



Introduction to REM 1.2.2

*Software Engineering and Databases Group
Department of Computer Languages and Systems
University of Seville
September 2015*

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Departamento de Lenguajes
y Sistemas Informáticos

- 1. What is REM?
- 2. Downloading REM
- 3. Installing REM
- 4. REM basics
 - 4.1 Project
 - 4.2 Base Document
 - 4.3 XML, XSLT & HTML
- 5. REM objects
 - 5.1 General
 - 5.2 Requirements
 - 5.3 Modeling
 - 5.4 Management

Introduction to REM 1.2.2

• REM origins

- PhD. Thesis "*A Methodological Environment of Requirements Engineering for Information Systems*", Amador Durán Toro, 2000.
- CICYT project "Methodologies, Tools and New Environments for Requirements Engineering" (MENHIR).
- Teaching experience with student projects (METRIC V2.1).
- Professional experience in application development and use of standards (MIL-STD-2167A, MIL-STD-498).
- Lack of methodologies for requirements engineering.
- Just a few, very complex requirements tools.

Un Entorno Metodológico de Ingeniería de Requisitos para Sistemas de Información

Departamento de Lenguajes y Sistemas Informáticos
Universidad de Sevilla



Sevilla, septiembre de 2000

Manuscrito de la tesis doctoral dirigida por el doctor José Miguel Toro Borón y defendida por Amador Durán Toro para optar al grado de Doctor en Informática por la Universidad de Sevilla

September 2015

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Introduction to REM 1.2.2

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- 2. Downloading REM
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 - 5.4 Management

Basic features of REM

- Free* requirements management tool.
- Simple, intuitive user interface.
- XML & XSLT based, it generates HTML.

*Permission of the author for non-academic use is required.

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2

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Introduction to REM 1.2.2

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- 2. Downloading REM
- 3. Installing REM
- 4. REM basics
 - 4.1 Project
 - 4.2 Base Document
 - 4.3 XML, XSLT & HTML
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 - 5.2 Requirements
 - 5.3 Modeling
 - 5.4 Management

Basic features of REM

- It uses requirements templates and linguistic patterns.
- Requirements are stored in a relational database (MS Access).
- All objects have a context menu.

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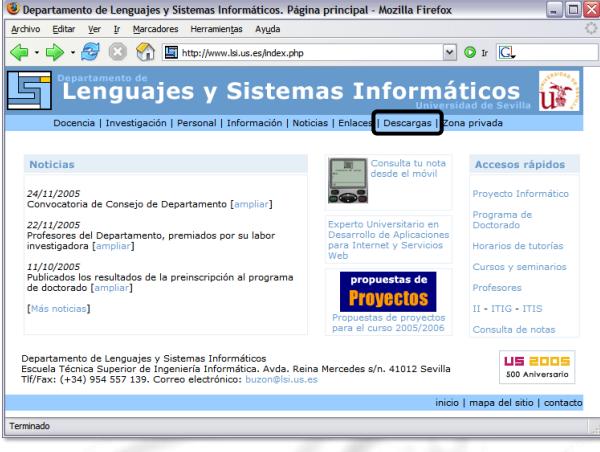
3

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RE

Introduction to REM 1.2.2

• REM website

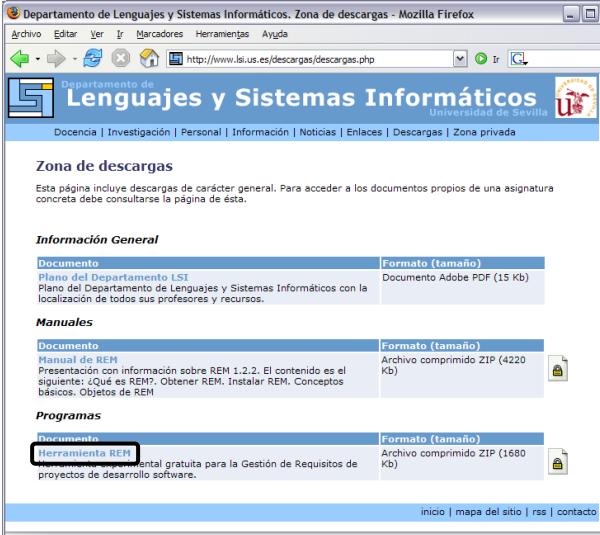


The screenshot shows the homepage of the Departamento de Lenguajes y Sistemas Informáticos (LSI) at the Universidad de Sevilla. The page features a sidebar with a navigation menu and a main content area with news items and links. A red box highlights the 'Descargas' link in the top navigation bar.

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Introduction to REM 1.2.2

• REM website



The screenshot shows the 'Descargas' (Downloads) page of the LSI website. It lists various documents and software packages. A red box highlights the 'Herramienta REM' link under the 'Documentos' section.

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Introduction to REM 1.2.2

• REM website

Herramienta REM
Descripción
REM (Requisito Management) es una herramienta experimental gratuita de Gestión de Requerimientos diseñada para soportar la fase de Ingeniería de Requerimientos de un proyecto de desarrollo software de acuerdo con la metodología descrita en la Tesis Doctoral "Un Entorno Metodológico de Ingeniería de Requerimientos para Sistemas de Información", presentada por Amador Durán en septiembre de 2000.

Información básica

Fecha: 25/11/2004
Versión: 1.2.2
Tamaño: 1680 KB
Plataformas: Windows 95/98/ME/NT/2000/XP
Requerimientos: Internet Explorer 5 y biblioteca DAO 3.5
Descargas: 1780
Autor: Amador Durán Toro
Contraseña: Si

Recursos

Metodología: Un Entorno Metodológico de Ingeniería de Requerimientos para Sistemas Software. (versión 2.2)
El objetivo de esta metodología es la definición de las tareas a realizar, los productos a obtener y las técnicas a emplear durante la actividad de elección de requisitos de la fase de ingeniería de requisitos del desarrollo de software.
Metodología: Un Entorno Metodológico de Ingeniería de Requerimientos para Sistemas Software. (versión 2.2)
El objetivo de esta metodología es la definición de las tareas a realizar, los productos a obtener y las técnicas a emplear durante la actividad de análisis de requisitos de la fase de ingeniería de requisitos del ciclo de vida de la ingeniería de requisitos.

[+] Ampliar imagen

Herramienta REM
Versión 1.2.2
Descargar

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• REM website

Descarga de documento protegido

Para descargar el documento **Herramienta REM** debe introducir una contraseña

Contraseña:

enviar

Si desea obtener la contraseña rellene y envíe este formulario

[Volver a la página de descargas | Volver a la página del programa]

inicio | mapa del sitio | contacto

Terminado

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Introduction to REM 1.2.2

• REM website

The screenshot shows a Mozilla Firefox window displaying the REM website. The URL is http://www.lsi.us.es/descargas/solicita_descarga.php?id=3&lang=es. The page title is "Solicitud de contraseña para la descarga de documento protegido - Mozilla Firefox". The main content is a form titled "Solicitud de contraseña para la descarga de documento protegido" with fields for Name, Institution, City, Country, and Role (Developer). A yellow box highlights the "solicitar contraseña" button. Below the form are links to "Volver a la página de descargas" and "Volver a la página del programa". At the bottom, there are links to "inicio", "mapa del sitio", and "contacto".

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Introduction to REM 1.2.2

• Installation process

- It needs **MSXML3** (comes with IE6) and **DAO 3.5** (shipped with Windows*).
- Decompress **REM_1_2_2.zip** to a temporary directory and run **SETUP.EXE**

The screenshot shows a Windows File Explorer window with the path "P:\Temp\REM_1_2_2". The contents of the folder are listed in a table:

Nombre	Tamaño	Tipo	Fecha de modificación
JN32I.EXE	294 KB	Archivo EXE	19/11/1997 17:05
JSD32.EXE	8 KB	Aplicación	19/11/1997 17:05
setup.dll	11 KB	Extensión de la aplicación	19/11/1997 17:08
sys1.cab	183 KB	MS-Cabinet-Archiv	07/10/2004 17:17
user1.cab	45 KB	MS-Cabinet-Archiv	07/10/2004 17:17
data1.cab	1,081 KB	MS-Cabinet-Archiv	07/10/2004 17:17
DATA.TAG	1 KB	Archivo TAG	07/10/2004 17:17
leng.dat	5 KB	Archivo DAT	30/05/1997 12:31
layout.bin	1 KB	Archivo BIN	07/10/2004 17:17
os.dat	1 KB	Archivo DAT	06/05/1997 15:15
setup.bmp	425 KB	ACDSee BMP Image	20/09/2004 0:41
SETUP.EXE	59 KB	Aplicación	19/11/1997 17:09
setup.inf	1 KB	Opciones de configuración	07/10/2004 17:17
setup.ins	59 KB	Configuración de comunica...	22/09/2004 19:05
setup.id	1 KB	Archivo IID	07/10/2004 17:17

* NT-based Windows since 2000.

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Introduction to REM 1.2.2

• Installation process

The screenshot shows the REM 1.2.2 Setup program interface. On the left, there is a sidebar with the University of Seville logo and a navigation menu:

- 1. What is REM?
- 2. Downloading REM
- 3. Installing REM**
- 4. REM basics
 - 4.1 Project
 - 4.2 Base Document
 - 4.3 XML, XSLT & HTML
- 5. REM objects
 - 5.1 General
 - 5.2 Requirements
 - 5.3 Modeling
 - 5.4 Management

The main window title is "Introduction to REM 1.2.2". Below it, a section titled "Installation process" contains a bulleted list.

Welcome window:

Welcome to the REM 1.2.2 Setup program. This program will install REM 1.2.2 on your computer.

It is strongly recommended that you exit all Windows programs before running this Setup program.

Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.

Software License Agreement window:

WARNING: international
Unauthorized portion of it, n
will be prosec

Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.

REM has been developed at the Department of Computer Languages and Systems of the University of Seville by Amador Durán Toro as part of his PhD Thesis.

Any feedback is welcomed to amador@isi.us.es

[Spanish]
REM es una herramientas CASE experimental para ingeniería de requisitos. Está diseñada para uso académico por lo que su uso para fines comerciales no se permite sin permiso por parte del autor.

REM se ha desarrollado en el Departamento de Lenguajes y Sistemas Informáticos de la Universidad de Sevilla por Amador Durán Toro como parte de su tesis doctoral.

Cualquier comentario es bienvenido en amador@isi.us.es

Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install REM 1.2.2, you must accept this agreement.

< Back Yes No

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Introduction to REM 1.2.2

• Installation process

The screenshot shows the REM 1.2.2 Setup program interface. On the left, there is a sidebar with the University of Seville logo and a navigation menu, identical to the previous screenshot.

The main window title is "Introduction to REM 1.2.2". Below it, a section titled "Installation process" contains a bulleted list.

Choose Destination Location window:

Setup will install REM 1.2.2 in the following folder.

To install to this folder, click Next.

To install to a different folder, click Browse and select another folder.

You can choose not to install REM 1.2.2 by clicking Cancel to exit Setup.

Select REM default language window:

Please, select the default language for the REM user interface. This can be also set in the options menu.

English

Spanish

German

< Back Next > Cancel

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Introduction to REM 1.2.2

• Installation process

The screenshot shows the REM 1.2.2 installation interface. On the left, a sidebar lists topics from 'What is REM?' to 'Management'. A central window titled 'Information' contains a message about a bug in InstallShield for Visual C++, requiring manual removal of the Ctrl-Z character at the end of a file. Below it, a 'Setup Complete' window shows a computer icon and the text 'REM 1.2.2 Setup is almost complete.' It also includes a note about removing the Ctrl-Z character and the path 'C:\Archivos de programa\REM 1.2.2\xml\default\REM_TraceImage.xls'. A large grey arrow points from the warning dialog down towards the setup complete window.

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Introduction to REM 1.2.2

• Installation process

The screenshot shows the REM 1.2.2 installation interface. On the left, a sidebar lists topics from 'What is REM?' to 'Management'. A central window titled 'REM_TraceImage.xls - Bloc de notas' displays XML code related to the trace image. A second window titled 'Documento de Requisitos del Sistema' shows a requirements document with sections like 'Proyecto SinNombre1', 'Documento de Requisitos del Sistema', 'Versión 1.0', 'Fecha 26/11/2005', 'Preparado para:', and 'Preparado por:'. A large grey arrow points from the note in the text editor down towards the requirements document.

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The diagram illustrates the REM Architecture. At the top right, a man in a suit sits at a desk, looking at a laptop screen. Below him, four icons representing different countries (Spain, UK, Germany) are positioned above three large cylinders labeled "Resources DLL", "Base Document", and "REM Document". Each cylinder has an asterisk (*) next to it. Double-headed arrows connect the cylinders to a central software interface window titled "REM 1.2.2 - Editor de documentos". This window shows a hierarchical tree structure of document components. To the right of the interface, a bracket groups two boxes: "XML" and "Transformed XML (HTML)". Double-headed arrows connect the interface to both of these boxes. Below the interface, two more cylinders are shown: "REM DTD" and "XSLT", also with an asterisk (*). Double-headed arrows connect the interface to both of these cylinders. A note at the bottom left states "* User configurable".

Introduction to REM 1.2.2

• REM Architecture

- 1. What is REM?
- 2. Downloading REM
- 3. Installing REM
- 4. REM basics
 - 4.1 Project
 - 4.2 Base Document
 - 4.3 XML, XSLT & HTML
- 5. REM objects
 - 5.1 General
 - 5.2 Requirements
 - 5.3 Modeling
 - 5.4 Management

* User configurable

Introduction to REM 1.2.2

• MDI Interface

- REM has an MDI interface, so you can have multiple open projects and several windows of the same project.

Figura 8: Prensa

Proveedor : Entidad suministradora de **materias primas**. La empresa tiene a su alcance una lista de proveedores de los cuales se obtienen cada una de las diferentes materias.

Pulidora : **Máquina** que se utiliza para pulir determinados tipos de losas.

Punta diamante : Tipo de losa cuya cara presenta el aspecto que se puede observar en la

Introduction to REM 1.2.2

REM Projects

- In REM, a Requirements Engineering project consists of four documents:
 - *System Requirements Document*
 - *System Analysis Document*
 - *Conflict and Defects Registry*
 - *Requirements Change Requests Registry*
- Projects are saved as files with **.rem** extension (MS Access databases).
- XML and HTML files are automatically regenerated.
- Creating a folder for figures in the project folder is recommended.

September 2015 Requirements Engineering 16

Introduction to REM 1.2.2

Base document

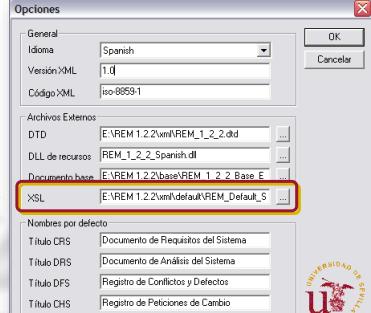
- When you create a new project, REM copies a base default project (document).
- The default is an empty project, but you can specify any project as the base project.
- Just save it in **%REM_HOME%/base** and configure REM options.

September 2015 Requirements Engineering 17

Introduction to REM 1.2.2

XSLT Stylesheet

- Whenever there is a change in a project, REM regenerates HTML by regenerating XML and transforming it applying an external XSLT stylesheet.
- It generates an HTML document by default, but you can develop stylesheets to generate different documents.

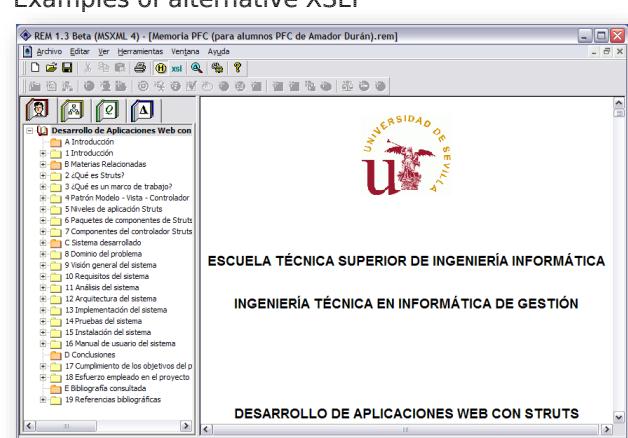


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Introduction to REM 1.2.2

XSLT Stylesheet

- Examples of alternative XSLT



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Introduction to REM 1.2.2

XSLT Stylesheet

- Examples of alternative XSLT

The screenshot shows the REM 1.3 Beta interface with the title 'REM 1.3 Beta (MSXML 4) - [Memoria PFC (para alumnos PFC de Amador Durán).rem]'. The left sidebar lists chapters 1 through 5. The main pane displays a requirement titled '1.1 Motivación' with a detailed description. Below it is another requirement titled '1.2 Objetivos del proyecto'.

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XSLT Stylesheet

- Examples of alternative XSLT

The screenshot shows the REM 1.3 Beta interface with the title 'REM 1.3 Beta (MSXML 4) - [ELCANO SLL.rem]'. The left sidebar lists chapters 1 through 5. The main pane displays a requirement titled 'ProyectoELCANO SLL' with a 3D bar chart titled 'Frequency of different types of requirements' showing data for categories OBQ, RQ, CRQ, UC, FRO, and NFR.

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- XSLT Stylesheet
 - Examples of alternative XSLT

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- XSLT Stylesheet
 - Examples of alternative XSLT

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Introduction to REM 1.2.2

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1. What is REM?
2. Downloading REM
3. Installing REM
4. REM basics
4.1 Project
4.2 Base Document
4.3 XML, XSLT & HTML
5. REM objects
5.1 General
5.2 Requirements
5.3 Modeling
5.4 Management

REM objects

- **First-level objects** are created with the **creation toolbar** and assigned as children to the selected object in the tree view.*
- All objects have a context menu with the *Clone*, *Edit properties*** and *Delete*.*** options.
- **Second-level objects** are created using the context menu of their potential parent objects.
- Objects can change their parent via drag&drop or copy&paste.
- During drag&drop, the cursor indicates if the object is accepted () or rejected () as child.

* Or to the root object if the selected object does not accept it as a child.
** Double click on an object is equivalent to the edit properties option.
*** An object can only be removed if is not referenced by any other object.

September 2015 Requirements Engineering 24

Introduction to REM 1.2.2

UNIVERSIDAD DE SEVILLA
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Departamento de Lenguajes y Sistemas Informáticos

1. What is REM?
2. Downloading REM
3. Installing REM
4. REM basics
4.1 Project
4.2 Base Document
4.3 XML, XSLT & HTML
5. REM objects
5.1 General
5.2 Requirements
5.3 Modeling
5.4 Management

REM objects

- All objects have common and type-specific properties.
- The properties edition dialog groups common properties in the same tabs.*

Objetivo

General	Descripción	Prioridad	Rastreabilidad	Historia	Comentarios
Identificación	OBJ-0001	Nombre	Gestionar las solicitudes de ayuda		
Versión	Número	1	0	Fecha	23/11/2005
Autores	Durán Toro, Amador			Añadir autor	Eliminar autor
Fuentes	Humanes Pereira, Fernando			Añadir fuente	Eliminar fuente

*User interface design pattern *Tabbed Hierarchy* [Duran et al., 2002]

September 2015 Requirements Engineering 25

Introduction to REM 1.2.2

REM objects

- All objects have common and type-specific properties.
- The properties edition dialog groups common properties in the same tabs.*

*User interface design pattern *Tabbed Hierarchy* [Duran et al., 2002]

September 2015 Requirements Engineering 26

Introduction to REM 1.2.2

Section / Appendix [📁📁]

- They represent document sections or appendices.
- They accept any first-level object as a child.
- Sections are numbered traditionally; appendices as A, B, C, etc.
- Their children objects can be sorted by name, useful for the development of glossaries of terms.

September 2015 Requirements Engineering 27

Introduction to REM 1.2.2

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- Section / Appendix [📁📁]
- Example of use

The screenshot shows the REM 1.3 Beta software interface. On the left, there's a sidebar with the university logo and a navigation menu. The main area displays a hierarchical tree structure of requirements under 'Documento de Requisitos del Sistema Curso'. To the right, there's a detailed index with various sections like 'Introducción', 'Participantes en el proyecto', and 'Objetivos del sistema'. A vertical toolbar on the right side contains various icons for different functions.

September 2015 Requirements Engineering 28

Introduction to REM 1.2.2

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Departamento de Lenguajes y Sistemas Informáticos

- Paragraph / glossary item [📄]
- Free text paragraphs or glossary item definitions.
- Links to glossary items are automatically generated when their names appear in the text of any object.
- The object name (ignored in paragraphs) is the name of the glossary item.

The screenshot shows a dialog box titled 'Párrafo/Elemento de glosario' with tabs for General, Detalle, Rastreabilidad, Historia, and Comentarios. The 'General' tab is selected. It has a text area containing the text 'Este sería el texto del párrafo o la definición del elemento de glosario.' and a checkbox at the bottom labeled 'El párrafo es un elemento de glosario'. A red watermark of the university logo is visible across the screen.

September 2015 Requirements Engineering 29

Introduction to REM 1.2.2

- Paragraph / glossary item [¶]
- Example of use (paragraph)

The screenshot shows the REM 1.3 Beta interface with a glossary item open. The left sidebar has a tree view of topics under 'REM objects'. The main area shows a glossary entry for 'Motivación' (Motivation) with its definition and examples. A large image of a forklift (Ferwi) is displayed on the right.

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Introduction to REM 1.2.2

- Paragraph / glossary item [¶]
- Example of use (glossary item)

The screenshot shows the REM 1.3 Beta interface with a glossary item open. The left sidebar has a tree view of topics under 'REM objects'. The main area shows a glossary entry for 'Ferwi' (Ferwi) with its definition and a photograph of a forklift. A caption below the image reads 'Figura 5 Ferwi'.

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Introduction to REM 1.2.2

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1. What is REM?
2. Downloading REM
3. Installing REM
4. REM basics
4.1 Project
4.2 Base Document
4.3 XML, XSLT & HTML
5. REM objects
5.1 General
5.2 Requirements
5.3 Modeling
5.4 Management

September 2015 Requirements Engineering 32

Graphic file []

- External image files.
- Any image type supported by Internet Explorer can be inserted and displayed properly, e.g. WMF or EMF (vector formats).
- It stores a relative path from the project file (*.rem) location, allowing project mobility in the file system.

Fichero gráfico

General Detalles Rastreabilidad Historia Comentarios

Ruta:

Imagenes Gestión de PFC.emf

Aceptar Cancelar

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Introduction to REM 1.2.2

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Departamento de Lenguajes y Sistemas Informáticos

1. What is REM?
2. Downloading REM
3. Installing REM
4. REM basics
4.1 Project
4.2 Base Document
4.3 XML, XSLT & HTML
5. REM objects
5.1 General
5.2 Requirements
5.3 Modeling
5.4 Management

September 2015 Requirements Engineering 33

Graphic file []

- Example of use (EMF exported from Visio)

REM 1.3 Beta (MSXML 4) - [Curso ICM.rem]

Archivo Editor Ver Herramientas Ventana Ayuda

3 Descripción del sistema actual

Profesor CA

Diseñar PFC
Diseñar PFC
Revisar PFC
Notificar Profesor
Publicar PFC

HTML generado en 0.34 segundo HTML activo NUM

Introduction to REM 1.2.2

Organization []

- Information about the participating organizations.
- It allows to indicate which organizations the documents are prepared for and by.

The screenshot shows two dialog boxes side-by-side. The left dialog is titled 'Organización' and contains fields for 'Dirección' (ETSI Informática, Avda. Reina Mercedes, s/n), 'Teléfono' (954 55 31 79), and 'Fax' (954 55 31 79). The right dialog is titled 'Documento de especificación' and contains fields for 'Nombre' (Documento de Requisitos del Sistema), 'Versión' (Número 1), 'Fecha' (23/11/2005), 'Preparado para' (Informática de la Comunidad de Madrid), and 'Preparado por' (Dpto. de Lenguajes y Sistemas Informáticos). Arrows point from the 'Prepared for' and 'Prepared by' fields in the specification document to their respective entries in the organization dialog.

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Introduction to REM 1.2.2

Organization []

- Example of use (organizations information)

The screenshot shows the REM application interface with a tree view on the left and two detailed panes on the right. The tree view shows a node for 'Organizaciones participantes'. The right pane has two sections: '2.1 Organizaciones participantes' and '2.2 Personas participantes'. The first section displays information for 'Organización Dpto. de Lenguajes y Sistemas Informáticos' (Dirección: ETSII Informática, Avda. Reina Mercedes, s/n; Teléfono: 954 55 31 79; Fax: 954 55 31 79; Comentarios: Ninguno) and 'Organización Informática de la Comunidad de Madrid' (Dirección: Consejería de Hacienda, c/ Embajadores, 181, 28045 Madrid; Teléfono: 915 80 50 00; Fax: 915 80 50 89; Comentarios: Ninguno). The second section shows 'Personas participantes' but the list is empty.

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Introduction to REM 1.2.2

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- Organization [🌐]
- Example of use (document cover)

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Introduction to REM 1.2.2

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- Stakeholder [👤]
- Information about the people involved in the project: developers, customers, users, etc..
- They can be set as authors and sources of requirements and other first-level objects.

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• Stakeholder [User]

- Example of use

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• Meeting [User]

- Information about interviews or meetings, including the minutes.

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- Meeting [b]
- Example of use

The screenshot shows the REM 1.3 Beta software interface. On the left, there is a sidebar with the University of Seville logo and a navigation menu:

- 1. What is REM?
- 2. Downloading REM
- 3. Installing REM
- 4. REM basics
 - 4.1 Project
 - 4.2 Base Document
 - 4.3 XML, XSLT & HTML
- 5. REM objects
 - 5.1 General
 - 5.2 Requirements
 - 5.3 Modeling
 - 5.4 Management

The main window displays a meeting agenda for a course meeting:

Reunión	Reunión sobre curso ICM
Fecha	16/11/2005
Hora	11:30
Lugar	Stand de Microsoft en el SIMO
Asistentes	<ul style="list-style-type: none"> Durán Toro, Amador Ruiz Cortés, Antonio Vara de Rey, Adolfo
Resultados	<p>En este primer encuentro con Adolfo Vara de Rey se intercambiaron impresiones sobre diversos temas relacionados con formación y se llegó al acuerdo de impartir el primer curso sobre REM en ICM.</p> <p>El resto de la reunión se dedicó a fijar los detalles técnicos del desplazamiento al curso, alojamiento, dietas y remuneración.</p> <p>En general, la reunión fue muy productiva y abrió una interesante línea de colaboración que es de esperar que da sus frutos en un futuro cercano.</p> <p>HTML generado en 0.33 segundo(s) HTML activo</p>

On the right side of the interface, there is a vertical toolbar with various icons, and one icon (a person) is highlighted with a red circle.

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Introduction to REM 1.2.2

- Objective [o]
- High-level requirements, usually in a hierarchy (other objectives are accepted as children).
- Information about prioritization and traceability is included (all requirements include it).

The screenshot shows the REM 1.3 Beta software interface. On the left, there is a sidebar with the University of Seville logo and a navigation menu:

- 1. What is REM?
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- 3. Installing REM
- 4. REM basics
 - 4.1 Project
 - 4.2 Base Document
 - 4.3 XML, XSLT & HTML
- 5. REM objects
 - 5.1 General
 - 5.2 Requirements
 - 5.3 Modeling
 - 5.4 Management

The main window displays three overlapping dialog boxes for managing requirements:

- Objetivo**: A dialog box for defining the objective. It has tabs for General, Descripción, Prioridad, Rastreabilidad, Historia, and Comentarios. The General tab contains the text: "El sistema deberá... gestionar la información correspondiente a los clientes de la empresa Escane SLL. El sistema permitirá almacenar toda la información relevante sobre los clientes y su administración y gestión de los clientes como: sus datos personales, su actividad, su historial de compras, etc." and a "Objetivo" button.
- Importancia**: A dropdown menu for setting the importance of the objective, with options like "Importante" and "Muy importante".
- Urgencia**: A dropdown menu for setting the urgency of the objective, with options like "Inmediatamente" and "Pronto".
- Estado de desarrollo**: A dropdown menu for setting the development status of the objective, with options like "Pendiente de verificación" and "Listo".
- Estabilidad**: A dropdown menu for setting the stability of the objective, with options like "Alta" and "Media".
- Objetivo**: Another dialog box for defining the objective, similar to the first one, with tabs for General, Descripción, Prioridad, Rastreabilidad, Historia, and Comentarios. It also has "Aceptar" and "Cancelar" buttons.
- Trazas desde este objeto**: A dialog box for tracing requirements. It has tabs for Origin and Destino. The Origin tab lists requirements: "[IRQ-0004] Consulta de clientes", "[IRQ-0001] Datos generales sobre clientes", and "[IRQ-0002] Datos económicos sobre clientes". The Destino tab is currently empty.
- Trazas hacia este objeto**: A dialog box for tracing requirements. It has tabs for Origin and Destino. The Origin tab lists requirements: "[IRQ-0004] Consulta de clientes", "[IRQ-0001] Datos generales sobre clientes", and "[IRQ-0002] Datos económicos sobre clientes". The Destino tab is currently empty.

On the right side of the interface, there is a vertical toolbar with various icons, and one icon (a target) is highlighted with a red circle.

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• **Objective [Ø]**

- Example of use

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• **Actor [♂]**

- Usually, user types; sometimes others systems.
- Used in the specification of cases use steps.

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Introduction to REM 1.2.2

• Actor [✖]

– Example of use

The screenshot shows the REM 1.3 Beta interface. On the left, there's a navigation tree with categories like 'What is REM?', 'Downloading REM', 'Installing REM', 'REM basics', 'REM objects', 'General', 'Requirements', 'Modeling', and 'Management'. A sub-menu under 'Requirements' is highlighted. In the center, a window titled 'REM 1.3 Beta (MSXML 4) - [Memoria PFC.rem]' displays an actor named 'ACT-0003 Usuario anónimo'. The window includes fields for 'Versión' (1.0 / 24/08/2005), 'Autores' (Pablo Rubiano Sosa, Prof. Dr. D. Amador Durán Toro), 'Fuentes', and 'Descripción' (A brief description in Spanish about anonymous users). Below the window, a UML-like diagram shows a stick figure interacting with a rectangle labeled 'Información Asignatura'. The status bar at the bottom indicates 'HTML generado en 2.22 segundos HTML activo'.

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Introduction to REM 1.2.2

• Information requirement [ⓘ]

– Information that must be stored by the system in order to satisfy the objectives, indicating specific data.

The screenshot shows the REM 1.3 Beta interface. The left sidebar has the same navigation tree as the previous screenshot. Two dialog boxes are open in the foreground. The top dialog is 'Requisito de información' with tabs for 'General', 'Detalle', 'Prioridad', 'Rastreabilidad', 'Historia', and 'Comentarios'. It contains fields for 'Concepto relevante' (el nivel y tipo de aceite en cada uno de los depósitos), 'Tiempo máximo de vida' (Valor: 10, Unidad de tiempo: año(s)), 'Tiempo medio de vida' (Valor: 7, Unidad de tiempo: año(s)), and 'Ocurrencias simultáneas' (Número máximo: 30, Número medio: 25). The bottom dialog is 'Datos específicos' with tabs for 'Descripción' and 'Comentarios'. It has a single field 'Descripción' containing 'Capacidad del depósito'. Both dialogs have 'Aceptar' and 'Cancelar' buttons.

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• **Information requirement [i]**

– Example of use

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• **Constraint requirement (business rule) [✓]**

– Business rules that must be considered when developing the new system.

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- Constraint requirement (business rule) [✓]
- Example of use

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Introduction to REM 1.2.2

- Use case [○]
- Services the system must provide to the actors.
- Formed by a sequence of steps that may have exceptions.

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Introduction to REM 1.2.2

- Use case [U]

– Example of use

The screenshot shows the REM 1.3 Beta software interface. On the left, there's a navigation tree with categories like 'What is REM?', 'Downloading REM', 'Installing REM', 'REM basics', 'REM objects', and 'REM management'. A specific node under 'REM objects' is highlighted. The main window displays a use case diagram with several actors (Client, Employee, System) and their interactions. A detailed description of a use case, 'UC-0001 Alquilar furgoneta', is shown in a central panel. This description includes version information (1.0 / 16/10/2002), authors (Dra. Tora Angulo), sources (Documentos generales), dependencies (IBSL-0002, IBSL-0003, IBSL-0005), and a pre-condition. The 'Secuencia normal' (Normal Sequence) section contains numbered steps describing the interaction between the client and the system. A status bar at the bottom indicates 'HTML generado en 0.48 segundos. HTML activo'.

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Introduction to REM 1.2.2

- Functional requirements [F]

– Services the system must provide to the actors described in the *classical* way.

The screenshot shows the REM 1.3 Beta software interface. Similar to the previous slide, it features a navigation tree on the left and a use case diagram in the center. A functional requirement dialog box is open in the foreground, titled 'Requisito funcional'. It has tabs for 'General', 'Descripción', 'Prioridad', 'Restrictividad', 'Historia', and 'Comentarios'. The 'Descripción' tab contains a text area with the following content:

El sistema deberá:

permitir a los usuarios consultar qué furgonetas están alquiladas en un momento dado, indicando matrícula, modelo, fecha de inicio de alquiler y fecha prevista de entrega. El usuario podrá ordenar la lista de furgonetas por cualquiera de los datos indicados e imprimirla si lo desea.]

A small watermark of the University of Seville logo is visible in the background of the slide.

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Introduction to REM 1.2.2

Functional requirements [F]

– Example of use

The screenshot shows the REM 1.2.2 application window. On the left, there's a sidebar with the University of Seville logo and a navigation menu:

- 1. What is REM?
- 2. Downloading REM
- 3. Installing REM
- 4. REM basics
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 - 5.2 Requirements
 - 5.3 Modeling
 - 5.4 Management

The "5.2 Requirements" option is highlighted. The main area displays a requirement document titled "FRQ.0001 - Listado de alquileres". The document includes fields like Version, Authors, Sources, Dependencies, Description, Importance, Urgency, State, Stability, and Comments. A large text area contains the detailed description of the requirement.

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Introduction to REM 1.2.2

Nonfunctional requirements [nf]

– Any other requirements that do not fit into the previous categories.

The screenshot shows a modal dialog box titled "Requisito no funcional" (Non-functional requirement). It has tabs for General, Descripción, Prioridad, Rastreabilidad, Historia, and Comentarios. The General tab is selected, showing a text area with the following content:

El sistema deberá...
ser conforme a los estándares XHTML 1.1 y CSS 2, así como a la recomendación de accesibilidad de sitios web WAI.

A small watermark of the University of Seville logo is visible in the bottom right corner of the dialog.

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Nonfunctional requirements [NF]

- Example of use

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Traceability matrix [TM]

- It displays dependencies graphically.

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- Traceability matrix [grid]
- Example of use

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Introduction to REM 1.2.2

- Object type (class) [document]
- Sets of objects with the same properties.
- They can have attributes, components (embedded objects) and invariants.

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Object type (class) [U]

- Example of use

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Value type [V]

- An enumeration of values or a complex value type (e.g. Address).

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Introduction to REM 1.2.2

- **Value type** [V]
- Example of use

The screenshot shows the REM 1.3 Beta interface with the title "REM 1.3 Beta (MSXML 4) - [LOSAS.REM]". On the left, there is a navigation tree with categories like "What is REM?", "Downloading REM", "Installing REM", "REM basics", "REM objects", "General", "Requirements", "Modeling", and "Management". The "Modeling" category is currently selected. The main area displays two value types: "VAL-0001 TipoCliente" and "VAL-0002 EstadoEncargo". The "TipoCliente" entry includes fields for Version (1.0 / 13/01/2005), Authors (Andrea Ferradas Garcia, Javer Quesada Tejero, Jesus Dominguez Pineda, Manuel Cabra Fernandez, Vanesa Bautista Ramos), Dependencies (None), Description (This value type represents the two types of clients that can exist in the system: special, which will be used for documents, and normal.), Definition (esum(especial,normal)), and Comments (None). The "EstadoEncargo" entry has a similar structure. A vertical toolbar on the right contains icons for various operations.

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Introduction to REM 1.2.2

- **Association** [A]
- Relationship between two object types.
- Apart from attributes, components and invariants, they must have **roles**.

The screenshot shows three windows from the REM 1.3 Beta interface. The first window, "Asociación", has tabs for General, Detalle, Descripción, Rastreabilidad, Historia, and Comentarios. It shows a note: "Esta asociación es derivada". The second window, also titled "Asociación", has similar tabs and a note: "Esta asociación representa el hecho de que un cliente realiza un encargo". The third window, titled "Rol", has tabs for General, Detalle, Descripción, Rastreabilidad, Historia, and Comentarios. It shows a role named "cliente" with a type base of "[TYP-0001] Cliente", multiplicity of 0..1, and a limit superior of 1. A vertical toolbar on the right contains icons for various operations.

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Introduction to REM 1.2.2

• Association [A]

– Example of use

September 2015 Requirements Engineering 62

Introduction to REM 1.2.2

• System operation [op]

- Specific service provided by the system involving some internal objects.
- It can have parameters, a result type, pre & postconditions and exceptions.

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Introduction to REM 1.2.2

• System operation [OP]

– Example of use

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• Conflict [!!]

- Problem detected in the requirements: lack of information, contradictions, etc...
- It can include alternative solutions.

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Introduction to REM 1.2.2

• Conflict [⚠]

– Example of use

The screenshot shows the REM 1.3 Beta software interface. On the left, there is a sidebar with the University of Seville logo and a navigation menu:

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The main window displays a conflict resolution dialog titled "CFL-0001 Devolución de artículos". The dialog shows a list of detected conflicts and their descriptions. One conflict is highlighted:

CFL-0001 Devolución de artículos
 Versión 1.0 (26/11/2005)

Conflictos detectados:

- [CFL-0001] Devolución de artículos metalúrgicos
- [CFL-0002] Descuento en la siguiente compra
- [CFL-0003] Cambio por otro artículo
- [CFL-0004] Concordancia con facturas impagadas

Defectos detectados:

- [CFL-0005] Facturas impagadas

Detalles del conflicto:

Subir **Bajar** **Añadir una nueva alternativa...** **Editar propiedades...** **Clonar** **Eliminar**

Descripción: Durán Toro
quesada Tejero
información sobre pedidos
realización de un pago de un cliente
es solicitado
compuesto por
incluye a
realizado a
tiene asignada

Possible solución: No queda suficientemente claro qué es lo que tiene que hacer el sistema en el caso del registro de una devolución de uno o más artículos por parte del cliente.

Importancia: importante

Impacto: Después de consultar con varias fuentes, la solución adoptada ha sido considerar que cuando un cliente devuelve uno o más artículos, se registran las siguientes situaciones de cantidad negativas, p.e. -3 si devuelve tres unidades de un producto, y se le abonará en metálico para importes inferiores a 50 euros y por transferencia para importes mayores.

HTML generado en 2.45 segundos / HTML activo

September 2015 Requirements Engineering 66

Introduction to REM 1.2.2

• Defect (nonconformity) [🚫]

- Lack of quality in one or more requirements.
- As with conflicts, they can have alternatives and their impact can be computed.

The screenshot shows three overlapping dialog boxes from the REM 1.3 Beta software:

- Defecto** (Top): A general dialog for reporting defects. It has tabs for General, Detalle, Solución, Prioridad, Impacto, Historia, and Comentarios. Buttons for Aceptar and Cancelar are at the top right. A dropdown menu for "Tipo de defecto" is open, showing options like Ambigüedad, Incapacidad, Incomprendibilidad, etc.
- Defecto** (Middle): A detailed view of a specific defect. It shows a list of affected objects under "Objetos afectados directamente" and "Objetos afectados indirectamente".
- Defecto** (Bottom): Another detailed view of a defect, showing similar information about affected objects.

The sidebar on the left is identical to the one in the previous screenshot, listing the same navigation items.

September 2015 Requirements Engineering 67

Introduction to REM 1.2.2

Defect (nonconformity) [⊖]

- Example of use

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Introduction to REM 1.2.2

Change request [Ⓐ]

- Request of one or more changes in one or more requirements.

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Introduction to REM 1.2.2

• Change request [A]

– Example of use

The screenshot shows the REM 1.3 Beta software interface. A central window displays a change request titled "CHR-0001 Incorporación de nuevos materiales". The window includes sections for "Versión" (Version), "Autores" (Authors), "Fuentes" (Sources), "Afecta directamente" (Affects directly), "Afecta indirectamente" (Affects indirectly), "Descripción" (Description), and "Análisis" (Analysis). The "Afecta directamente" section lists several requirements, such as "ASO-0002 compuesto_por" and "ASO-0003 es_encargado". The "Descripción" section contains a detailed text about the incorporation of new materials. The "Análisis" section notes the need to expand information about materials. On the left, a sidebar lists various topics related to REM. On the right, there is a vertical toolbar with icons and a status bar at the bottom.

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Introduction to REM 1.2.2

• Comments, suggestions, ...

The screenshot shows the REM 1.3 Beta software interface. A large, semi-transparent watermark of a hand holding a pen is overlaid on the screen. In the upper right area, there is a red stamp with the text "Amador Durán Toro" and "amador@us.es". Below the stamp, smaller text reads "Department of Computer Languages and Systems, E.T.S. Computer Engineering, University of Seville, Spain". On the left, a sidebar lists various topics related to REM. The main area of the interface is mostly blank, indicating a comment or suggestion has been made.

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