

*R-Bay
R-Bay; Creating an eMarketplace for the transfer of imaging related eHealth services in Europe.*

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Executive Summary

R-Bay aims to create a virtual and secure exchange for the provision and consumption of clinical eServices by developing a new working environment for professionals and teams, a shared workspace for virtual consultations and access to individual patient records. R-bay aims to build an eMarketplace to buy and sell remote reporting and second opinion services across borders. The eMarketplace is a broker taking care of the communications and data transfer in a secure and trusted way.

The added value in carrying out the work at a European level stems from the fact that some European countries have shortage and some surplus of radiological personnel and the need for this kind of an eMarketplace operating across national borders is evident. R-Bay provides benefits on the European level to citizens, professionals and the European healthcare IT industry.

In the first phase (market validation project) both public and private healthcare organisations from the EU member states are involved to validate the market through field trials. ***At a later stage*** other emerging countries will be included. When the validation is complete and the eMarketplace opened, in order to reach the maximum number of potential users (requesters and providers) in the identified countries, the project includes a detailed plan for cooperation and dissemination. The eConsultation portal will allow a market to develop where clients can browse through a virtual directory of providers and select the best match for their needs in terms of services offered, specialities covered (paediatric, cardiology etc), the level of expertise, availability and the price.

eTEN support will **diminish the risk** associated with this kind of a new approach in a multi-national setting. eTEN funding will also **give visibility** to the project and help in raising awareness of the available services. There are issues still to be resolved and barriers to be overcome, e.g. around security and privacy where local legislation is not fully developed. Investors cannot be expected to invest in this area till these issues are completely resolved.

Trans-European scope of the service

R-Bay aims to create a virtual and secure exchange for the provision and consumption of clinical eServices by developing a new working environment for professionals and teams, a shared workspace for virtual consultations and access to individual patient records. R-Bay aims to build an eMarketplace to buy and sell remote reporting and second opinion services across borders. We aim to connect 1) healthcare delivery entities (public or private) which have the need to buy imaging related services and 2) private reporting companies or public healthcare delivery entities which have the capacity to deliver these services. The eMarketplace is a broker taking care of the communications and data transfer in a secure and trusted way. R-Bay provides benefits on the European level to citizens, professionals and the European healthcare IT industry.

R-Bay unique value proposition

The eMarketplace has to offer added value for the already established point-to-point teleradiology links in order to attract them under the R-Bay umbrella. The added value has to be clear for both the customers and providers of the imaging related services. These existing teleradiological links is our target number 1 –both on the provider and customer side.

The added value for the customer side:

- opens up the whole market with more choices
- makes it possible to compare prices and take the best price available
- makes it possible to compare availabilities and response times for the reports
- makes it possible to select sub-specialists from a wider pool
- makes it easier to integrate the customer and provider systems
- the eMarketplace is taking care of the security and privacy issues
- it is possible to get the reports with your native language even in an international reporting environment; R-Bay multilingual structured reporting tool covering most of the anatomical regions
- the eMarketplace is taking care of the contracts, payments, etc.
- the eMarketplace is taking care of the quality assurance and certifications
- 24/7 cover through multiple providers
- Provides access to low-cost short or long time storage
- pay as you go –service particularly good for smaller volume end-users

The added value for the provider side:

- opens up the whole customer market
- makes it possible to compete with lower prices

- makes it possible to build other competitive advantages like sub-expertise, availability, correctness of the reports etc.
- makes it easier to integrate the customer and provider systems
- the eMarketplace is taking care of the security and privacy issues
- it is possible to give the reports with your native language even for foreign customers; R-Bay multilingual structured reporting tool covering most of the anatomical regions
- the eMarketplace is taking care of the contracts, payments, etc.
- you can show proven quality via the established quality assurance scheme (transparency of the results)
- back-up in case of illness, vacation etc

We have identified the characteristics of the potential customer and analysed the market in chosen countries in order to estimate the market potential. We have especially focused on the type one customers (customers with a resource problem) because this represents most of the reachable volume. We have estimated the maximum teleradiological reporting volume in the country based on the number of examinations produced and the truly available and needed number of radiologists in order to report them all. This is the target volume for R-Bay. However, in the coming two years we aim at getting 5 % of this target.

We have identified the existing reporting companies – both local and European level – which could potentially join the R-Bay eMarketplace. Marketing of the R-Bay concept will most probably accelerate forming of similar companies or establishing reporting via public healthcare delivery entities.

Besides the need for the service there are multiple ‘enablers’ that can make a particular market more favourable and suitable for R-Bay services.

- National eHealth programmes according to the EU eHealth initiative and action plan
- National infrastructures for image archiving or even more preferably for all medical data (general purpose archiving)
- Increasing private sector activity and capacity in both reporting and imaging examinations in conventional and advanced radiology
- High deployment of PACS on the local level
- Adoption of international standards and IHE standard profiles for document sharing, especially XDS (cross-enterprise document sharing) and XDS-I (sharing of images)
- Adoption of streaming technology to improve security and enable usage of low-bandwidth networks
- Adoption of the ASP (application service provider) model for purchasing

R-Bay contributes to greater benefits for all **European citizens**, by enabling:

- Provision of new types of services (eServices).
- Access to available expertise and the effective management of knowledge.
- Reducing of waiting times for imaging-related reports i.e. improving the reporting turnaround time.
- Reducing the costs for imaging-related reporting.
- Reducing delays in diagnostic services. This makes it possible to reduce delays in treatment - delays that potentially could have an adverse impact on the quality of life as well as on the health of the patient.

R-Bay also contributes to greater benefits for all **European healthcare professionals**, by enabling networking of expertise in three scenarios:

- Outsourcing reporting and/or processing of the images
- Consultations or second opinions
 - reaching out to another more experienced expert for advice or confirmation of a specific problem while still retaining the responsibility of the task
- eTeams
 - when carrying out of a task needs a multitude of skills of experts in complementary roles.
 - networking for the purposes of acting both as ad-hoc and permanent teams of professionals in the management of complex illnesses and disorders.

R-Bay supports the networking of expertise by using *multilingual structured reporting templates*. This way the professionals can use their own native language in collaborating across borders.

R-Bay also provides such services across regional and national boundaries, thus reducing the fragmentation of the relevant European IT market; hence also providing international leadership of **European Industry**.

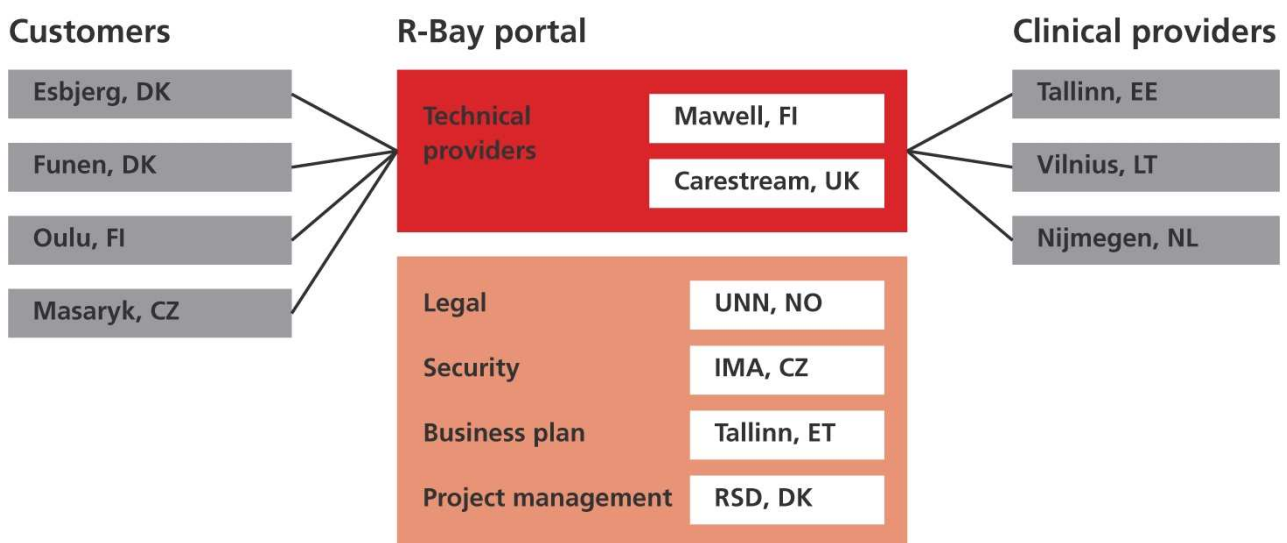
Project phases

The added value in carrying out the work at a European level stems from the fact that some European countries have shortage and some surplus of radiological personnel and the need for this kind of an eMarketplace operating across national borders is evident. The number of radiologists currently working in the European countries is between 60 and 250 per one million inhabitants. Healthcare delivery entities in countries with low number of radiologists (shortage of radiologists) are potential clients for our service (e.g. UK and Holland).

The required figure for radiologists per one million inhabitants is at minimum **100** and the radiologists report on average **10 000** examinations per year. Also rural (less populated) areas in countries with high number of radiologists can have a need for remote eInterpretation (e.g. the Lappish area in Finland or Estonia). This means that the resource problem varies country by country and even region by region. **Countries over 100** radiologists per one million inhabitants

include Czech Republic, Estonia, France, Austria, Germany, Norway, Sweden, Finland, Iceland, Spain, Belgium and Luxembourg. **Countries less than 80** radiologists per one million inhabitants, on the other hand, include Poland, Denmark, UK, Bulgaria, Switzerland, Portugal and Holland. As an example there are more than twice as many radiologists per one million inhabitants in Estonia than in Denmark and more than four times as many as in UK.

In the first phase (market validation project) both public and private healthcare organisations from the EU member states are involved. Below illustration provides an overview of the consortium roles. On the left side, the customers of the service are shown and at the right the clinical providers. In the middle, the R-Bay portal is surrounded by the organisation in charge of the legal and security issues (above), the technical providers (below) and the at the bottom the project management and business plan responsible.



These countries were selected, because:

- In Denmark (Sydvestjysk and Funen) and Finland (Oulu) there is a shortage of radiological personnel and in the Czech Republic (Masaryk) there is a shortage of sub-specialist expertise. These countries act as customers for the service.
 - An example is Oulu University Central Hospital (Finland) which belongs to so called RATU area consisting of 5 hospital districts. The RATU area has used a consultation portal in the clinical practise over 8 months now – reporting examinations across organizations inside their own area. There are over 1200 consultations per month performed by the Oulu University Central Hospital, for instance.
- The University Medical Centre Nijmegen (Nijmegen) is a famous teaching hospital in the Netherlands and Professor Hans Blickman has been setting up remote reporting across

national borders earlier as a chairman of the medical advisory board of Eurad, a commercial company in this field. Nijmegen is also specialized in complex image processing tasks as 3D, fusion and segmentation. (Clinical provider of the service)

- East-Tallinn Central Hospital (Tallinn) has an interest for extra reporting work across borders and has already on-going activities. E.g. there is a contract between Denmark (Funen) and East-Tallinn for certain types of reporting work already. Some of the Estonian doctors have also been working physically in Oulu to build trust and learn the clinical practise. (Clinical provider of the service)
- Vilnius University Hospital (Vilnius) – in the same way as East-Tallinn Central Hospital – has ongoing cross-border cooperation with Funen Hospital in Denmark. (Clinical provider of the service)

At a later stage other emerging countries will be included. When the validation is complete and the eMarketplace opened, in order to reach the maximum number of potential users (requesters and providers) in the identified countries, the project includes a detailed plan for cooperation and dissemination. Commercial teleradiology companies will also be contacted – some initial contacts have already now been established (Eurad Consult, Barcelona Telemedicine Clinic, eScanrad).

The eConsultation portal will allow a market to develop where clients can browse through a virtual directory of providers and select the best match for their needs in terms of services offered, specialities covered (paediatric, cardiology etc), the level of expertise, availability and the price.

The manager of the eMarketplace – Mawell - is a leading healthcare service operator in Finland and in the Baltic region. Mawell is running Finland's second biggest medical data archive (data centre) in Northern part of Finland. The area covers approximately 800 000 inhabitants. Mawell is a so called Managed Service partner to the regional healthcare organisations, which are the 5 hospital districts. The role of the Managed Service partner is to maintain and guarantee an agreed service level for the data archiving and data provisioning. As a company Mawell is committed to European wide distribution and is willing to resource and finance its operations. This year CapMan invested about 8 million euros to the company. In this European level exercise Mawell does not work alone, but a part of the company's strategy is to involve trusted partners such as Carestream, Sun Microsystems, WM-Data, IBM etc. Mawell's management team has experience of international business activities for more than 50 man years.

Justification for the EC funding

The needs and trends in healthcare delivery in Europe indicate that today the cross-border provision and consumption of eHealth services through electronic marketplaces appears a cost-beneficial proposition and in some settings possibly the only realistic proposition in meeting the demands. At the same time as healthcare organisations transform in adapting to the required new working models, obstacles and difficulties will be met. R-Bay can therefore be seen as the process of analysing, and assisting healthcare delivery entities in their business transformation enabled by the R-Bay technologies and service offering.

The barriers or issues to be resolved include pricing, lack of security services for cross-border communication, other data privacy and security issues, legal and contractual issues, lack of harmonised European legal framework, building of trust across borders, many different insurance models; lack of common protocols, guidelines and terminology; extension to multiple languages, networking, interoperability, providing of relevant priors and other patient data, motivation of existing commercial teleradiology companies, cultural differences, lack of common accepted clinical procedures, lack of agreement on division of costs and organizational change management. The risk to fail is high, but on the other hand the market is clearly moving to this direction.

eTEN support will **diminish the risk** associated with this kind of a new approach in a multi-national setting. eTEN funding will also **give visibility** to the project and help in raising awareness of the available services. There are issues still to be resolved, e.g. around security and privacy where local legislation is not fully developed. Investors cannot be expected to invest in this area till these issues are completely resolved.

Biography and References

- I. R-Bay Technical Annex version 4