The selection of authoring tools for the project

This is an openly published report based on deliverables of the Pilot Project Pilot "We4Authors" on Web accessibility for web authoring tools producers and communities (LC-00788801) lead by Funka in collaboration with CTIC and funded by the European Commission.

In the report, we use the term CMS (Content management System) as synonymous to authoring tool.

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The automatic search results are efficient but certainly not perfect. Therefore, the study team has also made manual checking, interviewing contacts at national government level as well as colleagues and partners in the ICT industry to get at broad picture of the current situation. In this study, the statistics of spread and usage of the CMSs are the key factors. Increasing the level of accessibility in wide-spread and well-used authoring tools are of course going to have much greater impact. Both directly by affecting many users in upcoming updates or versions, but also indirectly while the competing tools are looking at the leaders for inspiration.

It is clear that in most member states, there are local authoring tools that run smaller or larger parts of the public sector websites. These tools might indeed be relevant to focus on from a national perspective, but since this study is aiming to support the implementation of the Web Accessibility Directive in all member states, and also to discover and develop methods that can be used in several countries, we have chosen CMSs who are well spread and used by public sector in a broad variety of member states.

After cleaning the list from items that are not CMSs, there is a top 30 result which shows a good mix of many of the indicators that were chosen to look for to have a holistic view of the market. It is of course important to make sure that many different aspects of authoring tools are considered when making the final sample. This way, the result of the study will have as much impact as possible.

30 PRE-SELECTED CMS

DRUPAL	INFOPARK
WORDPRESS	MAGNOLIA
LIFERAY	PLONE
TYPO3	SITECORE
SHAREPOINT	HIPPO
JOOMLA	KENTICO
DNN (DotNetNuke)	CKAN
SITEVISION	OPENCMS
IBM WEBSPHERE PORTAL	JAHIA
EPISERVER	OPENTEXT
ADOBE EXPERIENCE MANAGER	SITEFINITY

CMS MADE SIMPLE	RAPIDWEAVER
IAPPS	SPIP
ORCHARD	UMBRACO
SDL	EXPRESSIONENGINE

Table 1: List of 30 pre-selected CMS

CMS selection process in two steps

Step one: criteria that all selected CMS need to fulfil

Apart from usage and spread, another set of criteria was used for the first round of selection. These criteria are aspects that all selected tools need to have in order to be relevant for the study.

- **Basic functionality**
  This criterion is a way of determining if the basic functionality – what you get "out of the box" - is enough to develop a standard information website for public sector or not. For a standard information website, we have assumed that the basic functionality should be: article, lists, forms, tables, multilingual handling and WYSIWYG editor. Content management systems that do not offer these are not relevant to the study, since the tool as such is not working as a stand alone system.
  The basic functionality is important as long as the client stays within the basic offer, the producer of the tool is responsible for the level of accessibility. A content management system without this basic functionality would require for the client to either buy the needed functions separately, or have a supplier to develop them "ad hoc". This means that the risk of the functionality being inaccessible increases.

- **Search functionality**
  Search is a key functionality for end users and if it not built into the content management system, it is usually quite expensive to buy separately. Therefore, we chose to have a built in search functionality as a criterion for the content management systems that will be part of the in-depth analysis. At this stage of the project, we have not checked the accuracy or quality of the built search functions.

- **Code libraries/component libraries**
  This is an important criterion since it is crucial to the website owner to ensure that not everything needs to be developed from scratch. In the licensed products, this criterion can mean that the producer is providing components, but also that there is a community around the tool where people or companies/partners contribute. In the case of open source tools, this can be a community driven or components for sale. As in all third party products, the risk of

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something not being accessible is often high and at the same time hard to discover for the web site   owner.

- **Templates/fixed packages**
Content management systems can come with pre-made templates of specific pages, functions or objects, either as separate templates or fixed packages that include templates. Some of these are made to be used directly and some are more inspirational. If there are no templates at all, the client becomes totally dependent on suppliers developing templates, so the responsibility for complying to accessibility requirements is placed on the supplier, not on the provider of the content management system. Some tools are created so that even the authors themselves are supposed to be able to create the templates without touching the code.

- **The need/possibility to create specific pages**
All public sector agencies, in reality most clients over all, requires the possibility to create different kind of pages with specific functionality. Only very simple websites can nowadays can be managed without this functionality and just rely on a fixed set up. To be certain that we are concentrating on systems that are relevant to the website owners covered by the Web Accessibility Directive, this is a key indicator that needs to be fulfilled for the content management system to be included in the study.

- **Cloud service**
Whether the content management system can be run as a cloud service or not is not affecting accessibility directly, but it can be a requirement for some website owners. It is also nowadays a flexibility that most serious tool vendors and open source communities provide. For the selection to be broad enough to fit a variety of public sector bodies in different regions and situations, we want to make sure that the selection made also covers this aspect.

- **Possibility to host independently**
This criterion is similar to the previous one. Whether the website can be hosted independently or not is not affecting accessibility, but the flexibility can be crucial to website owners, especially in public sector with specific security needs like tax authorities and social welfare systems etc. Therefore, it is important that the selection is containing only tools that offer this flexibility.

Based on the outcome of this selection process, three tools were omitted. One of three out of the top ten fails in spread and the other two each failed to meet at least one of the above selection criteria. Therefore, these three tools from the top 10 list were interchanged with tools from the top 30 list that fitted the aim of this project better.

The three omitted tools are:

- Government Sitebuilder
- Google Sites
- Adobe Experience Manager

Government Sitebuilder is not found outside of Germany and doesn't have any documentation in other languages. Since it does not seem to be aimed for the international market we deem it irrelevant for this study.

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Google Sites fails the criteria of modern website development, design and maintenance while it lacks the possibility to develop specific pages for certain needs. Google Sites is not a real system for content managing, only a extremely simple "out of the box" website-editor. Even if it in theory might be possible to make this very simple editor create basic accessibility, we do not see any future in this kind of tool. Organisations that use this tool will probably not have neither resources nor interest to drive accessibility forward.

Adobe Experience Manager is found in hard coded websites based on a series of different software, all of which nowadays are identified as Adobe Experience Manager. Even if some of these installed software can be used for publishing websites, this is not the core aim of the tools and they are clearly not content management systems, which makes them also irrelevant for this study.

After this interchange, the first selection step resulted in 10 CMS fulfilling all above criteria:

CMS	Basic functions	Search	Components	Templates	Page creation	Cloud service	Hosting
DRUPAL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WORDPRESS	Yes	Yes	Yes	Yes, store	Yes	Yes	Yes
LIFERAY	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TYPO3	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SHAREPOINT	Yes	Yes	Yes	Yes	Yes	Yes	Yes
JOOMLA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DNN (DotNetNuke)	Yes	Yes	Yes	Yes, store	Yes	Yes	Yes
SITEVISION	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IBM WEBSPHERE PORTAL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EPISERVER	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 2: Step one selection criteria

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Step two: criteria that are oriented to provide a breadth in the selection

For the second round of the selection process, criteria are chosen to ensure the list to be as broad as possible. To make this study successful, it is important that the 10 tools we are going to look closer into are representing different aspects of technology and business models, so that the outcome of the study can impact as many public sector websites as possible, no matter of region, kind or type.

- **Programming language used (such as .NET, PHP, JAVA etc)**
  Normally, each ICT supplier is concentrating on one (or, in the case of large corporations, a couple) of programming languages. Which language is most in use depends on technical trends and ongoing technical development and this often change over time. But it also differs heavily between countries and regions. In a country or community where one language is very popular, it can be hard to find developers who can handle another language. Therefore, it is important for the study to cover the most widespread programming languages. Nevertheless, it is important to take into account that the programming language as such does not affect the accessibility.

- **Headless/Decoupled**
  Until very recently, all content management systems have been monolithic, which means that back end and front end are deeply connected and not separable. Everything from templates, functionality and content is handled by the content management system.
  Nowadays, more headless or decoupled content management systems are being developed, which means that the front end code is not dependent on what lies behind. You can reach the content via an API and how the content is presented is much more flexible and outside of the actual content management system. This way, front end and back end are separated and as a client, you can change from one content management system to another without re-developing the website. In the top 30 list, there are only traditional content management systems. However, most of the tools on the top 10 have been opening up their APIs to make it possible to use them as decoupled content management systems as well as the traditional way. The terminology is not totally clear, many of the content management systems on the top 10 list describe themselves as headless even though they are clearly not.

- **The possibility to publish and follow up directly in other channels**
  Many website owners are publishing information on social media as a complement to their own websites. Some content management systems offer a built in possibility to publish, get statistics, handle and follow up the result of social media postings (LinkedIn, FaceBook Twitter, Instagram etc.) Others offer a plugin or extension for social media postings that can be bought separately. For some public sector organisations, social media is not at all on the agenda. This criterion has been included as the study team wanted the list to contain all alternatives.

- **Integrated statistical functions in the CMS**
  Statistical information is key for authors wanting to measure whether the website solves the problems of its users or not. It can also be used for making accessibility decisions, while pages with more users should be prioritised for accessibility testing and improvement. Some content management systems offer built in statistics, whereas others offer it as plugins or add-ons. Again, it is important for the breadth of the study that our list cover different kinds of solutions.

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- **Business model: license or open source**
  There are two basic alternative business models for content management systems, licensed products or open source ones. Some website owners can have very strong opinions on why one or the other kind of business model is more preferable; the decision can be based on political ideas, tradition, previous experiences, financial reasons or the fact that the client has staff with development skills in-house. In reality, the difference is very small. The perceived "free" open source tools often make the client become at least as dependent on suppliers as the licensed products. But to make sure we can cover a broad variety of public sector authorities throughout EU28, it is important that our selection contains both licensed and open source tools.

Based on these criteria, the selection was concluded and 10 content management systems chosen for next steps.

List of 10 selected CMS and reasoning behind

The process of making sure the chosen CMSs would cover large usage, functional relevance, technical breadth and business models resulted in a good variety of tools. The reasoning behind the selection process is described below.

Programming language used

The most common programming languages used for CMS are PHP, JAVA and .NET. This is true not only in public sector bodies within the EU, but as far as the consortium is aware, also in private sector and North America. For this reason, it was important to make sure the chosen CMS contained these three programming languages. We also chose to include Visual Basic, because IBM is such a large player and also one of the most active in the accessibility space.

The programming languages are spread over the list like this:

PHP:
Drupal, Wordpress, Typo3, Joomla

JAVA:
SiteVision, LifeRay

.Net:
SharePoint, DNN, EpiServer

VisualBasic:
IBM Websphere

Headless/Decoupled

Even though none of the top 30 CMSs found being used in public sector within EU are "true" headless CMS, the consortium wanted to make sure at least some of the chosen CMSs were possible to be used in the decoupled way, thus making sure they will survive the wave of change most experts believe will come in a few years.

Out of the 10 chosen CMS, 8 are possible to use as decoupled. Joomla and Typo3 don't have proper APIs at the moment and can at least not for now be considered possible to use as decoupled.

The possibility to publish and follow up directly in other channels

Since different CMSs have chosen to solve the functionality of publishing on social media in different ways, the consortium wanted to make sure to cover both the built in-alternative as well as the possibility to use extensions and plugins.

The solutions are spread over the list like this:

Built in:
Drupal, LifeRay, Sharepoint

Via extensions:
Typo3, Joomla, DNN, IBM Websphere, EpiServer

Via plugins:
Wordpress

SiteVision is the only CMS on the list which doesn't provide the possibility to publish, get statistics, handle and follow up the result of social media postings either built in, via extensions or plugins.

Integrated statistical functions in the CMS

Since different CMSs can provide the functionality of statistics in different ways, the consortium wanted to make sure that the chosen CMSs included both integrated and add-on alternatives.

Of the chosen CMSs, six provide integrated statistics:
Drupal, Wordpress, LifeRay, SharePoint, DNN and IBM Websphere

Four CMSs provide statistics as an add-on:
Typo3, Joomla, SiteVision and EpiServer.

Business model: license or open source

To make sure the chosen CMSs would be relevant to a wide variety of public sector bodies, the consortium wanted to make sure to cover both licensed and open source solutions.

Among the chosen CMSs, half were licensed and half were open source:

Licensed:
LifeRay*, Sharepoint, SiteVision, IBM Websphere, EpiServer

Open Source:
Drupal, Wordpress, LifeRay*, Typo3, Joomla and DNN

Please note that LifeRay exists in both an open source and a licensed version.

List of chosen CMS

Following the criteria above specified, the following table introduce the 10 selected CMS and their main characteristics according to the two step selection process stablished in the methodology. These 10 CMS tools will be the basis to start contacting providers or communities behind the tool in order to implement the pilot.

CMS	Rank (Use count)	Programming language used	Headless/ Decoupled	Social Media	Integrated statistics	Business model	Countries
DRUPAL	1 (210)	PHP	Can be used as decoupled	Yes	Yes	Open Source	27
WORDPRESS	2 (131)	PHP	Can be used as decoupled	Yes, different plugins	Yes	Open Source	27
LIFERAY	3 (72)	JAVA	Can be used as decoupled	Yes	Yes	Open Source free version/Commercial version license or service	20
TYPO3	4 (64)	PHP	No proper API at the moment	Yes, extension	Yes, add on	Open Source	13
SHAREPOINT	5 (61)	.NET Framework	Can be used as decoupled	Yes	Yes	License/Service	18
JOOMLA	6 (35)	PHP	No proper API at the moment	Yes, extension	Yes, add on	Open Source	13

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DNN (DotNetNuke)	7 (16)	.NET Framework	Can be used as decoupled	Yes, extension	Yes	Open Source	11
SITEVISION	8 (16)	JAVA	Can be used as decoupled	No	Yes, add on	License/Service	1
IBM WEBSPHERE PORTAL	9 (13)	C Visual Basic (Windows only) COBOL	Can be used as decoupled	Yes, extension	Yes	License/Service	10
EPISERVER	10 (13)	.NET Framework	Can be used as decoupled	Yes, extension	Yes, add on	License/Service	2

Table 3: Step two selection criteria

DRUPAL (27)	WORDPRESS (27)	LIFERAY (20)	TYPO3 (13)	SHAREPOINT (18)	JOOMLA (13)	DNN (11)	SITEVISION (1)	IBM WEBSPHERE PORTAL (10)	EPISERVER (2)
AT	AT	AT	AT	AT	AT	BE	SE	BG	IE
BE	BE	BE	BE	BE	BG	CY		ES	SE
BG	BG	BG	DE	CY	CY	EE		FR	
CY	CY	CY	DK	CZ	CZ	FR		GR	
CZ	CZ	CZ	FR	DK	DE	GR		LU	
DE	DE	EE	GR	ES	GR	IE		PL	
DK	DK	ES	IT	GB	HU	LU		RO	
EE	EE	FI	LU	GR	IT	MT		SE	
ES	ES	FR	LV	HU	LT	PT		SI	
FI	FI	GR	NL	IE	LV	SI		SK	
FR	FR	HU	PL	IT	PL	SK			
GB	GB	IT	RO	LT	RO				

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GR	GR	LT	SI	LU	SK
HU	HU	NL		MT	
IE	IE	PL		PT	
IT	IT	PT		RO	
LT	LT	RO		SI	
LU	LU	SE		SK	
LV	LV	SI			
MT	MT	SK			
NL	NL				
PL	PL				
PT	PT				
RO	RO				
SE	SE				
SI	SI				
SK	SK				

Table 4: Distribution of CMS per country

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