

THE USE AND EFFECTIVENESS OF ACCOUNTING INFORMATION SYSTEMS IN TRANSITION ECONOMIES

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Abstract

The constant developments in the area of accounting information systems unlock a wide area for contributing to the existing theory in the field of accounting information systems. Particularly in the case of the Federation of Bosnia and Herzegovina, where the benefits that the use of AIS brings with it, are not yet well recognized. The purpose of this research is to analyze the overall situation in the FBiH regarding the use of AIS in companies and its impact on strategic decision-making. Data is collected through surveys that were distributed to the companies in FBiH. Multinomial logistic regression was used to analyze the data. Research findings indicate that the industry sector and satisfaction with AIS are found to be statistically significant predictors of the probability of decision-making based on AIS and that accounting information is indispensable in the process of strategic decision-making, especially when it comes to the company's growth, investments, and borrowing.

Keywords: accounting information, business information systems, decision-making, small and medium-sized companies, effectiveness.

Introduction

Today, more than ever before, companies are faced with a constantly changing and challenging business environment that requires quick access to reliable and accurate information for decision-making purposes. Together with an increasing number of challenges, the opportunities for growth and development are also increasing, primarily through constant technological advancements. With the aim of achieving production efficiency and being more confident about the company's strategic decisions, businesses are progressively turning towards accounting information systems which are supposed to ensure a greater level of reliability and effectiveness in the processing of business transactions and financial reporting. This is especially important in recent times, given the fact that the beginning of the 21st century was marked by a series of financial reporting scandals. Financial reporting plays a critical role in the process of alleviating information asymmetry and sustaining financial system stability.

Klobučar (1999) asserts that the main purpose of accounting information is to be used in the process of conducting business operations of the entity in order to create preconditions for efficient and effective business decision-making. The right and effective decisions could be

made on the basis of complete and adequate information which should be provided by accounting information systems, and as such, they have, if not conclusive, then a very significant role in the decision-making process (Bibuljica, 2015).

The constant and advanced developments in the area of business information systems, with special emphasis on accounting information systems, unlock a wide area for building on and contributing to the existing theory in the field of accounting information systems. Particularly in the case of Bosnia and Herzegovina, where the benefits that the use of AIS (accounting information system) brings with it, are not yet well recognized. Therefore, this study has the following objectives:

- Analyze the overall situation in the Federation of Bosnia and Herzegovina regarding the use of AIS in business organizations.
- Investigate the relationship between the use of AIS and its impact on the decision-making process, with a special focus on strategic decision-making.
- Describe for which strategic decisions information provided by AIS is mostly used.

With regard to the existing body of knowledge in the area of accounting information systems, it is expected that the study will primarily contribute in a way that it enriches the theory and provides a better understanding of all potential benefits that companies will acquire after AIS implementation. In the case of Bosnia and Herzegovina, the existing body of knowledge in the field of AIS is scarce, especially when it comes to the use of AIS in small and medium-sized enterprises which are seen as a generator of economic growth and development in transition economies. At the same time, there is a lack of government support, which should facilitate AIS implementation through the adoption of appropriate legislation. So bearing this in mind, the study with its fresh findings, can contribute to the companies engaged in software development through a better understanding of the company's needs and working on the development of tailor-made accounting information systems. The study can contribute to the company owners and managers and financial managers in recognizing, identifying, and exploiting the advantages of AIS. Considering the fact that BiH is a fertile ground for innovation in the particular AIS field, the government may use the study as a source based on which it will work on legislation that will ease and foster the production and implementation of AIS software.

Literature Review

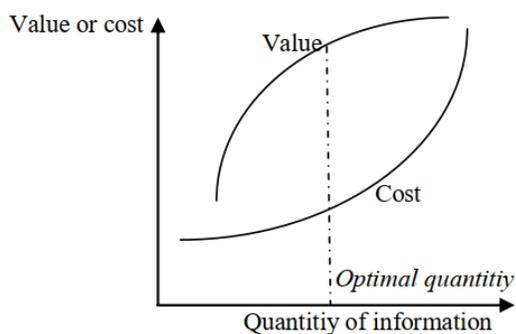
Accounting information systems provide information for different levels of managers, from production managers to human resource, finance, marketing, and logistics managers. Managers need information for the purpose of business planning and controlling, as well as for the financial statement preparation for stakeholders, creditors, and government agencies. Generally, AISs can be divided into two groups:

1. Accounting system installed on the computers within the company, and
2. Web accounting system installed on servers.

Web accounting software is based on Internet technologies where information is stored on the server or in the cloud. Contemporary AISs are closely related to the new cloud computing technology. Cloud accounting system enables the company to conduct accounting functions online and provides on-demand access to the clients. This is known as online accounting or SaaS (software as a service) accounting software. Cloud computing in accounting can be observed as a type of virtual AIS. The use of cloud computing technology in accounting enables cost reduction and quick access to accounting information. An important issue related to cloud accounting is information security – accounting is directly related to the process of managing money, and all information related to that is stored on the servers that are not in the company's possession, so if there is an Internet connection interruption, it is impossible to access accounting information stored on the server (Savić and Janković, 2015). Research conducted among managers in Europe showed a positive attitude toward cloud computing technology usage in accounting. When it comes to Bosnia and Herzegovina, Savić and Janković (2015) conducted research that included 32 legal entities (12 from the production sector and 20 from the service sector). The research findings revealed that 47% of the surveyed managers are not familiar with the use of cloud computing in accounting. Of the managers that are familiar with the use of cloud computing technology in accounting, 82% of them think that cloud computing in accounting contributes to the more efficient company's management, while the main reasons for its non-use are: potential data misuse, reduced control of accounting system and technology reliability.

McLaney and Atrill (2010) stress that specific items of accounting information should be provided when the benefit of providing it exceeds the cost. Figure 1 demonstrates the relationship between the value and cost of providing additional accounting information.

Figure 1 – Relationship between value and quantity of accounting information



The benefits of accounting information will eventually decline over time, and the cost, on the other hand, will increase by providing an additional piece of accounting information. The benefits of providing an additional piece of accounting information decline over time, perhaps, because it becomes less relevant, or because the decision maker might have problems in the processing quantity of information already provided. The optimal quantity of accounting information provision is where the gap between the value and cost of accounting information is the highest.

However, several research studies provide evidence that the use of AIS improves management efficiency and cost control, profitability, and organizational effectiveness (Kpurugbara, Akpos, Nwidiuudu, and Tams-Wariboko, 2016; Patel, 2015; Neogy, 2014).

Accounting information system as any other system or product has a life cycle. The goal of AIS is to process and present business information at the request of management and to prepare problem-solution proposals, with the aim to make qualitative and sound decisions based on which company will grow and develop. In order to properly and efficiently respond to management's requests, AIS needs to be constantly developed and improved. Growth, development, and improvement must follow certain phases.

Sačer and Žager (2008) in the book „Accounting Information System“, define the AIS life cycle phases as follows: system planning, system analysis, system design, system testing, implementation phase, and post-implementation phase.

Stanković, Knežević, and Mitrić (2012) in their study, assert that one of the crucial characteristics of AIS is the ability to adapt to changes in the contemporary environment and continuing on providing information for the smooth running of the organization.

Use and effectiveness of AIS

Chong (1996) states that accounting information helps managers to comprehend their tasks clearly and it lowers uncertainty in the process of decision-making. Uncertainty is considered as a lack of information in comparison with what a decision-maker needs in order to make the right decision. If the managers are less able to predict the outcomes of their decisions, the uncertainty is higher (Galbraith, 1976). According to Burchell, Clubb, Hopwood, Hughes, and Nahapiet (1980), there are various roles of information in the decision-making process, depending on the uncertainty level. These roles are specified based on two aspects: uncertainty of cause and effect and uncertainty of objectives. Accounting information may help to analyze how objectives can be accomplished by quantifying the financial effect of each available alternative. Accounting information can be used to convert various business dimensions into a common financial dimension. AIS of any organization is accountable for the preparation of qualitative information that will facilitate the decision-making process. So organizational success or failure depends mostly on the management decisions, and the quality of those decisions depends on the up-to-date data availability (Ogah, 2013).

The research done in the field of organizational effectiveness implies that the effectiveness of AIS depends on the quality of generated information that satisfies its users (Cameron, 1986; Delone and Mclean, 1992; Kim, 1989; Lewin and Minton, 1986; Quinn and Rohrbaugh, 1986). Effective AIS will result in an effective organization. Hunton (2002) asserts in his study that there exists a strong relationship between accounting information systems and organizational effectiveness, which means access to accounting information leads to organizational effectiveness. Based on the research findings, the effectiveness of accounting information systems is dependent on satisfaction with AIS usage (Yuthas and Eining, 1995). Furthermore, the

performance and use of AIS depend on the organizational size (Choe, 1996). Also, social factors, business expectations, and work environment significantly influence the interest in the use of AIS (Animah and Jumaidi, 2019). Given the significance of particular industry sectors and their contribution to the country's GDP, several research studies focused only on specific industries, such as the retail industry, with the aim of evaluating the impact of AIS on decision-making (Animah and Jumaidi, 2019).

Therefore, the first and second hypotheses of this research are:

Hypothesis 1 - Decision-making based on AIS depends on company size and industry sector.

Hypothesis 2 - Decision-making based on AIS depends on satisfaction with AIS and the way it is obtained.

Decision-making based on AIS

Ponemon and Nagoda (1990) state that the major reason for which accounting information is prepared is to assist in the decision-making process. Accounting information should provide the decision-maker with the ability to anticipate future actions that are crucial for business success. Thus accounting information system is necessary for all organizations (Rahman and Halladay, 1988). Capital market participants, government institutions, regulators, rating agencies, investment advisors, financial analysts, consulting agencies, and business partners rely on the accounting information provided in financial statements or reports. That's why the information contained in financial reports/statements must be objective, trustworthy and reliable in order to ensure the quality of such information (Stanković et al., 2012).

Decision-making is the first and one of the most important functions of management. It is closely related to the planning process because the main activity in the planning process is to bring decisions (Alsahen, 1986). With regard to the purpose of the study, decision-making can be defined as a selection of a strategy or a course of action from various available alternatives in a reasonable manner and based on information provided by AIS (Medina, Jimenez, Mora, and Abrego, 2014).

Company managers at different levels make decisions on a daily basis, tackling day-to-day issues to long-term strategic planning. Decision-making can be defined as a choice that leads to a particular anticipated objective (Lengauer, Mayr, and Parasote, 2006). According to Chand (2015), there are seven steps in the decision-making process: defining the problem, analyzing the problem, developing alternative solutions, selecting the best type of alternative, implementing of decision, following up, monitoring and feedback.

According to Alhelo (2000), decisions are categorized according to the level at which they are made:

- Strategic decisions are related to the goals and major organizational plans and are made for a long period of time. Strategic decisions determine the company's policy, annual and long-term business plans, and organizational structure.

- Management or tactical decisions are related to the way of managing performance in order to accomplish the strategy. Tactical decisions are distinctive but are within well-defined boundaries. They may require significant resources, have medium-term effects, and are taken by middle or senior managers.
- Operational decisions are usually related to routine work and following known rules. These decisions require more limited resources, have short-term implications, and are made by middle-of-first-line managers.

The strategic decisions which determine the company's course of action, expansion, and organizational culture are highly affected by the financial accounting information (Miko, 1998). Therefore, the third hypothesis of this research is:

Hypothesis 3 – Strategic decision-making is based on the information provided by the AIS.

Methodology

The main purpose of the research is to investigate the relationship between the use of AIS and its impact on the company's decision-making process. The study employed the cross-sectional design to examine whether AIS usage affects the decision-making process with data being collected through surveys distributed to the companies in the Federation of Bosnia and Herzegovina.

The population of the study refers to all companies or business organizations that conduct their operations on the territory of the Federation of BiH. From the population, the sample was selected using the random sampling procedure which was selected as the most appropriate for the purpose of the research. According to Owojori (2002), random sampling is defined in a way that all population members have an equal chance of being selected from the sample, while the selection of one population member does not influence the chances of any other population member being selected. The study involved 104 companies that were reached by e-mail (30% of them), and through direct visits (70% of them). Mostly, the company's respondents were top managers or financial/head of accounting managers.

Data collected through surveys were analyzed in the SPSS (Statistical Package for Social Sciences) using measures of central tendency and multinomial logistic regression. The survey consists of two parts: descriptive characteristics of companies and attitudes and experiences in the use of AIS.

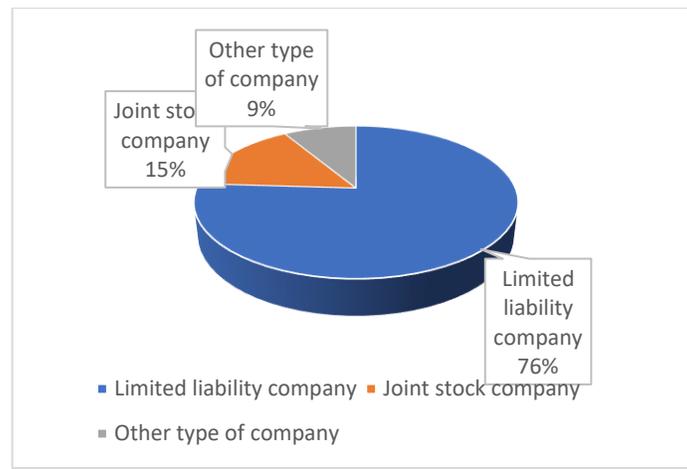
Multinomial logistic regression is the linear regression that is used when the dependent variable is categorical with more than two levels. It is used to describe data and to explain the relationship between one dependent nominal variable and one or more categorical or continuous independent variables.

Research Findings

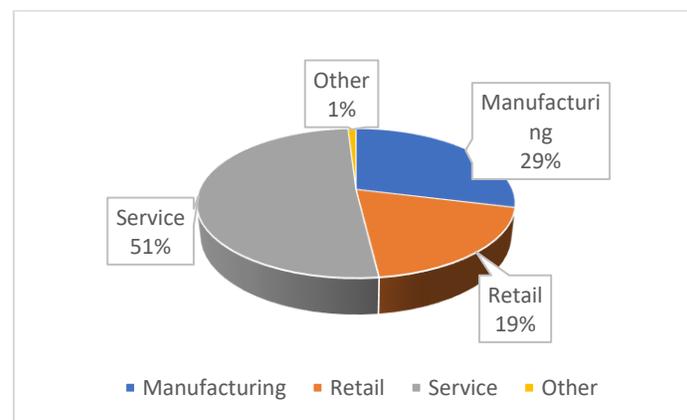
In total, 104 companies in the Federation of Bosnia and Herzegovina participated in the research. The descriptive characteristics of the sampled companies are described in the following lines.

With respect to the organizational form (limited liability, joint stock, or other), 76% of the sample represent limited liability companies, which is shown in the chart below. Out of 104 sampled companies, half of them are from the service sector (51%), followed by the manufacturing sector (29%), the retail sector (19%), and other (1%). With respect to the number of employees, 70% of the sampled companies have less than 50 employees, while 30% of the sampled companies have more than 50 employees. The analysis of respondents based on their job position within the company reveals that most of the respondents were CEOs and Heads of the Accounting Department within the company.

Graph 1 – Organizational form



Graph 2 - Sector



Out of 104 companies that participated in the research, 4 do not use AIS in conducting their business operations. The reasons for the non-use of AIS were following: two companies declared that there is no need for an accounting information system, and the other two companies stated that the main reason is the high cost of purchasing and implementation of AIS and the lack of education of employees regarding the use of AIS.

In more than 80% of the cases, companies are using purchased licensed AIS, and in less than 20% of the cases, the AIS was developed within the company.

Based on the findings, around 45% of the companies always rely on AIS while making business decisions, almost 50% of the companies sometimes rely on information provided by AIS, while around 5% of the surveyed companies do not use AIS information in the process of decision making.

In order to test Hypothesis 1 - Decision-making based on AIS depends on company size and industry sector, the multinomial logistic regression model is used. Decision-making on the basis of AIS is set as a dependent categorical variable with three levels (always, sometimes, and never), and the industry sector and the number of employees as independent categorical variables. As the reference category for the dependent variable, the response „never“ is used (in terms that the company never brings decisions based on AIS). Within the „Industry sector“ independent variable that has four possible responses (manufacturing, retail, services, and other), other is used as a reference category. Within the „Number of employees“ independent variable that has four possible responses (1-10, 10-50, 50-100, and More than 100), more than 100 is used as a reference category. The results are presented in Table 1.

Table 1: Decision-making based on AIS depending on industry sector and company size

Decision-making based on AIS		B	Std. Error	Wald	df	Sig.	Exp (B)
Always	Intercept	-12.773	2.615	23.852	1	0.000	
	Manufacturing	17.634	1.172	219.578	1	0.000	3.48E+07
	Retail	19.666	2.346	70.252	1	0.000	3.48E+08
	Service	16.828	0	.	1	.	2.03E+07
	Other (reference)	0			0		
	1-10 employees	-3.502	2.645	1.753	1	0.186	3.00E-02
	10-50 employees	-1.792	2.755	0.423	1	0.516	1.67E-01
	50-100 employees	-0.622	4.177	0.022	1	0.882	5.37E-01
	More than 100 employees (reference)	0			0		
Sometimes	Intercept	-13.394	2.617	26.193	1	0.000	
	Manufacturing	17.356	1.166	221.489	1	0.000	3.45E+07
	Retail	19.58	2.34	69.996	1	0.000	3.19E+08
	Service	17.521	0	.	1	.	4.07E+07
	Other (reference)	0					
	1-10 employees	-2.799	2.642	1.122	1	0.289	6.10E-02
	10-50 employees	-1.552	2.759	0.316	1	0.574	2.12E-01
	50-100 employees	-0.042	4.173	0	1	0.992	9.58E-01
	More than 100 employees (reference)	0			0		

Source: Author's work.

Based on the results of multinomial logistic regression, the industry sector is found to be a statistically significant independent variable in predicting probabilities of making decisions based on the AIS. Following the odds ratio interpretation (Exp B) companies in the manufacturing, retail, and service industry are more likely than other companies to prefer always and sometimes over never in making decisions based on AIS.

On the other side, the company size measured through the number of employees is found to be a statistically insignificant variable in predicting probabilities of making decisions based on the AIS.

The research findings provide evidence that Hypothesis 1 - Decision-making based on AIS depends on company size and industry sector, is partially confirmed, since only industry sector is found to be a statistically significant predictor of the probability of decision-making based on AIS.

Hypothesis 2 - Decision-making based on AIS depends on satisfaction with AIS and the way it is obtained is also tested using multinomial logistic regression. Decision-making on the basis of AIS is set as a dependent categorical variable with three levels (always, sometimes, and never), and the satisfaction with AIS and the way of obtaining AIS as independent categorical variables. As the reference category for the dependent variable, the response „never“ is used (in terms that the company never brings decisions based on AIS). Within the „Satisfaction with AIS“ independent variable that has three possible responses (very satisfied, moderately satisfied, and not satisfied), not satisfied is used as a reference category. Within the „The way of obtaining AIS“ independent variable that has two possible responses (purchased, and developed within the company), developed within the company is used as a reference category. The results are presented in Table 2.

Table 2 – Decision-making based on AIS depending on satisfaction with AIS and the way of obtaining AIS

Decision-making based on AIS		B	Std.Error	Wald	df	Sig.	Exp (B)
Always	Intercept	30.06	1.89E+03	0	1	0.987	
	Very satisfied	13.052	1.906	46.885	1	0.000	2.15E-06
	Moderately satisfied	13.991	1.299	116.085	1	0.000	8.39E-07
	Not satisfied (reference)	0			0		
	Purchased	13.644	1.89E+03	0	1	0.994	1.19E-06
	Developed within the company (reference)	0			0		
Sometimes	Intercept	31.282	1.89E+03	0	1	0.987	
	Very satisfied	13.831	1.449	91.119	1	0.000	9.85E-07
	Moderately satisfied	14.006	0		1		8.26E-07
	Not satisfied (reference)	0			0		
	Purchased	14.403	1.89E+03	0	1	0.994	5.56E-07

	Developed within the company (reference)	0			0	
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Source: Author's work.

Based on the results of multinomial logistic regression, satisfaction with AIS is found to be a statistically significant independent variable in predicting probabilities of making decisions based on the AIS. Companies that are satisfied with AIS are more likely to make decisions using the information obtained from AIS.

On the other side, the way of obtaining AIS is found to be a statistically insignificant variable in predicting probabilities of making decisions based on the AIS. In other words, it makes no difference whether the AIS is purchased or developed within the company when it comes to decision-making based on AIS.

Therefore, the research findings suggest that Hypothesis 2 - Decision-making based on AIS depends on satisfaction with AIS and the way it is obtained is also partially confirmed, given that only satisfaction with AIS is found to be a statistically significant predictor of the probability of decision-making based on AIS.

Table 3 provides the research findings when it comes to the strategic decisions which are made on the basis of accounting information provided by AIS. Based on the findings, companies are mostly using AIS (in more than 90% of cases) as a basis for strategic decisions related to the company's growth, investments, and production and equipment. Also, strategic decisions related to borrowing and marketing are mostly based on AIS (in more than 82% of cases). When it comes to training and development and human resources, information by AIS is used in the decision-making process (in more than 74% of cases) but less frequently compared to the previously stated strategic decisions.

Table 3 – Strategic decision-making based on AIS

Use of AIS for Strategic Decision-Making			
Strategic Decision	Always	Sometimes	Never
Company's Growth	55%	44%	1%
Training and Development	27%	47%	26%
Human Resources	29%	45%	26%
Borrowing	50%	32%	18%
Investments	47%	44%	9%
Marketing	32%	53%	15%
Production and Equipment	43%	50%	7%

Source: Author's work.

Following the above-stated findings, Hypothesis 3 – Strategic decision-making is based on the information provided by the AIS, is confirmed, given that information provided by AIS is used as a basis for strategic decision-making related to the company's growth, investments, production and equipment, borrowing, marketing, training and development, and human resources.

Discussion and Conclusion

The main purpose of the study was to analyze the overall situation in BH companies regarding the use and implementation of AIS in decision-making. The surveyed companies are from different sectors (production, retail, service) and out of 104 of them 100 companies use AIS in their daily business operations. A very small number, just four of the surveyed companies do not use AIS within their companies. The reasons for AIS non-use are of different natures: the high cost of purchasing and implementing AIS, avoiding the need for AIS, or lack of education of employees when it comes to using AIS.

Generally, the companies use AIS that is either purchased or licensed from another legal entity (more than 80% of the surveyed companies), while less than 20% of the companies develop their own AIS. Development and implementation of AIS with the company's own resources are very costly, challenging, and time-consuming. With respect that around 70% of the surveyed companies have less than 50 employees, for them, it is easier to purchase or license appropriate AIS. Large companies in terms of total assets, revenues, and the number of employees opt for the development of AIS with their own resources. Regarding the frequency of making decisions based on AIS, almost half of the surveyed companies always make decisions based on information provided by AIS, more than half of the surveyed companies sometimes make decisions based on AIS, and just 5% of the companies (including those that do not use AIS) never use AIS as a basis for decision-making.

According to the results of multinomial logistic regression, the industry sector and satisfaction with AIS are found to be statistically significant predictors of the probability of decision-making based on AIS. The nature of the business operations and work environment impact the company's decision to use AIS and the information provided by AIS.

Research findings provide evidence that the accounting information provided by the AIS is indispensable in the process of strategic decision-making, especially when it comes to the company's growth, investments, production and equipment, and borrowing. When strategic decisions are based on reliable, timely, and accurate accounting information, the future company's performance is more predictable in terms of the realization of business goals and risk mitigation.

This research has theoretical and practical implications for SMEs in transition economies. The theoretical implication of the research relates to the evidence that the industry sector is an important predictor of AIS use, together with the satisfaction of AIS in transition economies. This may help companies that are engaged in the development of AIS software where to put focus when it comes to the development of specific features of accounting information systems. Also, this research stresses the importance of following technological advancements in attaining and maintaining a competitive advantage, especially when it comes to the strategic decision-making.

The research revealed interesting findings, and as such brought fresh insights to the existing theory. The study demonstrates quite realistic findings regarding the situation in the Federation of Bosnia and Herzegovina. However, one of the limitations is related to the sample size so the study may be improved by including a greater number of companies, especially large companies in terms of the number of employees, assets, and revenue size.

This research established solid ground for the next research to be done in the field of accounting information systems, since the literature with adequate statistical analysis and findings in this area is quite scarce. Since it has been found that AIS impacts organizational strategic decisions, the following research studies may analyze the impact of AIS on tactical and operational decisions. Since the number of users of cloud computing technology in accounting is increasing in the world, this also represents an interesting area for future research.

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