

Implementation of a digital transition process for the documentation of an alumni association

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Abstract — Often consisting of stacks or boxes of disordered documents, stored in cabinets full of boxes and papers, files tend to be evaluated only as an administrative requirement. With the recognition of the importance of documentary memory, the opportunity arises for a new approach to this type of resource. Lean originated in the manufacturing industry, aiming to maximize customer value while minimizing waste. Ever since, lean tools have been increasingly used in several fields, namely in the office environment, giving rise to the so-called lean office. Their principles can be applied to any type of office, from administrative and support functions to product development and customer service. On the other hand, digitalization can be a key enabler of lean office principles since it can help to automate and streamline processes, reduce errors and waste, and improve the flow of information. For instance, in associations with several members, digitalization can provide improved member engagement, enhanced event management, increased efficiency, and also a greater reach with members. Herein, the Former Students Association of the Industrial and Commercial School of Braga members' information was gathered and organized into a digital file. The increase in the number of members over the last few years led to the need of digitizing their data, in order to improve the alumni association management.

Keywords – *Lean office; members; digitalization; management; documentation.*

I. INTRODUCTION

The lean office is based on the principles of lean manufacturing, which emerged in the automotive industry and since then have been applied to many other fields [1–3]. In brief, this aims to reduce waste and improve efficiency and increase productivity in workflows, by identifying and eliminating non-value-added activities and processes, and restructuring and improving the remaining ones [1,3]. Furthermore, the lean office can help to create a more positive and empowering work environment for employees, which can be translated into more agile, flexible, and responsive organizations to their needs [4].

Digitalization, for instance, can help support and enable the implementation of lean office principles and practices in the office environment. Over the years, the world has become mainly digital. Digitalization of information has increased, and this has been paramount to improve efficiency, accuracy, communication, and agility in a wide variety of fields [5–7].

Furthermore, information is more accessible and it can be preserved for future generations [5].

On the other hand, digital transformation refers to how digital technology can be used to change the way that businesses operate and deliver value to customers [8–11], a field that has been greatly explored [12–14]. In a recent study conducted by Tuukkanen et al [15], the authors investigated which cultural values play an important role in digital transformation in a small company that works in the information and technology field. Nine organizational values were identified (Dynamic responses to changing environmental demands; Strive for organizational development; Affinity towards the organization; Continuous learning; Tolerance towards mistakes; Openness towards calculated risks; Trust between the company and its client; Trust within the organization; and Cooperation within the organization), being the Affinity towards the organization identified as a new value in small companies. On the other hand, Freitas and Freitas [3] aimed to identify the main factors of information organization in lean office deployment contexts, having identified the “information-seeking,” “access to information,” “information quality,” “information processing” and “use of information and communication technology”. Another interesting study was performed by Macedo et al. [16] in which the relationship between the company's adoption of new technologies in continuous improvement and, gender, education, age group, and the years on the company, during the Covid-19 pandemic and its challenges was evaluated. The findings showed that all these factors had an impact on the effective adoption of those tools by the company. Also, the results showed the new technologies allowed a good functioning of the company in terms of continuous improvement while working from home. The use of lean tools in the academic environment has also increased [17,18]. For instance, Magalhães et al. [18] applied electronic standardization to improve processes in a postgraduate office of the department. The results were promising in terms of the efficiency of files and data search time, forms' development for student registration and project management, input times, and information processing among other benefits. In general, regardless of the scope, digital transformation can provide significant improvements to organizations in terms of performance indicators.

Given the advantages of digitalization, the present work shows the problems that the Former Students Association of the

Industrial and Commercial School of Braga has faced in the organization and management of its members' data, as well as how the existing information of the members has evolved since the creation of the association until the present times. Furthermore, the measures applied to improve the previous points are presented. Finally, some points of the work intended to accomplish in the near future are given.

II. CURRENT SITUATION ANALYSIS

This section presents the current situation and the problems diagnosed that resulted from direct observation, meetings with the association's staff, and documentation analysis.

The Former Students Association of the Industrial and Commercial School of Braga is a Portuguese private institution of social solidarity. This means that it is a non-profit institution, constituted exclusively on the initiative of individuals. The soul and heart of an association are and will always be its members. Therefore, every two years, these elect among their member colleagues, the association's board who will voluntarily guide the future of the association and guarantee the best for everyone. This association started in 1985 following the celebrations of the local industrial school centenary. From a group of alumni who decided to start an alumni association, in 1986 the association was formalized and started to engage members. From 1986 to 2022, passed through the association 1300 associates, which resulted in several files folders with its members' forms.

During the development of this project, several problems were detected, mostly, related to how the members' information has been managed by the association.

A. *Lack of a members' digital record and disorganization of members' archive*

The project focused on the study of information relating to the members of the association of former students of the industrial school in the city. To ensure the daily functioning of the association, the secretariat employee has folders with the forms of current members and a computer system with the invoicing program. Another folder has been used to archive forms of members who are no longer active, due to withdrawal or death. Additionally, there is one archive in two cabinets with paper files and several folders relating to members.

To understand the organization, the staff was asked to identify the archive procedure. As the secretariat employee had only been in office for a few months, it was explained to the project team that most of the archive was the responsibility of the previous employee and that it was organized by folders/themes: dues, application forms, non-active member forms, receipts payment for activities in the association, and correspondence.

When questioned about the age or profession of a particular member of the association, it was found that this information is only obtained by directly consulting the member's file. It was noted that this query requires searching the member's name in the invoicing program into the computer system, identifying the member number, and, subsequently, locating the member's form in the paper.

Additionally, when asked about the number of active members, the secretariat employee told us that it would be

difficult to provide this information but that, alternatively, she could access the invoicing program and create a list of members currently carrying out activities in the association.

The next step was to go through the members' archives on paper. This task was not easy because the members' information was dispersed into several folders and boxes, many of them without identification. It was noticed that the archive lacks a formal organization, with members' forms without a physical filing system.

B. *New member entry procedure*

Since the beginning of the association, it was defined that each new member would be subject to the initial condition of completing a membership application or proposal. After the candidature submission, the board of the association assesses the candidate's merit and decides on his admission as a member. If accepted, the application form is filed, a membership form is completed and a membership number is assigned. If not accepted, the application form is archived. All application or member forms are on paper.

Only on May 22, 1988, the association decided to create and register its members in a Book of Association Members. The first 15 members were designed as "founding members" and all the others were registered in alphabetical order with the assumed date of May 28, 1985, with a total of 179 members registered. From this date onwards, members were registered in the Book of Association Members, as they signed up.

C. *Amendments to application forms and membership forms*

The analysis of the paper forms revealed different amendments over time. The first membership proposal and effective member forms were created and implemented in 1986. These paper forms were used until 1995, although they have been replaced by new ones.

Members were all registered on new sheets in 1994. These new sheets were used until 2013. New forms appear in 2013 and all active members were asked to re-registered again.

D. *Successive (re)numbering of the members*

The association members' forms showed several and different member numbers, crossed out and overlapping. A careful analysis reveals successive renumbering of its members.

The first renumbering of all members took place in January 1996. The main reason given for this renumbering was the need to remove all the non-active members in order to avoid expenses within contacts by mail. Of the 502 existing members, the list was reduced to 440 active numbers. All active members received a new number of association member and the form of non-active members were archived in a different folder.

The registration of new members continued up to the number 685 in November 2004, when a new renumbering was carried out. Of the 685 existing members, the list was reduced to 519 effective members. Again, the active members changed their numbers.

In September 2008, a 3rd renumbering was carried out. Of the 653 existing members, the renumbering reduced it to 516 active members. Again, the active members changed their numbers.

A new renumbering took place in 2016 (the fourth). Of the 800 existing members, only 450 active numbers remained with a different member's number.

The last renumbering was carried out in July 2022. Out of 572 members only 347 were considered active members and a new number was assigned to them.

The analysis of the members' archives made it possible to define a timeline associated with the organization of the members' information (see Table I).

TABLE I. TEMPORAL SEQUENCE OF MEMBERS' INFORMATION

Year	Event
1986	Implementation of the first membership proposal and the first effective member form.
1988	Creation of a formal Book of Association Members. All members are registered with the assumed date of May 28, 1985.
1994	Implementation of the second membership proposal and the second effective member form. All association members had to repeat the registration process.
1996	1st renumbering of members. All active members received a new association's member number and the form of non-active members were archived in a folder.
2004	2nd renumbering of active members.
2008	3rd renumbering of active members.
2013	Implementation of the third membership proposal and the third effective member form. All association's active members had to repeat the registration process.
2016	4th renumbering of active members.
2016	Implementation of the fourth membership proposal.
2022	5th renumbering of active members.

E. Lack of an efficient document management

The different types of registration forms and successive renumbering resulted in several folders with obsolete member information. Additionally, since the association's headquarters already changed twice over its lifetime (October 1994 and 2013), this represented some risks associated with the organization and record availability or even possible loss of documentation.

Due to these situations, staff admitted difficulties in managing member information, including the member's status at the time (active/non-active). Regarding the former members, the secretary also revealed difficulties in knowing the reasons for the member to leave the association.

III. IMPROVEMENTS PROPOSALS

The study of the current situation of the organization of the association identified several problems related to the management of the information of the associates. In this sense, it was considered fundamental to help the association, with the implementation of proposals that minimize or eliminate the identified problems.

At the moment, two proposals have been implemented: paper archives organization and digitalization in order to create an effective and efficient archive and also help to identify and clarify the member situation; create an Excel file with the most relevant information for each member.

A. Archive review and reorganization

In order to know the evolution of members' information, it was decided to carry out an analysis of the identification requested over time in the different members' forms. Therefore,

the first task was to collect the files of the different members and organized them over time.

Because of the different forms and the successive renumbering of the members, a quick inspection of the archives concluded that there were forms with the same membership number referring to different members, duplicate forms and missing forms. After some reflection and analysis, it was decided to create a unique member number following the registration date at the Book Member Association. In this way, this member number was written in each form by hand and in each set of forms this numbering was maintained. At the same time, as each member's form was on paper, to increase efficiency and reduce the time it took to find it, it was decided to convert these documents into digital files.

The first forms used to collect members' information were quite simple. The information required for each member was: name, filiation, age, main occupation, contact address, telephone, and year of registration. The membership form included this information and also the annual fee payments from 1986 up to 1995.

In this period of time (from 1986 to 1995), up to 400 proposal forms and 470 membership forms were identified. All were numbered following the order of entries in the Association Book Members and arranged by date of registration. This resulted in information referring to 502 members, having identified that there were missing forms which, in some cases, resulted in the existence of members without any information. All forms were converted into digital files.

As already mentioned, in 1994 the association implemented new forms and as a result, all members had to register a second time using the new forms. This process started in 1995 and it ran

in parallel with the previous registration system. It is important to point out that on December 31, 1992, the Portuguese General Directorate of Action Social proceeded to the definitive registration of the association statutes, passing this association to the Private Institution of Social Solidarity (IPSS), also considered a collective person of public utility. With the new proposal form, new fields were introduced: instead of age, the birth date and place were required; also in the residence was also asked the parish, county, and district; tax number as well as identity card; marital status and the school that the member has attended. Each new candidate member was supposed to be proposed by an association member.

The new membership form also included an associate photo and the membership fee and registration date and annual dues from 1994 up to 2015.

An observations field was also included in the two forms and it was mainly used to register the member leaving date and motive. The new member has to be approved by the direction board and in most cases, the date was registered in the membership form and signed.

In this period (from 1994 to 2013), up to 400 member forms were identified. Again, all were numbered following the order of entries in the Association Book Members and arranged by date of registration. Some membership paper forms were missing.

In 2013, a new membership form was created and all the existing active members had to register again. The new form was very similar to the previous one and the main difference was in the considered years of payment with a time horizon of 10 years (from 2013 up to 2023). From 2013 to 2016, up to 450 membership forms were identified and renumbered. Again, some membership paper forms were missing. A last important note, during the analysis it was found that, despite the implementation of the new form, not all existing members filled out the new registration form and they continue to be updated in the 1994 form.

Again in 2016, a new membership proposal form was implemented. It introduced small differences: the names of the three schools that the members could have attended appeared already in the form and a separate field was created for the association management bodies (management board and general meeting of associate members) to write the date and decision on the new proposal member and the member number.

This resulted in information referring to 1300 members, having identified that there were some missing forms.

The different fields used in the membership forms over time are summarized in Table II.

TABLE II. MAIN FIELDS FILLED IN THE DIFFERENT FORMS

	1986 proposal form	1986 membership form	1994 proposal form	1994 membership form	2013 membership form	2016 membership form
Name	X	X	X	X	X	X
Filiation	X	X	X	X	X	X
Age	X	X				
Main occupation	X	X	X	X	X	X
Contact address	X	X	X	X	X	X
Phone	X	X	X	X	X	X
Registration year	X	X	X	X	X	X
Annual fee payments		X		X	X	X
Birth date			X	X	X	X
Birth place			X	X	X	X
Contact address parish, county and district			X	X	X	X
Identity card			X	X	X	X
Tax number			X	X	X	X
Marital status			X	X	X	X
School attended			X	X		
Member photo				X	X	X
Membership fee				X	X	X
Observation field				X	X	X
Names of the schools attended					X	X
Management field					X	X
e-mail						X

The paper forms identification, organization, and digitalization was a difficult and time-consuming task. In this process, because of the successive renumberings of the members, all dossiers have been organized considering the registration date at the Book Member Association, and in this way, each member has a unique number. The following dossiers were organized:

- Membership proposal forms from 1986
- Membership forms from 1986
- Membership proposal forms from 1994
- Membership forms from 1994
- Membership forms from 2013.
- Membership proposal forms from 2016.

In this process, more than 2500 paper forms were organized, digitalized and archived for history studies.

B. Creating an excel file

Although the paper forms digitalization and archive were very important to start to identify the association members over time, it was decided to select all the relevant information from these forms and create an informatic support to be able to track the member main data and to perform some statistical studies.

It was decided to create a database in Excel, due to its simplicity and knowledge of the association staff. The database structure has the following format:

- on the lines, the entities, in this case, the members by order of the Book Member Association;
- in the columns, the attributes or properties, in this case, the fields identified in the forms referring to each member of the association.

The first step was to select the relevant information and based on this, it was decided to divide the digital information into two sets of information. The first set is related to the registration number and date, member name, and successive registration moments and remunerations. The date of enrollment was recorded for each member and if he is no longer a member (withdrawn, died, excluded, or replaced), the year of the last fee paid was recorded and written on the paper form.

The second set of information is related to the member's personal data: name, birth date, and place, occupation, school attended and years of attendance, address. A final column was included to identify the situation of non-active members. These are the columns created:

- Registration year
- Membership number according to the date of registration in the Book Member Association
- Date of registration
- Member's name
- Member number on May 22, 1988
- Date of enrollment in the new 1986 form
- Last inscription registered in the 1986 form

- Membership number in the new renumbering January 2, 1996
- Date of enrollment in the new 1994 form
- Last inscription registered in the 1994 form
- Membership number in the new renumbering 10 Nov 2004
- Membership number in the new renumbering Sep 17, 2008
- Date of enrollment in the new 2013 form
- Last entry registered in the 2013 form
- Membership number in the new renumbering May 19, 2016
- Membership number in the new renumbering 1 July 2022
- Phone
- Email
- Date of birth
- Birthplace
- Profession
- School attended
- Years attended
- Residence
- Status of a non-active member (withdrawn, died, excluded)

Taking into account the various forms for each member, the Excel file was filled in and the most recent information was introduced. As the paper forms have missing fields (not filled in), not all lines in the Excel file have complete information.

Regarding the 1st set of the BD, and using typical database operations, it was possible to extract some relevant and interesting information, namely the evolution of the number of the members' association. From this exploratory analysis it was also concluded that, at the end of 2022, there were more than 400 associate members, information that the organization itself had difficulty specifying as it results from an extrapolation based on the number of members with monthly activities in the association (information obtained with the software billing). It was also possible to calculate 65 years as the average age of members considered active, which may question the relevance of requesting fields such as "e-mail" in existing forms. Given the exploratory nature of these first analyses, added to the fact that this database in Excel was created with information from the paper forms and presents missing information, it is important to emphasize that these conclusions are preliminary and require future validation.

C. Future work

From a perspective of continuous improvement of an organization, the implementation of information management procedures should seek to preserve information as well as allow its management in an easy and centralized way. In the case of the digital transformation of this organization, the project will continue to explore the existing data of the member of the association over the years, namely identify if there was a change

of residence to attend school and, study the impact of the school on the member's profession.

Despite the various improvements that have already been applied to the association's information systems, these can be further improved. Therefore, the implementation of the database in the MySQL programming language is proposed. Currently, its structure is under development. With this implementation, it will be possible to store larger amounts of data in a more organized and secure way, with faster access to the desired data, apply filters and perform more advanced analysis in SPSS.

IV. CONCLUSIONS

To conclude, in the present paper a historical perspective both on the number of members and the organization that was followed in its registration and processing was given. The first task was to identify the different forms that have been used and organized them over time. This reorganization of the paper forms was very complicated due to these different types of registration forms and successive renumbering, duplicated and wrong registrations, and especially, missing forms. Due to this situation, it was very difficult to manage the member information and situation of activity with the association. Some members were duplicated and the association allowed the substitution of one member by another relative maintaining the same member number.

Regarding the former members, it was difficult and in some cases impossible to know the reasons for the member to leave the association. Even more difficult, was the registration of the payment of the dues. Despite all these challenges, the lean office principles applied showed to be paramount in the organization of the association data. The majority of data was digitalized which constituted a great step for the improvement of the association management.

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