Review of collaborative software applications and integration with standard collaboration tools

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Abstract— **Collaborative software or groupware applications have become crucial communication channels for numerous companies all over the world. Nowadays it's really hard to keep track of huge amount of data and information that even small enterprises deal with. Knowledge management also plays a significant role in the whole story. Assuming all this, it is essential to know how those applications can help speeding up processes in almost every company, as well as making employees more productive. This review introduces some notable software solutions and possibilities to integrate them with the email. Furthermore, it provides both the comparison between given solutions and suggestions on what types of businesses are suitable for some of these applications.**

I. INTRODUCTION

Modern era which we live in brings a lot of challenges to everyone who is related to some kind of project management or any king of business coordination. A lack of time and high demands concerning productivity, force people to think about speeding up processes in their companies, but it's not all about speed it is also about quality. Speed and quality are often inversely proportional, and it's pretty hard to keep balance between them. To increase the quality it is essential to have optimal communication at the company level, and that is the point where collaborative software becomes necessary.

"To collaborate means to work together especially in some literary, artistic, or scientific undertaking," [1]. Communication and interaction, inside the group of two or more people working on a joint project, is crucial in order to get right results. Collaboration tools can boost these results since they can be helpful for improving aspects of communication. These tools are not required to be of technological nature, but in time where computers are dominant, regarding information exchange we get term collaborative software. Therefore collaborative software is an application created to help people obtain their business goals and to improve communication between team members, usually company employees [2]. Collaborative software is a term that was originally coined in the mid-1980s to describe computer applications that were explicitly designed to support team work [3].

There are three levels of collaboration [2], which should be part of every groupware application:

- Communication,
- Coordination,
- Cooperation.

For each of these levels there are corresponding collaboration tools. First in row, communication tools that enable information exchange between individuals. Coordination tools with a role to provide possibility of planning common activities and scheduling them. Finally, tools for cooperation supposed to enable group discussions, idea, and thoughts sharing in real time. A graphical overview of these tools is provided in Fig. 1.

Apparently, the presence of many of these tools can create confusion inside an organization and make monitoring of business tougher. To overcome that number of collaborative software applications are developed. These applications are mainly used for the purpose of unification of communication inside an organization and for the sake of better and more productive cooperation between its members. The main advantage of collaborative software applications is possibility of using more collaboration tools simultaneously in one place.

II. REVIEW OF COLLABORATIVE SOFTWARE APPLICATIONS

Collaborative software application is a broad term and there are so many products worldwide that can be referred as this kind of application. It is hard to keep track of all offered solutions on the web. In this paper we will focus on the most popular applications from November 2019 that are listed in Fig. 2, and explained it the rest of this section [4]. Some important features about these products are given in Table I.
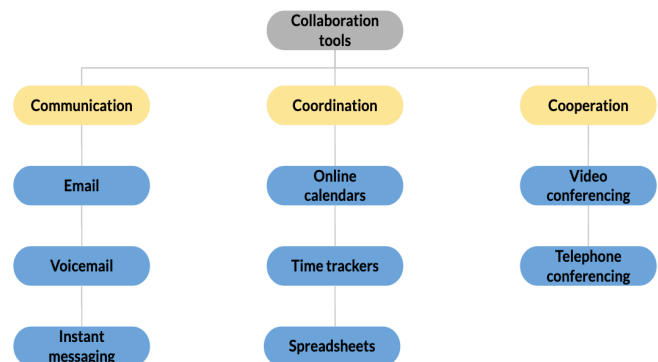

Fig. 1. Review and distribution of collaboration tools

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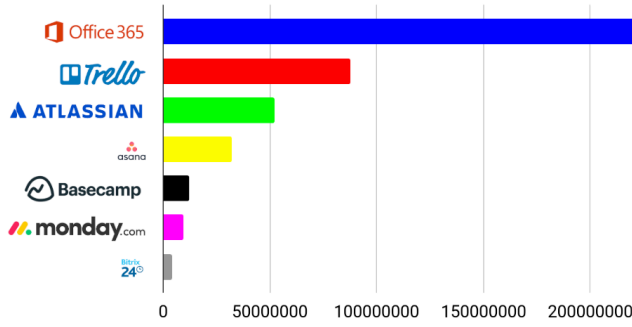
Fig. 2. Total number of visits in November 2019

A. Office 365 & Microsoft Teams [5]

Nowadays cloud computing dominates the world of technologies and many companies have realized the importance of it. Microsoft, of course, was one of these companies and that comprehension led to the Office 365 [6] first announcement in 2010. With this product they intended to gather all their products in one place and enable users to access it from wherever they want. With the addition of Microsoft Teams in 2017 Office 365 has become one of the most popular tools globally. Microsoft Teams is the fastest-growing application in Microsoft history, as they claim. Combination of everything that Office 365 offers makes this platform suitable for purposes of collaboration in business.

B. Trello [7]

Atlassian's Trello stands for a cloud-based application that uses the Kanban method of project management [8]. Trello users are capable of visually organizing projects into boards, dividing these projects into groups, and also dividing groups into tasks [9]. It was originally made by Fog Creek

Software in 2011.

C. Atlassian Jira [10]

This product is bug and issue tracking, and project management tool developed by Australian company Atlassian and initially released in 2002. It contains Jira Service Desk section which can be used as CRM application. Jira is primarily intended for software industry and is very popular in software developer community.

D. Asana [11]

Asana, created by former Facebook employees, is a personal task and project management application featuring tasks, projects, conversations and dashboards. Designed to improve team collaboration, Asana helps teams to manage projects and tasks in one simple tool. Users can create projects, make assignment to other users, specify deadlines, and share thoughts about specific tasks directly in Asana.

E. Basecamp [12]

Web-based project management application Basecamp, allows collaboration and file sharing including spreadsheets and text documents [13]. Basecamp was launched in 2004 by company 37signals, and its current release called Basecamp 3 is from 2014. Campfire an online chat service, originally from 2006 discontinued in 2013, is now part of Basecamp 3 as instant messaging system and can assure live communication inside a team.

F. Monday.com [14]

Monday.com is a web and mobile software platform, launched in 2010 in Tel Aviv Israel, which can be used for team collaboration, tracking projects, and task management. The product can be used for managing wide range of businesses.

TABLE I
SOME IMPORTANT FEATURES OF POPULAR COLLABORATIVE SOFTWARE APPLICATIONS

	Office 365	Trello	Atlassian JIRA	asana	Basecamp	monday.com	Bitrix 24
Cloud version	✓	✓	✓	✓	✓	✓	✓
On premises	✓	✗	✓	✗	✗	✗	✓
Mobile application	✗	✓	✓	✓	✓	✓	✓
Desktop application	✗	✓	✓	✗	✓	✓	✓
Free version available	✗	✓	✓	✓	✓	✓	✓
File sharing available	✓	✓	✓	✓	✓	✓	✓
Instant messaging available	✓	✗*	✗*	✗*	✓	✗*	✓
Video conferencing available	✓	✗*	✗*	✗*	✗*	✗*	✓
Email integration available	✓	✓	✓	✓	✓	✓	✓

G. Bitrix24 [15]

Web service Bitrix24 is a popular system for organizing joint work in enterprises and relationships with customers, to monitor performances and automate work processes. Technically it consists of a several built-in modules, such as CRM (Customer Relationship Management), social networking, business processes, telephony, etc. [16]. Bitrix24 was launched in 2012 in Russia, and could be used either as cloud based or self-hosted application. The fundamental part of this application is the CRM system.

III. STANDARD FEATURES OF COLLABORATIVE SOFTWARE

Collaborative software applications are mainly robust products with number of options available, but customization may be their most valuable aspect. Majority of mentioned companies have opened their APIs to developers in order to get some extensions for their applications. Currently, many of pointed tools have a variety of extensions available for use, and with these it is possible to get one complete and optimized tool for collaboration.

A. Cloud storage

Plenty of cloud storage solutions are currently available on the market, and giants in software industry are the leaders in this field and it is generally known how important for everyone is to have reliable, fast and secure remote storage. Hardly there is someone that has not heard about Google Drive, Microsoft OneDrive or Dropbox. Speaking about collaboration in business it is impossible to imagine any kind of it without constantly sharing files between team members. That is the part of story where cloud storage tools become key elements. Each mentioned collaborative software has possibility of remote data storing that implies certain space available to the end users. Free versions of course have limited space, but in paid versions available space can be expanded. Also with lot of available extensions it is pretty simple to connect each of considered tools with conventional cloud storage solutions like Dropbox or Google Drive. Activation of these extensions provides easier manipulation of stored documents. Usually these extensions can be easily found inside application interface. Finally, common use of collaborative software applications and cloud storage solutions makes better overall user experience.

B. Instant messaging and video conferencing

One of the most important aspects of collaboration definitely is live communication, especially instant messaging or video conferencing. It is crucial to have this kind of tools for achieving faster information sharing and organizing live meetings. Several of the considered applications (tick mark) have embedded tools for live communication and other (cross mark with asterisk) can obtain it from the extensions (Table I).

C. Notifications

There are two standard types of notifications for almost every software that is going to be mentioned in this paper, notifications through an email and push notifications through a web browser. Just like in the other fields collaborative software applications give a lot of freedom for customization, and it is pretty easy to set how frequently to get notifications and on what triggers notifications should be sent to the users. Of course notifications can be disabled totally.

IV. INTEGRATION WITH EMAIL

Electronic mail has huge historical and cultural importance for the world we know today. Considered for one of the pioneers in communications since internet beginnings, email established itself as one of the most popular ways to collaborate in business and it has been like that for many years. Recently, the fall in its popularity has been noticeable, but not big enough to stop people using it. Actually, the use of this way of communication is still pretty big. However every collaboration tool application has a proper way to integrate with email and that makes them acceptable for companies which communication is mainly based on email.

Comparing mentioned tools it is completely clear that Office 365 leads the race, and it is not hard to imagine why. The answer is Microsoft Outlook, the most popular email client application ever. Microsoft has been developing this tool for twenty or more years, and of course it has been included in Office 365 package since the very first introduction in the year of 2010.

The key for successful collaboration is exact and timely information sharing between members. Previously has been said that collaborative software applications can help users to achieve this. If team communication is based on email at the most, it is necessary to integrate collaborative software tool with it. The main purpose of integration definitely has to be making communication easier and more accessible to different team members.

A. Trello with email

Trello offers possibility for creating and following tasks just by forwarding email to the specified email address for given board. The address can be found inside board properties. Whole further communication is stored as part of the board. By simple recognition of email subject Trello knows which task is connected with ongoing conversation and where to keep messages. Each next email happens to be comment on previously created task. Unfortunately all mails that have not been copied to the specified email address are not visible to Trello and that can be considered for the main disadvantage.

B. Asana with email

Asana gives users two main options how to use email with the application. To create a new task inside specific project users should send email from previously assigned address. The other option implies creation of conversations for specified project by emailing [team-name]@mail.asana.com. It is possible to have multiple teams on a single project. Later on, users can follow the conversation in Asana's interface and take part in it.

C. Jira with email

Atlassian's Jira is also similar to previously considered tools regarding integration with email. Jira has more impenetrable interface than the other solutions, but also has one nice feature which makes it more attractive to end users. The main advantage over the other tools is some kind of automatization in task creating. In Jira it is possible to assign an email address that should handle with some requests and automatically create new tasks (issues). By adding comments on certain issue team members can communicate with each other or send response to the clients.

D. Basecamp and monday.com with email

Both Basecamp and monday.com are very similar to the Trello and have literally the same possibilities for integrations. Should be noted that is pretty simple to integrate monday.com with gmail and get similar automatization to one described in Jira. Just like in Trello the main flaw is the need for constant forwarding of emails to the specified address.

E. Bitrix24 with email

This product is actually pretty different from other tools described above regarding integration with email. Bitrix24 can be used as an email client by using section Webmail which is only available in paid versions. Users can receive and send emails from Bitrix24 just like from the Outlook or any other client application. The conversation can be transferred into CRM section in Bitrix24 and after that it becomes available to every authorized team member. There is also an option to create tasks just like in the tools previously described.

V. Choosing the right tool

Choosing the right tool for collaboration is often a tough decision for almost every enterprise regarding how hard is to determine the needs of group. The decision should not be made prematurely. First of all it is necessary to define a good project task that would lead to the best possible decision on what tool to choose. Creation of the project task is the crucial part of implementation of collaborative software tools to an enterprise, and usually lasts longer than the implementation. A good project task implies knowing or defining all processes within a company. To define the process correctly it is necessary to include as many as possible participants of the process in conversation about the process itself. After listening to the various opinions about the process it should be easy to create its pipeline.

In order to facilitate the choice, a company should be structured properly and if possible with predefined teams within itself. It should also be taken into consideration if the chosen tool would be the primary way of communication or it would be used side by side with another. The decision should be evaluated taking into account the number of employees and the field on what company operates.

VI. Conclusion

After meeting fundamental features of groupware software applications through this paper, and getting basic information about each of them it should be easier to understand the purpose of these applications. The described tools cannot meet every single requirement set by different types of teams and businesses. Before choosing any of these, it is very important to analyze needs and processes inside a company. Hopefully this paper would make easier the decision on what collaborative software to choose.

The author suggests using Trello and its alternatives Asana, monday.com or Basecamp for smaller teams and for businesses that does not require communication with external associates. For software companies Jira looks like a perfect solution not just because of advantages described here, but because there are so many other helpful features created for developers. Commerce business companies should consider using Bitrix24 simply because there is a CRM section available. Finally, for bigger teams and for those businesses that require communication with external associates Office 365 seems like a fair solution.

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