

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

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<b>Author(s):</b>	Claus Duedal Pedersen, Janne Rasmussen, Charlotte Beck (RSD)
<b>Partner(s) contributing:</b>	All

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### **Project Co-ordinator**

*Company name:* Region Syddanmark (RSD)  
*Name of representative:* Claus Duedal Pedersen  
*Address:* Rugaardsvej 15, 2  
5000 Odense C, Denmark  
*Phone number:* +45 65 43 20 30  
*Fax number:* +45 65 43 20 50  
*E-mail:* cdp@medcom.dk  
*Project WEB site address:* [www.r-bay.org](http://www.r-bay.org)

# 1. Project summary

R-Bay aims to create a virtual and secure exchange for the provision and consumption of radiology services. The new working environment for health professionals uses interoperable, secure and trusted Internet technologies to move all media and data types. R-Bay modifies healthcare working environments in Europe by making available specialist capacity, and generating new business models and business streams.

The R-Bay consists of a group of healthcare provider organisations, healthcare authorities, healthcare industry, security and legal specialists, and academic institutions:

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- Region of Southern Denmark (project co-ordinator and field trial site)
  - Carestream Health, UK (technology provider)
  - Mawell, Finland (technology provider)
  - East-Tallinn Central Hospital, Estonia (healthcare provider and field trial site)
  - Vilnius University Hospital (healthcare provider and field trial site)
  - Radboud University Nijmegen Medical Centre, Holland (healthcare provider and field trial site)
  - Masaryk Memorial Cancer Institute, Czech Republic (healthcare provider and field trial site)
  - Oulu University Hospital, Finland (healthcare provider and field trial site)
  - IMA, Czech Republic (security expert)
  - University Hospital North Norway (legal expert and academic research institution)

The reality in Europe today is that some regions and countries experience a shortage of radiologists while others have a surplus. The market potential investigation in R-Bay, demonstrated that there is among the partner countries + UK are large difference in the radiology specialist per capita ratio (see section 2.1.2) which demonstrates that there are clear opportunities on a pan-European scale.

The main assumption on which R-Bay builds is that this inequality can be levelled out by means of teleradiology. Traditional teleradiology uses point-to-point connections between clients and providers. It is a well-established service and used throughout Europe and other continents but the set-up has some restrictions because the number of providers, and thus the type and availability of

expertise that can be accessed, is limited. The vision of R-Bay is to extend traditional eRadiology by creating an eMarketplace, a “many-to-many” connection, which will function as a commodity brokering and exchange of radiology services. The R-Bay portal itself does not deliver diagnostic reporting services, but will facilitate the viewing and consulting of images across organisations, regions or nations. On the eMarketplace, providers make their services available and the customers will buy the services via a trusted and secure network.

In order to achieve the above mentioned vision the R-Bay project established a portal that not only provides a technical infrastructure that manages the many-to-many access and image exchange, but that builds on a solid security background, legal investigation, a clinical real-life validation and market and business analysis. In the R-Bay project’s lifetime these things have been worked through and provide in its entirety a full set of knowledge and services that can now be brought and applied to the healthcare market.

### ***1.1 Project objectives and rational***

The goal of the R-Bay project is as stated above to establish an online eMarketplace within the field of radiology and to thereby pave the way for the creation of an internal market for exchanging imaging services which will lift the sharing of healthcare resources to a new dimension within a pan-European scope and consequently even out the radiological resources. This could mean equal access to optimal medical care for all patients in Europe. This would also achieve the objective of preventing the import of specialists that we are witnessing in the countries lacking specialist resources, where they attempt to solve it by attracting new employees from other countries. In Europe it is often the Western countries that are importing from the Eastern countries where the risk of brain drain becomes realistic. The problem of uneven distribution is then not solved on a European scale.

The objective of this project was then to validate the business case for an eMarketplace – a web-based portal with a radiology eService portfolio - which delivers imaging related services in a new and improved way. The validation is done through a market analysis and with the majority of partners functioning as a clinical test bed for portal functionality.

Ultimately, the final ambition is for the project and the portal to be successful and have the participating countries – whether they are service providers and customers - continue using R-Bay as the solution for teleradiology at local, regional and national level and dealing with other consortium members or external organisation that have been connected later on.

The objectives of the R-Bay can be summarised in:

- Modernise healthcare working environments in Europe by making specialist capacity more equally accessible
- Generate new business models and business streams for health services
- Prevent brain drain from countries with a surplus of radiologists
- Perform the market validation of the R-Bay portal
- Obtain positive results and pave the way for normal operation and further deployment

## **1.2 Main achievements**

This section will outline the main aspects of the market validation in the project and its results and conclusions in terms of whether the project managed to achieve the results planned and reach its objectives.

### **Market validation**

R-Bay has carried out a market validation exercise based on field trials, legal and security aspects, technology, and market analysis (business plan). But the market validation performed in R-Bay has not limited itself to the direct results of field trials and theoretical business plan, but has been extended to a variety of areas and stakeholders on the market. A variety of methods and processes for collecting feedback, market response etc. from the stake holders in order to test the R-Bay concept in a wider audience has been used.

The market validation has focused around the following sources of information, piloting, feedback and market analysis:

1. Clinical trials (field trials in the project)
2. Legal & security work (internal and external)
3. Commercial stakeholders like commercial reporting companies, health service providers, and technology providers
4. Demos at international congresses (live demos of the service product at relevant exhibitions such as ECR and RSNA)
5. Health authorities (national and international organisations)
6. National radiologist associations & European Society of Radiology

## Results

In relation to above market validation sources, the main results from each source are listed in the same order as above. These results are a summary of the experiences and knowledge from the market validation that has formed the business and deployment conclusions of the project which are explained later in the report.

1. From the clinical field trials whose purpose it was to assess the quality and sustainability of the R-Bay solution, it is clear that technology and trust are the main obstacles to cross-border services. Integration to existing local systems is a prerequisite for satisfactory workflow and lack of trust in foreign radiologists exists to the extent it influences possibilities for cross-border reporting.
2. A number of questions were raised in the discussions about legal and security issues:
  - a. Lack of a common European database for authorisation of radiologist
  - b. Identification management
  - c. Different interpretations of the EU legislation concerning recognition of clinical qualifications of foreign radiologist
  - d. EU Procurement rules
3. There was initially scepticism from the remote reporting companies as R-Bay was perceived as competition. But the R-Bay business idea is not to sell reporting services but rather image brokering services which they became aware of through consistent contact and meetings and eventually they came to understand the possibilities that the solution would provide them with as providers. However, there is still a concern about the consequences of the transparency that R-bay will give the market in terms of their prices and quality. Healthcare service providers found the service in line with their strategies as their niche is transversal activities and service provision, meaning they were interested in the brokering part.
4. The combination of theoretical and practical (live demonstration) presentation of R-Bay at market events gave a precise picture of the portal and the possibilities to the participants at these events. This gave a more positive feedback. The demos were very valuable in the sense that they provided access to all stakeholder groups and enabled direct feedback from them. It was also possible to use the demos as groundwork for generating future R-

Bay clients since the events were highly targeted at this particular segment of the market. The feedback from these events was a strong indicator that R-Bay had a niche product that suited the market but that it faced several barriers.

5. Among the healthcare authorities there was a general interest and understanding of the need in the market and hence the opportunities in R-Bay. From this source it was also pointed out that the need for resource distribution was greater in regional and national environments than for cross-border services. Among the healthcare authorities special attention was given to the procurement situation which could pose a large problem.
6. The clinical societies, especially European Society of Radiology (ESR), have been rather sceptic of R-Bay because they feared if quality assurance, security and identification management could be managed appropriately in a pan-European setting. As the legal information also points out the problem in this regards is a genuine problem across Europe.

## Results obtained versus results planned

The first result of the project was to complete the validation of a business case for a radiology eService portal. Despite of delays and obstacles along the way this was achieved. Through market analysis and research, business calculations, security and legal research, and the practical use of the system through field trials the project has validated the R-Bay portal and business concept.

As stated in the beginning of this report the objective of the project was to create ***an internal market for exchanging imaging services which will lift the sharing of healthcare resources to a new dimension within a pan-European scope and consequently even out the radiological resources***. The plan was to deploy this via an established R-Bay company. The project must conclude after the market validation that this was not possible. In its total form the objective was not achieved. From the market validation we learned that the market was still somewhat way from a *pan-European service scope and a business plan for an R-Bay company is not sustainable at present time*.

Nevertheless, the objective was in parts achieved. R-Bay *does work as an internal market* – only the scope of the market is not as wide - pan-European - as expected. But the infrastructure and the brokering service incl. eContracts, eBilling and Identification Management works well for exchanging images with external organisations and is easily managed. It can be used as a solution

for managing the market in a smaller environment, e.g. regional or national. From the experiences gathered in the project, it was demonstrated that the portal can improve flexibility and access to expert competence or extra capacity because it makes it possible to easily deal with multiple providers/customers. Consequently, R-Bay can be a way to *lift the sharing of resources* and even out radiological resources – but again initially in a defined environment like e.g. Estonia which is clarified in section 2.1 on the business aspects.

R-Bay also achieved to validate the business concepts on which it builds against the market stakeholders and following objectives were verified:

- ✓ R-Bay enables a modernised working environment in the healthcare sector. As the R-Bay portal is web-based, the users are not limited to a specific location or specific system. This is more in line with work processes as they are developing at present time and as they are expected to be in the future - the change in work culture that is happening in the radiological community moves from fixed employment to consultancy based work. Therefore flexibility – in time and place – is important and R-Bay enables that.
- ✓ R-Bay demonstrates that an 'eCollaboration' application for health services can generate new business streams and a new business model. The portal enables the transformation from point-to-point teleradiology to freer market conditions.
- ✓ R-Bay brings added value for existing teleradiology. R-Bay can make it easier, safer and more flexible to use teleradiology because apart from the one connection reporting service (e.g. first reading, second opinion etc.) the brokering function enables online contracts, billing system and security system which adds unique value to the service.

## **Project impact on the market**

An establishment of an R-Bay portal could dramatically change the market for radiology services both in hospitals and in the relation between hospitals and private providers of teleradiology services. This will be the consequence wherever it is implemented as a regional, national or cross-border service. The R-Bay service will have an impact for a number of stakeholders on the market, hospital managers, private telemedicine providers, radiologist and IT-companies.

### Hospitals and hospitals managers

The R-Bay service will give hospital managers the opportunity to get access to a flexible and

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transparent pool of resources. The R-Bay marketplace will give the hospitals' managers a new set of tools in their planning of capacity, outsourcing and employment. It will change the access to specialised competences and to “mass production” off simple radiology reporting.

#### Private teleradiology companies

For the private teleradiology companies the R-Bay solution will mean a change in transparency of their service, quality and prices. It will probably mean that the competition between the companies will be harder but it will also give them access to new and open markets. If the solution is implemented in a cross-border setting it will truly create the first functional internal market for healthcare service in the EU.

#### Radiologists

For the specialists at the hospital it means that they can both send out work that they do not have time or qualification to do and at the same time act as providers if they have spare time or special qualifications. So the solution will on one side put pressure on their “monopoly” of radiology services within the hospital and on the other side give them an opportunity for making more interesting work and be a provider of services.

#### IT companies

For the IT companies the R-Bay portal means that they will get access to a market for selling of online services.

## 2. Management aspects

### 2.1 Business issues

#### Key elements for the business plan

Healthcare institutions throughout the European Union have to solve the dilemma that there is an increasing demand for better healthcare on a shrinking budget. At the same time, the volume of diagnostic radiology procedures increases at an average annual rate 3.7%. On this basis, the R-Bay project intended to create an R-Bay company that would be an innovative and creative provider of service that offers unparalleled quality, service and value to healthcare providers. The R-Bay company's main service would be the brokering service which is unique in that it opens radiology providers and customers to an eMarketplace and connects them by providing standardized technical connection, eContract, eBilling and quality assurance - all which streamlines process and enables healthcare providers to contain costs. As explained the market validation showed that it was not sustainable to launch such a company after the project – the existing market conditions (legal aspects, security, clinical acceptance, etc.) are not there at this point.

Therefore the R-Bay business plan has two main sections - the first is a plan for the creation of an R-Bay company as if the market situation had been mature and ready. The second is the plan for the utilization of the knowledge, solutions and results created in the R-Bay project through a process that is build on a national/regional deployment of the R-Bay concept in different countries.

One part of the business plan lays out the plan for the formation of a new company, the R-Bay company, which will offer imaging services for its clients via the R-Bay portal all over Europe. The plan provides a detailed overview of how such a company could be established (organisational details); on which ground (business concept, industry analysis, products and services, target market, marketing and sales strategy etc.); and at which costs (financial calculations for the first 5 years of operation). It is not unlikely that the company will be established in some form in the future as the R-Bay service concept still very much is relevant and the direction the market is taking seems to indicate more favourable conditions for R-Bay.

The second part therefore focuses on a business scenario which at present stage can bring about a national and regional deployment. The majority of obstacles for a launch of an R-Bay company and pan-European service were related to cross-border issues. Consequently, a new and revised

model was worked out in which regional and national deployment is the primary target on specified markets and from which cross-border activities can be added.

Since it is not a core business or part of their corporate strategy, no partners will foresee the brokering functionality of R-Bay. Consequently, the consortium is negotiating with external companies in order to collaborate on this part. Alongside these negotiations, regional and national R-Bay business and deployment initiatives are still taking place.

## Key elements for the market plan

The market analysis shows a potential for customers and buyers of R-Bay in the analysed countries. These countries include Denmark, The UK, Holland, Finland, Estonia, Lithuania and the Czech Republic.

Based on the required figure for radiologists per one million inhabitants is set at a minimum of 100 our market analysis showed that Holland is lacking 640 radiologists, UK 1000 and Denmark 125; whereas Finland has a surplus of 200, Estonia 40, Lithuania 39 and Czech Republic 100.

R-Bay has chosen to focus on these markets for the following reasons:

- The collective market is well-proportioned in terms of customers and providers.
- All but UK being clinical partners in the project means hands-on knowledge and access to it.
- The UK market has the lowest level of radiologists and has very high reporting prices – making it ideal for an R-Bay solution.

As deployment plan below will show then all these markets apart from Holland are part of the regional and national R-Bay roll-out that has been initiated.

## Deployment

The deployment will be carried out by focusing on a regional or national solution in each country that has been identified as primary markets listed above and at the same time offering the technical, legal and organisational possibility to carry out cross-border services. Based on the experiences from the project and the market knowledge obtained, it is the plan to start of the R-Bay portal domestically in order to overcome organisational and cultural barriers. The plan is that from domestic experiences the cross-border activities can be initiated through:

- Native language of reporting radiologist or English where applicable

- The use of structural reporting and translational tools

Deployment in these markets will occur via two identified tracks – through an external service provider organisation and through own regional or national deployment initiatives. These tracks are closely connected and can and will in some cases take place in collaboration, but they are not necessarily dependent on each other. Consequently, deployment will take inhomogenously – at different times, in different ways and through different channels.

The first country that will achieve full-scale deployment of R-Bay will be Estonia. Due to the changed market and employment situation in Estonia, there is a need for teleradiology services in the country beside the fact that there is a capacity to provide cross-border services. Based on the results from R-Bay, an agreement between 25 healthcare organisations in Estonia has been established for setting up the service and it is expected to be fully operational by October this year. After implementing the R-Bay portal, there will e.g. be possibilities for doctors living and working in rural areas to work for the other hospitals in Estonia as well to provide cross-border services in cases of surplus capacity. Using the R-Bay portal there will be possibility for hospital managers to manage the service queues more flexible.

The deployment set-up demonstrated for Estonia can be transferred as a model for deployment in another country with national adaptation possible, but other alternative plans for deployment are also ongoing in the other markets.

## **2.2 eService issues**

### **The R-Bay Service**

The eServices in R-Bay consist of four services. The targeted service is an eMarketplace with a brokering facility. The concept validated, under real market conditions, is an eRadiology service portfolio, which delivers imaging related services in a new way. This offers access to the healthcare providers in the R-Bay project to a virtual and secure exchange for the provision and consumption of imaging services.

Four services are included in the overall R-Bay service. All 4 services are available through the portal, but they are not all provided automatically. Meaning that the user decides which services he needs in the given situation. The services eInterpretation and eArchiving are in the project provided in each case.

## eInterpretation

eInterpretation is the most important service of the eMarketplace. It contains two services: **Consultation** and **Second Opinion**. Both services are web-based, which facilitates remote consultations / readings of images as well as a second opinion service. This is enabled by the R-Bay eMarketplace and Portal, which can easily and securely manage buying and selling of consultations or second opinions between different organisations and units. The service has been designed mainly for radiologists in the R-Bay project but can be extended to other specialists.

eInterpretation is an important tool in increasing the productivity and improving the reporting turnaround time. Reducing delays in diagnostic services 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.

A number of elements are drivers for change, such as the shortage of radiologists/radiographers, low reimbursement rates by national health insurers, and the increasing part-time medical profession. Efficient workflow practices, long present in the business world, can be implemented and made 'profitable' in most of the medical world as well. The digital workplace knows no boundaries: remote reporting, out-of-hour coverage and the 'virtual' staff radiologist are all ways to offer imaging services in a non-traditional way. These developments need to be balanced against legal, quality control and insurance issues, as well as cultural, language and protocol differences between locales

## eProcessing

The eProcessing service covers both **processing** and **analysis** of images. This consists of tools for efficient 3D visualisation, segmentation and image fusion. The amount of information produced by the imaging devices is growing rapidly, and the quality of the images in terms of resolution and sensitivity has improved, so that information can be extracted from a non-invasive imaging study so as to virtually create an 'invasive' one.

Scientific evidence and clinical experience have proven that image processing and analysis give new information beneficial to the patient care, often saving other resources, e.g. the length of the surgical operation can be reduced as can the subsequent length of hospital stay.

With the aid of eProcessing, interpreting radiologists and referring physicians are better able to maximise information from CT and MRI exams and readily apply that knowledge to diagnosis, planning and treatment. Since 3D reduces the number of images by summarising cross-sectional

scans, studies are easier and faster to read, thus increasing clinical productivity.

eProcessing is service that can be purchased in itself by a customer but in R-Bay it is used as an added-on service which the customers purchase on top of the eInterpretation in order for the reporting professionals to have available as many details about the image as possible.

### **eArchiving**

A support service to eInterpretation is **eArchiving** which enables all users to access the appropriate images and any earlier studies that have been performed that could be relevant. The customer of the eMarketplace can use the eArchiving services just for the images to be interpreted / processed, or the eArchive can serve as a total storage solution for the customer site.

In order for all images (current and previous studies) and other data sets to be available to the provider and the client “on line” and on demand, and controlled by appropriate security and privacy standards, a data centre needs to be in place as the central archive for all users, together with the appropriate network connections so that the large amounts of data can be accessed from the dispersed users.

### **eTraining**

**eTraining** is a support service and will train clinical personnel in using the eInterpretation service. From the R-Bay Portal there will be access to a web site, where it will be possible to learn and be trained in the use of the eInterpretation service. This training is interactive, and the trainee works through a self-assessment process for each module.

eTraining is included in the R-Bay service because of the dispersed nature of the clients and providers, it is important to offer the most sophisticated training and support services.

## **Considerations on the eService solution**

### **User aspects**

The users are both organisations and people. The organisations are the individual hospitals in the different countries. These hospitals can be categorised as two different actors. There are those hospitals which are provider of the services and those who are customers of the services.

In terms of user aspects, then customers and providers have different jobs in the making of the

radiology services and which means there maybe different experiences, outcomes etc. of the R-bay service. Any differences may also be ascribed to the geographical location and have different languages and cultural settings. Will e.g. their opinions about the same system and incentives and motivation to use the system be the same or will it vary according to which side of the portal they belong to (customer/provider), the type of organisation and location?

R-Bay has assessed the eService solution – an online portal with brokering services for the exchange and management of radiological images – in terms of user aspects based on different parameters:

- Technology
- The clinical process
- User experiences
- Efficiency
- Acceptance
- Value of the services
- Organisation
- Sustainability and up-scaling of the services

Results of the user evaluation performed in R-Bay, it can be concluded that the technology is easy to use so the experiences are good and the solution accepted. It has great value for the organisation and can be up-scaled easily. But it is all rather dependent on a seamless workflow, meaning that an R-Bay portal should be fully integrated with hospital systems like hospital and radiology information systems etc. (HIS, RIS, etc.). If there is no integration and the system needs to be managed and used separately by the users it will loose main parts of its value and its sustainability.

### **Service provider aspects**

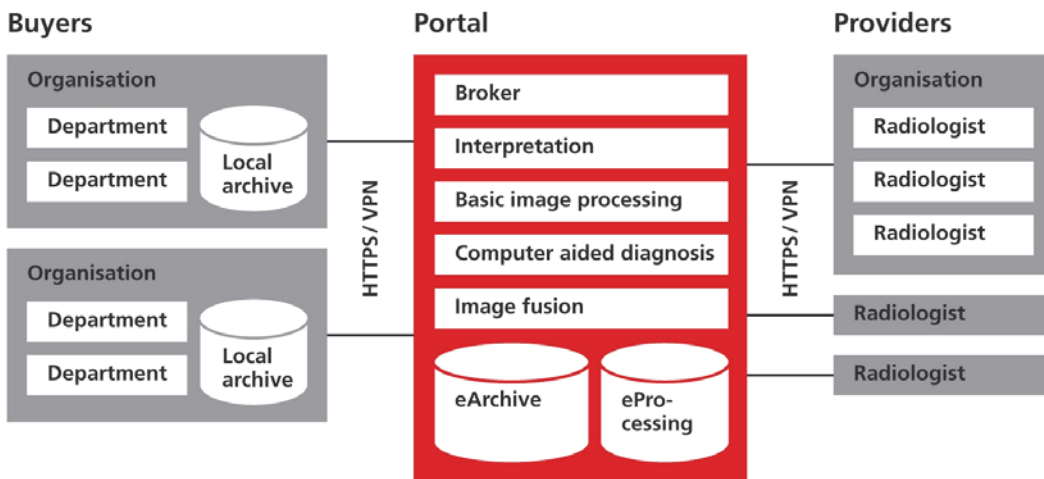
The service provider has during the project been the consortium but the service has been enabled through infrastructure provided by Mawell (consultation platform) and Carestream (processing, archive etc.). They have devoted a lot of attention and efforts towards setting up the clinical partners systems to enable the exchange and have throughout the project worked on adapting the solution as experiences and knowledge were gained.

From a future perspective, the R-Bay service provider was intended to be the R-Bay company which will deliver not only the infrastructure (supplied by e.g. Mawell and Carestream) but also manage and offer brokering services (support services, contracts, billing system, integration, support, etc.). Consequently, the project created a business plan for the establishment of such a company in terms of market strategy, financial resources, operations, etc. As a service provider the R-Bay company would specifically have to deal and decide on pricing structure (what fees and at what level); sales and marketing approach; and also technology and integration issues.

Since the conclusions of the project are that this is not a sustainable solution given the results of the market validation and have chosen to primarily focus on regional and national deployment, then a pan-European service provider is not required and the brokering part is managed in a local environment where the legal, clinical and organisational conditions are alike or very similar.

### 2.3 Technical issues

The architecture of the eMarketplace is shown below:



A secure service platform is established as the base for the exchange of the R-Bay Services. The platform hosts the required IT services that support the delivery and consumption of these. The system architecture represents the industry leading portal-based approach to providing the full range of imaging and information capabilities from a shared centralised service centre. Technical solution is based on Mawell eConsultation and enhanced by Carestream Health tools. This ensures the feeling of using single application.

The following represent the main building blocks of the eMarketplace: eInterpretation with an eConsultation portal (supplied by Mawell), eProcessing (supplied by CSH) eTraining (supplied by CSH and Mawell) and eArchiving (supplied by CSH).

Common features of the R-Bay marketplace include comprehensive tools for administration of the system, as well as different levels of administration and management of user roles and privileges, messaging between users and organisations, organisation or user specific reports, reports for billing and a localised user interface based on language and country of users or organisations.

## **Particular problems and solutions**

The technical implementation in R-Bay was mainly a generic solution for all pilot sites and the same services were provided to all partners: eInterpretation, eArchiving, eProcessing and eLearning.

However, some factors had an influence on the set-up of the technology and individual solutions were found. For instance, the implementation of eInterpretation had to be done differently according to whether same language was used in the pilot (e.g. English between RUNMC and MOU and Finnish between Estonia and Finland) or if a translation service was needed (RSD and ETCH+VULSK). Translation was in this case done through the Structured Reporting Tool (SRT) which is reporting templates with automated translation.

The requirements for adaptation to the R-Bay service are technologically simple but different from provider hospital to customer hospital. The hospitals providing radiology expertise did not need anything but an Internet access for the eInterpretation, eProcessing and eLearning service. For the hospitals creating requests and receiving reports, the requirements were higher as these hospitals' archive had to be DICOM (Digital Imaging and Communications in Medicine) compatible and also needed Virtual Private Network (VPN) connectivity to eArchive for secure image transferring.

The used R-Bay set-up was enough for market validation, but it has obvious limitations because it involves manual steps in the workflow which could be done automatically on system integrations, creating a seamless workflow.

## 3 Best Practice Aspects

### 3.1 Best Practice

The increased use of teleradiology nationally and internationally and the growth in companies living of selling remote reporting capacities that we are witnessing in these years are clear indicators of R-Bay's relevance and potential for the market.

The uptake of teleradiology and the ongoing changes has meant that large institutions like the clinical associations (European Society of Radiology, Radiological Society of North America) and national healthcare authorities in collaboration with national clinical boards (NHS UK and National Imaging Board) are producing reports, guidelines etc. on teleradiology.

The ESR states that they find teleradiology a valuable service but that it has limitations the proper provision of imaging services to the patients and therefore may pose a risk to the patient.

Therefore ESR has developed guidelines for teleradiology for the benefit of the patient (ref. ESR brochure 7). The guidelines concern issues relating to these overall guidelines:

1. **Clinical teleradiology should be an integrated medical service and not only an outsourcing reporting service** - Only fully qualified specialists clinical radiologists should perform teleradiology; and reporting radiologist must have proper knowledge of national language of the source country.
2. **Key management issues must be tackled** – the service must be organised properly between customer and provider
3. **Proper resource allocation should be made** – equipment is to be of sufficient standard for diagnostic quality; and security-privacy of transmitted data managed properly.
4. **Quality control of teleradiology services is required** – clinical audit procedures are required; and medico-legal and insurance cover must be clear for the service and the patient.

## Documentation of or references to best practice

ESR brochure 1 - Teleradiology

[http://www.myesr.org/html/img/pool/ESR\\_2006\\_I\\_Telerad\\_Web.pdf](http://www.myesr.org/html/img/pool/ESR_2006_I_Telerad_Web.pdf)

ESR brochure 7 - Teleradiology in the European Union - White Paper

[http://www.myesr.org/html/img/pool/ESR\\_2006\\_VII\\_Telerad\\_Summary\\_Web.pdf](http://www.myesr.org/html/img/pool/ESR_2006_VII_Telerad_Summary_Web.pdf)

National Imaging Board (UK) – The role of teleradiology in supporting the delivery of Diagnostic Imaging Services

[http://209.85.229.132/search?q=cache:fKCsJ7eFwxYJ:www.18weeks.nhs.uk/Asset.ashx%3Fpath%3D/Imaging/RoleofTeleradiology\\_131108.pdf+%22The+role+of+teleradiology+in+supporting+the+delivery+of+Diagnostic+Imaging+Services%22&cd=1&hl=da&ct=clnk&gl=dk](http://209.85.229.132/search?q=cache:fKCsJ7eFwxYJ:www.18weeks.nhs.uk/Asset.ashx%3Fpath%3D/Imaging/RoleofTeleradiology_131108.pdf+%22The+role+of+teleradiology+in+supporting+the+delivery+of+Diagnostic+Imaging+Services%22&cd=1&hl=da&ct=clnk&gl=dk)

## Barriers to good practice

Looking at the ESR guidelines for good teleradiology practise, R-Bay plans for regional and national deployment is much in line with the ESR Guidelines and Best Practise for teleradiology. Quality control, identification management, authorisation and accreditation systems is managed easily in a regional and national setting.

In terms of the pan-European service it would become more difficult to adhere to the Guidelines:

- No central European accreditation database of qualified radiologist makes complicates the accreditation process.
- Knowledge of national language of source country can be difficult in cross-border cases. Solution is to use same language e.g. English or translation tools (automated or interpretation).
- Control over what equipment and of which standard it is, is difficult in cases where images are being reported remotely as is the case in R-Bay.

### **3.2 Standards and standardisation**

The traditional healthcare systems are changing and a need and pressure to connect local and national systems and applications are emerging. Interoperability can create a unified and standardised environment for the connections and communication in and between these systems and applications. But in order to achieve this various connectivity and communication standards should be followed. A standard is an agreement among parties within an area of technology. Interoperability is the result of an agreement between or among systems to share information.

The whole workflow process in R-Bay uses well established standards with established standards – HL7 & DICOM V3.0 with web based tools to apply the facilitator concept for web sales for improved patient care across political and geographic boundaries.

#### **Impact on or references to standards**

Key standards for the R-Bay Projects are identified as:

- IHE – Integrating the Healthcare Enterprise: IHE is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. IHE promotes the coordinates use of established standards such as DICOM and HL7 to address specific clinical need in support of optimal patient care.
- DICOM: Digital Imaging and Communications in Medicine (DICOM) is a standard for handling, storing, printing, and transmitting information in medical imaging. It includes a file format definition and a network communication protocol.
- HL7 Messages: Health Level Seven (HL7)2 is an all-volunteer, not-for-profit organization involved in development of international healthcare standards

## 4 Dissemination activities

### 4.1 Purpose and objectives

Dissemination has throughout the project been a priority. Focus of it has been three-fold:

1. *General information to the public and healthcare market as a whole*
2. *Marketing – establishing business relationships with specific external companies (possible operators and portal users)*
3. *Cultural change - trying to change the mindset of the healthcare market, e.g. radiology communities*

The activities have reached the objectives of the project and have addressed and reached these three focus areas. Below we will describe through what means and with what outcomes this has been achieved. Emphasis is given to certain events which have had a major impact and directly contributed to the market validation exercise of the project. At the end of the chapter, lists of all details of the dissemination activities by category are provided.

### 4.2 Methods

The R-Bay consortium is a joining of key people from organisations and institutions involved in healthcare in some form. They come from:

- Healthcare provider organisations
- Healthcare authorities
- Healthcare industry
- Security and legal specialists
- Academic institutions

All partners have used available opportunities at conferences, exhibitions, meetings, etc. to promote R-Bay and to reach the audience at the event. Consequently, the dissemination of the project has been broad and reached a wide part of the healthcare market given the different background and core business of the partners as listed above.

The consortium has used a variety of traditional methods for reaching the audience:

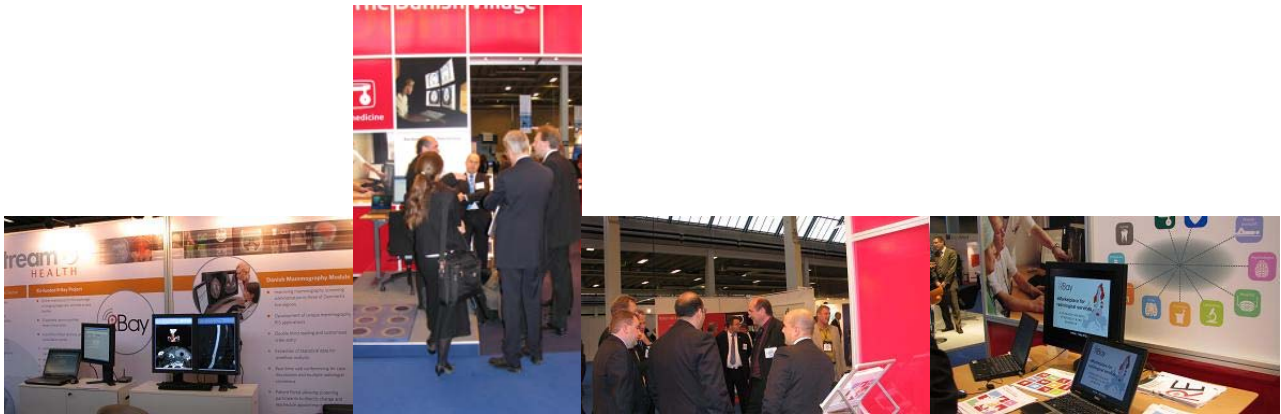
- **Conference presentations.** Presentations in session at different conferences have secured a broad knowledge of R-Bay in healthcare circles and have directly resulted in numerous organisations having approached R-Bay subsequently.
- **Demos at exhibitions.** This has been done several times at congresses specifically targeting the radiological healthcare community. R-Bay has had demos at World of Health IT (WoHIT), European Congress of Radiology (ECR), and Congress of Radiology Society of North America (RSNA). All demos had a massive turnout and resulted in many contacts to different audiences, especially potential portal users like remote reporting companies and radiologists, but certainly also radiological societies and service providers
- **Articles and interviews.** R-Bay consortium members have produced articles that have been published in a variety of healthcare and management journals and online magazines, among these are European Hospital, Public Service Review: Health, Imaging Management, eHealth News as well as national journals and websites.

### ***4.3 R-Bay Midterm workshop***

The midterm workshop was held in connection with the World of Health IT conference in Copenhagen on November 4-6 2008. Nature of the workshop was live demo sessions of R-Bay at the location of 'the Danish Village'. The reason for choosing this form for the midterm workshop was that we thought it would be the best possible way to reach the target groups which were:

- Clinical users
- Decision makers (e.g. hospital management)
- Future collaboration partners (e.g. potential user organisations and investors)

And we were right given the turnout and outcomes of the demo event. The demos had been announced by invitation and general information in advance at pre-scheduled times during the two-day exhibition. It turned out that so many participants were interested in the demos that they ran continuously throughout the days. Along with the demos meeting with companies that had approached us after the invitations to the demos were sent out was held. In that way we reached many interested health service provider and technology companies, healthcare authorities and providers etc. Meetings were for instance held with MedTel, Mediverkko, Medical Insight and Accenture.



#### **4.4. R-Bay Final Conference**

Purpose of the final conference was to use the opportunity for testing the R-Bay market validation experiences and decisions against external market experts and for exploring the possibility of a possible collaboration concerning further R-Bay deployment. Consequently the form chosen for the final conference was that of a business and investor meeting rather than having a traditional information purpose.

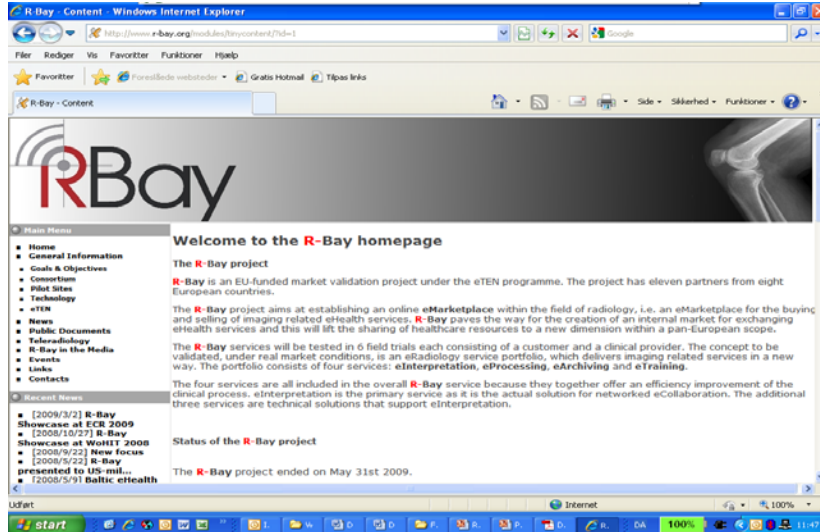
Two service provider organisations were invited to a meeting to discuss R-Bay and a possible collaboration. Both had been in regular contact with R-Bay and R-Bay partners for some time and had expressed serious interests in the project and the portal. The meetings were successful in the way that they have resulted in further meetings and more concrete discussions. It was also valuable to have direct market feedback on our own market validation results and outputs and helped in the planning of the subsequent deployment which was to be different from originally expected as explained earlier on the in report.

#### **4.5 Dissemination material**

*R-Bay logo*



R-Bay website



R-Bay brochure



**R-Bay: A European  
eMarketplace for  
radiological services**



## 5 Conclusions / lessons learned

This chapter will not sum up all the information above and repeat already stated issues, results and outcomes, plans etc., but rather its purpose is to finish off by stating that although the project did not achieve its ultimate goal of a pan-European commercial launch of R-Bay, we consider the project to have been successful –

- because despite many challenges along the way the consortium held on and fought for the project. The strong collaboration has been essential.
- because although the market validation gave a no-go to the original plan the ride the project took us on and the people and organisations we came across – friend or foe – during the market validation exercise and the knowledge and experiences we gained from these encounters have been immensely valuable for all the partners individually and for the project as a whole.
- because despite the decision that the original business idea and plan was not sustainable as the market is not mature enough for a European-wide launch of R-Bay, then we learned that the concept holds water, that R-Bay does have unique value and that the future direction of the market seems to be in our favour. R-Bay has also contributed through its dissemination activities to this change and made healthcare providers, authorities and radiologists, incl. the societies, address the issue of image exchange at this level and in this way.
- because deployment of R-Bay is still taking place, although in a form different from planned. Instead regional and national deployment plans are ensuring that the R-Bay service is being put into production in most of the hospitals that participated in the project and also extended to other hospitals and clinics as part of the regional and national deployment. There is still support and commitment to the service from the partners.

There is no doubt that R-Bay has had significant value to the partners of the project as well as to the market. We expect that R-Bay will eventually grow pan-European but in which way and in which form is not possible to state at this point. Maybe a launch of an R-Bay company will happen when the conditions are right or maybe we will witness multiple national or regional R-Bay portals throughout Europe.

## Appendix 1 - List of dissemination activities

**Participation at exhibitions/demonstrations**

<b>Date</b>	<b>Title</b>	<b>Project participants</b>	<b>Number of persons attended + other information</b>
1-4/03 2009	HIMMS 2009 Chicago, USA	Jouni Ruoppa (Mawell)	<u>Conference meeting</u> R-Bay introduction and discussions with several international clients (healthcare vendors)
6-10/3 2009	ECR2009	Carestream; Mawell; RSD	<u>Conference exhibition – R-Bay demo</u> A similar set-up the WoHIT showcase explained below is planned for ECR2009 (European Congress of Radiology). 18,000 attendees are expected. R-Bay will be showcased at Carestream's stand together with Mawell.
30/11 - 5/12 2008	RSNA	Carestream; Mawell	<u>Conference exhibition – R-Bay demo</u> Radiological Society of North America (RSNA) holds each year a large conference and exhibition. The congress gathered in 2008 59,181 attendees. Carestream exhibited there and presented R-Bay at the stand.
4-6/11 2008	WOHIT 2008	Mawell, CSH and RSD	<u>R-Bay hosted workshop at World of Health IT.</u> Together with Carestream Health and Mawell, the Danish Village invited interested parties to witness a live demonstration of R-Bay. The demonstrations were a success with an immense turnout. Two pre-scheduled demos per day had been advertised, but throughout both days many visitors came by at other times for a demo and discussion, so the small area of the Danish Village where the showcase took place was at all times busy with interested companies, healthcare providers etc.
7-11/3 2008	ECR 2008	Carestream, RSD	Poster of R-Bay at Carestream's stand

**Papers/publications**

<b>Date and Type</b>	<b>Details</b>
Article Public Service Review: Health	<b>In the Market for change</b>
19-11-2008 European Hospital Article	<b>R-Bay - A possible e-marketplace for buying and selling radiology services</b> <a href="http://www.european-hospital.com/topics/article/4860.html">http://www.european-hospital.com/topics/article/4860.html</a>
Article European Hospital Online	<b>Technical Infrastructure for EU funded R-bay project</b> <a href="http://www.european-hospital.com/topics/article/4587.html">http://www.european-hospital.com/topics/article/4587.html</a>
14-10-2008 eHealth Europe, News	<b>Carestream supports Ebay for radiologists</b> <a href="http://www.ehealthurope.net/news/4236/carestream_supports_ebay_for_radiologists">http://www.ehealthurope.net/news/4236/carestream_supports_ebay_for_radiologists</a>
06-10-2008 News	<b>Hospital Information Technology Europe</b> <a href="http://www.hospitaliteurope.com/default.asp?page=article.display&amp;article.id=13831">http://www.hospitaliteurope.com/default.asp?page=article.display&amp;article.id=13831</a>

10-02-2008 eHealth News	<b>Carestream Health Builds Technical Infrastructure for EU Funded R-Bay</b> <a href="http://www.ehealthnews.eu/content/view/1346/26">http://www.ehealthnews.eu/content/view/1346/26</a>
10-01-2008 Medical Industry News	<b>Carestream Health Builds Technical Infrastructure for EU-Funded R-Bay</b> <a href="http://www.dotmed.com/news/story/7082">http://www.dotmed.com/news/story/7082</a>
October 2007 Article in Danish Journal "Ugeskrift for Læger"	<b>"Læger i Baltikum skal vurdere danske røntgenbilleder"</b> "Doctors in Baltic States to evaluate Danish x-rays"
June 2007 Article in Danish Journal "Ugeskrift for Læger"	<b>"Langt fra men tæt på"</b> "From afar, but close"
May 2009 Article R-Bay at the German X-Ray Congress (Deutschen Röntgenkongress) 2009	<b>"Ein Geschäftsmodell für Teleradiologie"</b> "A Business Model for Teleradiology"  HealthTech Wire

### Presentation in conference proceedings

<b>Date</b>	<b>Title</b>	<b>Project participants</b>	<b>Number of persons attended + other information</b>
02/04 2009	Annual Finnish Telemedicine and eHealth Conference	Mawell	<u>Conference presentation</u> Presentation of R-Bay at annual Finnish Telemedicine and eHealth conference.
9-11/12 2008	WHIT 4.0	RSD	<u>Conference presentation</u> Presentation of R-Bay at the 4th Annual World Healthcare Innovation and Technology Congress (WHIT v.4.0), where more than 400 healthcare and technology executives as well as politicians were present.
5/11 2008	WoHIT 2008	RSD	<u>Conference presentation</u> Peder Jest presented R-Bay at the World of Health IT conference in Denmark
9-10/6 2008	TTeC 2008	RSD	<u>Conference presentation</u> Ulrik Schönemann presented R-Bay at the Tromsø Telemedicine and eHealth conference in Norway
3/6 2009	Europe INNOVA Thematic Workshop	IMA	<u>Conference presentation</u> Presentation by Tomáš Trpišovský. R-Bay is presented as example, reflecting recommendation and standards fostered by the Commission

### Press releases/brochures/leaflets and posters

<b><i>Product</i></b>	<b><i>Circulation</i></b>	<b><i>When and Where</i></b>	<b><i>Who</i></b>
Poster	European Congress of Radiology 2008	7-11/3 2008 Vienna/Austria	
Poster	International Society for Quality in Health Care (ISQua) Conference		
R-Bay Newsletter		October 2008	RSD
R-Bay Brochure	Circulated at various events, conferences and meetings		ALL