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IT for more effective team collaboration

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Abstract

ICT bring new possibilities in support of team cooperation, above all in creation and sharing of common content. On base of comparison of various systems for support of the cooperation it was found out that some systems purposefully solve a flow of time planning in a firm environment (e.g. Novell GroupWise), others supports in various way a cooperation in common contents space (discussion groups, Wiki, WCMS). Changes in approach to cooperation management appear in the social network. A substantial phenomenon of the present systems for cooperation support is their virtuality. The common space is „somewhere“ and a user can share (use) it from anywhere, if he/she is connected to the internet. An example still more often used is Google Apps.

Key words

Collaborative software, groupware, GroupWise, Moodle Forums, Wiki, CMS, social networks, Google docs.

Anotace

ICT přinášejí nové možnosti při podpoře týmové spolupráce, a to především při vytváření a sdílení společného obsahu. Na základě porovnání různých systémů pro podporu spolupráce bylo zjištěno, že některé systémy řeší cílevědomě tok plánování času ve firemním prostředí (např. Novell GroupWise), jiné podporují různě spolupráci nad společným obsahovým prostorem (diskusní skupiny, Wiki, WCMS). Změny v přístupu k řízení spolupráce se objevují v sociálních sítí. Podstatným jevem současných systémů pro podporu spolupráce je jejich virtualita. Společný prostor je „někde“ a uživatel ho může sdílet (využívat) odkudkoliv, pokud je připojen k internetu. Příkladem, který se stále častěji využívá, jsou Google Apps.

Klíčová slova

Software pro podporu spolupráce, groupware, GroupWise, Moodle Forums, Wiki, CMS, sociální sítě, Google docs.

Introduction

Information and communication technologies (ICT) bring new possibilities not only for the written and visual communications (e-mail, chat, videoconference, voiceIP, etc) but also for the collaboration of people.

Collaboration of people is a fundamental factor in the success of every team, community or the whole society. Systems with different degrees of sophistication that are used for the support of collaboration of people have been developed. These systems serve, first of all, for the creation and sharing of a common content. The basis for collaboration is always common space, e.g. a boardroom, chalkboard, flipchart or a shared database. The essential feature of collaboration is the fact that this space creates the necessary medium for the exchange of knowledge and of the common unstructured data. The collaboration space creates the framework within which the total value of knowledge exceeds the mere sum of knowledge of individual participants.

Modern ICTs make it possible not only to create and manage these common spaces (shared databases) but they, in particular, make it possible to create independent virtual work teams and their mutual communication. The user links up with a particular team, shares knowledge with it and participates in the solution of a certain task.

The authors of this article focus on what systems for the collaboration support are best for a given team, and they also search for the answer to the question of why 80-90% of the young generation are using social networks such as Facebook or Twiter, while the older generation generally rejects this solution and considers it to be a "technological bubble".

Aims and Methodology

The aim of this article is to provide a detailed evaluation and comparison of selected systems (technologies) from the viewpoint of the collaboration support and to point out their advantages and disadvantages. The aim is also to evaluate in a synthetic manner the various approaches and formulate recommendations for their use. In order to provide effective management, an analysis and evaluation of the trends in the use of the systems is essential. Successful teams utilize rationally the new systems of management, which are appropriately supported by ICT. Literature resources and experience acquired at the Department IT CULS Prague have been used in this study.

Results

The systems for the support of collaboration (collaborative software or groupware, or group support systems) represent software which can significantly assist the solutions of different tasks.

Each system for the support of collaboration supports to a greater or lesser degree three basic functions: coordination, cooperation and communication. The following selected systems for the support of collaboration have been analysed: Novell GroupWise, discussion groups – Moodle forums, Wiki, Web contents management systems (WCMS), social networks and Google Docs. The actual evaluation and comparison of the functionality of the different systems is provided by means of the tables which have been methodically based on Table 1 as a template.

GroupWise workflow

The GroupWise product (the Novell Company solution) has been used at the Czech University of Life Sciences for several years as a basic postal system. It is the most widespread, efficient and very safe alternative to the MS Exchange system. As the GroupWise name indicates, the functionality is much wider here – it is a comprehensive platform for team collaboration (communication of individuals, teams, support of projects solution, checking tasks, sharing information, resources, means and data).

Due to the use of the open source solution and respecting of open standards, its operation is not linked to specific types of equipment or operational platforms of individual users – team members (Windows, Linux, MacOS). Likewise, its operation is not limited by the work location of the user (classical, web or wireless client). The GroupWise system can be operand on standard network server operation systems (Windows, NetWare and Linux - SUSE, Red Hat). The users identity is verified against the Novell eDirectory and the system supports all important standards such as SSL (Secure Sockets Layer), S/MIME (Secure Multipurpose Internet Mail Extension), PKI (Public Key Infrastructure) and TLS (Transport Layer Security) in the same way as against the other data directory services with the LDAP support.[5]

Function	Activity	Explanation
Coordination - teamwork	Management of collaboration	Options for the management of people – e.g. monitoring their tasks according to a schedule
Cooperation	Creation of common space, mostly of the knowledge database	Creating and updating of databases of structured and unstructured data
Communication	Online or offline communication	Access to the shared space, possibility of mutual communication

Table 1: General comparison of the functionality of collaborative software.

High security and the overall functionality under a heavy workload in the demanding university environment was also the main mason for the selection of this system under the condititons of the Czech University of Life Sciences.

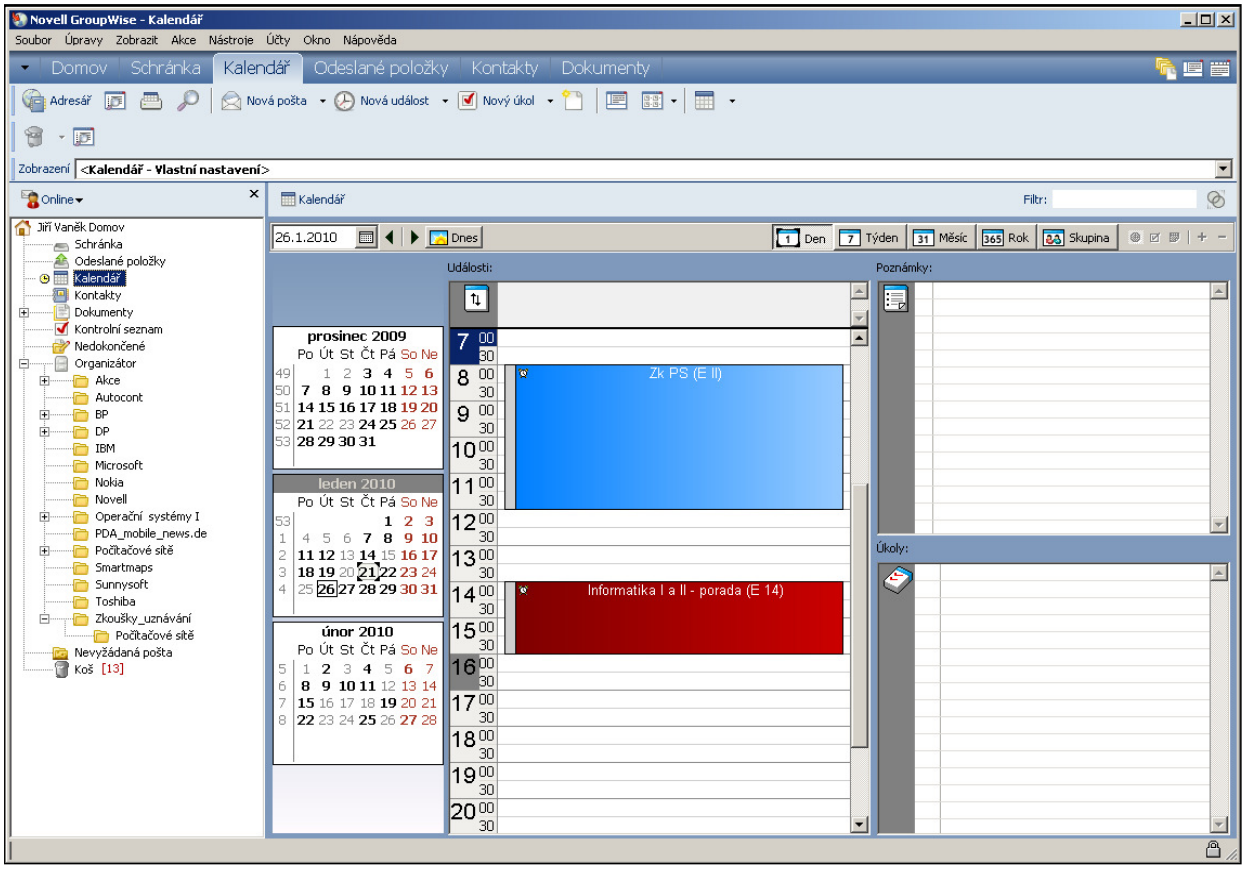

Figure 1: A classical desktop of the GroupWise client at the CULS Prague (calendar – mail box – notes - tasks).

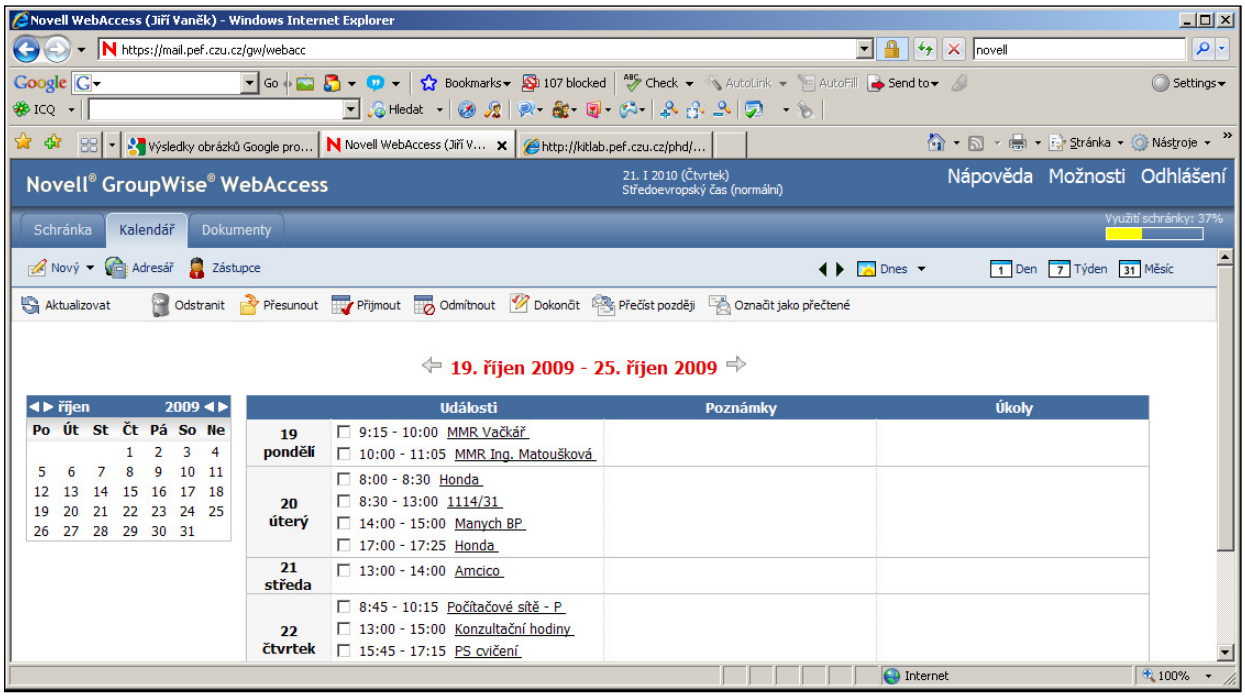

Figure 2: The CULS Prague WebAccess application of the GroupWise (calendar).

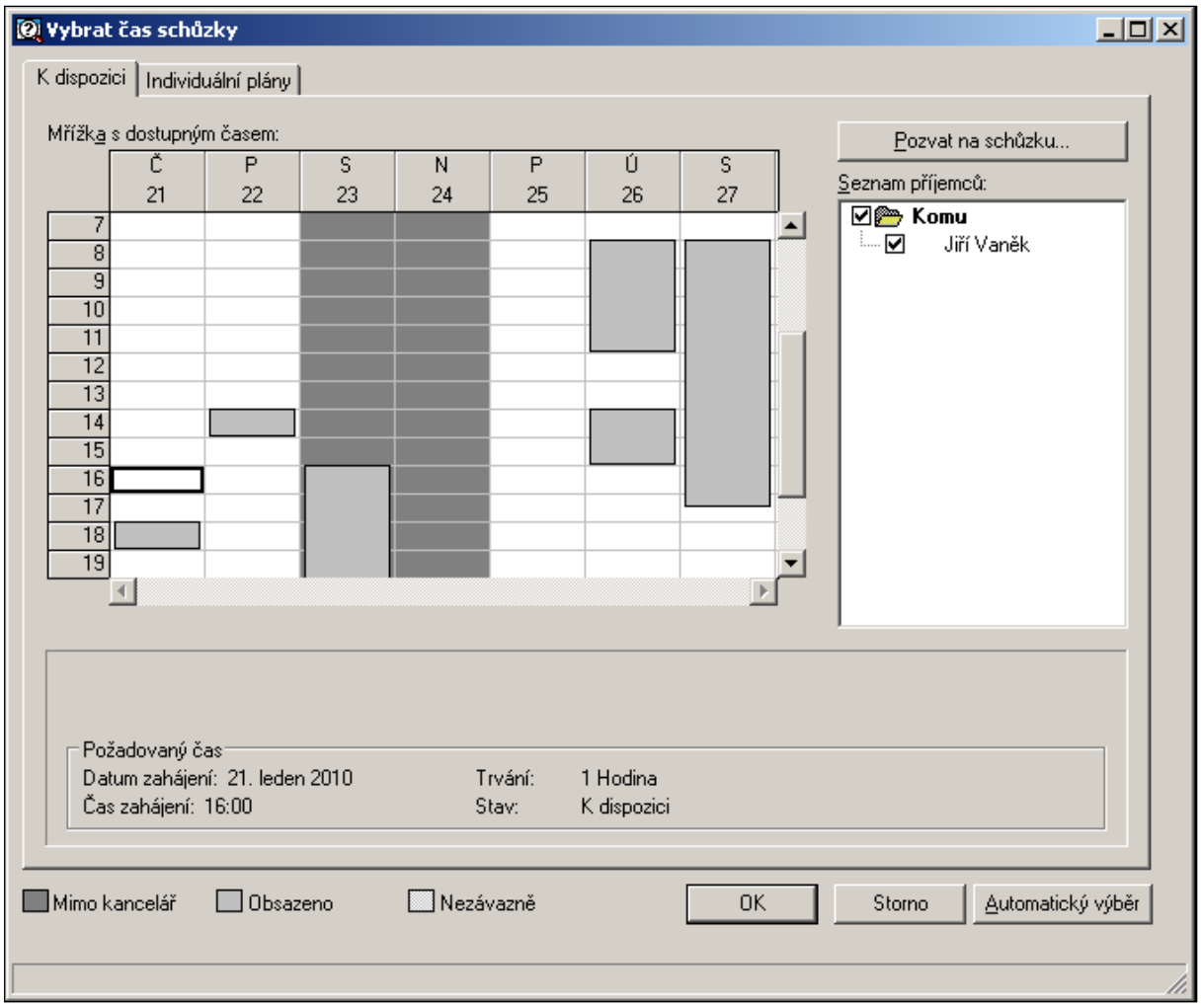

Figure 3: GroupWise planned appointment (meeting) – a shared calendar.

Function	Activity	Evaluation
Coordination	Transfer and sharing of information and resources between project leaders and team members regardless of where they work (theoretically in real time)	Information at the right place and at the right time. Detailed modelling of the organizational structure (real as well as virtual teams), rights and group rights.
Cooperation	Providing accessibility and sharing of resources, planning activities, planning resources, delegating tasks and authorities, checking deadlines, management of documents and their versions.	Support of team collaboration, including the use of social networks principles (blogs, wiki, shared and personal work spaces).
Communication	As a standard it is online by means of a classical desktop of the client, alternately by means of the web interface, or with the use of a wireless client.	Emphasis on security, without limitation by the HW platform or by the operational system of the work stations, support of mobility. There is no limitation by the operational system of the server.

Table 2: Evaluation of GroupWise (workflow) technology.

Result of GroupWise

GroupWise represents a comprehensive commercial tool for team collaboration which is an interesting and fully comparable alternative for the MS Exchange systems or Lotus Notes. Its advantage is in the central management of users and their access rights. It enables a controlled flow of the messages transfer. To some extent the software installation at the client side end is a disadvantage.

Discussion Groups (newsgroups) are a tool which assists in communication (discussion) with other users on specific topics. Within the framework of the LMS Moodle system, the so called forum is available to participants of every course. The forum is a virtual space for inquiries and exchange of views. The course participants can ask questions to which teachers as well as other students can respond. It is possible to create the so called thread – thematic areas, which then enable other students to find answers to previously discussed issues.[9]

Discussion Groups – Moodle forum

Result of Discussion Groups

Discussion Groups are a suitable tool for an informal exchange of views. However, if the exchange is not managed the discussion group can become congested and non-transparent.

The Wiki technology

Wiki is a technology for the content creation – or, more precisely, for the creation of hypertext documents which make it possible not only to add content in a similar manner as that in the discussion groups, but they also allow changing (updating)

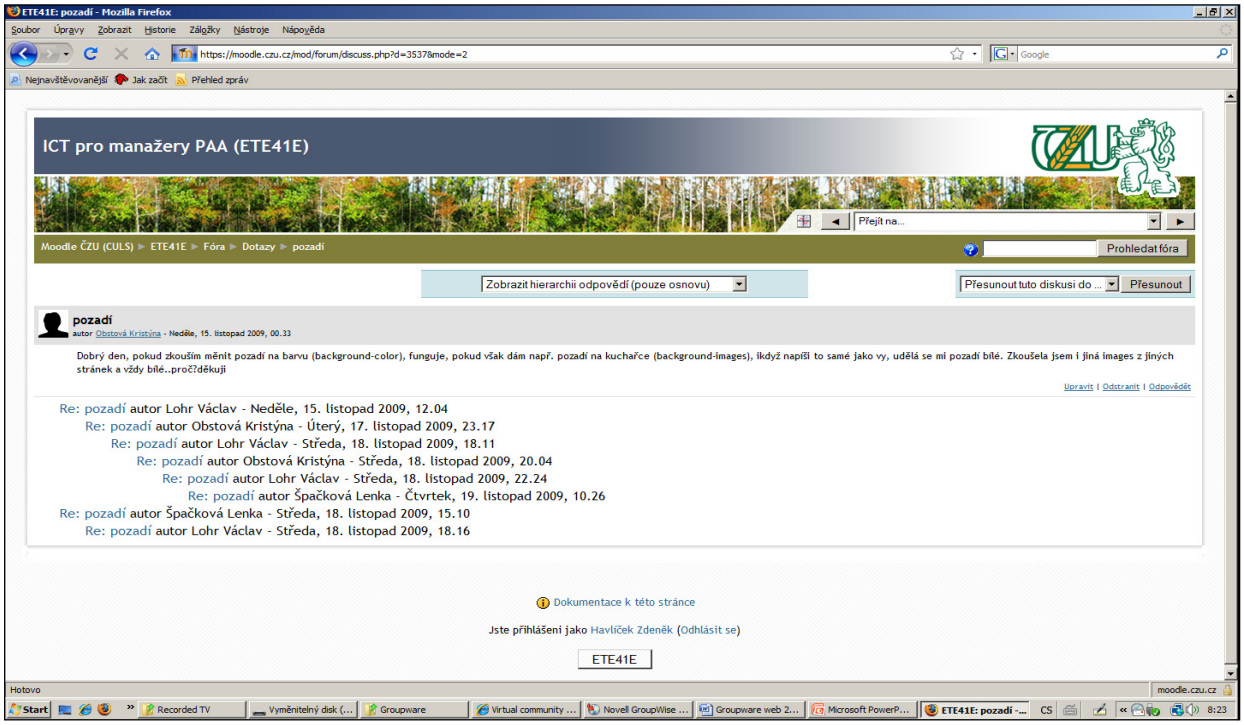

Figure 4: Forum on moodle.czu.cz.

Function	Activity	Evaluation
Coordination	All participants have the same rights.	Only the teacher can delete entire thread
Cooperation	Shared space for storing short messages, enquiries and replies	The shared space is well arranged
Communication	Communication is offline and operates only amongst the participants of the course	Participant can receive notice of a new contribution

Table 3: Evaluation of the Discussion Group (Forum) technology.

existing content. Collective creation of the content is provided by means of markup language and access to wiki is possible via any browser. The Wiki technology is generally known through the Wikipedia application. Wikipedia (a combination of the words wiki and encyclopedia - Wiki wiki means "quick" in Hawaiian) is a multilingual web encyclopedia which is being generated by the cooperation of voluntary contributors from around the world. Its aim is the creation and worldwide distribution of freely available encyclopedic information. Wikipedia exists in more than 250 language versions. The Czech version contains more than 140 000 articles.

Wiki, as an open source software, can be used for sub-applications. It has been used at CULS Prague for several years for the processing of the project teams documentation within the framework of the course unit Internet Technology.

Result of Wiki Technology

The Wiki Technology is suitable for creating a structured content. Users can easily update the generated content. Part of Wiki is also the management of the users and versions of the content.

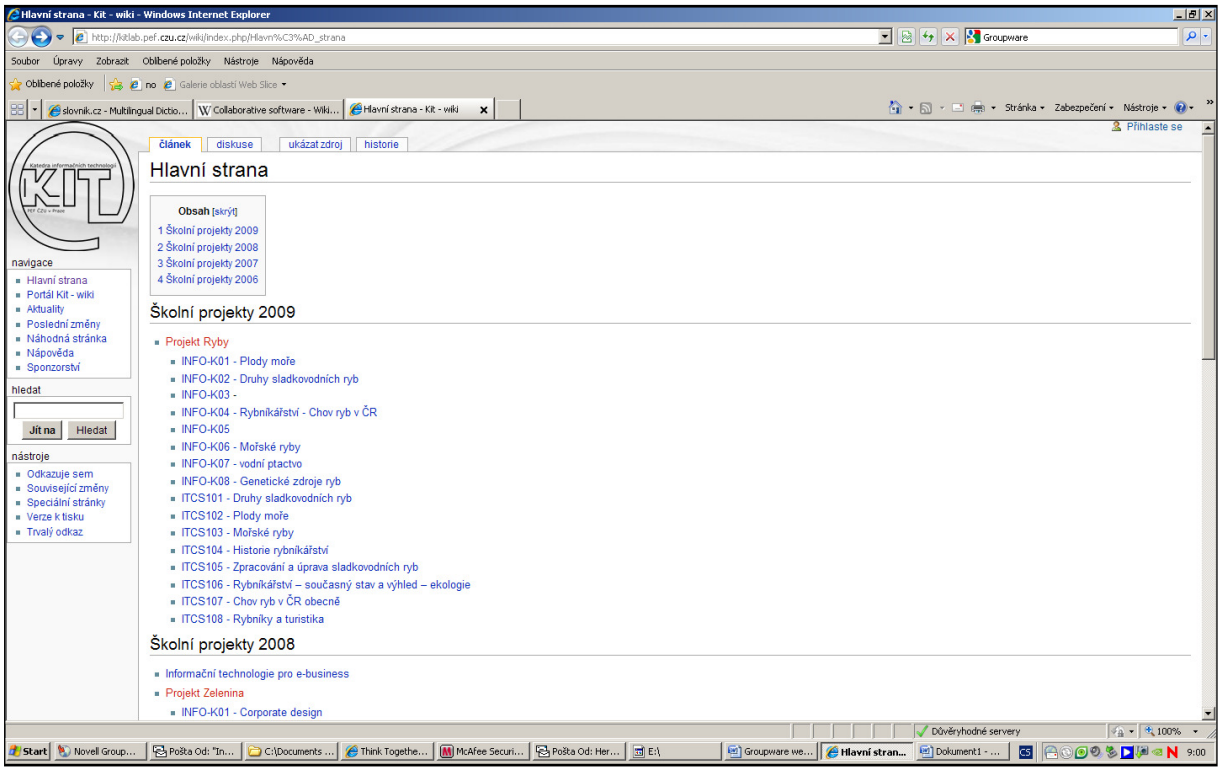

Figure 5: Wiki application at the DIT, CULS Prague.

Function	Activity	Evaluation
Coordination	All participants have the same rights .	The system manager only supervises and usually does not interfere. Wiki avoids obligatory registration procedures.
Cooperation	Shared space for editing and inserting content	Shared space can be easily updated and supplemented
Communication	Communication is off-line	Communication is generally anonymous, but it is possible to set the rights (limitations) for individual users

Table 4: Evaluation of the Wiki technology.

Content Management Systems

CMS (Content Management System) represent the software for the management of documents. It's most frequent use is in the area of the web content management, where the letter W is added before the CMS abbreviation, i.e. WCMS. CMS can also be described as an editorial or publication system. Its main functions include editing and publication of documents which usually takes place in WYSIWIG (What you see is what you get) of the text editor. The management systems make it possible to publish important information (documents, tasks) on www. At the same time the published content can be classified for different audiences (marketing, management, businessmen, etc).

In respect of its functionality each CMS has two parts: the users interface (frontend) and the administrator interface (backend).

The basic administrator functions of CMS include:

- publication of documents (articles),
- administration of users, including the management of access rights to the documents,
- administration of files (documents, images or galeries),
- management of modules which can include e.g. discussion forums, chats or calendars.

There is a great range of selection from amongst the CMS systems. Many CMS's are offered as free software but often various commercial solutions are being offered. Systems for the administration of contents vary by their range, purpose of use and technology. The most frequent combination of applied technologies is the PHP programming language and the MySQL database.

Examples of WCMS systems which are distributed as OSS (Open Source Software):

- E-learning – LMS (Learning Management System) - e.g. Moodle system,
- Communication tools, e.g. Wordpress which aims predominantly at creating and administration of personal pages and blogs. It is a multiplatform publication system which is based on the GNU GPL licence. Its advantages include easy operation, simple administration, easy distribution and output quality,
- Commerce – e.g. the Joomla+ ZenCart system used for administration of a small electronic shop.

Result of WCMS

Web Content Management System (WCMS) are suitable for publication and updating contents on www and sharing views on published content. The systems usually use a variety of graphic templates.

Social networks

Social networks represent specific environment for their users. They concern a location in which communication and presentation of views takes place. Social relationships are created here and to a certain extent the user lives here. A social network can also be a source of ideas and can contribute towards sharing and creation of knowledge.

The social networks bring a possibility of profit for their user. The users have their wishes, requirements, they get informed, but they also shop. The social network has a potential for using

Functionality	**Activity**	**Evaluation**
Coordination	Managed publication of messages	Easy updating of the web content
Cooperation	Minimal, only through discussion groups and chats	Shared space is used predominantly by administrators
Communication	Communication can be online – chats or in the form of discussion group	Communication is focused towards the published content

Table 5: Evaluation of the CMS.

targeted advertisements. The operators have a relatively great quantity of information about their users and direct marketing in this environment gets a new shape.

From 2008 to 2009 there was a repeated statistical survey which concerned the knowledge of students in the area of social networks.

The surveys of the world social networks of Facebook, LinkedIn and MySpace show that between the two years the awareness of the Facebook social network experienced the fastest growth – by more than 65 percentage points. That means that Facebook isnow known by practically all students. The percentage of users of this social network has grown to the value of 72, that is almost three quarters. Usage of the Czech social networks has experienced a significant fall.

The most frequently used network of the students – Spoluzaci.cz (= fellow-students) dropped by almost nine percentage points, while the other networks were also weakening. In the second place there was the only more important network which boosted its strength – Rajce.net (= tomato). It is practically a specialized network for sharing photographs. Its growth is probably due to its specialisation, simplicity of use and usefulness.

Result of Social networks

Social networks are a suitable platform for an exchange of views and for making contacts with other people with similar interests. Sharing the contents ranges from easy to dangerous.

Technologie Google Docs

The new technologies from the Google Company include several web applications (which are described as Google Apps), the functions of which are similar to those of the common office applications. Google Docs is the best known one.

This technology serves the individual as well as collective creation, editing and sharing of documents (texts, spreadsheet files, presentations and questionnaire forms). Any registered user of Google services can use them free of charge without the necessity of having to install anything

on their computers. The only condition is having a browser with permitted JavaScript. Google Docs can cooperate (import and export) with the most widely used text editors (Open Office, MS Office) and provides very similar options (basic functions and formatting).

The advantage of Google Docs is the option of a number of users being able to work on the same document simultaneously (changes are dynamically displayed on the screens of all simultaneously working editors). Another advantage is the option of an easy publication of the resulting document on the Internet. Due to the increasing number of options Google Docs is also becoming an alternative for the common text editors, spreadsheets and presentations.

Function	**Activity**	**Evaluation**
Coordination	Creating networks (groups)	Every participant can join some network (group). Management within the framework of a group is minimal.
Cooperation	In groups. Every participant has “friends“	Groups are virtual and the published content can be misused
Communication	Communication is very easy and direct	Communication is sometime supported by amusing elements and advertising

Table 6: Evaluation of social networks.

Function	**Activity**	**Evaluation**
Coordination	Collaborating team generates documents	Whoever creates (starts) a document can give rights to other participants for updating the content
Cooperation	Creating a joint document	Changing the document is accessible to all co-authors

Communication	Communication is very easy by means of the web browser	Communication (editing documents) is similar to that in the common text editors

Table 7: Evaluation of the Google Docs technology.

Result of Google Docs

Google Docs technology is suitable for the creation, editing and sharing of various types of documents. It brings the greatest advantages for team collaboration on the same document. The users interface is similar to that in the common office applications.

Conclusion

On the basis of analytical comparison of several typical products from the area of the systems for the support of collaboration it is possible to present the following conclusions – recommendations.

Ever more frequently there are tendencies towards the shared data spaces being saved "somewhere", but we do not know where. However, we have access to these data anytime and from anywhere. The so called clouds are being formed, abstract places with many computers which are distributed at many locations. The network applications, such as Google Docs or Microsoft Live Mash, require from the user's end only a quality Internet connection, but the saved data are not quite under the control of the users.

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Product	**Advantages**	**Disadvantages**	**Recommendation**
Novell GroupWise	Central administration of users and their access rights. It enables a managed flow of messages transfer	Disadvantage for a full use of the system is the necessity of having to install the software at client side	Comprehensive commercial tool for team collaboration. Similar to MS Exchange or Lotus Notes
Discussion groups – eg. Moodle Forum	Tool for an informal exchange of views	Unmanaged discussion group can become congested and messy	Standard tool for exchange of views
Wiki technology	Technology for the creation of structured content and its versions	It is necessary to ensure administration of users to prevent documents deformation.	Open Source product for the creation and publication of contents (eg. Wikipedia)
Systems for administration of content (WCMS)	For the publication and updating of content on www and sharing views on unpublished content. Systems usually utilize a variety of graphic templates.	A great range of a variety of products in many different versions.	There are several WCMS's (eg. WordPress, ZenCart) which are used for the creation and updating web sites.
Social networks	Platform for exchange of views and establishing contacts with other people with similar interests.	Sharing content is easy, sometime dangerous or can be misused.	Social networks are first of all a popular communication environment for the young generation. They are gradually becoming part of business.
Google Docs	For the creation, editing and sharing a variety of types of documents.	Nobody guarantees the content will be archived.	For team collaboration on the same document.

Table 8: Systems for collaboration - the final summary.

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