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APPENDIX I. GLOSSARY TERMS

A/E/C   Architecture / Engineering/ Construction

A/E   Architecture / Engineering

ASP   Application Service Provider

CAD   Computer Aided Design

CIB   International Council for Building Research Studies and Documentation

CIPIC   Construction Industry Project Information Committee

CO   Change Order

CPM   Critical Path Method

CTE   Codigo Tecninco de la Edificacion

DB   Database

DBMS   Database Management Systems

DM   Data Model

DMS   Document Management Systems

EDI   Electronic Data interchange

EDMS   Electronic Document Management Systems

EICS   Engineering Information Creation System

EIMS   Engineering Information Management System

ERMS   Enterprise Resource Management System

ERP   Enterprise Resource Planning System

HVAC   Heating, ventilation and Air Conditioning

IAI   International Alliance for Interoperability

ICT   Information and Communication Technologies

IFC   Industry Foundation Class

IT   Information Technology

LAN   Local area network

LOE   Ley de Ordenación de la Edificación

MPR II	Manufacturing Resource Planning
OCCS	Overall Construction Classification System
OODB	Object Oriented database
PERT	Program Evaluation and Review Technique
PLC	Project Life cycle
PMI	Project Management Institute
PSA	Professional services administration
RFI	Request for information
SMEs	Small and Medium Enterprises
Uniclass	Unified Classification for the Construction Industry
WAN	Wide Area network
WPMS	Web based Project Management Systems

APPENDIX II. USER'S GUIDE

Users: whatever construction company who wants to organize all the information related to a project specially those who will be using a Web based Project Management System (WPMS) for the management of the entire project. This system is independent of the WPMS used and can be used by: companies with paper based document management, companies with electronic document management, companies with central based document management, companies with Quality Management Systems, companies without Quality Management Systems, etc.

When: This system is to be used before starting the project and basically before starting using the WPMS to create a folder structure. It can also to be used during the project to consult basic information of the documents of the project to be delivered or downloaded.

Aim: All existing WPMS provide the same services, such as chat, web cam, document version management, agenda, news, archive management, etc. However, none of the existing software in Spain map all the possible documentation generated throughout the life cycle of the project. Before starting using a WPMS the organization of folders, subfolders and archives should be designed. So, the system is a web service where to define the characteristics of the project and to obtain the **organization structure of documents** to be used locally (in the PC or server) by all the actors involved in a project and centrally by the WPMS in each specific project. Each actor will know where to find the specific information, when and where to upload a document, when and where to download it, etc.

Another service of the system is to **make consults** during the project. Once the actors have their folder structure downloaded and while they are using the WPMS one of them might want to know if he has to deliver any specific document in a specific stage of the project and related to a particular activity. Then the system provides him this information.

Steps:

1. Go to the Construction Document Management System home page http://www.constructiondms.upc.es

2. The administrator will send you a mail with your username and password for each specific project.

3. Using your username and password login to the members lounge. (to test the system you can use for users: Username: aa, Password: aa)

4. From the form in the middle of the screen pick the correct role you will develop in this specific project (client, contractor, designer), choose between 'download' or 'consult' and press the button 'Submit'.

    a. **Download** means to download the same folder structure, which the administrator has already uploaded into the WPMS, into your PC. In this case, the system creates a life cycle folder structure with all the documents that are going to be used in the project.

    b. **Consult** means to make consults about specific documents to be uploaded or downloaded in a specific project.

If you choose 'Download'

5. If you choose 'Download' pick the option 'Download into your PC' from the form in the middle of the screen which is the only option available for users.

6. You will get a message for downloading the folder structure. To do so, save the archive 'carpetas.bat' in the folder of your PC where you want to have the folder structure for this project.

7. Go to 'My PC' of your computer and double click the archive 'carpetas.bat'. The folder structure will be automatically generated in your PC.

If you choose 'Consult'

8. If you choose 'Consult' from the form in the middle of the screen select the type of document you want to have information, for example, letter, drawing, etc. and the responsibility you will have, as a type of actor, on the document. There are two possibilities: Create and Receive. Choose 'Create' if you want to view the documents you should deliver or upload and choose 'Receive' if you want to view the documents that someone else will upload and you will need for any other purpose.

9. The information related to the phase, stage, activities and subactivities is organized in a matrix where the 'x' axis is the phase and stage, 'y' axis is the activity and the 'z' axis is the subactivity. You should only have to click on the gaps of the information you want to get and press the button 'Submit'.

10. After choosing the information to be filtered, the system returns a table with the results. At the top of the screen, the system gives the information related to the project: User, Project, Type of contractual arrangement, Actor, and related to the consult information: type of document, responsibility, Stage, Activity and Subactivity. Below, the system returns the matrix with the results. On the left hand side, there are all the Phases that

include the information of the consult. You should select one of them to view the 'Stage' and proceed with the 'Activity' and 'Subactivity' to end up with the 'documents'.

11. If you want to make another consult you should select the button 'Make another consult' on the right hand side of the screen and proceed with the consult.

12. If you want to view more information of a specific you should click on the document you want to view the extra metadata.

APPENDIX III. VALIDATION SURVEY

D: Designer, CO: Contractor, C: Client

	Constr. Pere Roca SA	Constructora CYCONS	Natur System	Grupo JG	Echeberria Izquierdo	Casas prefabricadas	QC Instal.lacions	Linares Arquitecte	TecnoImpianti	Shuppe & Sisco	Byggforsk	Ajuntament Mataró	Arquitectura JF	Enginyeria quadrant
Role	CO	CO	CO	D	CO	D	D	D	CO	CO	CO	D	D	D
Number of employees	16	16	25	198	50	6	6	5	25	45		15	5	6
1 Average n° of participants in a project from your company		16	5		12	6	4	2				2	5	6
2 Have you got any Quality System? — Yes		x		x	x				x			x	x	
— No	x		x			x	x	x		x				x
3 What type of repository of information do you have? — Central		x	x	x			x	x	x			x	x	x
— Local	x				x	x				x			x	
4 Who creates the system organization (folder, archives, etc) of each project?	one person	one person	every-body	one person	every-body	every-body	every-body	every-body	one person	one person	copy model	every-body	every-body	copy model
5 Steps when starting a project:	1. Open a folder 2. Give reference 3. Create docs. using templates	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Assign a bid n° 2.Copy templ. folder	1.Copy templ. Folder 2.Use templ. 3.Store docs.	Each project is differ-rent	Each project is differ-rent	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Create folders 2.Create docs.	All the info stored in a PM	Each project is differ-rent	1.Copy templ. Folder 2.Use templ. 3.Store docs.	Each project is differ-rent	Each project is differ-rent	1.Copy templ. Folder 2.Use templ. 3.Store docs.
6 Do you have a well structure file organization? — Yes	x	x		x					x			x		x
— No			x		x	x	x	x		x			x	
7 Do you have well defined formats? — Yes	x	x	x	x					x	x	x	x	x	x
— No					x	x	x	x						

D: Designer, CO: Contractor, C: Client

	Constr. Pere Roca SA	Constructora CYCONS	Natur System	Grupo JG	Echeberria Izquierdo	Casas prefabricadas	QC Instal.lacions	Linares Arquitecte	TecnoImpianti	Shuppe & Sisco	Byggforsk	Ajuntament Mataró	Arquitectura JF	Enginyeria quadrant
Type	CO	CO	CO	D	CO	D	D	D	CO	CO	CO	D	D	D
Number of employees	16	16	25	198	50	6	6	5	25	45		15	5	6
8 Are you satisfied with the organization of docs?														
Yes	x	x		x					x		x			x
No			x		x	x	x	x		x		x	x	
9 Have you ever used a WPMS for the man. of any project?														
Yes		x		x			x				x	x		x
Why?														
As a pilot program														
Driven by a party higher in value chain		x		x			x							x
View as future trend within firm											x	x		
Aware of benefits from similar tools		x									x	x		
How many?		2		2			1				2	2		1
Advantages														
Communication		x		x			x				x	x		x
Communication management		x									x	x		
Process automation		x									x	x		
Others														
Disadvantages														
Difficult Internet access				x			x							
Need training		x										x		
Not all partners use it														x
A leader is necesary		x												
No	x		x		x	x		x	x	x			x	
Why?														
Currently no perceived value	x							x						
Lack of critical mass	x													

D: Designer, CO: Contractor, C: Client

Number of employees

	Constr. Pere Roca SA	Constructora CYCONS	Natur System	Grupo JG	Echeberria Izquierdo	Casas prefabricadas	QC Instal.lacions	Linares Arquitecte	TecnoImpianti	Shuppe & Sisco	Byggforsk	Ajuntament Mataró	Arquitectura JF	Enginyeria quadrant
Type	CO	CO	CO	D	CO	D	D	D	CO	CO	CO	D	D	D
Number of employees	16	16	25	198	50	6	6	5	25	45		15	5	6
Insufficient understanding/training	x				x	x								
Have not been exposed	x		x					x					x	
10 Have you ever used any DMS?														
Yes		x	x	x	x	x	x	x	x			x	x	x
What type?														
Server (connected PC)		x	x	x			x		x	x			x	x
Paper based		x		x				x						
Intranet		x		x										
Extranet (WPMS)		x		x	x	x				x				
Advantages														
Efficient information access		x	x	x	x	x	x	x	x			x	x	x
Document management hability		x	x	x								x		
Version, delivering, etc. control		x	x	x								x		
Disadvantages														
System incompatibilities														
Need training		x	x		x	x			x					
Not all partners use it														
Need adaptation		x	x				x							
No										x			x	
Why?														
Currently no perceived value													x	
Lack of critical mass														
Insufficient understanding/training														
Have not been exposed	x													

D: Desgner, CO: Contractor, C: Client

Number of employees

	Enginyeria Dept.	Greccat	Egein S.L.	Tau SL	IDOM	Blazquez arquitectes	Estructures Beton S.A	Suberdeton SA	Formigons Girona	Suberolita	Oficina Tècnica G1 SA	Oficina Tècnica G2 SA	OFEP SA
Type	D	D	D	CO	D/C O	D	CO	CO	CO	CO	D	D	D
Number of employees	3	50	4	16	200	8	20	40	200	100	7	10	12
1 Average n° of participants in a project from your company	3	2	4			3					4	4	5
2 Have you got any Quality System? — Yes					x	x	x	x	x	x			
No	x	x	x	x							x	x	x
3 What type of repository of information do you have? — Central	x	x	x	x	x	x	x	x	x	x	x	x	x
Local													
4 Who creates the system organization (folder, archives, etc) of each project?	every-body	copy model	copy model	copy model	copy model	copy model	copy model	copy model	copy model	copy model	copy model	copy model	copy model
5 Steps when starting a project:	Each project is differ-rent	1.Copy templ. Folder 2.Use temp1. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.	1.Copy templ. Folder 2.Use templ. 3.Store docs.
6 Do you have a well structure file organization? — Yes			x	x	x	x					x	x	
No	x	x					x	x	x	x			x
7 Do you have well defined formats? — Yes			x	x	x	x	x	x	x	x	x	x	x
No	x	x											

	Enginyeria Dept.	Greccat	Egein S.L.	Tau SL	IDOM	Blazquez arquitectes	Estructures Beton S.A	Suberdeton SA	Formigons Girona	Suberolita	Oficina Tècnica G1 SA	Oficina Tècnica G2 SA	OFEP SA
	D	D	D	CO	D/C O	D	CO	CO	CO	CO	D	D	D
Number of employees	3	50	4	16	200	8	20	40	200	100	7	10	12
8 Are you satisfied with the organization of docs?													
Yes			x	x	x	x							
No	x	x					x	x	x	x	x	x	x
9 Have you ever used a WPMS for the man. of any project?													
Yes	x	x			x								
Why?													
As a pilot program	x												
Driven by a party higher in value chain		x											
View as future trend within firm					x								
Aware of benefits from similar tools													
How many?	1	2											
Advantages													
Communication	x	x			x								
Communication management													
Process automation													
Disadvantages													
Difficult Internet access													
Need training													
Not all partners use it	x				x								
A leader is necesary													
No			x	x		x	x	x	x	x	x	x	x
Why?													
Currently no perceived value													
Lack of critical mass													
Insufficient understanding/training													
Have not been exposed		x	x	x		x	x	x	x	x	x	x	x

D: Desgner, CO: Contractor, C: Client

	Enginyeria Dept.	Greccat	Egein S.L.	Tau SL	IDOM	Blazquez arquitectes	Estructures Beton S.A	Suberdeton SA	Formigons Girona	Suberolita	Oficina Tècnica G1 SA	Oficina Tècnica G2 SA	OFEP SA
	D	D	D	CO	D/C O	D	CO	CO	CO	CO	D	D	D
Number of employees	3	50	4	16	200	8	20	40	200	100	7	10	12
10 Have you ever used any DMS?													
Yes	x	x	x	x	x	x	x	x	x	x	x	x	x
What type?													
Server (connected PC)	x	x	x	x	x	x	x	x	x	x	x	x	x
Paper based					x								
Intranet					x								
Extranet (WPMS)					x								
Advantages													
Efficient information access	x	x	x	x	x	x	x	x	x	x	x	x	x
Document management hability	x				x								
Version, delivering, etc. control					x								
Disadvantages													
System incompatibilities													
Need training													
Not all partners use it													
Need adaptation													
No													
Why?													
Currently no perceived value													
Lack of critical mass													
Insufficient understanding/training													
Have not been exposed													
Others													