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A SURVEY OF THE USE AND PURPOSE OF SPREADSHEETS IN SMES IN SERBIA

Istraživanje upotrebe i svrhe programa za tabelarne kalkulacije u mikro, malim i srednjim preduzećima u Srbiji

Abstract

Due to their unique simplicity and flexibility, spreadsheets are nowadays used for various purposes, from financial calculations, planning and data aggregation, to decision making at different levels of management. Despite being created with the intention of being of temporary character, research shows that spreadsheets tend to provide support even in key business processes in organizations, often over longer periods of time. Starting from the related work mentioned in the paper, and prompted by issues to which articles dealing with spreadsheet errors especially drew attention, the objective of this research was to answer the following questions: Are spreadsheets used in SMEs and to what extent? How great is the significance of spreadsheets in respondents' regular activities? In which situations and for what purpose do respondents use spreadsheets in SMEs? The research encompassed 213 respondents from 147 Serbian SMEs. Among other things, research results have shown that more than 90% of respondents use spreadsheets to a certain extent, most frequently MS Excel. Almost three quarters of respondents regard spreadsheets as important for performing their work. More than two thirds of respondents have more than four years of spreadsheet experience, using them most frequently up to one quarter of their working hours, usually as an auxiliary tool, as follows: more than a quarter of respondents use spreadsheets when they cannot perform the task with the existing IS, and as many as 60% when they find it easier to perform their task with spreadsheets than using the existing official IS.

Keywords: *spreadsheets, shadow system, shadow IT, Serbian SMEs*

Sažetak

Zbog svoje jedinstvene jednostavnosti i fleksibilnosti, programi za tabelarne kalkulacije se danas koriste za različite svrhe, počevši od finansijskih kalkulacija, planiranja, agregiranja podataka, pa do donošenja odluka na različitim nivoima upravljanja. Istraživanja pokazuju da elektronske tabele, iako tipično nastaju sa namerom da budu privremenog karaktera, često u dužim vremenskim periodima pružaju podršku čak i ključnim poslovnim procesima u organizacijama. Polazeći od povezanih istraživanja navedenih u radu, a podstaknuti pitanjima na koja su radovi koji se bave greškama u elektronskim tabelama posebno skrenuli pažnju, istraživanje je imalo za cilj da pruži odgovore na sledeća pitanja: Da li se i u kojoj meri elektronske tabele koriste u mikro, malim i srednjim organizacijama? Kolika je važnost elektronskih tabela u redovnim poslovnim aktivnostima ispitanika? U kojim situacijama i za koju svrhu ispitanici koriste elektronske tabele? Istraživanjem je obuhvaćeno 213 respondenata iz 147 mikro, malih i srednjih preduzeća sa teritorije Republike Srbije. Rezultati istraživanja su, između ostalog, pokazali da više od 90% ispitanika u određenoj meri koristi elektronske tabele, najčešće MS Excel. Skoro tri četvrtine ispitanika smatra programe za tabelarne kalkulacije važnim za obavljanje njihovog posla. Više od dve trećine ispitanika steklo je iskustvo u radu sa elektronskim tabelama duže od četiri godine, koristeći ih najčešće do četvrtine svog radnog vremena, obično u svojstvu pomoćnog alata, i to: više od četvrtine ispitanika kada radni zadatak ne mogu da obave pomoću postojećeg informacionog sistema, a čak 60% kada im je lakše da svoj zadatak obave pomoću programa za tabelarne kalkulacije nego korišćenjem postojećeg, zvaničnog informacionog sistema.

Ključne reči: *programi za tabelarne kalkulacije, shadow system, shadow IT, mikro, mala i srednja preduzeća u Srbiji*

Introduction

Proliferation of spreadsheets in the late 1970s and the early 1980s created the phenomenon of initialization and delegation of the development of small software applications for end users not possessed of specific IT knowledge. However, due to sudden IT dissemination that was soon to follow and has persisted to present day, this phenomenon wriggled out of control, became independent and ceased to be transparent both to the management and to the IT sector [41].

Despite being present for over three decades, this phenomenon has only recently approached the focus of interest of the expert and academic community. It is for this reason that there is still no generally accepted terminology, but literature uses a broad spectrum of terms, whose meanings often overlap or are used in different contexts. When drafting this paper, the authors started from the terminology proposed by Kopper and Westner [19]. According to them, the use of information technology in non-standard ways, whose existence the IT sector is unaware of or does not control, is referred to as *Feral Practice* [41]. It is an umbrella term encompassing Workarounds and Shadow IT. The term *Workarounds* refers to the use of the mandatory information system (IS) within the official IT infrastructure in a manner not foreseen by design, whereas *Shadow IT* denotes all forms of unofficial supplements to official IT portfolios, starting from devices (smart phones, laptops, etc.) to locally developed and used spreadsheets to complex on-demand cloud services [19], [41]. The subset of Shadow IT with software in focus is referred to as *Shadow systems*. The most common forms of materialization of Shadow systems are Excel spreadsheets and Access databases [3], [13], [16], [17], [18], [22], [37]. Further narrowing the focus primarily to the development of Excel spreadsheets and Access databases, the literature uses the term End-User Computing (EUC) [1], [20], [45].

According to some estimates, only in the USA the number of people dealing with EUC to some extent is estimated to approximately 11 million, compared to 2.75 million professionals [12]. The reasons for emergence and proliferation of EUC are numerous. The literature lists as the most common the functionally inadequate and

untimely response of IT sectors and/or vendors of the mandatory IS to changed user demands [2]. The reason, however, can be the IS users themselves: making a powerful contrast to the practically ubiquitous resistance to the introduction of a new IS and fossilization of earlier acquired habits, contemporary IS end users are technologically emancipated to such an extent that they find the use of digital and network technologies an organic part of both business and private daily practices. Accustomed to instant information, they are fairly intolerant to the relatively long time periods required for upgrades of the official ISs and easily reach for their own instant solutions (mostly in the form of spreadsheet development), without informing and consulting the IT sector. This usually happens in situations when they cannot perform their tasks quickly enough or at all by using the official ISs. Due to all of the above, the IT sector finds it increasingly difficult to establish and maintain high-quality communication with such users [41].

Still, authors viewing EUC in a predominantly positive sense emphasize that it is not subversive by nature [7], but rather a source of flexibility and innovativeness in the organization [46]. It potentially contributes to improving working performance and thus supports the official IS, even when it is not fully in accordance with the official IT-related norms of the organization ([10], [11] mentioned in [19]). On the other hand, authors bringing the negative sides of using Shadow systems (and thus the EUC) in the foreground, emphasize significant safety risks, problems related to harmonization with legislation, potential loss of transparency of IT costs, low level of efficiency ([10], [11] mentioned in [19]). Although it may seem that Shadow systems (and the EUC within them) are cheaper in comparison with the official IS, some analyses show just the opposite [5]. One should also not disregard the fact that often, due to the development of a Shadow system, the completion of current tasks is often delayed, and the time used for the development of a Shadow system is not recorded as an IT cost, which affects the total performance of the organization [41]. Due to their rather disintegrated nature, Shadow systems may create redundancy of operations and problems with data integrity and quality ([2], [16] mentioned in [19], [41], [42]).

The most common topic within which literature deals with spreadsheets are spreadsheet errors [4], [14], [22], [23], [24], [25], [26], [27], [34], [36], [43]. The predominant opinion is that, although spreadsheets are ubiquitous in business operations, what is (mostly) neglected and insufficiently elaborated is the data on how much the spreadsheet-generated data are used, how important they are to end users, what the level of the users' knowledge is and in which situations and for which purposes the end users use spreadsheets.

Taking into account the above-stated opinions and questions, the objective of the study was set: to establish the extent, manner and purpose of using spreadsheets in the operation of micro, small and medium enterprises (SMEs) in Serbia, as the starting point for defining further investigation in the area of user-driven IT.

The paper is structured as follows: after a brief presentation of related work in Section 2 (that represented the starting point in defining of the research questions), the objectives, design and implementation of the survey are described in Section 3. The results are shown in Section 4, and discussion and conclusions, as well as the possible directions of further research, in Section 5.

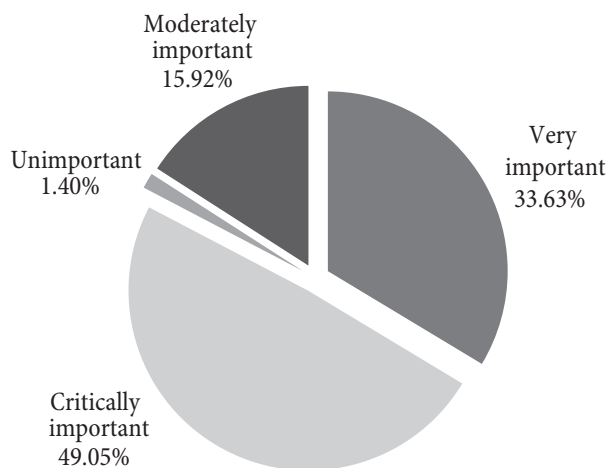
Section 2: Related work

Grossman, Mehrotra and Özlük [9] point out that spreadsheets are widely used for mission-critical functions and represent an efficient development platform for user applications. Pemberton and Robson [28] state that the focus of research on the use of spreadsheet applications is necessary to provide specific information. The authors state that it is very difficult to reach respondents in organizations, so that they decided to survey part-time students at the Newcastle Business School, who are employed on a full-time basis, as the target group. According to the classification of work, the majority of respondents belong to the group of clerical/technical staff (35%), junior management (26%), middle management (24%) and senior management (9%). Only 13% of respondents did not use spreadsheets in their work, 10% of respondents used them less frequently than monthly, 10% of respondents once or twice a month, 17% once/twice a week, and almost half of them (48%) used

them at least three times a day. The largest number of respondents used MS Excel (94%), while only 5% used Lotus 1-2-3, and Quattro Pro 1%.

A few years after the research conducted by Pemberton and Robson [28], a project was initiated at Dartmouth Tuck School of Business, entitled The Spreadsheet Engineering Research Project (SERP) [33]. The aim of the project was to improve the design and use of spreadsheets by individuals and organizations. The authors presented research results in several papers [29], [30], [31],[32]. The survey included almost 1,600 respondents. When asked which type of software they used in their work, the majority of respondents answered MS Excel (99.3%) and Microsoft Access (32.2%). As regards other spreadsheet programs, the users also use Lotus 1-2-3 (2.4%) and Quattro Pro (1.5%). Almost half of respondents regard spreadsheets as critically important for doing their work (Figure 1).

Figure 1: Level of importance of spreadsheets in respondents' jobs



Source: [33]

More than half of respondents state extensive experience (some expertise) within the classification of their experience, somewhat fewer state that they are very experienced (high expertise) (39.3%), and 6.4% qualify themselves as beginners, whereas less than one percent (0.7%) deem that they have little or no experience with spreadsheet programs. Somewhat less than one third of respondents work with spreadsheets between a quarter and a half of working hours (30.4%), whereas 44.7% of respondents use spreadsheet programs for up to a quarter of their working hours (Table 1).

Table 1: Approximate percentage of time spent with spreadsheets in respondents' jobs

Percentage of time	Percentage of respondents
0-25%	44.7%
26-50%	30.4%
51-75%	17.8%
76-100%	7.2%

Source: [33]

Spreadsheets are mostly used for making user applications for performing daily tasks. In the research conducted by Baker, Powell, Lawson and Foster-Johnson (2006), the largest number of respondents used spreadsheets for data analysis, evaluating alternatives, determining trends and creating projections and tracking data (Table 2).

Table 2: The main purposes of respondents' use of spreadsheets

Purpose	Percentage of respondents
Maintaining lists (e.g. names and addresses)	25.0%
Tracking data (e.g. budgets, sales, inventories)	47.2%
Analyzing data (e.g. financial, operational)	87.6%
Determining trends and making projections	54.8%
Evaluating alternatives	56.8%
Other	12.1%

Source: [33]

Section 3: Survey goal, design and execution

Survey goal and research questions

The survey goal was to provide latest insight into the usage and purpose of spreadsheets in SMEs in the Republic of Serbia. In relation to the set survey goal, the following research questions (RQ) were defined:

- RQ1 - Are spreadsheets used in SMEs and to what extent?
- RQ2 - How significant are spreadsheets in respondents' regular business activities?
- RQ3 - In which situations and for which purpose do respondents use spreadsheets in SMEs?

Survey design and questions

The majority of questions (questions 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 15 and 16) from the questionnaire contain predefined answers (metrics) and an option for the respondent to give an answer that is not offered in the content of the question, whereas some questions (questions 7 and 11) are worded as statements for which respondents expressed agreement using grades 1 to 6. In some questions, respondents could opt for several answers (5, 9, 12, 13, 14, 15 and 16).

Table 3: Structure of the questionnaire in relation to the defined research questions

Aspect (RQ)	Questions (and metrics)
Respondents' profiles and demographics	<ol style="list-style-type: none"> Completed education level Area of activity of the organization you are employed in Number of employees in your company Your position in the company Your area of work How long have you been using spreadsheets? Rate the level of your own experience acquired in work with spreadsheets (1 – very little experience, 6 – considerable experience)
Use of spreadsheets (RQ1)	<ol style="list-style-type: none"> Do you use spreadsheets? Which spreadsheet do you use (Excel, Lotus 1-2-3, Google Spreadsheets, etc.)? Average time of spreadsheet use during a workday
Degree of importance of spreadsheets in work (RQ2)	<ol style="list-style-type: none"> Your opinion on the degree of importance of spreadsheets in the work you do (1 – not important, 6 – extremely important)
Purpose of the use of spreadsheets in SMEs business (RQ3)	<ol style="list-style-type: none"> Out of all programs that I use for performing work, I use spreadsheets as... I use spreadsheets (MS Excel, etc.) in the following situations: The purpose for which you use spreadsheets is... I use spreadsheets in the following manner: I/We exchange data with other companies...

Note: Questions are adapted from [37]

Respondents' population, sample size and survey execution

The basic set of organizations is comprised of micro, small and medium-sized enterprises in Serbia. The negative experience from the previous research (insufficient response of organizations of only 5.62% [37, p. 120]), where the intention was to form a random sample of municipalities and organizations, led to the formation of a purposive sample of organizations. The survey strategy was executed on a purposive sample of 147 organizations which the European Commission [6] ranks among the categories of micro, small and medium-sized enterprises. 228 respondents took part in the survey, 15 of whom stated that they did not use spreadsheets in their operation. The number of relevant respondents for this research is therefore 213. They filled in an online questionnaire that was created using Google Forms web application. The data were exported in the Excel format and then were the subject of analysis of quantitative data, out of which predominantly individual descriptive statistical procedures were used.

Section 4: Results and findings

A detailed report of survey results and findings, according to directions of Wohlin et al. [44], is presented in this chapter in the order determined in Section 3.2 (Table 3):

- Organizations and respondents;
- Use of spreadsheets;
- Degree of importance of spreadsheets in work ; and

- Purpose of using spreadsheets in operation of SMEs .

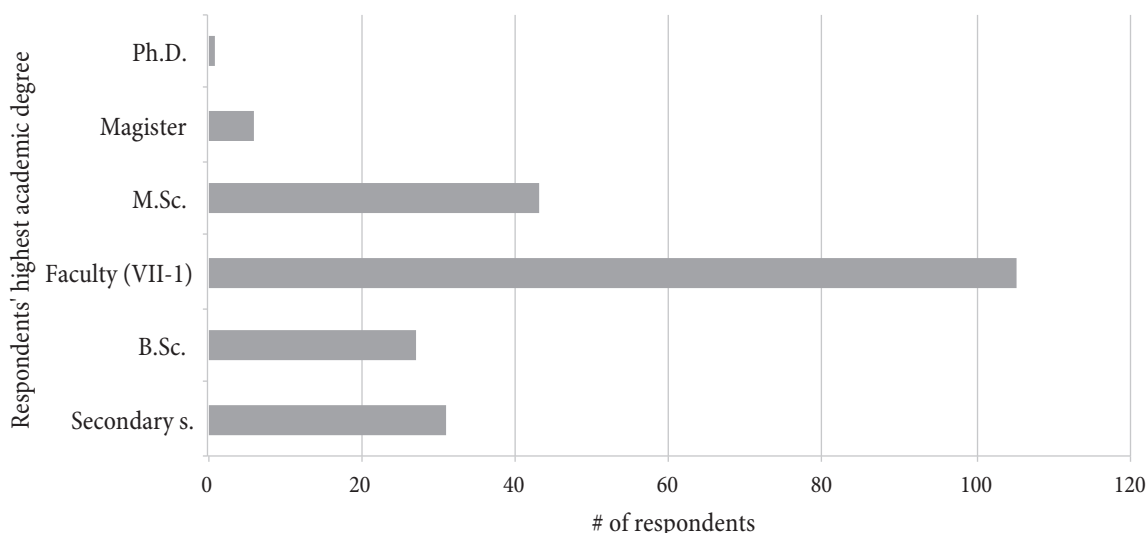
Organizations and respondents

To establish the respondents' education levels, data were gathered on their highest completed level of studies. The majority of respondents (Figure 2) have a VII-1 degree (49.30%); 20.19% of them have a M.Sc. degree, 12.68% have a B.Sc. degree, and 14.55% of respondents have secondary school degrees. The respondents include six Magisters of Science, whereas one has a doctoral degree.

The structure of the industries of SMEs' activity where the respondents are employed is varied. The largest number of respondents, 20.19%, perform their tasks in production industries, followed by finance (15.02%), 13.15% in trade and logistics, 12.68% in public enterprises and services, 11.74% in the IT sector, whereas somewhat under 10% work in education, science, social activities and agriculture. The least represented areas of activity are bookkeeping and construction, with 1.88% and 0.94% respectively. 7.98% of respondents work in areas of activities that were not predefined in the questionnaires: hospitality, media, healthcare, auditing, marketing, telecommunications and consultant services.

The structure of micro, small and medium enterprises where respondents are employed is equally distributed in the sample of organizations. Namely, one respondent from each micro-enterprise responded to the questionnaire, which resulted in 51 micro-enterprises in the sample of

Figure 2: The respondents' highest academic degree



organizations. A total of 61 respondents from 52 small enterprises responded to the questionnaire, plus 101 respondents from 44 medium-sized enterprises.

The highest percentage, 39.91% of surveyed respondents in SMEs, have clerical jobs in administration, while 12.21%, 20.19% and 16.90% work as managers in junior, middle, and top management, respectively. 10.8% of respondents perform other jobs that were not predefined.

As regards area of work, the respondent sample is heterogeneous (Table 4). Such results suggest that spreadsheet programs are used in most business functions and processes in surveyed enterprises.

Table 4: The respondents' area of work

	No	Percentage	Percentage of cases
Administration	71	22.61%	33.33%
Sale/purchase	65	20.70%	30.52%
Marketing	22	7.01%	10.33%
Human resources	18	5.73%	8.45%
IT jobs	56	17.83%	26.29%
Finance	52	16.56%	24.41%
Legal services	14	4.46%	6.57%
Other	16	5.10%	7.51%
Total	314	100.00%	147.42%

Note: Respondents could select more than one answer

Figure 3: Industries of SMEs

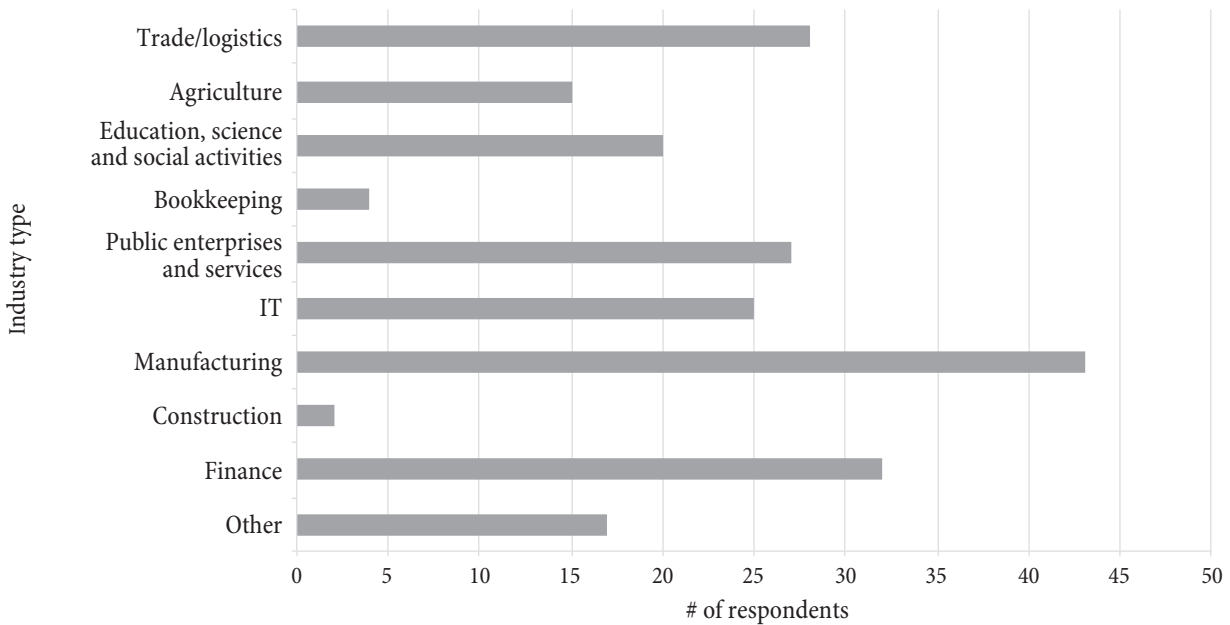
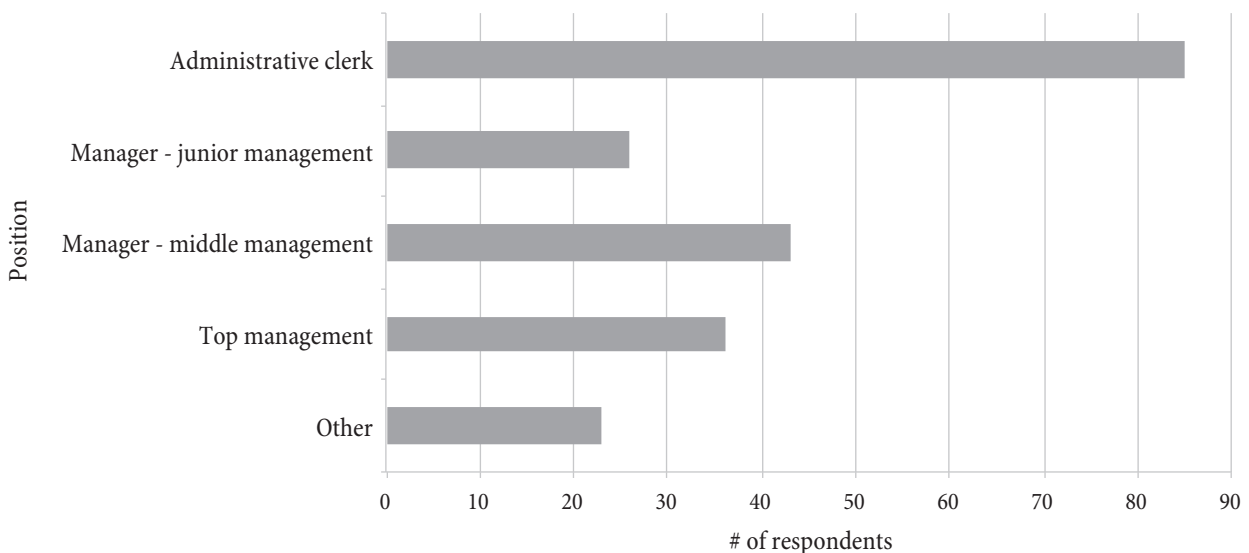


Figure 4: Respondents' positions

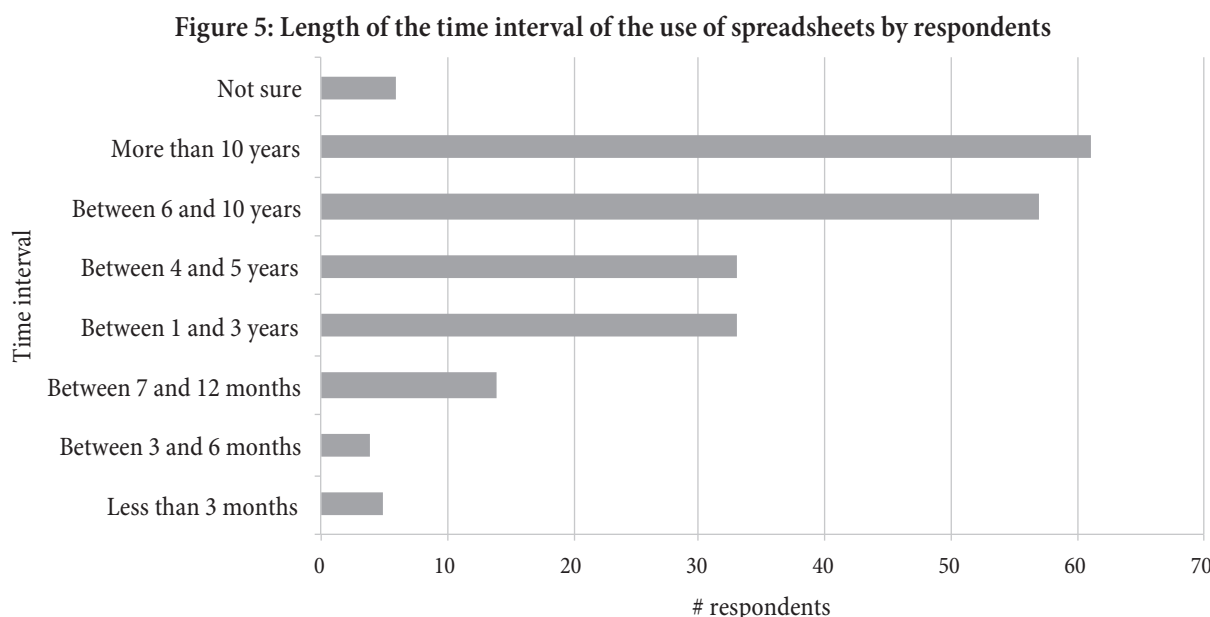


As regards the length of time interval of using spreadsheets, results show that the highest percentage of respondents, 28.64% of them, have been using these programs for more than ten years, 26.76% between 6 and 10 years, whereas a small percentage of them have been using these programs for less than six months (4.23%) (Figure 5). More than half of respondents have a significant experience in using spreadsheets.

Research results related to the respondents' self-assessment of the level of their own experience are shown in Table 5. The lowest percentage is present in respondents who reported to have very little experience in work with spreadsheets. Approximately one sixth of respondents reported to have considerable experience in working with worksheets. After the classification of assessments into low (1, 2 and 3) and high grades (4, 5 and 6), information was derived showing that there is a much higher percentage of experienced respondents in comparison to inexperienced spreadsheet users.

Table 5: Level of respondents' experience

	Frequency	Percentage	Cumulative percentage
Grades	1	7	3.29%
	2	7	3.29%
	3	49	23.00%
	4	68	31.92%
	5	46	21.60%
	6	36	16.90%
	213	100.00%	



Use of individual spreadsheets

Among surveyed respondents in SMEs, 93.42% of them use spreadsheets, whereas 6.58% of them do not. The respondents who do not use spreadsheets had no obligation to fill in the questionnaire for this research, thus, the number of respondents whose data are encompassed by the analysis amounts to 213, rather than 228 as stated in the respondent sample.

The results on the use of individual spreadsheets are shown in Table 6. By far most respondents use Microsoft's spreadsheets, whereas much fewer respondents use all other software products from this domain.

Table 6: Use of individual spreadsheets

	No	Percentage	Percentage of cases
MS Excel	205	80.08%	96.24%
Calc (OpenOffice)	35	13.67%	16.43%
Lotus 1-2-3	4	1.56%	1.88%
Google Spreadsheets (Google Docs)	12	4.69%	5.63%
Other	0	0.00%	0.00%
Total	256	100.00%	120.19%

Note: Respondents could select more than one answer

The highest percentage of respondents, 56.81% of them, use spreadsheets on average up to 25% of working hours. 19.72 % of respondents spend 26% to 50% of their workday using spreadsheets, 15.02% of them use spreadsheets from 51% to 75% of their workday, while 6.57% of them spend 76% to 100% of their workday using

these tools. A negligible number of respondents, less than 2%, could not estimate the average time of use.

Degree of importance of spreadsheets in work

The highest percentage of respondents think that spreadsheets are extremely important in the work they perform, while a really small percentage of them are of the opposite opinion (Table 7). After the division of grades into low (1, 2 and 3) and high (4, 5 and 6), the results have become even clearer. In particular, it can be seen that as many as 83.57% of respondents regard spreadsheets as important for performing their work.

The purpose of the use of spreadsheets in the operation of SMEs

The research results on the ratio of spreadsheets to other software products used in enterprises are shown in Table 8. The highest percentage of respondents use spreadsheets as

an auxiliary (secondary) software, whereas a significantly lower percentage use these programs as the only or primary software.

The research results pointing to situations in which respondents in SMEs use spreadsheets are shown in Table 9. The highest percentage of respondents use spreadsheets in situations where they find it easier to use them for performing a certain task than to use the existing information system. Then, almost half of respondents stated that they used spreadsheets in situations when they could not perform a certain task using the organization's information system, and a somewhat smaller percentage used them as the only software.

The research results pointing to the purpose of using spreadsheets are shown in Table 10. The use of spreadsheets for keeping various records was stated by most respondents. A somewhat lower percentage is related to creating reports, followed by data analysis. A significant

Table 7: Importance of spreadsheets in the respondents' work

	Frequency	Percentage	Cumulative percentage
Grades	1	2	0.94%
	2	5	2.35%
	3	28	13.15%
	4	36	16.90%
	5	54	25.35%
	6	88	41.31%
Total	213	100.00%	100.00%

Table 8: Ratio of spreadsheets to other software products

	No	Percentage	Percentage of cases
Only software	39	17.65%	18.31%
Primary software	47	21.27%	22.07%
Auxiliary (secondary) software	132	59.73%	61.97%
Not sure	3	1.36%	1.41%
Other	0	0.00%	0.00%
Total	221	100.00%	103.76%

Note: Respondents could select more than one answer

Figure 6: Average time of use of spreadsheets during the workday

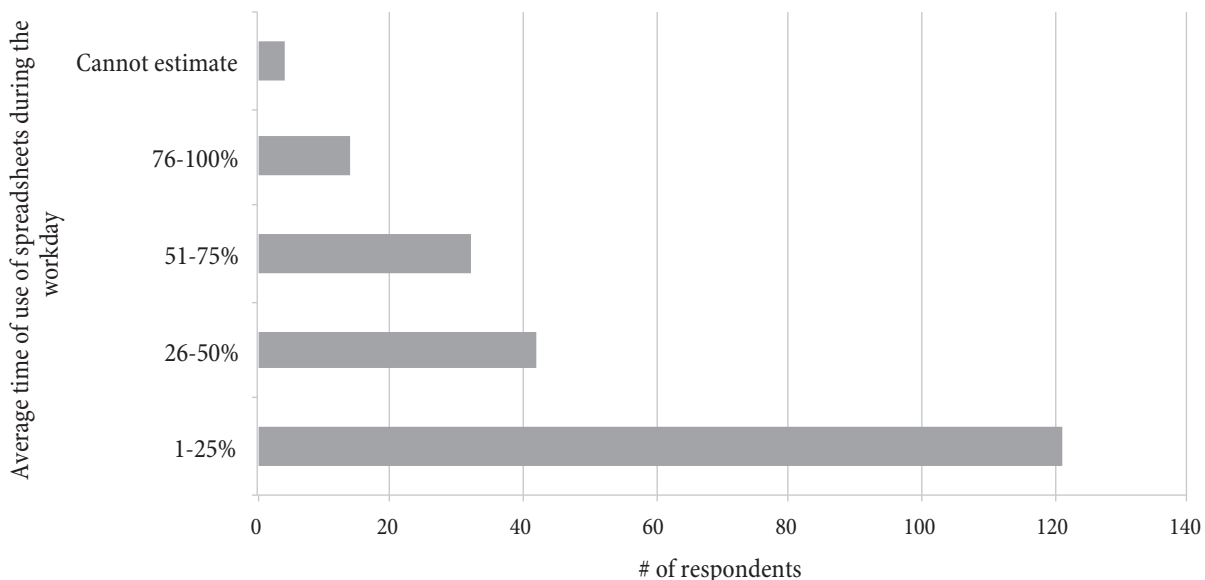


Table 9: Situations in which respondents use spreadsheets

	No	Percentage	Percentage of cases
When I cannot perform a certain task using the information system	67	25.28%	31.46%
When it is easier to perform the task using spreadsheets than using the existing information system	131	49.43%	61.50%
I use spreadsheets as the only software	61	23.02%	28.64%
Other	3	2.26%	2.82%
Total	262	100.00%	124.42%

Note: Respondents could select more than one answer

Table 10: Purpose of using spreadsheets

	No	Percentage	Percentage of cases
Data analysis	149	20.67%	69.95%
Assessing alternatives	32	4.44%	15.02%
Determining trends and creating projections	47	6.52%	22.07%
Data tracking (budget, sales, inventories, etc.)	128	17.75%	60.09%
Creating reports	163	22.61%	76.53%
Various records (e.g. lists of names, addresses, etc.)	168	23.30%	78.87%
I conduct the entire operation by using spreadsheets	28	3.88%	13.15%
Other	6	0.84%	2.82%
Total	721	100.01%	338.50%

Note: Respondents could select more than one answer

Table 11: Way of using spreadsheets

	No	Percentage	Percentage of cases
For complete data entry and processing (I do not use other programs for this)	65	21.89%	30.52%
For processing data that I obtain from DW databases	29	9.76%	13.62%
For processing data obtained from the information system	130	43.77%	61.03%
For entering data to be processed by the information system	66	22.22%	30.99%
Not sure	7	2.36%	3.29%
Other	0	0.00%	0.00%
Total	297	100.00%	139.44%

Note: Respondents could select more than one answer

number of respondents also use spreadsheets to track data related to the budget, sales, inventories, etc. However, spreadsheets are used significantly less for determining trends and creating projections, as well as for assessing alternatives. The lowest percentage of respondents use spreadsheets for the entire operation.

Research results regarding the way of using spreadsheets are shown in Table 11. In most cases, respondents use spreadsheets for processing data obtained from information systems. This is followed by the use for the purpose of entering data that will be processed by the information system, and the complete data entry and processing (without using other programs). The lowest percentage of respondents use spreadsheets for processing data that they obtain from DW databases.

The research results showing the ways of data exchange between SMEs and other enterprises are shown in Table 12. After printed documents, spreadsheets are the

second most preferred choice for data exchange between SMEs and other enterprises. Also, a significant percentage of respondents use the XML standard for this purpose.

Section 5: Discussion and conclusions

The results of empirical research conducted on the purposive sample of 213 participants from 147 Serbian SMEs provide a cross-section on the issue of respondents' profiles and

Table 12: Data exchange methods between SMEs and other enterprises

	No	Percentage	Percentage of cases
Spreadsheets	135	32.22%	63.38%
XML	79	18.85%	37.09%
Printed documents	143	34.13%	67.14%
Not sure	15	3.58%	7.04%
PDF	33	7.88%	15.49%
Other	14	3.34%	6.57%
Total	419	100.00%	196.71%

Note: Respondents could select more than one answer

demographics, use of spreadsheets, degree of importance of spreadsheets in work, and purpose of the use of spreadsheets in SMEs operations. A typical spreadsheet user in the surveyed micro, small and medium-sized enterprises is educated: about 85% of surveyed spreadsheet users have an academic degree. They are employed in manufacturing industries, financial organizations, trade and logistics, public enterprises, utility services, agriculture, science, social activities, hospitality, healthcare, telecommunications, marketing, etc. This confirms the postulations about the omnipresence of spreadsheets in business operations [8], [20], [39], [40]. Respondents are mainly performing jobs of administrative nature, or occupy positions in lower, middle or top-level management. Judging by the years of use of spreadsheets, respondents can be regarded as experienced users – about 60% of them have been using spreadsheets for more than 6 years. The respondents' own subjective assessment of their experience corresponds to the number of years of use: about 79% of them assess their spreadsheet experience as significant.

As expected, based on the results of similar research [15], [37], [38], the most frequently used program is Microsoft Excel (80.08%), and the second position, with a far lower percentage (8.08%), belongs to OpenOffice Calc. The largest number of respondents, somewhat more than 55%, use spreadsheets for up to one quarter of their working hours. About 20% of them spend between one quarter and a half of their working hours using spreadsheets, about 15% of respondents spend from a half to three quarters of their working time on these tools, whereas 7% use spreadsheets for more than three quarters of working hours. A significant percentage, almost 85% of respondents, regard spreadsheets as important for performing their tasks (similar results were also obtained by Baker et al. [33]), while they are mostly used as a secondary software (60% of cases). What is interesting is the finding that as much as 50% of respondents use spreadsheets instead of the existing IS, because they subjectively find using spreadsheets more productive than the use of the existing IS. This fact may point to the conclusion that the users are not sufficiently trained for working in the existing information system and/or that the information system is problematic from the aspect of usability, which could be a subject matter of

a separate research. Half of respondents use spreadsheets as a supplement to the existing IS, when the IS does not have the required functionality.

Spreadsheets are most frequently used for keeping records, creating reports and data analysis, while the least frequent use is related to determining trends, creating projections and assessing alternatives. The data used in spreadsheets are mostly exports from the existing IS (in about 43% of cases) whereas the case in which exports from spreadsheets are used as inputs in IS accounts for half of the frequency. In 22% of cases, respondents perform data capture and processing with spreadsheets only.

The limitation of the conducted empirical research is the formation of a purposive rather than a simple random sample of SMEs. The chosen forms of ethnographic interview, especially in the segment related to the purpose of the use of spreadsheets, would definitely present an additional confirmation of the validity of results of the conducted research. In order to place further research in the context of studying the user-driven IT, it would be desirable to conduct the following research: studying the gathered spreadsheets from the aspect of errors, determining the impact (quality) of spreadsheets on decision making, considering the presence of risk of using spreadsheets and awareness of the existence of risks, presence and detrimental effect of the overconfidence of spreadsheet users and defining the framework for creating and using spreadsheets.

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