A Sea of Data—Gaining Competitive Advantage by Creating a Portal of Seafood Insights in SAS® Visual Analytics Designer and SAS® Information Delivery Portal

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ABSTRACT

This paper presents how Norway, the world's second-largest seafood-exporting country, shares valuable seafood insight using the SAS® Visual Analytics Designer. Three complementary data sources: trade statistics, consumption panel data, and consumer survey data, are used to strengthen the knowledge and understanding about the important markets for seafood, which is a potential competitive advantage for the Norwegian seafood industry. The need for information varies across users and as the amount of data available is growing, the challenge is to make the information available for everyone, everywhere, at any time. Some users are interested in only the latest trade developments, while others working with product innovation are in need of deeper consumer insights. Some have quite advanced analytical skills, while others do not. Thus, one of the most important things is to make the information understandable for everyone, and at the same time provide in-depth insights for the advanced user. SAS Visual Analytics Designer makes it possible to provide both basic reporting and more in-depth analyses on trends and relationships to cover the various needs. This paper demonstrates how the functionality in SAS Visual Analytics Designer is fully used for this purpose, and presents how data from different sources is visualized in SAS Visual Analytics Designer reports located in the SAS® Information Delivery Portal. The main challenges and suggestions for improvements that have been uncovered during the process are also presented in this paper.

INTRODUCTION

Norway is the second largest exporter of fish and seafood globally. In 2015 the value of seafood exports from Norway reached 74 billion NOK, and 36 million meals of Norwegian seafood is served every day. The Norwegian seafood council (NSC) works together with the Norwegian fisheries and aquaculture industries to develop markets for Norwegian seafood. The Norwegian seafood council aims to increase the value of Norwegian seafood resources. We do this through market insight, market development, market risk management and reputational risk management in selected markets around the world. The Council also acts as an advisor for the Ministry of Trade, Industry and Fisheries in affairs concerning seafood exports and trade.

Our head office is located in Tromsø, Norway, and we have representatives in twelve countries, including the United States. In addition, we work to identify opportunities for Norwegian seafood products in both new and established markets. Our activities focus on three main areas: marketing, communication and risk management and market insight. NSC is the industry's main source for market insight based on statistics like trade information, consumption figures and consumer insight. We provide effective and rational services for Norwegian seafood exporters that adds to their knowledge and insight in bringing their products to the market. The services provided gives the industry continuous access to important insight that forms the basis of strategic decisions and competitive advantages.

We are using SAS® Visual Analytics in our work with market insight and this will be the main focus of this paper.

SEAFOOD INSIGHT

Almost all seafood information can be put in to numbers; from the weekly export price of fresh salmon, to the preference for a product in a certain demographic group of customers.

With SAS Visual Analytics, we now have a whole new way of presenting data, which is far beyond the large excel spreadsheets and extensive PDF/PowerPoint reports that were our basic ways of presenting data before. All of our data is now gathered in a platform which we call "Seafood Insight". Seafood Insight gathers all of the available market information data in SAS Visual Analytics Designer - based reports available in the SAS Information Delivery Portal to be further distributed to the Norwegian seafood industry.

The need for market information varies across users. In addition to users within our company, all organizations and trading companies working in the Norwegian seafood industry have the opportunity to access the data in Seafood Insight. As of today there are 445 registered companies in Norway that are exporting seafood, from small companies scattered along the coast of Norway, to larger corporations with hundreds of employees. Some users are only interested in the latest trade developments, while others working with product innovation, are in need of deeper consumer insights about when and where consumers prefer and eat (Norwegian) seafood. Some users have quite advanced analytical skills, while others do not. Therefore one of the most important factors is to make the information understandable for everyone, but also interesting enough for the advanced user. With SAS Visual Analytics Designer we are able to provide both basic reporting and more in depth analyses on trends and relationships to cover the various needs. Filtering capabilities, drilldown functions and list options have provided a solution to make visual reports covering large amounts of data without using hundreds of pages.

Seafood Insight is used by the Norwegian seafood industry all over the world. We have built a solution where market information reports are available in an efficient manner, where the users are able to log in and easily choose the reports and insights they are interested in, even without much prior knowledge of the data or SAS Visual Analytics. Due to contracts with various data suppliers the users need to apply for a username and password, and sign a third-party contract before they can access the market information in Seafood Insight.

One of the main challenges we had was that the SAS Visual Analytics Hub has a technically oriented user interface, which requires one to know where the reports are located in the folder structure. With no prior knowledge of the folder structure, our users might struggle to find relevant reports. To solve this challenge, we decided to create our own Hub (Seafood Insight Hub). We replaced the standard SAS Visual Analytics Hub with a custom designed Hub using SAS Information Delivery Portal. SAS Information Delivery Portal enables us to organize the reports in specific topics of interest, and make the selection of reports easier for the user, while still taking advantage of the predefined folder structure in SAS Visual Analytics. Since the users of Seafood Insight outside our department do not need access to SAS® Visual Analytics Explorer or other administrative functions it was not a problem to move away from the original SAS Visual Analytics Hub.
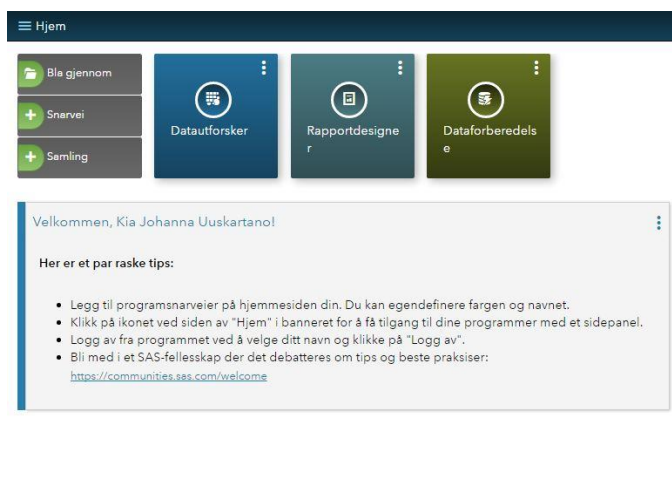

Figure 1. SAS Visual Analytics Hub

Figure 2. Seafood Insight Hub

KEY STATISTICS AND ADVANCED INSIGHT

To take care of the various needs and skill levels of the users, Seafood Insight is divided into two main sections; Key Statistics and Advanced Insight. In Key Statistics, more basic reports are presented, while Advanced Insight presents more in-depth reports, giving the user more choices of filters, graphs etc.

Based on their needs, the users can simply choose a topic of interest in our hub and a URL-link redirects the user to a chosen SAS Visual Analytics based report.
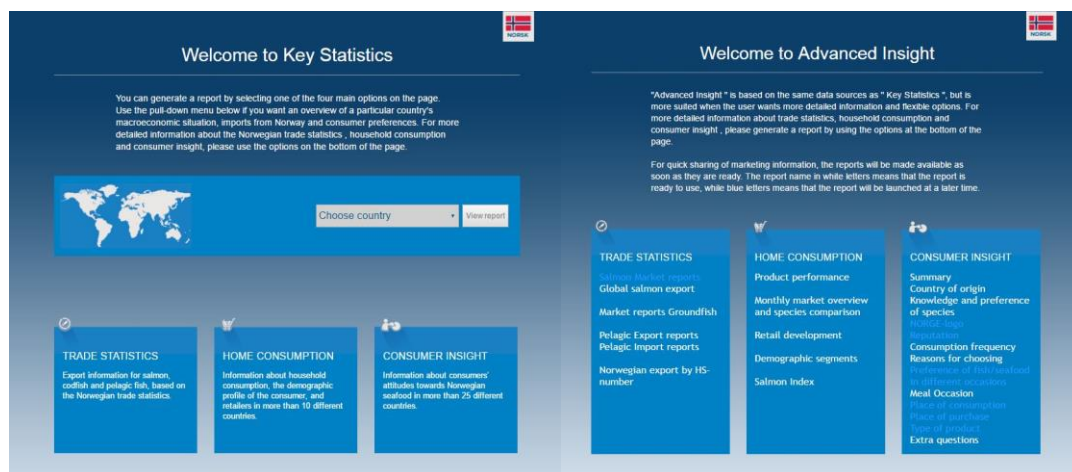

Figure 3. Key Statistics and Advanced Insight

DATA SOURCES AND DATA PREPARATION

As mentioned above, the reports in Seafood Insight are divided into different topics. The topics are organized by data source. The main data sources are trade statistics, household consumption data and consumer survey data. These are three different types of data, which together can contribute to a better

understanding of the seafood industry, from the moment the seafood is shipped, until it reaches the dinner plate of the consumers.

The seafood council purchases a vast amount of data each year to be able to provide the best insight to the Norwegian seafood industry. This is a potential competitive advantage if the Norwegian seafood industry manages to take strategic decisions based on the market information. A short introduction to our main data sources is presented below.

Trade statistics

Seafood Insight contains reports based on trade statistics from 55 countries, including Norway, the European countries and a selection of other countries. The trade data is important for understanding trade flows, estimate market shares and to get an overview of the global seafood market.

Home consumption

Home consumption data represents the purchase of seafood for household consumption in 14 European countries. In each country the data is collected through household panels using a sample of consumers designed to represent a target population in terms of their purchasing. Consumption data helps the users understand consumer behavior and to understand market movements and their implications. This is especially important for the companies that have products going directly into the retail sector. Reports including measures on buyers, frequency, loyalty and many other measures, gives valuable insight for companies working in the retail sector.

Consumer Insight

Seafood consumer insight data is gathered through annual surveys done by the Norwegian seafood council, TNS Gallup and their global partners. The surveys are conducted in around 30 of the most important and potential new seafood markets for the Norwegian industry. These studies provide insights about the consumers preferences, attitudes and choices towards Norwegian seafood consumption. By using consumer insight data, the users are able to differentiate between country, age, social status and so on. The users are able to analyze and find out who the seafood consumers are in different markets, and thus develop products and target their marketing of seafood products towards the consumer's needs.

DATA PREPARATION

We receive data in many different formats by email. The files are automatically read by our email server and saved through algorithms and read into the staging area as SAS-tables and loaded into the data warehouse. An automatic quality check of the data is conducted and a report is sent if errors are found. The data is accessible for the users as soon as the data preparation is completed. Trade statistics is updated on a weekly and monthly basis, consumption data is updated monthly, while consumer insight data is updated every year with the latest survey results.
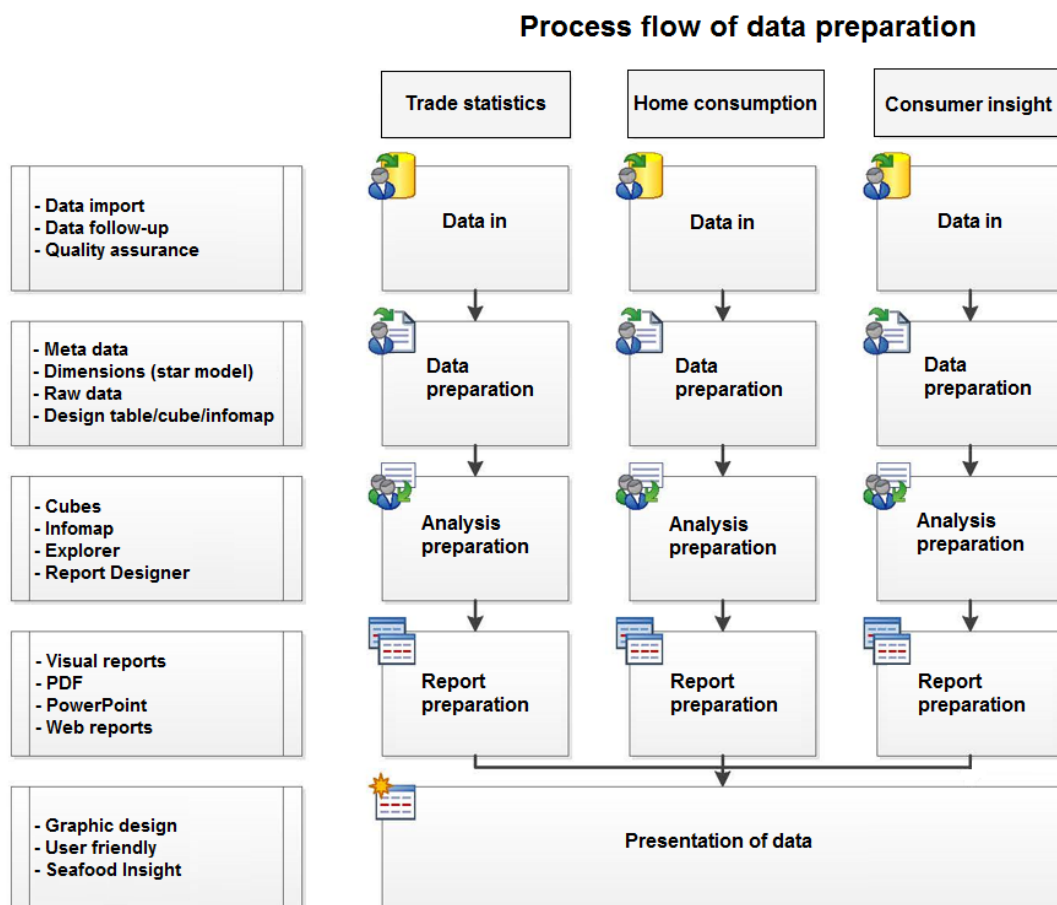
Process flow of data preparation

Trade statistics	Home consumption	Consumer insight

- Data import - Data follow-up - Quality assurance	Data in	Data in	Data in
- Meta data - Dimensions (star model) - Raw data - Design table/cube/infomap	Data preparation	Data preparation	Data preparation
- Cubes - Infomap - Explorer - Report Designer	Analysis preparation	Analysis preparation	Analysis preparation
- Visual reports - PDF - PowerPoint - Web reports	Report preparation	Report preparation	Report preparation
- Graphic design - User friendly - Seafood Insight	Presentation of data		

Figure 4. Process flow

DESIGNING REPORTS

After the necessary data preparation is done, the reports are carefully planned and designed according to topic. A basic report theme has been designed, so that the framework is similar across reports.

Following the main sections Key Statistics and Advanced Insight, the data sources described above are a good starting point for a further categorization of reports. But each data source can be looked at from several different angles, and one of our main challenges has been to cover the full scope of each data source, without the users getting lost in the amount of data. Therefore we have further divided the reports into sub categories, depending on the topic. Trade statistics for example, is divided into species-specific reports, since many companies work only with one or two main species of seafood. Another angle is division by country, therefore we have made reports by country, including all available data on an overall level. Where possible, the reports follow an industry standard, so that the users may find familiar elements.

One of our biggest challenges has been to provide reports for both the advanced and less advanced user using an unfamiliar tool for most. Since the main part of our users are located across Norway, the reports must be simple enough to be used without much prior knowledge or training. The range of users varies from CEOs, controllers and analysts to government representatives, therefore one report does not suit every occasion or user.

When we started the project about two and a half years ago, we started off small, only covering a few basic reports. But as the amount of data is growing, and the amount of reports is getting more extensive, it is important not to make new reports without careful consideration; What is the purpose of the report? What are the needs of insight? Which users are interested in this report? Do we already cover some of these topics in other reports? As described above, the reports have to cover a vast amount of different data from different angles, and at the same time serve a number of different types of users. If the users cannot find what they are looking for in an efficient manner, it benefits neither them or us.
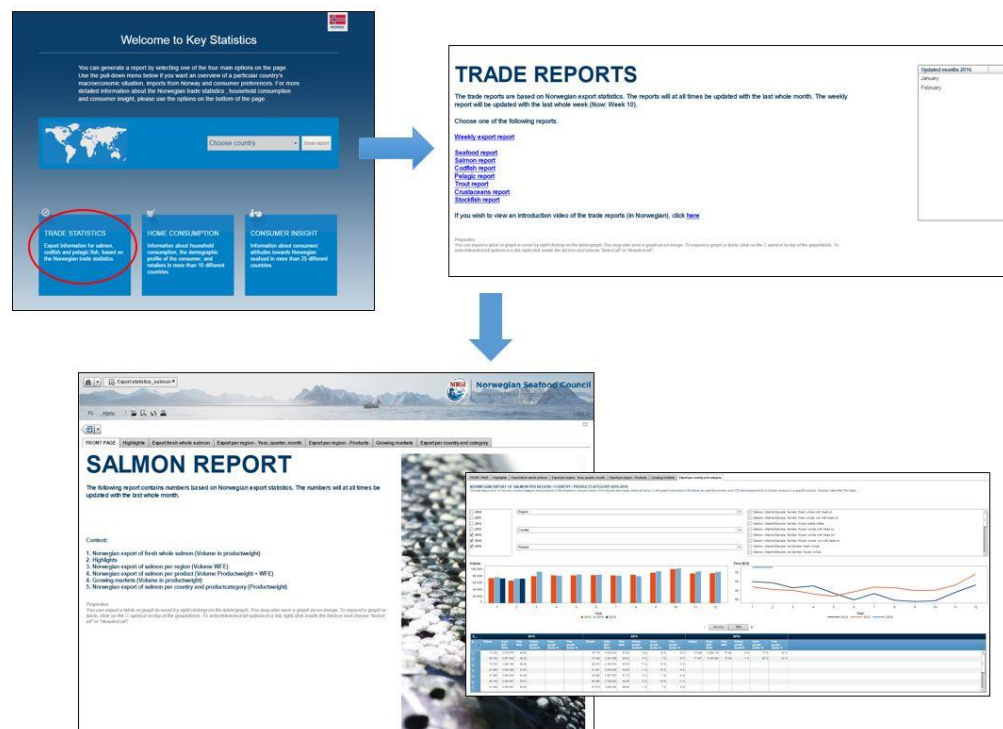

Figure 5. Report structure

IMPROVING THE USER EXPERIENCE

For users within our company, we are able to offer help whenever needed, but to serve the users within the vast number of other companies, we offer training and presentations of Seafood Insight either online or by simply visiting the companies in Norway or abroad. Our aim is not only to offer Seafood Insight as a service to all companies within the Norwegian seafood industry, but also to make them comfortable using the data. We continuously develop new and better reports based on the direct feedback from the users. The Administrative overview- report available in SAS Visual Analytics also helps us map the usage of reports in Seafood Insight, and enables us to make better decisions as we work forward to further develop the platform.
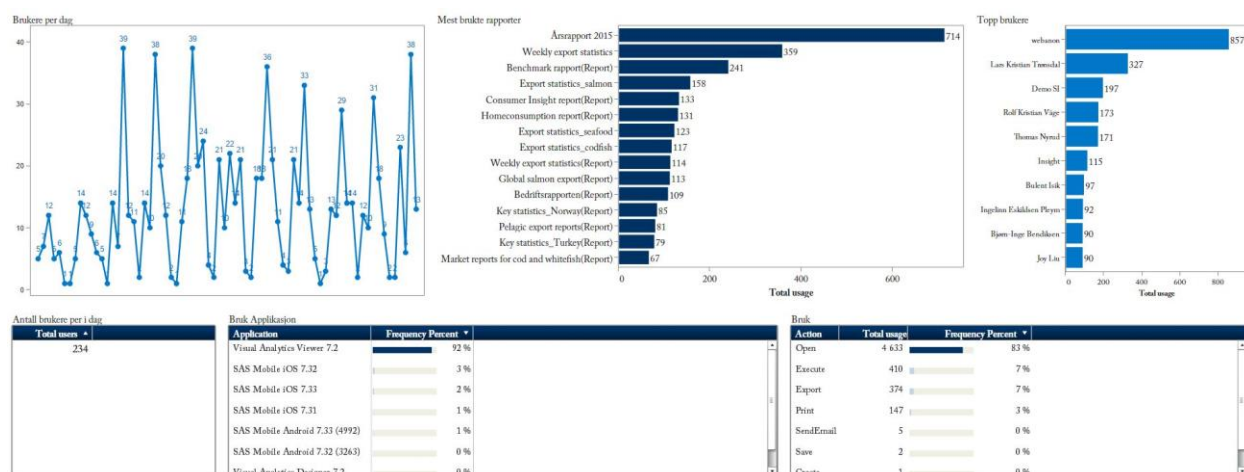
Figure 6. Administrative overview

Due to the vast amount of reports we are planning to make a search function available. But since we are using SAS Information Delivery Portal, this has not been straight forward and is thus not finalized. We also need to make use of the alert function in the reports. But due to the large amount of users, the need for alerts varies from user to user.

Downtime is never good for a website of any kind, and we have solved this by having an automated email delivered to one of the developers if the system is down.

TECHNICAL ISSUES

We have come a long way, but the process of delivering the best seafood insight is still work in progress. The view of how a report should look like changes along the way, and as new and better features in SAS Visual Analytics become available, we continuously work with developing Seafood Insight. Along the way we have discovered a few technical issues, which still require some adjustments, before we are completely happy with the user experience.

As many users are familiar with PDF or Excel versions of data, it is important that the reports can be made available in these formats. SAS Visual Analytics provides functions both for printing reports to pdf and excel, but as the pdf-function does not work optimally, we cannot provide the best possible user experience for our users.

In addition we have some problems with sub-total measures working with consumer insight data. There is a need for an easy solution in SAS Visual Analytics Designer to create aggregated measures that makes it possible to present the needed sub totals in bar charts and tables. Today we need to create many sub-calculated measures and sub-aggregated measures to display the needed values in the one aggregated measure. This also affects the performance negatively.

We have too much data and need to upgrade our servers to increase the responsiveness. Our experience tells us that users do not wait longer than ten seconds for something to load. Long response time could decrease the use of Seafood Insight.

CONCLUSION

We have now worked with SAS Visual Analytics for about two and a half years, and as described in this paper, we are continuously working with developing our products, to make sure that the best seafood

insight gets out there. We have mentioned competitive advantages, understanding consumer behavior and making better marketing decisions as some of the advantages that Seafood Insight can give the Norwegian seafood industry. But there are many advantages within our department that are equally important to mention. Before SAS Visual Analytics, our department spent a vast amount of time preparing data for both internal and external customers. Extracting large Excel spreadsheets and making extensive PowerPoint presentations took a lot of our time. But as the users are now more self-sufficient, extracting, analyzing and using the data from SAS Visual Analytics, this gives us more time to help customers with their analysis, finding new and interesting markets, consumer trends and monitor the trade flows. Data has no value if not utilized to its full potential. We are far from done, and as we learn new tips and tricks about SAS Visual Analytics every day, teaching new users, and as SAS Visual Analytics is improving, we are certain that Seafood Insight will give us great value in the coming years.

CONTACT INFORMATION

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