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Model for Auditing Search Engine Optimization for E-business

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Model for Auditing Search Engine Optimization for E-business

Examensarbete utfört i datakommunikation
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Abstract

E-commerce combines web technology with business economics. As of the last 10 years, online visibility for such online enterprises now heavily rely on the relationship between the own online sales platform and Search Engines for improved traffic consisting of presumable customers with the intent of acquiring products or services related to the customers' needs. In 2008 an Internet behavioural analysis showed that over 90% percent of Swedish internet users make use of search engines at least once a week, stating that online visibility through the use of search engines now is a crucial business marketing aspect. To improve the relationship between online e-commercial platforms and search engines several applications exists within the technical field of Online Marketing – one being Search Engine Optimization (SEO),

As a subset of Online Marketing, SEO consists mainly of three subareas; Organic Search Engine Optimization (Organic SEO), Search Engine Marketing (SEM) and Social Media Optimization (SMO). The true nature of how Search Engines operate to crawl and index web contents are hidden behind business secrets owned by the individual search engines operating online, leaving SEO auditors and operators to systematically "try-and-error" test for optimal settings.

The first part of this thesis unfolds the SEO theory obtained from online sources, acclaimed literature and articles to discover settings in which SEO auditors and operator may use as tools to improve online visibility and accessibility on live websites to search engines. The second part sets on forming a theory driven work model (called the "PS Model") to systematically work with SEO; structure for implementations and ways to measure the improvements.

Third part of the thesis evaluates the PS model using a case study where the model is implemented upon. The case study uses a website (in this thesis referred to as "BMG") owned by a company active in the biotechnological research and development field situated in Sweden (in this thesis referred to as "BSG"), which at the start of January 2010 was in need of SEO improvements as the relationship between the search engine Google had somewhat stagnated leaving several vital documents outside of Google's indexing and the relevancy between performed search quires and site-wide keywords had been lowered.

The focus of this thesis reside on bringing forth a work model taking in essential parts of SEO (Organic SEO, SEM and SMO), implementing it on the BMG platform to improve the website's online visibility and accessibility to search engines (mainly focusing on Google), thus enhancing and solving the stagnated situation identified as such in January 2010 by the BMG site-owners – consequently validating the PS Model. In May 2010 it was shown that the PS model did improve site-wide indexing at Google and search queries containing the main set of keywords in use of BMG was improved in terms of relevancy (higher placing on search result pages).

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Terminology

Apache	Web Server Platform provided by the Apache Software Foundation
Blog	Type of website focused on presenting regular entries of information on a more personal level.
BMG	E-commercial website owned by BSG.
BSG	Company mainly active in the biotechnological research and development field. Situated in Sweden and owned by Dr. Ronnie M. Andersson.
CMS	Content Management System
Cookie-cutter technology	Adopting technology residing on uniformity, pragmatically or common practice with the lack of originality
CR	Conversion Rate
Crawler / Spider	Application using a set of algorithms to scan a vast selection of information using links for transitional travel
CSS	Cascading Style Sheets (Style sheet language used to present markup language such as HTML)
E-business	Business being conducted online (on the Internet)
Feed	A way to distribute content on the Internet using pull & push technology – that can be subscribed to.
Holistic	Whole / wide, as in using a wide perspective while investigating an area of interest
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
IIS	Web Server Platform provided by Microsoft
IP address	Computer or computers address on a network
JavaScript	Script Language
Keyword(s)	Highlighted set of words within a website to match search queries from search engines.
PPC	Pay Per Click
PS Model	The SEO auditing model for e-business compiled by the thesis author: Patrick Schooner
ROI	Return on Investment
RSS	Really Simple Syndication, family of web feed
SEM	Search Engine Marketing
SEO	Search Engine Optimization
SERP	Search Engine Result Page – the page that provides search results after a conducted search query
SMO	Social Media Optimization
Social Media	Community based forums online where individuals meet for networking and personal communication
SPAM	Undesired electronically bulk messages/information

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1 Introduction

The development and evaluation of a work model for website administrators (also referred to as “auditors” and “operators”) working with Search Engine Optimization outlines the main objective of this bachelor’s thesis. Theory and empirical studies forms the main contents for the model development. The revilement of its use and accuracy in result bringing comes from an evaluation assessment done with a case study: a live e-commercial website depending on Internet exposure for revenue. The thesis also describes broad literature and online based theory as well as commonly used technologies for search engine optimization – focusing on essential parts needed for E-business.

1.1 Background

According to acclaimed web sources such as wikipedia, electronic commerce (E-business) is business conducted where customers and retailers met virtually to carry out economical transactions of products or services. As the global expansion of network connected information technology continues new market spaces are formed for new and established businesses that has knows no boundaries except the span of all Internet connected computers all over the planet. As such, the number of firms and professional individuals conducting search Engine Optimization (SEO) for E-business on consulting basis grows for each passing year.

The diversified inflow of web visitors to a e-commercial website outline what is commonly called as "traffic" and that traffic can be either be quality or quantity based in terms of potential customers. If the ratio of potential customers is higher than the amount of casual visitors the possibility of revenue is higher. Again, according to the Easyfairs e-commercial focused seminars, that means that not all traffic is beneficial for the e-business, only the part that brings in potential customers. Based on these arguments websites have to be better on attracting the right kind of traffic to potentially gain revenue. This is where Internet marketing comes in to picture, an area which can be divided into three major areas; Search Engine Optimization (SEO), Search Engine Marketing (SEM), and Social Media Optimization (SMO).

According to the author behind "SEO Warrior", performing search engine optimization is a time consuming effort as it requires marketing and information technological understanding as well as experience in web programming. According to Google, outsourcing SEO to hired professionals can be both provide advantages or disadvantages depending on how the optimizing work is performed. Agencies with acknowledged SEO competence and experience provide useful services for e-commercial website owners, such as; auditing content and site structure, technical advice on website development in terms of hosting, redirects etc, content and keyword research, management of e-commercial campaigns, SEO training, and expertise in specific markets, regions and geographies.

The need of effective SEO derives from the popularity of using search engines for simple and advanced search queries performed by individuals and corporations. In 2008 an Internet behavioural analysis was conducted by the Swedish SEO company iProspect. As a result of that study a press release was later on published the same year stating that in Sweden amongst many search engine using nations, over 90% percent of Swedish internet users use a search engine at least once a week. In terms of Internet marketing this statement becomes highly significant as search engines have over the last years improved their usefulness as an important channel for visitor traffic. In simple terms: web visitors are potential customers, and for online as well as offline commerce - every customer means revenue.

1.2 Purpose

The purpose of this report is to investigate techniques to revise (audit) already implemented search engine optimization (SEO) intended for E-commercial websites using a holistic perspective introducing business development theory with commonly and acknowledged SEO aspects. After identifying these techniques, this report wants to prove the possibility to construct a SEO work model based on these techniques on a broad holistic span.

1.3 Delimitation

- The objective of this report is examine the possibility to form and evaluate a practical work model for diagnostically revising implemented Search Engine Optimization (SEO) for e-business through the implementation of the work model on a live e-commercial website in need of SEO improvements; BMG from BSG.
- The theory driven work model (henceforward called "PS Model") will consist of essential partials from four areas affecting online accessibility and visibility (indexing and ranking) for E-commercial websites; (Organic) Search Engine Optimization, Search Engine Marketing, Social Media Optimization / Social Media Marketing, and Business Development.

1.4 Scope

According to wikipedia - Search Engine Optimization is a subset of Internet Marketing. This investigation will be limited to probe SEO for organic search results, SEM for keyword and content and SMO for web 2.0 accessibility/ business relations with the fundamentals of business development theory. The reason for the concluding limitations is that Internet Marketing is it own economical science and that the model development will only focus mainly on technical achievements that yields improvements by keyword and content holding incubating framework optimization. Other areas will only be used and mentioned briefly.

	Search Engine Optimization (a subset to Internet Marketing)			**Business Theory**
Thesis Scope	**Organic SEO**	**SEM**	**SMO**	**Business Concept**
Main focus	Framework Optimization			
Mentioned and used for model development		Keyword Research Content Optimization	Social Integration Blogging	Business Idea Market Plan Organization Product Intention

Table 1 Scope Outline

1.5 Method

This report consists of both inductive and deductive studies using recognized literature and field work (case study) providing empirical data. Model development and test cases where to be planned during the outline construction of the work model.

1.6 Structure of thesis

The thesis report starts with an introduction chapter explaining the current state of the relationship between Search Engines and E-commerce. Second chapter provides a Theory Overview to be used in constructing the theory driven work model for Auditing Search Engine Optimization for E-business. Third chapter provides the mentioned theory to construct the work model. Fourth chapter is the Case Study where the work model is implemented on the BMG website. Fifth chapter explains the results from the work model implementation. Sixth chapter details the conclusion from the results provided and obtained by the case study and evaluates the use of the work model. Seventh chapter is the discussion which highlights the overall results and problems during the creation of the work model and its application on the BMG web platform. Also in the seventh and last chapter the author presents the final revised work model (the PS model) for Auditing Search Engine Optimization for E-business, and suggestions for further work with the model as well as what has been learned during the thesis work.

2 Theory Overview

This thesis uses acknowledged (printed) literature and accredited information from online web sources to provide the essential span of theory needed to understand the concept of Search Engine Optimization.

2.1 Online accessibility and visibility

E-commercial websites depend on the same commercial principle as offline business; product exposure. While different methods exist to expose products and services online, the most effective way to expose online commodities is by using search engines. The prime search engine, Google.com, favoured by the vast majority of private and cooperate web searchers uses advanced patented technologies to provide relevant search hits for given search phrases. Two factors contribute to an e-commercial website's discoverability; grade of indexing and acquired ranking.

2.1.1 Search Engine Accessibility for efficient crawling

Google, as other search engines, uses robots (also called spiders) to crawl the Internet in search of high value content to be indexed and ranked in their databases. Processed content is then accessible to online searchers via the search engines web portals. The crawling process is link-oriented meaning that the search engine robots use links to navigate through a website. For both the site administrator and the robot this can be both beneficiary and hazardous. To travel through an entire website, checking every discovered link can – on larger websites – be a bandwidth stealing process. Also, some content not openly obtainable by web visitors can be crawled and indexed. For this reason the larger robots (from Google, Bing and Yahoo) uses a structured document called "robots.txt" which contains instructions on what content is allowed to be crawled and what content is to be left out from crawling. Also, most robots have been adjusted to be more bandwidth efficient on websites.

2.1.2 Content inclusions by search engines using data-mining algorithms

Indexing (adding and processing online data for searchable accessibility) from robots crawling the Internet are by most search engines a patented technology. The success behind Google can be derived from the efficient use of data mining algorithms, which all started from the paper called "The Anatomy of a Large-Scale Hypertextual Web Search Engine", a paper formed by the Google inventors Sergey Brin and Lawrence Page. In that paper Brin and Page states that: "search engines index tens to hundreds of millions of web pages involving a comparable number of distinct terms. They answer tens of millions of queries every day". Although the paper was first constructed in the late 90's last century – search engines still have the same work load on them and have to scale up their computing resources to match the ever growing of number of search queries being done each second globally with lightning fast responses. From the same paper, the method of acquiring a webpage through crawling and then being accessible to web searches from within the Google architecture is detailed in this figure:

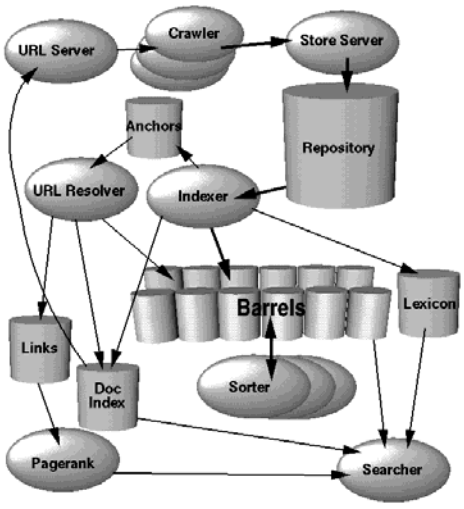


Figure 1 High Level Google Architecture (source: "The Anatomy of a Large-Scale Hypertextual Web Search Engine")

As the paper continues, the URL Server stores the gathering information of links to be fetched by the search engines crawlers and then sends the information to initiate the crawl process. The found content (web pages) is then sent to the Store Server. The main function of the Store Server is to compress and store the found content into a Repository. To further sort and structure the web pages, every page are designated an associated ID number called a docID (which is assigned whenever a new URL is discovered from a web page). Indexing is performed two separate functions called the "indexer" and the "sorter". The indexer reads the Repository and parses the data after un-compressing it. A list of word hits is constructed from the web page after being converted down to a set of word occurrences. Along with the word hits additional computed information is stored such as the words position in document, the on-page semantic use of highlighting text (like font-size and capitalization).

Every hit is then distributed into a set of "barrels" creating as the paper stats "sorted forward index". Also, the Indexer parses out links in every web page and stores important information about them in an anchors file. Further down the process the paper describes the conclusion of all tasks summarized down to a usable lexicon which holds references to the indexed data stored within the search engines databases. The same lexicon is then used by the search application on a web server together with PageRank calculations to provide answers to search queries.

2.1.3 Determining web page value through PageRank

PageRank (PR) brings order to web according to the Google authors behind "The Anatomy of a Search Engine". The patented algorithm to calculate PR consists mainly about determining the quantity and quality of external citations pointing to a specific web site and inbound links - or as the authors express it - "objective measure of its (web page) citation importance that corresponds well with people's subjective idea of importance".
The math behind PR is defined by the following expression:

$$PR(A) = (1-d) + d\,(PR(T1)/C(T1) + ... + PR(Tn)/C(Tn))$$

PR(A) is the given PageRank of a web page called A, C(A) is defined as the number of outbound links leaving web page A, and the crucial parameter d is damping factor spanning the interval of 0 to 1. The authors behind PR calculations use the damping factor of 0.85. T1 to Tn are pages that point to A. The sum of all PR determined web pages will be 1 as the PR form a probability span.
A web page with a high value PR receives better search ranking than a web page with low value PR emphasise the importance of site-wide citations and the number of quality inbound links to a specific web page. Using a search engine querying what the actual PR values practically mean, the following could be derived (as Google does not officially clarify what the actual PR values denote):

PageRank	Meaning
0	Called "PR0" – and is usually a sign for websites that used to have a higher PR being penalized by Google that uses questionable search engine optimization technologies. Having PR0 practically means being mostly always at the far back for searches relevant for that website.
10	Besides Google, only software developer Adobe dominates the top 10 of websites/pages receiving the PageRank of 10 (as of 2010).

Table 2 Explaining PageRank values.

However, several talks on SEO forums concerning the link between PageRank and SERP placing has been discussed – and in some cases websites with PR1 could show up on the top 10 in SERPs for given site tied keywords.

2.2 Organic Search Engine Optimization (Organic SEO)

The author behind the book "SEO warrior" explains that Search Engine Optimization (SEO) by itself is the iterative process of generating an inflow of useful traffic (quality and volume) to a website with use of constructed and targeted sets of keywords(s) via organic search results from search engines. Proving SEO effectiveness is done by looking into what order the search engine optimized site is presented on the search engines result page (SERP) for given keyword(s). The higher up a website reaches on the SERP, the higher likelihood according to the algorithmic calculations done by the search engine that the website corresponds to the given search phrase presented by the search inquirer, i.e. visitor). Search engine optimization can be performed to target different kinds of specific searches; image search, local search and vertical searches that are can be more industry-specific. Conducting SEO takes place on different technical and content driven layers; On-Page, On-Site and By-Externals, and consists of implementing measures (factors) to compensate flaws that could hinder search engine spiders work of crawling and indexing. In short, Organic SEO focuses on the optimizing the framework with the aim of placing relevant content as whole and especially keywords in the most effective and exposing way.

2.2.1 On-Page Optimization

To perform on-page optimizations means looking into the factors contributing to user and search engine friendliness in terms of semantic coding and content presentation. According to the web survey done by SEOMOZ in 2009, several key elements with different likelihoods to more or less affect the variables taken into account when Google and other search engines calculate search result relevancy. Through the web survey several SEO effecting factors were identified that can be summarized to:

Factor	Description / Area of Implementation
Page - Code/Text ratio	Counting ratio of code divided by text. Example: 45KB source code / 10KB content text = 4.5, the ratio should be near or less than 1 for best presentation (relevancy) to search engines
Breadcrumb Trail	Explained trail of site navigation from point of origin to present page. Example: Home >> Sector Page >> Category Page >> Product Page
Meta Distribution	Meta Distribution explains to the search engine the localization of contents
Meta Robots	Meta Robots tag describes for the search engine how to handle the page
Separation of visual representation elements	Separating HTML from CSS and JavaScript (page size optimization for faster crawling) as crawlers prioritize content before code.
Keyword - Initial spread	Keyword or keywords within the first 50-100 words on page
Page - Freshness	Having unique and substantial content on the webpage (utilizing the canonical tag to avoid duplicate content issues)
Page - Update frequency	Having a high update rate with fresh content
Semantic Coding - <b>, <i> etc	Highlighted text content placed within <b>, <i> etc tags
Semantic Coding - <H1>	H1 tag containing contents prime headline with keywords mentioned in it
Semantic Coding - <H2> to <H6>	Sub-headlines using H2 to H6 tags with keywords mentioned in it
Semantic Coding - <p>	Page text content placed in the <p> tags
Semantic Coding - Meta Description	Short description of page contents within the Meta Description tag
Semantic Coding - Tile	Using <title> to describe page contents with possible keywords
Anchor text - Internal linking	Anchor text with keywords describing links pointing inwards within website
Content arranging with CSS layers	Using CSS to arrange order of content within the web page code with layer technique for improved search engine crawl-ability
Image "alt" attribute	Image description readable for search engine
Menus with CSS formatted lists	Using CSS to transform lists to visual design elements (menus etc) to improve link-discovery and improved search engine crawl-ability
Code Validation	W3c validation of web page source code to eliminate crawling pitfalls for search engines
Meta Keyword	Business keywords (single or sets) placed within the Meta Keywords tag
Social Bookmarking	Giving web visitors the option to re-publish or mention a specific
Keyword Research	Deriving new useful keywords from existing keywords (or from the Business concept documentation)
Offline contact information	Offline contact information provides localization info for search engines and is valued positive by Google.

Table 3 On-Page Optimization Factors

2.2.2 On-Site Optimization

Using a Content Management System to deploy e-commercial websites with inbuilt SEO support takes minimizes the programming work load for optimal search engine friendliness. For an example - an intelligent and useful hierarchy of content presentation is crucial for link optimization. Other contributing factors that are mostly server based such as administrated data from when and where the site was launched - and who in regards of registrant stands behind the website. On-Site optimization can be summarized and presented into the following listing of factors:

Factor	Description / Area of Implementation
Blog	Having an active blog attracts attention from search engines – and is a possible source of externally inbound links to the main e-commercial website as well as increase in traffic.
Domain Ownership	Evaluating history behind the owner for domain
Domain Registration History	The actual documented history of the domain (times renewed etc).
Domain Registration Ownership Change	How many times a domain has been changed - same owner etc.
Domain Registration with Google Local	Registering the domain name with Google Local
Feeds in Google Blog Search	Including RSS feeds to Google Blog Search
Feeds in Google News	Adding RSS feed to Google News
Hosting Information	Information about other domains hosted on the same server (c-block of IP addresses)
HTML Sitemap	Visual presentation of website tree structure for visitors
Keyword - Page Folder URL	Keyword or keywords in the page folder URL
Keyword - Page Name URL	Keyword or keywords in the page name URL
Keyword - Root Domain Name	Keyword or keywords in root domain name
Keyword - Subdomain Name	Keyword or keywords in subdomain to root domain
Length of Domain Registration	The actual length (registered time) of a registered domain where longer is better
Location - Host IP Address	Location of the Host IP Address of the Domain
Offline contact information	Physical address, telephone number etc to office (geotargeting factor)
References in Librarian's Internet Index	References of the Domain in the Librarian's Internet Index - Lii.org
References in the Yahoo! Directory	External mentioning of a domain name in Yahoo! Directory
References of the Domain in DMOZ.org	External mentioning of a domain name in DMOZ.org
References of the Domain in Wikipedia	External mentioning of a domain name in Wikipedia
Robots.txt	Robots.txt tells the search engine what to index and what to exclude (directories)
Server - Architecture	Usage of CMS for website presentation
Server/Hosting Uptime	Calculating the uptime for server (longer better)
Sitemap in Footer	Having a HTML representation of the sitemap linked from the footer improves individual page relevancy as through the sitemap link from every page within the website – presenting a shorter path that leads to every page.
Social bookmarking	Social bookmarking function available for visitor
URL rewrite	Simpler and logical representation of URLs with keywords when possible
Use of Feeds on the Domain	Creating and publishing RSS feeds on the domain
XML Sitemap	XML representation of website tree structure for search engines
XML Sitemap - separated	Separating large Sitemap to smaller pieces limited to logical parts of website (like categories)

Table 4 On-Site Optimization Factors

2.2.3 By-Externals Optimization

Outside the individual webpage and sets of web content there exists variables which cannot be directly controlled by the own website. Google's algorithm for Page Ranking and search results relevancy takes different external factors into account; a websites trust factor and trust distance from a so called "trust seed"; a highly respectable website (both online and offline) such as nasa.gov etc. From the mentioned SEOMOZ several factors were identified that contribute to the external inflow of trustworthiness (factors that externally controlled):

Factor	Description / Area of Implementation
Link - External Links from other sites	Receiving links from external websites
Link - External mentions from other sites	Receiving mentions (in text) from external

Table 5 By-Externals Optimization Factors

2.2.4 Pitfalls hindering Search Engine accessibility

The authors behind "SEO Warrior" and "SEO – Search Engine Optimization Bible" both mention that there exists "snags" best described as "pitfalls hindering search engine optimization". Besides having factors that can be manipulated in such a way that they as whole contribute positive value (in terms of accessibility and relevancy for search engines), there exist so called pitfalls that can halter crawlers to effectively visit a website. For e-business driven websites this can be very damaging regarding revenue generation. Avoiding these pitfalls increases the likeliness of search engines having a best possible website visit.

SEO Pitfalls	Pitfall Description	Solution
Duplicate content	According to Google, "duplicate content generally refers to substantive blocks of content within or across domains that either completely match other content or are appreciably similar… deliberately duplicated across domains in an attempt to manipulate search engine rankings or win more traffic. Deceptive practices like this can result in a poor user experience, when a visitor sees substantially the same content repeated within a set of search results."	In most cases having duplicate content isn't intentional, i.e. having printer-only version of web pages etc. By using the "canonicalization" tag the site administrator is able to present to search engines the preferred page for exposure/indexing.
Page with overuse of keywords	The overuse of keywords on a single page ("keyword stuffing").	The content using the wanted keywords for exposure should be presented in a natural way as regular written text.
Disproportionate Repetition of the same Anchor Text in a High Percentage of External Links to the Site/Page	Multitude of inbound links having the same anchor text. According to forums discussing SEO, this can be regarded by search engines as "bought links", which is in direct violation of the terms presented by for example Google for sites being allowed to be index – as link buying is a deliberate way to manipulate PageRank calculations.	Avoid buying links from other websites, especially websites considered to be "spam-sites".
Internal linking - (Un-logical and un-balanced structure for web content	Having a defective structure for internal linking, which could be web pages non-reachable from start page with links, and/or web pages having more inbound links internally than the essential web content. Web crawlers navigate by links. Without a logical path, the web crawler may unintentionally exclude web content from a website.	Google advices that every web page within a website should be accessible from the start page (having a logical link path). E-business driven websites should have at least one inbound link to every product to guarantee the possibility to be discovered by web crawlers.
Cloaking	Providing set of content based on user-agent (example: type of web browser). Malicious cloaking provides one quality based content for Google (for indexing and ranking) based on the user-agent provided by the Googlebot (crawler), but as other visitors land on the page they are presented with totally different	Not all pages using different content based on user-agent are malicious, still, it's advised to avoid such coding for the sole purpose of adopting page contents for web crawlers.

	content.	
Outbound links to spam sites	Having links pointing to reported spam sites	Some hackers that infiltrate and manipulate site coding can insert links pointing to spam sites for the purpose of giving the sites higher PR (pagerank).
SEO un-friendly CMS	Not having a CMS (Content Management System) that is by native SEO friendly.	Strive to have a CMS that is easily SEO maintained
Frequent Server Downtime & Site Inaccessibility	Server is not accessible for users (and search engines)	Choose a service provider that can guarantee service up-time if not obtainable by oneself.
Content hidden in script, flash or other non crawler-friendly coding	Having content embedded in flash, scripts and other non crawler-friendly coding. Most crawlers have difficulties parsing information from flash videos.	Avoid having essential information (like site navigation) embedded in flash etc.
Hiding Text with same/similar colored text/background and/or with CSS by Offsetting the Pixel display outside the visible page area.	Using visible tricks to trick search engine and web visitors (keyword stuffing presented to search engine that is invisible to web visitors).	Common trick in the late 1990's to improve search engine ranking by invisible keyword stuffing. Does not work today and is punishable by the larger search engines.
Excessive Number of Dynamic Parameters in the URL	Having bad formatted URLs with dynamic parameters embedded.	Using URL rewriting formats dynamics parameters into readable text (for cleaner URLs)
Excessive Links from Sites Hosted on the Same IP Address C-Block	An IP C-block is defined by addresses matching for example 192.168.222.xxx, where xxx spans between 0 to 255	Having inter-linking or just inbound links from sites on the same C-block could indicate malicious link-building, as websites on the same C-block often belongs to the same owner.

Table 6 Outline of Search Engine Optimization Pitfalls

2.3 Search Engine Marketing (SEM)

The contents of "SEO – Search Engine Optimization Bible" explains Search Engine Marketing (SEM) as the way to promote websites for increased visibility within search engine result pages (SERPs) using marketing techniques adopted for Internet. SEM extends SEO with the possibility to promotionally target wanted audience using search engines with paid advertisement; Pay-per-click (PPC) and paid placement. SEM methods offer measurability that focuses on economical key figures such as Return on Invest (ROI) and Conversion Rate (CR). SEM sees visitors as potential customers, and with ROI thinking, every resource put into SEM is valued after the Conversion Rate where visitors turn into customers. SEM intersects with SEO in regards of PPC as PPC gives direct feedback on how well sets of keyword(s) perform attracts visitors.

2.3.1 Content development

Unique and fresh content has more value than duplicated and stale information according to Google, other search engines, literature and the vast majority of discussion boards on the Internet discussing professional SEO for e-commercial websites. The value diversity of the opposite content factors "unique" and "duplicate" is that wide that Google officially recognizes duplicate content (information repeatedly used throughout the own domain and across other websites) as (when maliciously and intentionally used to manipulate site Page Ranking) to be valid for extreme SEO punishment; being badly indexed and showing up low on result pages. Quoting Google support "Webmaster Tools Help":

> As a result, the ranking of the site may suffer, or the site might be removed entirely from the Google index, in which case it will no longer appear in search results.

2.3.2 Keyword Research

Keywords are both door openers for web visitors performing a search query on a search engine and also strategic content markers for distinguishing a business's own products and services from its competitors. From a search engine point-of-view: content with high relevancy for a chosen set of keywords will be prioritized above content with low relevancy for the same chosen keywords. Search engines point-of-view, it's all about providing high relevancy content to its search inquirers – failing to do so means dropped popularity amongst other search engines. With this in mind, website owners need to see the whole picture when formulating a platform for e-commercial interaction on the Internet. Ending up on the first result page is crucial, being the in the top 3 is desirable, still, being the top 1 is the ultimate goal as searchers seldom click on hits past the top 3. If the searcher have a high trust factor for the chosen provider of search results (search engine) than the first click is where they'll go first.
To perform a viable keyword research one has to first distinguish and summarize the whole e-enterprise into sets of few words as point-of-origin for keyword generation and additional permutations of discovered keywords. Using a holistic approach on finding ground material for identifying primer words, business development theory supplements data collecting with short and direct snippets of text used to build up documentation as business idea and business concept. Asking customers and brainstorming are also two other ways to find the initial keywords to worker further with. To start off a keyword research different point-of-origins (POO) can be used:

2.3.2.1 Business Concept POO

- Identify the sales pitch that describes the e-business
- From that sales pitch, tokenize useful keywords
- List the keywords in sets of one and more natural combinations

2.3.2.2 Brainstorming POO

- Gather a group of co-workers and/or customers
- Conduct a open-minded brainstorming session where every business associated word/phrases is noted
- Tokenize found phrases and redundancy check found keywords
- Rank resulting keywords and list them

According to "SEO – Search Engine Optimization Bible", having the POO defined, the next step is to construct if not already divided – two categories in which the keywords can be ordered in; generic (broad) keywords and specific keywords. Most important, if not already filtered out, stop words like: A, An, The, But, When, Where etc. These words are filtered out by search engines, so using them as keywords or in keyword sets is a waste of dedicated resources.
Next step in the keyword research is to construct (permutated generation) more relevant keywords out of the initially found. The goal is to find words corresponding with the initial "core" keywords and broaden them out with associative variations. Using the Google AdWords Tool it's possible to find variations in close proximity to the initially derived keywords that doesn't presently have lots of competition in terms of organic search result hits. When the niche is found (low competition keywords), the keyword research is completed. To evaluate keywords Google recommends using PPC (Pay per click) as it provide instant statistical data for a discrete cost determined by how long the evaluation period lasts (i.e. PPC campaign).

2.4 Social Media Optimization (SMO)

"SEO – Search Engine Optimization Bible" mentions that Social Media Optimization (SMO) improves traffic to a website by actively manipulating (in a positive manor) social media activity, driving quality visits to targeted website content. SMO consists of two method categories; utilizing of social bookmarking and social media contents imbedded to a website, and using promotional activities within social media forums to attract interest by presenting fresh web content to visitors.

2.4.1 Social Bookmarking

Website owners utilizing web 2.0 marketing strategies find that social bookmarking is a great method to create more inbound external links from web visitors that wants to share, organize, search, and manage bookmarks of content found on the Internet by creating bookmarks that references site content for others. Today Internet users are able to connect using personal accounts at own blogs and/or at Facebook etc. to create a reference of interest between the own social media space and other websites. As of 2010, Google (according to themselves in press releases) strives to index more social media content to provide more relevant search results as social media is mostly regarded as commercially unbiased and therefore more reliable.

2.4.2 Blogs

Blogs are mostly personal repositories for thoughts and opinions that have huge value for search engines as that kind of content is highly human created and therefore more relevant for its natural topic keywords. Swedish clothing manufacturers as "HM" have the past couple of years acknowledged this fact and offers fashion blogs easier access in "in-link" material from the own catalogue so that the bloggers can easier create content mentioning their brand amongst their readers. Also this kind of fashion blogs is considered to be individual-to-individuals communication, e-businesses can use the blogging platform to communicate with its customers (individuals and other businesses) in a more personal yet professional way vitalizing the press releases that communicate more directly to its concerned audience. Blogs also create a nice foundation for high-value external linking as it nicely fits in the heuristic way to analyse linked content; page with good anchor text links to link text relevant content, and search engines find that the content linked to is relevant to its inbound link – provides higher relevancy and ranks better.

2.4.3 Social Media Presence

Recommendations sprung in personal communication between people online have a higher trust factor than commercial forms of advertising according to survey done by "The Nielsen Company" in 2009. The survey covered 25000 Internet consumers from 50 different countries around the globe. In comparison with text ads sent to mobile phones consumer opinion posted online yields 70% trust factor, rather than 24% for mobile advertising. Still, recommendations from known individuals that share a personal connection bring in 90% in trust assurance. For that reason, social media presence – which focuses on personal communication amongst individuals online – presents an interesting platform for consumer contact.

2.5 Business Concept

Search Engine Marketing (SEM) focuses on presenting sales-driven keyword optimized content to presumable and present customers in efforts to convert online business offers to actual sales. Using a holistic approach on assessing commercial websites online visibility, the auditor begins with back-stepping to the entrepreneurial reason of why the e-business was set online for an open market. Established and newly founded business will at some point construct one or more sets of business documents clearly defining what their e-business is all about. This thesis focuses on the deriving essential business information needed for a solid SEO audit from the definition set by the master thesis work called "PAH Modellen - en analysmodell för ett affärskoncepts potentiella etablering". In that thesis, a business concept model was formed to assist entrepreneurs in constructively defining their own intentions and their business conjecture. The PAH model consists of five important areas for the SEO auditor; business idea, market, product, business organization and the intention behind the business venture. In combination with the essentials of SEM, documentation regarding the online ventures business concept lays out a platform for wider keyword development, permutations and content copy-creation for the web store. If not already defined, the outline to a developed business concept consists of:

- **Elevator pitch** – the sales pitch that compresses the whole business idea to just one sentence.
- **Business idea** – where the customer need, solution (product or service) and initial market is presented
- **Business Model** – how to perform the business, i.e. e-business
- **Market** – where the markets are in depth analyzed and quantified with target audience defined and strategy.
- **Organization** – the executive work crew and other interested party defined (performed competence inventory).
- **Product/service** – the commodity that the business is trying to sell within the defined markets.
- **Intention** – purpose of online business

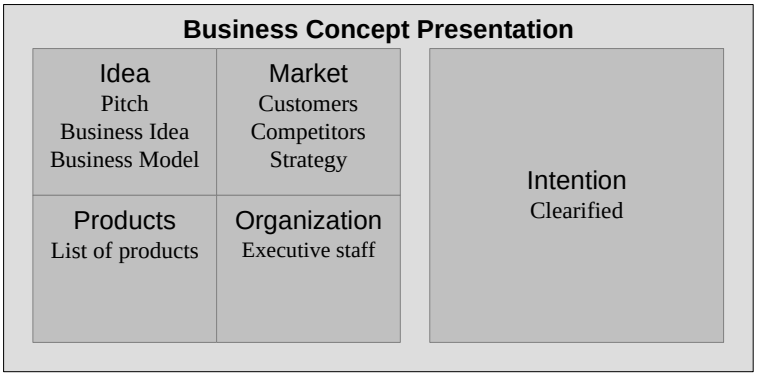


Figure 2Business Concept according to the PAH Model

2.6 Search Engine Optimization Measurement Tools

2.6.1 Google Webmaster Tools

Google Webmaster Tool (GWT) present information of the internal and externally inbound links, how Google bot is able to crawl, HTML errors such as duplicate meta and title tags, main keywords within the website, how of different keywords interact etc. In GWT web administrators are able to upload the XML sitemap for easier access by Google. Regarding indexing, GWT also present how many pages from a uploaded sitemap is currently being indexed.

2.6.2 Google Analytics

According to Google, "Google Analytics is the enterprise-class web analytics solution that gives you rich insights into your website traffic and marketing effectiveness". In combination with GWT it provides a more SEM (Search Engine Marketing) measurability where different goals can be set to measure SEO/SEM effectiveness.

2.6.3 SeoQuake SEO

SeoQuake (Mozilla Firefox SEO plug-in) is aimed at primarily aiding web administrators working with search engine optimization (SEO) and internet endorsement of web sites. SeoQuake obtains and investigate lots of vital SEO parameters of a website, and as the plug-in description outlines; saving future work to compare a website with the results obtained for other competitive websites.

2.6.4 AWStats

The log analytical web server based software AWStats is both free and plentiful of applicable areas for log analysis, such as logs generated from advanced web, streaming, ftp or mail server statistics – all of this presented graphically online.

2.6.5 Google Search Engine

It is possible to acquire data from the Google search engine using formatted queries (with operators) that provide more exact results, such as Google describes them:

Operator	Description
allinanchor:	All keywords have to appear in anchor text of links to the page.
inanchor:	Terms must appear in anchor text of links to the page.
allintext:	All query words must appear in the text of the page.
intext:	The terms must appear in the text of the page.
allintitle:	All query words must appear in the title of the page.
intitle:	The terms must appear in the title of the page.
allinurl:	All query words must appear in the URL.
inurl:	The terms must appear in the URL of the page.
site:	Gives a number of indexed pages from site: URL

Table 7 Google Search Engine Advanced Search Operators

3 Model Theory

Driving wanted traffic is the key to e-business success and using a logical approach this can be both time and cost-saving possible. Using the processed contents of different online and published literature as previously mentioned in chapter 2, the following can be said: SEO is an iterative process with initiates as often as the technology behind search engines evolves and expands. In general, the benefits of implementing an SEO audit can be summarized to:

- Search Engine Accessibility (indexing) Optimization: Adjusting content copy, website design and link strategies for best possible web presence and avoiding and removing sink-holes for search engines – making the own website more search engine friendly.
- Search Engine Visibility (ranking) Optimization: Increasing traffic and Improving SERP placing with re-tuned keyword sets.

The PS model for E-business sets a definition to how the iterative SEO process can be applied to already working e-commercial websites. Bringing in a holistic approach with understanding of search engine evolution, the PS Model consists of five essential *iterative* steps to achieve best possible inflow of wanted traffic:

1. **Assessment**: Gathering of essential background data concerning already implemented SEO.
2. **Preparation**: In-depth analysis of present SEO resulting in SEO tasks for improvement.
3. **Implementation**: Systematic implementation of SEO tasks.
4. **Evaluation**: Data collection aimed at measurability of implemented SEO tasks for evaluation.
5. **Continuity**: Routines for continuous SEO work and decision of restarting the PS model

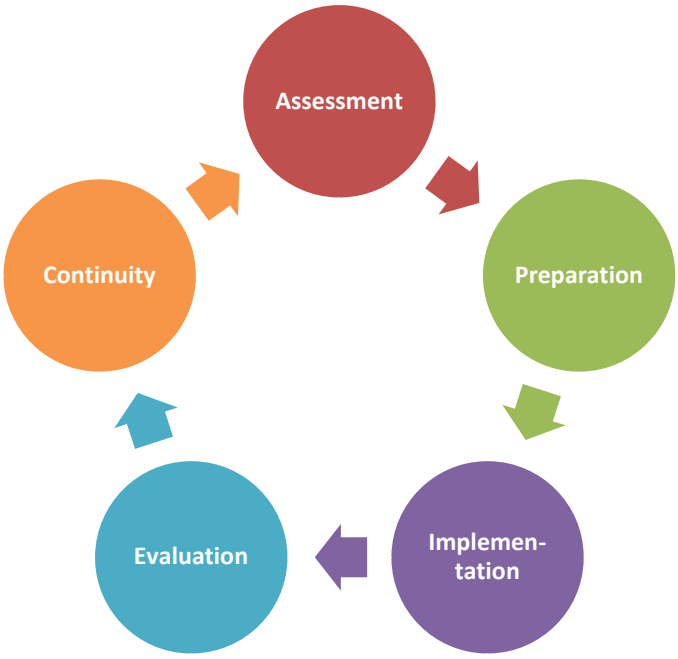


Figure 3 – Workflow description of the work model - PS Model

3.1 Assessment phase

The assessment phase lines out offline business documentation with present statistics from the website. The purpose of this assessment is to give a solid foundation for future SEO. Defining goals brings need for measurement, and when measuring the benefits and drawbacks from the search engine strategies – the auditor gets a truer picture of how effective the web presence really is. This phase is objective focused as it brings forth data for goals and activities to planned and prioritized in the next phase (preparation).

3.1.1 In-House Competence

The PS Model for SEO Auditing is much like a standard IT-assignment and should be handled like one. Every usual assignment has an owner whom sets the goals and determines when they are reached. Someone has to be handed the assignment for its work implantations and procedural reporting. As for any project or assignment, resources have to be defined accordingly to its place in overall priority.
The organization described in the business platform determines which key roles are in use. Smaller enterprises compared to larger cooperation's lack the versatile luxury of having several key competences in-house. The important question that has to be asked and answered is – regarding the vast spectra of SEO technologies: how much do we know, and can we handle the SEO work by ourselves? Today SEO is more than a few web page tweak – it is an integrated part of a business's short and long terms exposing strategy to both a local and global market. Taking e-business into concern – SEO exposure is even more important.

Checkpoint	Meaning
In house competence	State and answer the question of what SEO competences can be found in-house.
Evaluate need for external consultants	Consider taking in external expertise when the in-house competence is not sufficient for short and long term SEO work. When considering SEO experts – check what methods they're using. Choose only experts with high transparency in work methodology. Unethical or "non-revealing" experts can sometimes do more harm than usefulness when implementing "black hat" SEO techniques. In worst cases you can be totally banned by Google for misusing SEO factors. If the SEO expert does not co-operate with PR and marketing agencies – beware – as stated, SEO is more than just cookie-cutter technical implementations. The site owner needs the holistic overview to find out how to profile the website on the Internet.
SEO responsibility	Appoint a SEO-in-charge within the organization.

Table 8 In-House Competence Checkpoints

3.1.2 Current State Analysis

Before any work is put into optimizing the website some ground laying current state analysis has to be done to give some measurable Point-of-Origin.

Checkpoint	Meaning
Site crawl-ability	How well the site is accessible to web crawlers for indexing Using GWT documenting the number of presently indexed number of pages contra pages within the website should be at least between 50-75%, 75% and above is desirable for e-business driven websites with a multitude of sell-able products over the e-shop.
Page Ranking	How well the site is regarding amongst other websites in terms of PageRanking Using PageRanking tools determine site PageRank, the higher the better.

Table 9 Current State Analysis Checkpoints

3.1.3 Business Concept

It is important for the SEO auditor to know why the e-business exists. The written argumentation within the business concept can provide important leads for the current state analysis, business intelligence and keyword research. Answering these key areas will provide more background information for the assessment phase:

Checkpoint	Meaning
Business idea	Business idea that defines needs and provides solutions for.
Market plan	Presumable customers and market for where the e-business exists in.
Organization	Organization providing the e-business.
Product	Products making up the e-business.
Intention	Intention behind the e-business.

Table 10 Business Concept Checkpoints

3.1.4 Log Data Analysis

First of all – the auditor needs to access the server logs. Most server logs are produced in raw data usually following a common standard. The simplest standard is the as NCSA common format. This format provides information like: numerical IP of visitors' computer, ID to identify the visitor (blank if none provided by the visitor), username used by the visitor to communicate (this is also blank if none was provided by the visitor), date for visit in GMT, request from the visitor containing the HTTP method, request and protocol version used, code given to visitor (status code) like success, failure or redirections etc. Last is the total size of the HTTP transfer in bytes.
Having an Apache web server means the possibility to have extended information produced. Besides the contents from the NCSA common format, Apache extends NCSA Combined Format which adds referrer information (what web page did the visitor come from), useragent (web browser used by the visitor) and the visitor cookies. The extension that Apache uses is the third NCSA format called "NCSA separate" which divides the gathered visitor information into three separate logs; access log files, referral log files and agent log files. Other server platforms such as the IIS web server use additional log formats.
Analyzing the server (depending what server the website uses) logs can provide information like:

Checkpoint	Meaning
Visitor data	For a defined time period – how many visitors did the website as whole have, and how many of them where unique.
Page popularity (traffic)	Traffic tied to specific web pages.
Inbound links	Incoming URLs - from which sites.
Landing words (keywords from search query)	Search words used by search engines – what words did the visitors use to access the website
Crawler visits	Which web spiders visited the website and often.

Table 11 Log Data Analysis Checkpoints

Using third party software such as AWStats can be used to automate generate graphs and static presentations. Google provides Google Webmaster Tools and Google Analytics to ease the process of evaluating web stats.

3.1.5 Link Analysis

Metaphorically Google uses inbound links as casted votes. The more votes, the higher the importance and relevance of that web site compared to others. Sorting out the search engines from the server logs, it is possible to see which websites are currently linking to your website using the referral information. The auditor will only in stage of assessment look upon which inbound links are currently providing traffic. The possibility exists that the web site in question has links pointing to it from other web directories – but if they are not generating traffic, they will not be taken into account of this link analysis.

Checkpoint	Meaning
Source of inbound links	Check which websites are currently providing inbound links and what anchor text did these links provide
PR of inbound links	What PageRank did the actual page have that provided the inbound link

Table 12 Link Analysis Checkpoints

3.1.6 Internal Keyword Analysis

The server logs can by filtering out visits that did not come from search engines provide interesting information regarding useful keywords. A search query done at a search engine constructs a dynamic URL which contains search words. That URL gets entered in the server logs, and by deriving out the actual search words the auditor finds keywords that can be cross-referenced by the actual keywords used at the e-business website. If the website is already using tools like Google Webmasters Tools and Google Analytics, this assessment step becomes more manageable than reading the actual logs.

Checkpoint	Meaning
Popular keywords from search queries by listing.	List the keyword after popularity
Meta tag data	The keywords that are currently being used to attract visitors in forms of meta tags. List keywords from the meta tags (keyword and description)

Table 13 Internal Keyword Analysis Checkpoints

3.1.7 Visitor Analysis

As every actual webpage request can be tied to a multiple of visits, every visitor is unique. Analyzing the visitor provides background information as: which browser is most frequently being used by the visitor, where does the visitor come from (geographical point of origin of client making page requests). Using every bit of analytic possibilities provided from the server logs and stats broadens the perspective of what is working in terms of online visibility and what is not optimal. Visitor analysis is a huge part of SEM (Search Engine Marketing) – but as for this thesis only factors contributing to search engine friendliness and online visibility is taken to account. On a technical level – visitor analysis gives information on which browsers are being used to visit the website and the geographical point of origin tells what parts of the market is giving response and those that are not.

Checkpoint	Meaning
Visitor data information	Take note of the technical data that the logs provide in terms of what the visitor is using while surfing the website (user-agent etc).
Geo-targeting visitors	Make a list of different points of origin (geographically) for the visits and order them by traffic intensity.

Table 14 Visitor Analysis Checkpoints

3.1.8 Business Intelligence

Understanding competition in terms of SEO is to understand what makes other competitive websites rank and how to improve beyond them. Competition is formed when two or more websites share similar market, providing similar products and offerings. When SEO is taken into account – other similar websites may also have implemented strategies for high visibility on search engine result pages. From an economic perspective, evaluating competition can be done by performing a SWOT (strength, weakness, opportunities and threat) analysis. Identifying competition is primer for evaluating it. E-customers exist either locally or globally as do business rivals.

Checkpoint	Meaning
Finding competition	Running keywords-specific queries for the own website in question of an SEO audit. Finding out what other competitors match the keywords on the SERP (Search Engine Result Page). For each found competitor run the Google command of "related:" to find additional competitors. Finally, determine what meta tags and meta description information is being used by the business rivals.
Competition PR	Check what PageRank each competitor URL have
Competitors inbound links	Research competitor backlinks (inbound links to them) by utilizing Google commands as "inurl:", "inanchor:", "intitle:", "allintitle:" for competitor URLs, and different combinations of them provided by to Google online documentation. Determine the PageRank for each inbound link to the competitors to understand underlying site popularity.
Competitor hosting	Determine IP addresses for each competitor Check how long the address been existing. Try to find what webhosting service is being used by the competitor Does there exists other domain names (i.e. geographically top domains) tied to the IP?
Sort competitors	Form a list of the found competitors; order it after keyword relevancy, and number of quality backlinks.
SWOT analysis	When the list exists, to a SWOT analysis of the top 10 for comparison. Reorder the list after highest threat and strength against the website being audited. Determine the e-business's strong points in regards of the data found within the business platform. The weaknesses has to documented when considering business competitors presently on the market Opportunities are areas where your business excels over your competitors. Investigate this. Identify threats where your competitors have a stronger expanding foothold on the market than you.

Table 15 Business Intelligence Checkpoints

3.1.9 Use of SEO Software

Effective SEO is not possible without tools to measure the impact of improved keywords set or tools that can spawn sets of new keywords within the keyword research. Most search engines provide cost-effective measurement tools like Google Webmasters, Google Analytics (both presently free to use). Tools can also provide charts and graphs from text-massive server logs. If no SEO software has been historically used now is the time to choose some for future work.

Checkpoint	Meaning
Tools for SEO	Tools for measuring implemented search engine optimization done historically, and tools to be used for future SEO measurement and implementation.

Table 16 Use of SEO Software Checkpoint

3.2 Preparation phase

Having the assessment done, important questions and initial investigating provides enough data to at the end of the preparation phase form measurable goals and result bringing activities as technical specification. The preparation phase breaks down the gathered data into sets of task for the next phase – implementation.

3.2.1 Factor Analysis

Analyzing how well a website match to a set of specific factors causative to search engine optimization gives more detailed picture of the current state strong points and weaknesses. In accordance with the previously mentioned SEO factors - the auditor using the PS Model has match historical implementations with the recommended set of factors spanning the SEO improvements field. Lack of implementations points out weaknesses that needs to be covered. As the SEO survey done by SEOMOZ is largest source of the factor gathering, the following scale explains how the PS Model normalizes into a numerical priority span:

SEOMOZ scale	PS Model Scale
High Importance	1
Medium importance	2
Low importance	3

Table 17 Translating SEOmoz scale to PS Model

Group	Factor	Priority	Implemented	Not implemented	Note
On-Page	Anchor text - Internal linking	1			
On-Page	Breadcrumb Trail	1			
On-Page	Code Validation	1			
On-Page	Content arranging with CSS layers	1			
On-Page	Image "alt" attribute	1			
On-Page	Keyword - Initial spread	1			
On-Page	Keyword research	1			
On-Page	Menus with CSS formatted lists	1			
On-Page	Meta Distribution	1			
On-Page	Meta Keyword	1			
On-Page	Meta Robots	1			
On-Page	Page - Code/Text ratio	1			
On-Page	Page - Freshness	1			
On-Page	Page - Update frequency	1			
On-Page	Semantic Coding - <b>, <i> etc	1			
On-Page	Semantic Coding - <H1>	1			

On-Page	Semantic Coding - <H2> to <H6>	1			
On-Page	Semantic Coding - <p>	1			
On-Page	Semantic Coding - Meta Description	1			
On-Page	Semantic Coding - Title	1			
On-Page	Separation of visual representation elements	1			
On-Site	Keyword - Page Folder URL	1			
On-Site	Keyword - Page Name URL	1			
On-Site	Keyword - Root Domain Name	1			
On-Site	Keyword - Subdomain Name	1			
On-Site	Robots.txt	1			
On-Site	Server - Architecture	1			
On-Site	Sitemap in Footer	1			
On-Site	URL rewrite	1			
On-Site	XML Sitemap	1			
By-Externals	Link - External mentions from other sites	2			
On-Page	Offline contact information	2			
On-Site	HTML Sitemap	2			
On-Site	Location - Host IP Address	2			
On-Site	References in Librarian's Internet Index	2			
On-Site	References in the Yahoo! Directory	2			
On-Site	References of the Domain in DMOZ.org	2			
On-Site	References of the Domain in Wikipedia	2			
On-Site	Use of Feeds on the Domain	2			
On-Site	XML Sitemap - separated	2			
By-Externals	Link - External Links from other sites	3			
On-Site	Blog	3			
On-Site	Domain Ownership	3			
On-Site	Domain Registration History	3			
On-Site	Domain Registration Ownership Change	3			
On-Site	Domain Registration with Google Local	3			
On-Site	Feeds in Google Blog Search	3			
On-Site	Feeds in Google News	3			
On-Site	Hosting Information	3			
On-Site	Length of Domain Registration	3			
On-Site	Server/Hosting Uptime	3			
On-Site	Social bookmarking	3			

Table 18 Factor Analysis factor priority, implementation status and notes

3.2.2 Pitfall Analysis

The Pitfall analysis uses the information from chapter 2.2.4 to detect potential indexing/ranking faults and hinders in correlation with factor analysis. For the PS model the analysis usage outline is described in the following table – where the conclusion parts contains the empirical outcome of the specific analyzed search engine optimization snare:

SEO Pitfalls	Conclusion
Duplicate content	
Page with overuse of keywords	
Disproportionate Repetition of the same Anchor Text in a High Percentage of External Links to the Site/Page	
Internal linking - (Un-logical and un-balanced structure for web content	
Cloaking	
Outbound links to spam sites	
SEO un-friendly CMS	
Frequent Server Downtime & Site Inaccessibility	
Content hidden in script, flash or other non crawler-friendly coding	

Table 19 Pitfall Analysis Outline

3.2.3 Technical Specification

The Preparation phase details the needs and areas for improvement within PS model scope of SEO; Organic Search Engine Optimization, Search Engine Marketing, and Social Media Optimization – and does so in a structural manor for best possible execution. Summarizing the Assessment Phase with Preparation Phases initial analysis into a technical specification outlines the essential work to be carried out in the Implementation Phase. Using parts of the LIPS project model; a model first developed at Linköpings University by Tomas Svensson and Christian Krysander, the auditor enables simplified version of the LIPS outline for technical specification:

Specification Outline	Description and meaning
Company Name	Company procuring SEO improvements for the companies e-business driven website
SEO Auditor	In charge of SEO improvements – either in-house or external consultant
Specification Title	Work name for the SEO Audit
Contents	Table of contents for the technical specification
Revision History	Version number, revision date, responsible for revision and draft description of revision
Introduction	Background information to the SEO Audit
Purpose of Specification	Essential purpose of the specification
Definition and abbreviations	Definition and abbreviations for common technical and reoccurring specification details
Purpose of SEO Audition	Essential purpose of the SEO Audit
Primer Goals for SEO Audition	Primer Goals set for the SEO Audition in terms of indexing and ranking
Confidentiality	Terms for Confidentiality
Interested Party	The Interested Party for the SEO Audit
Roles for Audition	Specified roles for the SEO Audition process
Requirements	What has to be known to accomplish the SEO Audit
Uncertainties and Risks	Possible hinders to fulfill the SEO Audit
Documentation	Documentation to be created during the SEO Audit
Time estimation	Time span for the SEO Audit
Delivery	How the delivery shall be carried out

Table 20 Technical Specification Outline

3.3 Implementation phase

The third phase is straight-forward and utilized the technical specification from the Preparation phase. Documentation in these phase gives the auditor measurable data of done implementation and initial/long term results. The implementations are carried in accordance with the technical specification with the following reporting structure:

Type of SEO	Type of SEO activity; Organic SEO, SEM or SMO
SEO Activity (Name)	Name for SEO activity to be carried out
SEO Activity (ID)	Individual ID number for identification
Prioritized	Low, mid, high
Injection area	On page, on site or done to externally (in correlation to the website)
Time of Implementation	When the implementation is to be carried out
Short description	Shorter description of implementation
Long description	Longer description of implementation
Dependency	Eventual dependencies to the activity
STE (Short Term Effect)	The short term effect of the implementation
LTE (Long Term Effect)	The long term effect of the implementation
SE (Side Effect)	Eventual side effect by the implementation
Warning	Eventual warnings before, during or after implementing

Table 21 SEO Activity Description

3.4 Evaluation phase

When all of the activities have been performed accordingly to plan, the Evaluating phase analyses the results carried out in the Working Phase. If the evaluated results do not meet up with the declared goals – the cycle restarts in the Assessment phase to redo those areas that did appraise the goals. Using SEO tools to gather information about the new current status, the Evaluation Phase takes note on every check and the data acquired for each checkpoint. A structured way to carry out the data collection checks according to the PS model is the following:

Goal Name	The Goal name	
Goal Value	The numerical goal value	
Checkpoint (time)	Outfall	Goal deviation
Date of check	Type of data and summarized presentation of data	

Table 22 Structure for evaluating SEO Activities

When the data has been collected the auditor is able to parse information to compare collected information with the measureable goals set in the technical specification.

3.5 Continuity phase

When the goals are met from evaluating the measured output the model enters the Continuity phase of maintaining the goal fulfilment. Should the continuous results deviate from the goals, the model requires a restart in the Assessment phase. Still, most importantly, the continuity phase is heavily depended on routines to maintain every ounce of positive momentum provided throughout the different phases leading here. Determining forms for routines depends on what type of implementations has been done, the PS Model suggest the following structure to outline routine-needs:

	Daily basis	Weekly basis	Monthly basis	Yearly basis
System Maintenance	**Organic SEO:** Check Google Webmaster Tools determine crawling errors	**Organic SEO:** Check Google Analytics for visitor statistics and search trends If using	**Organic SEO:** Validate site platform, XML SiteMap and RSS feeds for errors	**Organic SEO:** Compare traffic data and determine if changes are needed on a server level to optimize work-load etc.
		SEM: Check keyword changes in popularity	**SEM:** Edit and freshen up site contents for improved site freshness	**SEM:** Compare site revenue with business docuemts – call upon a new SEO audit if the Contents/commodities are valid but traffic/indexing is shrinking
		SMO: If using social media as a part of a SEO strategy – a weekly maintained social activity is to be expected (Blogging etc)		
Competence	Browse SEO sources for information, especially Google staff forums for changes etc done to Google Search Engine	Read articles that focus on SEO (Organic SEO, SEM, SMO) (present and future changes and their effects).		Attend conferences and seminars where SEO expertise is discussed and presented.
Data evaluation		From a recent SEO audit compare deviations from collected data and compare them to set SEO goals. If the deviation is greater than what is acceptable – call for a new SEO audit		

Table 23 Routines chart

4 Case Study: BMG

To test the PS model a case study was used to provide the empirical feedback needed to evaluate the accuracy and potential flaws in the model design.

4.1 Background

In the beginning of January 2010, Dr. Ronnie Andersson from BSG situated in Stockholm asked the author of this report to provide some insights on how the website BMG could be SEO improved. As the author has had several years of professional web design for small enterprises in the industrial region of Gnosjö, Småland – the task was most interesting and intellectually stimulating.
BMG provides complete selection of information products on the global pharmaceutical, biotechnology, medical device and health care industries using the Magento e-commercial web platform. The website BMG and the "sister" e-business website (also owned by BSG) share the same platform solution and both a part of the BSG. The difference between the two websites are that BMG focuses more being a reseller of scientific information on a global market and the BSG platform focuses on its role as a publishing company doing its own research within the biotechnology and life science industry. As such, BMG is an essential part of the revenue contribution for BSG - as their market approach is solely Internet based.

4.2 Assessment phase on the BMG website

After the initial contact with Dr. Ronnie Andersson in January 2010, the author was connected with the in-charge of software engineering at BSG; Gary MacRitchie. After informing the author about the overall situation – having a low grade of indexing according to Google Webmaster Tools and not being able to rank enough for BMG's keyword sets, the assessment phase began with an in-depth analysis about the historical and present work done in the field of Search Engine Optimization.

4.2.1 In-House Competence

At BSG, both Dr. Ronnie Andersson and Gary MacRitchie had previous overall knowledge about Search Engine Optimization and had historically since the launch of BMG in 2003 implemented some SEO improvements over the years. Extending the SEO knowledge has been a time factor not often prioritized as technical maintenance and R&D (Research and Development) needed for the substantiality of BMG takes most of the work time invested into the e-commercial driven website. It was later decided that the thesis author with the supporting aid of Gary MacRitchie would take responsibility for SEO operations and that the need for other external consultants besides the thesis author and Gary MacRitchie wouldn't be necessary:

Checkpoint	Conclusion
In house competence	Dr. Ronnie Andersson, in-charge of biotechnology and life sciences R&D Gary MacRitchie, software engineer
Evaluate need for external consultants	SEO is an important part of making BMG more successful on the open Internet market for reselling biotechnology market research reports – which have been acknowledged by both Dr. Ronnie Andersson and Gary MacRitchie. Time is the only factor hindering optimal in-house development and research improving the overall SEO. The author was choosen to investigate and provide substantial information on how the BMG website could be effectively audited for Search Engine Optimization
SEO responsibility	Gary MacRitchie, Patrick Schooner (i.e. this report author)

Table 24 Case Study BMG: In-House Competence

4.2.2 Current State Analysis

On the 28th of January 2010, Gary MacRitchie wrote that BMG has several thousands of web pages - mainly containing different product pages sorted under topic oriented categories – all sorted in a site-generated XML validated SiteMap.
Performing an initial benchmarking checkpoint check gave the following results at the end of January 2010.

Current State Analysis Checkpoint	Measuring Tool	Result
Site crawl-ability	Google Webmaster Tools (GWT)	Several thousands of pages presented and uploaded to Google using GWT, less than 25% being indexed according to GWT
Page Ranking	http://www.page-rank-calculator.com/	PR 3 (out of 10)
SERP Placing for main set of keywords	http://www.google.com	Not showing up on the top 10

Table 25 Case Study BMG: Current State Analysis

4.2.3 Business Concept

Having a video conference with Dr. Ronnie Andersson, presently situated in the academic state capital city of Boston, Massachusetts, USA – the author asked for documents providing essential information for content and keywords generation; business plan papers. Given the explanation that such documents didn't exist structured within a business plan, the conference discussion together with derived information from the BMG website proved to efficient in accordance with the outline provided in model theory (3.1.2).

4.2.4 Log Data Analysis

On the 3rd of March 2010, Gary MacRitchie sent after the author's request a set of raw data logs for the BMG website. An extract from those logs showed the following raw data:

```
207.46.199.42 - - [02/Mar/2010:10:36:28 -0700] "GET /market-research-report/publication-series/spotlight-reports.html HTTP/1.1" 200 10252 "-" "msnbot/2.0b (+http://search.msn.com/msnbot.htm)"
67.195.37.190 - - [02/Mar/2010:10:37:47 -0700] "GET /market-research-report/ent-technologies-pty-ltd-company-report.html HTTP/1.0" 200 10726 "-" "Mozilla/5.0 (compatible; Yahoo! Slurp/3.0; http://help.yahoo.com/help/us/ysearch/slurp)"
67.195.37.190 - - [02/Mar/2010:10:42:25 -0700] "GET /market-research-report/nucryst-pharmaceuticals-corp-detailed-product-pipeline.html HTTP/1.0" 200 10947 "-" "Mozilla/5.0 (compatible; Yahoo! Slurp/3.0; http://help.yahoo.com/help/us/ysearch/slurp)"
```

Formatted in compliance with a standard log format (NCSA), the following example shows some few entries that two web spiders visited (Yahoo – Slurp and MSN – msnbot) the BMG website on the 2nd of March 2010. Using the HTTP protocol command of GET the crawlers retrieved different web pages presumably for indexing.
Using an own script, it was possible to determine through the use of server logs what pages where indexed and which were not (from the crawler fetching of web pages), and having it sorted out by search engines. Gary MacRitchie sent the results and it provided ground laying information on what pages were indexed – and what could have been the positive contributing factor or factors making it possible for indexing. Visitor data was better presented in Google Analytics (4.2.6). An extract of the retrieved data showed as followed (in February 2010):

ID	URL	Google Indexed	Yahoo Indexed	Bing Indexed
26	/market-research-report/breast-cancer-drug-pipeline-update-2010.html	No	Yes	No
50	/market-research-report/commercial-insight-cytotoxics-generic-adversity-facing-major-cytotoxics.html	Yes	No	No
85	/market-research-report/edetailing-reducing-costs-and-improving-the-effectiveness-of-the-detailing-process.html	Yes	No	No
102	/market-research-report/gilead-pharmavitae-profile-2005.html	Yes	No	No
141	/market-research-report/monoclonal-antibody-therapies-evolving-into-a-30-billion-market.html	Yes	No	No

Table 26 Case Study BMG: Log Data Analysis

To verify pages being indexed for example Google it was possible to the citation mark the query (being the URL). If a hit was presented on the SERP, the page was indeed being indexed by Google. Failing to show any results meant the page was not indexed.

4.2.5 Link Analysis

Using GWT the author could derive out the inbound links and determine the PR of the link-originating page. It was concluded that most web sites giving inbound links where either of the same or higher PR.

4.2.6 Internal Keyword Analysis

Analyzing the source code of the BMG website provided the Meta keywords, and by using Google Webmaster Tools together with Google Analytics it was possible to compare the provided and actual used

keywords to reach BMG. After listing the inbound keywords (parsed out from the search query from referring search engines) from GWT and noting Meta keywords the internal keyword analysis was concluded.

4.2.7 Visitor Analysis

Google Analytics provided in February 2010 interesting data about the BMG site visitors:

Checkpoint	Conclusion
Visitor data information	Most visitors were using common windows bases browsers.
Geo-targeting visitors	A majority of visitors were originating from North America, Asia, Europe and Australia.

Table 27 Case Study BMG: Visitor Analysis

4.2.8 Business Intelligence

In February 2010 the author began analyzing the competitors to BMG. Using the advanced search operators provided by Google it was possible to find competitors based on keywords and relevancy to BMG:

Checkpoint	Conclusion
Finding competition	Found three major competitors.
Competition PR	They had higher PR (3-6).
Competitors inbound links	Some had high valued PR "juiced" websites linked to them.
Competitor hosting	The IP addresses and hosting providers where detected using reverse domain name lookup.
Sort competitors	The competitors were sorted out according to keywords and sets of inbound links.
SWOT analysis	For the top three a SWOT analysis was conducted.

Table 28 Case Study BMG: Business Intelligence

4.2.9 Use of SEO Software

Historically, several essential SEO tools have been implemented on the BMG website to provide measurable data.

Checkpoint	Conclusion
Google Webmaster Tools	Implemented and used – uploading both Robots.txt and SiteMap.xml
Google Analytics	The tracking code provided by Google Analytics was embedded with the template code visually presenting the BMG contents.
AWStats	Implemented since the start of BMG (2003)

Table 29 Case Study BMG: Use of SEO Software

4.3 Preparation phase on the BMG website

Having the fundamental data covered the auditing process continued into the preparation phase. On the 5th of March the phase was concluded with an approved technical specification ready for further SEO implementations.

4.3.1 Factor Analysis

Having a set of factors contributing to positive SEO spanning partials from the Organic SEO, SEM and SMO work field, the author started evaluating historical improvements in comparison with a list of derived factors from the PS Model. The Factor Analysis was performed 4th of March 2010.

Group	Factor	Priority	Implemented	Not implemented	Note
On-Page	Anchor text - Internal linking	1	x		The essential links provided by the BMG platform (Magento) generates links with keyword driven anchor texts within.
On-Page	Breadcrumb Trail	1	x		Following the product and category pages, bread crumb navigation is implemented
On-Page	Code Validation	1		x	BMG did not validate for XHTML 1.0 Strict, had a number of errors and few warnings. This is a template issue for Magento and is possible to revise with some efforts for true validation.
On-Page	Content arranging with CSS layers	1		x	Yes and no, the BMG platform does use CSS to visually represent the semantic coding of the website, still, for optimal content arranging the template did not follow the recommendation of having: 1) content,2) main navigation, 3) other links (inbound or outbound) appear in this order within the source code.
On-Page	Image "alt" attribute	1	x		Logo has a defined alt attribute to IMG tag
On-Page	Keyword - Initial spread	1		x	In visual content, keyword is mentioned in the first 150 words. In source code keywords are not mentioned before 2000+ words. But as Search Engines navigate by source code, this need to be improved.
On-Page	Keyword research	1		x	Evaluating the site used keywords showed that the BMG wanted keywords were highly competitive – which in terms of SEO needs to be revised. The goal of a keyword research is to provide substantial keywords used by the wanted traffic of visitor that are still not heavily used by the competitors.
On-Page	Menus with CSS formatted lists	1	x		CSS being used to form main menu visually with lists
On-Page	Meta Distribution	1		x	Does not exist
On-Page	Meta Keyword	1	x		Does exist
On-Page	Meta Robots	1	x		Does exist

On-Page	Page - Code/Text ratio	1		x	The idea behind measuring Code/Text ratio is to have as high percentage of text in comparison with source code. BMG provided 40 as a numerical ratio meaning that the amount of source code extended the actual content on several product pages. Removing redundant parts of source code would improve this ratio. (Low value is preferred as less source code eases crawling for search engines visiting the website).
On-Page	Page - Freshness	1		x	Once a page has been posted, there is no update (at least the page doesn't show when it was last updated – which is read by Search Engines to evaluate content relevancy).
On-Page	Page - Update frequency	1	x		The update frequency is batch-orientated, meaning when new content is available it is submitted to BMG on a weekly basis.
On-Page	Semantic Coding - <b>, <i> etc	1	x		Is being used to highlight or differentiate text
On-Page	Semantic Coding - <H1>	1	x		Is being used
On-Page	Semantic Coding - <H2> to <H6>	1	x		Is being used on sub-headlines
On-Page	Semantic Coding - <p>	1	x		Is being used to for content text
On-Page	Meta Description	1	x		Yes, on /market-research-report/post-launch-brand-marketing-in-select-affiliate-markets.html <meta name="description" content="Explore marketing budgets for 8 brands throughout their first, second and third years of market availability." />
On-Page	Semantic Coding - Title	1	x		Is being used on pages, although sometimes exceeding the recommended 70 character length.
On-Page	Separation of visual representation elements	1		x	Not fully provided as large chunks of javascript exists within page source code. Some CSS exists within page source code (example: or order via fax order form.)
On-Site	Keyword - Page Folder URL	1	x		Keywords "Markets", "Research", "Report" are mentioned in the page folder (category) part of the page URL (http://.../market-research-report/post-launch-brand-marketing-in-select-affiliate-markets.html)
On-Site	Keyword - Page Name URL	1	x		Keywords exists in the page URL (http:/…/market-research-report/post-launch-brand-marketing-in-select-affiliate-markets.html)
On-Site	Keyword - Root Domain Name	1	x		Keywords exists in root domain name
On-Site	Keyword - Subdomain Name	1		x	No subdomains are used
On-Site	Robots.txt	1	x		Is being used to provide directions for Search Engines.

On-Site	Server - Architecture	1	x		Using Magento E-commerce (community edition)
On-Site	Sitemap in Footer	1	x		Sitemap is reachable from the footer part of the web page (at the bottom)
On-Site	URL rewrite	1	x		Is being used to present SEO friendly URLS
On-Site	XML Sitemap	1	x		Is being used and uploaded via Google Webmasters Tool
By-Externals	Link - External mentions from other sites	2	x		Yes, but only a few websites mention BMG, this can be improved.
On-Page	Offline contact information	2	x		Yes, but could be presented as part of the main template (showing up on every page within BMG). For better relevancy with localization – BMG should establish offline contact information for the main regional market areas.
On-Site	HTML Sitemap	2	x		HTML Sitemap exists sorted by products and by categories
On-Site	Location - Host IP Address	2	x		Situated where the main targeting audience is present
On-Site	References in Librarian's Internet Index	2		x	Not as yet
On-Site	References in the Yahoo! Directory	2		x	Not as yet
On-Site	References of the Domain in DMOZ.org	2		x	Not as yet
On-Site	References of the Domain in Wikipedia	2		x	Not as yet
On-Site	Use of Feeds on the Domain	2	x		No, not presently
On-Site	XML Sitemap - separated	2		x	No, but not needed as the XML SiteMap does not exceed the 1MB in filesize.
By-Externals	Link - External Links from other sites	3	x		Yes, a few websites are linking to BMG
On-Site	Blog	3		x	No, not as yet
On-Site	Domain Ownership	3	x		Provided
On-Site	Domain Registration History	3	x		Since 2003, single owner
On-Site	Domain Registration Ownership Change	3	x		Same owner since registration
On-Site	Domain Registration with Google	3		x	Not as yet

	Local				
On-Site	Feeds in Google Blog Search	3		x	No feeds as yet
On-Site	Feeds in Google News	3		x	No feeds as yet
On-Site	Hosting Information	3	x		Situated where the main targeting audience is present
On-Site	Length of Domain Registration	3	x		Since 2003
On-Site	Server/Hosting Uptime	3	x		According to the service provider, more than 99% uptime
On-Site	Social bookmarking	3		x	Not implemented as yet

Table 30 Case Study BMG: Factor Analysis

4.3.2 Pitfall Analysis

The pitfall analysis was carried out at the same time as the factor analysis. Although pitfall detection differs from factor comparison, it still provides another dimension on which hinders and obstacles can observed and dealt with.

SEO Pitfalls	Conclusion
Duplicate content	Some SEO tools reports that several pages within BMG look to much the same. Also, the "sister website" is very much alike BMG. Example: http://.../market-research-report/emr-2010-market-analysis-arra-incentives-key-players-and-important-trends.html is 62 % similar to http://www.aarkstore.com/reports/EMR-2010-Market-Analysis-ARRA-Incentives-Key-Players-and-Important-Trends--34622.html . Most interesting is that http://.../market-research-report/neuropathic-pain-emerging-drugs-and-current-treatment-practices.html is almost 96% similar to http://... [sister site URL] /market-research-report/neuropathic-pain-emerging-drugs-and-current-treatment-practices.html. This could also indicate redundant source code (making a negative balance on code/text ratio between the “sister sites” of BSG)
Page with overuse of keywords	Yes, here: http://.../market-research-report/catalogsearch/term/popular/
Disproportionate Repetition of the same Anchor Text in a High Percentage of External Links to the Site/Page	At the time of the pitfall analysis, a blog not owned by BMG was noticed using domain name frequently in anchor text. This could have negative impact on the evaluation (mostly PR calculation) of BMG.
Internal linking - (Un-logical and un-balanced structure for web content	BMG orders all products within categories. Some categories are better indexed than others, which affects general product indexing. Some issues are found within the website structure with items presently placed within the "Publication series".
Cloaking	No cloaking techniques are being used to "trick" search engines visiting BMG.
Outbound links to spam sites	No outbound links exists to spam sites
SEO un-friendly CMS	BMG is using Magento E-commerce, which is built upon SEO friendliness
Frequent Server Downtime & Site Inaccessibility	BMG has been online since 2003 with more than 99% uptime during that period
Content hidden in script, flash or other non crawler-friendly coding	None used.

Table 31 Case Study BMG: Pitfall Analysis

4.3.3 Technical Specification

On the 5th of March 2010 the technical specification draft was approved by BSG for further work with SEO implementations. The outlines of that arrangement were as followed:

Specification Outline	Description and meaning
Company Name	BSG
SEO Auditor	Patrick Schooner (supervised by Gary MacRitchie)
Specification Title	SEO Audit on BMG
Revision History	1.0 (2010-03-01) Established specification from notes and discussions.
Introduction	BSG focuses on business, competitive intelligence in biotech and life science and operates in two business areas: consulting and publishing. Their mission is to excel their customer's business operations by objective and unbiased research and analysis. As a publishing and consulting enterprise – they carry two strong brand marks within the Biotechnology business sphere; BSG and BMG. BMG has been online for e-commerce since 2003 – relaying on solid open source software from software developer "Varien" in their award winning e-commerce platform "Magento". BMG's main customers come from publically funded and private research organizations across the globe
Purpose of Specification	Patrick Schooner, media technology (b.sc) student at LIU (Linköpings universtitet, Sweden), is on behalf of BSG doing a study regarding the already implemented SEO (Search Engine Optimization) on their e-commerce platform BMG. The study is an integrated part of Patrick Schooners bachelor thesis on the subject of SEO auditing which is due to be presented spring/summer of 2010 at LIU.
Definition and abbreviations	SEO *Search Engine Optimization* *SERP Search Engine Result Page* LIU *Linköpings universtitet* BMG *Client website* BSG *Company owning BMG*
Purpose of SEO Audition	According to world leading search engine provider Google only 25% out of BMG website is currently being indexed by their search engine robot. Since BMG is relying heavily on customers finding their products using search engines – low efficiency of indexing means few items are searchable by current and potential customers. Adding to the indexing problem, individual product pages from BMG are not showing the same good SERP rankings as the main or category pages.
Primer Goals for SEO Audition	Perform an holistic audit on present SEO implementations Higher SERP placing (top 10) Improved percentage of indexing at Google (50%) Suggestions of routine and implementations for continued SEO work, focused where possible on automation.
Activities achieve Primer Goals	
Confidentiality	It is the wish of the BMG site-owners that no vital information regarding the business trade and operations will be published in the thesis carried out by Patrick Schooner. In depth analysis will only be shared by Patrick Schooner, supervisor and examinator for the bachelor thesis at LIU and BMG site-owners.
Interested Party	As of now – only Patrick Schooner, BMG site-owners and LIU are the interested party of this SEO audit since it deeply linked to Patrick Schooners

	bachelor thesis.
Roles for Audition	Patrick Schooner B.Sc thesis writer Gary MacRitchie, Supervisor from BSG Dr. Ronnie M. Andersson, CEO of BSG Dag Haugum, Supervisor and examiner from LIU
Requirements	In depth study of recent published literature obtainable for Patrick Schooner within the scope of SEO. Contact and advisement from both BMG and LIU Only suggestions and studies obtainable within the time frame of a b.sc thesis work will be presented to BMG as a part of the thesis work. Other suggestions and studies within the SEO audit will be an external part of the thesis exclusively for BMG. Progress reports via mail or telephone to LIU and BMG regarding the continuous SEO auditing / thesis work. Support (if needed) from both LIU and BMG regarding formalities and actual derived SEO implementations. Lists of suggestions and implementation that can be carried out by BMG for improved SEO performance.
Uncertainties and Risks	Rate of indexing by Google, and time of robot visits from Google bot Technical miss happens from faulty SEO implementations
Documentation	GANTT schema for implementations, measurements and delivery of results Specification of SEO audit (this document) B.sc report List of suggestion and implementation that can be carried out by BMG.
Time estimation	Start: mid January 2010 End: late April 2010 Work hours: 400 hrs spread over the start and end period.
Delivery	After the final presentation of the b.sc thesis, the thesis and list of other implementation suggestions will be delivered to BSG.

Table 32 Case Study BMG: Technical Specification

4.3.4 Activities for SEO implementation

On the 6th of April 2010 the author sent suggestions for improvements to Gary MacRitchie at BSG based on the done assessment gathering and the outcome from both SEO factor and Pitfall analyzing. This filled the empty gap in the technical specification regarding activities to achieve Primer Goals and ended the specification outlines.

SEO Tasks	Indexing	Positioning	Factor/pitfall issue	Task description
Re-tuning CMS (Magento) template/theme for BMG	x		Content arranging with CSS layers, Page - Substantial, Semantic Code - Validation, Separation of visual representation elements, Meta Distribution, Duplicate Content.	Editing CSS style sheet with focus on DIV ordering, and removing non crucial source code for optimal file size. Removing elements from template that yells for validation errors. Implementing Meta Distribution for better use of localization.
Re-evaluate Internal Linking Structure	x		Internal linking - Logical and balanced structure for web content	Google prioritize pages with high relevancy. One way to determine relevancy is to check the linking structure - more inbound links, higher probability for relevancy. BMG uses the following linking structure: Main page links to category pages. Category pages are paginated and present links to individual product pages. Paginated pages are mentioned by experts to be difficult for web spiders to crawl efficiently through. One category especially has a low grade of performed indexing by Google - Publication series (which also holds the most products on the website). In particularly those products that are not associated with other different site wide categories (as some indexed products already are).
Keyword Research		x	Page with overuse of keywords, Keyword - Initial spread, subdomain, Keyword research	A comprehensive keyword research will provide better basis for strategically search engine result page positioning.
Content Development		x	Page - Update frequency, Use of Feeds on the Domain, Blog, Feeds in Google Blog Search Feeds in Google News, Social bookmarking	Having fresh and updated content triggers search engines to crawl and index / re-index site content.BMG is presently using a newsletter to inform present/presumable customer of recent product additions as well as some business insight. With little customized work - this newsletter could be

				extended to blog content. Using the Blog structure and systemization BMG could benefit from Google's directed attention towards blogs with fresh and useful information. Social bookmarking provides an extra service to web visitors when they want to "spread" information of web info acquisitions.
External linking		x	Link - External Links to Reputable sites, References in Librarian's Internet Index, References of the Domain in DMOZ.org, References of the Domain in Wikipedia, Link - External Links from Reputable sites	A set of relevant external links are not as important as a solid internal linking structure, but they contribute to the notion of being "relevant" according to search engines. Still, having references on acclaimed sites with human revised content such as Wikipedia could improve the "relevancy" factor. Search engines also crawl human revised link repositories (directories) such as DMOZ etc as they provide "easy digested" material in terms of relevancy. Also, many directories are regionally tied which could (if mentioned in them) provide more "wanted" visits.

Table 33 Case Study BMG: Suggested SEO improvements (and areas of effect)

4.4 Implementation phase on the BMG website

The implementation phase began with great expectations from both the author and Gary MacRitchie on the 8th of April. Reforming the BMG platform was done physically by Gary MacRitchie having the author informed of every addition done directly when edited on the website. The phases ended on the 22nd of April 2010, having most of the suggested changes implemented on the BMG e-business platform.

4.4.1 BMG Blog

Type of SEO	SMO (Blog), Organic SEO (Internal linking)
SEO Activity (Name)	BMG Blog
SEO Activity (ID)	001
Prioritized	High
Injection area	The Blog is implemented on site and is reachable (embedded) from the main starting page and from the footer of every product page providing more internal links highlighting new content.
Time of Implementation	8th of April 2010
Short description	Blog platform embedded into the BMG platform
Long description	A plug-in was created by Gary MacRitchie that connected the BMG database with the already implemented BMG email marketing system (where at least four reports per week are marketed). The program grabs the text based content of that marketing and forms it into a blog post. The title of that blog post is then shown on the homepage under the "latest industry insights" box. A synergy effect would then be incorpated into the main website having more internal linking and also more fresh content being added as the author suggested. Most important, these blog pages also get added to the xml sitemap for detection by search engines.
Dependency	Marketing content from email marketing system
STE (Short Term Effect)	Better formatted on-site news presentation that is easily accessible from anywhere on the website.
LTE (Long Term Effect)	The long term effect of having a blog is more drawn attention from search engines as blogs by nature are frequently updated and provides interesting information (relevant) for most searchers looking for important content.
SE (Side Effect)	As the blog also provides more internal links – new content lifts up more which should increase traffic and eventually reselling revenue.
Warning	If the blog isn't maintained as often as a blog should be (1-2 weeks at most between updates) – the blog could get lowered grade of attention from search engines.

Table 34 Case Study BMG: BMG Blog

4.4.2 Social Bookmarking

Type of SEO	SMO (Blog), Organic SEO (external linking)
SEO Activity (Name)	BMG Blog
SEO Activity (ID)	002
Prioritized	High
Injection area	Source code where blog contents are present
Time of Implementation	8th of April 2010
Short description	Adding social bookmarking
Long description	Along with blog posts, the option to create social bookmarks was implemented.
Dependency	Contents to social bookmark
STE (Short Term Effect)	Utilizing Search Media interaction with social bookmarks
LTE (Long Term Effect)	Providing more wanted traffic as the number of social bookmarks expand – in accordance with the trusted factor – social bookmarks are more trusted when shared within a personal sphere of communication on different social networks.
SE (Side Effect)	Possibility to receive more external links
Warning	No direct threats by using social bookmarks.

Table 35 Case Study BMG: Social Bookmarking

4.4.3 Template (Code) Optimization

Type of SEO	Organic SEO (Internal linking, web page optimization)
SEO Activity (Name)	Template (Code) Optimization
SEO Activity (ID)	003
Prioritized	High
Injection area	Source code to the BMG platform (Magento template)
Time of Implementation	9th of April 2010
Short description	Changes to the main template regarding source code to minimize redundancy
Long description	By default, Magento uses a large chunk of JavaScript coding needed when the e-commercial platform serves a multitude of languages. As BMG is only serving English content – the translation java-script code becomes redundant. Also, changes where done to the top navigation menu, eliminating submenu items – reducing the source code even further.
Dependency	No direct decencies
STE (Short Term Effect)	The old source code (just text) was 71.8Kb and the new is 34Kb. That is a reduction of 53%.
LTE (Long Term Effect)	The total amount of text that is unique content for that a random product page (description, table of contents and companies mentioned) is a total of ~12Kb. This means that the old layout had roughly 84% template code and 16% unique content. The new layout has 66% template and 33% unique content.
SE (Side Effect)	A decrease in internal links was detected as the submenus were removed, still, having the webpage smaller in physical size means faster loading which is factor newly mentioned by Google to have greater impact on SERPs than before (Google forum, 2010).
Warning	The decrease of internal links could mean lesser site-wide relevancy importance for certain categories of products (not mentioned/sorted under more than one category).

Table 36 Case Study BMG: Template (Code) Optimization

4.4.4 SiteMap Ping

Type of SEO	Organic SEO (Internal linking)
SEO Activity (Name)	SiteMap Ping
SEO Activity (ID)	004
Prioritized	High
Injection area	Feature added to the administration (not visible) area of magento; new application
Time of Implementation	14th of April 2010
Short description	Re-generate the sitemap after a new product or blog entry is made and sending a ping to all major search engines
Long description	When BMG re-generate the sitemap after a new product or blog entry is made, it will automatically ping the search engines and tell them that the sitemap has been updated and they should come and get it. As there are services for all the major engines that allow this – all major search engines get a notice using a "ping" call.
Dependency	Changes within the BMG platform (new product or blog post)
STE (Short Term Effect)	All major search engines get a notice when a new product or blog post is done
LTE (Long Term Effect)	Should improve the rate of crawling as the search engines notice more often changes at BMG.
SE (Side Effect)	Should improve the rate and quantity of indexed pages at BMG.
Warning	If the website "pings" too often (several times a day) it could be flagged as a malicious way to promote/spam the website.

Table 37 Case Study BMG: SiteMap Ping

4.4.5 Category Navigation Change

Type of SEO	Organic SEO (Internal linking, site navigation)
SEO Activity (Name)	Category Navigation Change
SEO Activity (ID)	005
Prioritized	High
Injection area	Source code of the Magento template used by BMG (top menu navigation)
Time of Implementation	22nd of April 2010
Short description	Web pages will now automatically when applicable sort by date and will automatically show 15 results.
Long description	After detecting a site flaw hindering crawling (GWT reported errors accessing certain dynamic pages), a fix was brought forth for web pages automatically (when applicable) sort by date and automatically show only 15 results.
Dependency	No direct dependencies
STE (Short Term Effect)	Easier crawl-ability as some sorting parameters could initiate a time out (such as listing several hundred products on a single page
LTE (Long Term Effect)	Same goes for LTE, easier crawl-ability would mean better probability for indexing
SE (Side Effect)	Should improve the rate and quantity of indexed pages at BMG.
Warning	Monitoring for un-intentional side effects.

Table 38 Case Study BMG: Category Navigation Change

4.4.6 Activities chart for SEO implementation

From the preparation phase the following suggested activities where implemented:

Suggestion	SEO Activity ID	Date of Implementation	Note
Re-tuning CMS (Magento) template/theme for BMG	003	9th of April	Implemented changes were done to remove non crucial source code for optimal file size. Still not implemented is Meta distribution and DIV ordering with CSS (by changing the template style sheet)
Re-evaluate Internal Linking Structure	001 003 004 005	8th of April 9th of April 14th of April 22 of April	The actual number of overall internal links were lowered, but provided better overall access to individual pages. Publications category was especially affected by the category navigation change, optimizing it for better crawler access.
Keyword Research			Was not implemented due to shortage of time for the thesis
Content Development	001	8th of April	A blog and social bookmarking option was implemented on the website making BMG more attractive for visitors and search engines.
External linking	002	8th of April	The possibility to receive more external was increased by the use of social bookmarking utility, still – an extensive external link-building strategy is needed to improve the external linking to BMG.

Table 39 Case Study BMG: Implementation chart for SEO activities

4.5 Evaluation phase on the BMG website

Benchmarking data was collected from the very start of this thesis, providing control point measurements for every month spanning from January to May 2010. This was needed as changes done to SEO can take 1-3 weeks at best to be noticed consulting measurement tools provided by the larger search engines.

Checkpoint (time)	Data collected
28th of January	Google Webmaster Tools reports 25% of pages added to the Sitemap being indexed Google Analytics shows search trends and global interest in BMG (sorted by regions)
18th of February	Excel document presenting actual pages being index by Google, Yahoo and Bing in January
3rd of March	Statistical data (AWStats) and raw access logs from the server provider used by BMG
9th of April	Copy of original web document and edited document for page size optimization measurement
9th of April	Google Webmaster Tools reports having 21% web pages indexed from Sitemap Google Analytics shows
22nd of April	Google Webmaster Tools reports having only 5% index from Sitemap Excel document presenting actual pages being index by Google, Yahoo and Bing in April. Huge interest from Yahoo, low from Google. Raw server logs flagging errors done by the Googlebot accessing the website – tries to find pages that aren't existing.
1st of May	Google Webmaster Tools reports having 46% indexed web pages from Sitemap Google Analytics shows a 30% increase of normal inbound traffic since January 2010

Table 40 Case Study BMG: Evaluation Phase: Data collection

Using the data collection the following presentation of value deviation goal accomplishment can be summarized to:

Goal Name Goal Value	Higher SERP placing Top 10	
Checkpoint (time)	Outfall	Goal deviation
28th of January	Main set of keywords did not show up on the SERPs Top 10	Great
18th of February	Main set of keywords did not show up on the SERPs Top 10	Great
3rd of March	Main set of keywords did not show up on the SERPs Top 10	Great
9th of April	Main set of keywords did not show up on the SERPs Top 10	Great
9th of April	Main set of keywords did not show up on the SERPs Top 10	Great
22nd of April	Main set of keywords shows up on the SERPs Top 10 (7/10)	Accomplished
1st of May	Main set of keywords shows up on the SERPs Top 10 (7/10)	Accomplished

Table 41 Case Study BMG: Evaluation Phase: SERP Values vs. Goals

Goal Name Goal Value	Improved Percentage of indexing at Google 50%	
Checkpoint (time)	Outfall	Goal deviation
28th of January	25%	-25%
18th of February	25%	-25%
3rd of March	25%	-25%
9th of April	21%	-29%
9th of April	21%	-29%
22nd of April	5%	-45%
1st of May	46%	- 4%

Table 42 Case Study BMG: Evaluation Phase: Indexing rate

4.6 Continuity phase on the BMG website

The Continuity phase is about setting routines to work for keeping up positive results delivered by SEO implementations in previous phases. After discussion with BSG, the following routines are suggested to be implemented as soon as possible to keep up the mentioned momentum.

These routines should eliminate errors like the ones detected at the 22nd of April - errors found by Googlebot and the server logs belonging to BMG that could mean an obstacle for further higher values on SERP and Indexing. This can be resolved by investigating the exact pages and dynamic parameters being used to access the pages by Googlebot as a part of a daily routine.

	Daily basis	Weekly basis	Monthly basis	Yearly basis
System Maintenance	**Organic SEO:** BMG admin (Gary MacRitchie) checks Google Webmaster Tools and Google Analytics and repairs detected errors.	**Organic SEO:** BMG admin (Gary MacRitchie) checks Google Webmaster Tools and Google Analytics for search engine behaviors.	**Organic SEO:** Checks and optimizes SiteMaps and feeds	**Organic SEO:** BMG admin Compares traffic data and suggests server changes to BSG's CEO Dr. Ronnie Andersson
		SEM: BMG Admin checks keyword changes in popularity	**SEM:** BMG Admin freshens up site contents for improved site freshness	**SEM:** CEO Dr. Ronnie Andersson compares site revenue with business documents.
		SMO: BMG uses newsletters and a blog to present new products – and updates them on a weekly basis		
Competence	Browse SEO sources for information, especially Google staff forums for changes etc done to Google Search Engine	Read articles that focus on SEO (Organic SEO, SEM, SMO) (present and future changes and their effects).		Attend conferences and seminars where SEO expertise is discussed and presented, such as EasyFairs Internet Expo (yearly occuring in Gothenburg and Stockholm).
Data evaluation		BMG Admin evaluates data from Google Webmaster Tools and Google Analytics to check for indexing/traffic deviations that expands an acceptable tolerance (indexing +/- 10%, SERP 5/10 (+/- 4)		

Table 43 Case Study BMG: Routines Chart

5 Results

In this chapter the results from the BMG Case Study are presented and compared to the originating PS model for validity and confirmation of its use.

5.1 Assessment phase

According to the PS model, to begin an SEO audit on an e-commercial website the auditor needs to perform an assessment gathering of information regarding historical and present work with SEO as well as knowing what underlying business documentation constitutes the very existence for the e-business. Through the case studies empirical data in comparison with the outlined requirements presented in the theory driven model, the following results can be presented:

	PS Model Requirements	Empirical data (Case Study Outcome)
Current State Analysis	Current State Analysis required knowledge about site crawl-ability and present PR (PageRank)	The website started with 25% indexed data, during the auditing process is sunk at most to 5%, and at the time of final data gathering the website was nearly 46% indexed by Google according to Google Webmaster tools. PageRanking calculations were dropped due to the numerous mentions on the web and after discussion with Gary MacRitchie to be an archaic factor. It was concluded that SERP for given main keywords was superior and a more accurate way to measure ranking amongst the competitors
Business Concept	Formulating a Business Concept requires a defined business idea, market plan, organization, product and an intention for formulating an E-business	As no documents were presently accessible for in-depth analysis from BSG for BMG data was derived using their website and by interview with CEO and founder Dr. Ronnie Andersson.
Log Data Analysis	Log Data Analysis needed data describing visitor data, page popularity, inbound links, landing words, and crawler visits.	Visitor data, page popularity was obtainable from Google Analytics. Inbound links and landing words was derived from Google Webmaster Tools. Crawler visits were summarized from AWStat.
Link Analysis	Link Analysis requested information about source of inbound links (and anchor data) with the PR calculated on the externally pages providing inbound links to BMG.	Source of inbound links was obtained from Google Webmaster Tools. As PR calculations were dropped, PR was not calculated on the sources providing inbound links to BMG.
Internal Keyword Analysis	Perform an Internal Keyword Analysis to find popular keywords from search engines by listing and what meta keywords (and meta description) were being used by the website.	Popular keywords where assessed by Google Webmaster Tools and Google Analytics. They were then sorted after popularity and compared to the meta keywords (and description) found at.
Visitor Analysis	The Visitor Analysis part of the assessment phase required visitor data (obtainable technical data) and at the same time categorizing the visitors grouping them by geographical origin sorted after traffic intensity	Visitor and geographical data was obtained by using the Google Analytics which after corresponding with the CEO of BSG matched the targeted market on a global scale.

Business Intelligence	Necessary to broaden the Business Intelligence perspective the PS model requested a list of competitors with e-businesses near BMG and including meta keywords and description from them all. The PR calculation was desired to extend the meta assessment of the found competitors. Investigating backlinks to each found competitor to evaluate site popularity was also requested, as well as determining the physical geographical origins of the competitors' websites. The above would result in a list to be sorted keyword relevancy (in comparison with the website targeted for an audit) and number of quality backlinks. Final step concluded the business intelligence by performing a SWOT Analysis on the top 10 listed competitors.	An online gathering of data using Google with structured queries based on advanced search operators as briefly mentioned before in this thesis provided with a substantial list of competitors operating on the same market as BMG with near-like commodities. The Business Intelligence part of the assessment phase provided a raw list of competitors by different strengths of relevancy in compassion with BMG. During the gathering of meta data to add to the list of competitors, it was found that only three competitors were near enough to be considered competitive to BMG. As of result of that, the list of competitors focused on those three instead of the suggested top 10.
In-house competence	SEO Auditing is much like a standard IT-assignment to be handed out within a corporative business. As such, the assessment of In-house Competence will be most crucial when dealing with SEO implementations, as wrong types of implementations could falter or even resulting in a search engine wide "ban" (being removed from indexing). This part of the assessment phase needs to answer the following questions: what is the present In-House Competence in regards of SEO, is there a need for external consultants managing the audit, and who from the own business will be responsible for following the auditing process making sure that goals are fulfilled in a non-damaging way for the e-business.	At BMG, both the CEO (Dr. Ronnie Andersson) and Gary MacRitchie had enough competence to understand the fundamentals of search engine optimization, though lacking the time and resources to completely dedicate themselves to improve the overall search engine friendliness of BMG and to evaluate the sales-oriented textual contents presently driving the e-business. With that premise defined, the need of external SEO competence was needed to conduct an SEO audit – delivering a natural explanation on why this thesis was needed.
Use of SEO Software	The assessment phase according the PS model needs a set of tools able to provide essential measurable data to evaluate current states and progress. Suggested by the model was the least needing list of: Google Webmaster Tools and Google Analytic. If not already acquired by the website in question of an audit, the auditing process should not progress any further without the acquiring of such SEO tools.	Google Webmaster Tools, Google Analytics and AWStats were already implemented on the BMG platform.

Table 44 Model vs. Empirical data (Assessment Phase)

5.2 Preparation phase

The PS model process-orientated continuance extends the assessment phase with a preparation phase. Having the ground laying data, the auditor using the model would now have the data needed to evaluate specific historical and present SEO implementations (and lacks of such) to form activities and prime goals before actually implementing any changes to the audited website. Comparing requirements from the PS model with actual results from the BMG case study showed the following data:

<table>
<tr><th></th><th>PS Model Requirements</th><th colspan="2">Empirical data (Case Study Outcome)</th></tr>
<tr><td rowspan="3">Factor Analysis</td><td rowspan="3">Using a set of proven and evaluated factors contributing to overall SEO (organic SEO, SEM and SMO) based on the recent SEOMOZ online survey – three crucial key-areas where to be checked; On-Page factors (done on the web page), On-Site (done on the website) and By-Externals (done by others in terms of linking relations).</td><td colspan="2">Using a spread sheet evaluating the three groups of overall SEO contributing factors, the outcome of those evaluation can be summarized to the following (at the time of 4th of March 2010:</td></tr>
<tr><td>Implemented</td><td>Not Implemented</td></tr>
<tr><td>Anchor text - Internal linking, Breadcrumb Trail, Domain Ownership, Domain Registration History, Domain Registration Ownership Change, Hosting Information, HTML Sitemap, Image "alt" attribute, Keyword - Page Folder URL, Keyword - Page Name URL, Keyword - Root Domain Name, Length of Domain Registration, Link - External Links from other sites, Link - External mentions from other sites, Location - Host IP Address, Menus with CSS formatted lists, Meta Description, Meta Keyword, Meta Robots, Offline contact information, Page - Update frequency, Robots.txt, Semantic Coding - , <i> etc, Semantic Coding - <H1>, Semantic Coding - <H2> to <H6>, Semantic Coding - <p>, Semantic Coding - Title, Server - Architecture, Server/Hosting Uptime, Sitemap in Footer, URL rewrite, Use of Feeds on the Domain, XML Sitemap</td><td>Blog, Code Validation, Content arranging with CSS layers, Domain Registration with Google Local, Feeds in Google Blog Search, Feeds in Google News, Keyword - Initial spread, Keyword - Subdomain Name, Keyword research, Meta Distribution, Page - Code/Text ratio, Page - Freshness, References in Librarian’s Internet Index, References in the Yahoo! Directory, References of the Domain in DMOZ.org, References of the Domain in Wikipedia, Separation of visual representation elements, Social bookmarking, XML Sitemap - separated</td></tr>
</table>

Pitfall Analysis	Pitfalls Analysis provides another SEO improvement perspective. To the PS Model, Pitfalls are error-checking factors. Avoiding them provides better search engine accessibility. The PS Model identifies the following areas as SEO pitfalls: duplicate content, Page with overuse of Keywords, Disproportionate Repetition of the same Anchor Text in a High Percentage of External Links to the Site/Page, Internal linking - (Un-logical and un-balanced structure for web content, Cloaking, Outbound links to spam sites, SEO un-friendly CMS, Frequent Server Downtime & Site Inaccessibility –and – Content hidden in script, flash or other non crawler-friendly coding.	BMG did at the time of research (4th of March) pass well according to the PS Models mention Pitfall areas. The only weak-points were some notion put into the duplicate content area, and somewhat unbalanced internal linking structure.
Technical Specification	Derived from the LIPS model, the PS model acknowledges key areas from the LIPS model's technical specification documentation. The PS model focuses on; Company Name, SEO Auditor, Specification Title, Revision History, Introduction, Purpose of Specification, Definition and abbreviations, Purpose of SEO Audition, Primer Goals for SEO Audition, Activities to achieve Primer Goals and Confidentiality	Producing a technical specification depended on the interaction between BSG and the thesis author. All the wanted areas for a full technical specification were implemented and answered for. Based on previous factor and pitfall analysis led to a set of activities (tasks) to achieve set Primer Goals. In retro perspective, the time estimation was successfully reached and kept.

Table 45 Model vs. Empirical data (Preparation Phase)

5.3 Implementation phase

Based on the PS model, having the preparations done for SEO implementation led to next logical step in SEO Auditing process; the implementation phase. From the technical specification a set of activities were defined. As the implementation began, the following results can be derived from the BMG Case Study in correlation with the PS model:

	PS Model Requirements	Empirical data (Case Study Outcome)
Type of SEO	Type of SEO activity; Organic SEO, SEM or SMO.	Every SEO task (activity) could be type-sorted.
SEO Activity (Name)	Name for SEO activity to be carried out.	Every SEO task could be named.
SEO Activity (ID)	Individual ID number for identification	Every SEO task could be identified by an ID.
Prioritized	Either high, mid or low priority for implementation	Most of the task derived from the assessment and preparation phase where deemed to be of high importance for implementation.
Injection Area	On page, on site or done to externally (in correlation to the website), i.e. On-Page, On-Site or By-External	The injection area clarified what area the task would be affecting in regards of the BMG platform.
Time of Implementation	When the implementation is to be carried out	Every task was given a start time
Short description	Shorter description of implementation	A shorter description explaining the task was doable to every given SEO activity
Long description	Longer description of implementation	A longer description detailed a more in-depth description of the task.
Dependency	Eventual dependencies to the activity	This proved to be hard to determine as in the case of Category Navigation Change (id:005), as it could mean that without internal links no change would be possible to make, i.e. existing links would have to be there for the task to be implemented – the dependency data would then be more confusing than beneficiary for overall task description.
STE (Short Term Effect)	The short term effect of the implementation	This was possible to determine for every task
LTE (Long Term Effect)	The long term effect of the implementation	The short term effect of the implementation
SE (Side Effect)	Eventual side effect by the implementation	An interesting factor as it detailed contributions to the implementation besides those clearly intended – as in the task of implementing a Blog.
Warning	Eventual warnings before, during or after implementing	As in the case of the "Ping" implementation (SiteMap Ping, id:004) – if the implementation would ping to often it could result in search engine handed punishments.

Table 46 Model vs. Empirical data (Implementation Phase)

5.4 Evaluation phase

According to the PS model, the evaluation phase is intended to provide measurable data from the tasks within implementation phase. Presenting a structured way to delimit and present relevant data, the PS model in comparison with empirical data collected from the BMG Case Study showed the following:

- Goals (describing names and numerical values) were derived from the preparation phase (based on the assessment phase's data collection).
- Date of check was possible to determine, as well as the right type of data corresponding to set Goal (percentage for indexing, integer value for SERP placing)
- Deviation between Goals and actual data was doable to calculate.
- Worth noting was that the evaluation phase cycle of data collecting was imitated every time a new task was implemented in the implementation phase. For the BMG Case Study the implementation and evaluation phase where handled lateral.
- The Evaluation Phase concluded that the Primer Goals was obtained (indexing at 46% at 1st of May 2010, and SERP top 10 placing for main set of keywords).

5.5 Continuity phase

As mentioned in the BMG Case Study, BMG has to work with the implemented tasks that initially gave the high responses terms of indexing and SERP placing. The key to a well maintained website comes through page freshness and actions focusing on striving friendliness for visiting Search Engines. With the need of routines stated the PS model for Auditing SEO for E-business, errors like those detected in 22nd of April, were Googlebot and the server logs belonging to BMG indicated problems for the Googlebot to efficiently parse and dive into the contents of the BMG website. As Google Webmaster Tools shows these errors clearly, implementing daily routines to fix such errors provides better outcome when Search Engines (especially Google in this case) revisit the website.

The above exemplifies the need of routines to systematically revise errors, and the empirical data supports the PS model routine highlighting.

6 Discussion

The discussion part of this thesis will focus on how the model was brought forth, used and able to validate itself by using live on an e-commercial website within the delimitations of a case study. Objective facts will be discussed based on the forms of the PS model and its application on the BMG website.

6.1 PS model

Theory driven, the core of the PS model was created based on the mutual connections found within the SEOMOZ survey of SEO contributing factors and theory found within the "SEO – Search Engine Optimization Bible" and "SEO Warrior", but mostly from attending seminars from the EasyFairs's Internet Expo exhibition in Gothenburg and Stockholm 2010. General SEO gathers technical and economical expertise in a holistic cross-over; Organic SEO side by side with Search Engine Marketing and Social Media Optimization.

Using proven and acknowledged SEO theory, it was possible to parse and derive the essential non-contradicting material (as many authors in some areas can only speculate search engine algorithms as they are well-kept business secrets and patents owned by large companies owning the search engines applications) leading to a set of outlined directions to be used as a model for auditing search engine optimization for e-businesses.

During the work with PS model, a potential flaw was detected analyzing the different phase's results – what would happen if the assessment phase could not be conducted in full internally due to lacking of technical expertise at the site owners? In the case of BMG, both Dr. Ronnie Andersson and Gary MacRitchie were more than qualified to work on their own with search engine optimization, and as such, this situation might not be applicable for every e-business online today. This is solved by implementing a pre-phase to the Assessment phase where the technical specification is lifted from the preparation phase to be filled with initial values allowing an external SEO consultant to fill in the blanks for the continued SEO auditing process according to the PS model.

Could the part of e-business be taken out of the equation without damaging the PS Model? Most certainly, search engines use the same criteria to evaluate a website regardless of it being an e-business, news paper portal or a personal blog. To adopt the model for other types of website one must extract the business document driven parts and introduce other basic ground laying information background to suit the websites purpose (often is the purpose of the website found within the background information/intention behind the website). This is the author's opinion on giving the model a certain point of value – a good SEO model should be able to adapt to different kinds of websites profiles without falling apart.

Proving value and eliminating redundancy was done by the BMG Case Study. Within the case study it was showed that the implementation and evaluation phase went hand-in-hand for every implemented task. Without providing benchmarking data collected at the start of the implementation, proving constructive value would then be very difficult; information checkpoints at the start, mid, and the end of a test period are crucial for accurate result measuring.
Also, implementing a holistic approach where business theory meets organic SEO, SEM and SMO proved to be balance on a fine line proving one of the statements provided by Gary MacRitchie early into the thesis work:

> You might be adding a whole lot of extra work for yourself there and perhaps widening the scope too much into something that you might not have the resources to investigate.

Indeed, taking on the whole concept of SEO, summarizing it down to transitional phases within a model mainly focusing on SEO improvements on e-commercial websites could have proved to be an impossible task. Still, during the Case Study, it was showed that the delimited parts of SEO forming the PS model was doable and provided a wider array of changes that attracted the major three search engines, especially Google and Yahoo, to index and rate the BMG website better than at the starting point of this thesis.

6.2 Case Study: BMG

Using BMG as a test platform for the PS Model proved to be successful, mostly because of the regular flow of communication between the thesis author and the BMG site administrator by e-mail and phone calls during the months of January to beginning of May 2010. To analyze data acquired from different SEO tools was by far much easier when two sets of eyes looked upon the information rather than with just one set. This because that obtained data could be interpreted in so many different ways, and lacking experience in how the search engines navigate on the Internet could provide misleading conclusions while interpreting the information. Such an event occurred when Google Webmaster Tools reported that only 5% of the BMG website was indexed by Google – which was quite hideous and made the thesis author believe that implementations done according to the PS model had made more damage than good. Still, Gary MacRitchie provided insights that calmed the mater quite a bit. On the 22nd of April, Gary MacRitchie wrote:

> First of all, I want to preface this with saying, let's not jump to any conclusions. The situation is very dynamic and I don't think we can trust Google's Webmaster Tools (GWT) as being totally reliable. They may just be in a transitional phase. Having said that, we should both be aware of what is happening and ready to react.

We both agreed to wait a few more days to see if this change was just as Gary MacRitchie described it "transitional" or "permanent". More leaning towards a transitional change was the fact that Yahoo's web crawler (Slurp) was crawling and indexing like never before. On the same day at Google Webmaster Tools reported 5% indexed, a quick check with Yahoo showed that nearly 93% was indexed by Yahoo (comparing 500 random pages at BMG with both Google and Yahoo). Later on the 1st of May, 46% of the BMG contents was indexed by Google which proved and showed the transitional change – and that Google postpones indexing when detecting websites in change – as was the case of the BMG website. The PS Model proved to be good way to structure the path from Goal setting to Goal results. The different phases passed nicely with the communication flow between the thesis author and BSG.

7 Conclusion

To conclude this thesis the author wants to acknowledge the process of establishing a case study revised work model for auditing SEO with a holistic approach for E-business by highlighting the contextual body spanning this investigative paper. Primer for developing this work model, a purpose had to be defined:

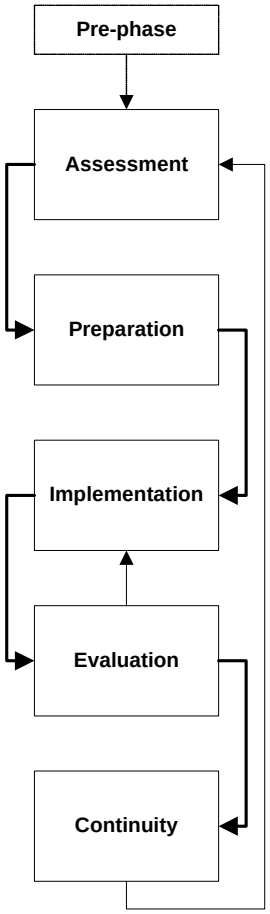
- Investigate techniques to revise (audit) already implemented search engine optimization (SEO) intended for E-commercial websites using a holistic perspective introducing business development theory with commonly and acknowledged SEO aspects.
- Prove the possibility to construct a SEO work model based on these techniques on a broad holistic span.

After having the purpose set as a thesis goal, delimitations narrows down the work field to utterly essentials suitable for this bachelor's thesis and model development:

- Investigate essential partials from four areas affecting online accessibility and visibility (indexing and ranking) for E-commercial websites;
    - Organic Search Engine Optimization (Organic SEO)
        - Framework Optimization (On-Page, On-Site, By-Externals)
    - Search Engine Marketing (SEM)
        - Keyword Research
        - Content Optimization
    - Social Media Optimization (SMO)
        - Social interaction
        - Blogging
    - Business Development
        - Business Concept

During the work with creating the outlines for the work model - a warning was given from Gary MacRitchie (BSG) for widening the SEO field to much making it incomprehensible to manage and to work with for the purpose of this thesis. From the discussion it was later shown that the delimitation gave a feasible platform throughout the thesis. Using a case study to evaluate flaws with the theory driven work model proved also to be successful as the outlines work model did not hinder the SEO auditing process but instead gave systematical insights on how constructive and measurable practical search engine optimization can be. Adding the pre-phase to the Assessment Phase, and using the empirical data and analyzing the work-flow from SEO auditing the BMG website, a final outline for the PS model was able to be created.

7.1 PS Model



Phase	Check Points
(Pre-phase)	Technical Specification (light)
Assessment	Current State Analysis Business Concept Log Data Analysis Link Analysis Internal Keyword Analysis Visitor Analysis Business Intelligence In-house competence
Preparation	Factor Analysis Pitfall Analysis Technical Specification (full)
Implementation	Set of SEO Activities
Evaluation	Analyzing output from SEO Activities
Continuity	Routines for SEO maintenance

Table 47 Final outline for the PS model

The above illustrates the final outline for the PS Model for Auditing SEO for E-business. The Pre-phase is optional as stated in the thesis discussion, only to be applied within the model when primary technological (web and server) knowledge is lacking within the organization driving the e-business. Where fundamental SEO knowledge is applicable within the e-business's staff, the PS model starts off with assembling primer SEO data in the Assessment phase, continues into the preparation phase with detailed analysis about historical and present SEO implementations. Found weaknesses are transformed into activities to be carried out in the implementation phase. The relationship between the implementation phase and evaluation phase is iteratively depended as evaluation starts for every initiated SEO activity. With set routines, the outcome from the implemented SEO changes is closely monitored. Should results deviate outside the e-business's acceptable tolerance, according to the PS Model, the SEO auditing process is highly recommended to be re-initiated.

7.2 Future work and recommendations

For further work with a holistic approach to revise e-business's search engine optimization, keyword and content optimization are a key factor for increased attention from Search Engines. As Google self recommends within the paper "Google's Search Engine Optimization Starter Guide" done in November 2008;

> Creating compelling and useful content will likely influence your website more than any of the other factors discussed here. Users know good content when they see it and will likely want to direct other users to it.

It is the authors' opinion that the further development on the PS model should extend its parts within the assessment, preparation and implementation phases to include detailed keyword research and keyword driven content optimization. Again, from the same paper, Google explains the relationship between framework optimization and content improvements:

> Search engine optimization is often about making small modifications to parts of your website. When viewed individually, these changes might seem like incremental improvements, but when combined with other optimizations, they could have a noticeable impact on your site's user experience and performance in organic search results.

The author also acknowledges that the model outlines also provide essential arguments to be lifted up as an integrated part of a project model. For that reason the author sees many natural interconnecting areas with the LIPS model. Utilizing and extending the PS model to a fully project model would further improve the systematically work of implementing changes and deriving measurable results.

If the PS model uses the above recommendations from both the thesis author and Google, a more substantial SEO audit will then be done when applying the new model directives. Still, the reason why keyword and content optimization was delimited from the thesis was the fact that such activities requires different expertise than sole technical – as true keyword and content optimization are an essential part of business marketing. The most efficient way to work with SEO is to include technical and marketing expertise for synergy – as SEO depends on both technical and marketing implementations for optimal web visibility.

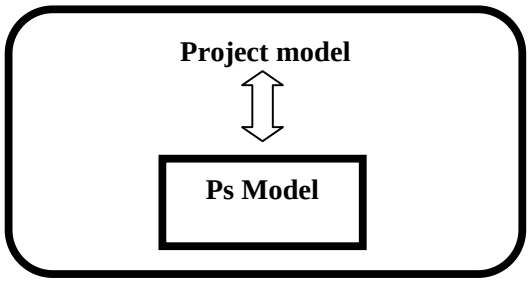


Figure 4 Further works with PS Model – developing a project model from the PS model

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Lips är en projektmodell - Tomas Svensson and Christian Krysander, 2009
(last retrieved 2010-05-22) [www]
http://www.liu.se/cul/resurser/lips?l=sv

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Jerkovic, John I. (2010). *SEO Warrior.* (Printed media) O'Reilly Media, Inc.

Ledford, Jerri L. (2008). *Search Engine Optimization Bible.* (Printed Media) Wiley Publishing, Inc

Schooner, Patrick (2006). *PAH - en analysmodell för ett affärskoncepts potentiella etablering.* (master thesis) University College of Borås

9 Appendix

9.1 Source code of BMG in January 2010

The domain specific URLs have been translated to respectively “{BMG-website}” and {BSG-website}.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
<head>
   <title> Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd edition  : Market Research Report</title>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<meta name="description" content="The Distribution Agreements in Pharma, Biotech and Diagnostics report provides comprehensive understanding and unprecedented access to the distribution partnering agreements entered into by the worlds leading biopharma companies." />
<meta name="keywords" content="distribution agreements in, online version of, an online version, version of the, of the actual, to an online, weblink to an, deal title links, title links via, via weblink to, the actual contract, actual contract document, to each contract, each contract document, contract document on, document on demand, access to each, easy access to, contract document providing, document providing easy, providing easy access, each deal title, links via weblink, biotech and diagnostics, entered into by, pharma biotech and, in pharma biotech, agreements in pharma, distribution contract documents," />
<meta name="robots" content="INDEX,FOLLOW" />
<link rel="canonical" href="http://{BMG-website}/market-research-report/distribution-agreements-in-pharma-biotech-and-diagnostics-2nd-edition.html" />
<link rel="icon" href="http://{BMG-website}/skin/frontend/default/default/favicon.ico" type="image/x-icon" />
<link rel="shortcut icon" href="http://{BMG-website}/skin/frontend/default/default/favicon.ico" type="image/x-icon" />
<script type="text/javascript">
//<![CDATA[
   var BLANK_URL = 'http://{BMG-website}/js/blank.html';
   var BLANK_IMG = 'http://{BMG-website}/js/spacer.gif';
//]]>
</script>
<script type="text/javascript" src="http://{BMG-website}/js/index.php?c=auto&amp;f=,prototype/prototype.js,prototype/validation.js,scriptaculous/builder.js,scriptaculous/effects.js,scriptaculous/dragdrop.js,scriptaculous/controls.js,scriptaculous/slider.js,varien/js.js,varien/form.js,varien/menu.js,mage/translate.js,mage/cookies.js,jquery/jquery-1.2.6.pack.js,jquery/ui.tabs.pack.js,varien/product.js,calendar/calendar.js,calendar/lang/calendar-en.js,calendar/calendar-setup.js"></script>

<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/reset.css" media="all" />
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/boxes.css" media="all" />
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/menu.css" media="all" />
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/clears.css" media="all" />
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/print.css" media="print" />
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/blog.css" media="all" />
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/js/calendar/calendar-win2k-1.css"  />
<!--[if IE]>
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/iestyles.css" media="all" />
<![endif]-->
<!--[if lt IE 7]>
<script type="text/javascript" src="http://{BMG-website}/js/index.php?c=auto&amp;f=,lib/ds-sleight.js,varien/iehover-fix.js"></script>
<link rel="stylesheet" type="text/css" href="http://{BMG-website}/skin/frontend/default/default/css/ie7minus.css" media="all"
```

```
/>
<![endif]-->
<script type="text/javascript">var Translator = new Translate({"Please select an option.":"Please select an option.","This is a required field.":"This is a required field.","Please enter a valid number in this field.":"Please enter a valid number in this field.","Please use numbers only in this field. please avoid spaces or other characters such as dots or commas.":"Please use numbers only in this field. please avoid spaces or other characters such as dots or commas.","Please use letters only (a-z) in this field.":"Please use letters only (a-z) in this field.","Please use only letters (a-z), numbers (0-9) or underscore(_) in this field, first character should be a letter.":"Please use only letters (a-z), numbers (0-9) or underscore(_) in this field, first character should be a letter.","Please use only letters (a-z) or numbers (0-9) only in this field. No spaces or other characters are allowed.":"Please use only letters (a-z) or numbers (0-9) only in this field. No spaces or other characters are allowed.","Please use only letters (a-z) or numbers (0-9) or spaces and # only in this field.":"Please use only letters (a-z) or numbers (0-9) or spaces and # only in this field.","Please enter a valid phone number. For example (123) 456-7890 or 123-456-7890.":"Please enter a valid phone number. For example (123) 456-7890 or 123-456-7890.","Please enter a valid date.":"Please enter a valid date.","Please enter a valid email address. For example johndoe@domain.com.":"Please enter a valid email address. For example johndoe@domain.com.","Please enter 6 or more characters.":"Please enter 6 or more characters.","Please make sure your passwords match.":"Please make sure your passwords match.","Please enter a valid URL. http:\/\/ is required":"Please enter a valid URL. http:\/\/ is required","Please enter a valid URL. For example http:\/\/www.example.com or www.example.com":"Please enter a valid URL. For example http:\/\/www.example.com or www.example.com","Please enter a valid social security number. For example 123-45-6789.":"Please enter a valid social security number. For example 123-45-6789.","Please enter a valid zip code. For example 90602 or 90602-1234.":"Please enter a valid zip code. For example 90602 or 90602-1234.","Please enter a valid zip code.":"Please enter a valid zip code.","Please use this date format: dd\/mm\/yyyy. For example 17\/03\/2006 for the 17th of March, 2006.":"Please use this date format: dd\/mm\/yyyy. For example 17\/03\/2006 for the 17th of March, 2006.","Please enter a valid $ amount. For example $100.00.":"Please enter a valid $ amount. For example $100.00.","Please select one of the above options.":"Please select one of the above options.","Please select one of the options.":"Please select one of the options.","Please select State\/Province.":"Please select State\/Province.","Please enter valid password.":"Please enter valid password.","Please enter 6 or more characters. Leading or trailing spaces will be ignored.":"Please enter 6 or more characters. Leading or trailing spaces will be ignored.","Please use letters only (a-z or A-Z) in this field.":"Please use letters only (a-z or A-Z) in this field.","Please enter a number greater than 0 in this field.":"Please enter a number greater than 0 in this field.","Please enter a valid credit card number.":"Please enter a valid credit card number.","Please wait, loading...":"Please wait, loading...","Please choose to register or to checkout as a guest":"Please choose to register or to checkout as a guest","Error: Passwords do not match":"Error: Passwords do not match","Your order can not be completed at this time as there is no shipping methods available for it. Please make necessary changes in your shipping address.":"Your order can not be completed at this time as there is no shipping methods available for it. Please make neccessary changes in your shipping address.","Please specify shipping method.":"Please specify shipping method.","Your order can not be completed at this time as there is no payment methods available for it.":"Your order can not be completed at this time as there is no payment methods available for it.","Please specify payment method.":"Please specify payment method.","Your session has been expired, you will be relogged in now.":"Your session has been expired, you will be relogged in now.","Incorrect credit card expiration date":"Incorrect credit card expiration date"});</script></head>
<body class=" catalog-product-view product-distribution-agreements-in-pharma-biotech-and-diagnostics-2nd-edition categorypath-biotechnology-companies-html category-companies">
<div class="wrapper">
    <!-- start header -->
    <div class="header">


<div class="header-top-container">
  <div class="header-top">
    <div id="logo"><a href="http://{BMG-website}" rel="nofollow"><img src="http://{BMG-website}/skin/frontend/default/default/images/{BMG-website}_logo.png" alt="{BMG-website}" /></a></div>
```

```
    <p class="no-display"><a href="#main"><strong>Skip to Main Content &raquo;</strong></a></p>
    <form id="search_mini_form" action="http://{BMG-website}/market-research-report/catalogsearch/result/" method="get">
  <fieldset>
    <legend>Search Site</legend>
    <div class="mini-search">

      <input id="search" type="text" class="input-text" name="q" value="" />
      <input type="image" src="http://{BMG-website}/skin/frontend/default/default/images/btn_mini_search.gif" alt="Search"
/>
      <div id="search_autocomplete" class="search-autocomplete"></div>
      <script type="text/javascript">
      //<![CDATA[
        var searchForm = new Varien.searchForm('search_mini_form', 'search', 'Search {BMG-website}...');
        searchForm.initAutocomplete('http://{BMG-website}/market-research-report/catalogsearch/ajax/suggest/',
'search_autocomplete');
      //]]>
      </script>
    </div>
  </fieldset>
</form>     <div class="quick-access">
       Welcome to {BMG-website}!<br />

       <div class="shop-access">
            <div>
    <ul>
                <li  class="first"><a href="http://{BMG-website}/market-research-report/customer/account/" title="My
Account" >My Account</a></li>
                <li ><a href="http://{BMG-website}/market-research-report/checkout/cart/" title="My Cart" class="top-link-
cart">My Cart</a></li>
                <li ><a href="http://{BMG-website}/market-research-report/checkout/" title="Checkout" class="top-link-
checkout">Checkout</a></li>
                <li ><a href="http://{BMG-website}/market-research-report/contacts/" title="Contact Us" >Contact
Us</a></li>

                <li  class="last"><a href="http://{BMG-website}/market-research-report/customer/account/login/" title="Log
In" >Log In</a></li>
            </ul>
  </div>
       </div>
            </div>
  </div>
</div>
<div class="header-nav-container">
  <div class="header-nav">

    <h4 class="no-display">Category Navigation:</h4>
    <ul id="nav">
      <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-biotechnology.html active
parent">
```

```
<a href="http://{BMG-website}/market-research-report/biotechnology.html"><span>Biotechnology</span></a>
<ul class="level0">
<li class="level1 nav-biotechnology-companies.html active">
<a href="http://{BMG-website}/market-research-report/biotechnology/companies.html"><span>Companies</span></a>
</li>
<li class="level1 nav-biotechnology-markets.html">
<a href="http://{BMG-website}/market-research-report/biotechnology/markets.html"><span>Markets</span></a>

</li>
<li class="level1 nav-biotechnology-bioinformatics.html">
<a href="http://{BMG-website}/market-research-report/biotechnology/bioinformatics.html"><span>Bioinformatics</span></a>
</li>
<li class="level1 nav-biotechnology-genomics.html">
<a href="http://{BMG-website}/market-research-report/biotechnology/genomics.html"><span>Genomics</span></a>
</li>
<li class="level1 nav-biotechnology-proteomics.html">
<a href="http://{BMG-website}/market-research-report/biotechnology/proteomics.html"><span>Proteomics</span></a>
</li>
<li class="level1 nav-biotechnology-technologies.html last">
<a href="http://{BMG-website}/market-research-report/biotechnology/technologies.html"><span>Technologies</span></a>
</li>

</ul></li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-business-development.html
parent">
<a href="http://{BMG-website}/market-research-report/business-development.html"><span>Business Development</span></a>
<ul class="level0">
<li class="level1 nav-business-development-branding.html">
<a href="http://{BMG-website}/market-research-report/business-development/branding.html"><span>Branding</span></a>
</li>
<li class="level1 nav-business-development-licensing.html last">
<a href="http://{BMG-website}/market-research-report/business-development/licensing.html"><span>Licensing</span></a>
</li>
</ul></li>
   <li class="level0 nav-chemicals.html">

<a href="http://{BMG-website}/market-research-report/chemicals.html"><span>Chemicals</span></a>
</li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-country.html parent">
<a href="http://{BMG-website}/market-research-report/country.html"><span>Country</span></a>
<ul class="level0">
<li class="level1 nav-country-argentina.html">
<a href="http://{BMG-website}/market-research-report/country/argentina.html"><span>Argentina</span></a>
</li>
<li class="level1 nav-country-australia.html">
<a href="http://{BMG-website}/market-research-report/country/australia.html"><span>Australia</span></a>
</li>
<li class="level1 nav-country-austria.html">
```

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<a href="http://{BMG-website}/market-research-report/country/austria.html"><span>Austria</span></a>
</li>
<li class="level1 nav-country-bahrain.html">
<a href="http://{BMG-website}/market-research-report/country/bahrain.html"><span>Bahrain</span></a>
</li>
<li class="level1 nav-country-bangladesh.html">
<a href="http://{BMG-website}/market-research-report/country/bangladesh.html"><span>Bangladesh</span></a>
</li>
<li class="level1 nav-country-belarus.html">
<a href="http://{BMG-website}/market-research-report/country/belarus.html"><span>Belarus</span></a>
</li>
<li class="level1 nav-country-belgium.html">
<a href="http://{BMG-website}/market-research-report/country/belgium.html"><span>Belgium</span></a>

</li>
<li class="level1 nav-country-brazil.html">
<a href="http://{BMG-website}/market-research-report/country/brazil.html"><span>Brazil</span></a>
</li>
<li class="level1 nav-country-bulgaria.html">
<a href="http://{BMG-website}/market-research-report/country/bulgaria.html"><span>Bulgaria</span></a>
</li>
<li class="level1 nav-country-canada.html">
<a href="http://{BMG-website}/market-research-report/country/canada.html"><span>Canada</span></a>
</li>
<li class="level1 nav-country-chile.html">
<a href="http://{BMG-website}/market-research-report/country/chile.html"><span>Chile</span></a>
</li>

<li class="level1 nav-country-china.html">
<a href="http://{BMG-website}/market-research-report/country/china.html"><span>China</span></a>
</li>
<li class="level1 nav-country-colombia.html">
<a href="http://{BMG-website}/market-research-report/country/colombia.html"><span>Colombia</span></a>
</li>
<li class="level1 nav-country-costa-rica.html">
<a href="http://{BMG-website}/market-research-report/country/costa-rica.html"><span>Costa Rica</span></a>
</li>
<li class="level1 nav-country-croatia.html">
<a href="http://{BMG-website}/market-research-report/country/croatia.html"><span>Croatia</span></a>
</li>
<li class="level1 nav-country-cuba.html">

<a href="http://{BMG-website}/market-research-report/country/cuba.html"><span>Cuba</span></a>
</li>
<li class="level1 nav-country-czech-republic.html">
<a href="http://{BMG-website}/market-research-report/country/czech-republic.html"><span>Czech Republic</span></a>
</li>
<li class="level1 nav-country-denmark.html">
<a href="http://{BMG-website}/market-research-report/country/denmark.html"><span>Denmark</span></a>
```

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</li>
<li class="level1 nav-country-estonia.html">
<a href="http://{BMG-website}/market-research-report/country/estonia.html"><span>Estonia</span></a>
</li>
<li class="level1 nav-country-europe.html">
<a href="http://{BMG-website}/market-research-report/country/europe.html"><span>Europe</span></a>

</li>
<li class="level1 nav-country-finland.html">
<a href="http://{BMG-website}/market-research-report/country/finland.html"><span>Finland</span></a>
</li>
<li class="level1 nav-country-france.html">
<a href="http://{BMG-website}/market-research-report/country/france.html"><span>France</span></a>
</li>
<li class="level1 nav-country-germany.html">
<a href="http://{BMG-website}/market-research-report/country/germany.html"><span>Germany</span></a>
</li>
<li class="level1 nav-country-greece.html">
<a href="http://{BMG-website}/market-research-report/country/greece.html"><span>Greece</span></a>
</li>

<li class="level1 nav-country-hong-kong.html">
<a href="http://{BMG-website}/market-research-report/country/hong-kong.html"><span>Hong Kong</span></a>
</li>
<li class="level1 nav-country-hungary.html">
<a href="http://{BMG-website}/market-research-report/country/hungary.html"><span>Hungary</span></a>
</li>
<li class="level1 nav-country-india.html">
<a href="http://{BMG-website}/market-research-report/country/india.html"><span>India</span></a>
</li>
<li class="level1 nav-country-indonesia.html">
<a href="http://{BMG-website}/market-research-report/country/indonesia.html"><span>Indonesia</span></a>
</li>
<li class="level1 nav-country-iran.html">

<a href="http://{BMG-website}/market-research-report/country/iran.html"><span>Iran</span></a>
</li>
<li class="level1 nav-country-ireland.html">
<a href="http://{BMG-website}/market-research-report/country/ireland.html"><span>Ireland</span></a>
</li>
<li class="level1 nav-country-israel.html">
<a href="http://{BMG-website}/market-research-report/country/israel.html"><span>Israel</span></a>
</li>
<li class="level1 nav-country-italy.html">
<a href="http://{BMG-website}/market-research-report/country/italy.html"><span>Italy</span></a>
</li>
<li class="level1 nav-country-japan.html">
<a href="http://{BMG-website}/market-research-report/country/japan.html"><span>Japan</span></a>
```

```
</li>
<li class="level1 nav-country-kuwait.html">
<a href="http://{BMG-website}/market-research-report/country/kuwait.html"><span>Kuwait</span></a>
</li>
<li class="level1 nav-country-latvia.html">
<a href="http://{BMG-website}/market-research-report/country/latvia.html"><span>Latvia</span></a>
</li>
<li class="level1 nav-country-lithuania.html">
<a href="http://{BMG-website}/market-research-report/country/lithuania.html"><span>Lithuania</span></a>
</li>
<li class="level1 nav-country-malaysia.html">
<a href="http://{BMG-website}/market-research-report/country/malaysia.html"><span>Malaysia</span></a>
</li>

<li class="level1 nav-country-mexico.html">
<a href="http://{BMG-website}/market-research-report/country/mexico.html"><span>Mexico</span></a>
</li>
<li class="level1 nav-country-malta.html">
<a href="http://{BMG-website}/market-research-report/country/malta.html"><span>Malta</span></a>
</li>
<li class="level1 nav-country-morocco.html">
<a href="http://{BMG-website}/market-research-report/country/morocco.html"><span>Morocco</span></a>
</li>
<li class="level1 nav-country-netherlands.html">
<a href="http://{BMG-website}/market-research-report/country/netherlands.html"><span>Netherlands</span></a>
</li>
<li class="level1 nav-country-new-zealand.html">

<a href="http://{BMG-website}/market-research-report/country/new-zealand.html"><span>New Zealand</span></a>
</li>
<li class="level1 nav-country-north-america.html">
<a href="http://{BMG-website}/market-research-report/country/north-america.html"><span>North America</span></a>
</li>
<li class="level1 nav-country-norway.html">
<a href="http://{BMG-website}/market-research-report/country/norway.html"><span>Norway</span></a>
</li>
<li class="level1 nav-country-oman.html">
<a href="http://{BMG-website}/market-research-report/country/oman.html"><span>Oman</span></a>
</li>
<li class="level1 nav-country-pakistan.html">
<a href="http://{BMG-website}/market-research-report/country/pakistan.html"><span>Pakistan</span></a>

</li>
<li class="level1 nav-country-peru.html">
<a href="http://{BMG-website}/market-research-report/country/peru.html"><span>Peru</span></a>
</li>
<li class="level1 nav-country-phillippines.html">
<a href="http://{BMG-website}/market-research-report/country/phillippines.html"><span>Phillippines</span></a>
</li>
```

```
<li class="level1 nav-country-poland.html">
<a href="http://{BMG-website}/market-research-report/country/poland.html"><span>Poland</span></a>
</li>
<li class="level1 nav-country-portugal.html">
<a href="http://{BMG-website}/market-research-report/country/portugal.html"><span>Portugal</span></a>
</li>

<li class="level1 nav-country-romania.html">
<a href="http://{BMG-website}/market-research-report/country/romania.html"><span>Romania</span></a>
</li>
<li class="level1 nav-country-russia.html">
<a href="http://{BMG-website}/market-research-report/country/russia.html"><span>Russia</span></a>
</li>
<li class="level1 nav-country-saudi-arabia.html">
<a href="http://{BMG-website}/market-research-report/country/saudi-arabia.html"><span>Saudi Arabia</span></a>
</li>
<li class="level1 nav-country-serbia.html">
<a href="http://{BMG-website}/market-research-report/country/serbia.html"><span>Serbia</span></a>
</li>
<li class="level1 nav-country-singapore.html">

<a href="http://{BMG-website}/market-research-report/country/singapore.html"><span>Singapore</span></a>
</li>
<li class="level1 nav-country-slovakia.html">
<a href="http://{BMG-website}/market-research-report/country/slovakia.html"><span>Slovakia</span></a>
</li>
<li class="level1 nav-country-slovenia.html">
<a href="http://{BMG-website}/market-research-report/country/slovenia.html"><span>Slovenia</span></a>
</li>
<li class="level1 nav-country-south-africa.html">
<a href="http://{BMG-website}/market-research-report/country/south-africa.html"><span>South Africa</span></a>
</li>
<li class="level1 nav-country-south-korea.html">
<a href="http://{BMG-website}/market-research-report/country/south-korea.html"><span>South Korea</span></a>

</li>
<li class="level1 nav-country-spain.html">
<a href="http://{BMG-website}/market-research-report/country/spain.html"><span>Spain</span></a>
</li>
<li class="level1 nav-country-sweden.html">
<a href="http://{BMG-website}/market-research-report/country/sweden.html"><span>Sweden</span></a>
</li>
<li class="level1 nav-country-switzerland.html">
<a href="http://{BMG-website}/market-research-report/country/switzerland.html"><span>Switzerland</span></a>
</li>
<li class="level1 nav-country-syria.html">
<a href="http://{BMG-website}/market-research-report/country/syria.html"><span>Syria</span></a>
</li>
```

```
<li class="level1 nav-country-taiwan.html">
<a href="http://{BMG-website}/market-research-report/country/taiwan.html"><span>Taiwan</span></a>
</li>
<li class="level1 nav-country-thailand.html">
<a href="http://{BMG-website}/market-research-report/country/thailand.html"><span>Thailand</span></a>
</li>
<li class="level1 nav-country-turkey.html">
<a href="http://{BMG-website}/market-research-report/country/turkey.html"><span>Turkey</span></a>
</li>
<li class="level1 nav-country-ukraine.html">
<a href="http://{BMG-website}/market-research-report/country/ukraine.html"><span>Ukraine</span></a>
</li>
<li class="level1 nav-country-united-arab-emirates.html">

<a href="http://{BMG-website}/market-research-report/country/united-arab-emirates.html"><span>United Arab
Emirates</span></a>
</li>
<li class="level1 nav-country-united-kingdom.html">
<a href="http://{BMG-website}/market-research-report/country/united-kingdom.html"><span>United Kingdom</span></a>
</li>
<li class="level1 nav-country-usa.html">
<a href="http://{BMG-website}/market-research-report/country/usa.html"><span>USA</span></a>
</li>
<li class="level1 nav-country-venezuela.html">
<a href="http://{BMG-website}/market-research-report/country/venezuela.html"><span>Venezuela</span></a>
</li>
<li class="level1 nav-country-vietnam.html">
<a href="http://{BMG-website}/market-research-report/country/vietnam.html"><span>Vietnam</span></a>

</li>
<li class="level1 nav-country-egypt.html">
<a href="http://{BMG-website}/market-research-report/country/egypt.html"><span>Egypt</span></a>
</li>
<li class="level1 nav-country-jordan.html last">
<a href="http://{BMG-website}/market-research-report/country/jordan.html"><span>Jordan</span></a>
</li>
</ul></li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-diagnostics.html parent">
<a href="http://{BMG-website}/market-research-report/diagnostics.html"><span>Diagnostics</span></a>
<ul class="level0">
<li class="level1 nav-diagnostics-markets.html">
<a href="http://{BMG-website}/market-research-report/diagnostics/markets.html"><span>Markets</span></a>

</li>
<li class="level1 nav-diagnostics-in-vitro-diagnostics.html">
<a href="http://{BMG-website}/market-research-report/diagnostics/in-vitro-diagnostics.html"><span>In Vitro
Diagnostics</span></a>
</li>
<li class="level1 nav-diagnostics-in-vivo-diagnostics.html">
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<a href="http://{BMG-website}/market-research-report/diagnostics/in-vivo-diagnostics.html"><span>In Vivo
Diagnostics</span></a>
</li>
<li class="level1 nav-diagnostics-glucose-testing.html">
<a href="http://{BMG-website}/market-research-report/diagnostics/glucose-testing.html"><span>Glucose Testing</span></a>
</li>
<li class="level1 nav-diagnostics-home-testing.html">
<a href="http://{BMG-website}/market-research-report/diagnostics/home-testing.html"><span>Home Testing</span></a>
</li>

<li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level1 nav-diagnostics-diseases.html parent">
<a href="http://{BMG-website}/market-research-report/diagnostics/diseases.html"><span>Diseases</span></a>
<ul class="level1">
<li class="level2 nav-diagnostics-diseases-cardiovascular.html last">
<a href="http://{BMG-website}/market-research-
report/diagnostics/diseases/cardiovascular.html"><span>Cardiovascular</span></a>
</li>
</ul></li>
<li class="level1 nav-diagnostics-diagnostic-imaging.html">
<a href="http://{BMG-website}/market-research-report/diagnostics/diagnostic-imaging.html"><span>Diagnostic
Imaging</span></a>
</li>
<li class="level1 nav-diagnostics-point-of-care-diagnostics.html">
<a href="http://{BMG-website}/market-research-report/diagnostics/point-of-care-diagnostics.html"><span>Point-of-Care
Diagnostics</span></a>
</li>

<li class="level1 nav-diagnostics-in-office-testing.html">
<a href="http://{BMG-website}/market-research-report/diagnostics/in-office-testing.html"><span>In-Office Testing</span></a>
</li>
<li class="level1 nav-diagnostics-laboratory-testing.html last">
<a href="http://{BMG-website}/market-research-report/diagnostics/laboratory-testing.html"><span>Laboratory
Testing</span></a>
</li>
</ul></li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-drug-delivery.html parent">
<a href="http://{BMG-website}/market-research-report/drug-delivery.html"><span>Drug Delivery</span></a>
<ul class="level0">
<li class="level1 nav-drug-delivery-companies.html last">
<a href="http://{BMG-website}/market-research-report/drug-delivery/companies.html"><span>Companies</span></a>

</li>
</ul></li>
   <li class="level0 nav-drug-discovery.html">
<a href="http://{BMG-website}/market-research-report/drug-discovery.html"><span>Drug Discovery</span></a>
</li>
   <li class="level0 nav-drugs.html">
<a href="http://{BMG-website}/market-research-report/drugs.html"><span>Drugs</span></a>
</li>
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   <li class="level0 nav-finance-investment.html">
<a href="http://{BMG-website}/market-research-report/finance-investment.html"><span>Finance &amp;
Investment</span></a>

</li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-generic-drugs.html parent">
<a href="http://{BMG-website}/market-research-report/generic-drugs.html"><span>Generic Drugs</span></a>
<ul class="level0">
<li class="level1 nav-generic-drugs-companies.html">
<a href="http://{BMG-website}/market-research-report/generic-drugs/companies.html"><span>Companies</span></a>
</li>
<li class="level1 nav-generic-drugs-markets.html">
<a href="http://{BMG-website}/market-research-report/generic-drugs/markets.html"><span>Markets</span></a>
</li>
<li class="level1 nav-generic-drugs-biogenerics.html last">
<a href="http://{BMG-website}/market-research-report/generic-drugs/biogenerics.html"><span>Biogenerics</span></a>

</li>
</ul></li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-healthcare.html parent">
<a href="http://{BMG-website}/market-research-report/healthcare.html"><span>Healthcare</span></a>
<ul class="level0">
<li class="level1 nav-healthcare-hospital.html">
<a href="http://{BMG-website}/market-research-report/healthcare/hospital.html"><span>Hospital</span></a>
</li>
<li class="level1 nav-healthcare-otc.html last">
<a href="http://{BMG-website}/market-research-report/healthcare/otc.html"><span>OTC</span></a>
</li>
</ul></li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-it-ehealth.html parent">

<a href="http://{BMG-website}/market-research-report/it-ehealth.html"><span>IT &amp; eHealth</span></a>
<ul class="level0">
<li class="level1 nav-it-ehealth-markets.html last">
<a href="http://{BMG-website}/market-research-report/it-ehealth/markets.html"><span>Markets</span></a>
</li>
</ul></li>
   <li class="level0 nav-management.html">
<a href="http://{BMG-website}/market-research-report/management.html"><span>Management</span></a>
</li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-marketing-sales.html parent">

<a href="http://{BMG-website}/market-research-report/marketing-sales.html"><span>Marketing &amp; Sales</span></a>
<ul class="level0">
<li class="level1 nav-marketing-sales-branding.html">
<a href="http://{BMG-website}/market-research-report/marketing-sales/branding.html"><span>Branding</span></a>
</li>
<li class="level1 nav-marketing-sales-markets.html">
<a href="http://{BMG-website}/market-research-report/marketing-sales/markets.html"><span>Markets</span></a>
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</li>
<li class="level1 nav-marketing-sales-pharmacoeconomics.html last">
<a href="http://{BMG-website}/market-research-report/marketing-
sales/pharmacoeconomics.html"><span>Pharmacoeconomics</span></a>
</li>

</ul></li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-medical-devices.html parent">
<a href="http://{BMG-website}/market-research-report/medical-devices.html"><span>Medical Devices</span></a>
<ul class="level0">
<li class="level1 nav-medical-devices-companies.html">
<a href="http://{BMG-website}/market-research-report/medical-devices/companies.html"><span>Companies</span></a>
</li>
<li class="level1 nav-medical-devices-markets.html last">
<a href="http://{BMG-website}/market-research-report/medical-devices/markets.html"><span>Markets</span></a>
</li>
</ul></li>
   <li class="level0 nav-production.html">

<a href="http://{BMG-website}/market-research-report/production.html"><span>Production</span></a>
</li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-publication-series.html parent">
<a href="http://{BMG-website}/market-research-report/publication-series.html"><span>Publication Series</span></a>
<ul class="level0">
<li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level1 nav-publication-series-analytical-
tool.html parent">
<a href="http://{BMG-website}/market-research-report/publication-series/analytical-tool.html"><span>Analytical
Tool</span></a>
<ul class="level1">
<li class="level2 nav-publication-series-analytical-tool-cancer-highlights.html">
<a href="http://{BMG-website}/market-research-report/publication-series/analytical-tool/cancer-highlights.html"><span>Cancer
Highlights</span></a>
</li>
<li class="level2 nav-publication-series-analytical-tool-drug-pipeline-updates.html">

<a href="http://{BMG-website}/market-research-report/publication-series/analytical-tool/drug-pipeline-
updates.html"><span>Drug Pipeline Updates</span></a>
</li>
<li class="level2 nav-publication-series-analytical-tool-triple-analysis.html last">
<a href="http://{BMG-website}/market-research-report/publication-series/analytical-tool/triple-analysis.html"><span>Triple
Analysis</span></a>
</li>
</ul></li>
<li class="level1 nav-publication-series-commercial-insight.html">
<a href="http://{BMG-website}/market-research-report/publication-series/commercial-insight.html"><span>Commercial
Insight</span></a>
</li>
<li class="level1 nav-publication-series-commercial-and-pipeline-insight.html">
<a href="http://{BMG-website}/market-research-report/publication-series/commercial-and-pipeline-
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insight.html"><span>Commercial and Pipeline Insight</span></a>
</li>
<li class="level1 nav-publication-series-deals-alliances-reports.html">

<a href="http://{BMG-website}/market-research-report/publication-series/deals-alliances-reports.html"><span>Deals &amp;amp;
Alliances Reports</span></a>
</li>
<li class="level1 nav-publication-series-detailed-product-pipeline-reports.html">
<a href="http://{BMG-website}/market-research-report/publication-series/detailed-product-pipeline-
reports.html"><span>Detailed Product Pipeline Reports</span></a>
</li>
<li class="level1 nav-publication-series-financial-company-reports.html">
<a href="http://{BMG-website}/market-research-report/publication-series/financial-company-reports.html"><span>Financial
Company Reports</span></a>
</li>
<li class="level1 nav-publication-series-financial-markets-research.html">
<a href="http://{BMG-website}/market-research-report/publication-series/financial-markets-research.html"><span>Financial
Markets Research</span></a>
</li>

<li class="level1 nav-publication-series-pipeline-insight.html">
<a href="http://{BMG-website}/market-research-report/publication-series/pipeline-insight.html"><span>Pipeline
Insight</span></a>
</li>
<li class="level1 nav-publication-series-pharma-partnering-guides.html">
<a href="http://{BMG-website}/market-research-report/publication-series/pharma-partnering-guides.html"><span>Pharma
Partnering Guides</span></a>
</li>
<li class="level1 nav-publication-series-pharmavitae.html">
<a href="http://{BMG-website}/market-research-report/publication-series/pharmavitae.html"><span>PharmaVitae</span></a>
</li>
<li class="level1 nav-publication-series-private-company-reports.html">
<a href="http://{BMG-website}/market-research-report/publication-series/private-company-reports.html"><span>Private
Company Reports</span></a>
</li>
<li class="level1 nav-publication-series-premium-company-profile.html">

<a href="http://{BMG-website}/market-research-report/publication-series/premium-company-profile.html"><span>Premium
Company Profile</span></a>
</li>
<li class="level1 nav-publication-series-stakeholder-insight.html">
<a href="http://{BMG-website}/market-research-report/publication-series/stakeholder-insight.html"><span>Stakeholder
Insight</span></a>
</li>
<li class="level1 nav-publication-series-stakeholder-opinions.html">
<a href="http://{BMG-website}/market-research-report/publication-series/stakeholder-opinions.html"><span>Stakeholder
Opinions</span></a>
</li>
<li class="level1 nav-publication-series-spotlight-reports.html">
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<a href="http://{BMG-website}/market-research-report/publication-series/spotlight-reports.html"><span>Spotlight
Reports</span></a>
</li>
<li class="level1 nav-publication-series-therapeutic-competitor-reports.html">
<a href="http://{BMG-website}/market-research-report/publication-series/therapeutic-competitor-
reports.html"><span>Therapeutic Competitor Reports</span></a>

</li>
<li class="level1 nav-publication-series-therapy-area-pipeline-reports.html last">
<a href="http://{BMG-website}/market-research-report/publication-series/therapy-area-pipeline-reports.html"><span>Therapy
Area Pipeline Reports</span></a>
</li>
</ul></li>
   <li class="level0 nav-r-d.html">
<a href="http://{BMG-website}/market-research-report/r-d.html"><span>R&amp;amp;D</span></a>
</li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-regulation-policy.html parent">
<a href="http://{BMG-website}/market-research-report/regulation-policy.html"><span>Regulation &amp;amp; Policy</span></a>

<ul class="level0">
<li class="level1 nav-regulation-policy-intellectual-property.html">
<a href="http://{BMG-website}/market-research-report/regulation-policy/intellectual-property.html"><span>Intellectual
Property</span></a>
</li>
<li class="level1 nav-regulation-policy-pricing-reimbursement.html last">
<a href="http://{BMG-website}/market-research-report/regulation-policy/pricing-reimbursement.html"><span>Pricing &amp;amp;
Reimbursement</span></a>
</li>
</ul></li>
   <li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level0 nav-therapeutics.html parent">
<a href="http://{BMG-website}/market-research-report/therapeutics.html"><span>Therapeutics</span></a>
<ul class="level0">

<li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level1 nav-therapeutics-companies.html
parent">
<a href="http://{BMG-website}/market-research-report/therapeutics/companies.html"><span>Companies</span></a>
<ul class="level1">
<li class="level2 nav-therapeutics-companies-oncology.html last">
<a href="http://{BMG-website}/market-research-report/therapeutics/companies/oncology.html"><span>Oncology</span></a>
</li>
</ul></li>
<li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level1 nav-therapeutics-diseases-
conditions.html parent">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions.html"><span>Diseases &amp;amp;
Conditions</span></a>
<ul class="level1">
<li class="level2 nav-therapeutics-diseases-conditions-addiction.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-
conditions/addiction.html"><span>Addiction</span></a>
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</li>
<li class="level2 nav-therapeutics-diseases-conditions-autoimmune-inflammation.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/autoimmune-
inflammation.html"><span>Autoimmune &amp;amp; Inflammation</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-cardiovascular.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-
conditions/cardiovascular.html"><span>Cardiovascular</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-dermatology.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-
conditions/dermatology.html"><span>Dermatology</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-dental.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/dental.html"><span>Dental</span></a>

</li>
<li class="level2 nav-therapeutics-diseases-conditions-gastroenterology.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-
conditions/gastroenterology.html"><span>Gastroenterology</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-genetic-diseases.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/genetic-diseases.html"><span>Genetic
diseases</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-infectious-diseases.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/infectious-
diseases.html"><span>Infectious diseases</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-metabolic-disorders.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/metabolic-
disorders.html"><span>Metabolic disorders</span></a>
</li>

<li class="level2 nav-therapeutics-diseases-conditions-neurological-disorders.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/neurological-
disorders.html"><span>Neurological disorders</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-oncology.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-
conditions/oncology.html"><span>Oncology</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-ophthalmology.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-
conditions/ophthalmology.html"><span>Ophthalmology</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-pain.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/pain.html"><span>Pain</span></a>
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</li>
<li class="level2 nav-therapeutics-diseases-conditions-pulmonary-respiratory.html">

<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/pulmonary-
respiratory.html"><span>Pulmonary &amp;amp; Respiratory</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-reproduction.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-
conditions/reproduction.html"><span>Reproduction</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-other.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/other.html"><span>Other</span></a>
</li>
<li class="level2 nav-therapeutics-diseases-conditions-ophthalmology-optometry.html last">
<a href="http://{BMG-website}/market-research-report/therapeutics/diseases-conditions/ophthalmology-
optometry.html"><span>Ophthalmology &amp;amp; Optometry</span></a>

</li>
</ul></li>
<li onmouseover="toggleMenu(this,1)" onmouseout="toggleMenu(this,0)" class="level1 nav-therapeutics-line-of-treatment.html
parent">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-treatment.html"><span>Line of
Treatment</span></a>
<ul class="level1">
<li class="level2 nav-therapeutics-line-of-treatment-biologicals.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-
treatment/biologicals.html"><span>Biologicals</span></a>
</li>
<li class="level2 nav-therapeutics-line-of-treatment-cell-therapy.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-treatment/cell-therapy.html"><span>Cell
therapy</span></a>
</li>
<li class="level2 nav-therapeutics-line-of-treatment-cytotoxics.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-
treatment/cytotoxics.html"><span>Cytotoxics</span></a>

</li>
<li class="level2 nav-therapeutics-line-of-treatment-hormone-therapy.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-treatment/hormone-therapy.html"><span>Hormone
therapy</span></a>
</li>
<li class="level2 nav-therapeutics-line-of-treatment-immunomodulators.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-
treatment/immunomodulators.html"><span>Immunomodulators</span></a>
</li>
<li class="level2 nav-therapeutics-line-of-treatment-surgery.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-
treatment/surgery.html"><span>Surgery</span></a>
</li>
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<li class="level2 nav-therapeutics-line-of-treatment-vaccines.html">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-
treatment/vaccines.html"><span>Vaccines</span></a>
</li>

<li class="level2 nav-therapeutics-line-of-treatment-targeted.html last">
<a href="http://{BMG-website}/market-research-report/therapeutics/line-of-
treatment/targeted.html"><span>Targeted</span></a>
</li>
</ul></li>
<li class="level1 nav-therapeutics-markets.html last">
<a href="http://{BMG-website}/market-research-report/therapeutics/markets.html"><span>Markets</span></a>
</li>
</ul></li>
   <li class="level0 nav-veterinary.html">
<a href="http://{BMG-website}/market-research-report/veterinary.html"><span>Veterinary</span></a>
</li>

      </ul>

   </div>
   </div>       </div>
      <!-- end header -->

      <!-- start middle -->
      <div class="middle-container">
         <div class="middle col-2-right-layout">
<h4 class="no-display">You're currently on:</h4>
<ul class="breadcrumbs">

         <li class="home">
               <a href="http://{BMG-website}/market-research-report/" title="Go to Home Page">Home</a>
            </li>
            <li> / </li>
               <li class="category3">
               <a href="http://{BMG-website}/market-research-report/biotechnology.html" title="">Biotechnology</a>
            </li>

            <li> / </li>
               <li class="category4">
               <a href="http://{BMG-website}/market-research-report/biotechnology/companies.html" title="">Companies</a>
            </li>
            <li> / </li>
               <li class="product">

               <strong>Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd edition</strong>
            </li>
         </ul>
         <!-- start center -->
```

```
            <div id="main" class="col-main">
            <!-- start global messages -->
                        <!-- end global messages -->

            <!-- start content -->


<script type="text/javascript">
   var optionsPrice = new
Product.OptionsPrice({"productId":"5891","priceFormat":{"pattern":"$%s","precision":2,"requiredPrecision":2,"decimalSymbol
":".","groupSymbol":",","groupLength":3,"integerRequired":1},"includeTax":"false","showIncludeTax":false,"showBothPrices":
false,"productPrice":2495,"productOldPrice":2495,"skipCalculate":1,"defaultTax":0,"currentTax":0,"idSuffix":"__none__","oldP
lusDisposition":0,"plusDisposition":0,"oldMinusDisposition":0,"minusDisposition":0});
</script>
<div id="messages_product_view"></div>
<div class="product-info-box">
   <div class="product-essential">
   <form action="http://{BMG-website}/market-research-
report/checkout/cart/add/uenc/aHR0cDovL3d3dy5iaW9tYXJrZXRncm91cC5jb20vbWFya2V0LXJlc2VhcmNoLXJlcG9ydC9kaXN0cmlidXRpb24tYWdyZWVtZW50cy1pbi1waGFybWEtYmlvdGVjaC1hbmQtZGlhZ25vc3RpY3MtMm5kLWVkaXRpb24aHRtbD9fX19TSUQ9VQ,,/product/5891/" method="post" id="product_addtocart_form">
      <div class="product-shop">
         <h1 class="product-name">
            Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd edition          </h1>
               <div class="collateral-box">

            <div class="head">
               <h4>Additional Information</h4>
            </div>
            <div class="collateral-box attribute-specs">
   <table cellspacing="0" class="data-table" id="product-attribute-specs-table">
      <tr>
      <td class="label">Published Date</td>
      <td class="data">Mar 10, 2010</td>

   </tr>
      <tr>
      <td class="label">Publisher</td>
      <td class="data">CurrentPartnering</td>
   </tr>
      <tr>
      <td class="label">Pages</td>

      <td class="data">261</td>
   </tr>
      <tr>
      <td class="label">PDF Fact Sheet</td>
      <td class="data"><a target=_blank href=http://{BMG-website}/market-research-report/factsheet-pdf/distribution-
agreements-in-pharma-biotech-and-diagnostics-2nd-edition.pdf>View Fact Sheet for the report Distribution Agreements in
```

```
Pharma, Biotech and Diagnostics, 2nd edition in PDF format.</a></td>
   </tr>
      <tr>

      <td class="label">Format</td>
      <td class="data">PDF</td>
   </tr>
      </table>
   <script type="text/javascript">decorateTable('product-attribute-specs-table')</script>
</div>
         </div>


         <fieldset class="no-display">

           <input type="hidden" name="product" value="5891" />
           <input type="hidden" name="related_product" id="related-products-field" value="" />
         </fieldset>









   <div class="price-box">
                                        <span class="regular-price" id="product-price-5891">
               <span class="price">$2,495.00</span>              </span>

      </div>



            <div class="add-to-holder">


   <fieldset class="add-to-cart-box">
      <legend>Add Items to Cart</legend>
            <span class="qty-box"><label for="qty">Qty:</label>
      <input name="qty" type="text" class="input-text qty" id="qty" maxlength="12" value=""/></span>
            <button class="form-button" onclick="productAddToCartForm.submit()"><span>Add to Cart</span></button>

      <!--<a href="#" onclick="productAddToCartForm.submit(); return false;"><img src="http://{BMG-
website}/skin/frontend/default/default/images/btn_add_to_cart.gif" alt="Add to Cart" class="v-middle" style="margin:0 0 0
5px;" /></a>-->
   </fieldset>
                     <span class="add-or"><a class="specialeffects" href="http://{BMG-website}/faxorderform.pdf" rel="nofollow"
style="color: red; text-decoration: underline" ><strong> or order via fax order form.</font></strong></a></span>
```

```
            </div>
                <div class="divider"></div>

                    <h4>Quick Overview</h4>
            <div class="short-description"><em>The Distribution Agreements in Pharma, Biotech and Diagnostics report provides comprehensive understanding and unprecedented access to the distribution partnering agreements entered into by the worlds leading biopharma companies.</em></div>

                        <a class="specialeffects" href="http://{BMG-website}/market-research-report/productquestion/index/index/product/5891/" rel="nofollow"><font color="#FF0000" style="color: red; text-decoration: underline"><strong>Request free sample pages from Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd edition</font></strong></a>



        </div>
        <div class="clear"></div>
          </form>
    <script type="text/javascript">
          var productAddToCartForm = new VarienForm('product_addtocart_form');
          productAddToCartForm.submit = function(){
                if (this.validator.validate()) {
                      this.form.submit();
                }
          }.bind(productAddToCartForm);
    </script>
    </div>
    <ul class="tabs">
                    <li id="product_tabs_description" class="active first"><a href="#" rel="nofollow" style="text-decoration:none">Product Description</a></li>

                        <li id="product_tabs_toc_html" ><a href="#" rel="nofollow" style="text-decoration:none">Table of Contents</a></li>
                                <li id="product_tabs_company_html" ><a href="#" rel="nofollow" style="text-decoration:none">Featured Companies</a></li>
          </ul>
<div class="padder">
                <div id="product_tabs_description_contents"><div class="product-specs"> <div class="product-collateral"><div class="collateral-box"><div class="head">
                  <h4>Product Description</h4>
              </div></div>

<p>The Distribution Agreements in Pharma, Biotech and Diagnostics report provides comprehensive understanding and unprecedented access to the distribution partnering agreements entered into by the worlds leading biopharma companies.<br><br>The report provides a detailed understand and analysis of how and why companies enter distribution deals.<br><br>The majority of deals are multicomponent whereby the licensor offers a right to distribute the resultant product of the research collaboration. There are also numerous pure distribution deals whereby the products originator takes on a distribution partner in order to maximize a products presence in the marketplace.<br><br>Understanding the flexibility of a prospective partner&amp;rsquo;s negotiated deals terms provides critical insight into the negotiation process in terms of what you can
```

expect to achieve during the negotiation of terms. Whilst many smaller companies will be seeking details of the payments clauses, the devil is in the detail in terms of how payments are triggered - contract documents provide this insight where press releases and databases do not.

This report contains over 500 links to online copies of actual distribution contract documents as submitted to the Securities Exchange Commission by biopharma companies and their partners.

Contract documents provide the answers to numerous questions about a prospective partner’s flexibility on a wide range of important issues, many of which will have a significant impact on each party’s ability to derive value from the deal.

The initial chapters of this report provide an orientation of distribution dealmaking and business activities. Chapter 1 provides an introduction to the report, whilst chapter 2 provides an analysis of the trends in distribution as well as a discussion on the merits of the type of deal.

Chapter 3 provides an overview of the structure of distribution deals. The chapter includes numerous case studies to enable understanding of both pure distribution deals and multicomponent deals where distribution forms a part.

Chapter 4 provides a review of the leading distribution deals since 2000. Deals are listed by headline value, signed by bigpharma, most active bigpharma, and most active of all biopharma companies. Where the deal has an agreement contract published at the SEC a link provides online access to the contract.

Chapter 5 provides a comprehensive listing of the top 50 bigpharma companies with a brief summary followed by a comprehensive listing of distribution contract documents available in the public domain. Each deal title links via Weblink to an online version of the actual contract document, providing easy access to each contract document on demand.

Chapter 6 provides a comprehensive listing of all distribution agreement contracts available in the public domain. Each chapter is organized by A-Z, stage of development at signing, and therapeutic area. Each deal title links via Weblink to an online version of the actual contract document, providing easy access to each contract document on demand.

The report also includes numerous table and figures that illustrate the trends and activities in distribution dealmaking since 2000.

In conclusion, this report provides everything a prospective dealmaker needs to know about distribution as an opportunity to participate in the commercialization of either candidate compounds in development or products already on the market.

Key benefits

Distribution Agreements in Pharma, Biotech and Diagnostics provides the reader with the following key benefits:

?In-depth understanding of distribution deal trends since 2000
?Analysis of the structure of distribution agreements with numerous real life case studies
?Comprehensive access to over 500 actual distribution contracts entered into by the world’s biopharma companies
?Detailed access to actual distribution contracts enter into by the leading fifty bigpharma companies
?Insight into the terms included in a distribution agreement, together with real world clause examples
?Understand the key deal terms companies have agreed in previous deals
?Undertake due diligence to assess suitability of your proposed deal terms for partner companies
Report scope

Distribution Agreements in Pharma, Biotech and Diagnostics is intended to provide the reader with an in-depth understanding of the distribution trends and structure of deals entered into by leading biopharma companies worldwide.

Distribution Agreements in Biopharma includes:

?Trends in distribution dealmaking in the biopharma industry since 2000
?Analysis of distribution deal structure
?Case studies of real-life distribution deals
?Access to over 500 distribution contract documents
?The leading distribution deals by value since 2000
?Most active distribution dealmakers since 2000
?The leading distribution partnering resources
In Distribution Agreements in Biopharma, the available contracts are listed by:

?Company A-Z
?Headline value
?Stage of development at signing
?Therapeutic area
Each deal title links via Weblink to an online version of the actual contract document, providing easy access to each contract document on demand.

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Chugai
CSL
Daiichi Sankyo
Dainnipon Sumitomo
Eisai
Eli Lilly
Forest Laboratories
Genentech
Genzyme
Gilead Sciences
GlaxoSmithKline
Hospira
Johnson & Johnson
Lundbeck
Menarini
Merck & Co
Merck Serono
Mitsubishi-Tanabe
Mylan
Novartis
Novo Nordisk
Nycomed Pharma
Otsuka
Pfizer
Procter & Gamble
Ratiopharm
Roche
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Recent report titles from CurrentPartnering Order Form - Reports Order form - Company Dealmaking Profiles Order Form - Report Update Subscription Order Form - CD-Rom

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</p>

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Abbott
Actavis
Alcon Labs
Allergan
Amgen
Astellas
AstraZeneca
Baxter
Bayer
Biogen Idec
Boehringer Ingelheim
Bristol-Myers Squibb
Cephalon
Chugai
CSL
Daiichi Sankyo
Dainnipon Sumitomo
Eisai
Eli Lilly
Forest Laboratories
Genentech
Genzyme
Gilead Sciences
GlaxoSmithKline
Hospira
Johnson & Johnson
Lundbeck
Menarini
Merck & Co
Merck Serono
Mitsubishi-Tanabe
Mylan
Novartis
Novo

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Nordisk</em><br><em>Nycomed Pharma</em><br><em>Otsuka</em><br><em>Pfizer</em><br><em>Procter &
Gamble</em><br><em>Ratiopharm</em><br><em>Roche</em><br><em>Sanofi-Aventis</em><br><em>Schering
Plough</em><br><em>Servier</em><br><em>Shire</em><br><em>Solvay</em><br><em>Takeda</em><br><em>Teva</e
m><br><em>UCB</em><br><em>Watson</em><br><em>Wyeth</em></div></div>

</div>
        </div>
<script type="text/javascript">
Varien.Tabs = Class.create();
Varien.Tabs.prototype = {
 initialize: function(selector) {
  var self=this;
  $$(selector+' a').each(this.initTab.bind(this));
 },

 initTab: function(el) {
    el.href = 'javascript:void(0)';
    if ($(el.parentNode).hasClassName('active')) {
     this.showContent(el);
    }
    el.observe('click', this.showContent.bind(this, el));
 },

 showContent: function(a) {
  var li = $(a.parentNode), ul = $(li.parentNode);
  ul.getElementsBySelector('li', 'ol').each(function(el){
    var contents = $(el.id+'_contents');
    if (el==li) {
     el.addClassName('active');
     contents.show();
    } else {
     el.removeClassName('active');
     contents.hide();
    }
  });
 }
}
new Varien.Tabs('.tabs');
</script><div class="product-collateral">
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report/productquestion/index/index/product/5891/" rel="nofollow"><font color="#FF0000" style="color: red; text-decoration:
underline"><strong>Request free sample pages from Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd
edition</font></strong></a>
                                                    </div>
</div> 
            <!-- end content -->
            </div>
        <!-- end center -->
```

```
        <!-- start right -->
        <div class="col-right side-col">
          <div class="box base-mini mini-cart">
   <div class="head">
            <h4>My Cart</h4>
        </div>


        <div class="content"><p>You have no items in your shopping cart.</p></div>

   </div>
<!-- [ends] .cart-sidebar // --><div class="box base-mini mini-compare-products">
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      </div>
        <div class="content"><p>You have no items to compare.</p></div>
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      <h4><span>Recently Viewed Products</span></h4>
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   <ol id="recently-viewed-items">
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Markets</a></li>
      </ol>
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</div>

<div class="box">
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alt="Keep your eyes open for our special Back to School items and save A LOT!" style="display:block;" /> -->
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   </div>
   <form action="http://{BMG-website}/market-research-report/newsletter/subscriber/new/" method="post" id="newsletter-
validate-detail">
   <fieldset class="content">
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        <!--
                    -->
        <label for="newsletter"><A HREF="{BSG-website}/bw/BWSubscribe.aspx?bwl=89f0345185214eef.-1.4133"
TARGET="_blank" rel="nofollow">Click here to sign up to the {BMG-website} industry newsletter</A></label>

   </fieldset>
</form>
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</div> 
        </div>
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    </div>

        </div>
    <!-- end middle -->

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        <div class="footer">
            <div class="informational">
   <ul>
<li><a href="http://{BMG-website}/market-research-report/{BMG-website}-group-privacy-policy/">Privacy Policy</a></li>

<li class="last"><a href="http://{BMG-website}/market-research-report/{BMG-website}-group-full-terms-and-conditions/">Full Terms and Conditions</a></li>
</ul>
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<noscript>
<a href="http://www.webstat.com">
<img src="http://hits.nextstat.com/scripts/wsb.php?ac=27181" border="0" alt="Web Analytics and Web Statistics by NextSTAT" /></a>
</noscript>
<!-- END WebSTAT Activation Code -->
<script src="http://{BMG-website}/scripts/gatag.js" type="text/javascript"></script>    <div>
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                <li ><a href="http://{BMG-website}/market-research-report/catalogsearch/term/popular/" title="Search Terms" >Search Terms</a></li>
                <li ><a href="http://{BMG-website}/market-research-report/catalogsearch/advanced/" title="Advanced Search" >Advanced Search</a></li>
                <li  class="last"><a href="http://{BMG-website}/market-research-report/contacts/" title="Contact Us" >Contact Us</a></li>
            </ul>
  </div>
</div>
<p class="legality">

&copy;  {BMG-website}. All Rights Reserved.

<br/>
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```
<a href="{BSG-website}">BSG</a> and <a href=http://{BMG-website}>BMG</a> are both trademarks of BSG</center></p>
</div>
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	<!-- end footer -->


<!-- BEGIN GOOGLE ANALYTICS CODE -->
<script type="text/javascript">
//<![CDATA[
var gaJsHost = (("https:" == document.location.protocol) ? "https://ssl." : "http://www.");
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//]]>

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edition.html");
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<!-- END GOOGLE ANALYTICS CODE -->
	</div>
</body>
</html>
```

9.2 Source code of BMG after SEO implementation done in April 2010

Code reduction after optimizing page size, improving page size from 71.8Kb and the new is 34Kb, giving a reduction of 53%. What was removed was a greater part of non-useable JavaScript and sublevel menus to main navigation.
The domain specific URLs have been translated to respectively "{BMG-website}" and {BSG-website}.

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 comprehensive understanding and unprecedented access to the distribution partnering agreements entered into by the worlds
 leading biopharma companies." />
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 an online, weblink to an, deal title links, title links via, via weblink to, the actual contract, actual contract document, to each
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   var BLANK_URL = 'http://{BMG-website}/js/blank.html';
   var BLANK_IMG = 'http://{BMG-website}/js/spacer.gif';
//]]>
</script>
<script type="text/javascript" src="http://{BMG-
 website}/js/index.php?c=auto&amp;f=,prototype/prototype.js,prototype/validation.js,scriptaculous/builder.js,scriptaculous/effects
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 ate.js,mage/cookies.js,jquery/jquery-
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 ></script>

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    <div class="header">


<div class="header-top-container">
  <div class="header-top">
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    <p class="no-display"><a href="#main"><strong>Skip to Main Content &raquo;</strong></a></p>
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/>
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      <script type="text/javascript">
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        var searchForm = new Varien.searchForm('search_mini_form', 'search', 'Search {BMG-website}...');
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'search_autocomplete');
      //]]>
      </script>
    </div>
  </fieldset>
</form>      <div class="quick-access">
      Welcome to {BMG-website}!<br />

      <div class="shop-access">
          <div>
    <ul>
                <li  class="first"><a href="http://{BMG-website}/market-research-report/customer/account/" title="My Account"
>My Account</a></li>
                <li ><a href="http://{BMG-website}/market-research-report/checkout/cart/" title="My Cart" class="top-link-
cart">My Cart</a></li>
                <li ><a href="http://{BMG-website}/market-research-report/checkout/" title="Checkout" class="top-link-
checkout">Checkout</a></li>
                <li ><a href="http://{BMG-website}/market-research-report/contacts/" title="Contact Us" >Contact Us</a></li>

                <li  class="last"><a href="http://{BMG-website}/market-research-report/customer/account/login/" title="Log In"
```

```
 >Log In</a></li>
                </ul>
  </div>
        </div>
              </div>
   </div>
</div>
<div class="header-nav-container">
  <div class="header-nav">

     <h4 class="no-display">Category Navigation:</h4>
     <ul id="nav">
        <a href="http://{BMG-website}/market-research-report/biotechnology.html">Biotechnology</a>
  <a href="http://{BMG-website}/market-research-report/business-development.html">Business Development</a>
  <a href="http://{BMG-website}/market-research-report/chemicals.html">Chemicals</a>
  <a href="http://{BMG-website}/market-research-report/country.html">Country</a>

  <a href="http://{BMG-website}/market-research-report/diagnostics.html">Diagnostics</a>
  <a href="http://{BMG-website}/market-research-report/drug-delivery.html">Drug Delivery</a>
  <a href="http://{BMG-website}/market-research-report/drug-discovery.html">Drug Discovery</a>
  <a href="http://{BMG-website}/market-research-report/drugs.html">Drugs</a>
  <a href="http://{BMG-website}/market-research-report/finance-investment.html">Finance &amp;amp; Investment</a>

  <a href="http://{BMG-website}/market-research-report/generic-drugs.html">Generic Drugs</a>
  <a href="http://{BMG-website}/market-research-report/healthcare.html">Healthcare</a>
  <a href="http://{BMG-website}/market-research-report/it-ehealth.html">IT &amp;amp; eHealth</a>
  <a href="http://{BMG-website}/market-research-report/management.html">Management</a>
  <a href="http://{BMG-website}/market-research-report/marketing-sales.html">Marketing &amp;amp; Sales</a>

  <a href="http://{BMG-website}/market-research-report/medical-devices.html">Medical Devices</a>
  <a href="http://{BMG-website}/market-research-report/production.html">Production</a>
  <a href="http://{BMG-website}/market-research-report/publication-series.html">Publication Series</a>
  <a href="http://{BMG-website}/market-research-report/r-d.html">R&amp;amp;D</a>
  <a href="http://{BMG-website}/market-research-report/regulation-policy.html">Regulation &amp;amp; Policy</a>

  <a href="http://{BMG-website}/market-research-report/therapeutics.html">Therapeutics</a>
  <a href="http://{BMG-website}/market-research-report/veterinary.html">Veterinary</a>

     </ul>
  </div>
  </div>       </div>
     <!-- end header -->

     <!-- start middle -->

     <div class="middle-container">
        <div class="middle col-2-right-layout">
<h4 class="no-display">You're currently on:</h4>
<ul class="breadcrumbs">
```

```
        <li class="home">
            <a href="http://{BMG-website}/market-research-report/" title="Go to Home Page">Home</a>
          </li>
          <li> / </li>

            <li class="category3">
            <a href="http://{BMG-website}/market-research-report/biotechnology.html" title="">Biotechnology</a>
          </li>
          <li> / </li>
            <li class="product">
            <strong>Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd edition</strong>
          </li>

        </ul>
        <!-- start center -->
          <div id="main" class="col-main">
          <!-- start global messages -->
                        <!-- end global messages -->

          <!-- start content -->

<script type="text/javascript">
  var optionsPrice = new
 Product.OptionsPrice({"productId":"5891","priceFormat":{"pattern":"$%s","precision":2,"requiredPrecision":2,"decimalSymbol
 ":".","groupSymbol":",","groupLength":3,"integerRequired":1},"includeTax":"false","showIncludeTax":false,"showBothPrices":
 false,"productPrice":2495,"productOldPrice":2495,"skipCalculate":1,"defaultTax":0,"currentTax":0,"idSuffix":"__none__","oldP
 lusDisposition":0,"plusDisposition":0,"oldMinusDisposition":0,"minusDisposition":0});
</script>
<div id="messages_product_view"></div>

<div class="product-info-box">
  <div class="product-essential">
  <form action="http://{BMG-website}/market-research-
 report/checkout/cart/add/uenc/aHR0cDovL3d3dy5iaW9tYXJrZXRncm91cC5jb20vbWFya2V0LXJlc2VhcmNoLXJlcG9ydC9ka
 XN0cmlidXRpb24tYWdyZWVtZW50cy1pbi1waGFybWEtYmlvdGVjaC1hbmQtZGlhZ25vc3RpY3MtMm5kLWVkaXRpb24ua
 HRtbD9fX19TSUQ9VQ,,/product/5891/" method="post" id="product_addtocart_form">
    <div class="product-shop">
      <h1 class="product-name">
        Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd edition          </h1>
            <div class="collateral-box">
        <div class="head">
          <h4>Additional Information</h4>

        </div>
        <div class="collateral-box attribute-specs">
  <table cellspacing="0" class="data-table" id="product-attribute-specs-table">
    <tr>
    <td class="label">Published Date</td>
    <td class="data">Mar 10, 2010</td>
```

```
  </tr>
     <tr>

     <td class="label">Publisher</td>
     <td class="data">CurrentPartnering</td>
  </tr>
     <tr>
     <td class="label">Pages</td>
     <td class="data">261</td>
  </tr>

     <tr>
     <td class="label">PDF Fact Sheet</td>
     <td class="data"><a target=_blank href=http://{BMG-website}/market-research-report/factsheet-pdf/distribution-agreements-
  in-pharma-biotech-and-diagnostics-2nd-edition.pdf>View Fact Sheet for the report Distribution Agreements in Pharma, Biotech
  and Diagnostics, 2nd edition in PDF format.</a></td>
  </tr>
     <tr>
     <td class="label">Format</td>
     <td class="data">PDF</td>

  </tr>
     </table>
  <script type="text/javascript">decorateTable('product-attribute-specs-table')</script>
</div>
        </div>


        <fieldset class="no-display">
          <input type="hidden" name="product" value="5891" />
          <input type="hidden" name="related_product" id="related-products-field" value="" />
        </fieldset>







  <div class="price-box">
                                        <span class="regular-price" id="product-price-5891">
              <span class="price">$2,495.00</span>              </span>

     </div>



           <div class="add-to-holder">
```

```
 <fieldset class="add-to-cart-box">

    <legend>Add Items to Cart</legend>
        <span class="qty-box"><label for="qty">Qty:</label>
    <input name="qty" type="text" class="input-text qty" id="qty" maxlength="12" value=""/></span>
        <button class="form-button" onclick="productAddToCartForm.submit()"><span>Add to Cart</span></button>
    <!--<a href="#" onclick="productAddToCartForm.submit(); return false;"><img src="http://{BMG-
website}/skin/frontend/default/default/images/btn_add_to_cart.gif" alt="Add to Cart" class="v-middle" style="margin:0 0 0
5px;" /></a>-->
 </fieldset>
                <span class="add-or"><a class="specialeffects" href="http://{BMG-website}/faxorderform.pdf" rel="nofollow"
style="color: red; text-decoration: underline" ><strong> or order via fax order form.</font></strong></a></span>



        </div>
            <div class="divider"></div>

                <h4>Quick Overview</h4>
        <div class="short-description"><em>The Distribution Agreements in Pharma, Biotech and Diagnostics report provides
comprehensive understanding and unprecedented access to the distribution partnering agreements entered into by the worlds
leading biopharma companies.</em></div>
                    <a class="specialeffects" href="http://{BMG-website}/market-research-
report/productquestion/index/index/product/5891/" rel="nofollow"><font color="#FF0000" style="color: red; text-decoration:
underline"><strong>Request free sample pages from Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd
edition</font></strong></a>



    </div>
    <div class="clear"></div>

      </form>
 <script type="text/javascript">
      var productAddToCartForm = new VarienForm('product_addtocart_form');
      productAddToCartForm.submit = function(){
          if (this.validator.validate()) {
              this.form.submit();
          }
      }.bind(productAddToCartForm);
 </script>
 </div>
 <ul class="tabs">
              <li id="product_tabs_description" class="active first"><a href="#" rel="nofollow" style="text-
decoration:none">Product Description</a></li>
                  <li id="product_tabs_toc_html" ><a href="#" rel="nofollow" style="text-decoration:none">Table of
Contents</a></li>
                          <li id="product_tabs_company_html" ><a href="#" rel="nofollow" style="text-
decoration:none">Featured Companies</a></li>
```

```
        </ul>
<div class="padder">
                <div id="product_tabs_description_contents"><div class="product-specs"> <div class="product-collateral"><div
 class="collateral-box"><div class="head">
            <h4>Product Description</h4>
          </div></div>
```


<p>The Distribution Agreements in Pharma, Biotech and Diagnostics report provides comprehensive understanding and unprecedented access to the distribution partnering agreements entered into by the worlds leading biopharma companies.

The report provides a detailed understand and analysis of how and why companies enter distribution deals.

The majority of deals are multicomponent whereby the licensor offers a right to distribute the resultant product of the research collaboration. There are also numerous pure distribution deals whereby the products originator takes on a distribution partner in order to maximize a products presence in the marketplace.

Understanding the flexibility of a prospective partner’s negotiated deals terms provides critical insight into the negotiation process in terms of what you can expect to achieve during the negotiation of terms. Whilst many smaller companies will be seeking details of the payments clauses, the devil is in the detail in terms of how payments are triggered - contract documents provide this insight where press releases and databases do not.

This report contains over 500 links to online copies of actual distribution contract documents as submitted to the Securities Exchange Commission by biopharma companies and their partners.

Contract documents provide the answers to numerous questions about a prospective partner’s flexibility on a wide range of important issues, many of which will have a significant impact on each party’s ability to derive value from the deal.

The initial chapters of this report provide an orientation of distribution dealmaking and business activities. Chapter 1 provides an introduction to the report, whilst chapter 2 provides an analysis of the trends in distribution as well as a discussion on the merits of the type of deal.

Chapter 3 provides an overview of the structure of distribution deals. The chapter includes numerous case studies to enable understanding of both pure distribution deals and multicomponent deals where distribution forms a part.

Chapter 4 provides a review of the leading distribution deals since 2000. Deals are listed by headline value, signed by bigpharma, most active bigpharma, and most active of all biopharma companies. Where the deal has an agreement contract published at the SEC a link provides online access to the contract.

Chapter 5 provides a comprehensive listing of the top 50 bigpharma companies with a brief summary followed by a comprehensive listing of distribution contract documents available in the public domain. Each deal title links via Weblink to an online version of the actual contract document, providing easy access to each contract document on demand.

Chapter 6 provides a comprehensive listing of all distribution agreement contracts available in the public domain. Each chapter is organized by A-Z, stage of development at signing, and therapeutic area. Each deal title links via Weblink to an online version of the actual contract document, providing easy access to each contract document on demand.

The report also includes numerous table and figures that illustrate the trends and activities in distribution dealmaking since 2000.

In conclusion, this report provides everything a prospective dealmaker needs to know about distribution as an opportunity to participate in the commercialization of either candidate compounds in development or products already on the market.

Key benefits

Distribution Agreements in Pharma, Biotech and Diagnostics provides the reader with the following key benefits:

?In-depth understanding of distribution deal trends since 2000
?Analysis of the structure of distribution agreements with numerous real life case studies
?Comprehensive access to over 500 actual distribution contracts entered into by the world’s biopharma companies
?Detailed access to actual distribution contracts enter into by the leading fifty bigpharma companies
?Insight into the terms included in a distribution agreement, together with real world clause examples
?Understand the key deal terms companies have agreed in previous deals
?Undertake due diligence to assess suitability of your proposed deal terms for partner companies
Report scope

Distribution Agreements in Pharma, Biotech and Diagnostics is intended to provide the reader with an in-depth understanding of the distribution trends and structure of deals entered into by leading biopharma companies worldwide.

Distribution Agreements in Biopharma includes:

?Trends in distribution dealmaking in the biopharma industry since 2000
?Analysis of distribution deal structure
?Case studies of real-life distribution deals
?Access to over 500 distribution contract documents
?The leading distribution deals by value since 2000
?Most active distribution dealmakers since 2000
?The leading distribution partnering resources
In Distribution Agreements in Biopharma, the available contracts are listed by:

?Company A-

Z
?Headline value
?Stage of development at signing
?Therapeutic area
Each deal title links via Weblink to an online version of the actual contract document, providing easy access to each contract document on demand.

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Dainnipon Sumitomo
Eisai
Eli Lilly
Forest Laboratories
Genentech
Genzyme
Gilead Sciences
GlaxoSmithKline
Hospira
Johnson & Johnson
Lundbeck
Menarini
Merck & Co
Merck Serono
Mitsubishi-Tanabe
Mylan
Novartis
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Nycomed Pharma
Otsuka
Pfizer
Procter & Gamble
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```
</div>
                                <div id="product_tabs_company_html_contents"><div class="product-specs"> <div class="product-
 collateral"><div class="collateral-box"><div class="head">
                <h4>Featured Companies</h4>
              </div></div>
<em>Abbott</em><br><em>Actavis</em><br><em>Alcon
 Labs</em><br><em>Allergan</em><br><em>Amgen</em><br><em>Astellas</em><br><em>AstraZeneca</em><br><em>
 Baxter</em><br><em>Bayer</em><br><em>Biogen Idec</em><br><em>Boehringer Ingelheim</em><br><em>Bristol-
 Myers Squibb</em><br><em>Cephalon</em><br><em>Chugai</em><br><em>CSL</em><br><em>Daiichi
 Sankyo</em><br><em>Dainnipon Sumitomo</em><br><em>Eisai</em><br><em>Eli Lilly</em><br><em>Forest
 Laboratories</em><br><em>Genentech</em><br><em>Genzyme</em><br><em>Gilead
 Sciences</em><br><em>GlaxoSmithKline</em><br><em>Hospira</em><br><em>Johnson &
 Johnson</em><br><em>Lundbeck</em><br><em>Menarini</em><br><em>Merck & Co</em><br><em>Merck
 Serono</em><br><em>Mitsubishi-Tanabe</em><br><em>Mylan</em><br><em>Novartis</em><br><em>Novo
 Nordisk</em><br><em>Nycomed Pharma</em><br><em>Otsuka</em><br><em>Pfizer</em><br><em>Procter &
 Gamble</em><br><em>Ratiopharm</em><br><em>Roche</em><br><em>Sanofi-Aventis</em><br><em>Schering
 Plough</em><br><em>Servier</em><br><em>Shire</em><br><em>Solvay</em><br><em>Takeda</em><br><em>Teva</e
 m><br><em>UCB</em><br><em>Watson</em><br><em>Wyeth</em></div></div>

</div>
        </div>
<script type="text/javascript">
Varien.Tabs = Class.create();
Varien.Tabs.prototype = {
 initialize: function(selector) {
  var self=this;
  $$(selector+' a').each(this.initTab.bind(this));
 },

 initTab: function(el) {
    el.href = 'javascript:void(0)';
    if ($(el.parentNode).hasClassName('active')) {
      this.showContent(el);
    }
    el.observe('click', this.showContent.bind(this, el));
 },

 showContent: function(a) {
  var li = $(a.parentNode), ul = $(li.parentNode);
  ul.getElementsBySelector('li', 'ol').each(function(el){
    var contents = $(el.id+'_contents');
    if (el==li) {
      el.addClassName('active');
      contents.show();
    } else {
      el.removeClassName('active');
      contents.hide();
    }
  });
```

```
 }
}
new Varien.Tabs('.tabs');
</script><div class="product-collateral">
                                                    <a class="specialeffects" href="http://{BMG-website}/market-research-
 report/productquestion/index/index/product/5891/" rel="nofollow"><font color="#FF0000" style="color: red; text-decoration:
 underline"><strong>Request free sample pages from Distribution Agreements in Pharma, Biotech and Diagnostics, 2nd
 edition</font></strong></a>
                                                                </div>
</div> 
            <!-- end content -->
            </div>
        <!-- end center -->

        <!-- start right -->
        <div class="col-right side-col">
            <div class="box base-mini mini-cart">
  <div class="head">
            <h4>My Cart</h4>
        </div>


        <div class="content"><p>You have no items in your shopping cart.</p></div>

  </div>
<!-- [ends] .cart-sidebar // --><div class="box base-mini mini-compare-products">
  <div class="head">
        <h4>Compare Products</h4>
      </div>
        <div class="content"><p>You have no items to compare.</p></div>
  </div><div class="box base-mini mini-product-view">
  <div class="head">

      <h4><span>Recently Viewed Products</span></h4>
  </div>
  <ol id="recently-viewed-items">
        <li><a href="http://{BMG-website}/market-research-report/patient-monitoring-markets.html">Patient Monitoring
 Markets</a></li>
      </ol>
  <script type="text/javascript">decorateList('recently-viewed-items')</script>
</div>

<div class="box">
 <!--<img src="http://{BMG-website}/skin/frontend/default/default/images/media/col_right_callout.jpg" width="195" alt="Keep
 your eyes open for our special Back to School items and save A LOT!" style="display:block;" /> -->
</div><div class="box base-mini mini-newsletter">
  <div class="head">
    <h4>Newsletter<a name="newsletter-box"></a></h4>
  </div>
```

```
  <form action="http://{BMG-website}/market-research-report/newsletter/subscriber/new/" method="post" id="newsletter-
 validate-detail">
  <fieldset class="content">
        <legend>Newsletter</legend>

        <!--
                        -->
        <label for="newsletter"><A HREF="http:// {BSG-website}/bw/BWSubscribe.aspx?bwl=89f0345185214eef.-1.4133"
 TARGET="_blank" rel="nofollow">Click here to sign up to the {BMG-website} industry newsletter</A></label>

  </fieldset>
</form>
<script type="text/javascript">
//<![CDATA[
  var newsletterSubscriberFormDetail = new VarienForm('newsletter-validate-detail');
//]]>
</script>
</div> 
        </div>
        <!-- end right -->

      </div>

        </div>
      <!-- end middle -->

      <!-- start footer -->
      <div class="footer-container">
        <div class="footer">
          <div class="informational">
  <ul>
<li><a href="http://{BMG-website}/market-research-report/{BMG-website}-group-privacy-policy/">Privacy Policy</a></li>

<li class="last"><a href="http://{BMG-website}/market-research-report/{BMG-website}-group-full-terms-and-conditions/">Full
 Terms and Conditions</a></li>
</ul>
<!-- BEGIN WebSTAT Activation Code -->
<script type="text/javascript" language="JavaScript" src="http://hits.nextstat.com/cgi-bin/wsv2.cgi?27181"></script>
<noscript>
<a href="http://www.webstat.com">
<img src="http://hits.nextstat.com/scripts/wsb.php?ac=27181" border="0" alt="Web Analytics and Web Statistics by NextSTAT"
 /></a>
</noscript>
<!-- END WebSTAT Activation Code -->
<script src="http://{BMG-website}/scripts/gatag.js" type="text/javascript"></script>    <div>
      <ul>
                  <li  class="first"><a href="http://{BMG-website}/market-research-report/catalog/seo_sitemap/product/"
 title="Site Map" >Site Map</a></li>
```

```
                    <li ><a href="http://{BMG-website}/market-research-report/catalogsearch/term/popular/" title="Search Terms"
 >Search Terms</a></li>
                    <li ><a href="http://{BMG-website}/market-research-report/catalogsearch/advanced/" title="Advanced Search"
 >Advanced Search</a></li>
                    <li  class="last"><a href="http://{BMG-website}/market-research-report/contacts/" title="Contact Us" >Contact
 Us</a></li>
                </ul>
  </div>
</div>
<p class="legality">

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<br/>
<a href="http://{BSG-website}">BSG</a> and <a href="http://{BMG-website}">{BMG-website}</a> are both trademarks of
 BSG</center></p>            </div>
      </div>
      <!-- end footer -->
 <!-- BEGIN GOOGLE ANALYTICS CODE -->
<script type="text/javascript">
//<![CDATA[
var gaJsHost = (("https:" == document.location.protocol) ? "https://ssl." : "http://www.");
document.write(unescape("%3Cscript src='" + gaJsHost + "google-analytics.com/ga.js'
  type='text/javascript'%3E%3C/script%3E"));
//]]>

</script>
<script type="text/javascript">
//<![CDATA[
var pageTracker = _gat._getTracker("UA-5896689-2");
pageTracker._trackPageview("/market-research-report/distribution-agreements-in-pharma-biotech-and-diagnostics-2nd-
  edition.html");
//]]>
</script>
<!-- END GOOGLE ANALYTICS CODE -->
      </div>
</body>
</html>
```

9.3 Google Webmaster Tools Status Presentation – May 2010

Crawler stats showing a greater interest in crawling pages after major improvements phase in April 2010, and the average page size reduction improving download time for individual pages by Google.

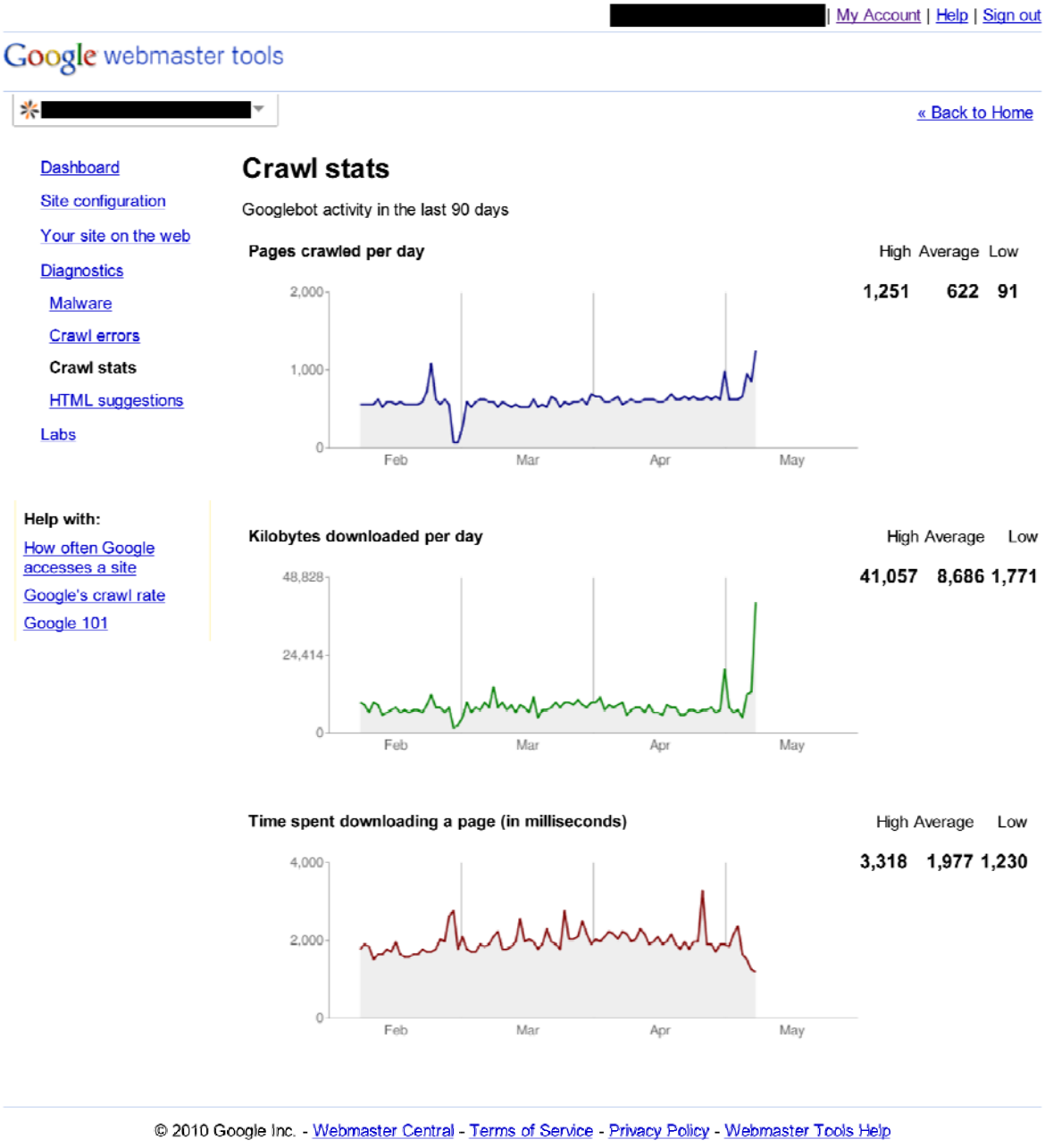

Figure 5 BMG Crawler stats from GWT