



# The Morgan Project: technological solution building with regard to personalized content management and storage

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## 1 Introduction and aims

The Morgan Project, an acronym for Media Organization And Networking, was started as a Web-based application for the clients of a Web interface design studio to manage their account and monitor the progress of work being done for them. The aim of this Web site was to allow users to view proofs of design work, comment and request changes, accept or reject these changes and order hard copy of proofs. The system was also designed to include a variety of communication tools such as e-mail and notification tools, for example SMS and a news reader.

Adaptable to a large market, the project has a wide scope of possible applications and is currently undergoing pilot testing in a printing company and a law firm. TMP is adaptable to many fields, but it is the educational avenue that is discussed in this article.

The project is now a Web-based content management system aimed at improving upon existing e-learning environments and creating a completely customisable application for a user to interact with, store data and use as a communication tool. To accomplish the creation of a cognitive learning tool, many aspects need to be considered. However, this is a description of the development of resources and the outcome of a limited testing of the on-line research and communications tool.

In today's world, there has been a global shift from traditional analogue methods of communication towards a digital system. This change is largely due to the development of the Internet, the advent of the home computer and the cellular communication revolution. However, this information and communication revolution is also influencing the educational sector. The Internet has made it much easier to find a wealth of information through the channels of the Internet. In fact, more often than not one can become inundated with an excess of information. A few years ago, an average search on Yahoo® would have yielded approximately 50 to 100 results. Today, there are programmes that search multiple search engines and provide in excess of 1000 results. During the past five years there has been an explosion of information available on the Internet. New skills and tools are therefore required to evaluate and manage large quantities of information. Such information can also be disjointed and disorganized. While technology can play a role in organizing information, constructivists believe that the sharing of valuable information between members of a group facilitates greater insight to be developed by the group. TMP attempts to provide a mechanism where information from different sources can be shared in a cooperative environment and thereby allow equal access to all members of a group. In TMP, system information can be pooled and shared, thus giving disjointed and raw content a flow and meaning.

The conversion of information into working knowledge is made easier through social interaction. Therefore, interaction between members of the group using communication tools to discuss issues related to information shared by the group fosters deeper understanding and knowledge construction. For this reason, the TMP system provides a number of communicative tools to the user, including e-mail, SMS, instant messaging and chat. Such tools provide users with both asynchronous and synchronous tools to discuss issues. Therefore users can elect either to communicate with members logged in at the same time (synchronous) or send messages to those not logged on to the system (asynchronous). Both forms have their advantages and their own unique 'language'. To understand how best these tools can support users, we must understand how these tools differ in their ability to express feelings and enable the transfer of factual data.

Crystal (2001) argues that 'it is the synchronous interactions which cause most radical linguistic innovation' and such communication usually takes place in a multiparty environment, where there are many participants. Such a multiparty chat group is usually referred to as internet relay chat (IRC). Acronyms very often replace full words to speed up communication within the synchronous environment. Emotions can be displayed too, by the use of certain character combinations that have come to resemble a smile, sorrow or anger (emoticons). These characters are a direct product of communication with an unseen or even an unknown party. For example, a common abbreviation is LOL that expresses laughter and is an acronym for laugh out loud. The most used character symbols are :) or another adaptation =) both of these denote a smile; conversely :( or =( signify a frown or sadness. These symbols are universal and cross many divides, by having the same meaning to all who see them in an on-line chat environment, be it synchronous or asynchronous.

E-mail and text messaging (SMS) are asynchronous forms of communication. While e-mail is a written medium, research findings suggest that e-mail communications are more closely related to the spoken word than the written word. However, entire documents or files may be attached to an e-mail, making it the most comprehensive form of communication available to users on the Internet. Some people express themselves far better in an e-mail than they might otherwise do in face-to-face communication. In general, SMS text messages are not much more than 400 characters long. Therefore such communications must be very brief and to the point. In this form of communication we also see the use of emotions. However they are used to keep a message short enough to be sent without losing meaning. Such brief text messages could also serve as a reminder system.

Therefore communication tools must include the use of emoticons that allow a much richer interaction between the users.

It has also been argued, that users are more likely to use software tools that allow them to customize the look and feel of the application. In support of this concept, TMP allows users to customize the environment to suit their own preferences. Customization is a major feature of the system and it is intended that learners become more productive and at the same time more relaxed as they structure their own environment. The graphical and design elements of the interface are therefore extremely important, as it is through the interface that the user interacts not only with the computer, but also with other users.

The combination and integration of tools that enable content pooling and management, different methods of communication, as well as the ability to create a personalized work and study environment are the aims of TMP.

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## 2 Methods

### 2.1 Programming and structural approaches

TMP makes use of open source products to develop expertise in these products and to support such an approach to software development. While PHP (a powerful HTML-enabled scripting language) and hypertext markup language (HTML), together with MySQL, provide the functional engine of the product, cascading stylesheets (CSS) provide the means to develop interchangeable and customizable interfaces.

PHP variables come into play in the style sheet, enabling the user to change the interface while the application is running. The variables selected by a user are stored in the MySQL database in a record related only to that specific user. This provides very quick and effective customization of elements such as the background colour of the site, table colours and sizes, font faces and so on. Elements of the style sheet are declared as variables and their values are extracted from the database table. The user can create his/her own style sheet in this way, selecting the colours and values that he/she prefers, or can simply choose one of the predefined styles available. This accommodates users who like to 'decorate' their interface with their personal choices, as well as a user who is not too concerned with the finer points of the interface and is happy to work in a predetermined or standard work space.

To accomplish a personalized storage facility unique to each user the system makes use of PHP's ability to manipulate the server file and directory structure. Each user has a folder created dynamically for him/her within the global *user's* folder as he/she signs up for use of the system. This folder is directly associated with only his/her individual log-in name and password. Management of user folders on the server is important as users may upload inappropriate files that could affect the security of the system. To prevent the introduction of executable files and script, the user folder file permissions are set to read and write only and not to execute. A secondary measure to protect the Web server is that files with certain file extensions are not permitted; this is hard coded within the application. File extensions such as .bat, .bin, .chm, .hta, .eml, .msi, .scr, .sys, .vb/a/s/e all have the potential to carry viruses or other harmful executables and are therefore not uploadable to the server. However, according to Computer Knowledge (2002) 'there is currently a big push toward relying heavily on recognizing "bad" file extensions and acting solely on this knowledge. That's not necessarily a good thing as extensions can be misleading'.

The formation of groups is managed through entries in a database table where a variable is used to associate users with each other. Such groups can also choose to use a specific colour

scheme to denote themselves, or may choose only to have a single icon in common, if desired. As with the individual styles, a group style is also stored in the users' table, along with all other information relating to them. A user can belong to many groups simultaneously. At log-in, a simple choice of the group they wish to join at that point pulls the correct colour scheme and personalized features for the group from the database. A group can be set up for a specific project or for an entire course where users wish to pool information and other resources.

The sharing of material can be achieved in a number of ways within the TMP environment and it is closely allied to the communication tools. TMP provides both synchronous (real time: IRC) and asynchronous (delayed time: e-mail, SMS) communication tools. In the regular chat groups, the system permits users to include emoticons and use of their own speaking or writing styles, thereby providing a richer set of opinions to support rapid and clear discussion.

The administration of the system that includes users, their accounts, groups and content is managed from a control panel available to the designated system administrator. The control panel is simply a secured page that enables administrators to maintain and set system parameters such as TMP interface colour schemes. The panel provides overriding access to the database so that changes to a user status can be made if required. The panel also makes access to the global users' folder available so that content can be modified or deleted if necessary. The administrator may also post news messages to one, many or all users of TMP.

TMP runs on an Apache Web server installed with PHP and MySQL. TMP files are saved to the World-Wide Web root directory. A single folder, named *users*, is created under the root and given read, write and execute permissions. Once this is in place, there is a setup page (*setup.php*) that creates the database and relevant tables. At this point the *index.php* page can be accessed and TMP is ready for use. Users create their own accounts and these can easily be controlled by an administrator from the TMP control panel.

## **2.2 Graphic design and layout**

TMP has a highly customizable interface and layout. The approach, that users can create entirely their own look to the application, provides a new area for research on the effect this may have on improving concentration and comfort, as well as any benefit users may find in being in control of their study environment.

The importance of interaction between user and computer is one of the most neglected topics in Web design. A Web site interface is more than linking pages together to form a logical path or map between topics and information. Its value lies in the simplicity, style, layout and the ability to sustain the interest of the visitor.

Ideas on making navigation easier on a site are numerous, ranging from studies into creating navigational standards to designing for colour-blind users. A number of these miss an important aspect: people are drawn to the visual, something they can relate to, a particular or individual style. In graphic design, as in advertising, knowing who the target audience is is of paramount importance. Knowing who will be looking at the product enables one to effectively create a style to capture their interest before presenting the content. When viewing or using a Web site, it is often not poor content but rather illogical links, unclear buttons and confusing menus that make the site unusable. While it is difficult to evaluate one's own work many designers find it very hard to view their creations from a layman's point of view, and they need to find creative ideas to overcome this problem.

TMP focuses graphically on building a system that incorporates user customization levels that are not only easy to use but also inspirational. Each user has the tools to create and design his or her own interface, by means of universal templates and dynamic style sheets.

### **2.2.1 Style sheet concepts**

The use of style sheets is an extremely important part of the TMP customization process. The system uses a database table to store the style sheets, making them fast and easy to create. The page has embedded styles that are set when content is retrieved from a database table. Included in this database table is a custom field for users to create templates for styles that may not be incorporated in the initial selection. The universal template system, in conjunction with dynamic style sheets, provides an effective way to store individual style settings.

### **2.2.2 Interfacing for multi-audiences**

A multi-audience interface is one that enables many users to access information and view it in their own preset personalized way. The advantage in designing for a multi-audience is that it enables users with specific needs (such as colour-blind palettes or large fonts for the sight impaired) to easily adapt the system to their needs.

### **2.2.3 Design, components and modifications**

Each section in TMP uses a component to deliver the relevant task; in other words, e-mail requires an e-mail component. These components can be installed as and when needed. The user or administrator can select each component from a components list and add the selection to the design. These components all need to integrate into a fully customizable user-friendly interface.

The ability to use predefined themes, or skins, is also an important part of the TMP project. The goal is to enable the user to create his/her own theme or skin.

Prior to the installation of TMP onto a server, the administrator has the option to add design features to the pages and components. As all the components are completely customisable; the administrator can set the user customization levels to full or limited access for users, as they see fit.

A layout template is used to retain consistency from component to component; this template merely retains the components in use, not their colour or positioning. If the administrator allows the applicable access, the user can override these and create his/her own templates for components. This means that the user is effectively the designer of the interface, adding images, borders, orientation colours and any other feature he/she finds aesthetically pleasing.

Images are a powerful means of communicating and the creation of images helps to improve creativity and imagination. A friendly, personal design is a relaxing way to learn and provides a sense of comfort and freedom.

For the site to have aesthetic value, the pages must be appealing, not only in colour but also in orientation. Giving users freedom to create their own page orientation opens a pathway for them to gain knowledge of where all the functions are, because the users plan the application's logical interface.

Components can be created as third party modules. Users can install them individually and upgrade them as they see fit. If a component gets damaged for any reason, the user can simply uninstall it in the user control panel and replace it with a working component. The primary aim of using a component system is to allow flexibility.

### **2.2.4 Style sheet control panel**

Within the user control panel, a style sheet control panel is available. This control panel permits complete style manipulation. Styles can be saved in the user style database and can be shared within groups or globally with all users. When a style is selected, it is stored within

the user style column in the database table, where it will work in much the same way as a cookie that retains session information. The style column will retain currently selected styles, thereby retaining the users' preferred style, no matter which computer they are logged on to.

Orientation too, plays a major role in TMP and, as mentioned before, the orientation is also fully customizable, allowing users to shift the links to any place on the page. Since all customization is saved in the styles database, the style can be quickly accessed and used as a new page loads or is refreshed, allowing for fast style implementation.

While the products that are part of graphic design are not open source, the open source ethos within the project itself is maintained and an environment of sharing is maintained. This is accomplished by the ability users have to share themes and layout templates. A cognitive environment is created where the user can build an interface that he/she finds most pleasing.

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### **3 Conclusion**

The success of the TMP system depends on usability studies that have not yet been implemented. However, the system described here lays the foundation for a Web application where users can easily join different groups and can customize their environment. It can be argued that learning tools become far more effective when the user has the ability to construct his/her own environment. In giving the user the ability to create his/her own environment, creative thought patterns are stimulated and, as a result, the learning process may be improved. Communication styles over the Internet differ greatly depending on the communication tool being used. However, simple text-based tools can be enhanced to include emotions when the system makes provision for the use of emotions. The open source ethos enables TMP to be added to and adapted by users in a wide variety of fields at a cost comparable to existing software.

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