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# Developing a dynamic website using WordPress CMS for BPS Finland Oy

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2014 Leppävaara

**Laurea University of Applied Sciences**  
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**Developing a dynamic website using WordPress CMS for BPS Finland  
Oy**

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**Developing a dynamic website using WordPress CMS for BPS Finland Oy**

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This Bachelor's thesis aims to develop a website for a small-to-medium-sized enterprise (SME), BPS Finland Oy, which is fully based on the customer's requirements. In this thesis project, a completely new dynamic website was developed from the design layout provided by the case company in a Photoshop version.

WordPress, a Content Management System (CMS), was used to create a dynamic website. CMS is a software programme to power, manage and modify the website's contents and avoid the need for manual updating. This thesis guides the customer in using WordPress CMS as an appropriate tool to change their website contents from the browser-based dashboard of WordPress. WordPress is an open source CMS widely used by small to large organizations to empower websites. WordPress also manages the general security of website.

This thesis consists of a theoretical and practical section. The theoretical section defines the concepts used in this thesis, such as website, CMS and WordPress. The practical section focuses on developing and implementing the website. The project was completed on the basis of the instructions and guidelines provided by the case company over several meetings and online discussions. For the demo website, a localhost server XAMPP was used for testing and to show stakeholders on browser the demo website. The website was tested on various versions of major browsers. Multiple devices such as desktop computer, laptop, android devices, and apple devices were used for the screen test. Successfully the website was launched online under the domain name [www.bps.fi](http://www.bps.fi), then training and guidelines documents were provided to stakeholders.

Key words CMS, website, WordPress, BPS Finland Oy

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## 1 Introduction

The digitalization of business and information is rapidly increasing with the development of Information Technology (henceforth IT). Business organizations and stakeholders are using Information Communication Technology (henceforth ICT) based technology such as websites, social media pages, e-mails and apps instead of manual marketing tools such as brochures and paper advertising. Websites are the best channels for sharing general information such as general information about the company or organization, business strategy, feedback from customers, and frequently asked questions (FAQ). A website allows the business organization to promote, advertise and market their business all over the world in a cost-efficient and speedy manner (Brown 2011, 11).

### 1.1 Background: Case Company

BPS consulting Finland is a Finnish SAP service partner since 1995 with 16 SAP implementation projects working in close cooperation with its partners. This company has had assignments from over 110 Finnish companies. This is also part of BPS Europe organizations as BPS companies in Germany, Hungary, UK, Czech Republic and Baltic countries. The strong process, project and system know how to get together with a variety of service products guarantees an appropriate solution for each customer. The case company provides SAP implementation projects, training, system maintenance, development and other SAP- Services coordinating with SAP Finland. The case company is doing consulting in some fields such as business development projects and management services, IT strategy consulting. They also handle ERP feasibility studies and design services with ERP implementation projects.

### 1.2 About the project

I connected to this company with the help of our teacher Paresh Rathod, who is guiding me for this thesis project. We did our first meeting in the Laurea University of Applied Sciences and agreed about the terms and conditions of the projects. Distance work agreed, and if necessary we can meet in the office of BPS Finland Oy, for important and emergency we shared our email and Skype id. The main idea of this project is to develop a dynamic website for the BPS Finland OY according to the design provided to us which was designed by professional designer. This project is based on customer's requirement. This development project is also part of my thesis, and I am doing research on it. So, they were agreed to implement good ideas found on the research without changing the main concept of their design provided. Project supposed to start from the first week of January 2013 but because of some changes in design it started on February and completed on the first week of May.

### 1.3 Objectives

The main objective of the project is to create new dynamic website using Wordpress Content Management System (CMS) so that the BPS employee can update this site themselves without having professional skills. After this project, I will be more experienced in Wordpress developer. Some other objectives of the project are to renew BPS Finland's web pages in order to give externals (customers, potential customers, consultants, other parties interested) relevant & correct picture of BPS in terms of the services offered, and of the overall company and Group. Making web site more concise, vigorous, eloquent and to change the 90's look to modern is another target. At last search engine optimized improved version in ease to update information about BPS's resource website will be delivering.

### 1.4 Structure of the thesis

This thesis is structured into 10 different chapters. The first chapter consists of the introduction part with a background of the case company, descriptions of projects and the main objectives of the project. Methods are in the second chapter that includes the incremental model and benchmarking. The third and fourth chapters are theoretical parts of this project in which the third chapter briefly described websites, its types and features in good websites. In the fourth chapter three open source Content management system Drupal, Joomla and WordPress described and included the reasons behind to choose WordPress CMS for development of websites for the case company. Chapter 5 included the implementation part which is followed by chapter 6 with a short description about technical tools and skills used in the project. Features of developed website for the case company placed in chapter 7 where we see the best features of developed website. Chapter 8 included testing, problems and maintenance of the project. Chapter 9 described training and guideline documents which were provided after successful complete of the project technically. Finally, the important part evaluations were in chapter 9 which is followed by chapter 10 conclusions.

Chapters	Topic
1	Introduction
2	Methods
3	Websites
4	Content management systems
5	Implementations
6	Technical tools and skills used
7	Features of develop website; case company
8	Testing, problems and maintenance
9	Evaluations
10	Conclusions

Figure 1: Structure of the thesis

## 2 Research Methods

“All those methods which are used by the researcher during the course of studying his research problems are termed as research methods” (Kothari 2004, 8). This project was conducted to increase the quality of website according to the design provided. This is based on as interviewing the stakeholders, communicating them in every issue and changes in site without affecting the main design. The methods used for the successful completion of the project were the incremental model and benchmarking.



## 2.1 The incremental model

This project was fully depends on customer's requirement basis that is why the incremental model or incremental development process implementation was decided as one of the main methods. This model is useful for the dynamic website development and allows us to deliver the projects in the different phase and adding features according to the requirements rather than a big bang (Dawson 2009, 120). This will help to avoid the misleading of design form the specification and delivery. Each and every time meeting with the client we could gather and be clearer about information and requirement. Our project also succeeded in the same way. This incremental design can be applied for a new development and maintenance too. In this model final deliverable only made public when increment meets all the requirements of the project. This model divided whole project into a separate component, and work in each such as first home page ok then contacts page started. The picture below will show about the process of the project diagrammatically.

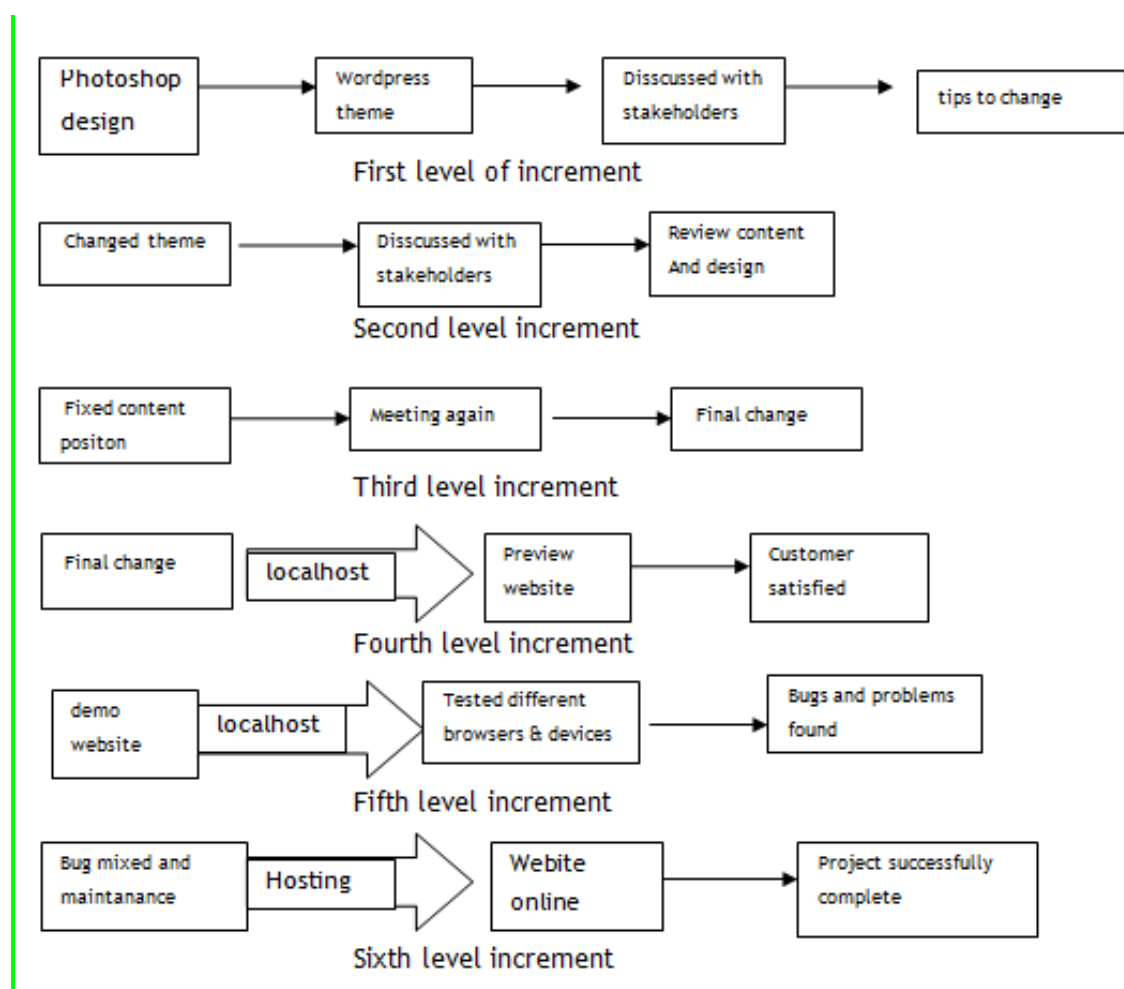


Figure 2: Incremental development process

The picture above try to shows the development of the website was made in incremental development with good partnership (developer & stakeholders) involvement from starting Wordpress theme to completion of the project. Face to face meeting, email feedback, Skype conversation were means of communication to continue the partnership beginning to end of the project.

The project used incremental development process or incremental model. So first Wordpress theme was developed which is a demo website according to the design provided. The demo website checked on browsers with stakeholders. Then different feedbacks were collected, and Wordpress theme changed to browsers compatible with some small changes. When we tried real contents of website, some of the content did not suit the design so with stakeholders decided to change the position of contents so that it suit the design. Then testing and maintenance were carried out and when stakeholders were satisfied the website was hosted with same domain name before they were using.

## 2.2 Benchmarking

Benchmarking is a good methodology to get some changes to organizational structure and processes. Benchmarking is the process of identifying and adapting new process or changes by analyzing the good practices doing by leading organizations or competitors. Benchmarking helps to perform better quality than before structure. Benchmarking is just simply accepting other better at some field and tries to make the relevant changes for achieving internal or external norms and standards (Stapenhurst 2009). So we are doing benchmarking some leading websites and try to add some features that will make the website more eloquent, customer friendly and can reflect organizational strategy well. Stakeholder showed another website doing same business in Finland and also asked us to look their competitor's site how it looks. The main idea of the project is to change the previous site to the user friendly and attractive so before and after design benchmarking included.

The examples of benchmarking in a new website of the case company are such as, use of social media icon, search box about BPS, contact form and read more options for larger content.

## 3 Website

Website is a collection of different web pages which are running under one domain name such as [www.google.com](http://www.google.com). Website and web pages are using interchangeably, but one website can contain many web pages (Website 2014). Website can also write as web site or only site is

hosted at least one web server which can be accessible via internet and or a private area network with a unique identification known as Uniform Resource Locator (URL). There are two types of website, static website and dynamic website.

### 3.1 Static website

Static website is very basic created just using HTML and CSS which display the same information until it updated manually. It does not need any programming skills, database and much cost saving. This website is suitable for the small organization almost same information for a long time. Static websites are very uncommon these days. (Static website 2009)

### 3.2 Dynamic website

Dynamic websites contain server-side scripting or client-side scripting and sometimes both. Dynamic websites are not such as a static website, they change the information depending on the users, time zone and the places where the site is accessing (Dynamic website 2014).

The dynamic websites are more costly to develop than a static website, but it is easy to update information through a simple browser interface. For example, some features of dynamic websites could be content management system, e-commerce system or bulletin boards. (Static Vs Dynamic website 2014).

### 3.3 Features of good website

Taking care on features of the website is much more important as the development of a business plan. Features or characteristics used on your websites affects the opinion of the website visitor. So sometimes badly features website breaks yours online investment to create a website and also opinion towards company. (10 Key Features for a Perfect Website 2008)

Some features have to take in count while developing websites are appearance, contents, functionalities, website usability and search engine optimization. (Spritz web solutions, 2012)

## 4 Content management system (CMS)

A Content Management System (hence after CMS) is a platform, system or software application which is powering websites, use to manage, edit, and upload the content of the website without changing any Html code or without having technical skills how the website is working. According to Kathuria (2006) a CMS is used to collect, manage, and publish content, storing

the content either as components or whole documents while maintaining dynamic links between components.

“One of the early justification for implementing a CMS was to empower content authors who either desired to or needed to manage website content but, did not have the necessary technical skills to edit the raw content or did not have the security right to access the publishing systems” (Shreve & Dunwoodie 2011, 5).

Open source CMS are free and bound to a diverse community rather than to bind formally or informally with single company relationships. So, I have the right to fix bugs, changes in the themes and making software enhancement (Shreve & Dunwoodie 2011). There are three renowned open source CMS which are Drupal, Joomla and WordPress (Mehta 2009).

#### 4.1 Drupal

Drupal CMS also known, as Drupal framework is a modular system composed of numerous small parts. “Drupal is a set of PHP scripts that provides a framework and basic functionality for building feature-rich dynamic web sites” (Douglass, Little and Smith 2006, 3). Consequently particular level of skills requires for understanding architectures of how Drupal works. It is completely free and distributed under the GNU GPL (General Public License). It is using as back-end system and almost 2.1% of world wide websites. Drupal core known as Drupal core contains basic features of CMS including user account registration, maintenance, menu management, RSS feeds, page layout customization and system administration. From a personal blog to a corporate company used Drupal. (About Drupal 2014)

#### 4.2 Joomla

Joomla is also another open source CMS to create websites and powerful online applications. Joomla is also very famous and powering many websites because of its ease-of-use and extensibility. Joomla is mostly focused for small companies, novices and not heavily experienced developers as compared to Drupal. Among all CMS using websites, about 10 percent of websites are using Joomla. Joomla is more than just code; it is about the people and culture that surrounds it (Marriott & Waring 1969). Joomla is also used from simple websites, blogs to advanced websites.

#### 4.3 WordPress

Wordpress is another most popular open source CMS started in 2003." Wordpress is powerful and effective open source web publishing platform that enables anyone, regardless of com-

puter skills, to create and maintain a world class website”(David, M. 2011). WordPress started as just a blogging system, but now it has established as full content management system because of thousands of themes, plug-in and widgets. Wordpress is now powering almost 62 percent of all websites that use CMS. It has grown as the largest self-hosted blogging tool used on millions of sites and visited by ten million every day.

I selected Wordpress CMS so that I can be more familiarizing with it which will help me for my further career and ease of use for the customers. Because of Wordpress CMS customers can update their site themselves. Behind this reason, there are a couple of reasons why I chose Wordpress are such as full standards compliance with easy installations and upgrades. It is very easy for importing and exporting. Different supports from Wordpress communities for protections of spam and bugs. Multiple authors manage the accounts from different computers. Wordpress powered websites can have password protected posts and very important is Wordpress is totally free and open source.

## 5 Implementation

### 5.1 Choosing content management system

When the project completed, run successfully and handover to the client they want to update and change the content by themselves with the help training and user guide provided to them. So we decided to use content management system to get relieve from manual update. Open source content management system was decided to use. In the initial phase, three Open source CMS were discussed Drupal, Joomla and Wordpress. The technical and non-technical part and some features, advantages and disadvantages of them were mentioned to the client, and some link of them provided for the self -study. I had done one project with Drupal during that time I felt it was quite technical and should be skilled to use this. After self study client also feel Drupal is more technical, so we reject Drupal. Our project time was limited, and I need more time because of not having previous experience about Joomla so I requested them not to use Joomla.

Then at last Wordpress was selected because I also have some experience about it and even non technical and non experienced can do an update and change the content of the site after few hour training and instruction provided to them.

The website was successfully completed and handover to the client and it has been already about 10 months they did not ask for any technical support and running website successfully. Client was very impressed, and they gave good comments that proved choosing Wordpress CMS was worth full.

## 5.2 Installation of WordPress

Wordpress is supposed to be easy and fast for installation within five minutes and also some web host such as Fantastico will install WordPress automatically for us.

For the successful installation of the WordPress, host should need to have PHP version 5.2.4 version or higher and MySQL version 5.0 or higher. Apache and Nginx server are recommended. They are most robust and feature full server to run WordPress, but we can use any other server which will support PHP and MySQL. (WordPress Requirements, retrieved 11.02.2014). I have downloaded the latest version of WordPress and unzipped its data than MySQL database was created using PhpMyAdmin for the web server. File name was renamed as wp-sample-config.php to wp-config.php. On the XAMPP server, unzipped WordPress data was uploaded to run the WordPress installation script by using the URL in a web browser. (Installing WordPress, 2014)

## 5.3 Design

The design of the website is most important as the information content of the website. The design or the outlook of the website should be attractive, concise and eloquent. “The design and the content should reflect the target of the audience and the purpose of the site” (Lawrence & Tavakol 2007, 8). Now for every idea, product, interest or groups have websites. So it is very challenging to create appropriate design that looks quite attractive, consider the idea behind it and different to others, however, we are using advanced and powerful software to build it (Lawrence & Tavakol 2007).

Professional designer developed the design of BPS Finland Oy’s website completely different outlook than the previous one they were using. Although the design was from a professional designer we agreed to change if necessary during the development of the website.

The Photoshop version of the design was converted to BPS themes by downloaded the similar WordPress themes and changed it according to need. The design of the website mainly based on three columns. The first column is for navigation, second column is for the main content of the individual pages, and the third column is for the image which change the colour frequently and which give general information about the company. Here in below the picture of the design of the website.

**BPS**  
FINLAND

Your Partner in Business,  
Processes and Systems

FI / EN

BPS FINLAND SERVICES & SOLUTIONS BPS GROUP ASSIGNMENTS CONTACT US

**BPS News**

Ke 5.12.2012  
BPS hakee jatkuvasti ammattilaisia asiakkaidensa toimeksiantoihin.  
BPS tarjoaa ammattilaisesti korkeatasoisen työpaikan ja erinomaiset urakehitysnäkymät. Sinulla on mahdollisuus kehittyä...  
[LUE LIIKAA](#)

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Read more about our services and solutions

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bpc@bpcfinland.fi | +358 9 5761 6100  
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Figure 3: Home page of BPS Finland Oy

**BPS**  
FINLAND

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**BPS FINLAND**

**BPS Consulting Finland:**

- SAP Service Partner working in cooperation with SAP Nordic
- Consultant resources in Finland: 44
- Belongs to BPS Group – European network's expertise available

Founded in 1998 – SAP competence builds up since 1995

**Since 1998:**

- Conducted assignments for more than 140 Finnish SAP customers
- 25 BPS SAP Projects
- 18 constant service maintenance and regular customers

Our key competence is strong process, project and system knowhow. We are specialized in ERP strategy consulting and SAP services and solutions: implementation projects, training, system maintenance, development and consulting. BPS SAP maintenance model, developed in the late 1990s, serves the needs of the even most demanding business environment.

*"We at the BPS believe in the partnership way of doing and thinking. We want to build long-term and sustainable relationships, which are based on real trust and commitment."*

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bpc@bpcfinland.fi | +358 9 5761 6100  
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Figure 4: BPS Finland page

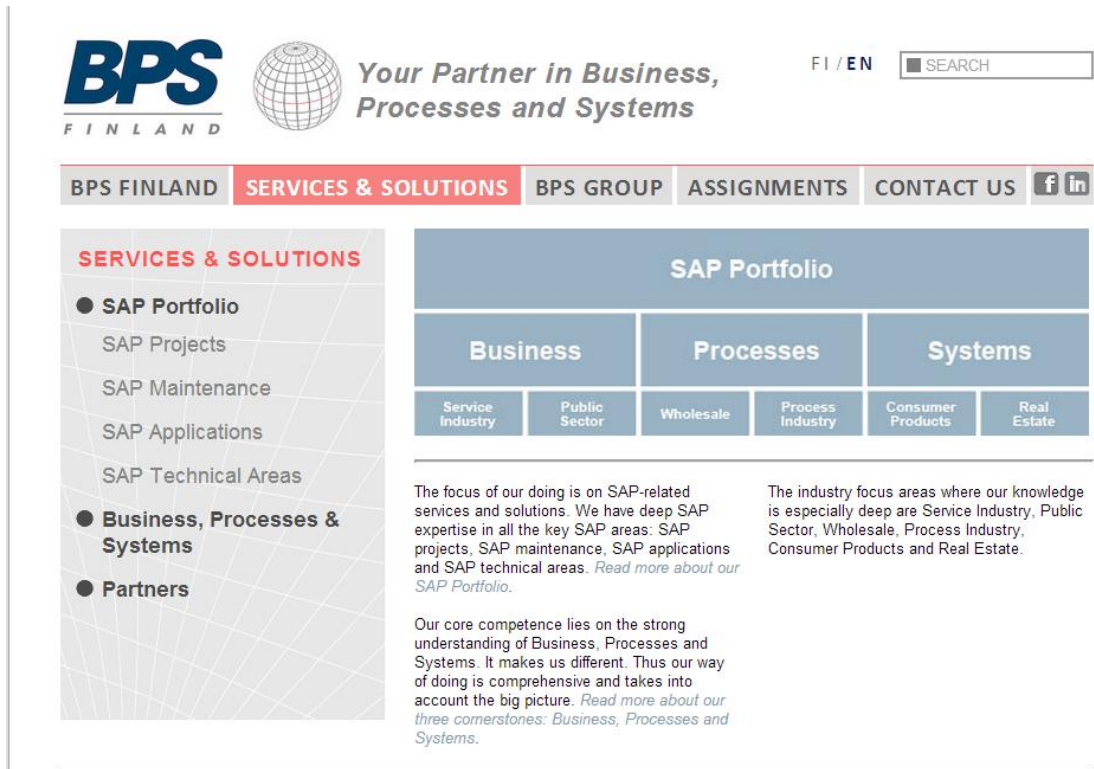


Figure 5: Services & solution page

In the above pictures, the fig 1 is an index page or home page of the BPS Finland Oy in which we can see only two columns, but in reality the first column is used for navigation and the two second and third column were used by one picture. The fig one also have the same column as shown in the fig 2 where we can see three separate columns clearly which are used for navigation, content and pictures or general information about BPS Finland Oy. In fig 3, we can see the first column is for navigation from where we can go to the different topics content by services & solution page. In the first half above part second and third column was use for the picture of Sap Portfolio and the down half portion were again divided into distinct two columns. So, basically the website was designed with three columns but the columns were used according to the content and requirements.



## 6 Technical tools and skills used

Before starting the development of the website using CMS, we should be familiarized with the technical parts and equipped with skills that are going to use. The technical tools and skills used in the projects are below.

### 6.1 HTML/HTML5

HTML Hypertext Mark-up Language began on early 1990s is the main mark-up languages in the existence of any web pages which can be displayed on the screen as heading, paragraph and content of the pages. The most recent version of HTML is HTML5 which is the development to meet the current and futures need of websites. Most of all the HTML elements comes in pairs such as start tags and end tags such as <h1>...</h1>, but also some tags come unpaired such as image tag <img> (Casto, E. & Hyslop, B. 2012). The file extension of the HTML file should be on .html or .htm.

Example of HTML5

```
<!DOCTYPE html>
<html>
<!-- Comment or just information>
<head>
<title>Bps Oy</title>
<body>
<p> Bps consulting Oy. </p>
</body>
</html>
```

HTML5 is better for error handling and reduce the use of external plug-in such as flash to insert video, audio and canvas on websites. Only new version of the browser support HTML 5, so we have to use conditional comments to make compatible with old one.

```
<!DOCTYPE html>
<!--[if lt IE 7 ]> <html class="ie6 ielt9"> <![endif]-->
<!--[if IE 7 ]> <html class="ie7 ielt9"> <![endif]-->
<!--[if IE 8 ]> <html class="ie8 ielt9"> <![endif]-->
<html lang="fi">
```

## 6.2 CSS

CSS is an acronym for Cascading Style Sheets which give a creative eye catching appearance and control the overall design of the websites or it is all about the changing, improving and controlling the outlook of HTML script including colour and fonts (McFarland 2009, 1). The file extension of CSS files is .CSS. With the help of CSS, we can make the web pages compatible with the screen or the devices use to view (Cascading style Sheets, accessed 13.02.2014).The example of CSS used to fix the container of web pages is below.

```
#container {
    width: 100%;
    max-width: 960px;
    border: 1px solid #A3A3A3;
    background-color: #FFF;
    margin: auto;
    padding: 0px;
    -webkit-box-shadow: 5px 5px 4px #818181;
    -moz-box-shadow: 5px 5px 4px #818181;
    box-shadow: 5px 5px 4px #818181;
}
```

## 6.3 XAMPP

XAMPP is an open source cross platform application package. It mainly consists of Apache HTTP server, MySQL database and interpreters. It is a set of scripts written in PHP and Perl programming languages.(XAMPP, retrieved 12.02.2014) XAMPP is famous for easy installation and most popular PHP development environment. XAMPP has a different type such as WAMP, MAMP, SAMP and LAMP. Many Operating Systems such as Windows, Mac OS, Linux and Solaris supports XAMPP. XAMPP is an acronym which stands for

X = X for cross platform  
A = Apache HTTP Server  
M = MySQL  
P = PHP  
P = Perl

XAMPP is used by many web developers and programmer to test their development as local-host without access of internet. So I used XAMPP before successful completion of the project and then only host to make it online. (Apache Friends, 2013.)

#### 6.4 PHP

PHP full form is Personal Home Page. It is an open source, cross-platform server-side scripting languages started on 1994 released under PHP license. PHP can be embedded to HTML pages and executed in each time visitors visit your site. PHP also interprets with the web server and generates HTML and other output to website (Welling & Thomson, 2009). More than 244 million websites and 2.1 million web servers already installed PHP. According to (Powers 2010, 1) PHP brings websites to life in following ways such as sending feedback from website directly to the mailbox. It will upload files via webpage and creates thumbnails for larger images. PHP help to display and update information dynamically. It also uses a database to display and store information that helps website searchable.

PHP is free and latest versions of PHP can be download from the link [http:// www.php.net](http://www.php.net). It is easy to learn and if you have some previous knowledge about C or Perl you can do productive task easily. Except MySQL, PHP can be connected to many database systems such as, PostgreSQL, FilePro, DB2, Hyperwave, Informix, InterBase and Sybase database.

#### 6.5 MySQL

MySQL is a very fast, robust, relational database management system (RDBMS) which enables you to store efficiently, search, sort and retrieve data”(Welling & Thomson 2009,3). The development history of MySQL was 1979, but it was publicly available on 1996.

MySQL is double license scheme as open source and commercial license too. C and C++ used to write MySQL which can be supported by many operating systems such as Windows, Linux, Solaris, OS X and FreeBSD. So, we have used MySQL as the database of the website which will help us to sort, store and retrieve our data. The best examples of using a database in the new case company website are website internal search engine, BPS news retrieves and contact form.

#### 6.6 PHPMyAdmin

PHPMyadmin is web based open source cross platform, PHP application and MySQL administration tools. This is used to handle MySQL database, which can be find in more than 70 languages. PHPMyAdmin was written in PHP, CSS, XHTML and Javascript, and it is easy to use

because of its user interface. CPanel is web hosting interface provided by most hosts. CPanel contains PHPMyadmin to manage and administer your database and if your host does not use cPanel contact them about the option of PHPMyadmin (Wilson 2011, 378)

## 6.7 JavaScript

JavaScript (JS) is a client-side scripting languages developed by Netscape in 1995. The main purpose of using JavaScript is to interact with the visitors of the website by making it attractive, functional, interactive content and validating contact form. The file extension of JavaScript file is .js. At the moment JavaScript is used mostly to do all the cleaver and annoying things in websites (Haverbeke 2011, 6).

In our case company website, we used JavaScript to format contents in a good manner, to change the colours of the picture in every re-load and to validate contact form. One clear example of JavaScript used on case company website is change in colours of resolution box in the right side of BPS FINLAND page and the of JavaScript code used for this is

```
<script>
  var color = new Array(2);
  color [0] = "#A4A4A4";
  color[1] = "#869BAE";
  function changeColor(){
    var ranNum= Math.floor (Math.random()*2);
    document.getElementById('sidebar-right-
text').style.backgroundColor=color[ranNum];
  }
</script>
```

After the implementation of this code the background colour of the box changes without affecting the content and size of the box such as picture shown below:

& SOLUTIONS	BPS GROUP	ASSIGNMENTS	CONTACT US	 
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**BPS Consulting Finland:**

- SAP Service Partner working in cooperation with SAP Nordic
- Consultant resources in Finland: 44
- Belongs to BPS Group – European network's expertise available
- Founded in 1998 – SAP competence since 1995

**Since 1998:**

- Conducted assignments for more than 140 Finnish SAP customers
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Our key competence is strong process, project and system knowhow. We are specialized in ERP strategy consulting and SAP services and solutions: implementation projects, training, system maintenance, development and consulting. BPS SAP maintenance model, developed in the late 1990s, serves the needs of the even most demanding business environment.

*"We at the BPS believe in the partnership way of doing and thinking. We want to build long-term and sustainable relationships, which are based on real trust and commitment."*



Figure 6: Color of box when opened first visit

S	BPS GROUP	ASSIGNMENTS	CONTACT US	f in
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**ing Finland:**

ice Partner working in cooperation  
Nordic  
t resources in Finland: 44  
o BPS Group – European  
expertise available  
n 1998 – SAP competence since

d assignments for more than 140  
AP customers  
AP Projects  
nt service maintenance and  
stomers

petence is strong process, project  
knowhow. We are specialized in  
/ consulting and SAP services and  
plementation projects, training,  
tenance, development and  
PS SAP maintenance model,  
the late 1990s, serves the needs of  
it demanding business

*"We at the BPS believe in the partnership way of doing and thinking. We want to build long-term and sustainable relationships, which are based on real trust and commitment."*



---

Figure 7: Box's background color changed when reloaded

## 6.8 Adobe Photoshop

Adobe Photoshop is close source graphic editing program which was initially released on 1990. Adobe Photoshop developed by Adobe Systems, and the file extension is .psd and .psb. Adobe Photoshop is a huge program and to cover very parameters of each functions several thousand pages required. (Bark 2012, 6)

The importance of Photoshop or the graphic editor is one the significant part of the web design. The designed done in a graphic editor or Photoshop is easier and faster to show the stakeholder how does their future website is going to look in client side. Then they can dis-

cuss and agree about the design and the developer can start back end work to give the right website as agreed on Photoshop version of the design.

Case company BPS Finland also provided the Photoshop version of their design and later on that design was converted to WordPress theme to created website. During the ongoing period of the project, some changes were made on design by keeping mainstream of the design same. So Photoshop was used to making changes in design, to change the resolution of the image and to edit them.

## 7 Features of developed website: case company

Building website is not great deal, nowadays every company, interest group and even personal websites can be found on the internet. Even for building websites there are many outsourcing companies, tools and software can be found. So keeping good features and distinct website than other is challenging part. The some features included on the website developed for case the company are below.

### 7.1 Multi-language website

WordPress 3.0 or above have a special mode in which a network of multiple websites can be created running on a single installation of WordPress. Case company website was created using WordPress multisite. So, there are options for visitors in which language they want to visit the website. Currently, English and Finnish versions of sites are available. The main site is in English, [www.bps.fi](http://www.bps.fi) and if the visitors want to visit sites in Finnish they can just click on the language icon FI on the top right side of the navigation bar. This selection leads to the subdirectories of the main page such as [www.bps.fi/fin](http://www.bps.fi/fin). Visitors can again return to English site just clicking ENG.

### 7.2 Search engine optimization

Search engine optimization (SEO) is the process of increasing the visibility and rank of websites in search engines such as Google, yahoo, Bing. The term Search Engine Optimization assumed started from 1997, but search optimization believed to begin on decades of 1960s based on the original database query technology (David, 2011). Creating distinct attractive website is not only sufficient for marking business information through it; website should be search engine optimization so that visitors who even don't know about us can visit our pages via search engine. For SEO, some common tricks were applied in the case company website is illustrated below.

### 7.2.1 Tags

There are different tags which affects on search engine optimization. They are Meta tags, alt tags and <a> tags. Meta tags are implicit information that passes more information to search engines. Meta tags used in website such as Meta keywords, Meta descriptions and Meta robots.

Alt tags are used to describe the information of images in Html page if images are turned off or not available. So keeping most common words to describe images inside alt tags can also help SEO.

Links inserted within the webpage are very helpful for SEO. So appropriate title with <a> tags were provided to the link inserted within website.

### 7.2.2 Keywords

Important keywords keeping by repeating three to seven times in meta tags, in first heading or paragraph within twenty words helps search engines to find your keywords.

### 7.2.3 HeadSpace2 SEO plugin

HeadSpace plugin reduces effort to manage Meta tags and most of the SEO tasks by providing several shortcuts. HeadSpace plugin allows us to add title, descriptions, keywords in every single page such as homepage, pages, search pages and 404 pages. One example of setting headspace plugin is below.





Figure 8: Headspace plugin

### 7.3 Compatibility

Cross browser compatibility regardless of its versions is as important as the design and contents of the website (Torres 2011). The case company website tested in different browsers such as Internet Explorer, Mozilla, Chrome, Safari and Opera mini. Different mobile phones such as Nokia, Samsung, iPhone and HTC used for the screen test even though there was no separate mobile version.

Cross browser compatibility was done in the following browsers and worked fine on all.

Internet Explorer 8, 9, 10

Mozilla FireFox 19.0.2

Google Chrome 26.0.1410.43

Safari 6.0.2

The older version of Internet Explorer browser such as 6, 7 and 8 does not support HTML5 and CSS3, so conditional comments were used to make compatible.

### 7.4 Search box

Search box is nowadays very common on most of the websites that allow visitors to find the right topic or content from the same website. The search box also helps to get the content that are not visible in the main content of the website or help to archive the older news and

content. So in the case company website also included search box in very appropriate place, just above the main navigation menu.

### 7.5 Clear navigation bar

The word navigation itself means the way or direction of movement. So it is essential for every website. There is clear navigation bar or menu in order to make easy for clients and visitors what they are searching and which page they are visiting. Try to manage not more than three clicks to find the content they want to explore. Visitors will be very happy to explore easily and return to the main page instead of they are hunting for some hidden treasure. A very good navigation can help website search engine ranking (Optimus01 2013).



Fig 7: BPS website hierarchy

In the case company website navigation menu or bar is kept very clear and shortcut way in order to make visitors get information very quickly and they know in which pages of the website they are visiting. The pages of the website where visitors are visiting it will get red background colour which is different from the light grey-blue colour used for all horizontal navigation menu in homepage and also vertical menu for services and solution page. If visitors want to get quick content and archive form website, they can use the search box and can return to the home page with one click on BPS logo on the left top. For example, the picture below makes clearer.

The image shows the BPS Finland website navigation bar and services section. The navigation bar includes links for BPS FINLAND, SERVICES & SOLUTIONS, BPS GROUP, ASSIGNMENTS, CONTACT US, and social media icons for Facebook and LinkedIn. A search bar is also present.

The SERVICES & SOLUTIONS section is organized into a column-based layout. On the left, there is a sidebar menu with the following items:

- SAP Portfolio
  - SAP Projects
  - SAP Maintenance
  - SAP Applications
  - SAP Technical Areas
- Business, Processes & Systems
- Partners

In the center, there is a circular diagram representing the BPS SAP overall SERVICE MODEL. The diagram is divided into several segments: Project Planning, Feasibility Studies, Strategic Phase Planning, Process Development, Implementation Projects, Hosting Services, Maintenance, and Service Management. The center of the diagram is labeled "BPS SAP overall SERVICE MODEL".

On the right side, there is a vertical list of service categories:

- SAP Projects
- SAP Maintenance
- SAP Applications
- SAP Technical Areas

Below the diagram, there are three dark blue buttons labeled "Business", "Processes", and "Systems".

At the bottom, there are two bullet points describing the services:

- SAP Application, technical and version upgrade implementation and development projects
- SAP implementation services - Implementation strategies, planning and support services

Figure 9: Navigation bar

## 7.6 Contents

In this case company website contents were placed in column base. So there are very clear and different places for all distinct content. For some important and big content even different pages are created which will open in new tab. The new tab opening will help visitors to visit the content separately in pages and easy return to the same page. For crucial news, content and resolutions of company picture boxes were used on the right side of the pages. As in the fig 7 different font sizes and colours are used so that visitors can differentiate the content in a short glance. The services and solutions process of the company are clearly described with the help of diagrammatic images inserted in the website. The diagram below shows all the services of the company.

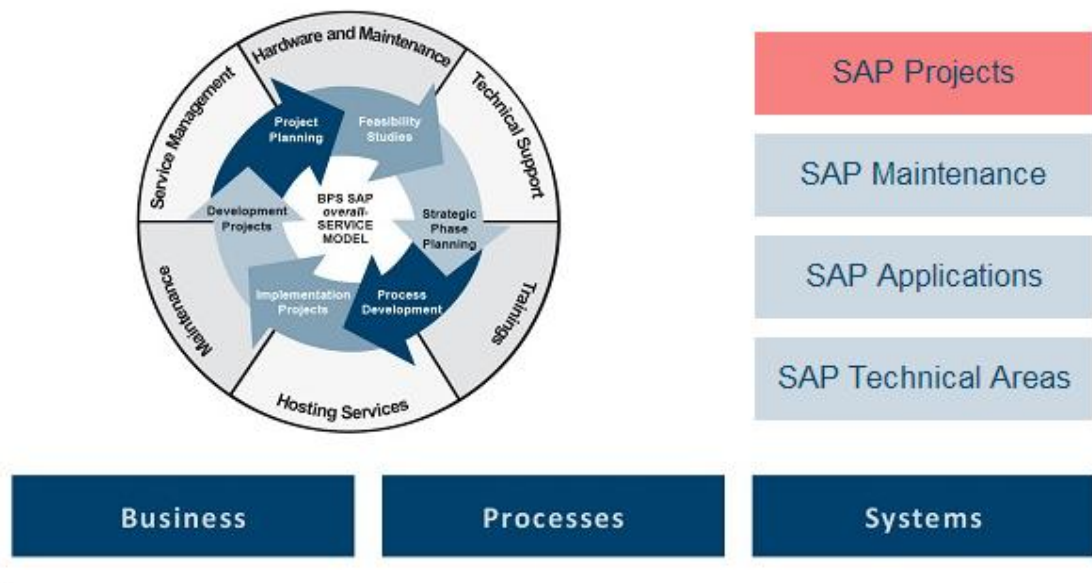


Figure 10: Services and solutions

### 7.7 Contact information

The case company is working as a consultant. It is very essential for the website visitors to have easy contact information on the website if they are looking similar services and solutions as the case company is providing. So contact us menu bar is kept on the right side of the page. The contact us page contain two pages one is for basic information about the address of office with map, telephone no and the general information of email address. There is a contact form for visitors them who are contacting first time or don't know the full name of BPS team. They can use the contact form by filling the information required and BPS team will reply later according to priority level.

### 7.8 Social media icon

Use of social media is increasing for different purposes, connecting to friends, sharing the video, pictures and pages what they such as and even for marketing. So now days most of the people have access to the internet, organizations, interest groups have social media pages. Most of the blogs and websites are also linked to social media because there are numbers of customers and visitors who visit social media almost every day rather than websites. Social media icons on the website provide a direct link to the right social media pages. After liked social media page is or followed once, they can get update about the offers and services of the company easily.

So in case company website social media icons such as Facebook and LinkedIn are placed as important as other menus in the navigation bar in order to make visitors easy to go social media pages and can get update about the company information even in their social time.

## 8 Testing, problems and maintenance

Testing of the website was carried out from the beginning when localhost XAMPP server started use to figure out the outlook and features of the website in different browsers such as Chrome, Mozilla, Safari and Internet Explorer. Some tools and code validators were used to test validation of codes, CSS and scripting languages used in website. Maintenances made at the same time when problem found and some changes suggested by stakeholders during discussion conducted before launching the website too.

Stakeholders were satisfied with localhost testing of the website, and website processed for hosting. When the website was online then there was a problem on the website for windows 2000 operating system using by stakeholder's desktop computer in the office. The website was not exactly the same layout displayed for other versions higher than windows 2000, but most of the features were working. Different devices and operating systems used for testing the website to figure out bugs and functional features. Testing was done together with stakeholders and some experienced friends in this field.

The problems and bugs figure out were fixed, but still some problems found for windows 2000 could not fix because it does not fully support the latest versions of HTML5 and CSS3. Stakeholders did not take this as significant problems because windows 2000 are already more than a decade old and most of the systems were updated already to higher versions.

## 9 Training and guideline document

Training and providing eloquent guideline document in order to help the client to update their website in the future is one of the most important parts of this project. Clients or stakeholders are not skilled about the technical skills such as programming language, HTML, JavaScript and CSS. Then we agreed to use Content Management System Wordpress to build up case company website so that they can update through browser base WordPress Dashboard which don't need any technical skills as such as for manual update with coding.

After successful launching of the website, guideline document was created. This will guide from login to WordPress dashboard to updating and managing overall web pages. Guideline document created in both languages, English for English theme and in Finnish to update Finnish theme. The document includes step by step instructions with screenshots of almost all

important steps and the special tricks. The areas where clients should give more attention highlighted with different colors.

Guideline document was provided to BPS staffs that are responsible for future updates before two days of training for self study. Training was successfully completed before the estimated period. Stakeholders highly appreciated the guideline documentation and way of training provided to them.

There is one example of the guideline document below that shows how to update the SAP Projects page. The SAP Projects page is the third level navigation of the website. The level of the navigation hierarchy is shown above in Fig 7. The portion of the guideline document is here below.

The content divided into two columns.

The first column is placed inside tag `<div id="col-1"></div>`

The second column is placed inside tag `<div id="col-2"></div>`

Inside two columns

- The lists (which have list's style as grey filled circle) are placed between tag `<ul class="content-list"></ul>`
- The sub-lists (which have list's style as dash -) are placed between tag `<ul class="sub-list"></ul>`
- The sub-sub-list (which list's style as square) are placed between tag `<ul class="child-list"></ul>`

The structure is followed:

```
<ul class="content-list">
<ul class="sub-list">
<ul class="child-list">
</ul>
</ul> <!--end .sub-listà
</ul> <!--end .content-listà
```

```

<div id="col-1"> ← start column 1
<ul class="content-list"> ← start content-list
<li><strong>SAP Application, technical and version upgrade implementation and development projects</strong></li><br/>
<li><strong>SAP surveys, strategies and troubleshooting</strong></li><br/>
<li><strong>SAP project management services</strong></li>
<ul class="sub-list"> ← start sub-list
<li>SAP project planning, phasing, team resourcing</li>
<li>Customer project manager tasks</li>
<li>SAP project support services guidance and control tasks</li> ← end sub-list
<li>SAP project quality assurance and auditing services</li>
</ul><!--end .sub-list-->
</ul><!--end .content-list--> ← end content-list
</div><!--end #col-1--> ← end column 1

```

Some other general tips and tricks applicable for other pages are

- For Title the space between words in title is displayed as “&nbsp;”

Do not use key “Space” in keyboard to display space between words.

- If we want to add a bold text, put text between <strong> and </strong>.
- If we want to add a list, put text between <li> and </li>.
- If we want to add a paragraph, put text between <p> and </p>.
- Use <!--more--> before the contents which are to be hidden which is inside <p> </p>

tag

- Add/Remove “company”/”industry” by adding/removing

```
<tr>
```

```
<td> “company” here </td>
```

```
<td> “industry” here </td>
```

```
</tr>
```

Color box: Text inside color box is placed in Code

[www/wp-content/themes/bpstheme/page.php](http://www/wp-content/themes/bpstheme/page.php)

## 10 Evaluations

From the beginning until the testing and maintenance of the project was carried out in a way of partnership with stakeholders. The main objective of developing a new website for the case company according to the design provided was complete successfully in the expected period. Another essential and a high priority expectation of the project manager was easy backhand work of the website after completion of the project that was fulfilled by using WordPress CMS. Stakeholders, their staff and some nearest friends evaluated overall website and appreciated the work done. Customers also appreciated training, tricks and guidelines document provided to them.

Stakeholders were very happy about deliverables, and then some formalities were completed according to the contract made before starting the project. It has been already one year of successful running of the website, and there is not any dissatisfaction from stakeholders that is the best example of the project evaluation.

## 11 Conclusions

The overall objectives of this thesis project are to create a new dynamic website for the Finnish company BPS Finland Oy according to the design provided from a professional designer which is supposed to achieve all the expectations of the company's benefits. From the beginning to launching the website online, there was very good coordination with stakeholders in every section of web development such as choosing CMS, functionality, managing contents, for some small changes in design and even participate in testing of the website in different browsers, operating system and devices. Finally, stakeholders got the new dynamic WordPress powered website as their design. They are able to update the contents and some features of the website from the browser based WordPress dashboard instead of manual code change according to effective training and guidelines provided initially and the experience they are getting since one year and onward.

During the period of this project, I have learned and gained experiences of technical skills and tools related to web development. I also got a chance to improve my knowledge gained in class and self studies by implementing in a real project. Besides of this technical knowledge of ICT and research fields, many other experiences were achieved based on real life working environment. These information and experiences will be beneficial for future career development which including team works, communication skills, realistic time managements and the most important are being patient to solve the problems occurred by evaluating it in depth and discussions with other stakeholders.



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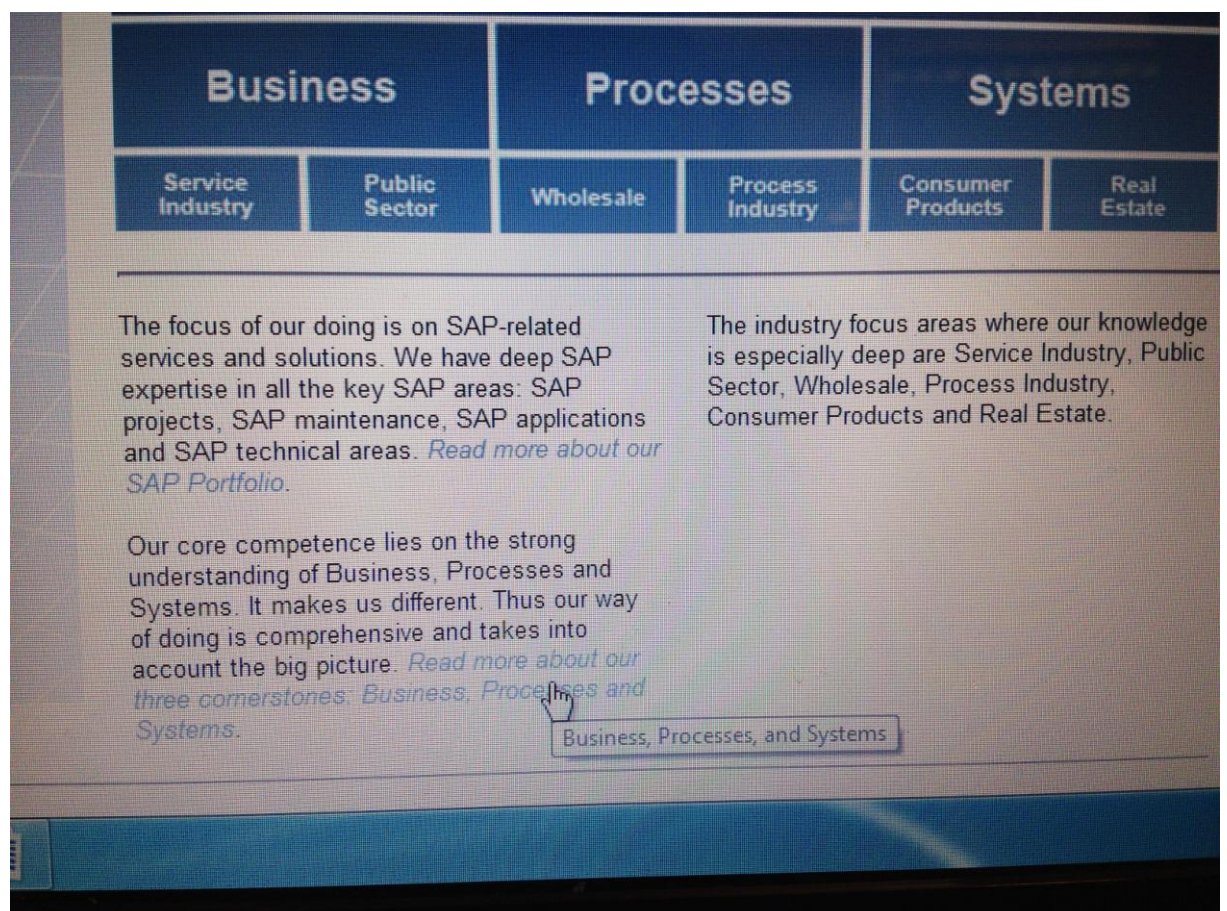
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## Appendixes

Possible common and most used name for mouse hover.



Contacts form including feature full CAPTCHA plug-in which helps to fill captcha and information about it.

**CONTACT US**

- **Contact Form**
- **Join Team BPS**

Name\*

Company

Job Title


Phone\*

Email\*

Message Title\*


Message\*

\*Mandatory Field



Type the text

[Privacy & Terms](#)



### Posts database during initial phase.

(Recent tables) ...


wordpress2


Sort by key: None

+ Options

	ID	post_author	post_date	post_date_gmt	post_content	post_title	post_excerpt	post_status	comment_status	ping_stat
<input type="checkbox"/> Edit Copy Delete	2	1	2012-12-07 17:02:07	2012-12-07 17:02:07	<b>BPS Consulting Finland:</b><ul><li>SAP Ser...	BPS FINLAND		publish	closed	closed
<input type="checkbox"/> Edit Copy Delete	4	1	2012-12-07 17:02:07	2012-12-07 17:02:07	This is an example page. It's different from a blo...	Sample Page		inherit	open	open
<input type="checkbox"/> Edit Copy Delete	5	1	2013-01-07 21:42:44	2013-01-07 21:42:44	[twocolumns] <p>The focus of our doing is on SAP-...	SERVICES & SOLUTIONS		publish	closed	closed
<input type="checkbox"/> Edit Copy Delete	6	1	2013-01-07 21:42:25	2013-01-07 21:42:25		Auto Draft		inherit	open	open
<input type="checkbox"/> Edit Copy Delete	7	1	2013-01-07 21:43:04	2013-01-07 21:43:04		BPS GROUP		publish	closed	closed
<input type="checkbox"/> Edit Copy Delete	8	1	2013-01-07 21:42:56	2013-01-07 21:42:56		Auto Draft		inherit	open	open
<input type="checkbox"/> Edit Copy Delete	11	1	2013-01-07 21:44:48	2013-01-07 21:44:48	<div id="contact"><strong>BPS Consulting Finland...	CONTACT US		publish	closed	closed
<input type="checkbox"/> Edit Copy Delete	12	1	2013-01-07 21:43:20	2013-01-07 21:43:20		Auto Draft		inherit	open	open
<input type="checkbox"/> Edit Copy Delete	13	1	2013-01-07 21:40:31	2013-01-07 21:40:31	This is an example page. It's different	BPS Finland		inherit	open	open

Homepage of live web site with domain name: [www.bps.fi](http://www.bps.fi)





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**BPS News**


Fri 07.02.2014

**SAP FINUG's SolMan seminar draws full house**

The house was full on January 23<sup>rd</sup> as SAP FINUG held a seminar on SAP Solution Manager. Tommi and Martti were representing us and reported that there were literally no chairs left at the start of the seminar, which is a strong indication that there is great interest towards SolMan in Finland. In fact, due to the great amount of demand the topic generated, SAP FINUG will arrange another seminar on March 10<sup>th</sup>.

Strong arguments were made on the new functionalities and usefulness of the new SolMan 7.1 version. The most concrete takeaways of the seminar were **CONTINUE...**

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