data Collection • Generation and Transformation of Virtualized Assets • SEMed • Metadata and Ontologies Semantic Matching • DyVisual

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5.1.3.1 Webinar November 2014

This webinar was held 20th November 2014, which focused on providing key information to the Phase III accelerators. 8 participants from FITMAN were involved in delivering the webinar; from IT Innovation, INNOVALIA, Atos, I-VLab, NTUA and VTT. Of the 16 accelerators, 6 participants joined the webinar, from SOUL-FI, FInish, CreatiFI, FABulous and FINODEX.

A questionnaire was sent to the participants to get feedback on the webinar. Only 3 of the 6 participants filled in the questionnaire. Nevertheless, the feedback was positive. In terms of the topics of interest, Figure 5 shows that it was the technical information the respondents were the most interested in (platforms and SEs). All respondents said the information was useful to them, as seen in Figure 6. Only 1 respondent said they visited the FITMAN website after the webinar for further information. All respondents said that the webinar clarified they ways in which FITMAN could support them.

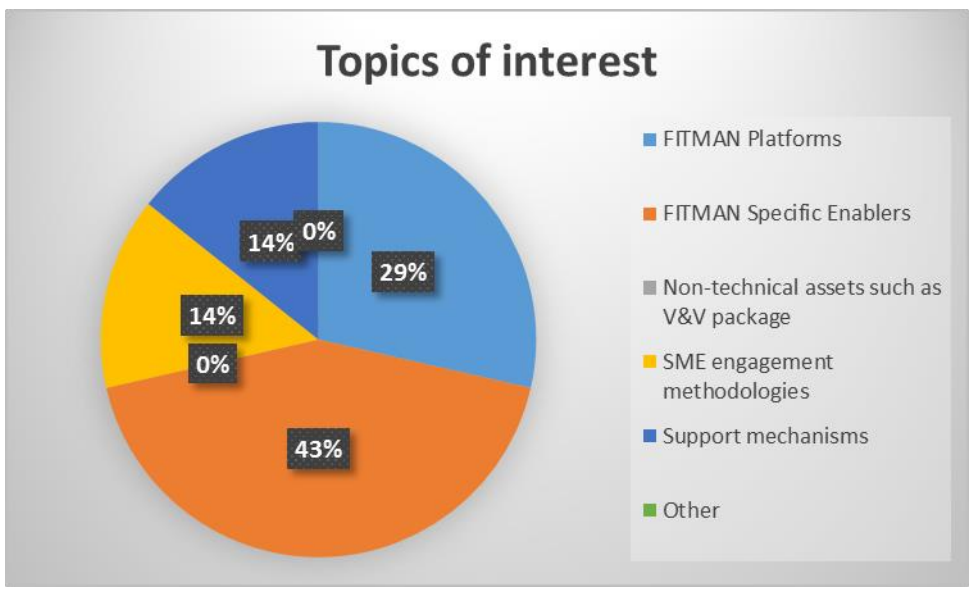

Figure 5: Webinar November 2014 – topics of interest.

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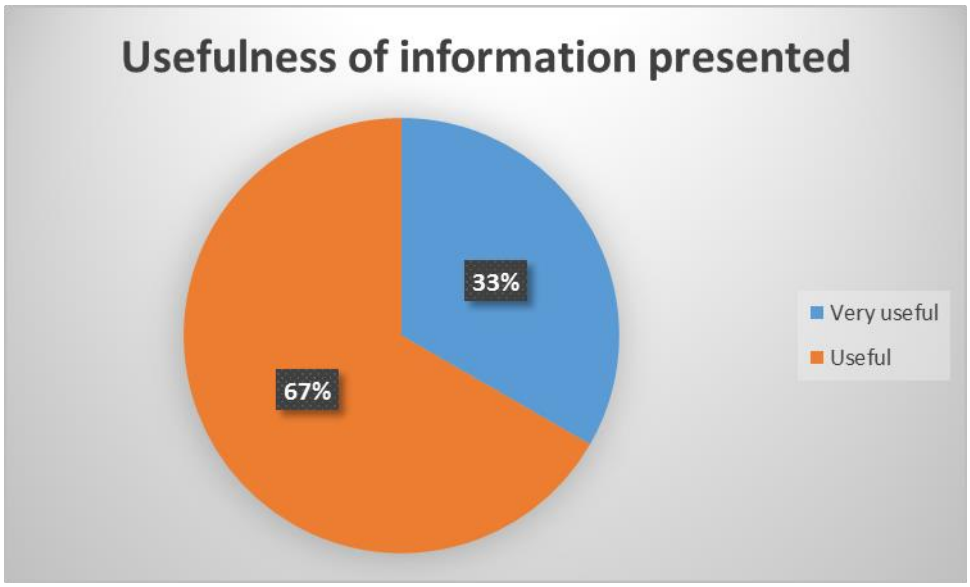

Figure 6: Webinar November 2014 – usefulness of information presented.

After the webinar was held, the slides were made available on SlideShare to download. At the time of writing, end of September 2015, there were 274 views on SlideShare. In terms of website traffic, the number of page views for the Phase III package increased in the run-up to the webinar and had a peak of 31 page views in the middle of December, as seen below in Figure 7.

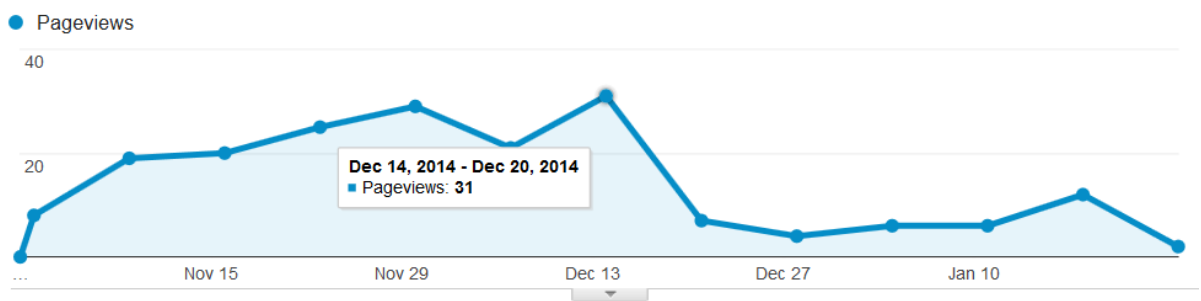

Figure 7: Webinar November 2014 – Phase III package page views.

5.1.3.2 Webinar June 2015

On June 16 2015, FITMAN held a series of webinars, which was open to any FI-PPP Phase III participants. Each webinar was 30 minutes long, and participants could drop in and out through-out the day to attend the ones they were interested in.

Three webinars were held for non-technical FITMAN assets:

- Verification & Validation Methodology (NTUA)
- SME Engagement Methodology (Innovalia)
- Socio-economic Analysis Methodology (IT Innovation)

Four webinars were held for technical FITMAN assets (SEs):

- Collaborative Asset Management (Engineering)
- Collaborative Business Process Management (Engineering)

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- DynamicCEP (Nissatech and FZI)
- Unstructured and Social Data Analytics (NTUA)

In summary, 7 FITMAN partners were involved in presenting the webinars. The organisations are noted in brackets above. In total, 15 different people attended the webinars; some of which attended multiple webinars. See Table 7, below for an overview.

Table 7: Webinar series June 2015 - Overview of attendees.

Asset	Expected	Attended	Views[5]
Collaborative Asset Management	4	10	69
Collaborative Business Process Management	5	11	63
DyCEP	3	3	82
Unstructured and Social Data Analytics	3	4	90
V&V methodology	3	2	126
SME engagement methodology	6	2	109
Socio-economic impact methodology	3	3	103

When planning this webinar series, we collected interest from participants first, via the FITMWAN website (and further disseminated), and attempted to plan the timing of the webinars accordingly. However, as we present above in Table 7, the number of expected attendees versus those who did participate varied. In some cases, such as for the two first SEs, the number of attendees was more than double of what was expected.

As with the previous webinars, a post-webinar questionnaire was shared with the participants. 30 people started the questionnaire, though only 5 completed it. In terms of attendance, we have more complete information to report, as we took a record at each respective webinar. What we observe in Figure 8, below, is that most of the attendees attended more than one webinar. The webinar series was broken up in such a way that there were two SE webinars before lunch and 2 SE and 3 methodology webinars after lunch. Where people attended multiple webinars, this was typically during either the morning or afternoon sessions. Only one person attended webinars across both sessions, with 6/7 webinars attended. Of those who attended 4 webinars, 2/3 attended all SE webinars. One of these attended all but one of the afternoon webinars.

[5] The 'views' figure is a sum of the views of the slides on SlideShare and YouTube, as of the end of September 2015.

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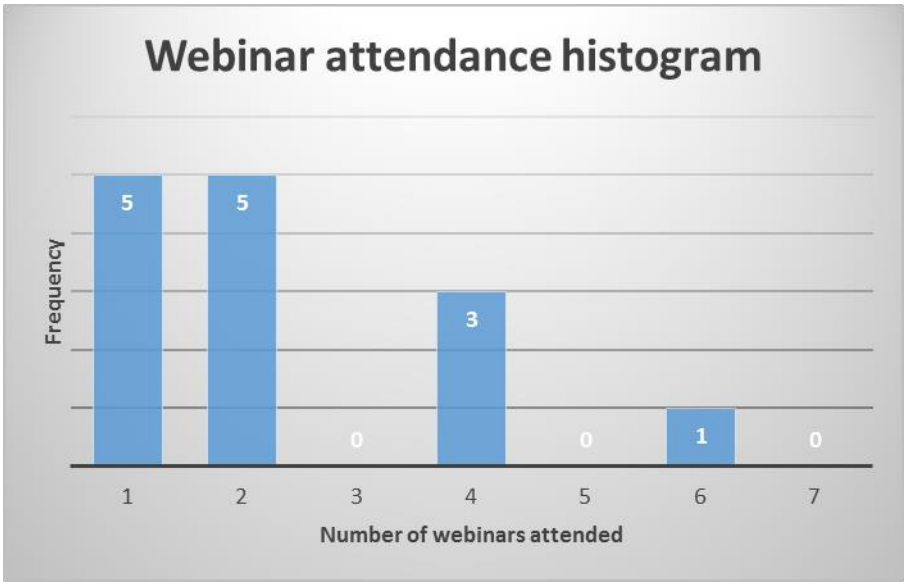

Figure 8: Webinar attendance histogram.

As seen below in Figure 9, of the 5 responders to the questionnaire, one represented an accelerator, three represented open call participants (trials). One responder selected 'other', but did not specify what this meant. Figure 10 shows the breakdown of how useful the responders found the webinars to be.

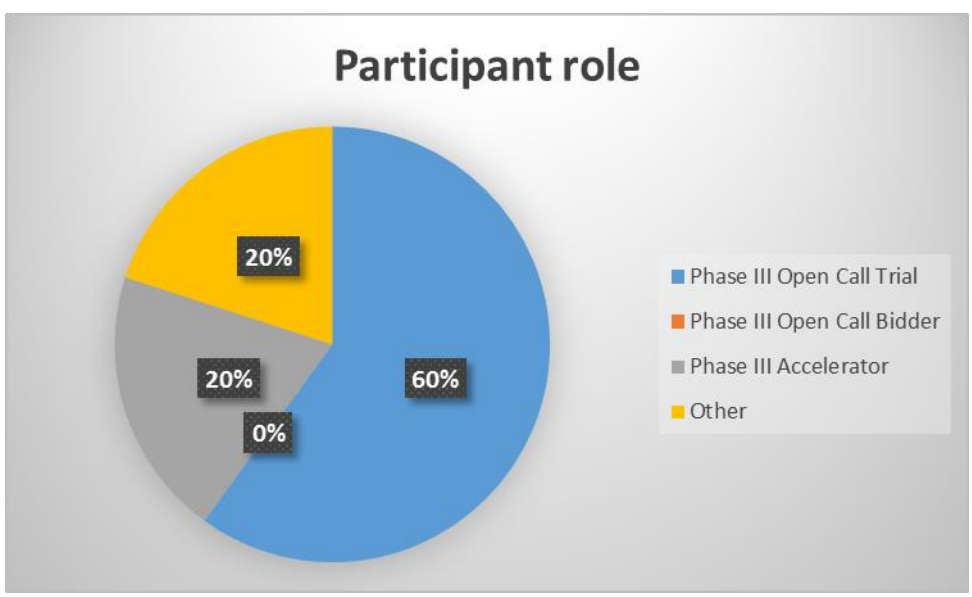

Figure 9: Webinar series June 2015 – participant role.

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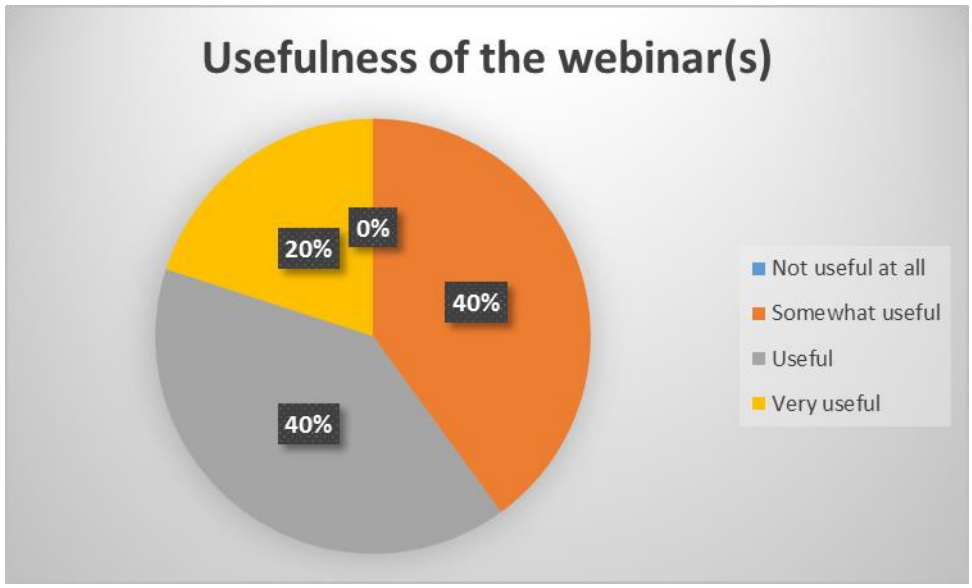

Figure 10: Webinar series June 2015 – usefulness of the webinar(s).

The majority of the responders said they visited the FITMAN website after the webinar, as depicted below in Figure 11. One of these said they contacted FITMAN for further information or support.

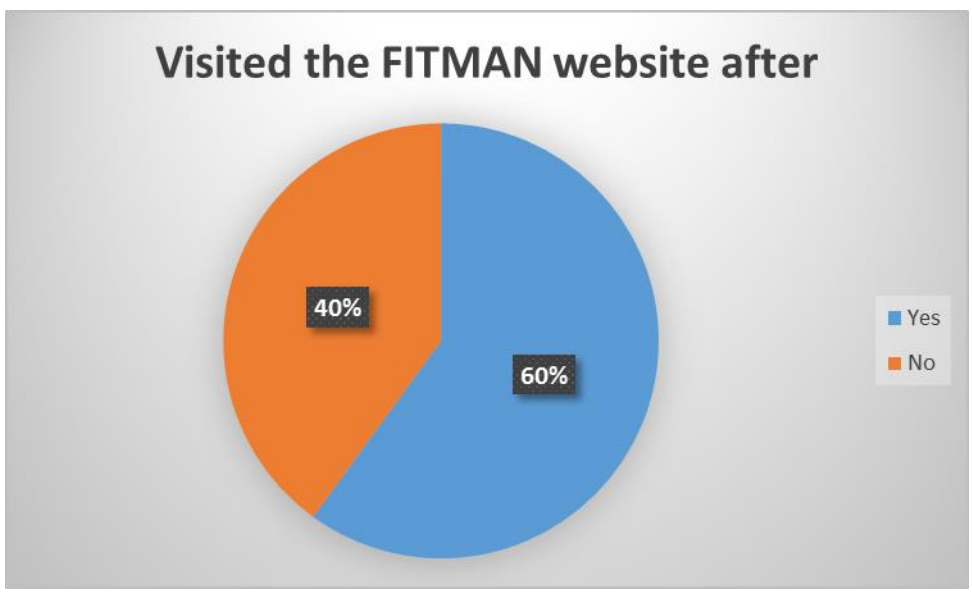

Figure 11: Webinar series June 2015 – visits to the website after webinar.

As with previous webinars, we observe an increase in page views on the Phase III package website, as seen in Figure 12, below.

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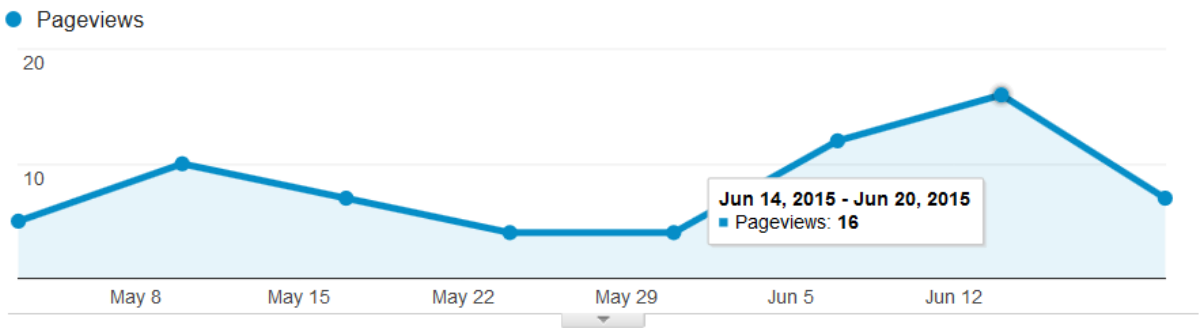

Figure 12: Webinar series June 2015 – page views for Phase III package.

5.1.3.3 Webinar September 2015

On September 21 2015, FITMAN held a series of webinars over one day, which was open to any FI-PPP Phase III participants. Like the webinar series held on June 16 2015, each webinar was 30 minutes long, and participants could drop in and out throughout the day to attend as many webinars they were interested in.

The webinars in this series covered 10 FITMAN SEs:

- 3DScan (DataPixel)
- Data Interoperability Platform Services (TXT)
- Supply Chain & Business Ecosystem Apps (TXT)
- Secure Event Management (TXT)
- Advanced Management of Virtualized Assets (DITF)
- Shopfloor Data Collection (Atos and UNINOVA)
- Generation and Transformation of Virtualized Assets (STI)
- SEMed (BIBA)
- Metadata and Ontologies Semantic Matching (NTUA)
- DyVisual (DFKI)

In summary, 9 FITMAN partners were involved in presenting the webinars. The organisations are noted in brackets above. In total, 9 different people attended the webinars; some of which attended multiple webinars. One person attended all 10 webinars; one person attended 8 webinars. The rest attended one or two webinars. The participants were all from FIWARE; including open call winners from FABulous and FInish.

Since this was the final webinar series held shortly before this report was due, post-webinar survey results are not available for this series. Neither are statistics for webinar views on SlideShare and YouTube at the time of writing.

5.1.3.4 Webinar Conclusions and Lessons Learnt

The FITMAN webinars have been well received, having only positive responses regarding their usefulness. Moreover, as the webinar materials have been made available online on SlideShare and YouTube, they have been viewed by hundreds of other interested people; 274 for the November 2014 webinar, and 642 for the June 2015 webinar series.

Although FITMAN has made available several assets that are not specific to manufacturing, a challenge has been to put this across, especially to the open call bidders to the Phase III Accelerators. All accelerators have been contacted and have been provided with information. In terms of the ones who have attended the FITMAN webinars, we observe that they have predominately been those overlapping in domain. Ultimately, as will be discussed further below, the users of the FITMAN technologies have been related to the manufacturing domain,

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which only one Phase III accelerator addresses directly (although this is only a small subset of the manufacturing domain pertaining to 3D printing). In this context the attendance at the webinars exceeded our expectations.

In the June 2015 webinar series, we took the approach to gauge interest in what to cover, as well as the availability of the people who expressed their interest. This created more organisational effort, and the end result showed that this was unnecessary. Firstly, most of the people who indicated their interested in attending and were available at the times scheduled, did not attend. Secondly, a significant number of unexpected attendees joined instead. Therefore, the approach taken for the September 2015 webinar series was to agree a date early on with the SE owners and announce this well in advance. In terms of format, having a series of 30 minute webinars in one day worked well.

5.2 Support Statistics

At the time of writing (the middle of October 2015) we have the following break-down of support queries that FITMAN have received from Phase III participants:

- 42 queries in total
- 17 of which were pre-sales queries (people planning to bid to Phase III)
- 25 of which were post-sales queries (FABulous open call winners)

The first pre-sales queries were received November 2014, corresponding to the launch of the first Open Call (OC) from the FABulous accelerator, as depicted below in Figure 13. In this figure, we also observe an increase in post-sales support queries corresponding to when the first open call projects from FABulous started.

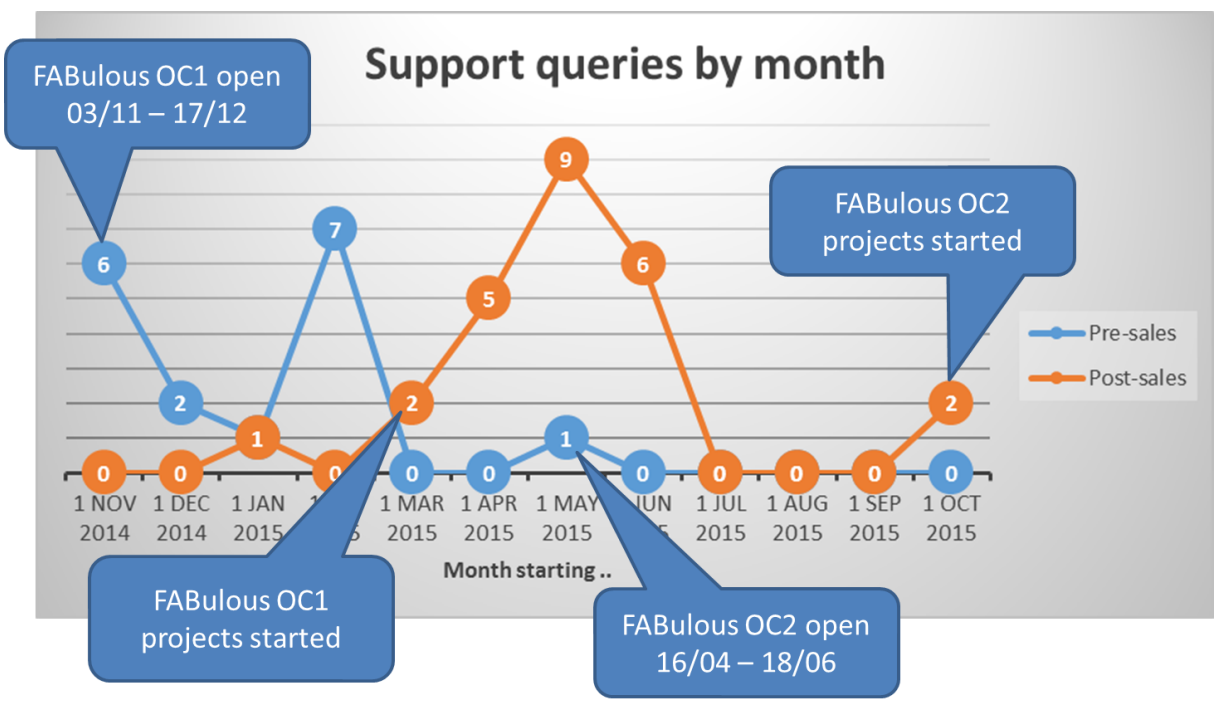

Figure 13: Support queries by month.

In Figure 13, above, we observe that the number of post-sales queries decrease after a peak in May 2015, which corresponds with the FABulous open call projects coming to an end by July 2015. Also, we note that the number of pre-sales support queries being significantly lower for the second open call from FABulous is likely to be due to a FITMAN presentation a part of a

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FABulous open call webinar in May 2015. Also, it is worth noting that this decrease may also be due to the continuous improvement of the online information available to the Phase III participants. Both the Phase III package on the FITMAN website and the technical information about the FITMAN SEs have been updated to maximise the self-help aspects of support, as discussed above in Section 3 and 4. Moreover, as noted above in Section 5.1.1, 44 open call projects funded via FABulous required FITMAN SEs. Only 9 out of these projects have sought support, which we assume is because the information given to them via the online documentation and webinars has been sufficient for them to use without requiring assistance.

A breakdown of the queries according to the different support assets is given below in Table 8. As expected, since the users of the FITMAN assets are via the FABulous open call projects, the highest support demand has been for digital and virtual factory SEs, in particular related to handling 3D information[6].

Table 8: Support query breakdown.

Asset	#queries
Virtual Factory Platform	1
SE-DF-2: C3DWV	12
SE4: Collaborative Asset management	6
SE5: Supply Chain & Business Ecosystem Apps	4
SE8: Data Interoperability	3
SE2: Secure Event Management	2
SE-DF-3: 3D Scan	2
SE7: Collaborative Business Process Management	1
SE-SF-1: Dynamic CEP	1
SE-SF-2: DyVisual	1
SE-DF-1: SEMed	1
SE-VF-1: MoVA	1
General FITMAN technology queries	4
Other	3

The three queries classed as ‘other’ were all pre-sales queries. One regarding 3D printing development expertise, one regarding developing SEs and one general query about FIWARE open calls.

At the time of writing (mid-October 2015), new projects funded from FABulous’ second open call have started. As a consequence, more post-sales support tickets have been issued, which is expected to continue. FITMAN is supporting this continued demand via the FITMANovation Lab (FML), which is discussed in Section 6. We note also here that a final

[6] Although Table 8 gives an indication of support demand, readers should not infer here a correlation with the popularity and use of SEs. That is, SEs may have been used that users did not need to ask for support for due to the online documentation.

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set of FITMAN webinars were held at the end of September 2015, targeting the participants in the second open call projects from FABulous, as discussed above in Section 5.1.3.3.

5.3 Web Traffic

The last discussion of web traffic related to Phase III Support was in D8.6, up to June 2014. Therefore, we discuss web traffic from the beginning of July 2014 to the end of August 2015 here. Note that it is not the scope here to discuss the web traffic for the FITMAN website in general. The focus here is on the web traffic related to Phase III support.

With the exception of the front page and the intranet (used by FITMAN consortium members only), the Phase III Package webpage is the most visited area of the website with 4,049 page views. We can note the following peaks in Figure 14, below:

- Mid August – October 2014: Phase III Accelerators starting. Run-up to November webinar and FABulous launching the first open call
- End November - Mid December 2014: FABulous open call open and FITMAN webinar held.
- Beg March 2015: FABulous open call projects started.
- Mid June 2015: FITMAN webinar series.

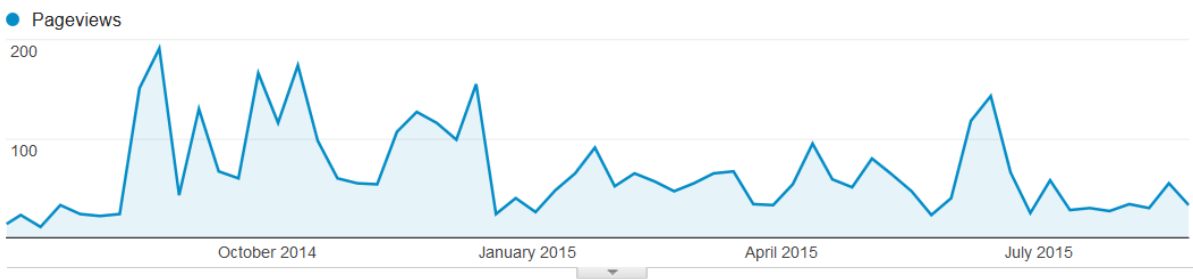

Figure 14: Page views for the Phase III Package web page; July 2014 – August 2015.

The most visited page on the Phase III package, with 57.8% of all traffic, is the Information for Phase III Bidders page. We observe that the web traffic for the Phase III package has been lower since the peak at the end of November 2013, as discussed in D8.6 (Hooper, et al., 2014). That peak corresponded with the deadline for people to bid for accelerator projects to Phase III, which has been the key target audience for the Phase III package on the FITMAN website. Since then, a FITMAN Catalogue has been made available, which targets the Open Call participants in Phase III with technical information – i.e., those bidding to the accelerators for funding to use FIWARE GEs and Phase I/II project SEs.

The most visited pages on the Phase III Package are shown below in Table 9. We observe that the most popular resources on the Phase III Package in this period are information on the FITMAN architecture and trials, checklists, terms and conditions of SEs, and methodologies / tools. We further break down the 'Methodologies and Tools' area of the Phase III package, below in Table 10.

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Table 9: Phase III Package page visits.

Page	Unique views
FITMAN Architecture and Trials	862
Checklists and External Resources	256
Terms and Conditions of SEs	180
Methodologies and Tools	150
FITMAN Trials	148
FITMAN Deliverables for Phase III Participants	144
Best Practices and Lessons Learned	60

Table 10: Breakdown of FITMAN methodology website visits.

Page	Unique views
Socio-Economic Impact Assessment	27
V&V Method Instantiations Per Trials	25
SME Innovation Preparation (first)	18
FITMAN Business and Technical Indicators	18
FITMAN V&V Method	11

As seen below in Figure 15, the web traffic on the FITMAN Catalogue has been significantly higher than the Phase III package, with the greatest peaks in November 2014 and March 2015 with ~3,000 visitors. These dates correspond with the time the first FABulous Open Call was launched (November 2014) and when the winning projects started (March 2015).

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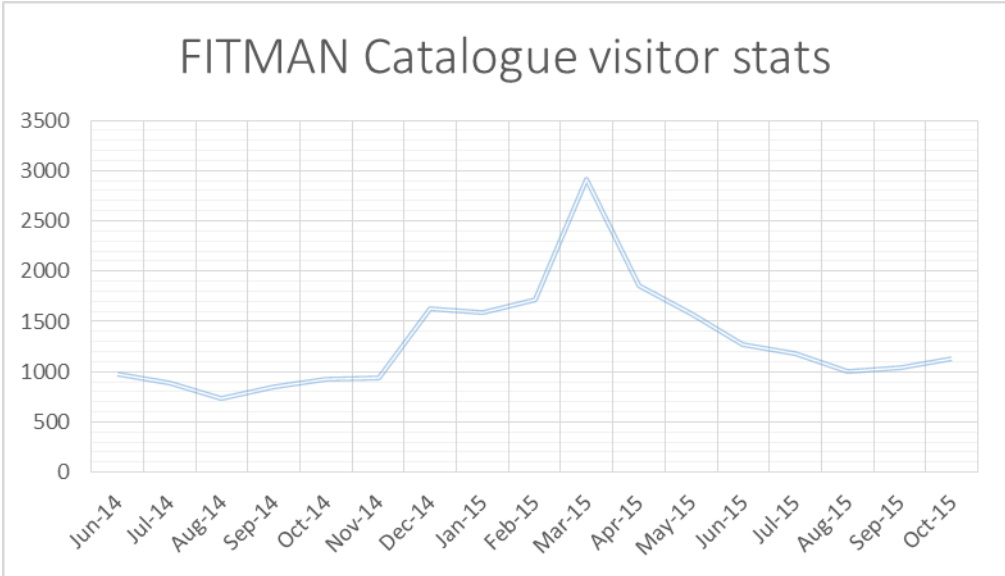

Figure 15: FITMAN Catalogue visitor statistics.

5.4 Discussion and Lessons Learnt

We have discussed specific lessons learnt in respective sections above. Here we summarise key and high level lessons learnt from providing Phase III Support in the FITMAN project.

Following the implementation of the technology awareness methodology, FITMAN information was propagated by 36% of the contacted organisations. Even though the outcome is below the targeted number of 50%, a remarkable number of 116,343[7] SMEs and WEs was estimated to be reached through these networks.

The actions taken under the technology awareness methodology were successful. We have learned that contacting the responsible person in the organisation was an asset. The original email for first contact was effective as short, understandable and attractive. Concerning the dissemination message, the networks appreciated a short text which facilitated dissemination through newsletter and webpages.

In case of no response to the first contact email, the methodology indicated to send a follow-up email one week after the initial email; however, we learned that in this case, phone calls right after 2 days would maximise the response rate.

In terms of targeted network, we learned that not all categories of networks might be relevant for the scope of these actions; we should consider to focus on the ones which had the highest response rates (ecosystems, incubators/accelerators, National Associations / Federations, and Regional Development Agencies). Furthermore, some organisations ranked low on the list to be contacted, for example some Incubators/Accelerators, responded immediately.

In terms of measuring the success of outreach activities, this is non-trivial. The outcomes of the webinars are more straightforward, as we have been able to measure attendance and get feedback on their usefulness. This has been clearly positive, and we have learned that holding a series of webinars over the course of a day has been successful. This has been useful for both awareness creation and post-sales support, giving the opportunity for Phase III participants to discuss specific questions with the FITMAN technical team. In terms of organisation and scheduling, the lesson learnt is that trying to schedule timings of webinars

[7] This number is the sum of an estimation of the SMEs/WEs linked to the organisations and reached by them via different communication means (newsletters, social media accounts etc.)

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according to both the presenters' and audiences' availability is not successful; many participants indicating they would attend, did not, but instead more unexpected participants attended. Gauging interest has been useful, in terms of determining demand in order to prioritise the material to cover. However, it was not useful to attempt to schedule the webinars according to the availability of the people indicating they would attend, except for those webinars addressing the accelerators only.

The Phase III web traffic has continued throughout the lifetime of the project, with the most notable peaks before the Phase III proposal deadline for accelerator projects. Since then, the focus has shifted to the technical information provided via the FITMAN Catalogue. Having a separate Catalogue meant users have had a similar experience to FIWARE in general, as FITMAN chose the same technology as the FIWARE Catalogue. Traffic has increased in line with key FIWARE events and webinars hosted by FITMAN, which shows that the engagements with Phase III have been positive.

However, the FITMAN Catalogue has not been a successful medium for customer support beyond being a source of information and making the SEs available for download. The forum has been unused and none used the feedback functionality on each SE page, which was the approach taken by FIWARE[8]. The principle of forums are sound, however, the most likely reason we observe for the non-existent activity is that it is quicker and easier for people to make use of email support, as well as queries being of a sensitive nature. In terms of email being quick and easy, it is worth noting that to use the Catalogue forum, users would have to register for an account. A step they may not consider worth it, given they could instead write an email quickly.

In terms of the support processes set up, the anticipated need for processes and technologies for managing support queries that support both scalability and privacy has been important. All support queries were via email, managed via the OTRS Help Desk. This system has worked well in practice, especially in terms of managing tickets in appropriate queues according to visibility (for privacy purposes in particular) and in terms of tracking and assigning tickets to different people.

There has indeed been a need for support orchestrators, as incorporated into the processes from the beginning. The alternative would have been a self-organising approach, relying on the asset owners (support agents) picking up the appropriate tickets and dealing with them independently. Firstly, the orchestration and front line support role has been important both in terms of the general interface with people asking queries, e.g., to determine if they were eligible for free support, collecting some more information before assigning to owners of the respective asset in 2nd line support to be more efficient about their time. The orchestrator role has also been important to keep track of tickets, to ensure they were answered and closed in a timely manner.

Dealing with support via textual mediums, such as email, has been successful in most cases. However, some queries were more complicated and being able to have a conversation about the issues was a) requested, and b) proved to be effective. Skype was used in these cases, on an *ad hoc* basis if the respective asset owner (support agent) was happy to do this.

Validation of valid free support was not factored into the original support processes, discussed in Section 4. The solution was straightforward, as open call winners could provide evidence of their participation in Phase III. However, this did cause delay in responding to the actual

[8] We note that, since FITMAN decided to use the same technology as FIWARE for the Catalogue, the FIWARE Catalogue has seen some updates. For example, there is no forum facilitated via the Catalogue, which may be due to similar observations as made in FITMAN. The FIWARE Catalogue still includes a feedback functionality on each GE page, but was changed to use email instead of Jira.

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query. To reduce overhead and delays in providing support, FABulous shared information with FITMAN about the projects who had indicated using FITMAN technologies, from which the support orchestrators could check against. However, moving forward, allowing for a more scalable approach, this is an aspect that has triggered some changes to the support processes for supporting the FML, which is discussed below in Section 6.

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6 SUPPORT FOR THE FML

Based on the lessons learnt from supporting Phase III during the course of the FITMAN project, this section discusses the support for the FITMANovation Lab (FML), which is the joint exploitation vehicle for FITMAN. The FML will continue to provide free support to Phase III, but also to any commercial clients outside of Phase III.

6.1 General Support and User Registration

A new website has been developed, which we refer here to as the FML Portal. It is not the scope here to discuss this website in general, only the aspects relevant to support.

The intention for the FML Portal is to be a one-stop-shop, instead of having separate websites with different user management, for people to access the FITMAN services. The FML Portal includes general information, much like in the Phase III Package, about use cases and non-technical resources, such as the various methodologies developed in FITMAN. The FML Portal includes technical information about the SEs, which has previously been in a separate FITMAN Catalogue previously.

With the new FML Portal, users register in a single place, which gives access to relevant information and support channels, including both email support and forums. This is discussed further below. Anybody can register on the FML Portal, provided a valid email address. Registered users, by default have access to an email address for general queries, which are addressed on a best effort basis. Phase III participants and other paid users (clients) will have a different role, and will have access to enhanced, technical, support.

6.2 FML Support Process

Based on the lessons learnt from Phase III support as part of the FITMAN project, there are a few modifications to the general support process for FML. These changes are integrated into the FML Portal, the new website discussed above.

The FML support process is depicted below in Figure 16. This process diagram does not differentiate between pre- and post-sales support; both parts are more integrated, relying on people registering on the FML Portal.

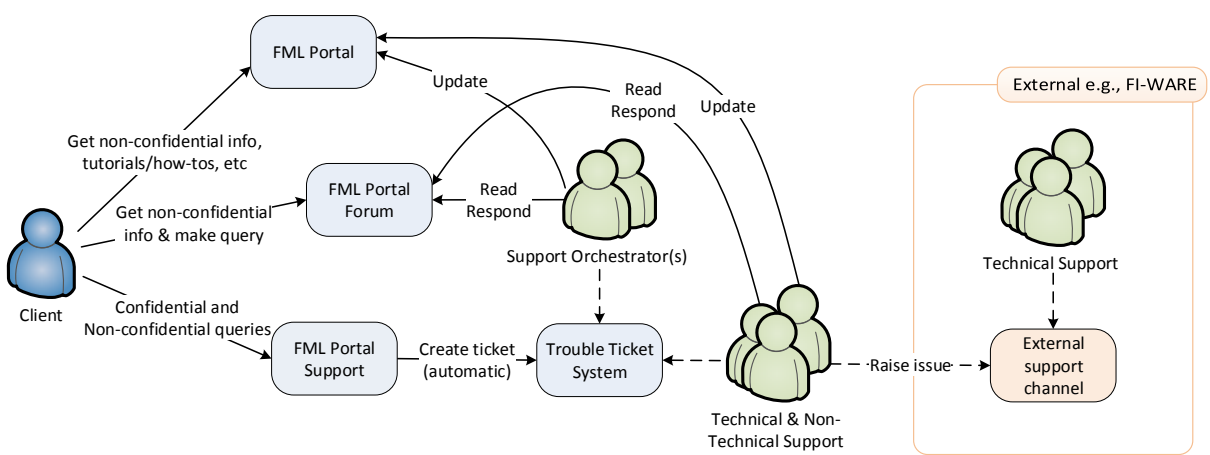

Figure 16: FML support process.

To achieve a more sustainable and efficient solution to the question of validating the support eligibility, e.g., identifying that a support query is from a Phase III participant and, thus, will

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receive free support, the new process has moved away from a single, publicly available, support email address. Instead, when users register and sign on to the FML Portal and are verified as clients, as discussed above, they can submit queries via web forms that are available to them (not other users). Therefore, a verification step at query time (as was the case previously) is avoided, which reduces overhead and delay in providing the support.

Separate support queues in the OTRS Help Desk have been set up for each SE, which are linked to the respective support forms on the FML Portal. Therefore, queries go straight to the SE owners who are providing the support, reducing overhead for support orchestrators as well.

The FML Portal also includes a forum. Although this was not used on the FITMAN Catalogue, it is available to all users, and users will be encouraged to use this above the form-based support (via email). Since users need to be registered to access support in the FML in the first place, there is no additional step to take when using the forum channel for support, as there was previously (as discussed above in Section 5.4).

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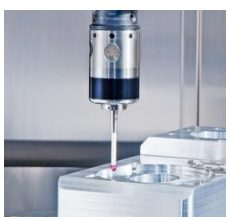
7 LESSONS LEARNT FROM TRIAL EXPANSIONS

Based on the existing ten use case trials in the FITMAN project, potential expansions in Phase III has been considered. In particular, expanding a trial from 'small scale' to 'large scale' pilots is of key importance, both to FITMAN's value proposition and to achieve exploitation to the manufacturing industry.

In FITAN deliverable D8.2 (Doumeingts, et al., 2015), we have matched the demand for IT-driven expansions from Whirlpool (trial n°4) with the offer currently in place in the FIWARE Acceleration program, FABulous[9]. One of the FABulous projects, 3DQuality, supported by Nissatech Cie, has collaborated with Whirlpool.

The Whirlpool scenario is based on an extended measuring system, involving new hardware (3D scanning system) and an enhanced mechanism to identify defects or process drifting and using an innovative approach to send 3D pictures to the users. The following sections report on the business requirements and IT specifications, as well the lessons learnt.

7.1 Business Requirements for the Whirlpool Trial Expansion



Currently the measurement of complex parts is carried out manually with physical or optical gauge system able to detect one measure a time. This operation is time consuming and, consequently, is carried out within a Statistical Process Control, based on a very low sampling rate. Moreover, the more complex the part, the more points are needed to be collected, which increases both the operation time and the management of the data. Consequently, such quality controls are seldom made and only for very critical parts. In the expanded scenario, the 3D scan system will act as a potential IoT object and as a source of big data. The data measurement will be then treated by DyCEP SE in order to analyse data and generate events based on the deviations of the component versus its design.

The expansions allows for integration of a completely new field of measuring and have a very important business rationale: currently Whirlpool has no capability to effectively and efficiently manage complex measurements (e.g. stamped parts, assemblies etc.) and, thus, the expected quality on those parts has to be achieved through extra work. Furthermore, the expansion is completely integrated with the initial scope of the original Whirlpool trial in FITMAN (i.e. using data to empower better decision making) and within the existing business processes. Whirlpool has sought such a system for a long time, although previous attempts were not completely brought to success mainly because of the following reasons:

1) Inconsistencies in scan times, and
2) Lack of integration between the gauge system (i.e. the equipment making the measurement) and the further data management.

The new scan system provided by Datapixel and the improved data elaboration capability provided by FITMAN system can actually change the game and allow Whirlpool to reconsider the adoption of a 3D Scan system to make on-line measurements. Whirlpool's Operation Manufacturing Quality is involved in the evaluation of the system and will constantly provide support and feedback to its development.

The Expanded Smart Factory platform will be used. It is also planned to add the 3D scan system SE provided by Datapixel and currently integrated in Digital Platform. Data will be generated by a 3D scan system currently in use in the Datapixel facility. Whirlpool is going to provide the requested number of samples that will be required to ensure a proper design of

[9] http://fabulous-fi.eu/

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experiment. Datapixel will generate data by scanning the parts and will provide datasets to the FITMAN platform for further processing.

It is fundamental that a 3D scan system is made available to generate scans. This is implying a step condition both from the economical point of view related to the investment cost to acquire and set up the system, and from the technical point of view, since a robust competence is needed to run and maintain such a system. For the trial expansion both of the two pre-conditions will be satisfied by using Datapixel's internal resources.

It would be a cornerstone to implement complex measurement on-line. The demonstration that a 3D measurement is capable of being placed in a production line and integrated in the Manufacturing Execution System (MES) will allow, once exploited, to dramatically improve quality. The current approach to gauging the system is limited to mechanical measurement or single point laser measurement usually requiring a complex structure (jigs, heads etc.) and limited in number of points, flexibility, accuracy and maintainability. A 3D system will solve all those drawbacks by its nature (measure every point). An improved capacity of measuring complex parts in line has a direct consequence on product quality and performances and transforms to evident benefits for both the consumer and for the company.

Whirlpool's standard cost/benefit evaluation is conducted through a complex business case simulation requiring a lot of data input. For this specific experiment, we can list the following direct benefits:

1) reduction of Total Cost of Quality (TCQ) represented by:
    a. reduction of service calls during warranty period
    b. reduction of parts needed to be replaced during warranty period
    c. reduction of cost of factory quality operation in case a gauge tool is substituted by this new technology
2) improvement in Equipment Efficiency in case the part could be measured just after its production

The cost side has to take into account:

1) Total Cost of Ownership (TCO), which comprises:
    a. Equipment acquisition cost
    b. Installation and start-up cost
    c. Operating cost (energy, consumable, etc.)
    d. Maintenance cost
    e. Labour cost
    f. Dismissal (EOL) costs.

According to this schema it is quite clear that a cost/benefit ratio has to be accurately computed for each specific case. Based on the hypothesis of the application to a production line having a production volume of 500kpcs a year the Return on Investment (RoI) after 5 years is 35%

Of course the real capacity of the system to influence positively the improvement of quality figures reflecting in a reduction of 4% of the service calls is strongly dependant on the matching between chosen components and gauging capability.

The expansion will be focused on the production of microwave ovens which is currently located in Biandronno (Italy) limiting the scope to the measurement of a specific part (a small plastic fan) chosen among a group of components Whirlpool is not currently able to measure, taking into account the size, the complexity and relevance. The parts will be sampled in the

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production line and sent to Datapixel for measurement. The analysis results will then be examined by WHR Quality experts. The experimentation will last 6 to 8 months.

7.2 IT Specifications Proposed by 3DQuality

For the Whirlpool use case, a standalone Web App was developed that can be deployed on any Web server, which shows some aspects of the visualization features of the DyVisual SE. The idea of a deviation map is that it visualizes the differences (i.e. deviations) of a physical part from the CAD model which was defined for its design. For this, usually a point cloud is produced for the physical part. In the context of FITMAN this point cloud is produced by a high accuracy laser scanner. The point cloud is then compared with the CAD model which results in the deviation map. The scanning and computation of the deviation is not part of the Web App, however. The Web App purely displays the deviation maps that were already computed.

Interested readers may access the Web App at the following URL:
http://xml3d.org/xml3d/scenes/magnifi/.

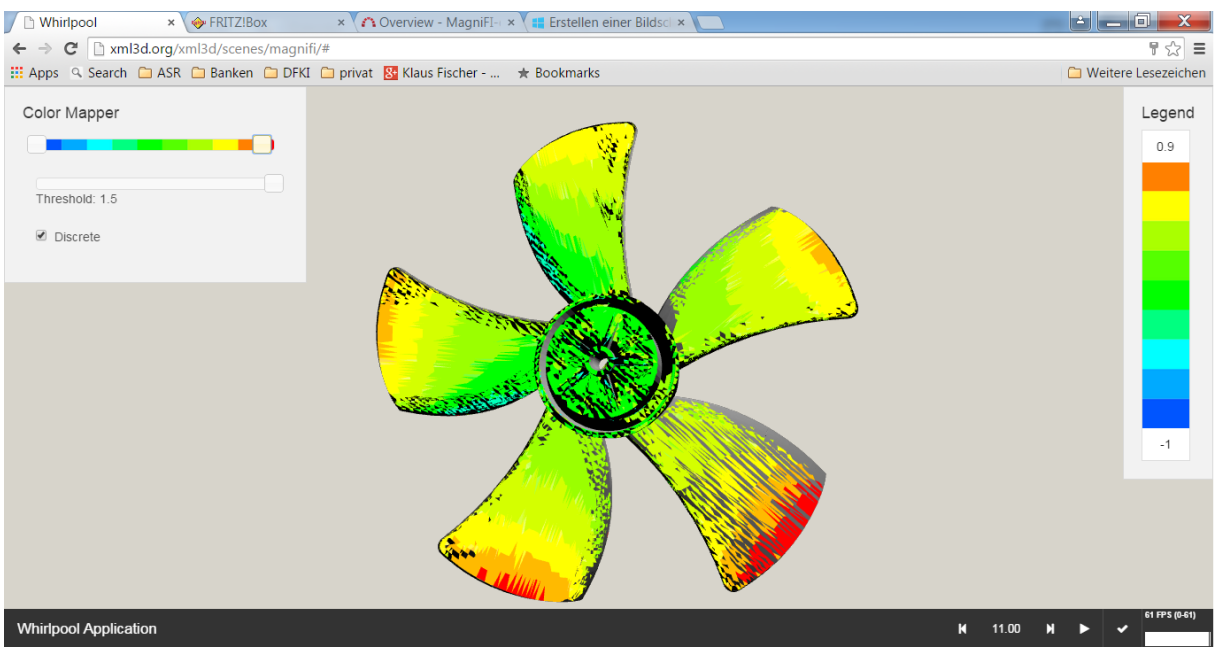

Figure 17: Web App for the Visualization of Deviation Maps

Figure 17 displays a screenshot from this Web App for displaying deviation maps. The deviation maps are in the first place provided as binary data which is, however, easy to interpret. It consists of a list of triangles all of which have a deviation value assigned. For the visualization of the deviation map in a browser on the basis of XML3D, it was necessary to convert the data into XML3D. For this, the pure model information (i.e. the triangles) were extracted. The deviation information is given as a separate vector where the position of the deviation values in the vector need to correspond with position of the respective triangle in the mesh of the model to which the deviation information belongs.

In addition to the Web App, a full version of a DyVisual Web client was implemented. The advantage of using the DyVisual Web client is that the deviation map can be investigated cooperatively, i.e., serval users located at geographically distributed sites can view the model simultaneously while all changes of the view in which the deviation map is visualized is synchronized among all clients connected to the same DyVisual server. The Web client

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provides a RESTful interface where REST services for uploading a new deviation map and for adding or modification of the deviation information for a given model.

The idea of the synchronization is that a group of experts who may be located at different sites can cooperatively investigate a given deviation map. The assumption is that only one expert is manipulating the synchronized view. We assume that the experts have an audio connection for their discussion which they can use to agree on who is allowed to modify the view.

7.3 Lessons Learnt

From the experiences with the FITMAN trials one can conclude that DyVisual is a powerful tool for the visualization of dynamic 3D content in the context of the World Wide Web. The main issue to solve for an application is to acquire the data for the 3D models in the first place. The data representation format of this data is an issue. DyVisual supports the most important standards for representing 3D models and, thus, a large number of applications. The pure visualization of the model in a browser is straightforward. However, when the model should be dynamically modified or even animated, deeper knowledge of XML3D, FiVES and 3D data in general is necessary. For applications like the visualization of deviation maps special shaders might be necessary which also requires special knowledge of XML3D. However, the generic enablers which form the basis for DyVisual, i.e., XML3D/Xflow and FiVES are well supported and documentation can be found at http://catalogue.fiware.org/enablers/3d-ui-xml3d and https://github.com/fives-team/fives.

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8 SUMMARY AND CONCLUSIONS

In this deliverable, we have detailed the support assets available via the FITMAN project. During the course of the project, the FITMAN project has provided support to two types of FIWARE participant: Phase III Accelerators and the SMEs / Web Entrepreneurs participating in the accelerator projects' open calls. An overview of the main FITMAN assets is given below in Table 11, with an indication of who they are of interest to.

Table 11: Overview of main FITMAN assets (source of asset given in brackets).

FITMAN asset	Phase III accelerators	SME & web entrepreneurs
FITMAN Platforms (WP4-6)		✓
FITMAN Specific Enablers (SEs) (WP3, WP12-14)		✓
Use case scenarios and business requirements (D8.5)	✓	
FI-PPP capacity building analysis (D8.5 and D8.6)	✓	
Verification and validation method (D8.5)	✓	
Methodologies for SME engagement and technology awareness (D8.5)	✓	✓
Business and technical indicators (D8.5 and D8.6)	✓	
Methodology for best practices in SME engagement (D8.5)	✓	
Lessons learned from FI-PPP engagement (D8.6)	✓	✓
Open Call specifications (D8.5)	✓	
Trials business cases (D8.5)	✓	✓
Socio-economic impact assessment methodology (D9.2 and D8.6)	✓	✓
FITMAN architecture (D8.5 and D8.6)	✓	✓
FITMAN Platforms and SEs for manufacturing (D8.5 and D8.6)	✓	✓
Service/application development support (D8.5)		✓
Checklists of legal issues and business models (D8.5)		✓

The support processes defined in the FITMAN project have successfully satisfied the requirements for both confidentiality and scalability. Support has been provided solely via email, managed via the OTRS Help Desk system. None of the Phase III participants used the support forum on the FITMAN Catalogue. We consider that this is because a) many queries have been of a private nature, and b) it is so quick and easy for people to send an email, they do not see an advantage of using the forum. However, we note that there were a few

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occasions where Skype was used to assist users, on an *ad hoc* basis, where this proved to be more effective than email.

FITMAN has provided support and training via webinars, which have been positively received. Different webinars have been provided during the course of the project, first focusing on providing information to consortia applying to Phase III (to become accelerators), and then a mixture of webinars targeting the Phase III accelerators as they started, and, later, the participants in their open calls (focused on the SEs and methodologies). The webinar materials (slides and videos) have been made available as a resource that has since been viewed by thousands of people.

A Technology Awareness Creation methodology has been developed in the project, which was executed in November – December 2014, when most of the accelerators were launching their first open calls; among which, the three closest related to FITMAN: FABulous, CEED Tech and FInish. Using this methodology, FITMAN partners identified and contacted SME networks across Europe, and was able to reach over 100,000 potential SMEs and Web Entrepreneurs with information about FIWARE, FITMAN and the opportunities for funding and support.

Although manufacturing has not been fully represented in the FIWARE acceleration programme, 9 out of the 16 accelerators have been interested in the FITMAN assets. In particular, we note that a direct, collaborative, connection with FABulous was made, which is an accelerator that represents a small subsector of manufacturing pertaining to 3D Printing. This collaboration has had a very positive outcome, with just over 50% of the SMEs and WEs funded by FABulous requiring FITMAN SEs as part of their proposed work.

As the FITMAN project has come to an end, continued support is provided to Phase III participants for free, which has been enabled by the FITMAN Exploitation Agreement and the FITMANovation Lab. Moreover, we have also reported on a trial expansion for Whirlpool in collaboration with one of the Phase III projects funded by FABulous, 3DQuality. In this expansion scenario, the DyVisual SE has been used to create a Web Application allowing for 3D scanning and fault detection in products based on 3D models to greatly enhance the quality control procedures at Whirlpool. Moreover, the Web Application developed allows multiple users, from geographically distributed locations, to simultaneously perform quality control.

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APPENDIX A: TECHNOLOGY AWARENESS EXECUTION DETAILS

Table 12 below presents the numerical targets set in relation to the technology awareness raising actions which are based on Table 13: Metrics set with regard to the pilot action of D8.4 (Achinioti, et al., 2014), having done necessary adjustments for the implementation of the present actions.

Table 12: Targets linked to technology awareness raising actions

Planned action	Metric	Target
Awareness of FITMAN results among SMEs and WEs	D2 Proportion of networks to disseminate FITMAN information to their SMEs / WEs.	FITMAN information propagated by 50% of all organisations contacted.
	D2.1 Number of SMEs and WEs to be reached out	800 SMEs and WEs
Contact types of organisations mostly relevant to FITMAN / ICT for manufacturing	D4 Number of organisations positively responded per category: ecosystems	Positive response from 50% of the contacted organisations
	D5 Number of organisations positively responded per category: VC/BA	Positive response from 50% of the contacted organisations
	D6 Number of organisations positively responded per category: Incubators / Accelerators	Positive response from 50% of the contacted organisations
	D7 Number of organisations positively responded per category: Technology Parks	Positive response from 50% of the contacted organisations
	D8 Number of organisations positively responded per category: Clusters	Positive response from 50% of the contacted organisations
	D9 Number of organisations positively responded per category: National Associations / Federations	Positive response from 50% of the contacted organisations
	D10 Number of organisations positively responded per category: Regional Development Agencies	Positive response from 50% of the contacted organisations

Table 13 below illustrates the main outcomes obtained from the awareness actions.

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Table 13: Positive responses overall and per category

Planned action	Metric	Results
Awareness of FITMAN results among SMEs and WEs	D2 Proportion of networks to disseminate FITMAN information to their SMEs / WEs.	36%
	D2.1 Number of SMEs and WEs to be reached out	116.343
Contact types of organisations mostly relevant to FITMAN / ICT for manufacturing	D4 Number of organisations positively responded per category: ecosystems	38%
	D5 Number of organisations positively responded per category: VC/BA	67%
	D6 Number of organisations positively responded per category: Incubators / Accelerators	28%
	D7 Number of organisations positively responded per category: Technology Parks	25%
	D8 Number of organisations positively responded per category: Clusters	25%
	D9 Number of organisations positively responded per category: National Associations / Federations	46%
	D10 Number of organisations positively responded per category: Regional Development Agencies	50%

Figure 18, below, illustrates the publication of the FITMAN information on the UPTEC Facebook account.

Figure 18: Screenshot from UPTEC Facebook account – dissemination of FITMAN info.

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