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Contact details:	<p>BMT MARINE INFORMATION SYSTEMS LTD Grove House, 7 Ocean Way, Ocean Village, Southampton, Hampshire, SO14 3TJ. United Kingdom.</p> <p>Tel: +44 (0) 2380 232222 Fax: +44 (0) 2380 232891</p> <p>e-mail: mis@bmtmis.demon.co.uk Website: http://www.bmtmis.com</p>

	Name	Signature	Date
Author:	Paul Taylor		
Approved by:	Owen Harrop		

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Contributors

Company	Name
BMT	Paul Taylor
	Chris Rawlings
	Owen Harrop
CEDRE	Vincent Gouriou
	Karen Quintin
	Emmanuelle Poupon
	Sylvie Ravailleau
	Michel Girin
Netherlands Coastguard	Kees Koning
TXT	Matteo Villa
Met Office	Paul Lancaster
IMGW-OM	Wlodek Kryzminski
	Bogusz Piliczweski



Distribution List

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BMT	Paul Taylor	1
TXT	Matteo Villa	1
CEDRE	Vincent Gouriou	1
Met. Office	Paul Lancaster	1
IMGW-OM	Wlodek Kryzminski	1
NC	Kees Koning	1

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Table of Contents

1. INTRODUCTIONS.....	6
2. MET OFFICE REPORT.....	7
2.1. Exploitation Potential Assessments	7
2.1.1. Functionality Assessment	7
2.1.2. Business Assessment.....	7
2.2. Key Issues	8
2.3. Met Office Summary.....	9
3. CEDRE'S REPORT	10
3.1. Exploitation Potential Assessments	10
3.1.1. Functionality Assessment	10
3.1.2. Business Assessment.....	10
3.2. Key Issues	11
3.3. CEDRE's Summary.....	11
4. NETHERLANDS COASTGUARD'S REPORT.....	12
4.1. Exploitation Potential Assessments	12
4.1.1. Functionality Assessment	12
4.1.2. Business Assessment.....	12
4.2. Key Issues	12
4.3. NC's Summary	13
5. IMGW-OM'S REPORT	14
5.1. Exploitation Potential Assessments	14
5.1.1. Functionality Assessment	14
5.1.2. Business Assessment.....	14
5.2. Key Issues	15
5.3. IMGW-OM's Summary	15
6. TXT'S REPORT	16
6.1. Exploitation Potential Assessments	16
6.1.1. Functionality Assessment	16
6.1.2. Business Assessment.....	18
6.2. TXT's Summary.....	19
7. BMT'S REPORT	20
7.1. Exploitation Potential Assessments	20
7.1.1. Functionality Assessment	20
7.1.2. Business Assessment.....	22
7.2. Key Issues	23
7.3. BMT's Summary.....	23
8. CONCLUSIONS	24



Mermaid Exploitation Potential Assessment Report

1. INTRODUCTIONS

This document provides an assessment of the Exploitation Potential of the MERMAID prototype Data Broker that has been developed through the MERMAID Project. It is drawn from the honest and independent opinions of each of the 6 consortium partners. As the partners are from a wide cross-section of the community, and are naturally very different organisations, with different remits, agendas, domains and working practices, the opinions are unlikely to be identical.

The potential is assessed in both technological and business terms, and also considers more general aspects such as the benefit to the community.

Each partner was asked to provide their report, which were produced completely independently. These have been collated here, and the key points have been summarised in Section 8 - Conclusions.



2. MET OFFICE REPORT

This report provides an assessment of the Met Office's position on the future exploitation of the technology that has been developed by the Mermaid project. Assessment is provided both from a functionality and business perspective, in addition to a number of key issues that we feel will have a significant impact on service potential. A conclusion is also provided that summarises our current position.

2.1. Exploitation Potential Assessments

2.1.1. Functionality Assessment

The data provider testing phase of the Mermaid prototype revealed a number of issues that would need to be resolved if the service was to be launched commercially. One of the key areas will be the ease of use of the service, which would be enhanced by the availability of comprehensive help facilities.

The flexibility that Mermaid provides is very attractive from a data provider perspective. The purchasing of space on the Mermaid server itself is simple and allows an easy route for providers to offer their data services and perhaps test the benefits of the system. The setting up of remote hosting of data using the RDAE is more complex, but should not be beyond the reach of most companies once the bugs in the software have been resolved. The fact that we have tested remote access on Unix, Windows and Linux platforms, will give potential data providers a good start in setting themselves up.

The range of pricing and discount options available is an important feature of the site that will make it attractive to data providers. At the moment this seems to be quite a complex procedure, but could be made simpler when help features are available.

Although the option to be able to describe datasets in detail is welcome, it perhaps needs to be extended to allow them to be described in sufficient detail.

Overall, from a functionality point of view, it is felt that the system will be able to offer a range of options that will cater for most data providers needs.

2.1.2. Business Assessment

The Met Office already has a well established position in the marine market, targeting commercial and leisure users, plus organisations involved in emergency response, with a wide range of services through a number of media (web, mobile, fax etc).

In order to provide additional business benefit, Mermaid would need to either enhance the services we currently offer or open up new markets for us. In the marine market it is anticipated that the main use of Mermaid would be in



providing 'one stop shop' access to data important in an emergency response situation – in both real and simulated environments. It is felt that there is potential to generate additional business in these markets, specifically in the following segments:

- Offshore oil and gas
- National EEZ authorities
- Marine/Coastguard authorities
- Ports and harbours
- Shipping companies

The overall success of Mermaid will be determined by building a critical mass of users, which will be influenced by the range of appropriate data available through Mermaid and the ability to interact with the data to enable customers to make the appropriate decisions in an emergency response situation. The Met Office has an established business in the provision of GRIB data to other meteorological service providers, who understand and can interpret the format of the data. In order for end users to be able to use this data, they would either need to download a GRIB viewer application, or ideally to have this functionality built into third party models, such as those provided by BMT. These factors will strongly influence the success of a commercial Mermaid service.

Mermaid could be further exploited by moving into other market areas, and using the technology to provide other industries that require this type of online data brokerage system.

The costs involved in setting up and running a commercial Mermaid service are likely to be significant. These will include creating awareness and demand for Mermaid in the targeted communities, technical set up costs, and ongoing support and maintenance. The latter would be an important aspect of the service, as it will be relied upon to provide information in emergency situations.

Although the Met Office would probably make its data available through the Mermaid service if it was launched, at the current time it is felt that the major benefit from the project will be to use the range of technologies that have been developed to enhance our own services. It is unlikely that we would be interested in being involved in the commercial running of the service.

2.2. Key Issues

To summarise, we see the key remaining issues to be:

- Investment required to bring Mermaid service to market.
- Identification of key target markets and business model. How will Mermaid generate a return?
- Generation of awareness in key target markets, and recruitment of core of data providers.
- Availability of 3rd party models that can display and manipulate data.



- Setting up of a commercial entity to oversee the running of Mermaid.
- Update of system functionality and usability, including full end to end testing with end users and data providers.

2.3. Met Office Summary

It is the Met Office's view that the Mermaid project has developed a number of technologies and other deliverables that provide the potential to enhance the services we can provide to customers. Although the system requires a number of improvements to be made, the basic concept and approach appear to be sound.



3. CEDRE'S REPORT

3.1. Exploitation Potential Assessments

CEDRE participated in the Mermaid project as a provider of datasets, as well as a consumer. During the test plan, CEDRE had to test both elements of the site; registering datasets as a provider as well as the consumer connection on the Mermaid site.

3.1.1. Functionality Assessment

The tests allowed the developers to control and develop the functionality of Mermaid site and to improve a lot the user-friendliness following feedback from the testing partners. The tests focused on the register facilities, the browse catalogue and the purchased datasets. The tests by CEDRE were carried out by 3 persons.

BMT provided us with an evaluation report (document with a list of questions) to drive us step by step during the test plan. This evaluation report was developed through discussion amongst the consortium. Each tester had to complete this document to explain the problems that occurred.

The developers (BMT and TXT) reacted to feedback from us. The search Interface has improved a lot in a user-friendly way during the test phase. For example, this interface allows to the user to use a map to select the area where we want to purchase data, the criterions which allow to select dataset are very accurate. It is possible to make a “cross request”. The request system (and, or) is very useful too.

When have finish to fill the form, a page of results appear with the form of search to specify the selection of datasets. At the bottom of this page, there is a small description of the selected data (summary, the price, the rate).

When we click on a selected datasets, the site shows a complete description of the data with the metadata and a preview, it is very useful to choose the appropriate dataset.

Different supply medium (CD, mail, online, paper...) are available to purchase selected data. This system allows the providers to reach many consumers.

For an easy access to all the functionality of Mermaid site, there is a helpful guideline. It explains how to download datasets (as consumer, as provider).

3.1.2. Business Assessment

Mermaid project has greatly increased our consciousness of the potential, techniques and constraints related with the numerisation (digitization) and electronic distribution of environmental data, particularly as regards the subject of our part in Mermaid; the numerisation (digitization) and electronic



distribution of environmental information in the French Marine pollution response (Polmar) plans. Indeed, it is now accepted by all parties concerned in France that the appendices of future Polmar plans will be numerised (digitization) and put online through the Internet. This way, data will be available for French organisms, public and international community (subject to the agreement of the Prefects of the "départements"). The experience gained through Mermaid will be invaluable for us to assess the nature, difficulties and potentialities of the job, and to gear it toward the most adapted and most efficient approach.

While this will be implemented, would Mermaid be continued at completion of the present EU contract, CEDRE would be delighted to provide the operators of the Mermaid site with environmental data on the French marine pollution response plans, on a non-commercial basis : CEDRE would expect from that contribution to incite similar structures in other countries to contribute to the Mermaid service with equivalent information. This could contribute to the development of an international environmental data network for accidental marine pollution interest, to which CEDRE would expect, as a contributor in kind; to have a privileged access.

3.2. Key Issues

Suggestions to improve the testing phase :

- The date when the last update was made should appear on each Mermaid page with the aim of showing the site's evolution to the test team.
- The tests should have been carried out during the whole development of Mermaid system and not only at the end of the project. However, we realise that it was not possible to test the system until at least the core functionality had been developed, which was not due for completion until near the end of the project.

3.3. CEDRE's Summary

The Mermaid system seemed at our level to be extremely complex and excessively oriented toward the computer field. But we understood along the implementation of the project the rationale of that complexity and we became aware of the actual constraints and specificity of such a system as regards such examples as data organisation. We realised also, like the Netherlands Coastguard, that the Internet allowed over the 3 years of the Mermaid project, through other projects, access to more and more information (environmental data, satellite data, marine pollution data etc ...) which are within the terms of reference of Mermaid. We are unable to judge whether that evident multiplication of sources will be positive for the future of Mermaid (showing that the concept behind it had its merits) or negative for it (through increased competition), but right at that stage, having participated in Mermaid was positive for us, for the reasons given above and also because it allowed us to develop constructive relations with European partners we were not acquainted with and we will be motivated to work with in the future.

4. NETHERLANDS COASTGUARD'S REPORT

This report provides an assessment by the Netherlands Coastguard on the future exploitation of the technology that has been developed by the Mermaid project. Assessment is provided from a functionality perspective.

4.1. Exploitation Potential Assessments

4.1.1. Functionality Assessment

The consumer testing phase of the Mermaid prototype revealed a number of issues that would need to be resolved if the service was to be launched commercially. One of the key areas will be the ease of use of the Catalogue (search engine), which would be enhanced by on-line help facilities.

4.1.2. Business Assessment

Mermaid could become an important 'one stop shop' access to data in an emergency response situation – in both real and simulated environments. It could generate added value to the following segments:

- Offshore oil and gas
- Oil Pollution Control authorities
- Marine/Coastguard authorities
- Ports and harbours
- Shipping companies

The commercial success of Mermaid will be determined by acquiring sufficient data providers and the range of available data through Mermaid to enable customers to make the appropriate decisions in an emergency response situation. It can also serve as an important tool for third party models, such as those provided by BMT. These factors will strongly influence the success of a commercial Mermaid service.

To launch Mermaid commercially we feel that it is important that they also consider other market areas that require an on-line data brokerage system.

4.2. Key Issues

To summarise, we see the key remaining issues to be:

- Investment required to make Mermaid service commercially viable.
- Identification of key target markets and business model. This is important to determine if Mermaid can be made profitable.
- Recruitment of sufficient data providers with a wide variety of available data to broaden the potential market.
- Availability of 3rd party models that can display and manipulate data.
- Setting up of a commercial entity to oversee the running of Mermaid.
- Update of system functionality and usability.



4.3. NC's Summary

The Netherlands Coastguard is convinced that Mermaid can make a difference in the emergency response area. However the available data during the test period was more tailored to i.e. Oil Pollution Control authorities. We feel that the present layout of the Catalogue (search engine) contains too much scientific terminology for Coast Guard personnel. Our personnel are more specifically trained in SAR emergency response. During emergency response for i.e. Oil Pollution Control we make use of the specific knowledge of specialized authorities that will guide us in making the correct decisions. The usability of Mermaid for The Netherlands Coastguard is determined by the type of data available on Mermaid. During the test period the available data did not fall within the scope of relevant data for The Netherlands Coastguard, however it could become an important tool in the future provided Mermaid can and will be able to supply a wider range of data.



5. IMGW-OM'S REPORT

This report reflects the opinion of the partners involved in marine environment research mainly, however it is also the result of an attempt to assess the value for the hydrological and meteorological services of the Institute of Meteorology and Water Management of the broker concept on the basis of other experiences.

5.1. Exploitation Potential Assessments

5.1.1. Functionality Assessment

The ease of use is the crucial feature of each brokerage system. From the point of view of the customer (the client), the Broker side needs some improvements leading to the easier use of the service. The Mermaid Internet side should be further developed providing more intuitive and subsequent features at different levels of data searching and retrieving. The process of online purchasing is not easy enough so far since an FTP server is required for downloading the data. In our opinion the bought files should be accessible and ready for downloading from the Mermaid or a RDAE servers rather than sent to the user.

Another potential problem is the datasets preparation and description by the data providers. For instance, as a result of searching the data from the Baltic Sea we shouldn't find data from e.g. China Sea.

Safety is probably the most important condition of online transactions. Each Mermaid user has to be sure that his money is safe. For the commercial service it is necessary to utilise an external reliable credit card processing service. The consumer data cannot be stored on Mermaid.

In our opinion it also could be considered the extension of the service into the linkage to other existing networks of metadata basis established within other EU founded projects. At the moment Mermaid provides only the information on the resources of registered data providers, while there is great potential in any other data holders.

It seems to be worthy to investigate possibility to link Mermaid to external distributed data bases also, what could significantly extend the range of data to be sold, allowing the client to browse through the big data sets and selects what they need. This may include the use of SQL protocol, etc. As the result, the efforts necessary to prepare data sets by data provider could be less.

5.1.2. Business Assessment

The IMGW-OM has a wide number of external users of our services, among other daily forecasts, expertises, assessments, etc. In our daily practice most of the requests are processed manually and provided by post. Assuming



further development of the Internet exchange of information in countries, it may be foreseeable the existence of a big potential for such a service.

An advantage of Mermaid is that the purchase of data can be performed without a direct human assistance on the provider site and daily transfer of many even small data sets could give big income, however there is a need for extensive promotion of Mermaid. Establishing one commercial entity dealing with data purchase and transfer from different institutions should be advantageous in the comparison with the establishing such service separately by data providers.

5.2. Key Issues

- General improvement of the Mermaid site, i.e. the system functionality and usability
- The Improvement of security features
- The improvement of the data transfer mean to the client
- Investigation of the number of institutions ready to register at the Mermaid site before the finalisation of commercial enterprise.

5.3. IMGW-OM's Summary

Due to fact that Polish regulations have changed in relation to data release at the moment, it is difficult to definitely state the Institute position in future commercial enterprise. It likely that the Institute could rather co-operate as registered data provider then partner in the commercial enterprise. It has to be discussed further after the completion of the project.

Besides some weakness of the present service it seems to be very promising for further development especially for the benefit of the permanent clients which use the data on the emergency situation only, as it lets for automated data retrieval and charging for the transfer.



6. TXT'S REPORT

As the one of the two principle technology providers for the project, TXT e-Solutions is interested in a possible industrial exploitation of Mermaid. In particular, TXT is interested in joining a possible “Mermaid Business Entity” aimed at running a Mermaid Service over the Internet.

In such an Entity, TXT intends to continue with the same role which it had during the Mermaid Project, thus acting as technology provider. Therefore TXT's real possibilities for a future exploitation depend on the willingness of the other project partners, in particular of the ones that are more involved in the maritime data / application sectors.

In addition, there are some issues that should be addressed by the future Entity before being able to run the service. In particular these are:

1. real market opportunities analysis
2. service cost/revenues analysis (business model definition)
3. technological steps to be undertaken in order to move from a prototype solution to an industrial implementation

Due to its core competencies, TXT will focus in this document on points 2 and 3. We believe that point 1 should be analysed by the partners directly involved in the maritime market.

6.1. Exploitation Potential Assessments

6.1.1. Functionality Assessment

During the 30 months in which the project has been developed, many functionalities have been analysed and most of them have been implemented. In particular, the process undertaken during the project considered both internal and external users.

Of course, a set of priorities has been set up, and all the most critical requirements have been implemented. During the last part of the project, the end-users testing helped to further improve the system and to fix those problems that usually appear when developing such a complex solution.

In particular, at the end of the testing, it is been possible to distinguish between:

- implementation errors: these errors have been fixed, as they were related to the implementation of the requirements that were agreed during the project
- new critical requirements: also these requirements have been implemented (i.e. HTTP download) even if not discussed or agreed before or even if at the beginning they were classified as “not so relevant”
- new not-critical requirements: the testing phase helped to reveal a set of new “nice to have” functionalities that are not critical to run the



Mermaid service, but that would be beneficial to have in case of an industrial exploitation, to attract new users and therefore to contribute to the success of the system

In addition, some other issues have not been considered during the research project because they were not relevant at all during the project, and therefore their impact on the project was only recently discussed. Such issues appear now very relevant in front of a real service open to the public.

These are:

- Datasets availability controls: before purchasing some dataset from Mermaid, more controls should be performed on the real availability of the products that the user is about to buy. This problem derives from the fact that datasets available in Mermaid catalogue can be located at the remote providers sites.
- Datasets Quality Assurance: this can be seen as a generalisation of the previous point. Even if available, the content of a dataset could not correspond to the description supplied by the provider to Mermaid (i.e. the area covered is not as big as claimed, the precision of the data is very poor, etc...)

During the research project the approach followed to address these two points has been that Mermaid acts as a brokerage service, and therefore can not be liable for any errors made by the providers. Even if formally correct, this approach could be very risky in case of a real execution of the service. In fact, users can lose confidence with the system if they know that there are not guarantees with what they buy and that every time some incoherencies are found they have to get in touch with the provider who caused the problem.

Some more flexible and effective solution should be found for this kind of problem.

- Integration with 3rd party credit card processing: during the research project, credit cards processing was just simulated as the real processing was out of scope, and a precise analysis was conducted on 3rd parties able to process credit cards and electronic transactions. Before enabling the service a specific party should be selected. The choice of course could depend on many criteria, such as cost of the transactions, reliability of the party, performances, new possibilities offered.
- New e-payment methods: a big constraint during the research project has been the fact that the only e-payment method universally accepted was the credit card. Many other e-payment forms are available but many of them depend on specific agreements with banks. As technology is evolving quickly, a state-of-the-art analysis on e-payment solutions should be performed again and all viable payment possibilities should be seriously considered, in order to offer to end-users a service as flexible as possible



In addition, it should be considered how much the public's opinion towards e-payments and e-commerce has changed in the last months. Mermaid should seriously take into account these changes and try to capture users' confidence.

Finally, a further analysis of the features offered by the system, the ones classified as "nice to have" and new market needs (unknown at the moment by the consortium) should be performed, in order to be sure that what the service can offer corresponds to what the end-users need.

Of course, the analysis, as well as the implementation of the new requirements would require a certain amount of time and effort, which should also be taken into account

6.1.2. Business Assessment

From a technological point of view, some cost items have been identified. They are now listed with a brief analysis on how they could be managed:

- Third parties services for e-payments: there could be two different costs with them: a subscription cost and a transaction fee. Both of them could be charged to Mermaid or directly to end-users
- Mermaid Site maintenance costs: this includes:
 - equipment costs
 - maintenance costs, like periodic backups, system upgrades, ...
 - power supply
 - other ancillary costs
- It should be analysed if it is more convenient to host the system ourselves, or to rely on a third-party web-hosting provider. The first option seems to be much better in order to let the Mermaid consortium follow the system evolution
- Service announcements: if the system wants to reach the big public, some periodic announcement campaign should be considered
- Licences: the system requires a certain core technology, as Microsoft Win2000 as Operative System and Microsoft CommerceServer 2000 as e-commerce engine

Now, some possible service revenues are considered:

- Transaction Fees: every time a user buys something from Mermaid, a transaction fee is issued
- Mermaid DataWarehouse space rent: if providers want to store their dataset on the Mermaid DataWarehouse, they have to pay for it. The cost of the space rented can be greater than the actual cost of the maintenance of the DataWarehouse
- Provider's Announcement: a solution could be investigated where providers can place announcements or advertisements on Mermaid site. However, this solution is not ready yet and was not considered during the project, but is a potential source of revenue.



Finally, it should be remarked a further exploitation possibility, which is the one called “Single provider portal”: The Mermaid system is naturally able to be configured as a portal for a single provider wishing to sell his maritime data on the Internet. This solution offers some benefits, such as:

- It solves all data QA and liabilities problems, because all data provided by the system would come from one single provider
- Mermaid could be sold to many providers, therefore generating a bigger revenue to the consortium
- Mermaid could be run in an ASP (Application Service Provider) like way, where the provider would pay for the hosting / maintenance of the system
- The provider would be free to select the e-payment processing 3rd party they prefer.

Obviously this approach is apparently against the Mermaid project strategy, aiming at developing a unique brokering service gathering data from different providers. However it should be stressed that a provider interested in a “Mermaid-like” portal, would probably not be interested in joining the Mermaid brokering service, and the fact that some providers choose the Mermaid single portal would not affect the Mermaid Service, because

- they would not participate to Mermaid in any case
- they would find another vendor offering them a similar solution

6.2. TXT’s Summary

As technology provider, TXT can see good possibilities for a real exploitation of the Mermaid service. Two main constraints have been identified that must first be addressed:

1. System technical / functional improvements
2. Other partners willingness to exploit the system



7. BMT'S REPORT

BMT's role in the project has been multi-faceted. As well as the overall management of the project, BMT were also one of the two principle technology providers for the project. In addition, BMT were both a provider and consumer of datasets, and naturally participated in all aspects of the testing phase. BMT were therefore heavily involved in all aspects of the project, including also the exploitation and business plan.

This report contains BMT's objective assessment of the exploitation potential of the system.

7.1. Exploitation Potential Assessments

7.1.1. Functionality Assessment

Through the 30 month development of the Mermaid system, and especially during the testing phase following constructive feedback from the testing partners, BMT see a great potential of the Mermaid System. In terms of functionality, these can be grouped as follows:

Flexibility

The greatest aspect of the whole system is its flexibility, despite the obvious limitations that have had to be implemented in such a system. The Data Broker is open to any data format, which gives it enormous scope, with the possibility of expanding into other domains. Data Providers can define a complex pricing structure that allows the provider to configure discount policies based on dataset size, on the potential use of the data, the type of consumer, or even by specific organisations. Datasets can be supplied on a range of media, decided by the provider, and shipped via a number of different mechanisms, which includes automatic transfer by either FTP, e-mail or HTTP download. This also allows for the brokerage of non-electronic data, such as paper charts, which can then be shipped by post or courier. The provider also has the option of storing their datasets either on the Mermaid Warehouse, or on their own local 'server'. The ancillary software required for this, the Remote Data Access Engine, is also platform-independent, and can run on MS Windows, UNIX / Linux Operating Systems.

Consumers also have flexibility in how they use the site. The search engine is very user-friendly, and allows the user to define the geographic region they are interested in by drawing on a map, or by simply typing in their co-ordinates. The user can also search via a number of selection criteria, and the Boolean logic that is employed (and / or options) gives increased flexibility.

Ease of Use

Even without the on-line help that will be incorporated, the site itself is very simple to use, despite the fact that it deals with a very complex problem. A data provider registers and describes their data, defines their pricing structure,



supply and shipping methods, and then uploads the datafile. Default information can be configured, and edited at any time, and new datasets can be added, and old ones deleted or edited at any time, free of charge.

A consumer will use the site to search for data that is required. There is no other purpose for a consumer other than to search for and then buy datasets. Therefore the consumer is first presented with a search interface, then the search results. From here the consumer can easily interrogate the metadata information, and then add the datasets to their basket. Finally payment is authorised and the transfer is initiated. Obviously more comprehensive on-line help is required, but this has already been partly addressed, and can easily be incorporated.

Expandability

Finally, the system can easily be expanded for use in other domains, initially within the maritime sector, but not limited to this field. The technologies employed, and the system design will allow the system to easily be configured for the brokerage of other types of data. The crucial aspect will be the metadata specification, as it is this that allows the effective search for datasets. The metadata structure and terminology will therefore require adequate research in order to expand the system into other domains. However, the Data Broker theory, together with the technology employed is obviously applicable in any brokering system. The dataset registration and cataloguing, dataset searching (including subset extraction), remote data access (to 'third-party' servers), e-commerce facilities, and data file transfer issues have all been resolved, and with only a few improvements in some places, these mechanisms have now been developed, and would be available for implementation in any other system.

From a functionality perspective therefore, it can be said that all of the original requirements established in the User Requirements Specification have been addressed. However, there is naturally some room for improvement in the way the system operates, and also during the project new requirements have emerged. The issues that will need addressing will be detailed in the Technical Implementation Plan, but are summarised as follows:

- Improve the usability of the site (on-line help etc.)
- Improve the layout of the site
- Improve the methods for inputting information
- Expand the metadata structure
- Expand the supported data formats for subset extraction
- Expand payment methodologies
- Improve Security



7.1.2. Business Assessment

BMT see the principle business potential of the Mermaid system as a true, on-line data broker, that facilitates the sale and distribution of datasets, while not replacing the existing traditional methods used. The idea of the site as a 'one-stop-shop' for data consumers, who can purchase data from multiple sources in one transaction was one of the underlying principals. In addition was the ability for the user to purchase only the data they require as a small subset from the much larger original dataset.

These fundamental requirements of the end-users have not changed during the development of the project, although there may now be increased competition from similar systems. Therefore the business opportunities original foreseen remain. However, the successful exploitation of such a system will depend on attracting enough data providers, and then ultimately adequate consumers to cover the costs of the establishing and maintaining the system. It was realised early on in the project that there would be substantial costs associated with the commercial exploitation of Mermaid, and that a Mermaid Business Entity would need to be established. The project has progressed throughout this research phase under the assumption that all exploitation issues would obviously be addressed by such an Entity, in order to allow the design and technological development of the system to progress without constraint (whilst bearing these issues in mind). The financial issues that must be considered are as follows:

- Technological improvements to the site
- Marketing of the system
- Establishing the system, including; Licence Fees, Hosting Fees,
- Maintaining the system

The Exploitation and Business Plan (D12.3) addresses these issues in more detail.

Therefore, a full market assessment and cost analysis must be undertaken by the Entity to ensure that the costs of launching such a system can be covered.

The other aspects that should be addressed before commercial exploitation are;

- Expansion of electronic payment methods – currently only (simulated) payment by credit card has been incorporated. This implies a serious restriction of the use of the system, and alternatives would need to be researched again.
- Quality Assurance of the datasets – all QA issues currently lie with the Data Provider, and liability lies with the Data Provider. Although Mermaid was developed as a pure 'Broker', in that it could and would not validate any datasets registered, this is a potential weakness of the site which should be reconsidered.

There are also other business opportunities that should be considered, in addition to the exploitation of Mermaid as it stands;

- Expanding the Broker system for use in other domains
- Tailored configuration of the search and e-commerce facilities for a single provider
- Exploitation of the component technological developments

7.2. Key Issues

Therefore, BMT see the key issues as follows:

- The system is extremely flexible and expandable
- The system is fundamentally complete in terms of core functionality
- The system will require refining before being ready for launch
- The payment methods should be expanded
- The liability / QA issues need resolving
- The establishment and running costs must be carefully analysed
- User-Critical Usability improvement

7.3. BMT's Summary

Therefore, BMT feel that there are functional aspects of the system that could lead to a variety of business potentials for exploiting the Mermaid system, but that a full marketing and cost analysis will need to be undertaken beforehand.



8. CONCLUSIONS

The key conclusion as taken from the consortium partners is that the fundamental principles behind the Mermaid project are sound, and that the system that has been developed meets all the basic requirements. The system is however not yet ready for commercial exploitation, but once the outstanding issues raised through the testing have been resolved, there is sufficient exploitation potential to consider this further. The main points raised are as follows:

- There is enormous potential of exploiting datasets on a national and international level through Mermaid
- The system is extremely flexible and expandable
- The system is fundamentally complete in terms of core functionality
- The system requires some final refinement and technological improvement
- There are liability and Q/A issues that should be resolved
- A commercial entity must be set up to oversee the running of Mermaid.
- There will be significant Investment required to bring the Mermaid service to market.
- Identification of key target markets, and a full business model analysis is essential