

Deliverable No. 6.4

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PrimeFish

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"Developing Innovative Market Orientated Prediction Toolbox to Strengthen the Economic Sustainability and Competitiveness of European Seafood on Local and Global markets"

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¹ Document will be a draft until it was approved by the coordinator

² PU: Public, PP: Restricted to other programme participants (including the Commission Services), RE: Restricted to a group specified by the consortium (including the Commission Services), CO: Confidential, only for members of the consortium (including the Commission Services)

³ The initials of the revising individual in capital letters

Deliverable D6.4

Evaluation of added value

February 28th, 2019

Executive Summary

This report sets out to describe the key performance indicators (KPIs) for added value that have been implemented to monitor and evaluate the toolbox. The deliverable is a public and open communication.

The PrimeDSS was developed as a prototype decision support system (DSS) arising from a large-scale inter-disciplinary publicly funded research project assessing the competitiveness of European aquaculture and fishery sectors. It has been designed as an interactive, user friendly web-based tool which will enable industry stakeholders and policy makers to run intra and inter-sectoral comparisons on a range of parameters with potential to influence competitiveness. Stakeholder feedback during dissemination activities throughout the project lifecycle supported iterative development of five embedded tools and sub-modules, with the objective of developing a prototype that could commercially exploited post-project.

By evaluating key performance indexes, building on a co-creation process and information from case studies on the impact assessment on socio-economic and innovation, this deliverable identifies the competitive advantage that will be derived from the PrimeDSS tools.

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1 Definitions and Acronyms

CPA: Competitive Position Analyser

DSF: Decision support framework

DSS: Decision support system

EC: European Commission

FAC: Fisheries Competitive Index

FACI: Fisheries and Aquaculture Competitive Index

GRA: Growth Risk Analyser

IRG: Industry Reference Group

PF: PrimeFish

PSC: Product Success Check

SFS: Success and Failure stories

SME: Small and medium-sized enterprise

VCA: Value Chain Analyser

WP: Work Package

WTP: Willingness to Pay

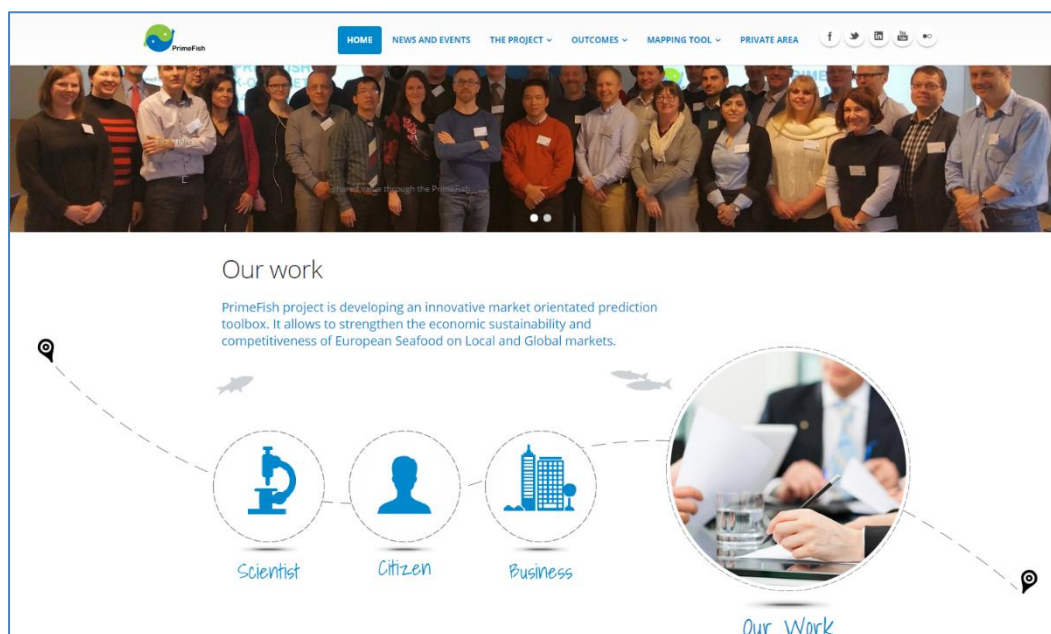
2 Introduction

2.1 PrimeFish objectives revisited

The overall aim of the PrimeFish project was to improve the economic sustainability of European fisheries and aquaculture sectors. The results of the project provide the user with a better understanding of the competitive environment in which their business exists, their competitive position and strategy and pathways to innovation and gaining competitiveness.

PrimeFish gathered data from individual production companies, industry and sales organisations, consumers and public sources. Data related to the competitiveness and economic performance of companies and sectors includes data on price development, supply chain relations, markets, consumer behaviour and successful product innovation.

The primary target users; fishermen, aquaculture producers and production companies, can use the PrimeDSF to improve understanding of their markets and in setting strategic plans for future production and innovation. The tools also support cross-learning from more to less evolved (consolidated and/ or concentrated) sectors which may be of value to SME's seeking niche market or anticipating exit strategies. We envisage this will in turn help strengthen the long-term viability of the European fisheries and aquaculture sectors. This should also benefit consumers, leading to more diversified European seafood products, enhanced added value, novel products and improved information on origin, certification and health claims.⁴



⁴ Annex 1 – PrimeFish: Description of action (DOA) (part A)

2.2 Evaluating value-added

The legacy of a project is possible to evaluate fully only after a suitable length of time post project. What can be evaluated at this point is not the actual, but rather “a potential“ for impact (or value-added), for example through analysis of stakeholder feedback and the monitoring of key performance indicators (KPIs) which should be developed with stakeholder input; measurable values that demonstrate how effectively specific objectives are being achieved. Two types of impact can be distinguished – direct and indirect⁵. The direct outcome of the project is the development of a decision support toolset aimed at supporting the competitiveness of seafood businesses for the targeted groups defined by the project and indirectly through our dissemination activities.

While the application of the toolset is sufficiently broad and inclusive of different types of users, a particular user group has been identified throughout the course of the project, which holds the highest potential for exploitation of results, namely SMEs.

As the EC puts it⁶, “Small and medium-sized enterprises (SMEs) are the backbone of Europe's economy. They represent 99% of all businesses in the EU. In the past five years, they have created around 85% of new jobs and provided two-thirds of the total private sector employment in the EU. The European Commission considers SMEs and entrepreneurship as key to ensuring economic growth, innovation, job creation, and social integration in the EU”. At the same time, SMEs usually require highest level of support, due to the resource limitations and disproportionate competitive pressure. Therefore, the dissemination of the PrimeDSS tools was targeted towards SMEs, although larger organisations involved in the fisheries industry also participated in dissemination activities and displayed interest in what the PrimeDSS tools had to offer.

As a part of the dissemination process, social media has been utilised to generate awareness of the PrimeDSS amongst the fisheries industry. This included intensive use of Twitter, which was also directed towards PrimeFish presentations and events. LinkedIn and Facebook were used in a less intensive way as well as follow-up emails to presentations, webinars, summer school, presentations at scientific events (IIFET...) and email marketing campaigns that were run to promote registration on all events.

The Industry Reference Group (IRG) also played a key role in providing feedback, having participated in the stakeholder's workshops held along with annual meetings, presentations at trade fairs (Conxemar, 17 & 18, Seafood Expo Global 18) and individual meetings with National Contact Points. They're general feedback was positive, without pointing to anything more concrete apart from the need of updating data frequently and adding more species (hake, etc). The large industry reference group (IRG) has facilitated access to data on specific case studies. A data repository has been created,

⁵http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/dissemination-of-results_en.htm

⁶ https://ec.europa.eu/growth/smes_en

and PrimeFish has joined the H2020 Open Research Data Pilot to ensure future open access to that data.

The effectiveness of demand stimulation through health, label and certification claims has been evaluated and compared with actual consumer behaviour. PrimeFish has assessed the non-market value associated with aquaculture and captured fisheries as well as the effectiveness of regulatory systems and thereby provided the basis for improved societal decision making in the future. The collected data has been used to verify models and develop prediction algorithms that have been implemented as the decision support system: PrimeDSS.

This deliverable sets out to explain the key value performance indicators that have been used to monitor and evaluate the PrimeDSS tools. The KPIs cover the dissemination and exploitation of the PrimeDSS toolset. The deliverable considers the competitive advantages of the tools/case studies in terms of their usefulness in post-project commercialisation based on an impact assessment on socio-economics and innovation.

The main KPIs that were used in the evaluation of value added included:

- Google Analytics
- Feedback surveys
 - PrimeFish summer school in Bremerhaven
 - Webinars for PrimeDSS tools
- Final PrimeFish conference (Vigo): Industry feedback

However, apart from the direct results, the project has also created the potential for bringing about positive changes in society in an indirect way, through the educational and research capacity building which it has supported.

Resulting from the project will be two PhD degrees in:

- Industry organisation and competitiveness in aquaculture
- Media impacts on seafood consumption

The research capacity which has been created throughout the project can easily find application in governmental and non-governmental organisation, business, research and education addressing the challenges of a new and expanding aquaculture industry, projected to play an important role in providing nutrition to a growing human population, however operating in increasingly competitive environment.

2.3 Potential barriers to application of results

One of the main tasks in PrimeFish was to develop a comprehensive framework to address the broad ranging and multi-faceted concepts of 'Competitiveness' and 'economic sustainability'. The concept of competitiveness, for example, can be applied at multiple levels i.e. product, firm, industry and nation; it is the outcome of multiple factors e.g. demand condition, supply conditions, value chain structure, industry structure etc; and can be achieved through multiple strategies.

Each tool within the PrimeDSS addresses a single, or only a few, aspects of competitiveness. For example, FACI works at the national level, VCA – at the industry level, while product success check, SFS, and willingness to pay – at the product level. However, competitive strategies at product level for instance, require understanding of the competitive environment at broader levels, too; benefit from understanding of price development etc. Therefore, while individual tools can provide valuable decision support, the main value of PrimeDSS is not in any single tool, but in the collection of tools which build a frame of thinking and analysis.

In this respect the toolbox can benefit from further integration and harmonisation between the tools, in order to enrich the analysis for users. For example, there are clear linkages between 'industry structure' and 'boom and bust cycles', productivity growth, product range, and profitability, case studies of companies can be linked to competitive environments. And, while data availability constrained the development of some of the tools, the 'infrastructure' provided through the toolbox, is valuable and can be populated with market intelligence data such as are collected by business consulting companies in the industry, who may also have an interest in providing this integrated analysis and extending the coverage of countries and species.

3 Key Value Performance Indicators & Results: Added Value

3.1 Introduction

To determine the value added, it was necessary to decide on a group of Key Value Performance Indicators to confirm the effectiveness and feedback from the dissemination of the PrimeDSS amongst interested stakeholders. CETMAR (WP7) have organised many dissemination activities over the last year and of specific interest to the evaluation of added value were the summer school in Bremerhaven (Germany), Webinars, and the final conference in Vigo where the PrimeDSS tools were demonstrated for user feedback. Also, from a monitoring perspective to understand the traffic and which pages were used on the PrimeDSS website, Google Analytics was set up to capture statistical information on user hits and their behavioural and navigational activities. In summary, the key indicators decided upon were:

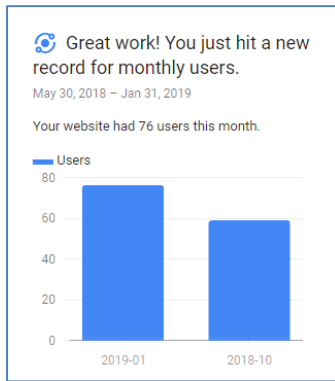
- Google Analytics
- Feedback surveys
 - PrimeFish summer school in Bremerhaven
 - Webinars for PrimeDSS tools
- Final PrimeFish conference (Vigo): Industry feedback

To promote all dissemination events, the PrimeFish website, Twitter, LinkedIn, Facebook, email marketing campaigns were used and an observed average of 1-2 registrations were recorded on Google Analytics after each related event was held.

In summary, the user feedback received identified areas where value could be added, and the tool improved, both from the perspective of developing the project prototype and later for post project commercialisation. A key to ensuring the commercial exploitation of the tools will be to ensure that

current fisheries data can be collected daily from trade databases and other publicly published data sources from the fishing industry. This and other key recommendations have been made to ensure the successful ongoing exploitation of the tool by a commercial company. One of the partners in the consortium, the SME Kontali, will continue to invest in the tools post project with the aim of exploiting them commercially.

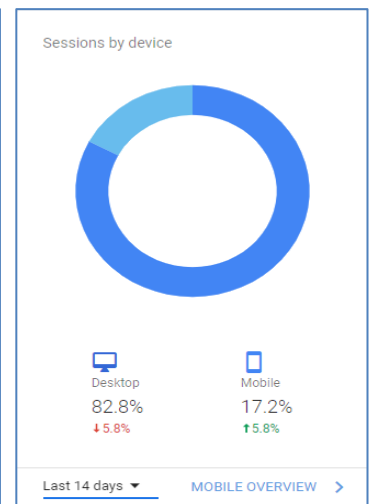
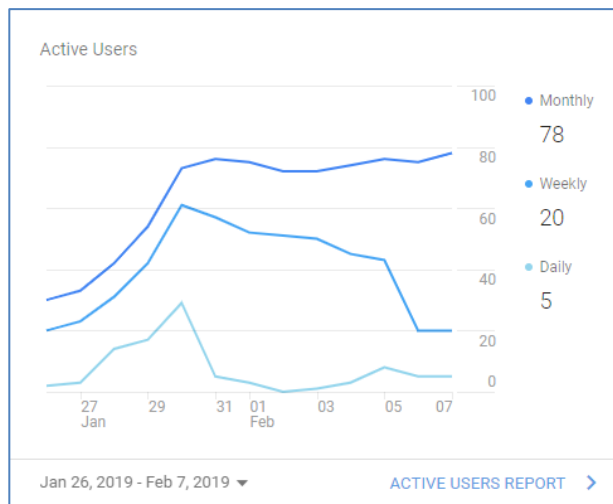
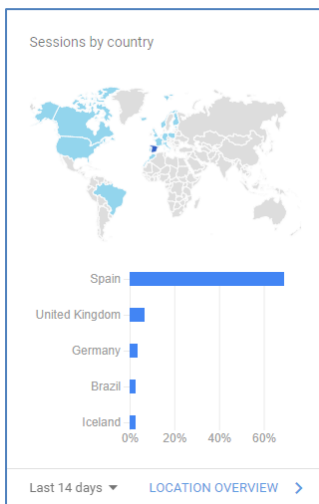
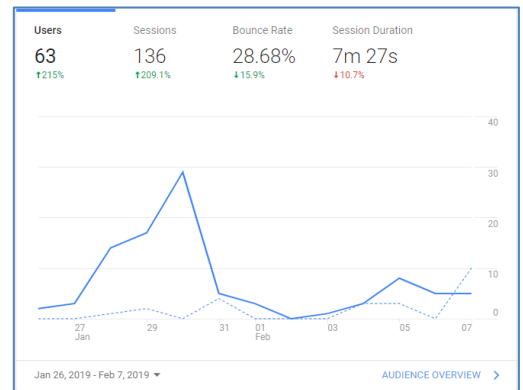
3.2 Google Analytics (GA)



Set up by CETMAR (WP7), the purpose of Google Analytics is to analyse in-depth detail about the visitors on your website. For example, PrimeFish has monitored traffic, user behaviour and time spent on each page. From a feedback perspective, this has helped, along with feedback from various surveys, to determine iteration on the PrimeDSS tools on the PrimeDSS website.

It is important to note that there is a large bias towards Spain in the results due to many

users taking advantage of creating an account whilst attending many of the dissemination activities that were organised in Spain. Below are some examples of the reports that are accessible in Google Analytics.



3.3 Feedback Surveys

3.3.1 PrimeFish summer school in Bremerhaven

Between the 6th to the 10th of August in Bremerhaven (Germany), a summer school was conducted to improve the knowledge of young professionals and researchers in the seafood sector as well as students of business or finances within the European seafood sector. The objectives of the course were to give a general outlook on the current challenges of a highly internationalized seafood sector whilst developing the skills needed to build a career in the seafood sector. The program was aimed at providing participants with the latest analysis of the value chain, international trade or market research, whilst offering practical insights on the development of business and marketing proposals adapted to the particularities of the seafood sector. The summer school was also an opportunity to disseminate the PrimeDSS tool to a wide young audience for usability feedback.



The course was undertaken when the tools were still going through an iterative process of improvement and feedback was still being received from participants, mainly NOFIMA, and stakeholders. Therefore, additional feedback was considered important to ensure continued improvements to the PrimeDSS tools prototype to improve readiness for commercial exploitation post project.

As a part of this course, the attendees spent time reviewing the PrimeDSS tool set and survey was completed providing end-user feedback which included an assessment of the Value Chain Analyser (VCA), Product Success Check (PSC), Competitive Position Analyser (CPA) and Willingness to Pay (WTP).

The Summer School participants profiles covered several nationalities including attendees from the Netherlands, Germany, Syria, Vietnam, Spain and Greece. Their wide and varied backgrounds are listed below and indicate the impact that this dissemination activity had on broadening the public's knowledge on PrimeFish and the PrimeDSS:

- Business Development Manager for Aquaculture and Seafood Consultancy Company providing market research services
- Business & Financial Management Graduate with work experience in various sectors currently undertaking voluntary work
- Experienced Banker interested in better understanding of the aquaculture and seafood sectors
- Biotechnology student with MSc in Food Quality and Security and experience as a food technician, currently involved in nutritional research
- Junior Economist with a Fisheries Research Organisation and prior experience working for a bank. Qualifications in Business Administration and Marketing
- Marine Biologist with experience working on the bioenergetics of fish
- Veterinarian working on border inspection point with responsibilities including seafood
- Participant with previous work experience in the food industry looking for a new challenge in the seafood industry



- Student of economics with interest in seafood
- International student with interest in seafood marketing

3.3.1.1 *Feedback from the Survey*

4 All participants agreed that the tool offered practical information. Based on the survey conducted in References

Bagstad, K.J., Semmens, D.J., Waage S, Winthrop, R. 2013 A comparative assessment of decision-support tools for ecosystem services quantification and valuation. *Ecosystem Services*. 5, e27–e39.

Karpouzoglou, T., Zulkafli, Z., Grainger, S, Dewulf, A., Buytaert, W., Hannah, D.M. 2016 Environmental Virtual Observatories (EVOs): prospects for knowledge co-creation and resilience in the Information Age, *Current Opinion in Environmental Sustainability*.18,40-48

Mathies M. 2007 Environmental decision support systems: current issues methods and tools. *Environmental Modelling and Software*. 22. 123-127

McInerny, J., Chen, M., Freeman, R., Gavaghan, D., Meyer, M., Rowland, F., Spiegelhalter, D.J., Stefaner, M, Tessarolo, G., Hortal, J., 2014 Information visualisation for science and policy: engaging users and avoiding bias *Trends in Ecology & Evolution*, 29, 3, 148-157

Appendix 1 – Survey Results: summer school in Bremerhaven (Germany) & Webinars, the results can be summarised as:

- The “Value chain analyser” was the preferred tool (40%) (someone assessed it as the most “user-friendly”), together with positive votes for the Willingness to Pay, Product Success Check and Competitive Position Analyser.
- The least preferred tool: Growth Risk Analyser (“We needed to input the information. It was not explained how and exactly in what order, etc. Did not manage to use it.”)
- Overall, the tool was assessed as having a good design and being easy to navigate through, although some would need some training.
- There were some problems with the registration (one did not get the email at the first attempt), some complaints on unavailable options in the CPA (maybe due to an incomplete survey), and the limited number of species available.
- They rated it as a very useful tool to be used when developing business proposals, mainly because of the market information.

4.1.1.1 Feedback from Google Analytics (GA)

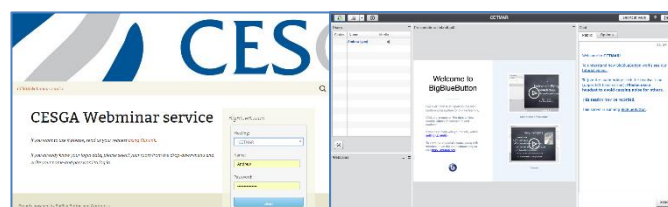
- In line with what was commented on in the survey, the GRA and the CPA have very low “Time on page” rates, low “page views” and were the most common “Exit pages”.
- GA shows some speed suggestions for the login page and CPA, WTP, PSC, VCA referred to images, html and css optimization, mostly. (Behaviour> Speed suggestions)

4.1.2 Webinars for PrimeDSS tools



A group of webinars was organised for each of the tools: Competitive Position Analyser (CPA), Growth Risk Analyser (GRA), Product Success Check (PSC), Willingness to Pay (WTP) and the Value Chain Analyser (VCA). The webinars were mainly aimed at SME’s with invitations being sent to companies, researchers and interested colleagues. The format followed an introduction to the specific area of research that had been done for each tool and was followed by a live overview of the tools.

The online software used to present the webinars was a tool called CESGA. This software has been specifically developed for webinars and allows for audience participation in the event as well as allowing presenters to share their screens to show presentations or to give live demonstrations of the PrimeDSS tools.



1	Dioni	Ocáriz	Spain	Palacio de Oriente
2	Hayley	Every	Netherlands	EFFoST
3	Manfred	Goerz	Germany	HSH Nordbank AG
4	Esthela	Melcón	Spain	Dia Group
5	Geert	Hoekstra	Netherlands	Wageningen Economic Research (Wageningen University & Research)
6	Simão	Zacarias	Scotland	University of Stirling
7	Romain	López	France	
8	Theodoros	Mavraganis	Greece / Iceland	TEI of Epirus, Holar University College
9	Sivaraman	Iyemperumal	India	Central Institute of Freshwater Aquaculture

Prior to each webinar, a registry of registered attendees was shared so that the presenters knew who their target audience was. Registration for each webinar was driven by an email campaign and announcements on the social media channels used by the PrimeFish project such as Twitter and the PrimeFish website. Word of mouth was also encouraged to alert interested participants about the webinars.

Five webinars were held to demonstrate the five tools, CPA, GRA, PSC, WTP and VCA. Each webinar included a practice run to ensure the presenters were familiar with the tool and confirm that the introductory research slides complemented the live demonstration of the tool. For each tool, SYN (WP6) developed scripts to ensure all the important information was covered during the live demonstration of each tool.



The activity included 112 participants (including those attending the market level webinars), many of which participated in several webinars. Those webinars focused on the Product Success Check and the Willingness to Pay tools received the most attention and feedback from the audience. All webinars concluded with a slot for audience questions.

Recordings are available through the YouTube channel of the project and the “Learning Resources Center” of the website: <http://www.primfish.eu/content/webinars-competitiveness-seafood-sector>.

4.2 Final PrimeFish conference (Vigo): Industry feedback



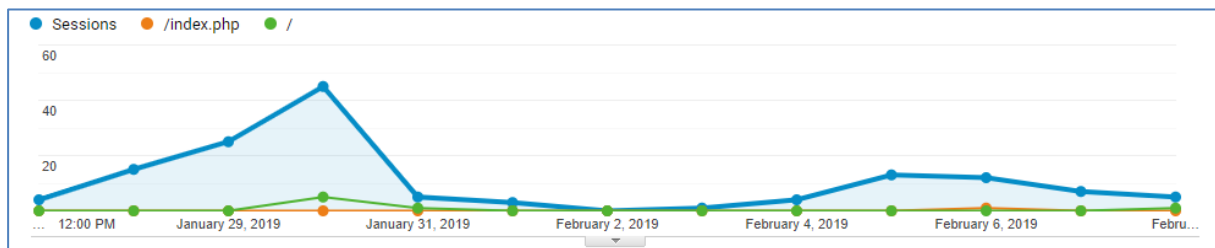
The final PrimeFish proved to be very successful event with the opportunity to present the PrimeDSS tools and science developed behind them. The morning began with several presentations given including a presentation on the PrimeDSS tools. The morning's presentations were followed by a coffee break where members of the PrimeFish consortium setup five hot-desks with laptops for each of the tools: Competitive Position Analyser, Growth Risk Analyser, Product Success Check and the Value Chain Analyser. For each tool, there was at least one PrimeFish team member manning the hot-desk to explain how the tool functioned. At least 23 participants participated in the demonstration of the tools. The response to the tools was generally very positive and



industry representatives could see the benefits of having access to them. The feedback results are shown in Appendix 2 – Final PrimeFish conference (Vigo): Industry feedback.

As can be seen from the results of the demonstration, the overall reception of the tool was positive with concerns mainly being expressed about some species of interest to the industry, such as hake, missing from the tools.

As is shown by Google Analytics, there was also a sharp increase in registrations to the PrimeDSS during the final conference where sessions peaked. The interesting thing to note is the consistent usage of the tool since the conference.



The adjoin table below also shows pageviews with the login page with the highest results which is to be expected, but then you will observe that the tools, in terms of page views, has been the most heavily used. In descending order, they are the CPA, VCA, PSC, GRA and WTP. You can also see that users have also been accessing the PrimeDSF wiki to gather more information on each of the tools if you drill down further into the results.

Page	Pageviews	Unique Pageviews	Avg. Time on Page	Entrances	Bounce Rate	% Exit	Page Value
	827 100.00% (827)	527 100.00% (527)	00:01:26 Avg for View: 00:01:26 (0.00%)	139 100.00% (139)	27.34% Avg for View: 27.34% (0.00%)	16.81% Avg for View: 16.81% (0.00%)	\$0.00 % of Total: 0.00% (\$0.00)
1. /index.php/login	178 (21.52%)	111 (21.06%)	00:01:03	107 (76.98%)	29.91%	21.91%	\$0.00 (0.00%)
2. /index.php/cpa	64 (7.74%)	27 (5.12%)	00:00:51	0 (0.00%)	0.00%	3.12%	\$0.00 (0.00%)
3. /index.php/vca	62 (7.50%)	35 (6.64%)	00:03:58	2 (1.44%)	50.00%	30.65%	\$0.00 (0.00%)
4. /	57 (6.89%)	42 (7.97%)	00:00:25	7 (5.04%)	14.29%	14.04%	\$0.00 (0.00%)
5. /index.php/psc	57 (6.89%)	31 (5.88%)	00:01:32	1 (0.72%)	0.00%	14.04%	\$0.00 (0.00%)
6. /wiki/PrimeFish_Wiki	51 (6.17%)	25 (4.74%)	00:00:37	4 (2.88%)	25.00%	17.65%	\$0.00 (0.00%)
7. /index.php	37 (4.47%)	29 (5.50%)	00:02:26	1 (0.72%)	0.00%	10.81%	\$0.00 (0.00%)
8. /index.php/gra	35 (4.23%)	22 (4.17%)	00:01:41	1 (0.72%)	0.00%	14.29%	\$0.00 (0.00%)
9. /index.php/login?view=registration	30 (3.63%)	19 (3.61%)	00:01:12	1 (0.72%)	100.00%	16.67%	\$0.00 (0.00%)
10. /index.php/wtp	30 (3.63%)	19 (3.61%)	00:00:31	6 (4.32%)	0.00%	13.33%	\$0.00 (0.00%)

5 Impact assessment on socio-economic & innovation

5.1 Introduction

The underlying question is, has PrimeFish and the PrimeDSS tools met 'the intertwined social and economic needs of society'⁷? Will the innovation be supportive at the firm-level and lead to further market opportunities? Will SMEs be able to benefit from the research and science that forms the backbone of the PrimeDSS tools?

Based on the feedback and commercial interest in developing the tools further, the answer to this question is quite clearly yes! As the PrimeDSS tools have gone through their various iterations of development and improvements, feedback from stakeholders and IRG representatives has been overall positive. Kontali also believes that there is commercial potential in improving their business model and marketability of their data driven products through the potential implementation of several tools. Kontali is planning to move their product model from spreadsheet reporting to a cloud-based model where clients will be able to interact with tools developed in PrimeDSS to generate real-time reports based on current industry data sets. The change in their business model potentially includes:

- Moving from written reports (word/pdf) to
- Digital/web-based reports
- Digital dynamic/interactive information sources
- Online «real-time» market information
- Use of advanced digital tools

Kontali, analysing their current business model identified key areas where industry requests specific information which includes:

- Expected harvest volumes coming to the market => volume forecasts
- Market trends – main markets – volume and price => the history (as recent/up-to-date as possible!)
- Business performance benchmark
- Sector structures/overview
- Product trends
- Customer preferences

Based on the tools developed in the PrimeDSS, Kontali could see the potential in the exploitation of those tools by aligning them with the above information that they already provide for their customers. The links between the customer queried information and which tool may satisfy this requirement are:

- Expected harvest volumes coming to the market => volume forecasts (-> **Growth risk analyser**)
- Market trends – main markets – volume and price => the history -> **Growth risk analyser**
- Business performance benchmark -> **Competitive position analyser**
- Sector structures/overview -> **Value Chain Analyser**

⁷ <https://jamierwilson.wordpress.com/2013/06/22/socioeconomic-innovation-for-socioeconomic-competitiveness/>

- Product trends ~> **Product success check & Success and failure stories**
- Customer preferences ~> **Willingness to pay & Product Success check**

Note that the current business model has not been so concerned with the individual customers' pricing or product preferences, however, this area is a business opportunity that Kontali may be able to exploit by offering their customer base new and innovative approaches to exploiting their markets.

To be able to implement PrimeDSS commercially, Kontali will need to invest in the tools which means they need to seek further finance. Finance will be required to define the technical requirements and subsequent development of the tools into a commercially exploitable product. To satisfy customer requirements, further content will need to be built into the system such as other countries/species and creating a substantial database. Tools for scraping current data from trade databases will also need to be developed along with learning algorithms for predictive modelling.

DG Mare/EUFOMA also expressed interest during the final conference in Vigo to potentially including some of the tools on their website. This is to be confirmed, but this could be quite an exciting development for the further exploitation of the PrimeDSS post project.

5.2 Value added recommendations – Conxemar 2017

PrimeFish was strongly represented during the Conxemar exhibition in 2017. The Exhibition provided PrimeFish with a platform from which to disseminate the project amongst the fishing and aquaculture industry. PrimeFish maintained an information booth as well as having consortium members interacting with other industry booths to promote awareness of the PrimeFish project and the PrimeDSS tools. Following the Conxemar exhibition, CETMAR hosted a stakeholder meeting where the following tips were provided by the attendees on what value-added activities could improve the tool to better suit industry needs. They included:

- Data: the project should ensure the protection of sensitive financial data from companies, while getting a significant sample to offer accurate results. A possible solution: data from a single source will not be used, to respect its anonymity.
- Quota management and the role of institutions was outlined as a key factor for the competitiveness of the Spanish sector and companies.
- Possible improvements are the extension of the PrimeDSS tools to include additional countries (e.g. China) and the output as a chronological review, instead of an assessment of the performance in a particular moment in time.
- Companies know their position in the market, but a market-orientated tool will support them when detecting new trends and competitors' behaviour.
- Inputs & outputs suggestion: develop young people segment, claims on fair labour conditions for workers, other presentations such as sushi, and comparisons between national and local markets.



- Many Spanish producers and processors do not own a brand for its products, therefore they are less interested in market information.
- Emerging trends in the Spanish market: fresh products, chilled products, variable size of portions (fillets), young consumers, convenience lines or products with MAP (Modified Atmosphere Packaging).

6 Learning from Other Decision Support Tools

Soft-ware decision support tools (DSM) have become an increasingly normative output of many publicly funded research projects, responding to the need of demonstrating beneficial societal impact from such expenditure (Mathies 2007). Amongst the most prevalent have been DSM targeting agriculture and environmental management stakeholders. However, several country studies have pointed to a disappointingly low-uptake of such tools, also postulating reasons for this (Gibson et al, 2017, Rose et al 2016, Karpouzoglou 2016, McInerny 2017). At a minimum, successful adoption requires clear alignment and performance with respect to stakeholder-specific business or policy objectives and context (i.e. relevance), however the above reviews also highlight a range of other considerations.

First, Rose et al (2016) identified ease of use (aka usability or user-friendliness) as one of the single most important factors influencing uptake. Here, use of effective data visualisation techniques is paramount whilst also striking the correct balance between visualisation and the amount textual (interpretive) information. It is also important to assess how far users will use the tool (i) as a general information source to improve their evidence base for decisions or (ii) whether they require more directions such as clear steps towards optimal decision paths. This points to the prospect of interactions with enterprises i.e. with SMEs' conceivably likely to place greater value on the latter approach than larger entities. This in turn could then point to a potential need for greater integration between PrimeDSS modules and tools in future iterations. For example, the simplicity of the report-generator tool within the Value-Chain-Analyser module was widely praised in stakeholder feedback (section 3.4). During supervised demonstrations by project staff, the same respondents also valued the strategic competition lessons that could be drawn from the combination of this and industry dynamics visualisation tool in the same module, whilst indicating greater challenge they faced in drawing the same conclusions independently. An alternative to embedding further interpretive integration capacity within the tool could be to offer this as part of an expert-engagement service within the commercial exploitation model for PrimeDSS.

Second, uptake is highly contingent on the cost of the tool both in direct financial terms (i.e. linked to the DSM commercial exploitation model including subscription terms, etc) and the time-costs of using and applying the DSM (enterprise scale-interactions can again be envisaged here). This also alludes to the level of data input required by users which may for example be partially offset by subscription discounts.

Rose et al (2016) also highlight a need to identify champion(s) for the tool within the target institutions coupled with contextual understanding of the autonomy of the individual within the institution and of the institution itself (e.g. within policy settings). Coupled to this is the level trust in the provenance of the DSM, also critical to wider peer recommendation. PrimeFish responded to these challenges in various ways; through embedding commercial partners within the research consortia, through establishment of a consultative multi-national Industry Reference Group (IRG) as representatives of the primary target user-groups and through the close personal & R&D linkages of many of the consortia researchers to the commercial aquaculture and fisheries sectors in their respective countries; perhaps most notably in Spain, the UK, Iceland, the Faroes, Norway, Germany and Canada.



Finally, for sustained uptake, consideration must be given to future proofing to ensure effective performance of the tool both now and in the future. The critical point here is the ease with which qualitative and quantitative data particularly that behind visualisation tools can be updated.

7 References

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8 Appendix 1 - Survey Results: summer school in Bremerhaven (Germany) & Webinars

Date	1. The tool offers practical information and indicators	2. What is your most preferred feature of the tool?	3. Please, explain your preference.	4. What is your least preferred feature of the tool?	5. Please, explain your preference.	6. Do you think that it has an attractive design?	7. Please, explain why.	8. The tool is easy to navigate.	9. Please, explain your choice	10. You have found the information you were looking for on the first attempt.	11. Have you found any problems when searching for information? Which ones?	12. The tool is useful for the development of business and marketing proposals.	13. Please specify for which activities you could continue to use the tool.	14. Do you have any additional suggestion or comment?
10/5/2018 8:33:09	Strongly agree	Willingness to Pay		Product Success Check		Agree		Strongly agree		Agree		Strongly agree		
10/9/2018 13:46:16	Strongly agree	Product Success Check		Success & Failure Stories		Strongly agree		Strongly agree		Agree		Agree		
11/27/2018 16:04:09	Agree	Value Chain Analyser		Product Success Check		Agree		Agree		Agree		Strongly agree		
8/10/2018 11:48:44	Agree	Value Chain Analyser		Growth Risk Analyser		Agree		Strongly agree		Neutral		Agree		
8/10/2018 11:48:49	Strongly agree	Willingness to Pay		Success & Failure Stories		Agree		Strongly agree		Agree	the log in was first a bit of a problem, cause I didn't get the mail	Strongly agree	pecially to find out the potential costumer group	at the moment only out of interest, cause I dont work in the field
8/10/2018 11:52:38	Agree	Competitive Position Analyser	It was very easy (self explaining) while using it and the outcome is very detailed	Growth Risk Analyser	Sorry, I did not use all of them and therefor I'm not able to give a proper answer here	Agree	good overview, good design	Agree	I found everything I looked for on the direct way	Strongly agree	No, just that only a few kinds of fish are included, but the reason is quite clear and better less species, but proper outcome	Strongly agree		
8/10/2018 11:53:09	Agree	Product Success Check	It's good to have an idea whether a product would be successful or not, in order to adjust the decision-making process.	Product Success Check	My choice is because I don't have much idea about the field of growth risk analyses.	Agree	The tool use is easy and simple.	Agree	The tool is very intuitive. Maybe sometimes you have to know about certain concepts in order to understand the process, but it doesn't make the tool use difficult.	Neutral	Didn't find any problem so far, the times I used.	Strongly agree	Product Success Check, willingness to pay and value chain analyser.	For future development of business projects and business research.
8/10/2018 11:58:16	Agree	Value Chain Analyser	I think is the most user friendly	Growth Risk Analyser	We need to input the information. Not explained how exactly in what order, etc. Not managed to use it.	Neutral	It requires training from a trainer and that is not the most user-friendly way	Neutral		Neutral	Yes, Competitive Position Analyser Unavailable options	Agree	Market data	Value Chain Analyser, Willingness to Pay, Competitive Position Analyser

9 Appendix 2 – Final PrimeFish conference (Vigo): Industry feedback

PF Presenter	Tool	Total people interactions	Industry Representative	Reaction	Feedback comments
Olia Untilov (WP4)	Product Success Check (PSC)	3	Pilar Otero, manager of Frigoríficos Rosa de los Vientos	Positive	<ul style="list-style-type: none"> - They were very interested in the tool and really surprised by the fact that it's totally free. So, it's a major positive point. - Like to have the market research and tools SPC and WTP for cephalopods.
Birgit Hagen (WP4)	Product Success Check (PSC)	5	Various	Positive	<ul style="list-style-type: none"> - 2 explicitly requested Hake to be added to the tool - Christophe (the reviewer) liked the tool but said we needed to dig deeper in regional differences - coast/inland) - Bernd (the German IRG) who said the German picture looked very realistic
Francis Murray	Value Chain Analyser (VCA)	3	P1 – Spanish processing company exec P2 – With Audun P3 – MSc regional coordinator	Positive	<ul style="list-style-type: none"> - The reductive nature & simplicity of the value-chain report generator was well appreciated - Assistance needed to help interpret CR4 trends graphical outputs in terms of strategic implications <ul style="list-style-type: none"> o Perhaps indicating need for further cross-reference functionality between this and qualitative VC report sections o Or incorporation of this service as part of a commercial business model? - Standards maps – bring out linkages between geographical distribution of certified entities and market segments/ demand - VC position analyser – P1 very interested in this – but challenges remain re. parameterisation of production costs - P1 would like to see tools extended to cover Cephalopods
Davide MENOZZI	Willingness to Pay (WTP)	4-6	3 Spanish producers PhD student	Mixed	<ul style="list-style-type: none"> - Producers: interested in the tool, taking pictures to the screen (“may I use it from my desk?”), but a bit disappointed that some species were not included (hake) - PhD: interested in the methodology, who has developed a similar exercise
Sveinn Agnarsson	Competitive Position Analyser (CPA) - FACI	4	<ul style="list-style-type: none"> - One graduate student from the university of Coruna - Two persons from the Spanish fishing sector - The chairman of the European processor's union 	Mixed	<ul style="list-style-type: none"> - They were all very interested in the application but worried that not many firms would be taken part. - Need to make it possible to compare their competitiveness to both local and international competitors. - A little complicated to fill out and understand the questions of the surveys. May need to add some additional information on the background and what we are trying to get out of each question.
Andrew Baxter	Growth Risk Analyser (GRA)	3	CEO and the Marketing director of Isidro de la Cal a big processing company	Positive	<ul style="list-style-type: none"> - interested in the pricing prediction of the GRA - keen to know how the tool took into consideration fluctuating prices as this is what they see in the marketplace.



					<ul style="list-style-type: none"> - very interested in the tool and the potential is showed to estimated trends 12 months into the future taking into consideration the confidence bands and prediction accuracy - liked the ease with which data could be uploaded and found the results clearly explained - Boom & bust data would need to be regularly updated to keep the tool relevant - felt that it was a tool that could be very useful and were pretty positive about it.
Margrethe Aanesen	General comments on the PrimeFish project	4	2 students Production company Leader of a German PO for aquaculture producers	Positive	<ul style="list-style-type: none"> - Found it very useful that research projects were so open about their project results and let the industry get some insights. - German Aquaculture <ul style="list-style-type: none"> o argued that this industry could need some financial support as it was in an early stage. o economic theory arguing for the relevance of public support to "early bird" companies/industries, which struggle to solve technological and other challenges that will be available to the wider industry/economy



10 Appendix 2 – WP Leader Challenges & Tool Feedback

WP	1. What were the greatest challenges you faced in developing your tool(s)?	2. During or after development did you receive any feedback from potential end-users (who, when, what...)?	3. If yes to above (2) - was it possible – or how easy would it be - to make refinements based on the feedback?	4. Next steps; assuming additional resources were available – what further tool development steps/ refinements would you prioritise & why?
WP4 – Birgit Hagen	Modelling the 'match' (because of the multiplicity of options) between segments and firm data (offering).	During development: mainly with IRG members during PrimeFish meetings; with Italian IRGs also intermediate discussions (Fattoria del Pesce); at the occasion of the PrimeFish summer school in Bremerhaven; Requests: add other species; more 'regional' details; more segments; how often does this need updates;	Addition of species: would require another wave of survey; Updates: if there are no significant changes (e.g. in terms of marketing/prices/'external shocks') the segments will move but they will move slowly More segments: would need bigger samples/additional responses to be on the safe side; however, sub-segments could also be determined statistically (confidence intervals of course would change);	1) Additional species because this would add insight also into behaviour patterns and so would be useful in more general 2) Updates 3) More segments - because then a more ingrained view could be obtained - however, niches and emerging trends can also be discovered with comparisons of markets/Europe, marketing know-how and/or the in-depth view with qualitative analysis.
WP5 – Sveinn Agnarsson	Lack of data - unwillingness by firms to take part in the survey, even if it did not involve providing us with information on revenues and costs.	No	NA	For the FACI to work it is necessary both to have a database with many firms so that firms will have a decent pool of firms which they can benchmark against. Norwegian salmon farming firms would for instance like to be able to compare their own situation with other Norwegian firms, firms in other countries and global regions, possibly also between regions within Norway. Furthermore, they would like to have up-to-date data, meaning that the database would have to be re-populated often
WP6 – Andrew Baxter & Jorge Andrade (Development)	- Insufficient data. Much of the data used in the development of the platform was delivered towards the end of the project chronogram, and some of the data was incomplete or in a different format than expected, which combined with our time and resources constraint limited the amount of refinement and detail that could be implemented in the platform.	Yes. We received feedback from users who attended conferences and from project partners: - Feedback collected from testers by Nofima - 1st quarter of 2018 - Feedback received from conference attendees in Brussels exhibition - 2nd quarter of 2018	Most of the feedback, including the ones that related to errors and bugs in the platform were covered to the extent of our resources. Some of the feedback however could not be implemented due to our limitations and was instead included as suggestions of improvements in the final deliverable for the platform (D6.3).	- First and foremost, creating the data collection and formatting mechanisms for the platform. This was one of the tasks that consumed most of the time on the development of each tool and was done through a series of meetings and discussions with the teams for each application. This will allow the application to grow and scale, and open new possibilities for data analysis and



	<ul style="list-style-type: none"> - Lack of application model or reference model. The project research and resulting scientific models are a novelty in the fish industry, and there is no point of reference when it comes to how this would be translated into a web application. The models and research were done by different teams of scientists from different universities across Europe and resulted in a wide array of formats and assets necessary and specific to each research context. Merging all the results into one platform meant we had to find different ways of making them work - Limited infrastructure and resources. Given the fact that this was designed as a prototype and had limited resources and time, some models resulting from the research provided quite a challenge to integrate in our infrastructure. This meant we had to make compromises in the implementation to make sure we would be able to have a working prototype that our infrastructure was able to run but will not be the best solution once it is scaled and is fed increasing amounts of data. in the same platform. 	<ul style="list-style-type: none"> - Feedback from project partners during monthly meetings throughout the project 	<p>All software projects are complex and require constant planning and refinement, especially when it comes to web platforms. This requires a dedicated team and resources to expand and improve the application. The main challenge for the platform will be creating an automated way of collecting, formatting and feeding data into the platform, which was done manually for the prototype.</p>	<p>recognition of useful information for the industry, even more if we include in this discussion the creation of intelligent data analysing algorithms and scraping mechanisms.</p> <ul style="list-style-type: none"> - Fully implement the VCA Gross margin calculator. This tool was developed last and is just a simple example of what could be done if we had access to data for different processing chains for the fish industry. This tool generated some good interest and can be further improved to provide more complete and recent information that is critical for business. The other VCA tool also generated good interest and can be greatly improved with data scraping. - Integrate all tools to share information and results from one part of the platform to another. This will require some planning and discussion in regard to what can be integrated and the best form to do it but can be very useful as to provide a user with a wide array of information about a potential product.
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