



End-of-term Report

“The online implementation
of a Multi-Level Marketing
business model.”

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1.0 Introduction

The problem statement can be summarised as follows:

“What is the best method to implement a Multi-Level Marketing company business model online?”

Through investigating this question, online marketing techniques will be analysed, along with the structure of existing Multi-Level Marketing organisations and current online opportunities.

The nature of MLM is such that every business is unique, and is built on a uniquely derived system for promoting and distributing products. It would not be possible to define and investigate every business model within MLM, but they can be summarised into categories.

The technologies that could play a part in implementing the web site will be investigated, and a basic prototype explained to show the implementation to date.

1.0.1 MLM versus Pyramid Schemes

It should be noted that when investigating MLM companies, a distinction be made between a legitimate MLM company and a “Pyramid Scheme”.

“In recent decades, pyramid schemes have become an insidious, pervasive and corrupting influence in the marketplace and community, causing financial and social harm on a global scale.” - Pyramid Scheme Alert,
<http://www.pyramidschemealert.org>

An important difference between a legitimate MLM company and a Pyramid scheme is the emphasis on product sales. MLM companies would encourage sales of a line of products, and the recruitment alongside. On the other hand, pyramid schemes focus more on the recruitment, and often have no product for sale.

A second identifier of pyramid schemes is the increasing of the price depending on how far ‘downline’ the dealer is located. At some point the product out-prices itself, and can no longer be sold. In such an organisation, only the few at the top may benefit, and such systems are designed to exploit people.

Legitimate MLM companies are bound by laws and stringent controls to ensure that they represent a genuine business opportunity.

1.1 The Internet and its effect on business

1.1.1 World Wide Web

The development of the Internet can be divided into three generations (*Molenaar, C, 2002*).

Until the early 1990s, the Internet represented a data infrastructure. It was used by government authorities, such as defence, and by universities to share information. At this point, the internet was essentially a closed network of universities, and in its first generation.

Generation two arrived with the development of a backbone, to which servers and computers were linked. Along with this, the browser provided a user-friendly way to surf, and the Internet became more commonly accepted.

The third generation facilitates more applications, and alternate methods of using the internet. Access is not limited to computers, but can be achieved through other means, such as WAP.

1.1.2 How the Internet is Used

Figure 1.1 represents the structure of the Internet and its uses:

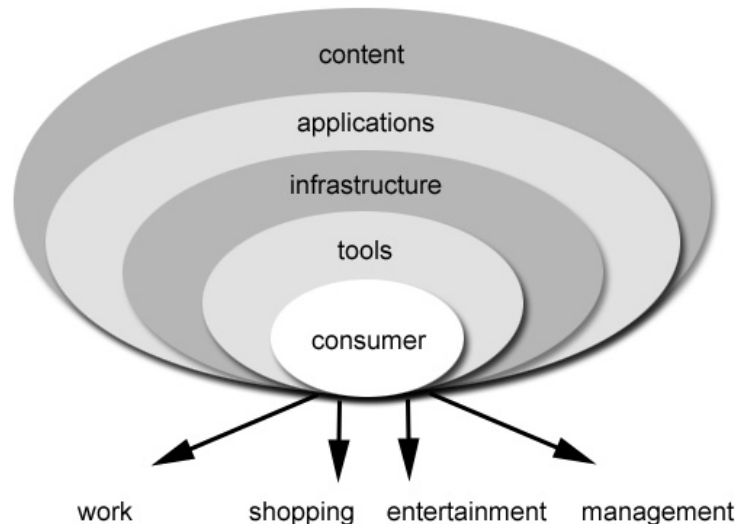


Figure 1.1: The structure of the Internet

Source: Molenaar, C, 2002, *The Future of Marketing*, Prentice Hall, p.18

The *infrastructure* represents the telephone and cable networks that enable the internet to function. As the infrastructure improves worldwide, more people will gain access to it.

Applications are constructed on the basis of the possibilities provided by the infrastructure, such as web sites, shops, portals and communities that are accessed via the Internet.

Above applications is the *content*. The content is the overriding reason for a visitor to a web site or online application. It also determines the length of time a visitor may stay.

In order to access information and sites, users can use a range of *tools*. These can include WebTV, WAP-enabled telephones, and computers. Internet access is expanding into new technology, and may be used in items as diverse ways as washing machines and refrigerators.

Consumers, at the centre of the structure, determine the acceptance and use of the Internet. The consumers' use of the Internet can be divided into four categories: *working*, *shopping*, *entertainment* and *managing*.

1.1.2.1 Working

The Internet has led to many changes in working methods. Ease of communication has led to less face to face contact, and the opportunities to work from home allow people more flexibility in working.

1.1.2.2 Shopping

The need to go out to shops has diminished along with the necessity to travel to the workplace. Items can be ordered via the Internet and delivered to the user's home. The information-delivering capabilities of the Internet allow for convenient comparison of competing offers, and consumer information promotes informed choice.

A disadvantage of online shopping is the loss of the tactile characteristics. It is not possible to touch or see the objects before purchase. Such items as clothes would therefore not make the transition well.

1.1.2.3 Entertainment

Online communication can be extended to chatting, forums and community sites. Newsgroups are also a popular option.

As the Internet becomes more popular, and broadband access increases, the entertainment capabilities will be expanded.

1.1.2.4 Managing

The ability to manage finances and investments online is a relatively new development. Web sites such as Quicken.com, Smartmoney.com or Fool.com have been developed to offer professional advice and guidance.

Future applications may allow the Internet to play a larger part in people's daily lives.

1.2 The Internet as a Marketing Tool

“...with the power of network marketing combined with the power of the internet ... we will purchase nearly everything from network marketing companies. All things will be available in virtual malls ... to view and purchase” - Rod Nichols

1.2.1 Customers

The growth of the Internet brings with it new opportunities for contacting, providing support and selling products. As the customers can find information about products and companies before buying or signing up, they can afford to be choosier, and better informed in their choices. For example, it may be easier to find, and cheaper to order a book from a site such as Amazon.com than from the local bookstore.

The consequences can be summarised as follows:

- An independent customer who makes careful choices;
- A customer who can choose from a multitude of suppliers;
- A customer who will no longer be bound to one particular supplier – as a result customer loyalty will diminish in favour of the possibility of making selective and careful choices.

With a larger range of choice, customers are in a better position to shop from different suppliers. It is often beneficial for web sites to collaborate into groups of related products, or take part in affiliate marketing.

1.2.2 Suppliers

The Internet can be used to monitor and inform the company of stock levels and sales trends, and even inform suppliers automatically when stock levels are low. While these systems have been in place for some time, the Internet has made the integration of such systems easier.

In order to encourage customer to shop online, the order fulfilment process must be as streamlined and efficient as possible. This requirement has led to the development of specialist companies, their sole purpose being to process and deliver products.

The nature of the Internet allows companies to collaborate in their purchasing, resulting in a stronger bargaining force able to negotiate better prices.

The global nature of the Internet allows more options for sourcing products from overseas providers. The price reductions can then be passed on to the customer, offering greater incentive to shop online.

1.3 Multi-Level Marketing (MLM)

There are many resources dedicated to Multi-Level Marketing, including web sites, books, mailing lists, journals, magazines and even cable television channels (such as “The Success Channel”, USA).

1.3.1 What is Multi-Level Marketing?

“It is a strategy for selling products whereby independent salesmen are permitted to recruit other salesmen and to draw commissions from the sales of their recruits.” – Wave 4, Network Marketing in the 21st Century, 1999.

To the manufacturer or company, MLM represents a means to distribute products without the need for a salaried sales force. To the individuals within the business, it is an opportunity to build a sales organisation which will eventually lead to financial independence.

1.3.2 The Origins of MLM

Multi-Level Marketing is believed to have been successfully employed for the first time by Carl Rehnborg. In the 1920s, Rehnborg developed his own unique range of food supplements. In 1934, he started a company to distribute the supplements, called the California Vitamin Company, and later renamed Nutrilite Products Inc.

Nutrilite operated until 1945 as a direct sales company, before introducing a new payment system. Under the new system, distributors could introduce new distributors to the company, and earn 3% commission on their sales. This commission continued indefinitely, and allowed distributors to build their own sales force.

The strength of the system lay in the fact that each distributor would earn commissions not only from their own recruits, but from distributors recruited by their recruits, and so on. When a recruit introduces new recruits to the company, it forms what is described as a *downline*. The recruiter is referred to as the *sponsor*.

As distributors introduce new distributors, and they introduce more distributors, the company can grow at a geometric rate. The number of recruits can quickly become very large, resulting in *leverage*, which can be used to develop a residual or ongoing income.

1.3.3 Duplication and Leverage

For a MLM business to succeed, it should be built using a system that can be duplicated. In essence, each distributor is a microcosm of the entire organisation, in charge of running their network of distributors. To maximise the chances of success, each distributor is taught by a mentor (usually their sponsor) to duplicate the system in order to build their own network. The application of this duplication results in an effect known as leverage. A large number of people, only selling products or services at a modest level, can result in a strong sales force and can result in a strong earning potential.

Leverage represents an opportunity for people to earn more than can be earned while working for a linear income. The majority of people earn either a salary, commission, or are paid on an hourly basis. These incomes are limited by either the number of hours in the week or number of potential customers a salesperson may speak to in a day.

When the principle of leverage is applied, it is possible to earn many times the amount that can be earned with linear income, by using the income generating potential of a network.

1.3.4 Compensation Plans

Compensation plans are the payment structures used within MLM businesses. While all are based on the concept described above, there are many implementations of payment

structures. Each results in a different kind of organisation, and can require very different techniques in order to succeed.

The variety of compensation plans results in some that suit certain kinds of people. However, all are based on six main governing variables.

1. Depth

When recruiting new distributors, they are 'placed' into a structure. This can be wide or deep, and in some companies the width or depth can be limited. The width is the number of people that are placed directly under the recruiter, known as the 'frontline', and depth is the number of levels down from which a distributor can earn commission.

2. Qualifications

Most organisations require that in order to receive a commission, each distributor must remain 'active'. This usually involves purchasing a minimum amount of stock from the company each month.

These quotas can affect the style of the organisation. For example, if the quotas are placed high, there can be pressure to buy a lot of product, possibly more than can be sold. However if the quota is set too low, there can be little incentive to sell product, resulting in a lazier organisation.

3. Front / Back End

Some organisations offer greater commissions on certain levels, referred to as 'front end' and 'back end'. The front end is the initial recruits, positioned directly beneath the sponsor.

With higher commissions on the front end, money can be earned faster and more easily. Whereas with commissions placed on the lower levels, it would require more work and a longer time to build a profitable organisation.

Most well established plans place greater emphasis on the lower levels, in order to encourage longer-term development of networks. The geometric growth of the network also plays a part when considering commissions on the lower levels, as they would contain many more people than the higher levels.

4. Payout

Payout is described as the percentage of the total product price that is paid to distributors in the form of commissions.

While a high payout can be attractive to distributors, it can result in expensive products that are difficult to sell or provide little income for the company. It is generally accepted that a lower payout on a product that sells in greater numbers is better than a high payout on a slow-selling product. As explained by Leonard Clements in *Inside Network Marketing*, "Seventy-five percent of zero is still zero".

5. Breakage

Breakage is the use of an arbitrary measure to represent the level of sales achieved by a distributor. For example, a distributor may sell £1,600 of stock in a month, but the company may only pay commission based on £1,000 units. In this way the company would describe the sales as £1,000 of *bonus volume* and calculate commissions based on £1,000.

Companies choose to use a method such as this in order to offer more attractive rates of *payout*.

6. Type of Plan

There are four main types of compensation plans, which are known as the *Stairstep / Breakaway*, the *Matrix*, the *Unilevel* and the *Binary*.

The Stairstep / Breakaway Plan

This plan is structures like a staircase, in that as the number of distributors in the downline grows, and the amount of product sold increases, the sponsor climbs in status and gains a higher rate of commission. They may also be entitled to commissions on a greater number of levels.

The distributors that have been introduced are also climbing the staircase, and when they achieve a certain status, they 'break away' along with their downline. When this happens, the sales of this group no longer count toward the quota of the original sponsor, and the level of commission from this group is often reduced.

Even if the 'breakaway' group draws a lower rate of commission, it is possible to earn more on this group, as the total earnings of the group are considered, rather than simply the number of levels under which the sponsor would usually earn a commission.

This plan allows 'deeper' structures than any other, and the greatest earning potential.

The majority of companies that have survived in MLM have used this method. While being one of the more complex methods, the high corporate profits it generates offer a financial stability not present in some plans.

This plan tends to also be weighted toward the back end, and would reward more in the longer term. There is a tendency in more modern variations of this plan to lighten the monthly quotas and offer higher front end commissions, in order to allow for more short term earnings.

The Matrix Plan

Whereas in the previous plan the number of people in a sponsor's frontline was unlimited, the Matrix plan sets fixed limits on the structure of the downline.

For example, in a 2 x 12 plan, the first two people to be introduced would be placed in the sponsor's frontline. The third person would spill over to the next level, beneath the first person. The commission structure would take into account sales based on the first twelve levels beneath the sponsor.

The advantages of such a plan are that it is simple to understand and explain. It is also easier to manage a small number of frontline distributors than the larger numbers in other plans.

On the other hand, the fixed structure can result in limits on the number of distributors in an organisation, which can stifle growth. The automatic spill over can result in laziness, as distributors' downline is built up by their sponsor.

The Unilevel Plan

This plan is similar in a number of ways to the Stairstep / Breakaway plan, though it does not involve breakaway groups.

The Unilevel plan sets a limit on the number of levels from which commission is calculated, but no limit on the width. The sponsor can earn higher commissions and earn on deeper levels by meeting specific monthly quotas.

It is an easy plan to explain and operate, and allows an unlimited number of frontline recruits. In some cases, higher commissions are offered on level three, encouraging sponsors to place distributors in the frontline of other distributors.

While having no limit to the number of recruits in the frontline can result in a strong sales force, it also places extra pressure on the sponsor to teach a larger number of distributors.

The Binary Plan

A Binary plan is made up of two *legs*. The sponsor begins with a frontline of two distributors, and further recruits spill over beneath them, similar to a Matrix plan.

The organisation then grows within the two legs, and commissions are paid on the weaker of the two. The stronger leg generally would not generate commissions.

Though the commissions are only paid on one half of the organisation, they are calculated on the *entire* leg, no matter how many levels it involves. In this way it can generate a large income.

However, as the stronger leg is generally not considered for commissions, an unbalanced organisation would result in a large amount of income for the company, but little for the distributor.

1.4 Online Opportunities

A search in Google returns many thousands of MLM websites. A few have been selected which represent different methods and approaches to the online marketing business.

Buy MLM Tools (<http://www.buymlmtools.com>)

This is a MLM-themed online shop, specialising in books and audio tapes about Network Marketing. It has an affiliate scheme that pays a percentage to the referrer. An interesting addition is the use of cookies to store the referrer information, so that if a customer returns and purchases again, the original referrer continues to benefit.

eVisionLink (<http://www.evisionlink.com>)

eVision was established by the New Vision International Company. The product was the 'webCenter', a customisable web site that allowed people with little technical skills get online.

The webCenter was set up as a tool to sell webCenters, offering a commission to the owner of the webCenter for any sales.

Due to technical difficulties, eVisionLink no longer functions, and its member sites are expired as of April, 2003.

Euphony (<http://www.euphony.com>)

A telecommunications company, Euphony began marketing their services via a MLM system in 1998.

Their system is based on the Unilevel plan, paying out over seven levels. The commissions are paid on the phone use of customers introduced by the distributor, based on the number of 'points' created during a calendar month.

When qualified to "Gold" level, distributors qualify for double the commission levels.

Gold Glory (<http://www.gold-glory.net>)

Gold Glory sells subscriptions to its monthly newsletter. At \$15 to join, each direct sale results in \$5.00 commission.

The compensation plan is then based on a 3 x 8 Matrix plan. In this, the first three distributors are placed directly beneath the sponsor, and further recruits would spill over to the lower levels. This plan allows a maximum of 6,561 recruits in any distributor's downline.

Vitastar International (<http://www.vitastarintl.com>)

Vitastar sell a range of vitamin and health products.

The compensation plan is a Unilevel plan, weighted heavily toward the second level. The aim of this plan is to encourage sponsors to work with their immediate downline to ensure that they recruit people.

Happeneurs (<http://www.happeneurs.com>)

This is an online marketing site, which specialises in web promotion techniques

This site uses an affiliate program along with an MLM plan. Their program includes promotional flash movies and marketing guides to help sell the compensation plan to new recruits.

2.0 Project Aims

The overall aim of this project is to make a customisable web site capable of representing the working of a multi-level marketing business model. As network marketing businesses are built around the concept of each member building up their own organisation, the site should be used a tool to facilitate and encourage this duplication.

To do so, the web site will incorporate the following functionality:

- The web site will be well designed and easily navigated, and offer a product to be purchased online.
- As well as selling a product, the site will promote itself as a money-making opportunity.
- Customers will be able to join and become distributors.
- The site will allocate each distributor a unique web address, and the site will present customised content unique to the distributor, to give a sense of ownership.
- An administration section will allow distributors to log in and see who their site has recruited, monitor the sales levels and check the number of visitors have viewed their site.
- A site administration section will allow the overall site owner to update the product details, add new products, remove products, and perform administrative tasks on the directory of members.
- Functions will calculate the total amount of product sold by each distributor's site, and calculate commissions based on their downline, in accordance with the payment plan. This information would then be used to calculate monthly commission amounts for each distributor, and to monitor the success of the site.

A static HTML web site would not be flexible enough to meet these requirements, and so it will be necessary to investigate alternate options.

2.1 Databases and Web Technologies

To build a dynamic, customisable web site, it will be necessary to store each distributor's information on the server and bring it into the site as required. By storing the personalised information for each distributor, it will be possible to create a template site from which any number of customised versions can be created.

Data could be stored, such as the number of visitors or amount of product sold, and used for further analysis.

There are two methods for storing this information, either in a *flat file* or a *database*.

2.1.1 Flat Files

A flat file is essentially a text file in which the information is stored on a line by line basis.

While flat files are easy to set up and use, there are some disadvantages to using them, as described by Welling, L and Thomson, L, 2001:

- When a file gets large, it can be very slow to work with.
- Searching for a particular record or group of records in a flat file is difficult.
- Dealing with concurrent access can become problematic. With enough traffic on the site, a large group of users may be waiting for the file to be unlocked before they can place their order. If the wait is too long, people will go elsewhere to buy.
- Inserting records into or deleting records from the middle of the file (random access) can be difficult—the whole file must be read into memory, before the changes are made, and the file written out again. With a large data file, this becomes a significant overhead.
- Beyond the limits offered by file permissions, there is no easy way of enforcing different levels of access to data.

2.1.2 Relational Database Management Systems (RDBMS)

The DBMS (Database Management System) is the software that interacts with the application programs and the database. Relational databases are a very popular type of database, and are based on relational algebra. While there are other types of database available, including Object-Oriented, Network and Hierarchical Databases, Relational Databases are the most commonly used and well suited to this project.

RDBMSs hold some advantages over flat file systems, including:

- RDBMSs can provide faster access to data than flat files.
- RDBMSs can be easily queried to extract sets of data that fit certain criteria.
- RDBMSs have built-in mechanisms for dealing with concurrent access.
- RDBMSs provide random access to the data.
- RDBMSs have built-in privilege systems.

Relational databases are made up of relations, more commonly called tables. A table is similar to the data displayed in an electronic spreadsheet.

Each table has a name, a number of columns, each corresponding to a different piece of data, and rows that correspond to each set of data.

The columns each have their own data type, for example an integer or string, and are often referred to as fields or attributes. Each row consists of a set of individual values that correspond to columns. Each value must have the data type specified by its column.

2.1.2.1 Key Values

Tables usually contain a column used to identify each record individually. This is referred to as the *key* or *primary key*, and is usually a unique number. By creating a unique reference for each record, the reference can be used in other tables of the database.

For example, a database may contain a table of customers, each with a unique customer ID number. A second table could be used to store orders, each with a unique order ID. The customer ID would be stored in another column of the order table, to associate a customer with each order.

An advantage of this approach is that the customer information is not duplicated across the tables, but is stored only once, in the customer table. It would be redundant to store the data in both tables.

Key values from another table are referred to as *foreign keys*, and can be used to create efficient relational databases.

2.1.3 Database Software

While there are two main types of data storage, there are many solutions available, each with strengths and weaknesses.

2.1.3.1 MySQL

MySQL is an open source relational database management system that uses Structured Query Language (SQL), the most popular language for adding, accessing, and processing data in a database. Because it is open source, anyone can download MySQL and tailor it to their needs in accordance with the general public license. MySQL is noted mainly for its speed, reliability, and flexibility.

The MySQL relational database system was first released in January, 1998. It is fully multi-threaded using kernel threads, provides application program interfaces (APIs) for C, C++, Eiffel, Java, Perl, PHP, Python, and Tcl, allows for many column types, and offers full operator and function support in the SELECT and WHERE parts of queries.

MySQL currently runs on the Linux, Unix, and Windows platforms, and currently has more than 4 million installations powering websites, datawarehouses, business applications, logging systems and more (MySQL.com, 2003).

2.1.3.2 CORBA

Common Object Request Broker Architecture (CORBA) is an architecture and specification for creating, distributing, and managing distributed program objects in a network. It allows programs at different locations and developed by different vendors to communicate in a network through an "interface broker." CORBA was developed by a consortium of vendors through the Object Management Group (OMG), which currently includes over 500 member companies. Both International Organization for Standardization (ISO) and X/Open have sanctioned CORBA as the standard architecture for distributed objects (which are also known as components). CORBA 3 is the latest level.

The essential concept in CORBA is the Object Request Broker (ORB). ORB support in a network of clients and servers on different computers means that a client program (which may

itself be an object) can request services from a server program or object without having to understand where the server is in a distributed network or what the interface to the server program looks like.

While CORBA is powerful and feature rich, its complexity makes it an unsuitable choice for smaller scale enterprises.

2.1.3.3 Access Database

Microsoft Access was introduced in 1992 as a flexible and easy to use database package.

It retains the standard Microsoft "look and feel", and employs a range of "wizards" to make it an easy package to learn. By integrating with other Microsoft products, such as Microsoft FrontPage, it allows for the rapid development of database-based web pages. However, the proprietary and often excessive code it generates can result in difficulties for non-Microsoft browsers and result in inefficient page design.

2.1.3.4 Oracle

Oracle (in ancient Greece, someone in touch with the deities; from Latin, *oraculum* or divine announcement) says it is the world's leading supplier of software for information management but it is best known for its sophisticated relational database products (notably Oracle9i), which are used by many of the largest Web sites. Oracle's relational database was the world's first to support the Structured Query Language (SQL), now an industry standard.

Oracle targets high-end workstations and minicomputers as the server platforms on which to run its database systems. Along with Sun Microsystems, Oracle has long been a champion of network computers. It now boasts that it was the world's first software company to develop and deploy 100 percent Internet-enabled enterprise software across its entire product line: database, server, enterprise business applications, and application development and decision support tools. In fact, Oracle CEO Ellison has said, "If the Internet turns out not to be the future of computing, we're toast. But if it is, we're golden." (Informationweek.com, 2000)

Based in Redwood Shores, California, it has more than 43,000 employees worldwide and does business in over 150 countries.

2.1.4 Web Technologies

2.1.4.1 ASP (Active Server Pages) and .NET

An Active Server Page (ASP) is an HTML page that includes one or more scripts (small embedded programs) that are processed on a Microsoft Web server before the page is sent to the user. An ASP is somewhat similar to a server-side include or a common gateway interface (CGI) application in that all involve programs that run on the server, usually tailoring a page for the user. Typically, the script in the Web page at the server uses input received as the result of the user's request for the page to access data from a database and then builds or customizes the page on the fly before sending it to the requestor.

ASP is a feature of the Microsoft Internet Information Server (IIS), but, since the server-side script is just building a regular HTML page, it can be delivered to almost any browser. ASP files can be created in VBScript or JScript in an HTML file or by using ActiveX Data Objects (ADOs) program statements in the HTML file.

ASP.NET (originally called ASP+) is the next generation of Microsoft's Active Server Page (ASP), and supports code written in compiled languages such as Visual Basic, C++, C#, and Perl. It features server controls that can separate the code from the content, allowing WYSIWYG editing of pages. Although ASP.NET is not backwards compatible with ASP, it is able to run side by side with ASP applications. ASP.NET files can be recognized by their .aspx extension (Techtarget.com, 2003).

2.1.4.2 PHP (PHP: Hypertext Pre-processor)

In Web programming, PHP is a script language and interpreter that is freely available and used primarily on Linux Web servers. PHP, originally derived from *Personal Home Page Tools*, now stands for *PHP: Hypertext Pre-processor*, which the PHP FAQ describes as a "recursive acronym".

As with ASP, the PHP script is embedded within a Web page along with its HTML. Before the page is sent to a user that has requested it, the Web server calls PHP to interpret and perform the operations called for in the PHP script.

PHP is open source, easy to learn and contains a powerful command set. It can be used with most databases, and can carry out a range of tasks with comparatively few lines of code. It is a popular option, currently being used on over 12 million domains worldwide (PHP.net, 2003).

2.1.4.3 JavaBeans

JavaBeans is an object-oriented programming interface from Sun Microsystems that lets you build re-useable applications or program building blocks called components. The components can be deployed in a network on any major operating system platform. Like Java applets, JavaBeans components (or "Beans") can be used to give World Wide Web pages (or other applications) interactive capabilities.

From a user's point-of-view, a component can be a button or a small calculating program activated by a button. From a developer's point-of-view, the button component and the calculator component are created separately and can then be used together or in different combinations with other components in different applications.

When the components or Beans are in use, the properties of a Bean (for example, the background colour of a window) are visible to other Beans and Beans that haven't "met" before can learn each other's properties dynamically and interact accordingly.

Beans are developed with a Beans Development Kit (BDK) from Sun and can be run on any major operating system platform inside a number of application environments, including browsers, word processors, and other applications.

2.1.4.4 HTML (Hyper-text Mark-up Language)

HTML (Hypertext Markup Language) is the set of markup symbols or codes inserted in a file intended for display on a World Wide Web browser page. The markup tells the Web browser how to display a Web page's words and images for the user. Each individual markup code is referred to as an element (but many people also refer to it as a tag). Some elements come in pairs that indicate when some display effect is to begin and when it is to end.

HTML is a formal Recommendation by the World Wide Web Consortium (W3C) and is generally adhered to by the major browsers, Microsoft's Internet Explorer and Netscape's Navigator, which also provide some additional non-standard codes. The current version of HTML is HTML 4.0.

2.1.4.5 XML

XML (Extensible Markup Language) is a flexible way to create common information formats and share both the format and the data on the World Wide Web, intranets, and elsewhere.

For example, computer makers might agree on a standard or common way to describe the information about a computer product (processor speed, memory size, and so forth) and then describe the product information format with XML. Such a standard way of describing data would enable a user to send an intelligent agent (a program) to each computer maker's Web

site, gather data, and then make a valid comparison. XML can be used by any individual or group of individuals or companies that wants to share information in a consistent way.

XML is "extensible" because, unlike HTML, the markup symbols are unlimited and self-defining. XML is a simpler and easier-to-use subset of the Standard Generalized Markup Language (SGML), the standard for how to create a document structure. (Techtarget, 2003)

2.1.4.6 JavaScript

JavaScript is an interpreted programming or script language from Netscape. It is similar to Microsoft's Visual Basic, Sun's Tcl, the UNIX-derived Perl, and IBM's Rexx. In general, script languages are easier and faster to code in than the more structured and compiled languages such as C and C++. Script languages generally take longer to process than compiled languages, but are very useful for shorter programs.

JavaScript differs from server side languages such as ASP or PHP in that the code is executed on the client side. This is most useful for tasks such as form verification, where it is faster to verify the data on the client computer than to send a request to and from the server.

2.1.4.7 CSS (Cascading Style Sheets)

CSS is defined by the World Wide Web Consortium as "a simple mechanism for adding style (e.g. fonts, colors, spacing) to Web documents".

A CSS file contains definitions for both standard HTML tags and custom tags. By defining the standard font to be used in all paragraph (<p>) tags, all paragraphs in the page or site would be affected at the same time. The display settings of an entire site can be managed from a single file.

By separating content from presentation in this way, HTML pages are lighter and can be accessed by more than standard web browsers (for example, web-enabled PDA devices).

2.1.4.8 Databases and Web Technology Conclusions

With a wide range of options available, it is important to select an option that is not only suitable for the scope of this project, but is scalable and flexible to allow for further enhancement. To be realised in the time scale available, the software should be easy to learn, but also powerful enough to carry out the tasks required.

For this purpose, the combination of PHP as a scripting language, and MySQL database for data storage, is ideal. Both are well documented and supported through a vibrant and growing community of users. Being open source, they are available for free.

PHP also offers strong authentication methods, and supports secure web technologies such as Secure Sockets Layer and Pretty Good Privacy (PGP).

The site will use CSS extensively, to ensure that the site's visual formatting can be easily controlled, and that the pages are not cluttered with unnecessary HTML code. This will also allow the pages to comply to XHTML standards, which ensures their compatibility with future web browser clients.

JavaScript will also be used, in such cases where client side scripting is advantageous, including form validation and image rollovers.

2.2 Security

As a web site is exposed to the world, it is important to ensure that it is protected from malicious users. Risks to web sites can also take the following forms:

- Exposure of confidential data
- Loss or destruction of data
- Denial of service

2.2.1 Exposure of confidential data

Any web server is inherently a publicly accessible machine, and so confidential data (for example, credit card details) should not be stored on the server.

To protect the information that is stored on the server, firewall software can be used to monitor incoming and outgoing traffic, and spot any malicious intent. Authentication systems would also be required to ensure that unauthorised users cannot access certain areas, such as an administration section.

Data is very exposed while being transmitted and it could be read or changed while being sent from the server to the client machine. A typical web page often travels through 10 to 20 computers between the server and client (Welling, L and Thomson, L, 2001).

To protect data, it is possible to encrypt it. Web servers often use Secure Socket Layer (SSL), developed by Netscape, or Transport Layer Security (TLS), to accomplish this as the data travels between Web servers and browsers.

2.2.2 Loss or destruction of data

Data can be lost through crackers gaining access to the system, careless administrators, faulty hardware or accident. It is important to ensure that the site is backed up on another machine regularly.

2.2.3 Denial of service

“On the Internet, a denial of service (DoS) attack is an incident in which a user or organization is deprived of the services of a resource they would normally expect to have. Typically, the loss of service is the inability of a particular network service, such as e-mail, to be available or the temporary loss of all network connectivity and services.” – Techtarget, 2003

Denial of Service (DoS) attacks can take many forms, and can be very difficult to prevent. Methods include installing programs on the server to slow it down, or *reverse spamming*, where a large amount of unsolicited e-mail is sent with the Web site's e-mail address as the sender. This would then generate a lot of angry responses, and possibly damage the Web site's reputation.

Automated tools can be used to carry out distributed DoS attacks, wherein a cracker would use many host machines (usually without the computer owner's consent) to repeatedly access a site, thus overwhelming the server.

As these attacks can take so many forms, there is no sure way to protect a site against them. To minimise the impact of such an attack, it would be necessary to monitor the web server, or host the site with a company specialising in web hosting.

2.3 Products

In Jakob Nielsen's Alertbox, "Why People Shop on the Web" (Useit.com, 1999), a survey of people who had shopped online resulted in the following three conclusions:

- Convenience and ease of use are the main reasons people buy at websites.
- Shoppers only buy 5% of the time they visit e-commerce sites: facilitate product research, cross-shopping, and other non-buying tasks that account for 95% of visits if you want to turn people into loyal users.
- E-commerce is going international, with many users buying from foreign sites (this latter conclusion is less true for American *customers* who mainly buy from domestic sites, but it has profound implications for American *vendors* who can sell a lot overseas if they bother to serve international customers)

From this information, it would be fair to conclude that a site should be easy to use, offer good product information, and be able to supply global demand.

The same report also noted the following results, from a survey sponsored by the Danish E-Commerce Association.

Most Important Reasons People Shop on the Web

Large Selection of Products	63%
Cheaper Prices	63%
Faster Service and Delivery	52%

Source: "Why People Shop on the Web", Useit.com, 1999

These results suggest that the prices of the products are as important as the selection, and that people also have high expectations of the delivery times and customer service.

It is important also to consider the types of products being sold online. Perishable products, such as fruit or vegetables, may not be well suited to online purchasing, as the time required to deliver the items is usually too long. However, this has been tried, notably by Tesco.com.

Large or bulky items present difficulties in terms of the expense of delivery, and require warehouses for storage.

On the other hand, light, easily duplicated items such as CDs and books are well suited to online purchasing. As proven by the success of Amazon.com, people enjoy browsing a catalogue of such items and placing orders online.

Another alternative is to eliminate the delivery problems entirely by selling items that do not physically exist. E-books and downloadable music are two such examples. Apple.com has recently established an online music store, selling downloadable music in digital form, and within one week sold over one million songs (TheRegister.com, 2003).

It would be outside the scope of this project to establish a selection of items such as CDs or downloadable music. Instead, a selection of graphics and web templates, created specifically for demonstration within the project, will be used as a product. This will allow the product sales to be simulated at little or no expense. However, the structure of the project should allow for modification for use with alternate products and ordering methods.

2.4 Financial Transactions

As well as providing fast delivery times, the payment method used online should be as convenient as possible. For this reason, it is important to provide the option of paying by credit card, or an online payment service.

2.4.1 SSL

The Secure Sockets Layer (SSL) is a protocol for managing the security of a message transmission on the Internet. SSL has recently been succeeded by Transport Layer Security (TLS), which is based on SSL.

SSL uses a program layer located between the Internet's Hypertext Transfer Protocol (HTTP) and Transport Control Protocol (TCP) layers, and is included as part of both the Microsoft and Netscape browsers and most Web servers.

Developed by Netscape, SSL also gained the support of Microsoft and other Internet client/server developers as well and became the standard until evolving into Transport Layer Security.

2.4.2 TSL

Transport Layer Security (TLS) is a protocol that ensures privacy between communicating applications and their users on the Internet. When a server and client communicate, TLS ensures that no third party may eavesdrop or tamper with any message.

TLS is composed of two layers: the TLS Record Protocol and the TLS Handshake Protocol. The TLS Record Protocol provides connection security with some encryption method such as the Data Encryption Standard (DES). The TLS Record Protocol can also be used without encryption. The TLS Handshake Protocol allows the server and client to authenticate each other and to negotiate an encryption algorithm and cryptographic keys before data is exchanged.

2.4.3 Merchant Account Services

Merchant account processing services are provided by a bank or a third party processor (on behalf of the bank) to the merchant. These services include authorization of credit cards, settlement of funds through the bankcard associations (MasterCard/Visa), depositing of funds to checking accounts, merchant billing, and account activity reporting.

Setting up a merchant account usually involves a fee, but allows the business to accept credit card payments.

2.4.4 Online Payment Facilities

As well as carrying out credit card processing in-house, there exists a range of online payment processing facilities, including the following.

2.4.4.1 Verisign Payment Services

Verisign offer a range of credit card processing options, including recurring billing, SSL Certificates and hosted pay services. The services' setup fees vary from \$179 to \$300, depending on the level of service required.

2.4.4.2 Paypal Merchant Tools

Paypal offers hosted credit card processing, along with "Instant Payment Notification" for use when incorporating sales tracking. Paypal IPN sends an encrypted signal back from the Paypal server to the original site to verify the transaction, and eliminate fraud. The services are free to set up, and include a charge (around 2.3%) on each transaction.

3.0 Design Specification

3.1 Development Model - Rapid Prototyping

A prototype is a miniature version of an end product. It is an executable version of an actual product, incorporating key elements of the final version but is incomplete in terms of functionality, and robustness (Wong, 1993).

The spiral model of rapid prototype development can be summarised as the following:

1. concept definition
2. implementation of a skeletal system
3. user evaluation and concept refinement
4. implementation of refined requirements
5. repeat from step 3

This form of development is the most appropriate and allows the specification to be flexible. Any problems can be identified through testing at each prototype stage, and fixed before the next iteration.

3.2 Site Structure

The site would be based around the seven modules shown in figure 4.1.

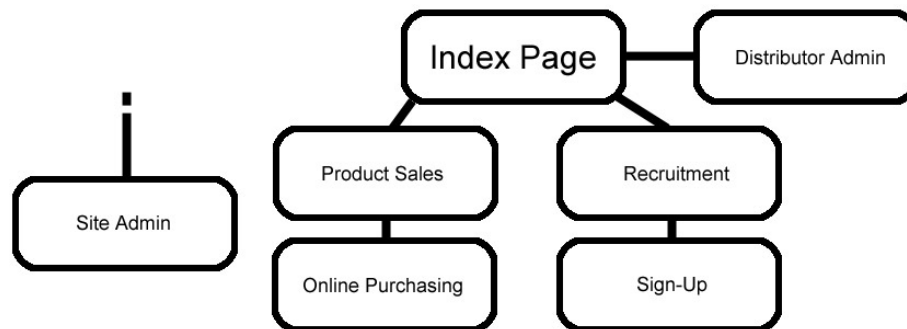


Figure 3.1: Basic site structure

The content and functionality of each module is described as follows:

3.2.1 Index Page

This is the starting page of the site, and is the first page any visitor would see. It is therefore important that it present clearly the purpose of the site.

In the same way an advertisement has limited time or space to sell its message, the index page of the site should sell the value of the site quickly. The page size should be small, so that the content is displayed quickly, and the content should be concise and well written.

The emphasis of the site is to sell its products, and so of the two functions this should be given precedence. Signing up as a distributor should be presented as an option, though not as prominently as the products.

3.2.2 Site Administration

The advantage of a database driven site is that the content can be updated and managed via online forms. An administration section would allow the site content to be managed and site statistics monitored.

For security, the administration section would not be linked from the main site, and would require user verification, in the form of a username and password.

Functions within the site administration section include:

- Listing the current signed-up distributors.
- Adding or removing distributors.
- Adding, updating or removing products from the database.

3.2.3 Distributor Administration

To encourage participation, it would add value to the site to allow distributors to monitor their site statistics, and update their information online.

As with the site administration, authentication would be required to maintain privacy.

3.2.4 Product Sales

The product sales section will offer categorised products for sale. As well as providing product information, it will provide an option to purchase the products online.

3.2.5 Recruitment

In order to take advantage of the benefits of multi-level marketing, the site should work as a tool to building a network of distributors linked to the site owner. This recruitment should require minimal involvement from the distributor, and set forth the benefits to the new distributor in a clear manner.

It should also set out clearly the implications of the contract being entered into when a distributor signs up. This should include codes of practice and payment plan information.

3.2.6 Online Purchasing

As it would be outside the scope of this project to set up a merchant account and credit-card processing, it would be more practical to use a third-party merchant such as Paypal.

To track sales, and provide data on which commissions may be calculated, successful sales should return a confirmation to the system. Where the product can be delivered electronically, this confirmation could be used by the system to authorise the sale, and trigger the delivery system. This could be in the form of an e-mail with either an attachment or download location.

3.2.7 Sign-Up

Once the benefits of joining the company as a distributor have been explained in the "Recruitment" module, the sign-up process begins. This will involve one or two web based forms which collect the distributor's information.

The form will add the distributor's details to the database, and create a unique ID number for the distributor. Web address options will be presented, which will check against the previously chosen addresses to ensure that duplications do not occur.

In order to ensure that the supplied e-mail address is valid, the chosen web address would be activated by an e-mailed activation code or hyperlink.

3.2.8 Additional Pages

To promote confidence in the site, one or more *Frequently Asked Questions* (FAQ) pages should be included. When customers or distributors require assistance, the FAQ should attempt to cover the most common questions, thus saving them time.

As the site would be accepting credit card payments, and requesting the customer's e-mail address, a *Security Policy* should be put together. This should be able to convince the customer that the credit card details are secure and that their e-mail address will not be sold to a third party.

Depending on the products for sale on the site, it may be appropriate to offer a return and refund option. For this, *Returns Policy* would be appropriate. Even in cases where the product cannot be physically returned, a returns policy page could explain the reasons why it is impractical to accept returns of the items.

A "Contact Us" page could allow users to contact either the distributor in charge of the site, or the parent company.

4.0 Prototype

PHP pages, ending in the extension “.php”, are processed by the web server before being sent to the user’s browser. The code is delineated in the original file by “<?php ... ?>” tags, and as such can be mixed with standard HTML. By the time the page is displayed in the browser, the PHP code has been removed and processed.

4.1 Testing Database Connections

The first step is to insert data from the MySQL database, by setting up connections in the PHP page. To test the PHP and MySQL connections, a simple database was constructed using the tool, “phpMyAdmin”. The table contains a key field, called *ID*. This is an auto-incrementing number.

The database was connected to using the following PHP commands:

```
$db = mysql_connect("localhost", "username", "password");
mysql_select_db("database_name", $db);
```

Once this has established a connection with the database, the following code is used to draw from the table a record with ID number matching that fed to the page, via the URL:

```
$result = mysql_query("SELECT * FROM dists WHERE id=$id", $db);
$myrow = mysql_fetch_array($result);
```

The query selects information from the table, *dists*, and stores it in the variable, *\$result*. This variable is parsed into an array called *\$myrow* by the command, *mysql_fetch_array()*.

The variable, *\$id*, can come from a number of sources, but for this example, it is included in the URL of the page. An example of this would be the address:

```
http://www.foo.com/index.php?id=1
```

In cases where the page might be accessed without the *\$id* variable included in the URL, the following PHP code sets the variable to 1:

```
if ($id == null)
    $id = "1";
```

Since the variable *\$myrow* now contains the all the information from the row with ID number equal to 1, the page can be customised. In this prototype, the page displays the name, address and other information stored in the table. To do this, the following PHP code is used:

```
Referrers Info<br />
ID Number:
    <?php printf($myrow["id"]); ?><br />
First Name:
    <?php printf($myrow["firstname"]); ?><br />
Surname:
    <?php printf($myrow["surname"]); ?><br />
E-mail:
    <?php printf("<a href='mailto:%s'>\n%s\n<br></a>", $myrow["email"],
    $myrow["email"]); ?><br />
```

In this code, the *printf()* command is used to print the data to the HTML page, which is then displayed in the browser, as shown in figure 4.1.

```
Referrers Info
ID Number: 1
First Name: Donovan
Surname: Hutchinson
E-mail: djpreach@hotmail.com
```

Figure 4.1: HTML output using the printf() command

4.2 Passing Variables

While it is useful to use the ID number to customise the content of a single page, it is important to pass this variable from page to page, so that the entire site is customised. To do this, PHP can be used in the anchor tags, as shown:

```
<a href="index.php?id=<?php echo $id ?>">Home</a>
```

When the page is processed on the server, the *echo* command prints the variable *\$id* to the HTML. The resulting HTML page would contain the following line:

```
<a href="index.php?id=1">Home</a>
```

4.3 Database Structure

To track sales, update content and build a network, the database should store appropriate data. To do this, the table structure should be designed to efficiently store the correct data and avoid redundancy.

To establish a link between each distributor and the person who introduced them, the “dists” table contains a field called “sponsor”. This field contains the ID number of their sponsor, and is set during the sign-up process.

Other tables will be established to store data such as product sales and site content.

4.4 Sign-Up Process

An online form is used to collect the new distributor’s information. To transfer the details from the form into the “dists” table, the following PHP code is used:

```
$sql = "INSERT INTO dists (firstname,surname,email,sponsor,u) VALUES
('$firstname','$surname','$email','$id','$u')";
$result2 = mysql_query($sql);
```

The resulting value of the variable *\$result2* is a Boolean, which can then be tested to confirm whether the query contained in the variable *\$sql* was successful.

The variable *\$id* in the above code is the ID number of the current distributor (the new distributor’s sponsor) which is inserted into the “sponsor” field.

Once this information has been stored, the new ID number is unique to the new distributor. If this number is passed into the URL, the site would then be customised for the new distributor.

4.5 Distributor Administration

One of the features of the distributor’s administration section is the ability to view their downline. To show this information, a function is required to look for the records in the table with a sponsor number equal to the distributor’s ID number. These distributors are the frontline, and they each have recruits of their own. The resultant structure resembles an upside-down tree, as shown in figure 4.2.

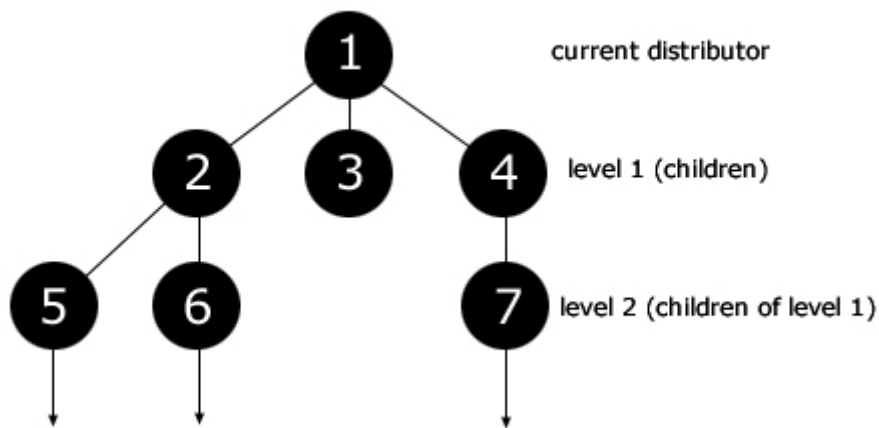


Figure 4.2: Distributor structure

To find this data in order to display the downline, the function must recursively parse the tree, and place the data into an array. The resulting function is as figure 4.3.

```

function downline($root)
{
    //connect to the database
    include("include/connect.inc");

    //declare the arrays
    $queue = array();
    $store = array();

    // add root to first place in $queue
    array_splice($queue, 0, 0, $root);

    while ($queue[0] != null)
    {
        //get node from front of queue
        $current = $queue[0];

        // get children of current node
        $result = mysql_query("SELECT id FROM dists WHERE
sponsor=$current", $db);

        // add children to the end of the queue
        while ($row=mysql_fetch_array($result)) {
            $queue[]=$row["id"];
            $store[]=$row["id"];
        }

        //remove the first item in queue
        array_splice($queue, 0, 1);

        // add the 'end of level' separator character to $store
        array_splice($store, count ($store), 0, '*');

    } //end while

    return $store;
} // end function

```

Figure 4.3: "Downline" function, to return a distributor's downline

The function in figure 4.3 uses two arrays, and a combination of two “while” loops to parse the tree. It follows a breadth-first parsing algorithm. To begin, it adds the *\$root* variable to the beginning of the *\$queue* array. The *\$root* variable is the ID number of the distributor at the top of the tree.

The number stored in *\$root* is now the first item in the *\$queue* array, and is passed into the variable *\$current*. A MySQL query finds the children of this node, and adds them to the end of the *\$queue* array, and inserts them into the *\$store* array.

The first item in the *\$queue* array is then removed, and the process repeated for the next node in the *\$queue* array. This process is repeated, continually adding children values to the two arrays until the *\$queue* array is empty.

Comments throughout the code (beginning with “//”) are used to explain the purposes of each part of the function.

The purpose of the “end of level” separator is to delineate the children so that it is possible to determine which children belong to which node.

For example, if the function was applied to the tree in figure 4.2, the resultant *\$store* array would contain the following:

```
$store = [ 2, 3, 4, *, 5, 6, *, *, 7, * ]
```

The first node, 1, has three children, 2, 3 and 4. The asterisk symbol then signals the end of the children of node 1. Node 2’s children are then listed, followed by another asterisk to show the end of node 2’s children. A second asterisk shows that node 3 has no children, and so node 7 is a child of node 4. The final asterisk signals the end of the children.

This data can then be processed to create a visual representation of the distributor’s downline, calculate the commissions for each distributor and other functions.

4.6 Online Testing

The prototype has been tested online, and can be viewed at the following address:

<http://www.designni.com/widgets/>

While further prototypes will be developed on the local machine, in order to test real-world factors such as download times, the online testing will continue at this location.

4.7 Next Steps

The current prototype is basic, and as such contains no visual formatting or branding. It has been decided that the functionality of the site be given attention first, with the look-and-feel and content to be developed later in the process. In order to allow the content to be updated, the database design will have to take this into account. Efficient database design will be investigated further.

A system to allow users to set up their own URL will be investigated, along with authentication techniques on order to protect the administration areas.

The Paypal Instant Purchase Notification (IPN) system will be investigated, as this may play an important role in tracking sales and delivering the purchased content.

Processing the output from the function in figure 4.3 will be taken further, as the current data does not display the tree structure in an intuitive way.

Payment plans will also be investigated, such as the commission percentages offered on each level, to establish a plan suitable for the capacity of a web-based business model.

5.0 Bibliography

5.1 Books

Carmichael, A, 1994, *Multi-Level Marketing*, M&K Jerry

This offers a comprehensive introduction to the world of Multi-Level and Network marketing. In contrast to the majority of such books, it is written from a British perspective, and as such is a more practical, less hype-filled book than some.

Cataudella J, Greely D and Sawyer, B, 1998, *Creating Stores on the Web*, Peachpit Press

A step-by-step introduction to the world of e-commerce. Cataudella shares his experience in developing and establishing an online video game shop, which is used as a case study throughout the book.

Elmasri, R, and Navathe, S, 1999, *Fundamentals of Database Systems (3rd Edition)*, Addison-Wesley Publishing

The leading textbook for introductory database management courses, *Fundamentals of Database Systems* reflects the latest developments in database research and practice. It combines explanations of theory and real systems, broad coverage of modelling and design of databases, and examples with introductions to database technology.

Greenspan, J, and Bulger, B, 2001, *MySQL/PHP Database Applications*, John Wiley & Sons

An overview of PHP and MySQL, written with real world problems in mind. Rather than simply cover the theory behind PHP, this book features code snippets that illustrate the behaviour of code structures. A good introduction explains the background of PHP and MySQL in a clear, easily understood manner.

Krug, S, 2000, *Don't Make Me Think: A Common Sense Approach to Web Usability*, Que

Krug, a usability consultant who has worked for companies like Apple and Netscape, offers straightforward solutions to fundamental Web design problems. He shows how to design pages for scanning, how to eliminate needless words, how to design a home page, and how to streamline design for user navigation. Much of the content is devoted to proper use of conventions and content layout. Topics such as the wise use of rollovers and usability testing are covered in depth.

Meyer, E, 2000, *Cascading Style Sheets: The Definitive Guide*, O'Reilly

This is a comprehensive text that shows how to take advantage of the benefits of CSS while keeping compatibility issues in mind. The text covers CSS1 in depth—including syntactical conventions along with specificity and inheritance. Other topics covered include units and values, visual formatting and positioning, and the use of text, fonts, and colours. It is written to help readers build a well-rounded knowledge of CSS, and prepare for real-world debugging.

Molenaar, C, 2002, *The Future of Marketing*, Prentice-Hall

Cor Molenaar is a leading authority on the use of information technology in marketing, and is Professor of e-Marketing at Erasmus University. This book examines the practical possibilities of the Web and presents a strategic model to help choose the correct marketing tools to exploit and survive on the internet. This book aims to provide the ability to respond to this new marketing environment.

Nielsen, J, 2000, *Designing Web Usability: The Practice of Simplicity*, New Riders Publishing

This book contains annotated examples of actual Web sites, setting out many of the design principles that all Web developers should follow. Topics covered include cross-platform design, response time considerations, writing for the Web, multimedia implementation, navigation strategies, search boxes, corporate intranet design, accessibility for disabled users, and international considerations.

Poe, R, 1999, *Wave 4: Network Marketing in the 21st Century*, Prima Publishing

In his previous book, *Wave 3*, Richard Poe revealed how the new world of computers offers new opportunities for network and multi-level marketing. *Wave 4* shows how the marriage between the Internet and people-to-people sales will accelerate the growth of network marketing, and offers predictions for future development of the marketing business model.

Welling, L and Thomson, L, 2001, *PHP and MySQL Web Development*, Sams Publishing

This book introduces general programming concepts and database design, before moving on to showing how PHP and MySQL can be used together. Real world examples are explained, along with example code to illustrate each lesson.

Zeldman, J, 2001, *Taking Your Talent to the Web: Making the Transition from Graphic Design to Web Design*, New Riders Publishing

Based on a curriculum in Web communication design created in association with the Pratt Institute, this book written for active and aspiring Web designers offers a discussion of the Web's people, parts, and processes; and applying tools and techniques to HTML code and visual Web contents.

5.2 Papers

Alba, J, Lynch, J, Weitz, B, Janiszewski, C, Lutz, R, Sawyer, A and Wood, S, 1997, *Interactive Home Shopping: Consumer, Retailer, and Manufacturer Incentives to Participate in Electronic Marketplaces*, Journal of Marketing

This study examines the implications of electronic shopping for consumers, retailers, and manufacturers. It assumes that near-term technological developments will offer consumers unparalleled opportunities to locate and compare product offerings. It examines these advantages as a function of typical consumer goals and the types of products and services being sought and offers conclusions regarding consumer incentives and disincentives to purchase through interactive home shopping.

Smith, M, Bailey J, and Brynjolfsson, E, 1999, *Understanding Digital Markets*, MIT.edu

This paper sets out to investigate the characteristics of electronic markets. Topics covered include the practicality of electronic commerce, dispersion of Internet prices, and future commerce developments.

Wong, S, (1993), *Quick Prototyping of Educational Software: An Object-Oriented Approach*, Journal of Educational Technology System, 22(2), p.155-172

This article introduces and demonstrates the "quick" or "rapid" prototyping software engineering paradigm which can be easily employed by casual software designers, such as classroom teachers, using object-oriented software production tools. Development of an educational software called "The Match-Maker," a game for learning new words, is used as an example using HyperCard and its scripting language, HyperTalk, for quick prototyping.

5.3 Web Sites

MLM Information

MLM versus Pyramid Schemes (http://www.stopspam.org/general/mlm_vs_pyr.html)

MLM Frequently Asked Questions (<http://www.mlmlegal.com/faq.html>)

MLM Watch (<http://www.mlmwatch.org>)

Pyramid Scheme Alert (<http://www.pyramidschemealert.org>)

The Future of Network Marketing (article by Rod Nichols)
(<http://www.internet-mlm-home-business-opportunity.com/articles/The-Future-of-Network-Marketing.htm>)

MLM Example Websites

Buy MLM Tools (<http://www.buymlmtools.com>)

Euphony (<http://www.euphony.com>)

eVisionLink (<http://www.evisionlink.com>)

Gold Glory (<http://www.gold-glory.net>)

Happeneurs (<http://www.happeneurs.com>)

Vitastar International (<http://www.vitastarintl.com>)

Technical Resources

Cascading Style Sheets (<http://www.w3.org/Style/CSS/>)

Databases on About.com (<http://www.databases.about.com>)

DevShed: Open Source Web Development (<http://www.devshed.com>)

Informationweek.com: Oracle's Talking... (<http://www.informationweek.com/772/oracle.htm>)

Jakob Nielsen's Useit.com (<http://www.useit.com>)

Microsoft Developer Network (<http://msdn.microsoft.com>)

MySQL Database (<http://www.mysql.com>)

PHP (<http://www.php.net/>)

PHPBuilder (<http://www.phpbuilder.com/>)

Techtarget (<http://searchtechtarget.techtarget.com/>)

World Wide Web Consortium (www.w3.org)