What Drives Business Intelligence Satisfaction and Expansion? An Empirical Study of Swiss Companies

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***Abstract*—Business Intelligence (BI) tools are widely adopted to support decision-making and operational efficiency; however, empirical evidence on the factors driving BI satisfaction and future expansion remains limited, particularly in small and open economies, such as Switzerland. This study examines the technological and organizational determinants of BI user satisfaction and intentions to expand BI usage in Swiss companies. Drawing on the Technology–Organization–Environment (TOE) framework, the study analyzes data from a quantitative survey of employees in Swiss firms across multiple industries. Correlation and multiple regression analyses show that BI satisfaction is primarily driven by real-time data access, data visualization, mobile usability, and strategic alignment focused on decision-making, while excessive alerts and notifications have a negative effect on satisfaction. In contrast, BI expansion intentions are influenced by data visualization, cost-effectiveness, system integration, and industry technology intensity, whereas training and support challenges act as barriers to further adoption. The findings demonstrate that BI satisfaction and BI expansion are distinct but related post-adoption outcomes shaped by different drivers. The study contributes region-specific empirical evidence and offers practical implications for BI investment and alignment decisions.**

Keywords-business intelligence; analytics adoption; Switzerland

I. Introduction

Business Intelligence (BI) remains a core component of organizational analytics, supporting structured data analysis for decision-making, performance monitoring, and operational control. Global spending on BI and analytics software exceeded USD 23 billion in 2023, underscoring the sustained strategic relevance of BI solutions across industries [1]. Despite rapid advances in artificial intelligence and advanced analytics, BI tools continue to constitute the foundation of analytics maturity by enabling transparency, governance, and standardized reporting.

Switzerland consistently ranks among global innovation leaders [2]. However, high technological capability does not automatically translate into effective BI use. Empirical evidence from other advanced economies, including Germany and the United States, highlights persistent challenges related to system integration, customization, user training, and the alignment of BI tools with organizational strategy [3]–[5]. It remains unclear whether Swiss companies face similar constraints or whether BI outcomes in this context are shaped by different technological and organizational factors.

To address this gap, the objective of this study is to identify and empirically analyze the key technological and organizational factors that influence BI user satisfaction and future BI adoption or expansion intentions in Swiss companies. By focusing on post-adoption outcomes rather than binary adoption decisions, the study provides empirical evidence to support more effective and context-sensitive BI investment and alignment decisions.

The remainder of the paper is organized as follows. In Section II, the literature overview and theoretical background are presented. In Section III, the research questions are formulated. In Section IV, the methodology, variables, and data collection and analysis procedures are described. In Section V, the empirical findings are presented. In Section VI, the main conclusions are summarized and directions for future research are outlined. The paper concludes with acknowledgments, disclosure of interests, and references.

II. Literature Overview

Business Intelligence (BI) analytics tools are information systems designed to collect, integrate, analyze, and present structured organizational data to support managerial decision-making and performance management [6]–[8]. Traditionally, BI focuses on descriptive and diagnostic analytics using structured data from enterprise resource planning (ERP), customer relationship management (CRM), and financial systems to generate reports, dashboards, and key performance indicators [9]–[11]. Although advanced analytics and artificial intelligence (AI) increasingly attract attention, BI remains the entry point and stabilizing layer of organizational analytics architectures [12]–[14].

Prior research shows that BI success depends not only on technical quality but also on organizational acceptance and strategic alignment. Information systems success studies consistently identify perceived usefulness, usability, and relevance to business goals as key drivers of user satisfaction and continued use [15][16]. In the BI context, alignment between BI functionalities—such as data visualization, integration, real-time reporting, and collaboration—and strategic objectives significantly enhances perceived value and satisfaction [17]. Conversely, misalignment leads to underutilization, dissatisfaction, and resistance to further analytics investments [18][19].

Several theoretical perspectives have been used to explain information systems adoption and use, including the Technol-

ogy Acceptance Model (TAM) [20], the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Resource-Based View (RBV). However, these approaches primarily focus on individual user perceptions or firm-level capabilities. In contrast, the Technology–Organization–Environment (TOE) framework [21] provides a more comprehensive perspective by integrating technological characteristics, organizational conditions, and environmental context. This makes TOE particularly suitable for analyzing post-adoption outcomes, such as user satisfaction and expansion decisions, which are shaped by multiple interacting factors.

The TOE framework has demonstrated strong explanatory power in BI and analytics research across organizational sizes and industries [22]. Recent studies further emphasize that local and regional contexts influence technology outcomes through regulatory regimes, industry structures, and organizational characteristics [23]. Switzerland's regulated environment, strong data protection norms, and small and medium-sized enterprise (SME)-dominated economy suggest distinct trade-offs in BI adoption and expansion decisions [24].

Despite its relevance, prior research has predominantly focused on initial technology adoption rather than post-adoption outcomes, and has often been conducted in large economies or specific industries. As a result, there is limited empirical evidence on how technological and organizational factors jointly shape BI satisfaction and expansion in small, highly developed economies, such as Switzerland. Furthermore, existing studies rarely distinguish between different post-adoption outcomes, such as user satisfaction and expansion intentions, which may be driven by different mechanisms.

This study addresses these gaps by applying the TOE framework to examine the determinants of BI satisfaction and expansion in Swiss companies, thereby providing context-specific insights and contributing to a more nuanced understanding of post-adoption dynamics.

III. Research Questions

Based on the research objective outlined in the Introduction, the study addresses the following research questions:

- **RQ1:** Which technological and organizational factors most strongly influence user satisfaction with Business Intelligence (BI) tools in Swiss companies?
- **RQ2:** Which technological and organizational factors most strongly influence future BI adoption or expansion intentions in Swiss companies?

IV. Method

This study employs a quantitative, cross-sectional survey design. This approach is appropriate for the research objective, as it enables the identification and statistical assessment of relationships between technological and organizational factors and BI outcomes across firms. A quantitative design allows for the measurement of multiple variables and the evaluation of their relative influence on BI satisfaction and expansion intentions. The cross-sectional design provides a snapshot of current BI practices and perceptions in Swiss companies, which is suitable for examining post-adoption outcomes in a specific context.

TABLE I. Key variables and their measurement

Variable	Type	Description
BI Satisfaction (Y_1)	Dependent	5-point Likert scale
BI Expansion (Y_2)	Dependent	Yes / No
BI Feature Importance (X_1)	Independent	Feature importance scores
Strategic Alignment (X_2)	Independent	Alignment with business goals
Company Size (M_1)	Moderator	Firm size categories
Industry Sector (M_2)	Moderator	Industry classification
Technology Intensity (M_4)	Moderator	Low / Medium / High
Region (C_1)	Control	Company location
Respondent Role (C_2)	Control	Organizational role

The analysis focuses on two dependent variables: user satisfaction with BI tools (Y_1) and future BI adoption or expansion intent (Y_2). In line with the TOE framework, BI outcomes are modeled as a function of technological and organizational factors, while accounting for moderating and control variables.

The general regression model is specified as:

$$Y_n = \beta_0 + \sum_{i=1}^{k} \beta_i X_i + \sum_{j=1}^{p} \gamma_j M_j + \sum_{l=1}^{q} \delta_l C_l + \varepsilon \qquad (1)$$

All variables and measurements are summarized in Table I.

Data were collected via Qualtrics between October 2023 and February 2024. After screening, 72 observations were retained for BI satisfaction analysis and 57 for BI expansion analysis. Statistical analyses were conducted using SPSS, including descriptive statistics, correlation analysis, and multiple regression modeling.

V. Results

A. Correlation analysis

Table II reports the bivariate correlations between BI satisfaction (Y_1), future BI expansion intentions (Y_2), strategic alignment variables, BI functionalities, and selected firm characteristics. Several statistically significant relationships emerge, offering preliminary insights into the drivers of BI outcomes.

BI satisfaction is positively associated with strategic alignment aimed at improving decision-making ($r = 0.289$, $p = 0.014$), suggesting that BI tools perceived as supporting managerial decision processes are evaluated more favorably by users. In addition, data visualization ($r = 0.309$, $p = 0.008$) and collaboration features ($r = 0.253$, $p = 0.032$) show significant positive correlations with satisfaction, indicating the importance of interpretability and shared use of BI outputs. In contrast, alerts and notifications ($r = -0.304$, $p = 0.009$) and BI tool categories ($r = -0.360$, $p = 0.002$) are negatively correlated with satisfaction, suggesting potential issues related to information overload or tool–user mismatch.

Future BI expansion intentions (Y_2) are most strongly correlated with data visualization ($r = 0.403$, $p = 0.002$), data integration ($r = 0.348$, $p = 0.008$), and integration with

other systems ($r = 0.281$, $p = 0.034$). In addition, monitoring financial performance ($r = 0.276$, $p = 0.038$) and cost-effectiveness ($r = 0.272$, $p = 0.041$) are positively related to expansion plans, indicating that both strategic relevance and economic considerations shape forward-looking BI decisions.

Several features—such as predictive analytics, mobile access, scalability, and industry-level characteristics—do not exhibit significant correlations with either outcome, suggesting a more limited role in this sample. Overall, the correlation analysis indicates that different BI features matter for satisfaction and expansion, justifying separate multivariate models for Y_1 and Y_2.

TABLE II. BIVARIATE CORRELATIONS WITH BI SATISFACTION AND BI EXPANSION.

Variable	Y_1	Y_2
BI expansion plans (Y_2)	0.23	1.00
Improve decision-making	0.29*	0.04
Monitor financial performance	−0.06	0.28*
Data integration	0.20	0.35**
Data visualization	0.31**	0.40**
Alerts & notifications	−0.30**	0.16
Data security & compliance	0.24*	0.20
Cost-effectiveness	0.15	0.27*
System integration (CRM/ERP)	0.09	0.28*
Collaboration	0.25*	0.16
BI tools used	−0.36**	0.04

Notes: Pearson correlations reported. Y_1 = BI satisfaction ($N = 72$), Y_2 = BI expansion intention ($N = 57$). $^*p < 0.05$, $^{**}p < 0.01$.

B. Model 1: Determinants of BI tool satisfaction

Model 1 examines the determinants of user satisfaction with BI tools. The final specification explains 46.4% of the variance in BI satisfaction ($R^2 = 0.464$; Adjusted $R^2 = 0.386$), indicating substantial explanatory power (Table III).

TABLE III. REGRESSION RESULTS FOR MODEL 1 (BI SATISFACTION).

Variable	β (SE)	Std. Coef.	p
Constant	1.923 (0.310)	—	$< .001$
Improve decision-making	0.208 (0.119)	0.183	0.086
Data visualization	0.133 (0.062)	0.232	0.038
Mobile access	0.162 (0.063)	0.299	0.013
Alerts & notifications	−0.264 (0.071)	−0.461	$< .001$
Training & support	−0.133 (0.071)	−0.213	0.066
Customization	−0.118 (0.068)	−0.191	0.088
Real-time updates	0.278 (0.076)	0.466	$< .001$
Industry sector	0.129 (0.049)	0.253	0.012
BI tools used	−0.101 (0.069)	−0.155	0.151

Notes: Dependent variable: BI satisfaction (Y_1). Unstandardized coefficients reported with standard errors in parentheses.

Among technological factors, real-time updates and data refresh emerge as the strongest positive predictor of satisfaction ($\beta = 0.466$, $p < 0.001$), followed by mobile access ($\beta = 0.299$, $p = 0.013$) and data visualization ($\beta = 0.232$, $p = 0.038$). These results highlight the importance of timely, accessible, and interpretable information for positive BI user experiences.

In contrast, alerts and notifications have a strong negative effect on satisfaction ($\beta = -0.461$, $p < 0.001$), suggesting that excessive or poorly designed alert mechanisms may reduce perceived usefulness. Training and support and customization also display negative but marginally significant effects, indicating that implementation complexity or unmet expectations may undermine satisfaction.

From an organizational perspective, strategic alignment focused on decision-making improvement shows a positive, albeit marginal, effect ($\beta = 0.183$, $p = 0.086$). In addition, industry sector is a significant moderator ($\beta = 0.253$, $p = 0.012$), suggesting that satisfaction levels vary systematically across industries. Multicollinearity diagnostics confirm acceptable VIF values, supporting model robustness.

C. Model 2: Factors influencing BI future expansion

Model 2 analyzes the determinants of future BI adoption or expansion intentions. The model explains 50.5% of the variance in expansion plans ($R^2 = 0.505$; Adjusted $R^2 = 0.370$), indicating slightly higher explanatory power than the satisfaction model (Table IV).

TABLE IV. REGRESSION RESULTS FOR MODEL 2 (BI FUTURE EXPANSION).

Variable	β (SE)	Std. Coef.	p
Constant	−0.313 (0.320)	—	0.333
Monitor financial performance	0.221 (0.113)	0.221	0.056
Identify growth opportunities	−0.295 (0.177)	−0.189	0.102
Data integration	0.102 (0.070)	0.218	0.154
Data visualization	0.217 (0.068)	0.461	0.003
Predictive analytics	−0.116 (0.067)	−0.228	0.091
Mobile access	−0.106 (0.054)	−0.251	0.058
Alerts & notifications	0.133 (0.059)	0.298	0.028
Cost-effectiveness	0.157 (0.061)	0.333	0.014
Training & support	−0.145 (0.062)	−0.299	0.024
Scalability	−0.120 (0.061)	−0.233	0.058
Technology intensity	0.122 (0.064)	0.221	0.062
Company region	−0.083 (0.070)	−0.136	0.244

Notes: Dependent variable: BI future expansion intention (Y_2). Unstandardized coefficients reported with standard errors in parentheses.

The most influential predictor is data visualization ($\beta = 0.461$, $p = 0.003$), underscoring its role not only in current satisfaction but also in motivating further BI investment. Cost-effectiveness ($\beta = 0.333$, $p = 0.014$) and alerts and notifications ($\beta = 0.298$, $p = 0.028$) also positively influence expansion intentions, suggesting that firms consider both economic feasibility and operational monitoring capabilities when planning BI growth.

In contrast, training and support negatively affect expansion decisions ($\beta = -0.299$, $p = 0.024$), indicating that perceived implementation or skill-related barriers may discourage further adoption. Several technological features—including predictive analytics, mobile access, and scalability—exhibit negative but marginal effects, suggesting that complexity or maturity requirements may delay expansion.

Among contextual factors, industry technology intensity shows a positive, marginally significant effect ($\beta = 0.221$, $p = 0.062$), implying that firms in more technology-intensive environments are more inclined to expand BI usage. Company region does not exert a significant influence.

D. Regression analysis summary

Table V summarizes the regression results for both models. Both Model 1 and Model 2 are statistically significant ($p < 0.001$), with Model 2 exhibiting slightly higher explanatory power. ANOVA results (Table VI) further confirm model robustness.

TABLE V. SUMMARY OF REGRESSION RESULTS FOR BI SATISFACTION AND BI FUTURE EXPANSION.

Model	R	R^2	Adj. R^2	SE	F
BI satisfaction (M1)	0.681	0.464	0.386	0.436	5.97***
BI future expansion (M2)	0.711	0.505	0.370	0.353	3.74***

Note: $^{***}p < 0.001$.

Moderation analysis indicates that industry sector plays a meaningful role in BI satisfaction, whereas technology intensity is more relevant for BI expansion decisions. Company size, BI tool category, respondent role, and region were excluded due to weak or insignificant effects, suggesting that strategic and functional factors outweigh structural characteristics once BI is in use.

TABLE VI. ANOVA SUMMARY FOR BI SATISFACTION AND BI FUTURE EXPANSION.

Model	**Source**	SS	df	F
BI satisfaction (M1)	Regression	10.206	9	5.97***
	Residual	11.781	62	—
BI future expansion (M2)	Regression	5.580	12	3.74***
	Residual	5.473	44	—

Note: $^{***}p < 0.001$.

VI. CONCLUSION AND FUTURE WORK

This study examines the technological and organizational drivers of Business Intelligence (BI) satisfaction and expansion in Swiss companies, contributing to the limited body of region-specific research on post-adoption analytics outcomes. The findings demonstrate that BI satisfaction and BI expansion are distinct but interrelated outcomes, shaped by different sets of factors.

The results show that BI satisfaction is primarily driven by usability-oriented features, particularly real-time data access, data visualization, and mobile availability. In contrast, excessive alerts and notifications negatively affect user experience, suggesting that information overload may reduce perceived usefulness.

BI expansion decisions are influenced by a different set of considerations. While data visualization remains a key driver, cost-effectiveness, system integration, and financial monitoring play a more prominent role, reflecting a strategic and investment-oriented perspective. The negative effect of training and support highlights the importance of organizational readiness and skills availability as potential barriers to further BI adoption.

The findings also indicate a limited role of advanced analytics features, such as predictive analytics, suggesting that many Swiss firms remain focused on core BI functionalities. This reflects a preference for reliability, governance, and compliance over analytical sophistication at the current stage of BI maturity.

This study contributes to the literature by providing empirical evidence from a small, innovation-driven economy, thereby extending existing BI and analytics adoption research beyond commonly studied large-market contexts. From a practical perspective, the results suggest that improving user satisfaction alone may not be sufficient to ensure continued BI investment. Organizations should also address cost considerations, system integration, and capability development to support BI expansion. From a theoretical perspective, the study highlights the importance of distinguishing between different post-adoption outcomes and accounting for contextual factors when analyzing analytics adoption.

Future research could extend this study in several directions. First, larger and more diverse samples across countries would improve the generalizability of the findings. Second, longitudinal studies could provide deeper insights into how BI satisfaction and expansion evolve over time. Third, further research could explore the role of artificial intelligence and advanced analytics capabilities in shaping BI outcomes, as well as the interaction between organizational culture, skills development, and analytics adoption.

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The author has no competing interests to declare that are relevant to the content of this article.

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