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Statement of originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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EASTIN 1.1. Search Engine: EASTIN-CL project
EASTIN 1.1. Search Interface: EASTIN Association
Executive Summary

This second release of the Thematic Network Portal includes three main components:

- The institutional website of the ETNA Consortium, intended to disseminate detailed information about the ETNA project across a wide audience, not only made of professionals dealing with ICT or specifically with Assistive Technologies;
- The initial core of the search engine of the thematic network, based on EASTIN 1.1 – the latest release of the EASTIN system (European Assistive Technology Information Network);
- The user rating and comments prototype, resulting from the joint work of the ETNA and the ATIS4All networks.

The virtual room – another tool extendedly used within the project – is also mentioned in this Report, although not technically being a “component” of the Portal.

The first chapter (Overview of the website) provides a concise summary of the main characteristics of each component. It also describes the process that led to their production.

The second chapter (The institutional webpages) provides details of all pages of the institutional website; it also tells about their contents, which has been continuously updated since the previous version. The webpages design intends to convey a public image of a solid network – a tangible token of the consortium's internal work and live collaboration – and of a unique cluster between the ETNA and the ATIS4All Consortium (reflected by the similar graphic layout of both networks' websites).

The third chapter (The search engine) describes the main characteristics of the EASTIN 1.1 system. This has been released in September 2011 thanks to the efforts of the EASTIN Association and the EASTIN-CL project. Although not being a direct achievement of the ETNA project, some key requirements arising from ETNA have been implemented, in order to ensure its ability to work as the future search engine of the Thematic Network (EASTIN 2.0).

The last chapter (The ratings and comments prototype) illustrates the prototype system jointly developed by the ETNA and the ATIS4All network. The system allows users of the ATIS4All community to review products retrieved through the ETNA search, and express rating and comments. On this subject, this deliverable provides details of the work done by ETNA, while an ATIS4All deliverable describes the work done on their side.
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Overview of the website

The current version of the ETNA website represents the second step of an evolving process that will last 3 years and will gradually lead to the final Portal to be released at the end of the project, in collaboration with the ATIS4All network.

- The overall concept of the Portal includes various components (Picture 1):
  - the institutional websites of the ETNA and the ATIS4All Thematic Networks;
  - two main applications, namely the “Search Engine” and the “Community”;
  - working tools supporting the project activities, such as the Virtual Room; and
  - applications working across the various components, for instance allowing people from the community to express comments or judgments on products retrieved by the search engine.

![Diagram of Portal components]

Picture 1 – The ETNA/ATIS4All joint Portal: overall vision

The Institutional website

The institutional website was published first in March 2011, as described in Deliverable D1.2. It has been continuously updated in the course of the project in order to report progress and make available all public documents that have gradually been produced. The current version does not differ significantly from the first release in terms of structure and graphics: this deliverable will mainly describe the contents updates introduced so far.

The website structure and graphics of both the ETNA and the ATIS4All institutional websites have been developed by FUNDOSA TECHNOSITE, coordinator of the ATIS4All Consortium, while the contents of each website are – of course – responsibility of each project coordinator. This joint effort responds to the Commission’s recommendation to collaborate, exploits the synergies and also delivers the public image of the two networks as being part of a single cluster.

Indeed the ETNA and the ATIS4All Websites share the same layout and graphics, which have been intentionally made attractive and easily understandable. The pictures chosen show common people using ICT, thus delivering the image of technology as a useful tool that can be easily used during ordinary life. Bright and vivid colors have been chosen to avoid the feeling of a “dark image of disability” and – conversely – convey an idea of positive energy that can be fostered through joint action to positively contribute to the
European society.
The institutional website is addressed to a very large and varied audience – not necessarily to people familiar with assistive technology, ICT or accessibility issues – therefore the contents are concise and organized in short paragraphs to facilitate reading. At the moment the website consists of 13 main pages, organized in a tree-structure, as represented in the “Sitemap” page (Picture 2).

Picture 2 – Map of the Institutional website

The Search Engine

In 2011 significant technical developments occurred “behind the stage” in relation to the EASTIN search engine. As pointed out in the DoW (Description of Work), ETNA didn’t plan to develop a new search engine from scratch – which would have been beyond the project resources – but rather take advantage of the existing EASTIN system. However, at the beginning of the project the EASTIN engine was not technically ready for the challenge: it needed substantial reengineering with state-of-the-art technology. This has been possible thanks to another CIP-ICP project called EASTIN-CL (“Crosslingual and multimodal search in a portal for support of assisted living”; www.eastin-cl.eu, due to end in May 2012), aimed at enriching the EASTIN system with advanced linguistic services (cross-lingual query processing, machine translation and speech processing) that also claimed for re-engineering of the EASTIN architecture. The re-engineering process was completed in August 2011.

The EASTIN web interface was also completely re-designed – through direct investment by the EASTIN Association – in such a way to improve its user-friendliness, to fully exploit its multilingual capabilities, and to achieve best level accessibility (WCAG AA).

The re-engineered system, called EASTIN 1.1, was released in September 2011 (www.eastin.eu). What’s more, in February 2012 the entire contents migrated to the new assistive technology classification standard (ISO 9999:2011).

This deliverable describes the main features of the EASTIN 1.1 system that need to be
known for the further developments of the ETNA project. It also provides information on some advanced linguistic services introduced by the EASTIN-CL project – still being validated in a separate test environment (http://test.eastin.eu) and not in the public environment www.eastin.eu – that help overcome linguistic problems that will be encountered also in ETNA.

Community: the ratings and comments prototype

The development of the Community is a task of the ATIS4All network. To date, such a community does not exist yet: it is planned in a later stage of that project. However, a first step has been taken in relation to the cross-applications between the Community and the Search Engine, which will be a major challenge for the ETNA / ATIS4All cluster. Indeed, the final result of the joint collaboration between the two networks is expected to include both the information search/retrieval functionalities and the community/web 2.0 tools, working together in an environment called “EASTIN 2.0”.

This step consists of a prototype tool that allows people from the Community to perform searches of assistive technology products through the EASTIN 1.1 search engine, express comments or judgments on any product based on their own personal experience, and look at other people’s comments/judgments. The application has been produced jointly by ETNA and ATIS4All, where ETNA has worked at identifying the appropriate rating methodology and developing the “ratings display” side, while ATIS4All has worked at developing the “rating input” side.

This deliverable will describe the achievements of the ETNA work. The results of the other network’s developments are described in the ATIS4All deliverable D2.5. “Demonstrator for the user’s ratings and comments”.

Both deliverables include as Annex the joint technical document that served as basis for development, named “EASTIN 2.0 ratings and comments prototype specs”.

The Virtual Room

The last component of the ETNA web platform – that will be active for the whole duration of the project – is the “virtual room”: a virtual space created to hold project meetings, to facilitate long-distance communication among partners whenever audiovisual support is needed, and to carry out educational activities such as in-depth presentations of each partner’s project.

This tool has become vital for the projects activities: several public Webinars, project meetings (Picture 3) and technical consultations have been carried out so far, thus avoiding travels, maximizing communication effectiveness and speeding up decisional processes. The main events carried out by means of this tool are listed in Deliverable D1.3 (ETNA 1st Year Report), while the educational seminars are described in Deliverable 8.1 (Archive of the ETNA Webinars – month 12).

After a market survey, a commercial product was selected for this purpose: the Adobe® Connect 8 Platform (www.adobe.com/products/adobeconnect.html). The configuration chosen for ETNA allows for an attendance of max 200 people. Each attendant needs just a PC with a loudspeaker/microphone headset and a DSL Internet connection. The system can be accessed through any of the most common browsers (Explorer, Firefox, Chrome etc.) without any need to download further applications.

Attendants may perform several actions depending on whether they are host (full control of the platform, such as managing the discussion, reorganizing the room layouts, enabling/disabling other attendants’ privileges, loading and sharing files, performing polls etc.; see Picture 4), presenters (sharing documents such as showing slides or movies, or even sharing the full contents of their computer screens) or simply participants.
The system also allows for video-communication through webcams. However, in all ETNA activities this facility wasn’t used because it is not really essential; what’s more, it requires a great amount of bandwidth, which often results in critical delays or malfunctioning for partners who participate from within the corporate LAN of their organization.

Picture 3 – The Virtual Room (screenshot taken during the Management Committee 20/12/2012)

Picture 4 – The Virtual Room seen by the host side, in presentation mode
The institutional webpages

The home page and the main contents page

The Homepage provides a concise presentation of the ETNA project and of the Project Leading Institution (Picture 5). Page “Presentation” adds some more details on the objectives and the expected outcomes (Picture 6 Errore. L’origine riferimento non è stata trovata., Picture 7).

Picture 5 – Homepage

Picture 6 – Presentation webpage
Page “Consortium” displays the partners’ logos, each one linked to the related website (Picture 8), then a list with the full name of the partners and their Country (Picture 9). Each name in the list contains an internal anchor to a more detailed description of the organization and of the person/s in charge of the ETNA project (Picture 10).
Picture 9 – Consortium webpage: second section with the list of partners

Picture 10 – Consortium webpage: for each partner, a brief description is provided.

Page “News” provides short descriptions of key events (Picture 11, Picture 12). Some News contain a link to more detailed descriptions and related material. For instance, Picture 13 and Picture 14 show the detailed report of the Second ETNA Workshop, with all related downloadable material.
News

**Fourth ETNA Webinar**

The Fourth ETNA Webinar was held on-line on February 8th, 2012. The presenters were another two partners of the ETNA Consortium: the Edinburgh, Third University, Interactive Systems Research Group (Edinburgh, UK) and the National Technical University of Athens (Greece, GR).
[Watch and Return to the recording](#)

**Third ETNA Workshop**

The Third ETNA Workshop took place in Thessaloniki, Greece, on January 25-26, 2012.
[More details](#)
[Watch and Return to the recording](#)

**Third ETNA Webinar**

The Third ETNA Webinar was held on-line on December 1st, hosting the presentations of two partners: TROMA in Oulu, Finland, and EAMT Centre for AAC and AS, Sahlgrenska University Hospital (Göteborg, Sweden).
[Watch and Return to the recording](#)

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**Second ETNA Webinar**

The second ETNA Webinar took place on-line on September 14, hosting the presentations of two partners: CMI, Melbourne, Australia, and DIUL and KIES, Technical University of Athens (Athens, Greece).
[Watch and Return to the recording](#)

**Second ETNA Workshop**

The Second ETNA Workshop took place in Maastricht, the Netherlands, on August 27-29, 2011.
[More details](#)

**First ETNA Webinar**

The First ETNA Webinar was held on-line on June 22, hosting the presentations of two partners: Fondazione Don Carlo Gnocchi (Milan, Italy) and AudSketch+Inc (Bilbao, BHS).
[Watch and Return to the recording](#)

**First ETNA Workshop**

The First ETNA Workshop was held on-line on March 24-25 in Milan, Italy, at the Fondazione Don Carlo Gnocchi Centre.
[More details](#)

**Kick Off Meeting**

The ETNA Kick Off Meeting was held on-line on January 14 using an innovative webinar platform.
[Watch and Return to the recording](#)

**Start of the ETNA Project**

The ETNA Project started on January 1, 2011, according to schedule.

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See also:

- [Picture 11 – News webpage](#)
- [Picture 12 – News webpage (continued)](#)
Second ETNA Workshop

Internet resources related to ICT-based Assistive Technology in Europe

07/09/2011

The second ETNA workshop was held in Hertford, The Netherlands, at the Hertford School of Management on August, 29-30, 2011. The workshop was the occasion to enhance user awareness and disease methods to classify them, enhance their visibility and create on the possible way to link them to the future TP Portfolio. The workshop was attended by representatives of all project partners, including some EXIST partners and national contacts of a representative of the ATIS/Alliance.

The event was split in two parts. The first day was devoted to the progress report of the new ETNA website, necessary for the future development of the ETNA and external stakeholders. The second day was focused on work resources. In particular, presentations and plenary interactions and discussion were eased by finding a functional methodology to include or exclude resources and eventually to link them.

All the presentations and the results of discussion during Session 3 will be gradually available in the web page.

Page “Documents” contains all public documents available for download (Picture 15). It also includes the links to the recordings of the public Webinars that have been held so far (Picture 16).

Finally, the Contact page provides the address, telephone number and e-mail address of the Project Coordinator’s team (Picture 17).
Picture 15 – Documents webpage, with the downloadable material

Picture 16 – Documents webpage, with links to the Webinars recordings

Picture 17 – Contacts webpage
Service webpages and external links

The footer of all pages displays the “accessibility” and “legal notice” links, leading to the related pages. Page “Accessibility” describes the accessibility policy of the website (Picture 18), while the “Legal Notice” page explains responsibilities in the use and management of the website contents (Picture 19, Picture 20).

Page “EASTIN 2.0” explains the ETNATIS cluster and anticipates the future portal that will be the main outcome at the end of the ETNA project (Picture 21).

Picture 18 – Accessibility webpage

Picture 19 – Legal notice webpage
Picture 20 – Legal notice webpage (continued)

Picture 21 – The EASTIN 2.0 webpage

On each page, selected links are displayed to the following external websites:

- the EASTIN Network¹;
- ATIS4All² (Picture 22);
- the E-Inclusion Campaign³ (Picture 23);
- ePractice (the EU e-Accessibility practice, policy and monitoring)⁴ (Picture 24);
- the ICT-PSP Programme⁵ (by clicking the EU Flag) (Picture 25).

¹ www.eastin.eu
² www.atis4all.eu
⁴ http://www.epractice.eu/community/eaccessibility
⁵ http://ec.europa.eu/information_society/activities/ict_psp/index_en.htm
Picture 22 – Links: the ATIS4All homepage

Picture 23 – Links: the e-Inclusion website
Picture 24 – Links: the e-Accessibility webpage within the e-Practice website

Picture 25 – Links: the ICT PSP webpage
The search engine

This chapter provides a brief overview of the main features of the EASTIN 1.1 search engine and its web interface.

The EASTIN engine is maintained by the EASTIN Association; it currently works on six national assistive technology databases from the following Countries:

- Belgium, (Vlibank [www.vlibank.de])
- Denmark (Hjælpemiddelbasen [www.hmi-basen.dk])
- France (Handicat [www.handicat.com])
- Germany (Rehadat [www.rehadat.de])
- Italy (Siva [www.portale.siva.it])
- UK (Dlf-data [www.dlf-data.org.uk])

thus providing information on almost 70,000 assistive technology products.

In 2012 the Spanish national database (Catalogo de Ayudas Técnicas [www.catalogo-ceapat.org]) will complete its migration to the new classification standard ISO 9999:2011 and thus will be able to join again the EASTIN network; the Dutch national database (Vilans Hulpmiddelwijzer [www.vindeenhulpmiddel.nl]) will also join the EASTIN as a new member, thus bringing to eight the number of database involved, with an estimated coverage of some 85,000 products, some 8,000 out of them being estimated to belong to the ICT domain.

The following sub-chapters provide details of the current web interface, the current engine architecture and the additional linguistic services that are going to be released in 2012.

The EASTIN 1.1 web interface

The EASTIN web interface currently works in 23 European languages and in 31 cultures. When “landing” on [www.eastin.eu], the homepage recognizes the language/culture of the user’s browser and automatically adapts to it (Picture 26). In case of unrecognized language/culture, by default it displays in English/UK.

The EASTIN homepage includes five tabs:

- Assistive Technology products, with its six search options, by default appearing in the foreground;
- Companies;
- Associated information (fact sheets, case studies etc.);
- A “submit a product” facility (for companies who want inform about their products)
- An “info request” facility (for users who need personalized information from any EASTIN partner or national contact organization).

The homepage continues with a list of “popular topics” (subclasses of the ISO 9999:2011 classification having the highest number of products within each class) (Picture 27 and Picture 28), serving as shortcuts for searches through the ISO classification. This list is also useful for people unfamiliar with assistive technology, in that it provides a rough idea of what the contents of the Portal are.

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6 For instance, Dutch-Netherlands and Dutch-Belgium are two different “cultures” of the same language. The distinction between different cultures of the same language is very important in the Eastin system, because the specific terminology of this domain of knowledge may vary from one Country to another due to differences in legislation, traditions and professional practice.
Picture 26 – The EASTIN homepage

Picture 27 – The EASTIN homepage (continued)
Switching to another language/culture can be done at any time by clicking on “change language”. A table appears with all the languages/cultures available (Picture 29), from which the choice can be made. Then the system will work in that language/culture (Picture 30) until the user wants to change it.

Picture 28 – The EASTIN homepage (continued)
The EASTIN web interface works in any EU language.

Editing the wording of the EASTIN webpage is responsibility of each partner, or – for countries having no Eastin partner – of national contact organizations. Those who have appropriate authorization to edit a given language/culture can do it directly online: after password-protected log-in, the system displays a red flag beside each label or text (Picture 31). By clicking on the flag, an editing page appears where the revised text can be entered and saved (Picture 32).

[Picture 30 – The EASTIN web interface works in any EU language]

[Picture 31 – Authorized national contact persons can edit the wording directly on-line]
Picture 32 – A label in editing mode, after clicking on the red flag aside

Picture 33 shows an example of products search through the ISO 9999:2011 classification. When the desired category has been found, a query is sent to the national databases by using the Web Service Technology. Each database returns the required data (Picture 34). The search results can be filtered and sorted in various ways, then displayed as a concise list (Picture 35), and eventually as individual product records (Picture 36). Each product record is displayed in the user’s language, with the exception of the free-text description that – if not native in that language – appears in an English translation (generated by the provider of the national database through human or machine translation) (Picture 37). Finally, from the EASTIN individual product record it is possible to jump to the native national database that provided the data (Picture 38).

Search of “associated information” works in a similar way. For instance, Picture 39 shows a “Fact sheets” search, leading to the retrieval of relevant documents that match the user’s request (Picture 40).
Picture 33 – EASTIN search through the ISO 9999:2011 classification

Picture 34 – Examples of search results from all the EASTIN databases
Picture 35 – Example of a list of found products

Picture 36 – Example of a product record, as displayed by the EASTIN interface
Picture 37 – Example of product record, automatically translated into English

Picture 38 – Example of a product record, as displayed in the native database
The EASTIN 1.1 search engine architecture

Picture 41 shows the new architecture of the EASTIN system. Apart from upgrades of underlying software components, the main progress consisted of separating the different layers of the portal application (presentation business logic, and data access), thus enabling the software to access other web services, like the language processing services, in a consistent way within the application logic.

The portal implementation was finished and tested in September 2011, and has been
serving as a platform for integration from then onwards. Picture 42 shows the workflow of an EASTIN search with the current architecture.

The re-engineering work involved the following steps:

- **Platform step-up**: a migration from Microsoft DOT NET Framework 1.1 (2003) to 4.0 (2010) was executed. The latest version of the Framework brings about improvement in relation to both accessibility and interoperability towards third party components.

- **Architecture re-design**: the application tier was completely re-designed using a different new architectural pattern: Microsoft ASP.NET Model View Controller (MVC). This pattern enforced the introduction in the Application tier of three distinct well defined layers: an interface layer (called View), containing the dynamic HTML pages, and two logic layers (Model and Controller) containing the application domain model and business logic, respectively. The modularity of
this new architecture makes it easier integrating in the Application tier the new Eastin-CL linguistic functionalities as well as any further future functionality provided via Web.

- **Communication with external services**, such as the linguistic services provided by Linguatech and Tilde, and any future external service generated within the ETNA and the ATIS4All networks. These functionalities are plugged into Eastin through the Controller layer (by the use of a proper proxy interface). Now the logic layer works on top of the Data access layer, responsible as usual of data retrieving.

- **Database step-up**: in order to improve performance and maintenance, the Eastin database migrated from SQL Server 2000 to SQL server 2005 RDBMS. During this process also a re-design of the Entity-Relationship schema was executed to solve some previous scaling limitations.

### The EASTIN-CL linguistic services

The advanced linguistic services introduced by the EASTIN-CL – to date still in validation stage – include **query processing** in natural language, on-the-fly **machine translation** from English to the user’s language (in order to solve the problem of the free text product descriptions, that now are available only in native language and in English), and **text-to-speech**. All these services work for the languages of the EASTIN-CL partners i.e. English, German, Italian, Danish, Lithuanian, Latvian and Estonian.

An additional service – **speech recognition** – was experimentally developed only for the German language; it will not be described in this deliverable as it is out of the scope of the ETNA project.

The main resource underlying the linguistic services is the **term list** that has been developed for each language, including several thousands of terms related to the assistive technology domain; however the component includes also lexicons, normalization (e.g. to cope with spelling variants and spelling errors) and other procedures, and finally it applies a ranking to find the best matching term(s) of the term list. It is designed to increase recall, as it would be frustrating for users to have zero results for a search.

**Query processing** works as follows.

When the user enters a term or a sentence in the appropriate box – in any of the above languages - (Picture 43), the query is processed in order to find the appropriate ISO 9999:2011 categories that best match the concept. These categories are shown in a list, sorted in decreasing relevance ranking (Picture 44). Also the products and the manufacturers whose names match the term are listed (Picture 45). Then the user can select the ISO category or the product or the manufacturer that best matches what he or she actually wanted to find.
Picture 43 – Query processing in natural language (in the test environment)

Picture 44 – Example of Eastin-CI multilingual search results
When an individual product record is displayed on the screen, the user can take advantage of the machine-translation service. Picture 46 shows an example of an English product found by an Italian user: all data are displayed in Italian, with the exception of the free-text description which is only in English. By clicking “traduci in italiano” (translate into Italian), the service soon returns a reasonably good-quality Italian translation, based on the above mentioned term list (Picture 47).
In order to facilitate reading and understanding the contents of the product description, the portal also offers **text-to-speech** options. By clicking on the ‘read’ button in the page, users can listen to the system which reads out the text of the page by means of a little mp3 player popping up.
The ratings and comments prototype

Background

The users’ field experience with using assistive technology products or e-accessibility solutions is of great value for many stakeholders.

First, it is obvious that end-users – who are the main protagonists within the assistive technology world – should have a say about the quality of the products they use, about their effectiveness and about possible improvements. Second, the users’ views may help other prospective users to get a better insight before making a choice; are useful to health care professional to better understand the actual effectiveness of a given product or solution in meeting the users’ needs in real life; are sought by researchers and developers to understand strengths and weaknesses of a product or solution when working at its improvement.

However, capturing the users’ field experience on this kind of products through an on-line system is not a trivial task. The individual context of use may be so varied – depending on so many personal and environmental factors such as the pathology, the place where the person lives, the service provision system, the availability of professional support, the amount of training received, etc. – that a comparison between different individual judgments is often difficult. The judgment may be based on having actually used the product in daily life for years, or having just seen the product at a Trade Fair, or having tried out its trial version downloaded from the Internet: which raises the question on whether the three perspectives deserve the same weight. What’s more, the European multilingual environment claims for ratings based as much as possible on objective scores rather than on free-text comments; unfortunately free-text comments – although more informative on the individual user’s context – can be understood only by people who know the language in which they are written.

Matching person and assistive technology is a complex process. Inferring solid conclusions by assembling individual views – based on different experiences and framed in different contexts – requires deep insight: a simplistic approach may be misleading for end-users and professionals, useless for developers and unfair towards the manufacturers. What’s more, we can hardly expect hundreds or thousands of judgments for an assistive product as we could expect for a mainstream product. Indeed, processing a great amount of judgments would help normalize the findings, so as to separate “average” trends from “artifacts” (for instance, occasional negative judgments based on inappropriate recommendations by incompetent professionals, rather than bad features of the product).

In brief, three challenges need to be addressed:

- How to collect the users’ views effectively, in the European multilingual and multi-cultural environment;
- How to process the data in such a way to infer reliable overall indicators from individual judgments;
- How to present the resulting indicators in an effective/non-misleading manner.

For this purpose, the rating and comments tool to be implemented on the Portal should have sound construct validity (actually measuring what we wish to measure), face validity on the input side (self-explanatory, unambiguous and user-friendly for those who wish to enter their judgments) and contents validity on the output side (presenting the processed data to the audience in such a way to provide relevant information, avoid misinterpretations and help draw one’s own opinion). The tool should be technically reliable and well performing and – as it is based on voluntary commitment - it should be

also designed in such a way to **motivate** the user to spend time on it (easy-to-use, quick to be completed, perceived as worthwhile etc.).

Achieving a “perfect” system that meets all the above goals may take long; it will require extended discussion within the Consortium. It also requires to keep both feet on the ground: “*it is better a vague estimate of the exact concept, rather than a precise estimate of the wrong concept*”\(^8\). The fact that the system has to be developed in collaboration with another network (ATIS4All) adds a significant coordination effort, although beneficial to the overall vision.

For this reason, an iterative process was adopted that will involve 1) formulating some initial assumptions 2) developing a prototype 3) testing the prototype 4) reformulating the initial assumptions and eventually 5) developing the final system.

At the time of production of this deliverable, the prototype has been developed and testing has started.

**Initial assumptions**

The ETNA deliverable *D2.2 (Synopsis of the information needs)* detected 30 “search profiles” related to the use of the future EASTIN 2.0 Portal. While 24 profiles are related to situations in which the audience just **seeks information**, 6 profiles depict situations in which the audience is willing to **provide input**. In particular:

Two profiles are related to those who look at the Portal from the “end-users” perspective:

- **Rating**: possibility to provide feedback on one’s own experience with a product, and learn from other users’ experiences;
- **Participating**: possibility to provide advice/ideas for solving users’ problems, for developing new solutions, for improving existing solutions, for improving policies.

One profile is related to those who look at the Portal from the “professionals” perspective:

- **Assessing outcome**: possibility to provide feedback on a product or a category of products – based on research, field evidence or just one’s own experience – and to know about the experience of other professionals and users.

The other three profiles are related to those who look at the Portal from the perspective of “manufacturers/suppliers”, “researchers/developers” and “policy makers” respectively:

- **Advertising**: possibility to upload information about their own products;
- **Exploiting**: possibility to disseminate publishable results or contact possible partners for technology transfer;
- **Awareness raising**: possibility to disseminate information and raise awareness about regulations and opportunities.

These profiles are very different from each other and involve different types of information: each of them needs to be investigated in depth in order to identify the most appropriate methodologies.

The **user rating and comment prototype** – which is described in this deliverable – is addressed to the first of the six above-mentioned profiles (“rating”). It aims at collecting views and judgments on single products, rather than higher-level views on categories of products or related issues (which would fall within the second profile “participating”).

The intended target includes people who have **direct experience** of using an assistive product or an e-accessibility solution in relation to their disability; it does not include people who have “just an opinion” based on having seen the product, or seen other

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persons using it, or read about it. Even professionals’ views (by therapists, teachers etc.) are not included at this stage, as they would fall within the third profile “assessing outcome”.

A look at other rating systems

User rating tools have been already implemented in several information systems. The following examples show the most common approaches that are in use.

Picture 49 shows the “users’ opinion” facility in the SIVA Portal (www.portale.siva.it). For each product record, a forum opens where users can post their views in free text (Picture 50) and read the views of other users. No identification or log-in procedure is required. The editorial team monitors the messages just to ensure netiquette and remove possible unfair messages (which in fact happened not more than 3-4 times in seven years).

The US Abledata system (www.abledata.com) has a more sophisticated method to collect the user feedback, with two main questions. A first question (Picture 51) asks whether the information on this product has been useful (with possibility to enter a free-text comment); the second question “Review the product” (Picture 52) leads to a detailed online interview.
The interview requires the user to be identified (Picture 53) and then to reply to five questions in free text (Picture 54).

Although these ways of entering the user’s comment are very simple and open, very few end-users made use of them so far. Comments are very rare; most products have no
comments or just one comment; in the case of several comments, they are never so many that they would achieve the “critical mass” needed to generate lively discussions, where different views can be compared so as to get an objective insight. It is obvious that the view of a single user, although valuable in itself, describes just a personal experience, which is not fully representative of the “most users’ view” about that product.

Some information systems feature other ways to rate products. For instance, the living made easy service (www.livingmadeeasy.org.uk) of the Disabled Living Foundation in the UK rates the “information quality” of each product record (Picture 55) based on an automatic weighting of the completeness of information, the availability of price info, and the product or company accreditation by a qualified Body. Although useful, this system has nothing to do with a “user rating”.

![Picture 55 - Automating rating of “information quality” in the DLF-Data Portal](image)

In the world of mainstream commercial services, the most successful user ratings system usually combine numerical scores with free text comments. The advantage of numerical scores is their language-independence: scores provided by customers all over the world can be compared and statistically processed; any customer is able to understand them; customers who see a “critical mass” of ratings already collected for single product are more motivated to add their view. Conversely, free text comments are language-dependent: they should be looked at as additional information which does not substitute for the scores but rather complements or better clarifies them, although understandable only to those who know that language.

For instance, the well-known hotel reservation system www.booking.com asks each customer for an overall judgment based on a score, then gives the opportunity to add a free-text comment in the customer’s preferred language. When another potential customer is about to make a reservation, the overall average score is shown, along with the most recent free-text comment in the customer’s browser language (Picture 56, Picture 57); in case no comment is available in that language, by default the comments in English language are shown (Picture 58). Then – of course – the customer may wish to see all comments and ratings in detail.
Picture 56 – Example of hotel user rating: comments in the reader’s language are shown first.

Picture 57 – If the reader’s language is different, comments are shown in that language.

Picture 58 – In case no comment is available in that language, English is chosen as default.
The approach

The rating approach adopted in our prototype is conceptually similar to the hotel rating described above. It is based on numerical scores but also offers the possibility to add free text comments.

However, the experience of using an assistive product or an e-accessibility solution cannot be synthesized in just one or two comprehensive questions as it would be for a simple experience such as “spending one night in a hotel”. As said above, the impact of an assistive product on the person’s life, activities and relationships is very complex and well studied in scientific literature\(^9\)\(^{10}\)\(^{11}\). Inventing a new questionnaire wouldn’t be a good idea, as several well established and internationally validated instruments already exist for detecting the user’s perceived impact of an assistive device. The issue is to find the instrument that best fits the ETNA/ATIS4All purpose in terms of construct validity, face validity, availability in as much European languages as possible, ease of implementation as an online tool and – last but not least – possibility to grant the authors’ authorization to have it used in the Portal.

The above considerations lead to choosing the QUEST (Quebec User Evaluation of Satisfaction with Technical Aids)\(^12\). Authorization was granted by the authors for free use in the EASTIN environment, in any of the languages in which it has been validated\(^13\).

The QUEST questionnaire asks questions about the user’s satisfaction with an AT product (8 items), and the service associated with that product (4 items). Each question is answered by giving a score, ranging from 1 (not satisfied at all) to 5 (very satisfied). Intermediate scores are 2 (not very satisfied), 3 (more or less satisfied) and 4 (quite satisfied). Free-text comments can be added for each item. Questions considered non-applicable by the user can be left unanswered: they will be treated as “invalid items” in the score calculation. The user is also asked to point out the three items he/she thinks are the most important for that product.

The aggregated scores are calculated as follows:

- **product score**: sum of valid product scores, divided by the number of valid items;
- **service score**: sum of valid service scores, divided by the number of valid items;
- **overall score**: sum of all scores, divided by the number of valid items.

Thus each aggregated score will also range from 1.00 (not satisfied at all) to 5.00 (very satisfied).

The QUEST has been translated into different languages (Swedish, Danish, French, Dutch, Italian, German etc..) and validated through population studies for various categories of assistive products. Due to its simplicity and user-friendliness – in comparison with other instruments developed for AT products\(^14\) - it can be used on a large

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13. Mail 23/9/2011 by prof. Marcia Scherer, president, the Institute for Matching Person and Technology (Webster NY) which holds the QUEST IPR
scale to detect possible satisfaction or dissatisfaction issues of individual users as well as groups of users.

The twelve QUEST items are listed below.

**Satisfaction with the product:**

*How satisfied are you with:*

- the *dimensions* of your assistive device (size, length, height, width, etc.)
- the *weight* of your assistive device
- the *ease in adjusting* of your assistive device (fixing, fastening, configuring, etc.)
- how *safe and secure* is your assistive device
- the *durability* of your assistive device (endurance, resistance to wear, etc.)
- the *ease of use* of your assistive device
- the *comfort* of your assistive device
- the *effectiveness* of your assistive device (the degree to which it meets your needs)

**Satisfaction with the related services**

*How satisfied are you with:*

- the *service delivery program* in which you obtained the assistive device (procedures, length of time etc.)
- the *repairs and servicing* provided for your assistive device (maintenance)
- the related *professional services* provided for your assistive device (information, attention, etc.)
- the *follow-up services* provided for your assistive device (continuing support services)

**The three most important items**

*What are the three aspects that – in your view – are most important for this assistive device:*

- Dimensions
- Weight
- Ease in adjusting
- Safety and security
- Durability
- Ease of use
- Comfort
- Effectiveness
- Service delivery programme
- Repairs and servicing
- Related professional services
- Follow-up services

The user’s indication of the three most important scores is not considered in the calculation. However, it is an important indicator that can be used when aggregating the ratings of more users.

In the population studies carried out in various Countries so far, the instrument was always well received, mainly because it is quick, simple, not asking for sensitive personal information, going directly to the points on which users are pleased to offer their views.

However, for certain products not all QUEST items seem applicable. The questions should be formulated in such a way that users clearly understand case-by-case which items are valid and which are not.

For instance, in the view of several ETNA partners, only three **product items** seem valid for software products – **ease in adjusting, ease of use, effectiveness** – unless we look at the whole assistive solution which the software is part of: the questionnaire should make it clear whether we want a judgment on the product or on the whole solution. Indeed, a non-technical user being asked about the “dimensions” of a communication software may think in terms of the product itself (thus he or she will rate “non-applicable”, because a software has no physical dimension) or in terms of the whole embodiment that includes the device on which the software is installed, the operating system on which the software runs, and maybe even the mounting systems of the device to the wheelchair (thus he or she will rate how satisfied is with the sizes of the whole embodiment).

Similar considerations may apply to products that have a service combined with them (e.g. emergency phone): the questionnaire should make clear whether we want a judgment of the individual piece of equipment (in which case the QUEST items will apply) or of the service provided (in which case they won’t).

**The user rating and comments prototype: the ETNA side**

In the prototype, a simplified version of the QUEST instrument has been used for three reasons:

- **Time constraints.** Priority has been given to develop, try out and validate the technical set-up before proceeding with a refinement of the instrument; therefore possible introductory questions and the indication of the “most important aspects” have been skipped.
- **Uncertainty** as whether the four QUEST **service items** should be implemented or not. Indeed, the answers to the service items refer more to the local service providers than to the product itself. This information is not available from the search engine: it can be obtained only from the user, and it is not clear yet how this can be done. This issue still requires discussion within the Consortium.
- **Free-text comment**: instead of a separate comment for each item, a single comprehensive comment has been preferred to make life easier for the user and for the readers.

This deliverable describes the work done on the ETNA side: the system that – within the EASTIN 1.1 search engine – displays the existing ratings/comment related to a product and allows users to jump to the ATIS4All community for expressing a new judgment. Conversely, the work done on the ATIS4All side (the system that allows users to log in the community and enter their judgment on products found by the EASTIN 1.1 engine) are described in the ATIS4All deliverable **D2.5. “Demonstrator for the user’s ratings and comments”**. Both the ETNA and the ATIS4All deliverables include as an **Annex** the joint technical document that served as basis for development, titled “**EASTIN 2.0 ratings and comments prototype specs**”.

When a product record is displayed as result of a search, the button “review this product” (Picture 59) leads to the QUEST input form in the community. The button only appears if the user has first logged successfully in the community on the ATIS4All side.

The same page – provided the user has first logged in the community – also informs of any other review already available. The list can be expanded (Picture 60) and each single review can be read in detail (Picture 61).
Picture 59 – Product webpage, with link to the ATIS4All product review facility

Picture 60 – List of reviews available for that product
Next developments

This prototype should be considered a starting point for the development of the user rating system. There are a number of open issues that still require discussion in order to identify satisfactory solutions.

The first issue is about products identification: a unambiguous method should be found to link a product to its ratings. A product often evolves over time; a new release of a product may be considered – from the rating perspective – as being the same product or a completely different product; or, conversely, a product may change its name although remaining technically the same product.

The second issue is related to the QUEST service items: their inclusion is still questionable, for the reasons explained above.

The third issue is related to the need to distinguish whether the judgment is based on first-hand experience (having actually used the product) or second-hand experience (having just seen it or read of it). We should avoid that people who don’t have sound experience enter emotional comments that would bias the interpretation of the rating. This might be solved by means of additional triggering question (e.g. “How long have you been actually using this product (not yet / one day to one week / one week to one month/ one month to one year / more than one year”) with a threshold under which the system quits without asking for comments. A question might be also added to identify whether the judgment is provided by a real end-user or not (e.g. “what is the term that best describes your experience with this product: end-user; family member; professional...”).

The fourth issue is related to the way the reviews findings are presented. In order to prevent misunderstandings, appropriate ways to present such information should be investigated before making the ratings visible to a wider audience. For the time being, the rating and comment facility will be initially accessible and visible only to people who are registered within the ATIS4All & ETNA virtual community. The possibility to open this facility to the general public may be considered in a later stage of the project.
Annex

EASTIN 2.0 Ratings and Comments prototype specs

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Introduction

The collaboration between the two thematic networks ETNA and ATIS4all will give birth to a joint Web portal, originated by integrating two Web sites: the EASTIN portal, a search engine on Assistive Technologies, and the ATIS4all Community Web site. The new portal, whose codename at the present moment is EASTIN 2.0, will be published on line in its final version at the end of the project but by the end of December 2011 a prototype will be developed to present the basic functionalities offered by the integrated portal and to put in evidence any eventual integration issue. This document describes the technical specifications for the development of the EASTIN 2.0 prototype.

Architectural approach

The EASTIN 2.0 portal will be composed of two distinct Web applications:
- the ATIS4all Community Web site
- the EASTIN search engine
These applications will be developed, deployed and maintained in distinct domains and environments but they:
- will have the same look and feel, giving the end user the sense that they are navigating in the same Web application;
- will be both embedded in a joint home page, that will be hosted on the ATIS4all Community Web site;

Even if the new joint home page becomes the main entry point for end users who want to access EASTIN 2.0 functionalities, additionally the EASTIN search engine will maintain its original home page, for the benefit of its traditional users.

Basic concept

The basic idea behind the integration is to give to the end users of the EASTIN search engine and of the ATIS4all Community the possibility of expressing their review on any of the assistive technology products which can be retrieved using the EASTIN search engine.
Let’s consider the following scenario: users entering the ATIS4all Community using the new EASTIN 2.0 home page. If they are already registered into the Community they can access all the functionalities provided by EASTIN 2.0 site, including the EASTIN search engine, otherwise they are invited to register. After the registration they can use the EASTIN search engine integrated interfaces to search into the EASTIN network’s repositories; these interfaces will have the same look and feel of the other interfaces of the Community and they will be reachable using a specific link that will be present in the EASTIN 2.0 home page. Once they have found a product of particular interest for them, they will be able to express their review about it using a form provided by a specific interface in the Community.

On the other side, another scenario is possible. Users may come through the EASTIN search engine traditional home page. In this case, once they have found a product of particular interest, a link present in the detail view for the product will access the Community and here they will be invited to register and/or login. At this point, using the appropriate Community form, they will be able to express their review about the product and then keep on navigating on the Community or turn back to the EASTIN search engine.

![Diagram of Communication between environments](image)

**Picture 1 – Communication between environments**

Picture 1 shows the communication between the two environments. As can be seen, there are two different homepages, one for EASTIN 1.1, shown as a blue square, and another for EASTIN 2.0, shown as a violet square. The different colors indicate two distinct “look & feel” (L&F1 and L&F2).

At the left side the EASTIN 1.1 environment is shown. There are two different searching tools, one with the original look and feel of EASTIN 1.1 and another with the look and feel of EASTIN 2.0. When the user accesses the search engine from the EASTIN 1.1 homepage, he is directed to the first one. When the user accesses the search engine from the EASTIN 2.0 homepage, he is redirected to the second one.

The “Review” button and the list of user reviews and ratings are activated on both interfaces (L&F1 and L&F2) in EASTIN 1.1 side.
**Technical specs: the EASTIN search engine**

On the Eastin search engine side a distinct set of interfaces dedicated to the interaction with the Community will be developed but at the same time the current EASTIN interfaces will remain available, too. The dedicated interfaces will have the same look and feel of the interfaces of the Community. The interfaces will be developed using Microsoft ASP.NET MVC 3 technology (.NET Framework 4.0). The set of interfaces will be composed of the following pages:


plus the two dynamically produced interfaces:


plus two new interfaces:

- **Searches > Assistive Technology Products > Product review detail** for a specific product; the URL for this interface will be something like: [http://www.eastin.eu/en-GB/searches/products/reviewdetail/review-1512](http://www.eastin.eu/en-GB/searches/products/reviewdetail/review-1512).

In **Searches > Assistive Technology Products > Details** interface two new elements will be added (picture 2):

- **A call to action** to express a review on the product (“Review this product” in picture 2). This element will be implemented as a form submit button which redirects to the Community. The parameters passed by the form (method GET or POST to be defined) will be:
  - the Eastin network’s national database ID which the product belongs to (type: String)
  - the product ID (that is the ID identifying the product in its national database) (type: String)
  - the commercial name of the product (type: String)
  - the name of the manufacturer of the product (type: String)
  - the ISO Classification code of the product (type: String)
  - the ISO Classification version (type: String)
  - the URL to the original Eastin product page
the URL of the product image

A link to Searches > Assistive Technology Products > Product review list, which will contain the aggregate data about all reviews for the specific product (“125 reviews for this product” will appear in the area shown in Picture 3).

Searches > Assistive Technology Products > Product review list (picture 3) will contain the following data:

- No. of users that have expressed their review on the product
- average rating of the product (that is the average of all rates expressed by all reviewers of the product)
- a list of links to each individual review (each of these links is composed of the name of the reviewer, the review date, the aggregate rate for the product and the short version of the user comment)

Searches > Assistive Technology Products > Product review detail (picture 4) will contain the following data:

- review date
- name of the user that inserted the review
- geographical location of the user who inserted the review
- aggregate rate for this product
- detailed rates for this product
- user comment
**125 reviews for this product**

Average satisfaction with the product: 3.5 quite satisfied ★★★★★

- ★★★★★ John Smith  (25/05/2011)
  This product was very useful to... [see all]

- ★★★★★ Paul Green  (15/09/2011)
  I found this product useful in... [see all]

- ★★★★★ Sam Doe       (02/07/2011)
  This product is terrible because... [see all]
Technical specs: The Community

On the Community side a complete set of interfaces to manage user registration will be developed. The Community will keep in its database all registered users’ data.

The registration interface is a web form with the following fields:
- first name: the first name of the future user, stored as a string (UserFirstName)
- last name: the last name of the future user, stored as a string (UserLastName).
- password: the secret password of the user, stored as a string (UserPassword).
- repeat password: the new user must introduce again the password.
- email: a valid email address.
- location: the geographical location of the user, stored as a string (UserGeographicalLocation).

Internally, each user will be assigned a User ID once created.

At this point, each new user will be assigned the “en-GB” culture.

The Community will also provide the interface needed to collect the reviews of AT products expressed by users; this interface will allow the users to enter the following set of information:
the ratings on the AT product, which consist in assigning a value between 1 and 5 expressing the user’s satisfaction for each of the following product’s features (see table in fig. 4):
  - Dimensions
  - Weight
  - Ease in adjusting
  - Safety and security
  - Durability
  - Ease of use
  - Comfort
  - Effectiveness

  - a free text comment

Other important information will be automatically collected (not inserted by the user):
  - the review date
  - the user ID (coming from the Community database’s table for registered users)
  - the user geographical location (coming from the Community database’s table for registered users)
  - the product’s national database ID (coming from the EASTIN search engine repositories)
  - the product ID (coming from the EASTIN search engine repositories)
  - the commercial name of the product (coming from the EASTIN search engine repositories)
  - the name of the manufacturer of the product (coming from the EASTIN search engine repositories)
  - the ISO Classification code of the product (coming from the EASTIN search engine repositories)
  - the ISO Classification version (coming from the EASTIN search engine repositories)
  - the URL to the original Eastin product page
  - the URL of the product image

All these fields will be inserted in the “Reviews” table (or in two or more related tables) of the Community database and each record will be identified by the key “ReviewID”.

Almost all this data will be reachable by the EASTIN search engine by means of a Web service exposed by the Community side. These data will be displayed in the EASTIN interfaces:

  - Searches > Assistive Technology Products > Product review list
  - Searches > Assistive Technology Products > Product review detail

The Community Web service for EASTIN will expose two methods:

1. **List<Review> FindProductReviewList** (String productDatabaseID, String productId)
   
   Input parameters:
   - **String** productDatabaseID: a string representing the unique ID of the national database containing the given product.
   - **String** productId: a string representing the unique ID in the national database of the given product.

   Returns:
1. a List<Review> object. This is a strongly typed list of Review objects. In case no reviews are present for the given product the method returns an empty (but not null) List<Review> object.

2. Review FindProductReviewDetail(Int32 reviewID)

Input parameters:
- Int32 reviewID: the unique ID of the review in the Community database.

Returns:
- a Review object.

Here is the definition of the objects returned by the Web methods:

**Review** is a class made of the following properties:
- Int32 ReviewID: the unique ID of the review in the Community database
- DateTime InsertDate: the insert date of the review
- String UserFirstName: the first name of the user
- String UserLastName: the last name of the user
- String UserGeographicalLocation: the geographical location of the user (for example “Milan, Italy”)
- List<Rate> ProductRates: see the definition below
- Int32 AggregateRate: the average of all values contained in Rates list
- String Comment: the free text comment of the user;

**Rate** is a class made of the following properties:
- String FeatureName: can assume one of the following values: “Dimension”, “Weight”, “Ease in adjusting”, “Safety and security”, “Durability”, “Ease of use”, “Comfort” and “Effectiveness”.
- Int32 Value: an integer between 1 and 5 expressing the satisfaction level of the user

**Rate** class is the representation as an object of the information of the table in picture 4.

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Not satisfied at all</th>
<th>not very satisfied</th>
<th>More or less satisfied</th>
<th>Quite satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Weight</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ease in adjusting</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Safety and security</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Durability</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ease of use</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Comfort</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Picture 1*
Product review Community’s interfaces functional analysis

Introduction

The following paragraphs describe the technical aspects for the implementation of the product review interfaces of the EASTIN 2.0 prototype on the Community side. The document has been written without using any specific language for software architecture description, such as UML, or other standard analytic notations, such as functional diagrams or class diagrams. If you need such standards to manage the design and development processes inside your company feel free to convert these specifications in such formats.

Functionalities

On the Community side the following list of functionalities will be designed and implemented for the product review:

1. User registration
2. User login
3. Product review collection
4. Reviews data retrieval service

The functionalities from 1 through 3 will be implemented as Web pages; functionality 4 will be implemented as a Web service. The following paragraphs will present the fields that will be required for each functionality in the insertion of a Review by the end user. The fields will be described using the notation:

(<form’s field name>), <internal field name>, <CLR Type>, (<notes about max length or about value range>)

where (<form’s field name>) is the text to be inserted in the form input field’s label (present for visible fields only) while <internal field name> is the programmatic name of a variable or the name of a Property in a class. <CLR Type> is the field type according to the .NET Common Language Runtime and <notes about max length or about value range> (present if some further specification is needed only) contains some notes about the maximum length of the fields or some comments about their range of values.

The fields described in the following paragraphs are the minimum set of fields which are mandatory for the correct management of a review inside EASTIN 2.0 prototype but in case the Community needs other additional fields in its interfaces and repository feel free to add them.

1. User registration

This Web page will contain a form for the collection of the following mandatory information:

– First name, UserFirstName, String, max chars: 200
– Last name, UserLastName, String, max chars: 200
– Geographical location, UserGeographicalLocation, String, max chars: 400

This information will be stored in your repository and identified by the unique key:

– UserID, Int32
All these fields, together with other additional fields you may need to store (for example username and password, email, etc.) will be persisted on your repository using the data types and structures that you prefer.

2. User login

Feel free to implement the user login Web page as you prefer. According to what you have proposed in the Madrid meeting we agreed that the authentication will be managed using the ASP.NET Form authentication pattern: if the login is successful an authentication cookie will be sent to the user’s browser, and this cookie will be used in your interface to keep trace of the identity of the user even if the user jumps out to EASTIN 1.1 interfaces and then comes back to the Community interfaces. For the authentication cookie use the name that you prefer (EASTIN 1.1 does not need to manage this cookie on its side).

3. Product review

After the registration/login, to express a review on a product the user has to be able to jump to the EASTIN 1.1 Community dedicated search interfaces and perform a product search. The jump to EASTIN 1.1 will be executed clicking on a link that you have to insert somewhere in the Community interfaces (may be in the Community home Page). Both the text and the target (that is the href attribute) of the link will be decided later during our development activities and it will be communicated to you at the proper time.

After the user has jumped in EASTIN 1.1 and has found the desired product he starts the review process by clicking on the “Review this product” button (see “EASTIN 2.0 Prototype Specs” figure 2). This button will be the submit button of a form contained in the EASTIN 1.1 Web page and the target of this form will be the Web page for Review on the Community side whose URL you will decide and communicate us. The submitted form will contain in the POST method the following field collection:

- ProductDatabaseID, String, max chars: 200
- ProductID, String, max chars: 200
- ProductCommercialName, String, max chars: 200
- ProductManufacturer, String, max chars: 200
- ProductIsoCode, String, max chars: 200
- ProductIsoClassificationVersion, String, max chars: 50
- OriginalEastinProductUrl, String, max chars: 400
- ProductImageUrl, String, max chars: 400

In the Community Web page for Review the user has to be presented with a form for the collection of the following mandatory information:

- Comment, Comment, String, max chars: 4000
- Dimension, Dimension, Int32 value from 1 to 5
- Weight, Weight, Int32 value from 1 to 5
- Ease in adjusting, EaseInAdjusting, Int32 value from 1 to 5
- Safety and security, SafetyAndSecurity, Int32 value from 1 to 5
- Durability, Durability, Int32 value from 1 to 5
- Ease of use, EaseOfUse, Int32 value from 1 to 5
- Comfort, Comfort, Int32 value from 1 to 5
- Effectiveness, Effectiveness, Int32 value from 1 to 5
All these fields are mandatory. The eight fields from **Dimension** to **Effectiveness** will be valorized with a single integer value in the range from 1 to 5; feel free to use the Web form input type (select, radio buttons, etc.) that you think is better, considering our accessibility aims.

Additional information to be stored in your repository association with the previous reviews data (but not visible to the user in the Web page) is:

- UserID, Int32
- ReviewID, Int32
- InsertDate, DateTime
- ProductDatabaseID, String, max chars: 200
- ProductID, String, max chars: 200
- ProductCommercialName, String, max chars: 200
- ProductManufacturer, String, max chars: 200
- ProductIsoCode, String, max chars: 200
- ProductIsoClassificationVersion, String, max chars: 50
- OriginalEastinProductUrl, String, max chars: 400
- ProductImageUrl, String, max chars: 400

UserID can be retrieved by means of the ASP.NET Forms authentication pattern (that is by mean of the authentication cookie); ReviewID must be created; InsertDate is the system’s current datetime; the eight fields from ProductDatabaseID to ProductImageUrl come from EASTIN 1.1 and are contained in the field collection of the POST method.

### 3. Product review Web service

All review fields inserted in the Community’s repository will be exposed to EASTIN 1.1 by means of a Web service. The Web service will be deployed at a public URL that you will communicate us. For the EASTIN 2.0 prototype neither authentication nor other security features (such as SSL tunneling) need to be implemented. The Web Service will be implemented using the new Microsoft Windows Communication Foundation (WCF) framework, part of the .NET Framework 4.0 and will expose an endpoint using the binding **WSHttpBinding**. The Web service contract will expose the following two Web methods:

3. **List<Review>** **FindProductReviewList**(String productDatabaseID, String productID)
   
   Input parameters:
   - **String** productDatabaseID: a string representing the unique ID of the national database containing the given product.
   - **String** productID: a string representing the unique ID in the national database of the given product.

   Returns:
   - a **List<Review>** object. This is a strongly typed list of Review objects. In case no reviews are present for the given product the method returns an empty (but not null) **List<Review>** object.

4. **Review** **FindProductReviewDetail**(Int32 reviewID)
   
   Input parameters:
   - **Int32** reviewID: the unique ID of the review in the Community repository.

   Returns:
   - a **Review** object.
Here is the definition of the objects that will be contained in the service data contract:

**Review** is a class made of the following properties:
- **Int32 ReviewID**: the unique ID of the review in the Community database
- **DateTime InsertDate**: the insert date of the review
- **String UserFirstName**: the first name of the user
- **String UserLastName**: the last name of the user
- **String UserGeographicalLocation**: the geographical location of the user (for example “Milan, Italy”)
- **List<Rate> ProductRates**: see the definition below
- **Int32 AggregateRate**: the average of all values contained in Rates list
- **String Comment**: the free text comment of the user;
- **String CultureCode**: the code (ISO 639-1 language code plus ISO 3166-1-alpha-2 country code, for ex “it–IT”, “es–ES”, “en–GB”) of the user’s culture

**Rate** is a class made of the following properties:
- **String FeatureName**: can assume one of the following values: “Dimension”, “Weight”, “Ease in adjusting”, “Safety and security”, “Durability”, “Ease of use”, “Comfort” and “Effectiveness”.
- **Int32 Value**: an integer between 1 and 5 expressing the satisfaction level of the user