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Development of a software aimed at financial control for family farming

Criação de software para controles financeiros destinados a agricultura familiar

Evandro Mendes de Aguiar¹ e Geysler Rogis Flor Bertolini²

¹ Universidade Estadual do Oeste do Paraná, Brasil, Mestrando em Desenvolvimento Rural, e-mail: evandro.info@gmail.com

² Universidade Estadual do Oeste do Paraná, Brasil, Doutorado em Desenvolvimento Rural, e-mail: geysler_rogis@yahoo.com.br

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Abstract

This technical report aims to present a software tool for financial control in rural establishments characterized by family farming, these controls are based on scientific materials researched in SCOPUS, SPELL and WEB OF SCIENCE databases. These scientific bases were chosen because of their proximity to the thematic area of the research question. The developed tool was called SisFarming, all the construction took place in Object Pascal language with the construction carried out on the development platform called Delphi®, from Embarcadero Technologies, under a license typified Delphi Community Edition®. The entire software storage database is named Firebird, it is a database management system. The financial controls implemented in SisFarming were defined based on the notes of the researched scientific materials and using the definition of data according to the methodology of the Support Service for Micro and Small Enterprises (SEBRAE). The SisFarming software was tested with data provided by ten producers who agreed to participate in the research, as a result, only the use of the cash flow technique by all producers was detected.

Keywords: SisFarming; Financial management; Family Rural Producer; Rural Information System.

Resumo

Este relato técnico possui o objetivo de apresentar uma ferramenta de software para o controle financeiro em estabelecimentos rurais caracterizados pela agricultura familiar, esses controles são embasados nos materiais científicos pesquisados nas bases SCOPUS, SPELL e a WEB OF SCIENCE. A escolha destas bases científicas se deu por sua proximidade com

a área temática da pergunta de pesquisa. A ferramenta desenvolvida recebeu o nome de SisFarming, toda a construção se deu em linguagem Object Pascal com a construção realizada na plataforma de desenvolvimento chamado Delphi®, da Embarcadero Technologies, sob uma licença tipificada Delphi Community Edition®. Toda a base de dados de armazenamento do software é nomeada como Firebird, trata-se de um sistema gerenciador de bando de dados. Os controles financeiros implementados no SisFarming foram definidos com base nos apontamentos dos materiais científicos pesquisados e utilizando a definição dos dados segundo a metodologia do Serviço de Apoio às Micro e Pequenas Empresas (SEBRAE). O software SisFarming foi testado com dados fornecidos por dez produtores que concordaram em participar da pesquisa, por resultado detectou-se apenas a utilização da técnica do fluxo de caixa por todos os produtores.

Palavras-chave: SisFarming; Gestão Financeira; Produtor Rural Familiar; Sistema de Informação Rural.

1 INTRODUCTION

In Brazil, food production is highlighted not only nationally, but also internationally. However, success is not intrinsic only in the way of production, but in the sustainability of the process and the permanence of this important agent, the rural producer, in his activity.

A partnership promoted between the Center for Advanced Studies in Applied Economics (Cepea) of Esalq/USP, the Confederation of Agriculture and Livestock of Brazil (CNA), and the Foundation for Agrarian Studies Luiz de Queiroz (Fealq) resulted in studies that pointed to a 3.81% growth in agricultural production in 2019, when compared to 2018. With this mark, agribusiness accounted for 21.4% of total Brazilian GDP (CNA, 2020).

Within the context of agribusiness, there is the presence of family farming. It is responsible for an important fraction of food production, bringing food to many. The proportion of rural establishments is 77% family versus 23% non-family farming. The same 77% of the number of establishments corresponds to a coverage of 23% of productive territory under this category (IBGE, 2017).

There is some complexity in defining what exactly family farming is, as there are countless approaches that give shape to this activity. In order to know this important activity, one should answer the question: what really is family farming?

Law 11.326, of July 24, 2006, makes explicit the guidelines that formulate the National Family Agriculture Policy, attributing the characterization of family farmer and rural family entrepreneur to anyone who practices activities in rural areas; whose property has an area estimated in up to four fiscal modules; where the labor force employed in the activity belongs to the family itself; the main source of family income is linked to the enterprise; and finally, when its management is performed through the family itself (BRASIL, 2006).

Also characterized in this activity are individuals from the same family who combine factors of production in order to meet their own subsistence and, subsequently, the demand for food generated by society. It is also important to mention that the family member must form housing in the establishment or in a place close to it (BRASIL, 2017).

This same decree also establishes that the tax modules in question, the unit of agrarian measure used for land classification, will be expressed in hectares. The size in hectares may

vary according to the municipality and is determined by INCRA (National Institute of Colonization and Agrarian Reform) (BRASIL, 2017).

Family farming covers about 77% of the total rural establishments, i.e., 3.9 million meet this classification. The area coverage is 23% of the total occupied by rural establishments, corresponding to 80.9 million hectares (IBGE, 2017). Also according to the last Agricultural Census, this activity generated 23% of all Brazilian agricultural production, reaching the mark of R\$ 107 billion.

Brazil is considered one of the great world producers, also occupying a position as a great barnyard of the world and having increased productive capacity; however, even in the face of positive attributes like these, there is an underutilization of resources and a field to be explored. We also noticed the Brazilian economic development is based on agricultural activities, and there is also scientific research presenting arguments in favor of agriculture as a factor of economic expansion and better conditions for the population (ABBADE, 2014).

Once the importance of family farming for the country is properly characterized and recognized, one must take note of issues caused by the category. A survey conducted by Paixão et al. (2017) reveals the negligence on the part of the producers regarding the use of financial controls in the management of rural enterprises.

Lizzoni, Feiden and Feiden (2018) identify the difficulty on the part of farmers in making decisions, a fact that is attributed to the lack of financial controls, in addition to the use of obsolete tools or that are not intended for the activity. In the view of Salume, Silva and Christo (2015), properties surveyed in their research demonstrated they do not use basic management premises, in this case, the use of financial controls.

Even though these establishments show economic profitability in its operations, financial management is vital for survival and its absence will lead the business to bankruptcy (CRUZ; ANDRICH, 2013). The work developed by Haberli Jr., Oliveira and Yanaze (2017) defends the importance of using computerized management tools in the management of rural enterprises.

With this information in mind, the objective of this technical report is to present a software tool to enable the financial control of family farming activities. Such software is the result of a master's thesis from the Graduate Program in Sustainable Rural Development (PPGDRS) at the State University of Western Paraná - Unioeste.

2 CONTEXT OF THE INVESTIGATED REALITY AND RESEARCH METHOD

In this section, the context of the investigated reality and the methodological framework of the work are presented.

2.1 Context of the investigated reality

The focus of this technical report is on family farming and the presentation of a tool for its financial management. With family farming properly characterized in the introduction of this work, one must explain the need to use a tool in the management area. This subject is also mentioned in the introduction, highlighting the importance of application in the conduct of the rural enterprise.

Next, we identify, in the context of family farming, the reality investigated through research carried out on materials located in scientific bases, considered to be related to the subjects treated in this technical work. Namely, the use of financial controls and information tools.

As the investigated reality of the category, the following stand out:

- a) Producers have difficulty making decisions;
- b) They do not make use of basic management premises and financial planning;
- c) They do not use, for the most part, information technology tools, such as spreadsheets or software that contemplate the basic financial control mechanisms;
- d) There is a lack of training and knowledge for employment and the use of basic controls in the financial sphere;
- e) Producers find it difficult to calculate results because they do not use methodology with cost accounting.

Thus, making connections between the researched works of the authors Cruz and Andrich (2013), Haberli Jr., Oliveira and Yanaze (2017), Lizzoni, Feiden and Feiden (2018), Salume, Silva and Christo (2015), one is able to point out the need for family farmers to apply financial control management techniques for the survival of the rural establishment and, as a consequence, assist decision making based on the results obtained with the exercise of the activity.

2.2 Methodological framework

In order to describe the research procedures carried out in this work, this section describes the steps used by the observer to obtain the documents. Three scientific bases were chosen, namely Scopus, Spell and Web of Science. The choice of these was motivated by its proximity to the area and the theme of the research question.

Also as a methodological framework, the steps for creating a software tool for financial control and planning by family farmers are presented. The developed tool was called SisFarming - Management in Family Agriculture. It was developed in Object Pascal language (Object Oriented Pascal), which is a language intended for scientific programming (ASCENCIO; CAMPOS, 2007).

The entire construction of the source code was carried out using the development software called Delphi®, owned by Embarcadero Technologies, based in Austin, Texas, USA. The software license is typified as Delphi Community Edition® (*Copyright by Embarcadero Technologies*), being indicated for early stage developers or startups with limited revenue, allowing the download of the tool and later use without cost until revenue is obtained.

The creation of the data access screens and the database connection component are native to the construction tool itself. Images used in the construction of the software were taken from the internet and are in the public domain. Data storage will be carried out by the SGDB (Database Manager System) known as Firebird, an open source manager, and does not have a double license (CANTU, 2010). Firebird, an open source software, has a free use license.

The tool presented in this technical report will be made available in an executable file format, ready for use on the Microsoft Windows® operating platform (*Copyright by Microsoft Corporation*) and without a license fee. Hence, it can be used by anyone who wish.

For Sommerville (2007), the functionalities of an information system, called software requirements, define the functionalities, their services, what is implemented and also their restrictions (SOMMERVILLE, 2007). The functionalities implemented in the tool followed the notes found through the survey and the individual reading of scientific materials.

The definition of which registration data should belong to the database followed instructions contained in the SEBRAE manual (Support Service for Micro and Small Enterprises) called “How to Prepare Financial Controls”, authored by Oliveira (2013).

For Bühler (2010), rural activities perform multiple functions, such as buying, selling, contracting services and production, as well as a company, even if they are not included in such legal format. Principles such as planning, organization, direction and control are universal and can be applied in any administrative activity, regardless of whether it is industry, commerce or rural production (ALBUQUERQUE, 1985).

Silva, Rech and Rech (2010) establish that, for a company to be competitive, it needs organization and improvement. The rural sector is no different. Equipped with these studies, it can be considered that financial controls that are normally applied in joint ventures are also applicable to agricultural activities.

To justify the fields used in the tool, we should mention once again that the software present in this technical report aims to meet family farming needs within the software requirements, namely cash control, accounts payable and receivable, and cost accounting for outcomes calculation. These software requirements are functional.

Other resources are considered non-functional requirements, that is, they do not reflect the user’s need (SOMMERVILLE, 2007). For cash control, the fields were used to meet the requirements contained in Table 1.

Table 1: Cash flow model

DAILY CASH FLOW			Month/year: October/2020	
DAY	BACKGROUND	INPUTS	OUTPUTS	BALANCE
2	Cash sales	650.00		1,540.00
2	Sales Receipts	1,250.00		2,790.00
2	Stationery Payment		45.00	2,745.00

Source: Adapted from SEBRAE-MG (p. 15, 2013).

The accounts payable and receivable controls required a specific data structure, the fields considered to be minimal were collected from the indications provided in Tables 2 and 3. Other fields implemented were used only to serve informational functions.

Table 2: Basic structure for accounts receivable

CONTROL OF ACCOUNTS RECEIVABLE			Month/year: October/2020		
DAY	CUSTOMER	DESCRIPTION	AMOUNT	RECEIPT	
				DAY	AMOUNT
2	Maria Moreira	Check 386-A	370.00	2	370.00
3	Três Marias	Boleto 101	450.00	2	450.00

Source: Adapted from SEBRAE-MG (p. 24, 2013).

Table 3: Basic structure for accounts payable

CONTROL OF ACCOUNTS PAYABLE			Month/year: October/2020		
DAY	CUSTOMER	DESCRIPTION	AMOUNT	RECEIPT	
				DAY	AMOUNT
2	Souza Accounting	Fees	400.00	2	400.00
2	Fiação Estrela	Trade note 1280	380.00	2	380.00

Source: Adapted from SEBRAE-MG (p. 28, 2013).

The functionalities of the chart of accounts and cost centers operate for the purpose of calculating results, consolidating the structure of the data tables necessary to meet the requirements that are set out in Table 4. In the same way that accounts payable and receivable have extra fields, these requirements also receive the addition of fields for user information. It should be noted that the chart of accounts has the function of standardizing the entries, whereas the cost centers have the function of absorbing the standardized entries for determining the result.

Table 4: Tying up the chart of accounts and cost centers.

OUTCOMES CALCULATION	
ACCOUNTS	AMOUNT
Sales	60,000.00
Payroll	(10,980.00)
Fuels	(300.00)
Electricity	(600.00)
Total REVENUE	60,000.00
Total EXPENSES	(11,880.00)
RESULT	48,120.00

Source: Adapted from SEBRAE-MG (p. 88, 2013).

Other functionalities of the system, recognized as non-functional requirements, were implemented to provide operational support and data complementation for operations of the functional requirements or for the informative character of the operator.

3 PROBLEM SCENARIO DIAGNOSIS

From the characterization of family farming, it is essential that it remains strongly active; therefore, the use new tools capable of providing support to the process is of paramount importance. These alternatives need to play an important role in terms of decision making by the farmer, that is, supporting decision making. Thus, we highlight the use of ICT (Information and Communication Technologies).

The emergence of ICTs occurred around the 1960s and 1970s, thanks to the advances of the electronic industry, being the best known the television, telephony and the internet. Following such trend, one can also observe the information systems as a member of such group (DEPONTI; KIST; MACHADO, 2017).

For Prates and Ospina (2004), technology can be considered an essential raw material in the transformation of businesses, whether in the production of goods or in the delivery of services. In addition to being an important engine capable of driving the birth of new processes and management tools.

Deponti, Kist and Machado (2017), Magnoni Júnior et al. (2017) agree that Brazilian agriculture has advanced with technologies used in the field, despite the difficult access, promoting a new era of cultivation and with the objective of improving people's lives and the management processes of rural establishments. An increased production is noticed with the use of the same cultivation area.

But quantity must also be associated with quality, so the delivery of quality food is essential, guaranteeing food security, as well as the connection with digital technologies that promote not only production, but mainly conscious and sustainable consumption (MAGNONI JÚNIOR et al., 2017).

Relevant research work carried out in the context of family farming highlighted concern on the part of farmers with regard to management processes and costs. The research still shows that, even in the face of concern, there is resistance on the part of these actors regarding data recording, cost accounting, in addition to restricted participation in management processes; there is still difficulty in making decisions for lack of information and difficulty in monitoring the market (DEPONTI; KIST; MACHADO, 2017).

For Deponti, Kist and Machado (2017), Universities need to head the role of training family farmers, mainly through the use of ICTs and techniques and information for decision-making in management, mainly by extension projects.

Even in the face of the resistance Brazilian farmers have regarding the use of IT (Information Technology), the slow introduction to computing and the great difficulty they have regarding the use of information systems (MENDES; OLIVEIRA; SANTOS, 2011), it is necessary to make IT an indispensable tool for organizational sustainability, gaining organizational benefits, supporting the objectives set and the removal of distance barriers, as well as promoting the establishment to better competitive levels (ALMEIDA; OLIVEIRA, 2011).

The survey carried out in this work through the individual reading of scientific productions in the scientific bases SCOPUS, WEB OF SCIENCE and SPELL allowed the classification into ten macro variables, which will be presented below, regarding the use and/or application of technological information tools in family farming.

1) Total/partial absence of basic administrative controls

Five studies were identified that describe the tribulation that producers face to manage their rural enterprises for not using basic administrative controls (CHRISTO, 2015; DUMER et al., 2018; PAIXÃO et al., 2017; SALUME et al., 2015; SCHWERT et al., 2015). Researchers mention in their work that mistakes are made by producers in decision-making processes due to the negligence in the use of forms of administrative controls.

2) Use of software and/or spreadsheets by producers

Rural producers must use some type of tool, be it software or spreadsheets, for financial control (AFFONSO; HASHIMOTO; SANT'ANA, 2015; ARTUZO et al., 2016; HABERLI Jr.; OLIVEIRA; YANAZE, 2017; LIZZONI; FEIDEN; FEIDEN, 2018; SZABO et al., 2017; TYRYCHTR; ULMAN; VOSTROVSKÝ, 2015).

3) Financial controls in decision making

The authors Biasio et al. (2015), Lizzoni, Feiden and Feiden (2018), Moreira; Melo; Carvalho (2016), Vian et al. (2019) report the importance of using financial controls providing support in the decision-making process and that its implementation is independent of the form, which may be software or spreadsheet.

4) Complex and/or obsolete and/or inappropriate software

Several authors agree that the producer must use some type of tool, software or spreadsheet, to implement financial controls to support decision making (AFFONSO; HASHIMOTO; SANT'ANA, 2015; ARTUZO et al., 2016; HABERLI Jr.; OLIVEIRA; YANAZE, 2017; LIZZONI; FEIDEN; FEIDEN, 2018; SZABO et al., 2017; TYRYCHTR; ULMAN; VOSTROVSKÝ, 2015).

But it was also admissible for some researchers that information technology tools are outdated, in addition to the demands for consumption of computational resources and their somewhat degree of complexity in using them (LIZZONI; FEIDEN; FEIDEN, 2018; NITSENKO et al., 2019; SALUME; SILVA; CHRISTO, 2015).

5) Lack of knowledge and need for training

Authors such as Artuzo et al. (2016), Dumer et al. (2018), Kozachenko, Panadiy and Chudak (2019), Silva and Gazolla (2016) conclude that the farmer does not make use of financial controls due to the lack of information, as well as the lack of training that generates sufficient knowledge to handle control tools. The training will also contribute to the interpretation of the results generated by the financial control mechanisms.

6) Cost Accounting

This study also identified, during the individual reading process, several authors agreeing that cost accounting can also be used as a tool for the management of the rural establishment, thus promoting cost control (DUMER et al., 2018; KOZACHENKO; PANADIY; CHUDAK, 2019; MOREIRA; MELO; CARVALHO, 2016; SCHWERT et al., 2015; SERAMIM; ROJO, 2016; SILVA; GAZOLLA, 2016; THOMAS; ROJO; BRANDALISE, 2015; ZAMBON; BEE, 2016).

7) Cash Flow

Authors such as Socoloski et al. (2017), Soschinski et al. (2018), Thomas, Rojo and Brandalise (2015) recommend the use of cash flow control and control of accounts payable and receivable as effective mechanisms in the management of the rural enterprise. Also according to the authors, these mechanisms provide the producer with a view of his finances and the commitments to be assumed in the future.

8) Use of result indicators

The use of these mechanisms can be enriched if the results from cost accounting, together with cash flow control, are converted into result indicators that facilitate the understanding and visualization of results (HABERLI Jr.; OLIVEIRA; YANAZE, 2017; SERAMIM; ROJO, 2016; SOCOLOSKI et al., 2017; SOSCHINSKI et al., 2018).

9) Use of simplicity in tools

Nitsenko et al. (2019) believes that both software and a spreadsheet do not need complexity and that simplicity should be present in the routines and in the user interface. The author also mentions care in the development process, considering that resources need care and with a view to the end user and their limitations, in this case, the family rural producer.

10) Lack of scientific work

Despite indications made by researchers on the subjects of applying the accounting methodology to control costs, an important fact stands out in the work of Rosa, Soares and Iudícibus (2018), who report the lack of scientific research that will measure the use of the control methodology in rural properties.

4 ANALYSIS OF THE PROBLEM SCENARIO AND INTERVENTION PROPOSALS

This research made it possible to identify that there are no exact notes of which financial controls are intended for family farming in terms of property management and producers' finances. It is still of great relevance to mention that the researched materials mention the use of control mechanisms such as the use of cash flow, monitoring of accounts payable and receivable, the use of cost accounting in providing information for decision making and results visualization.

The use of these management methodologies must be associated with technology tools that have easy access, a friendly interface with easy understanding and without the use of too much computational resources. Moreover, in order to obtain good results in the use of methodologies, training and qualification of producers should be recommended in the handling of the tool, thus obtaining a better result.

As an intervention proposal, it is suggested to use a software tool that contemplates equipping financial controls. Thus, we could devise a software to serve family farmers. Figure 1 shows the initial screen of the proposed information system.

Figure 1: Main system screen.

Source: Prepared by the authors, 2020.

The following basic registration options are offered through the tool: Customers, Suppliers and Users. In table 5, one can identify the data fields used for the construction of the registration screens.

Table 5: Registration of customers, suppliers and users.

Registration	Data fields
Customers	Code; Type; Name; Fantasy; Address; Neighborhood; City; UF; ZIP CODE; Phone; Branch; Contact; Cell phone; Whatsapp; Internet purchase; CPF / CNPJ; RG / IE; Email; site
Suppliers	Code; Type; Name; Fantasy; Address; Neighborhood; City; UF; ZIP CODE; Phone; Branch; Contact; Cell phone; Whatsapp; Sells over the Internet; CPF / CNPJ; RG / IE; Email; site
Users	Code; Name; Department; Login; Password; Level of operations; Disable

Source: Prepared by the authors, 2020.

These fields aim to connect data from the Customers screen to the Registration of Receivables; also connecting Suppliers data to and informing the links to Payables. The Users table has the function of registering users who may have access to the system together with administrative operating permissions.

In the tool, the farmer can register all his clients, regardless of whether or not the service is taking place. With this, you can have contact data with quick access. The supplier register is available, the object is to register all suppliers of products for resale or even inputs for cultivation or production.

User registration has functionality restricted only to registering information of users who will be entitled to access the system. Access is controlled at three levels, as follows: Administrator, user with full access to the system; Manager, configurable access with broad permissions, but subordinate to the system administrator; User, user with restricted and configurable access.

All system operation screens have parameterization for access control, the Administrator user being able to assign to whomever he wishes. To parameterize the operator, the user must be an Administrator type user and have access to the “Access level and system parameters” menu (emphasis added).

The movements proposed in the system, although not mentioned in the scientific works, which in addition to the information function will contribute to the verification of results and control of the purchase and sale operations carried out in the rural establishment.

The following options were proposed as options in the Handling menu: Product Registration, Production | Harvesting, Entry and Sale of Products. The data fields used for the construction of the screens can be found in Table 6.

Table 6: Registration, production/harvest, entry and sale of products.

Registration	Data fields
Products	Code; Description; Model / Complement; Bar code; Cost; Sale Price; Percentage; Stock; Minimum stock; Type; Cost center; Chart of Accounts
Production / Harvest	Code; Released; Date; Product Code; Amount; Note
Entry of Products	Code; Date; Released; Provider; Document number; Document Date; Value of Products; Freight Value; Other Values; Total Entry; Product Code; Product; Amount; Unitary value; Subtotal
Sale of Products	Code; Date; Released; Client code; Note; Value Products; Front Value; Other Values; Amount; Product Code; Description; Amount; Unitary value; Subtotal.

Source: Prepared by the authors, 2020.

Product registration has the function of registering products or inputs, and the product may be the result of local production of the rural establishment. Each registered product can be connected to the so-called Cost Center. The purpose is to allow the farmer to perform cost accounting in a simple way. With this, any entry of income or expenses that are associated with the specific Cost Center will provide the producer with a report of earnings from the activity. In addition to the centralization of data by Cost Center, there is also an association with the Chart of Accounts, allowing its correct and standardized entry in the control of cash flow.

Local productions generated by the rural establishment can be launched under the option “Production | Harvest” (emphasis added), in order to generate control of what is produced and also to monitor stocks.

Products originating from external sources, such as inputs for production, must be launched in the “Product Entry” menu (emphasis added). The rural producer will be able to control input stocks and distribute, through apportionment, his investments in specific cost centers. Thus allowing a tracking of the use and correct application of cost accounting. It is important to note that products classified in the system as inputs will not be eligible for sale, only product types are intended for sale in the system.

Closing the movement menu, there is the “Sale of Products” routine (emphasis added), allowing the farmer to control his sales in terms of frequency, period and customers

served. This routine will launch the cost center associated with the product, originating the revenues from the activity.

In the list of options in the Financial menu, you can find: "Account Plan", "Cash Flow", "Post Accounts Payable", "Post Accounts Receivable", "Download Accounts Payable", "Download Accounts Receivable", "Cost Centers", "Appropriation of Revenue / Expenses", "Capture Payments Center Cost" and "Use / Consumption of Input".

The Chart of Accounts requirement has, as stated before, a function of standardizing the entries, a way of organizing the data during the entry process. Its structures provide support for Cash Flow, Accounts Payable and Accounts Receivable. Both Accounts Payable and Receivable have separate routines for the write-offs of securities previously launched by the user. There are also links with the Cost Center allowing the user, if he so chooses in the future, to calculate the result.

Cash Flow, on the other hand, presents itself as a requirement present in the studies identified in this technical report, where the producer will be able to monitor and identify financial seasonality between the inflows and outflows of monetary resources. It also receives data from Accounts Receivable, in the form of value entries, as well as data from Accounts Payable, which in their order are output cash values.

As an indication of the researched works, a control of accounts payable and receivable is available in the tool, allowing the producer to control payments and receipts of the activities carried out in the establishment. Both accounts payable, associated with suppliers, and accounts receivable, associated with customers, are connected to the chart of accounts for the standardization of launches.

The requirements "Appropriation of Revenues / Expenses", "Capture Payments Center Cost" and "Use / Consumption" function (emphasis added) are optional for the user, that is, there is no obligation to use them. If the producer is not interested in making use of cost accounting, there will be no impediment to using the tool. This functionality is independent and allows its operator, in the future, to make associations and perform the entries with the cost centers to calculate the result. The calculation can be carried out by an independent cost center.

If the producer is interested in knowing the results of his operations, profit or loss, he will need to make use of these routines. Its use may start at any time, where registrations already made in the past may be captured in the form of entries and make up the final calculation report. In the moments when the captures start to be made and some system parameter is missing, the user will be guided by the tool itself to solve the problem objectively.

Explaining the launches, the application or use of inputs in the production process will also fit a specific routine in the software. Its functionality is not mandatory, as well as appropriation, leaving the farmer to choose and implement it later.

Table 7 shows the specification of the fields used in the construction of the screens and routines contained in the list of options in the Financial menu.

Table 7: Fields of screens and routines in the Financial menu

Registration	Data fields
Chart of Accounts	Code; Type; Description; Abbreviation
Cash Flow	Code; Operation; Date; Historic; Movement Value; Species; Balance
Post Accounts Payable	Code; Settled; Appropriate; Provider; Chart of Accounts; Release Date; Document number; Document Date; Expiration Date; Amount Payable
Post Accounts Receivable	Code; Settled; Appropriate; Client; Chart of Accounts; Release Date; Document number; Document Date; Expiration Date; Amount Receivable
Download Accounts Payable	Code; Provider; Chart of Accounts; Release Date; Document number; Document Date; Expiration Date; Settled; Amount Payable; Form of payment; Amount paid
Download Accounts Receivable	Code; Client; Chart of Accounts; Release Date; Document number; Document Date; Expiration Date; Settled; Amount Receivable; Form of payment; Amount received
Cost Center	Code; Date; Description; Complement
Appropriation of Revenues / Expenses	Code; Date; Cost center; Chart of Accounts; Complement; Percentage; Appropriate Value
Capture Payments Center Cost	Code; Provider; Accounts Plan; Release Date; Value; Settled; Cost center; Percent
Input Consumption / Use	Code; Date; Appropriate; Cost center; Product; Unitary value; Amount; Amount; Complement

Source: Prepared by the authors, 2020.

For the extraction of information in the form of reports, the options are available in the Reports menu; Table 8 shows the layout of the reports according to their classification or functionality within the software tool.

Table 8: Layout of reports in the tool

Menu	Report	Composition fields
Registrations	Customers	Code; Type; Name; City; UF; Phone; Cell phone; Internet
	Suppliers	Code; Type; Name; Phone; Cell phone; Contact; Whatsapp
	Products	Code; Type; Description; Model; Stock; Sale Price
Movements	Production / Harvest	Code; Description; Amount; Date; Released
	Product Entries	Code; Product; Provider; Date; Amount; Unitary value; Amount;
	Products Sold	Code; Product; Date; Unitary value; Amount; Total amount
	Products Sold by Date	Code; Product; Amount; Total Amount

Continua.....

Finance	Accounts Payable	Code; Provider; Due date; Amount Payable; Payment Date; Amount paid; Payment Status
	Accounts Receivable	Code; Client; Due date; Receivable Value; Low Date; Amount received; Receiving Situation
	Cash Flow	Code; Operation; Date; Historic; Movement Value; Balance; Species; Total Inputs; Total Outputs
	Cost Center Result	Date; Cost center; Chart of Accounts; Price Cost; Type
	Accounts Payable Plan	Code; Release Date; Chart of Accounts; Value; Provider; Total Releases
	Accounts Receivable Accounts Plan	Code; Release Date; Chart of Accounts; Value; Client; Total Releases
Inventory Inventory		Code; Type; Description; Minimum stock; Current inventory; Price Cost; Subtotal; Amount

Source: Prepared by the authors, 2020.

The functionalities developed in the technological tool SisFarming aim to meet the needs found during the study through research and individual reading of the works.

SisFarming was validated with financial data from 10 producers characterized by family farming, the rural establishments are located in the northwest, west and southwest regions of Paraná. To participate in the research, the producer agreed to share his financial reports so that launches could be carried out in the SisFarming software.

By analyzing the farmers' financial reports, a chart of accounts can be developed that is capable of serving all participants. From this list, the registrations were carried out at SisFarming, paying attention to using the maximum possible functionalities in the software.

After the releases, a reading of the use of SisFarming functionalities was performed, identifying that only the Cash Flow control was used to meet the demand for information by producers. It was also discovered that the use of Cash Flow has more adaptability, requires little technical knowledge in management on the part of producers, in addition to corresponding very well because they work with immediate receipts and payments to the taxable event.

A decision-making process identified by producers who used the cash flow control was the diversification of activities within the rural establishment that could contribute to the apportionment of the payment of expenses. In this way, with the improvement of the profitability of the activity performed. This perception of diversification was due to the occurrence of secondary activities in billing and payment of expenses.

5 TECHNOLOGICAL/SOCIAL CONTRIBUTION

With the survey of scientific works linked to family farming and financial controls, it is estimated that the use of SisFarming will bring financial balance to the category.

With accurate information in hand, the producer will be able to make decisions regarding investments, increased production or even cost containment. The importance

in the decision-making process of secondary activities in rural establishments is also highlighted, contributing to the apportionment of general expenses.

In addition to the massive use of Cash Flow control by the actors involved, it was also possible to observe that other SisFarming functionalities, such as cost accounting, control of accounts payable and receivable, control of sales or inventory of the property were not used. It is believed that the fact is due to the level of complexity reported in the researched scientific materials.

Producers, assisted by the company Coopermais, who do not use any means of financial control were consulted about the possibility of participating in this research. After denying interest, they claim not to know whether the current rural activity has generated any profit. This result corroborates with identifications made by this researcher in scientific materials, revealing that establishments that do not have any type of financial control are also unaware of the viability of the activity.

The software was built in such a way that each and every rural product that may wish to use the tool has access. To gain access to the tool, it will not be necessary to purchase a software license. However, training these actors in the production process is necessary so that SisFarming is better used, that information is extracted from the system for decision-making, and these in turn become more assertive.

This report ends with the recommendation of future studies on the application of cost accounting in rural establishments, measuring the intensity of its use and bringing scientific content rich in information for further research.

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