

EXAMINING THE RELATIONSHIP BETWEEN AUTOMATED TIME TRACKING SOFTWARE ADOPTION AND SME PRODUCTIVITY: THE ROLES OF EMPLOYEE ACCEPTANCE AND PRIVACY CONCERNS

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Abstract

This paper examines the relationship between employee acceptance, privacy concerns, and SME productivity in the context of automated time tracking software. Although technology acceptance and workplace monitoring have been widely studied, limited empirical evidence exists on automated time tracking systems, particularly within SMEs in Bosnia and Herzegovina. The study provides a quantitative research based on an anonymous online questionnaire completed by 200 respondents. Employee acceptance, privacy concerns, and perceived productivity were measured using five-point Likert-scale statements, while current adoption, operational transparency, and SME readiness were included as additional explanatory variables. Data was analyzed using descriptive statistics, simple linear regression, and multiple linear regression in IBM SPSS Statistics. The results showed that employee acceptance has a positive and statistically significant effect on SME productivity ($\beta = .426, p < .001$), while privacy concerns have a significant negative effect on employee acceptance ($\beta = -.267, p < .001$). The findings suggest that productivity gains from automated time tracking software depend primarily on employee acceptance, highlighting the importance of addressing privacy concerns to support successful technology implementation.

Key words: Automated time tracking, Employee acceptance, Privacy concerns, Productivity, Small and medium-sized enterprises (SMEs)

JEL Classification: O32, O33, O47

I. INTRODUCTION

Small and medium enterprises are seen as one of the most important parts of modern economies, not only because they create jobs, but also because they support innovation and competitiveness in the long term. They often operate with fewer people, limited budgets, and less structured systems than big companies. In one hand this is an advantage, but in the other hand, this means that even small inefficiencies in daily operations can have a strong impact on performance. This is also a reason why SMEs tend to use any tool and/or resource available in order to increase productivity and improve their operations, therefore increasing their revenue. One of the ways for them to do that is tracking where the working time went and ideally automating that process. Escos Barragan (2025) found that SMEs with stronger digital orientation demonstrate greater adaptability and are better positioned to respond to changing market conditions, suggesting that digital readiness contributes not only to operational efficiency but also to long-term competitiveness. Existing research has explored many different areas of digitalization and automation, providing a solid foundation for deeper analysis. However, less attention has been given to quantitative evidence from Bosnia and Herzegovina. Regional research is limited, especially when the focus is placed on specific behavioral predictors of employees. This research on employee behavior and attitudes toward automatic time tracking will provide a clear image of whether their privacy concerns outweigh the benefits of implementing such tools. Two main determinants (Employee Acceptance and Privacy Concerns) were examined, as well as their association to Productivity as dependent variable. This paper therefore contributes to the literature by examining these two determinants using anonymous survey data and regression analysis. However, research results should be interpreted with caution, since the findings are based on self-reported perceptions and noting that small portion of sample includes respondents outside Bosnia and Herzegovina and outside SMEs. The main objective of this paper is to statistically evaluate what kind of roles do Employee Acceptance and Privacy Concerns play when it comes to adopting automatic time tracking software in SMEs. The paper is structured as follows. The next section reviews the relevant literature on relevant topic and prior

experiences with similar digitalization cases and employee behavior. The methodology section explains the research design, sample, variables, and analytical procedure. The results and discussion section presents the empirical findings, while the final section provides conclusions and recommendations.

II. LITERATURE REVIEW

The broader idea of automation improving SME efficiency appears in research on automated accounting tools, where automation is linked to improved operational efficiency and reporting quality in SMEs (Nwankwo et al., 2025). These findings support the argument that automation does not only reduce workload, but can also strengthen how SMEs manage internal operations. However, when talking about any technology adoption it is not enough to only outline the benefits. There is also a matter of human acceptance and readiness. Basic technology adoption theories (TAM - Technology Acceptance Model and UTAUT- Unified Theory of Acceptance and Use of Technology) explain that employees and organizations adopt tools when they believe they are useful and easy to use (Davis, 1989), and when the environment supports adoption through resources, norms, and facilitating conditions (Venkatesh et al., 2003). Particularly interesting recent article by Kahveci (2025), supports these models and emphasizes that digital transformation is not achieved through technology adoption alone. Instead, SMEs must combine digital awareness, effective implementation, organizational flexibility, and continuous improvement to realize productivity gains from digital technologies. Recent research, done by using data from Swiss firms, found that organizations adopting business software and Industry 4.0 technologies increasingly rely on performance-based incentive systems because digital technologies improve the measurement of employee activities and work outcomes (Lehmann and Beckmann, 2025). Their findings suggest that digital tools don't automate existing processes but fundamentally change how organizations evaluate performance, shifting management practices from subjective observation toward data-driven assessment. A key issue is that automated time tracking can easily be perceived as a form of 'employee monitoring'. With that in mind, The International Labour Organization (2025) also highlights a that, while monitoring technologies can improve accountability, operational visibility, and managerial decision-making, they may also increase employee concerns regarding privacy, autonomy, dignity, and fairness. The report emphasizes that employee acceptance of monitoring systems depends heavily on transparency regarding data collection, the purpose of monitoring, and the extent of employee participation in implementation decisions. This perspective is very relevant to automated time tracking systems, which seek to improve organizational transparency while simultaneously raising concerns about employee monitoring. While monitoring can improve transparency, it can also create discomfort and trust issues which later on creates resistance if employees feel that they are being controlled rather than supported. Research done by Siegel et al. (2022) supports this claim by showing that monitoring can influence job satisfaction, work stress, and counterproductive behavior. More recent research on electronic performance monitoring by Ravid et al. (2023) shows that monitoring can impact work outcomes but may also increase stress and trigger negative reactions depending on how it is implemented. On the other hand, based on empirical evidence, benefits of time tracking can not be denied: research done by Kimani and Nyatuka (2018) gives example of how web-based time tracking improves operational accuracy through timely recording. Kim et al. (2016) extend this by showing of real example called '*TimeAware*', one computer activity tracking system. It is fascinating to find out that this system, for example, can shape human behavior when framed effectively, which is relevant to how automated time tracking may influence work patterns of people. Conclusion that can be drawn from existing literature is that the key to acceptance is trust, communication, and organizational culture.

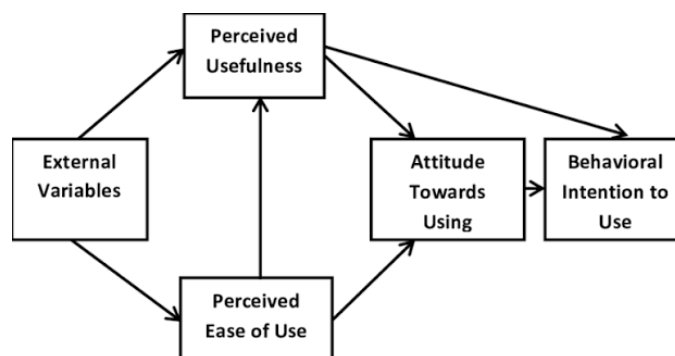


Figure 1 - TAM model (Samuel et al., 2018)

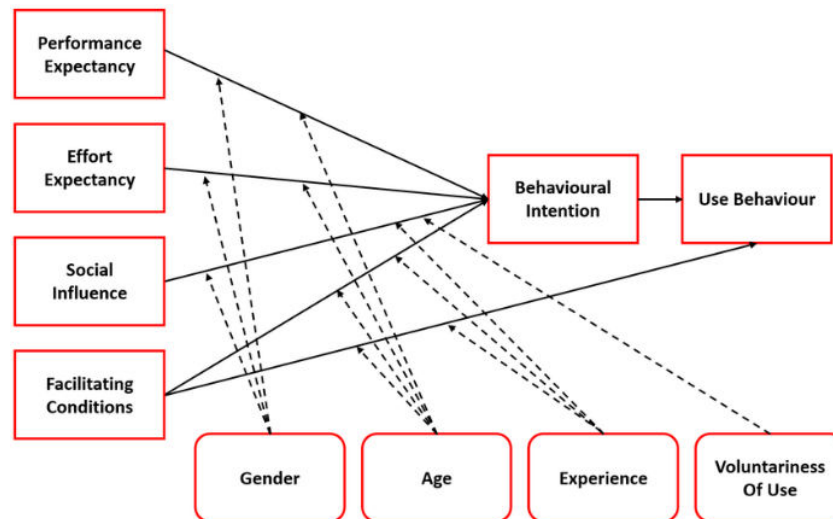


Figure 2 - UTAUT model (Fashoto et al., 2024)

H1: Employee acceptance of automated time tracking software positively influences SME productivity, while privacy concerns negatively influence employee acceptance.

III.METHODOLOGY

This study used a quantitative research approach to clearly collect and evaluate employee's opinions and concerns regarding automatic time tracking. For that purpose, an online questionnaire was made and distributed to 200 people working in various industries where time tracking is perceived as important. Once the results were gathered, analysis was performed in order to determine whether the adoption of automated time tracking software contributes to improved productivity, and whether this relationship is influenced by employee acceptance and privacy concerns. The study is based on survey data collected from employees, managers, freelancers, and professionals working in companies where digital tools and time tracking may be relevant. The questionnaire used a 5-point Likert scale, where respondents expressed their level of agreement with different statements. The scale ranged from 1, meaning strong disagreement, to 5, meaning strong agreement. This type of scale was appropriate because the research focused on perceptions, attitudes, and experiences related to time tracking software. Analysis of the results was conducted using IBM SPSS Statistics. Descriptive statistics were used to summarize respondents' perceptions of employee acceptance and privacy concerns. **Simple linear regression analysis** was conducted to examine whether privacy concerns significantly influence employee acceptance. Following that, current adoption, operational transparency and SME readiness were included in the **multiple linear regression analysis** as additional impactful variables. All of the mentioned variables were measured through a five-point Likert-scale statement assessing whether respondents believed that they increase or decrease their productivity at work.

IV.RESULTS AND DISCUSSION

1) Descriptive statistics

Descriptive statistics were calculated to examine overall respondent perceptions regarding automated time tracking software and related organizational factors. The results revealed generally positive attitudes toward automated time tracking systems. Acceptance had recorded a mean score of 3.56, which is above the neutral midpoint of the scale, indicating that respondents generally perceived automated time tracking systems as beneficial. Privacy Concerns also produced a moderately positive mean score ($M = 3.41$), suggesting that concerns regarding monitoring and privacy remain present despite the perceived benefits of the technology.

2) Simple linear regression analysis

Because Privacy Concerns were expected to influence Employee Acceptance rather than Productivity directly, a **separate simple linear regression analysis** was conducted. The results showed a significant negative effect of Privacy Concerns on Employee Acceptance ($\beta = -.267$, $p < .001$), additionally confirming Hypothesis 1 and indicating that employees who perceive greater privacy risks are less likely to accept automated time tracking systems. This result is consistent with mentioned literature, indicating that employees often perceive electronic monitoring systems as intrusive, leading to lower acceptance, higher stress, and greater resistance to workplace technologies (Ravid et al., 2023; Siegel et al., 2022).

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Privacy ^b	.	Enter

a. Dependent Variable: Acceptance

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.267 ^a	.071	.067	1.09912	1.891

a. Predictors: (Constant), Privacy

b. Dependent Variable: Acceptance

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.289	1	18.289	15.139	<.001 ^b
	Residual	237.988	197	1.208		
	Total	256.276	198			

a. Dependent Variable: Acceptance

b. Predictors: (Constant), Privacy

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B		Zero-order	Correlations		Collinearity Statistics	
		B	Std. Error				Lower Bound	Upper Bound		Partial	Part	Tolerance	VIF
1	(Constant)	4.560	.268		16.989	<.001	4.030	5.089					
	Privacy	-.293	.075	-.267	-3.891	<.001	-.441	-.144	-.267	-.267	-.267	1.000	1.000

a. Dependent Variable: Acceptance

Figure 3 - Simple Regression Analysis

3) Multiple linear regression analysis

The main hypothesis was subsequently tested using **multiple linear regression analysis**. Productivity was treated as the dependent variable, while in addition to Acceptance and Privacy Concerns, Adoption, Transparency, and SME Readiness were also included as impactful independent variables. The regression model was statistically significant ($F = 53.833$, $p < .001$), while Employee Acceptance emerged as the strongest predictor of Productivity ($\beta = .426$, $p < .001$), followed by Transparency ($\beta = .358$, $p < .001$) and Adoption ($\beta = .194$, $p < .001$). These findings provide strong support for the Hypotheses 1 and suggest that productivity improvements are primarily influenced by employee attitudes toward the technology.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.646	5	15.329	53.833	<.001 ^b
	Residual	54.673	192	.285		
	Total	131.318	197			

a. Dependent Variable: Productivity

b. Predictors: (Constant), Readiness, Privacy, Adoption, Transparency, Acceptance

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B		Zero-order	Correlations		Collinearity Statistics	
		B	Std. Error				Lower Bound	Upper Bound		Partial	Part	Tolerance	VIF
1	(Constant)	1.168	.229		5.101	<.001	.716	1.620					
	Adoption	.112	.032	.194	3.514	<.001	.049	.175	.520	.246	.164	.712	1.404
	Transparency	.335	.061	.358	5.472	<.001	.214	.456	.667	.367	.255	.506	1.977
	Acceptance	.305	.047	.426	6.437	<.001	.212	.399	.668	.421	.300	.496	2.018
	Privacy	.047	.039	.059	1.201	.231	-.030	.124	-.082	.086	.056	.885	1.130
	Readiness	-.072	.047	-.090	-1.546	.124	-.165	.020	.398	-.111	-.072	.638	1.568

a. Dependent Variable: Productivity

Correlations Zero-order

Highly Positive: (None)

Positive: (Adoption <----> Model 1), (Transparency <----> Model 1), (Acceptance <----> Model 1), (Readiness <----> Model 1)

Figure 4 - Multiple regression analysis

4) Discussion of H1 hypothesis

The regression results support the main hypothesis of the article. Employee acceptance of automated time tracking software does positively influence SME productivity, while privacy concerns do negatively influence employee acceptance. Result of the multiple linear regression model was $\beta = .426$, $p < .001$, which means that Employee Acceptance was the strongest predictor of productivity in predominantly Bosnian SMEs. It clearly shows that the success of automated time tracking depends more on employee acceptance than on adoption alone. To conclude, productivity improves most when employees perceive the system as useful and feel comfortable using it. This finding is consistent with technology acceptance theories, especially the Technology Acceptance Model (TAM) developed by Davis (1989) and Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. (2003). Employees who find time tracking useful and comfortable are more likely to report productivity benefits.

Simple linear regression supports the second part of H1 hypothesis - privacy concerns had a significant negative effect on acceptance ($\beta = -.267$, $p < .001$). This finding confirms one of the main risks discussed in the literature: automated time tracking can be perceived as employee monitoring. Since employee acceptance was the strongest predictor of productivity, privacy concerns may influence productivity indirectly. It is a chained reaction: privacy concerns reduce acceptance, and lower acceptance may reduce productivity.

While the software may be intended to improve productivity and transparency, employees may interpret it differently. If they feel watched, controlled, or evaluated unfairly, their acceptance of the system decreases.

V. PRACTICAL IMPLICATIONS

The results have practical implications for managers leading digitalization changes in teams and for SaaS providers offering automatic time tracking software. Managers should not implement time tracking as a purely technical project. They must also manage employee perceptions. If employees see time tracking as helpful, supportive, and useful for their own work, the tool is more likely to succeed. If they see it as controlling, unnecessary, or intrusive, the tool may face resistance even if it is technically effective. This is especially important in SMEs, where organizational culture and interpersonal trust often play a strong role. In smaller teams, employees may be more sensitive to changes that feel like increased control or reduced autonomy. It is important to note that privacy concerns do not necessarily mean employees reject time tracking completely. The mean score for privacy concerns was moderate, not extremely high. This suggests that employees recognize some risks but may still accept the system if it is implemented properly. Therefore, privacy concerns are not an unavoidable barrier, but they must be managed. For example, if employees can use time data to show that they are overloaded or that certain tasks require more time than expected, the system may be perceived as supportive rather than intrusive. The International Labour Organization (2025) discussion of workplace monitoring is relevant here because it emphasizes that monitoring technologies can improve accountability and decision-making, but may also raise concerns about privacy, autonomy, dignity, and fairness. Companies should be transparent about what is tracked, why it is tracked, who can access the data, and how the data will be used. Ambiguity only creates mistrust.

This result has direct importance for SaaS providers as well. Software companies that design time tracking systems should focus not only on technical accuracy but also on user experience, trust, and perceived usefulness. Features that increase employee control, transparency of data use, and ease of interpretation may improve acceptance.

Overall, the results suggest that employee acceptance is the key bridge between automated time tracking and productivity improvement. Without acceptance, adoption may remain formal or superficial. With acceptance, time tracking can become a meaningful productivity tool.

VI. CONCLUSION AND RECOMMENDATIONS

This paper examined Employee Acceptance and Privacy Concerns as determinants of productivity in SME's in Bosnia and Herzegovina. The study was based on survey data from 200 respondents and used simple and multiple linear regression to test whether Privacy Concerns significantly affect Employee Acceptance and does Employee Acceptance significantly affect productivity at the same time. Current adoption, operational transparency and SME readiness were included as additional impactful variables in the model. The results show that Employee Acceptance has a positive and statistically significant effect on productivity, while Privacy Concerns have negative and statistically significant effect on Employee Acceptance. Employee Acceptance was also the strongest predictor in the regression model. Results showed that automated time tracking software can improve productivity in SMEs,

but the path to productivity is not only technical. More specifically, many of SME digital transformation projects fail not because of technology limitations but because management views digitalization solely as a technical project rather than an organizational change process that takes adjusting and patience. So even if SMEs are ready, it does not mean productivity will increase over night. Instead, successful digital transformation depends on managerial commitment over time, organizational culture, and the ability to integrate new technologies into daily work practices (Kahveci, 2025). Privacy Concerns remain a real barrier, but not the one that can not be tackled. They do not directly reduce productivity, but they reduce acceptance, and acceptance strongly predicts productivity.

Results of this research can be useful for SME owners and managers who wish to improve their operations through digital tools, as well as for SaaS providers and policymakers interested in supporting different ways of digital transformation in Bosnia and Herzegovina. The results may also be used as a starting point for future research that includes larger samples, comparisons across industries, or deeper analysis of additional variables.

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