

PROJECT, DESIGN AND MANAGEMENT

ISSN: 2683-1597



How to cite this article:

Borges de Amorin Amorin, D. F. (2021). G Suite As a solution in collaborative, academic and professional work tools *Project, Design and Management*, 3(1), 28-40. doi: 10.35992/pdm.v3i1.515

G SUITE AS A SOLUTION IN COLLABORATIVE, ACADEMIC AND PROFESSIONAL WORK TOOLS

Diego Felipe Borges de Amorim Amorim

Conselho Regional de Administração do Estado do Rio Grande do Sul (Brazil)

amorim@fgtas.rs.gov.br - <https://orcid.org/0000-0001-8259-5703>

Abstract. The wonders brought by innovations from cloud computing help collaborative productivity and work management processes, revolutionize the way we learn and work, mitigate boundaries, in addition to expanding services and reducing costs for companies and people globally. In this perspective, the objective of the present research is to present the G Suite functionalities as a productivity, storage and cooperation tool. In order to achieve the proposed objective, an investigation was carried out on the Google Docs application, understood as an essential tool in the creation, edition, management and sharing of office-type documents - office applications, which is part of the G Suite solution. This study was carried out exploring the Google Docs tool, as well as books, articles, websites, blogs and technical documents. The following was concluded, among other things: G Suite is a powerful and complex tool for productivity, storage and collaborative work, with Google Docs as its greatest exponent; the G Suite is the evolution of Google Apps, the latter representing free tools, including Google Docs; and, access to office type tools requires the user to have an active Gmail account.

Keywords: G Suite, Google Docs, Google Apps, Collaborative work.

G SUITE COMO SOLUÇÃO EM FERRAMENTAS DE TRABALHO COLABORATIVAS, ACADÊMICAS E PROFISSIONAIS

Resumo. As maravilhas trazidas pelas inovações a partir da computação em nuvem auxiliam nos processos de produtividade e gerenciamento de trabalho colaborativos, revolucionam a forma como aprendemos e trabalhamos, atenuam fronteiras, além de ampliarem os serviços e reduzirem custos para empresas e para pessoas à nível global. Nessa perspectiva, o objetivo da presente pesquisa é apresentar as funcionalidades do G Suite enquanto ferramenta de produtividade, de armazenamento e de cooperação. Para atingir o objetivo proposto, foi realizada uma investigação sobre o aplicativo Google Docs, entendido como ferramenta essencial na criação, na edição, no gerenciamento e no compartilhamento de documentos do tipo office – aplicativos de escritório, sendo este uma vertente da solução G Suite. Este estudo foi realizado explorando a ferramenta Google Docs, bem como livros, artigos, sites, blogs e documentos técnicos. Concluiu-se, entre outras coisas, o seguinte: (1) o G Suite é uma poderosa e uma complexa ferramenta de produtividade, de armazenamento e de trabalho colaborativo, tendo no Google Docs seu maior expoente;

(2) o G Suite é a evolução do Google Apps, este último representante das ferramentas de caráter gratuito, incluindo o Google Docs; e, (3) o acesso às ferramentas tipo office exigem que o usuário tenha uma conta Gmail ativa.

Palavras-chaves: G Suite, Google Docs, Google Apps, Trabalho colaborativo.

G SUITE COMO SOLUCIÓN EN HERRAMIENTAS DE TRABAJO COLABORATIVAS, ACADÉMICAS Y PROFESIONALES

Resumen. Las maravillas que traen las innovaciones de la computación en la nube ayudan a la productividad colaborativa y a los procesos de gestión del trabajo, revolucionan la forma en que aprendemos y trabajamos, mitigan los límites, además de ampliar los servicios y reducir los costos para las empresas y las personas a nivel mundial. En esta perspectiva, el objetivo de la presente investigación es presentar las funcionalidades de G Suite como una herramienta de productividad, almacenamiento y cooperación. Para lograr el objetivo propuesto, se llevó a cabo una investigación sobre la aplicación Google Docs, entendida como una herramienta esencial en la creación, edición, gestión y uso compartido de documentos de tipo office, aplicaciones de oficina, que forma parte de la solución G Suite. Este estudio se llevó a cabo explorando la herramienta Google Docs, así como libros, artículos, sitios web, blogs y documentos técnicos. Se concluyó lo siguiente, entre otras cosas: (1) G Suite es una herramienta poderosa y compleja para la productividad, el almacenamiento y el trabajo colaborativo, con Google Docs como su mayor exponente; (2) G Suite es la evolución de Google Apps, esta última representa herramientas gratuitas, incluidos Google Docs; y, (3) el acceso a las herramientas de tipo oficina requiere que el usuario tenga una cuenta de Gmail activa.

Palabras clave: G Suite, Google Docs, Google Apps, trabajo colaborativo.

Introduction

Cloud technology has revolutionized communication and transactional ways between individuals across borders. It enables collaborative work in a variety of ways, including the formation of high-performance remote work teams. It is not limited to this, of course, but encompasses functionalities that go beyond the business environment, through scientific academies and on to the individual working and/or studying alone. Regardless of the environment in which this technology is inserted, it is responsible for satisfying a diverse range of demands that extends from businesses to governments to individuals.

An appropriate conceptualization of cloud technology is that it is Internet-based computing in which shared resources (such as hard disks for storage) and applications are offered to multiple devices (such as a computer and/or PDA, for example) on demand, as a public utility (Turban and Volonino, 2013). In other words, it is the distribution of computing services-servers, storage, databases, networking, software, analytics, intelligence, and more-over the Internet, providing faster innovation, flexible resources, and economies of scale (Microsoft, 2018).

The idea of cloud computing is to store applications and information in the providers' data centers instead of on the company's local servers. This cloud concept refers to data sources stored outside the customers' internal network (Turban and Volonino, 2013). The concept of cloud computing is a type of RIA - Rich Internet Application,

which is nothing more than software that has the functionality and complexity of traditional application software but runs in a web browser and does not require local installation (Stair and Reynolds, 2011). Google Apps - redesigned as G Suite and the subject of this research -, for example, provides common business applications online, accessed via the web, while the software and data are stored on servers (Turban and Volonino, 2013).

The way in which this technology has emerged converges with the new labor and educational needs and realities that transform the means and methods of learning and the working relationships of individuals as a society. Coupled with the tangential advance of information, media, and technological tools that support decision making in increasingly complex and dynamic environments, these technologies are capable of transforming the way we communicate, learn, and work in such a way that distance becomes merely a negligible element. The move to cloud computing, especially provider-provided distributed hosting, is increasing with the introduction of new applications (Turban and Volonino, 2013). This means that these advances break traditional paradigms and open space for the new to emerge and reveal itself from emerging innovations, generating new paradigms.

For this research, the focus will be on the type of service known as SaaS -*software as a service*-, which is a method of distributing software applications over the Internet on demand and generally subscription-based (Microsoft, 2018; Turban and Volonino, 2013). In other words, SaaS is a type of solution dubbed software-as-a-service, in which cloud providers host and manage the software application, its underlying infrastructure, and perform maintenance, such as software updates and security *patches* (Microsoft 2018; Turban and Volonino, 2013). Access to this service is remote, and the user only needs to connect through the browser (Google Chrome, Mozilla Firefox, Safari, or Microsoft Edge, for example) from any device (computer, *tablet*, or *smartphone*, for example) connected to the internet. In the case of G Suite, the subject of this research, the target will be the free service provided by the company Google®, although the focus of this tool is directed, more explicitly, to the corporate branch.

Therefore, the object of inquiry of this research is: what is G Suite, how can it contribute to collaborative work, whether in the academic or professional environment? Pointing out that the main focus will be on the free version of this tool, although the payment option of this business technology solution will be detailed. Thus, the functionality of this integrated solution of technological resources will be presented, highlighting Google Docs as part of this solution and emblem of collaborative work, both academic and professional.

Methodology

This research is characterized as applied in nature, since its objective is to generate knowledge for practical application aimed at solving specific problems, involving local truths and interests (Prodanov and Freitas, 2013). From the point of view of the objectives, this study is characterized as exploratory because it aims to give more knowledge to the problem in order to make it explicit or build hypotheses (Gil, 1988 *apud* Bertucci, 2012). As for the technique used in this research, it is defined as a case study because it is an empirical research that ascertains a contemporary phenomenon within its real context, especially when the boundaries between the phenomenon and the context are not clearly defined (Yin, 2001 *apud* Prodanov and Freitas, 2013). Thus, the objective of this research

is to describe the use of the G Suite tool as a solution in collaborative, academic, and professional work.

To achieve this objective, the literature review as a structuring object of the foundation of the proposed topic focused on documentary research, consisting of the search for diverse information, both technical and qualitative, according to the reading of books, articles, specialized websites, blogs, and specific documents, for the purpose to analyze and interpret the existing paradigm (Bertucci, 2012). In order to develop the topic in alignment with the objective already qualified as exploratory, the present research was outlined in synchrony through the use of the technological tool G Suite, in order to test it. That is, this work was written entirely through the Google Docs application. The latter, being one of the essential tools that incorporates the platform of technological solutions for productivity, development, and collaborative work known as G Suite and offered by the company Google®.

It is worth noting the lack of informative sources on the subject, something that is noticeable even in the few manuals on the concept and its operation within the Google® site itself. Although technological themes and innovations have a habit of reaching the market at an ever-increasing speed, this does not mean that their potential for use can be fully exploited. This is something that happens, recurrently, with the use of free software - which has its shortcomings due to its defective or even nonexistent documentation (Amorim, 2015). It is in this sense that the present research conditions the possibility of discussing the use of this technological tool nicknamed as G Suite, describing its operation and disclosing its usefulness.

Results

Introductory procedures

Google® can be characterized as an Internet *Service Provider* (ISP) that provides individuals and organizations with access to a robust set of services. It has free and paid commercial and non-commercial services (Stair and Reynolds, 2011; Baltzan and Phillips, 2012). In other words, it is a service-oriented company with a complete infrastructure (servers, storages, software, datacenters). Web services encompass all the technologies used to transmit and process information over a network, more specifically the Internet (Baltzan and Phillips, 2012).

In the specific case of the object of this research, in order for the user to have access to the basic services offered by the Google® company, it is necessary to create an email account - specifically a Gmail account. This is the company's official email and is the basic procedure for the user to enjoy the set of productivity tools offered by the company. Once logged in, the user has access to a broad platform of services including office applications, storage, and collaborative work. For this research, in particular, G Suite as a platform of integrated solutions and Google Docs as a specific tool for collaborative work will be detailed. These technological tools are described below.

G Suite

G Suite can be defined as a suite of solutions in productivity tools (office automation) based on cloud technology, i.e. a diverse set of Google® products aimed at both businesses and individuals. It replaces the former Google Apps and has a set of web-based applications with features similar to traditional office suites, such as Microsoft *Office*® and *LibreOffice*, for example. It contains a set of integrated online productivity

tools, such as email, calendar, *office*, storage, video calls, etc. Based on cloud technology, such a service is active 24/7 and can be accessed from anywhere, anytime, and from any device connected to the Internet (Wikipedia, 2018; Rhous, 2018).

G Suite offers cloud storage solutions, productivity tools, and collaborative work, being a diverse set of applications (software) developed by Google® with very popular free versions, such as Gmail, Google Drive, and Google Docs, for example, in addition to the paid version, which accumulates a set of additional features oriented to commercial use. The commercial G Suite trial is free for 14 days. After that, the most basic service package is paid and has a fee of \$6 per user/month (Wikipedia, 2018; Rhous, 2018). The prices of the service packages are illustrated in Figure 1.

PACOTE	Basic	Business	Enterprise
PREÇO	R\$24,30 por usuário/mês	R\$48,60 por usuário/mês	R\$112,00 por usuário/mês
SOLUÇÕES	e-mail comercial	e-mail comercial	e-mail comercial
	videoconferência e chamada de voz	videoconferência e chamada de voz	videoconferência e chamada de voz
	mensagens	mensagens	mensagens
	agenda	agenda	agenda
	pacote of fee	pacote of fee	pacote of fee
	30gb de armazenamento na nuvem	desenvolvimento de aplicativos	desenvolvimento de aplicativos
	suporte 24 horas, 7x7	armazenamento na nuvem ilimitado	armazenamento na nuvem ilimitado
	controle de segurança e administração	suporte 24 horas, 7x7	suporte 24 horas, 7x7
		controle de segurança e administração	controle de segurança e administração
		recurso e-discovery	recurso e-discovery
		definição de políticas e relatórios de auditoria	definição de políticas e relatórios de auditoria
			prevenção, hospedagem, integração, controle, análise

Figure 1. G Suite pricing by package type

Note: Source: Google® (2020).

On the other hand, the non-commercial version (the most popular) is completely free and offers a solid range of office tools, cloud storage, and collaborative work solutions. The entire suite of applications including search engine, email, calendar, storage, video calling, translator, GPS, and blogging are offered for free up to the 15gb storage limit (Google, 2020). Beyond this limit, Google® charges a fee as shown in Figure 2.

PACOTE DE SERVIÇOS	
ARMAZENAMENTO	PREÇO
15gb	Gratuito
100gb	R\$6,99/mês
200gb	R\$9,99/mês
2tb	R\$34,99/mês
10tb	R\$349,99/mês
20tb	R\$699,99/mês
30tb	R\$1049,99/mês

Figure 2. Price according to the storage to be contracted.

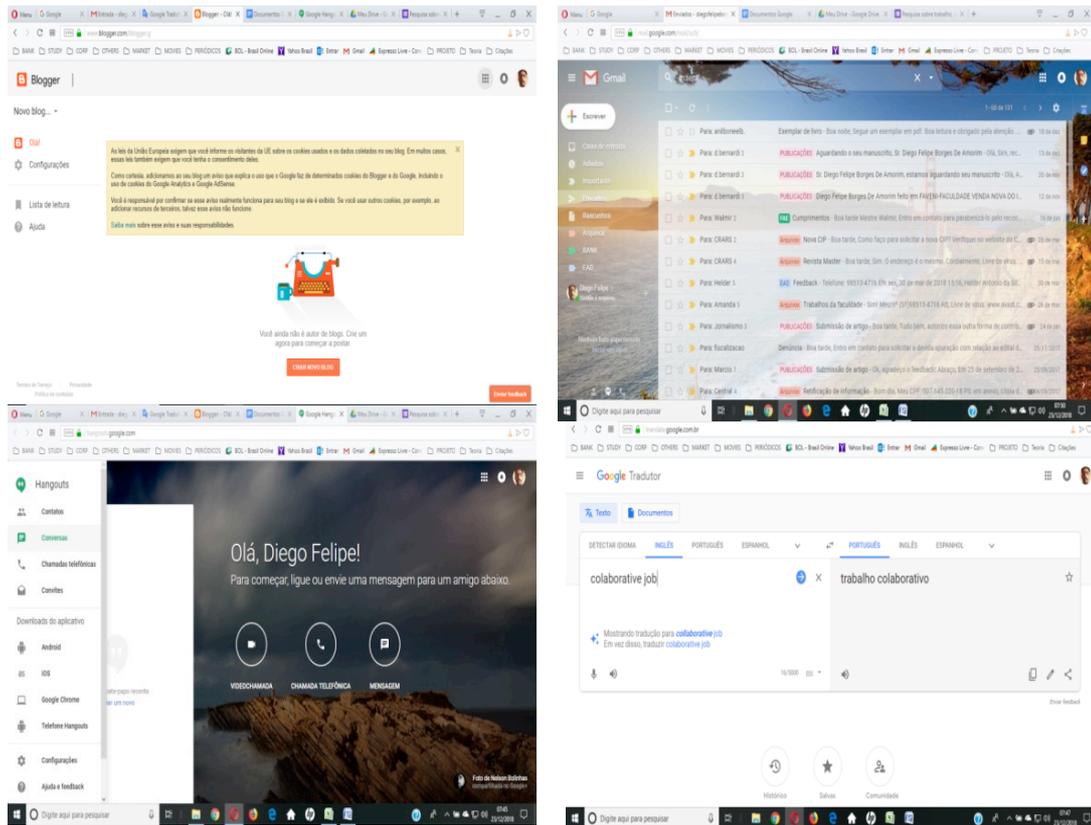
Note: Source: Google® (2020).

To access the package of free services offered by the company, reinforcing what has already been said, the user must create a Gmail account. From a valid username and password, the user has access to all the most basic tools that support productivity, storage, and collaborative work, as already specified. Below we will summarize some of these main tools mentioned that make up the free service package.

Basic tools and Google Docs

From a valid email, when logging into the system, the user can avail a wide range of free and integrated services in a single platform, including connection tools (Gmail, Calendar, Google+, Hangouts Chat, and Hangouts Meet), creation (Google Docs, Google Forms, Google Sites, and Blogger), and access and storage (Google Drive). The system interface is quite intuitive and user-friendly, being easy to use (Botacim and Athayde, 2018).

When it comes to collaborative work, for example, the user can count on tools that will allow an excellent level of information flow, such as chat and video conferencing through the Hangouts application. In it, it is possible to combine voice, video, and audio transmission, reducing steps with travel and time, increasing efficiency in management communication through quick responses, access to more people, and less duplication of efforts due to geographically dispersed locations (Stair and Reynolds, 2011). Figure 3 illustrates some of the designs of some of the G Suite tools.



*Figure 3. Home pages of some Google Apps tools.
Note: Source: the author.*

Google Docs, on the other hand, can be identified as the application most inclined to collaborative work, as it brings together a suite of productivity software such as documents, spreadsheets, forms, and presentations. It is considered a shareable workspace where authorized project members and colleagues can share documents, problems, templates, spreadsheets, photos, and other forms of information to keep up to date on project status or topics of common interest (Stair and Reynolds, 2011). For logical reasons, this optimizes work time and space constraints, facilitating the collaborative creation, organization, sharing, and management of this information. Figure 4 illustrates the concept presented.

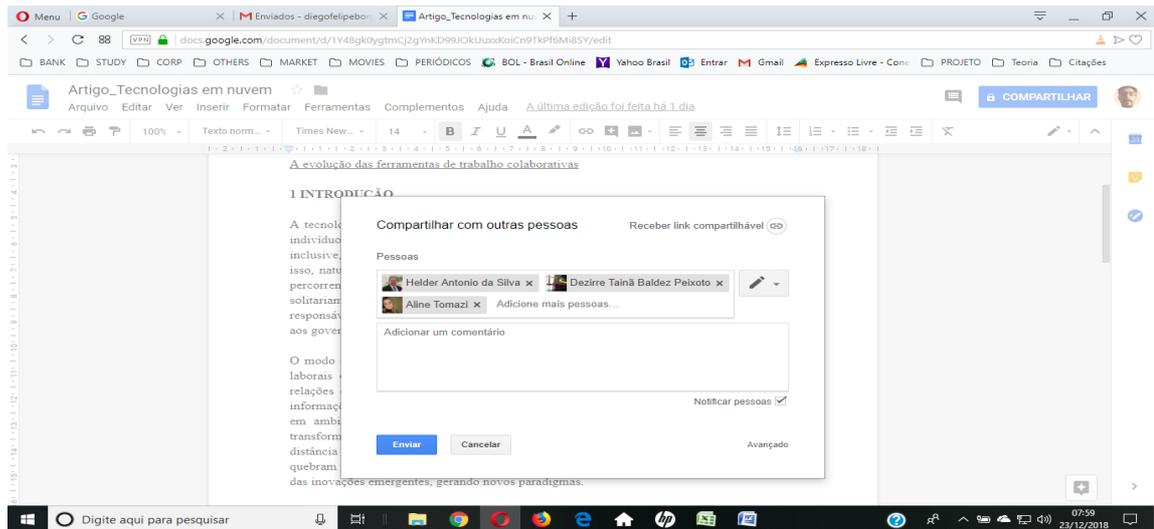


Figure 4. Layout of the Google Docs tool with sharing option.

Note: Source: the author.

By using Google Docs, the user has a complete basic tool for creating, storing, and sharing files in the different possible recording formats, which are compatible with the most traditional commercially available *office* programs, such as Microsoft *Office*® and Libre *Office*. Perhaps the most obvious perceived advantage, among all those already presented, is the possibility of having access to the file on different mobile devices, such as *notebooks*, *tablets*, and *smartphones*, as long as the file in question is stored in cloud technology and there is an Internet connection. On the other hand, the clearest disadvantage is the need to be online, since in offline mode there is no possibility to access the files stored in the cloud technology. When connected, the files are automatically opened and saved in the Google Docs application.

Web applications, collaboration and education environment

Online *office-type* applications - word processor, spreadsheet, and presentation creator - make it possible to create, edit, collaborate, and share documents over the Internet, which was previously only possible on the computer (Jorge, 2009). If in the past there were only two options: developing or acquiring the technology, there is now a third option: renting it through a permanent service base (Turban and Volonino, 2013). This leads to the encounter of cloud computing or cloud technology, which provides greater computing capabilities, such as web services that encompass all technologies used to transmit and process information through a network, more specifically, the Internet. (Baltzan and Phillips, 2012; Turban and Volonino, 2013).

In this sense, Google Docs can be identified as a collaborative system, since it allows its users to create, edit, manage, and share documents. A collaborative system is a set of IT-based tools that support the work of teams by facilitating the exchange and flow of information (Baltzan and Phillips, 2012). It has the power to solve various specific tasks such as business or non-business, academic tasks, online meetings, remote projects, etc. (Jorge, 2009; Baltzan and Phillips, 2012; Turban and Volonino, 2013). Another suitable definition says that it is a workgroup application, which is designed to support group work whether people are in the same location or globally dispersed (Stair and Reynolds, 2011).

This type of tool is very useful in the development of collaborative work (Jorge, 2009). Users can create, edit, manage, and share documents. As the content is stored on the Internet (cloud), it will be accessible to the users of the work group at any time and place. Specifically, within the Google Docs application, it is possible to define access parameters (Jorge, 2009; Botacim and Athayde, 2018), i.e., the owner member can define the level of participation of each project member, for example. Each time a group member contributes, it is possible to follow the modifications - Figure 5 - made to the work from the "version history."

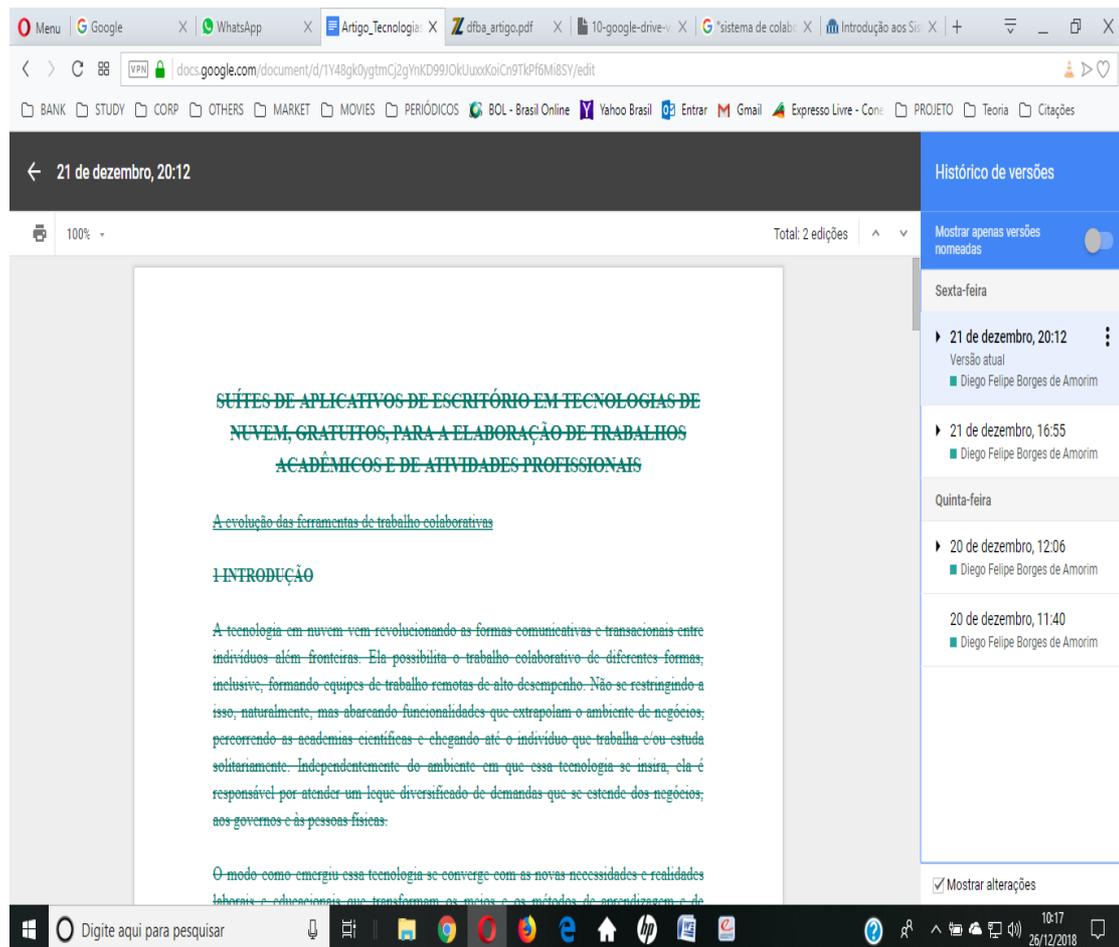


Figure 5. Version management within the Google Docs application.

Note: Source: the author.

The tool keeps track of the versions edited by each member of the working group, and the contributions of the participants are identified by color. Thus, the teacher can monitor the progress of the work and know the contribution of each student (Jorge, 2009). The moderator user (in the case of a teacher, for example), has the possibility of creating evaluation parameters according to the individual contribution of the working group. Each edited contribution to the project (document) is automatically saved by the system and can be retrieved at any time and place through a hyperlink generated by the application itself. Of course, in the case of individual use, the user will perceive the evolution of his work in the same way, because the platform is aimed at both collaboration and individual use by a student or an employee of a company.

The Google Docs package, although with less functionality than traditional software, has a constant updating of the tool, providing it with more and more themes,

options and features (Jorge, 2009). Moreover, an increasing number of software applications rely on online connections to support group documents and information sharing (Stair and Reynolds, 2011). Google® advances innovation in online services by creating robust and diversified web applications, including the sharing of documents, spreadsheets, presentations, calendars, and notes between workgroups. At the educational level, the tool can be used by a group of students working on a common project involving the creation of one or more types of artifacts: documents, spreadsheets, or presentations (Jorge, 2009).

Google Docs is an excellent tool for preparing texts, spreadsheets, and presentations, which can be prepared individually or collectively. Being able to become a collaborative space, the application favors collective work, providing advantages that can be used in an educational and professional context, as mentioned above. With an Internet connection, document creation, editing, management, and sharing are guaranteed. The secret of the success of cloud computing, among other things, perhaps lies in the fact that it maintains a virtuous circle of information that can be accessed anytime, anywhere. And sharing produces experiences capable of promoting ideas and solutions for the most diverse paradigms.

Therefore, the trend of cloud computing responds to the new global realities of learning, which require the insertion of various technologies in the educational process (Jorge, 2009; Stair and Reynolds, 2011). With distance learning programs and systems, teachers can easily create course *homepages* on the Internet. Students can access the list of course topics and books and the instructor's notes on the homepage (Stair and Reynolds, 2011). These are productivity web applications, videoconferencing, e-mails, discussion forums, chats, blogs, social networks, etc., that enhance learning processes and knowledge construction. Teaching and learning strategies that emphasize the importance of collaborative knowledge construction require tools that facilitate the collective production of artifacts in real time and in different places (Kasielewska, 2008 *apud* Jorge, 2009).

Discussion and conclusions

The purpose of this research is to describe the functionality of the G Suite web tool as an integrated application solution for connecting, accessing, creating, and controlling productivity and collaborative work. It focuses on the presentation of the Google Docs application as a tool oriented to cooperative work, both academic and professional. To do this, we followed a path that started with a brief explanation of G Suite and continued in more detail with Google Docs and its contributions to collaborative and educational environments. The elaboration of this study was structured on the restricted material available on the subject and on the use of the application, object of investigation of this research, by this researcher. Reinforcing that it was carried out exclusively within the web application called Google Docs, both for the construction of the text, as well as for the composition of the spreadsheet in which the tables and figures that make up this article were created.

It is understood that the objective of the present investigation has been fulfilled. Therefore, we conclude the following: (1) G Suite is a powerful and complete package of web services oriented to companies, so the products that make up this integrated solution can be customized according to the desired contracting. (2) Google Docs is a G Suite tool, being the most oriented to collaborative work, from the creation, editing, management, and sharing of documents with various recording extensions. (3) G Suite is the evolution

of Google Apps, reinforcing its commercial nature. However, the use of productivity, storage, and collaborative work applications can be accessed for free with some limitations as long as the user creates a Gmail account. (4) Google Docs is an excellent collaborative work tool with an intuitive and simple layout. Although its functionality is modest, it provides what is necessary to carry out work with minimum standards to be followed. On the other hand, it provides the advantage of having several integrated support tools, such as Gmail, Google Forms, Google Drive, Google Translator, and Google Hangouts. (5) This integration and conformity of solutions creates value in learning, education and work processes, collaborative or not. Google Docs becomes an environment for knowledge construction, management, and sharing, oriented to innovation. (6) A possible disadvantage of using cloud computing is the dependence on a continuous Internet connection. These applications cannot be accessed offline and that includes Google Docs.

As the evolution of technologies is becoming faster and more complex, and cloud computing is already a reality that should be better explored, we recommend an in-depth study of the other tools that make up the G Suite or those of the competition, such as Microsoft® Office Online, for example. Something that could be better explored, in addition, is the Google Classroom tool, since it is offered completely free of charge on the Google® portal. This could be a very relevant topic if refined with practical applications of successful cases in the implementation of these educational support tools.

References

- Amorim, D. F. B. (2015). Softwares de sistema e de aplicações livres: benefícios e limitações no uso dessas tecnologias nos negócios. *Revista Científica Semana Acadêmica*, 1(69), 1-25.
https://www.researchgate.net/publication/307924382_SOFTWARES_DE_SISTEMAS_E_DE_APLICACOES_LIVRES_BENEFICIOS_E_LIMITACOES_NO_USO_DESSAS_TECNOLOGIAS_NOS_NEGOCIOS
https://www.researchgate.net/publication/307924382_SOFTWARES_DE_SISTEMAS_E_DE_APLICACOES_LIVRES_BENEFICIOS_E_LIMITACOES_NO_USO_DESSAS_TECNOLOGIAS_NOS_NEGOCIOS
- Baltzan, P. and Phillips, A. (2012). *Sistemas de informação*. AMGH.
- Bertucci, J. L. O. (2012). *Metodologia básica para elaboração de trabalhos de conclusão de cursos: ênfase na elaboração de TCC de pós-graduação Lato Sensu*. (1st ed.). Atlas.
- Botacim, R. S. & AThayde, S. S. (2018). Google Drive no desenvolvimento de trabalhos acadêmicos na educação a distância. *Revista Científica Intelletto*, 3(1), 103-112.
<https://doi.org/10.17648/intellecto-2525-9075-v3-n1-10>
<https://doi.org/10.17648/intellecto-2525-9075-v3-n1-10>
- GOOGLE. (2020). *Uma forma simples de obter ainda mais do Google*.
<https://one.google.com/about>
- Jorge, N. R. (2009). *Contextos de aprendizagem 2.0: a utilização de ferramentas web 2.0 para uma aprendizagem em contexto*. Universidade Aberta.
- MICROSOFT. (2018). *O que é computação em nuvem? um guia para iniciantes*.
<https://azure.microsoft.com/pt-br/overview/what-is-cloudcomputing/>

- PRodanov, C. C. & Freitas, E. C. (2013). *Metodologia do trabalho científico: métodos e técnicas da pesquisa e do trabalho acadêmico*. (2nd ed.). Feevale.
- Rhous, M. (2018). *G Suite, o que é?* <https://marcosrhous.com/g-suite/>
- Stair, R. M. and Reynolds, G. W. (2011). *Princípios de sistemas de informação*. Cengage Learning.
- Turban, E. and Volonino, L. (2013). *Tecnologia da informação para gestão: em busca do melhor desempenho estratégico e operacional*. (8th ed.). Bookman.
- Wikipedia. (2018). *G Suite* https://pt.wikipedia.org/wiki/G_Suite

Receipt date: 07/22/2021

Revision date: 03/24/2021

Acceptance date: 03/29/2021