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Optimizing Service Production and Project Outcomes: The Role of Business Intelligence and Work Environment in Palestinian Banks

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Abstract In the modern banking industry, the performance of service production systems, where transaction and compliance processes and digital transformation projects coexist, is considered the core for any bank. This research aims to investigate the effect of both business intelligence (BI) as an operational control and project monitoring mechanism and work environment (WE) as social and organizational conditions on employee satisfaction (ES) and perceived operation effectiveness (POE) in the banks of Palestine. Socio-Technical Systems (STS) Theory addresses the integration of the technological aspect with that of the human aspect as subsystems to explain how clarity of data, feedback, and psychological safety impact the levels of workers' engagement and performance. A quantitative, cross-sectional method was adopted to study a stratified random sample of 216 employees across 13 banks. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to analyze the data. The findings show that BI and WE have a positive impact on satisfaction and operational effectiveness. Plus, Employee Empowerment (EE) fully mediates the relationship between BI and satisfaction but did not succeed in doing so between WE and satisfaction. The R^2 for the model is 0.68. This research contributes to the STS Theory by laying down an understanding of business intelligence (BI) as a control mechanism that interacts with social conditions to maintain the production of services, processes, and projects in a politically and economically restricted environment. A concept of informational empowerment is added to this research to show how the availability of updated data can replace hierarchical power to lead voluntary actions. Beyond that, this research employs STS theory to integrate BI, empowerment, and work environment aspects in the Digital Transformation Projects of the banking industry in countries with limited economies and political conflicts.

Keywords: Banking performance, business intelligence, employee satisfaction, socio-technical systems, work environment.

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1. Introduction

Modern banks are intricate ecosystems that engage in both provision and consumption simultaneously. They consume, process, and produce loans, transactions, and digital transformation projects as part of their operational system. The employees are the thinking and acting core of this process, and their wellbeing, precision, and enthusiasm determine the quality, reliability, and speed of banking services. Discomfort among employees leads to inaccuracies in transactions, non-compliance with regulations, and project delays, which are agents of customer distrust and demise. Perceived Operational Effectiveness (POE) is a subjective assessment that is used to measure an employee's ability to consistently, reliably, and consistently perform service-production processes and projects to achieve objectives associated with coordination quality, error reduction, and task completion. Hence, employee satisfaction has changed from a Human Resources (HR) issue to a strategic factor that determines the quality of production, operational control, and sustainability (Inceoglu et al., 2018; Bakotić, 2016).

Palestinian banks face problems of political instability, scarce resources, and regulatory uncertainty. Compounding these issues is a weak management team that fails to adapt, a process that requires combining technical innovation with human motivations in order to ensure service continuity and updates (Abusharbeh and Nazzal, 2018).

As a technical control system, BI plays a critical role in a banking enterprise. BI not only supports decisions but also provides real-time surveillance of processes, risks, and project performance. Dashboards, data stores, and analytic

instruments bring together information from across the units, credit, operations, compliance, and customer service, to improve coordination, accuracy, and transparency (Rouhani et al., 2016; Isik et al., 2013). BI, by cutting down on uncertainties and facilitating input, gives the employees power to make intelligent, evidence-based decisions that keep the business running efficiently.

The Work Environment (WE) is the social-psychological infrastructure that determines the extent to which technology is productive. Trust in leadership, fairness, and psychological safety secures human reliability under pressure (Newman et al., 2017). In situations where there are not enough hands, supportive environments will be the ones where people collaborate, be accountable together, and innovate, thus being the ones where continuity of project success and service is guaranteed (Al-Omari and Okasheh, 2017).

Using Herzberg's Two-Factor Theory, the Job Characteristics Model (JCM) (Hackman and Oldham, 1976), and Spreitzer's Psychological Empowerment Framework (1995) as the main sources, the present research is to investigate the interplay of BI and WE as joint determinants of employee satisfaction, with employee empowerment, consisting of the four dimensions of meaning, competence, self-determination, and impact (Seibert et al., 2011), as the mediating mechanism. Based on the Socio-Technical Systems (STS) Theory, the author views the performance as the result of the interaction between the technical subsystem (BI) and the social subsystem (WE) (Clegg, 2000; Cherns, 1987).

Although a great amount of research has been done on the relationship between BI and organizational performance, only a few studies have looked at the joint impact of technology and social systems on employee satisfaction in developing or politically constrained economies. The present study fills that void by looking at the case of Palestinian banks as socio-technical production systems to get an idea of the interaction between business intelligence, work engagement, and employee engagement in bringing about satisfaction and performance outcomes.

Accordingly, the research addresses the following questions:

• RQ1: How do Business Intelligence systems, as operational control tools, influence employee satisfaction and effectiveness in banking service production?

• RQ2: To what extent does employee empowerment mediate the relationship between BI-enabled process transparency and satisfaction?

• RQ3: How does the work environment contribute to employee satisfaction within the engineered workflows of Palestinian banks?

• RQ4: Does empowerment serve as a bridge linking social support and technological control to sustained service quality?

In theory, the research builds upon STS theory and applies it to banking as a hybrid production–project ecosystem in which information flow and human agency co-evolve. The study uses the PLS-SEM mediation model in its methodology to determine the relationship between technological transparency and social empowerment. On the practical side, the research provides a framework that is beneficial for banking managers in coordinating BI investing, work atmosphere, and empowerment programs to strengthen company resilience and boost employee satisfaction.

2. Literature Review and Theoretical Framework

Modern banking is a socio-technical system consisting of human and machine interaction that guarantees the performance to be continuous with high-reliability. The Socio-Technical Systems (STS) Theory states that capable organizations are going to obtain superior results via the joint optimization of the technical and social subsystems (Cherns, 1987; Clegg, 2000). The integration in banking is completed by using co-created decision-maker dashboards, the algorithms for loan processing, and the feedback mechanisms to enhance the precision and speed of the process. Mismatching, however, leads to employees being overwhelmed with data and having to deal with mental strain that, in turn, affects reliability negatively (Rasool et al., 2022). On the other hand, alignment takes banks through a path of resilience and agility in operations, thus being able to endure while creating better customer service (Wulff and Finnestrand, 2023). Therefore, a bank is not simply a financial intermediary; it is a deliberately designed socio-technical system in which information flow, team cognition, and motivation together determine the efficiency of production.

Business Intelligence (BI) has come a long way from being merely a reporting tool to the controller of service-production systems. BI dashboards and analytics are now the main drivers for the continuous monitoring of the system throughput, errors, and performance of the workflow (Isik et al., 2013; Rouhani et al., 2016). BI uses data warehousing and process mining to provide ongoing improvement and project supervision, which in turn supports governance and resource efficacy (Ahmad and Van Looy, 2020; Tallon et al., 2019). There are empirical studies that show a correlation between BI maturity and higher responsiveness plus shorter decision-making cycles (Alzghoul, 2024). In challenging resource situations such as Palestine, the implementation of an integrated BI system leads to the alignment of strategic goals with the operational front, thus facilitating the processes of transparency and accountability (Korherr et al., 2022).

The WE is the social platform that keeps human reliability notwithstanding the operational and project stresses. The psychological safety and fairness work as the main motivators of the employees to report risks in the process, with no blame attached to them (Edmondson and Lei, 2014). On the other hand, trust in leaders and support from colleagues are the factors sustaining employee's engagement during crisis situations (Freeman and Brigandi, 2019). Moreover, fair workload distribution along with open communication is another measure to eliminate burnout and maintain cognitive accuracy (Newman et al., 2017). In accordance with STS theory, the WE converts technical data into behavioral action, BI provides information, and the social climate determines the employees preparedness to respond.

Employee Empowerment (EE) means that the data are interpreted in a way that the company can react to them. Spreitzer's (1995) explanation of empowerment includes terms like meaning, competence, self-determination, and impact, thus creating a situation where the employees have freedom of action and accountability at the same time. This research studies empowerment as informational-psychological empowerment, where real-time BI outputs contribute to employee's sense of meaning, competence, self-determination, and perceived impact without altering formal hierarchical structures. Empowerment comes with BI, making employees quicker at finishing their work, less dependent, and better coordinated because they are interpreting BI outputs, fixing process issues alongside, making independent decisions (Seibert et al., 2011; Hurbean et al., 2024). Empowerment also offers creativity and change in learning for a data-driven organization (Papathomas and Konteos, 2024).

Employee Satisfaction (ES), once seen strictly as a feeling, has grown to involve assessments of system dependability, collaboration, and the effectiveness of processes (Bakotić, 2016). In a perfectly blended socio-technical setting, where open data, just management, and team spirit live together, satisfaction indicates the total wellness and steadiness of the organizational system.

To sum up, the current research study has come up with a holistic framework that combines five different theories, namely the STS theory, Herzberg's Two-Factor Theory (TFT), Job Characteristics Model (JCM), Psychological Empowerment (PE), and the Resource-Based View (RBV). In this context, BI and WE play the roles of technical and social subsystems of a banking organization, whereas empowerment is considered a mediator in their effects on satisfaction and performance. If you examine it from the RBV, BI infrastructure with human capital empowerment is the unique and non-imitable resource that first creates the dynamic capabilities for organizational resilience over a long period (Pitelis et al., 2023). The efficient cooperation of these sub-systems generates excellence in empowerment, satisfaction, and efficiency, so the company gets the power to handle the challenges and to achieve performance with lasting effects over time.

These connections are shown in Fig. 1, which displays the socio-technical structure and the intermediary routes (H1-H4) assumed to be effective in Palestinian banking institutions.

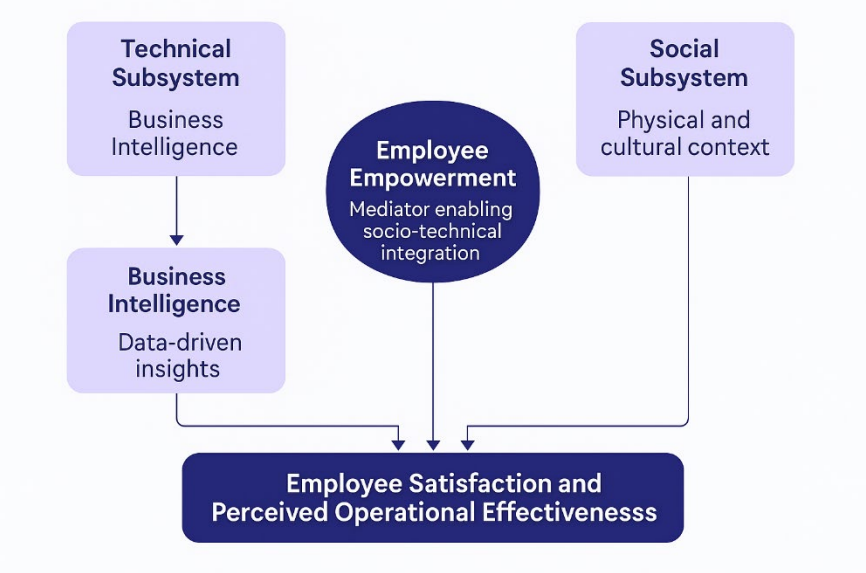

Fig. 1. Conceptual framework of the socio-technical model linking BI, WE, EE, and ES

3. Methodology

This research used quantitative cross-sectional method to investigate the causal relationship between BI, WE, ES, and POE with EE as the mediator. This method provided simultaneous interaction with many latent variables that characterize organizational complexity according to STS Theory, which views an organization as a collection of cooperative entities that integrate the technological subsystem and social system. This research provided a great opportunity to test this theory regarding Palestinian banks that faced limited resources and political turbulence, where the fit between human and technological factors makes organizations more adaptable and increases their efficiency.

The sample was made up of about 7,525 workers from 13 licensed banks in Palestine, which included local, Islamic, and foreign banks. By means of stratified random sampling, the sample was drawn from across the bank departments, such as operations, IT, compliance, finance, and HR, including managers, officers, and operational staff at the hierarchical levels. Power analysis (G*Power 3.1) indicated that a sample size of 200 would provide 0.80 power to identify medium effects ($f^2 = 0.15$) at $\alpha = 0.05$. In all, 216 valid responses were received (response rate = 67.5%), which was sufficient for the PLS-SEM analysis. The comparison between the early and the late responses ($p > 0.05$) established that the nonresponse bias had no significant effect.

The questionnaire comprised multi-item scales adapted from previously conducted research and tailored to the context of the Palestinian banks. All the scales were measured on a 5-point Likert scale, ranging from (1) Strongly Disagree to (5) Strongly Agree. The concept of BI was borrowed from Isik et al. (2013) and Rouhani et al. (2016) to measure their process monitoring, decision-support, and data transparency. Newman et al. (2017) and Edmondson and Lei (2014) on fairness, trust,

and psychological safety were used to determine WE. Spreitzer (1995) and Seibert et al. (2011) on meaning, competence, self-determination, and impact were used to measure EE. ES/POE was taken from Bakotić (2016) and Hackman and Oldham (1976) in terms of satisfaction with workflow efficiency and team performance. Three academic professors examined the questionnaire to verify its content for conceptual issues, followed by a pilot test on 20 employees, and the questionnaire demonstrated good reliability (Cronbach's $\alpha > 0.80$). To make sure that the translation was correct, a forward and a backward translation was done according to Brislin's (1980) procedures.

Data collection took place through paper and online surveys between April and June 2025, and before that, informed consent had been obtained from the participants. The Research Ethics Committee of Palestine Ahliya University issued a positive opinion (Ref. No. 15/10/AC.G.S/P.A.U/2025; dated 27 October 2025) that not only approved but also confirmed adherence to the Declaration of Helsinki and local ethical standards. Participants were allowed to opt out, and their identities were completely kept secret along with their data.

The data analysis was based on the methodological standards established by Hair et al. (2021) and Kline (2015). SPSS v28 was used to carry out the descriptive statistics and normality checks. The reliability and validity were confirmed by Cronbach's α (≥ 0.70), composite reliability (≥ 0.70), average variance extracted (≥ 0.50), and discriminant validity using the Fornell – Larcker criterion and HTMT (< 0.90). Common method bias was evaluated by Harman's single-factor test, where the first factor accounted for only 28.7% of the variance, and full collinearity VIF values < 3.3 indicated minimal bias. The structural model was assessed by SmartPLS 4.0 with 5,000 bootstrap resamples for the estimation of direct and indirect effects. Model fit and predictive power were tested with R^2, Q^2 (Stone–Geisser > 0), f^2 (effect size), and SRMR (< 0.08), with all VIF values < 5 further validating the absence of multicollinearity. Outliers flagged by Mahalanobis distance (> 25) were discarded and re-estimated, yielding similar results. Multi-group analysis across job hierarchies ($\Delta\beta < 0.10$, $p > 0.05$) corroborated structural stability, while one-way ANOVA and Tukey post-hoc tests indicated variations in satisfaction by department and job position.

All data sets and results were saved for transparency and reproducibility. The methodological rigor applied through the use of validated instruments, adherence to ethical standards, and thorough statistical analysis ensured that the results were reliable, valid, and in line with quantitative research best practices.

4. Results

4.1. Descriptive and Construct-Level Results

The data was gathered from 216 employees working in local, Islamic, and international banks. In terms of sex, 64.8% of respondents were male, while 35.2% were female. The majority of respondents were ages 25–34 years old (41.1%), followed by 35–44 years old (28.7%). More than half of the respondents indicated having more than ten years of professional experience (53.7%), while 58.8% of the respondents worked for foreign banks. In terms of function, respondents worked in operations (32%), finance and compliance (28%), IT and digital service functions (24%), and HR and support functions (16%).

Table 1. Distribution of BI tools used in Palestinian banks

Category	Operational Role	Frequency (%)
Dashboards and Reporting	Operational performance monitoring (throughput, error rates, service times)	31.5
Customer Analytics	Service process optimization (client behavior and service improvement)	30.6
Data Warehousing	Integrated data infrastructure for strategic control	19.1
Advanced BI and Predictive Tools	Strategic forecasting and risk modeling	17.9
Enterprise Reporting	Compliance and governance reporting	0.6
Analytics and Performance Modules	Specialized decision support add-ons	0.3

Mean values along with standard deviations for WE factors showed that the collaboration within the team was quite high (M = 3.92, SD = 0.79), along with mutual respect (RII = 78%), while the lowest rating was given to psychological safety (M = 3.31, SD = 0.81, RII = 66%).

In the case of EE, the statement "I have confidence in my ability to perform my work effectively" received the highest rating (M = 4.50, SD = 0.64, RII = 90%), and the statement "I enjoy the independence to make decisions related to my work" got the lowest rating (RII = 69%).

The statement with the maximum average score for ES/POE was "I have a high degree of confidence in my team to successfully execute projects" (RII = 90%). Workload balance and evenness of communication scored lower than that.

4.2. Measurement and Structural Model Results

Table 2. Construct reliability and validity statistics

Variable	Items (n)	AVE	Cronbach's α	Composite Reliability (CR)
Business Intelligence (BI)	7	0.481	0.837	0.873
Work Environment (WE)	7	0.507	0.846	0.879
Employee Empowerment (EE)	8	0.509	0.847	0.888
Employee Satisfaction/POE	8	0.520	0.860	0.901

All constructs demonstrated internal consistency ($\alpha \geq 0.83$) and convergent validity (AVE ≥ 0.48). Discriminant validity is confirmed using the Fornell – Larcker criterion and the HTMT ratio (< 0.90). Multicollinearity diagnostics (VIF range: 1.68 – 2.23) indicated no multicollinearity issues.

Table 3. Structural model results

Hypothesis	Path Relationship	β	t-value	p-value	Result
H1	BI → ES/POE	0.516	6.57	< 0.001	Supported
H2	WE → ES/POE	0.784	20.25	< 0.001	Supported
H3	BI → EE → ES/POE	0.514 (indirect)	—	< 0.001	Supported (Partial mediation)
H4	WE → EE → ES/POE	0.190 (indirect)	—	0.098	Not Supported

Model fit indices were satisfactory ($R^2 = 0.68$; SRMR = 0.061; $Q^2 > 0$; f^2 (moderate)) (see Fig. 2).

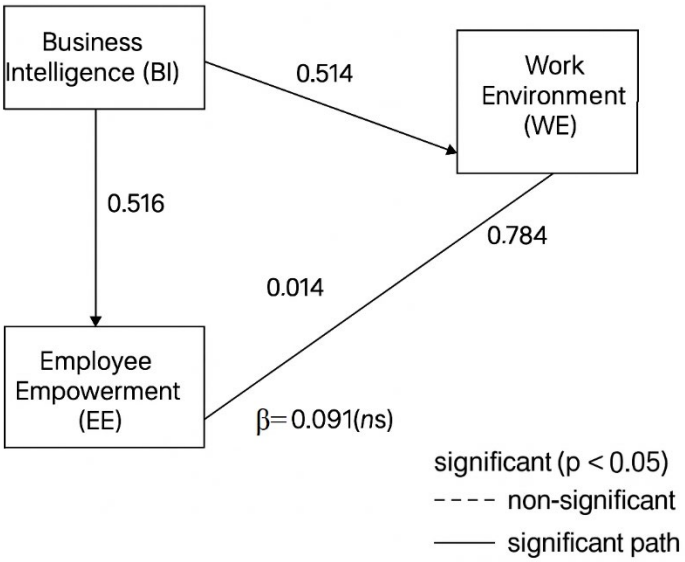

Fig. 2. PLS-SEM showing the relationships between BI, WE, EE, and ES/POE.

Note: Solid arrows indicate significant relationships (p < 0.05); dashed arrows represent non-significant paths.

A one-way Analysis of Variance (ANOVA) revealed the presence of a statistically significant difference in satisfaction levels across different job hierarchies ($F = 7.75$, $p < 0.001$). Subsequently, Tukey's post-hoc comparisons pointed out that managers and directors perceived their satisfaction to be greater than that of front-line workers. In general, the final model explained 68% of the variation in ES and POE, $R^2 = 0.68$, which is a strong predictor within the PLS-SEM framework.

5. Discussion

The research being presented has looked into the interplay of BI and WE, on ES, and POE in the Palestinian banking sector within the framework of EE as a possible intervening factor. Backed by STS theory, the results show that employee satisfaction arises from the simultaneous optimization of control mechanisms for technology and support structures for social interaction. More generally, the total results verify that technology, empowerment, and work climate as interlinked subsystems that preserve organizational performance.

The fact that BI has not only a positive impact but also a negative one on the operational effectiveness and satisfaction of users indicates that BI is the technical control subsystem in the socio-technical systems framework by Clegg (2000), who said that through converting information into actions that are easily understood, thus making the work processes more accurate and stable. This is in line with the previously mentioned studies of Isik et al. (2013), Ciampi et al. (2021), and Gierlich-Joas et al. (2024), who stressed the importance of BI systems, their impact on decision-making, and, by this, indirectly on productivity in the workplace. The current study adds to the above knowledge by revealing that in certain service-production situations like banking, BI is not only one part of the whole BI system being analyzed, but it also acts as

a powerful coordinator that integrates performance evaluation and responsibility into everyday practices. From a theoretical perspective, based on Herzberg's Two-Factor Theory, BI supplies the constant flow of accomplishment, acknowledgment, and the importance of one's job role to the employees, thus becoming a motivator (Herzberg, 1959). On the contrary, from the JCM (Hackman and Oldham, 1976) viewpoint, BI is the source of the job feedback that drives the generation of intrinsic motivation. Converging the findings into Palestinian context, these BI systems empower the employee to see their part in the overall success of the organization, which in turn helps to create satisfaction based on the mentioned parameters of clarity, autonomy, and recognition through data.

The work environment had a major positive and direct impact on satisfaction, performance, and productivity, which, in social terms, was the stabilizing foundation of the production system. Fairness, leadership trust, and psychological safety worked hand in hand with technology in the creation of conditions where the employees felt free to express their ideas and to suggest the best possible solutions. These findings are in line with the findings of Newman et al. (2017) and Edmondson and Lei (2014), who pointed out the importance of psychological safety and open communication in promoting the characteristics of trust and reliability. The social mechanisms that worked within the limited institutional and economic context of Palestine, in fact, acted as compensatory safeguards against the unavailability of proper infrastructure and inadequate regulation. Furthermore, these findings were in agreement with Al-Hawari (2015) as they not only highlighted the inter-relational aspect of trust but also showed it as a characteristic that was crucial for banks in the Arab world to gain and maintain reliability and commitment. Therefore, the work environment acts as a redundancy mechanism of organizational stability when there are technological, institutional, or sociocultural limits.

From a business perspective, BI in Palestinian banks is primarily deployed from performance dashboards, risk monitoring systems, regulatory reporting platforms, and workflow analytics embedded within existing bank systems. Dashboards aggregate transactional information into real-time indicators of service throughput, error rates, compliance alerts, and project milestones that allow front-line employees and managers to detect deviations early and respond quickly to problems.

In digital transformation initiatives, business intelligence applications offer insights into migration performance indicators, system uptime, and adoption rates. For compliance-related projects, they ensure regulatory reporting, audit preparation, and risk identification. The transparency offered by business intelligence facilitates enhanced processing efficiency and automation in areas like loan processing, customer onboarding, and transaction reconciliation.

The findings suggest that BI contributes not only to the satisfaction of employees through improved productivity, but also to enhancing employees' sense of control, awareness, and accountability. The availability, interpretability, and embeddedness of BI outputs enable employees to make informed micro-decisions within a more flexible routine and without a hierarchy.

The relationship between BI and satisfaction was partially mediated by EE, thus confirming its role as the interface where technological transparency meets human motivation. Empowerment can be seen as the operationalization of BI to the employees' inner selves, meaning that the employees can make comprehensive micro-decisions, foresee troubles, and do away with inefficiencies without waiting for the hierarchy to move. This is in line with the notion of Seibert et al. (2011) and Gierlich-Joas et al. (2024), who interpreted empowerment as a way of connecting structural clarity to psychological engagement. The present research thus pushes the models further by proving that in digital and data-heavy organizations, empowerment is not only the result of granting authority but also of providing access to real-time information, a state that can be called informational empowerment. Thus, empowerment turns out to be a capability based on information that changes BI transparency into self-directed action. In synergy with the RBV (Prayag et al., 2023), the study reveals that the BI infrastructure and the empowered human capital together form a unique organizational capability that improves adaptability and resilience.

In contrast, empowerment was not a mediator of the connection between WE and satisfaction, hence indicating that social support, though very important for morale, is not a prerequisite for gaining autonomy or having decision latitude. Empowerment is still, however, heavily restricted structurally in the banking sector due to hierarchical control and compliance procedures. This point matches with the suggestions of Liu and Ren (2022), who said that empowerment is impossible without procedural decentralization and cannot come from mere trust, and with Tavares et al. (2024), who explained that empowerment thrives mostly in flatter organizations. The takeaway for Palestinian banks is that social cohesion will only be a productive factor if combined with the formal redesign of decision-making processes, especially via BI-enabled delegation frameworks that move power closer to the operational level and thus converting trust into real empowerment.

In general, the findings not only confirm but also broaden the horizon of previous studies regarding BI, empowerment, and satisfaction (Mikalef et al., 2023; Pancić, 2023). Those relationships are located in a socio-technical model that integrates BI as the technical control system, WE as the social support structure, and EE as the transformation mechanism, which is the study's contribution. Moreover, it takes STS theory forward by demonstrating that psychological safety and information transparency are the two pillars of resilience in organizations that are developing and politically constrained. The collaboration between society and technology, where the technology is precise and thus very helpful for the relations among people, gives us an understanding of the way such financial institutions in these cases manage to maintain their performance in spite of pressure from outside.

In theory, the paper expands STS theory by providing a different reading of socio-technical alignment in digital companies as juggling between data openness and psychological strength. Moreover, it advances empowerment theory by coining the term "informational empowerment," which reveals that granting access to trustworthy data can act as a substitute for vertical power in motivating and guiding people through intrinsically driven and self-directed behavior. Additionally, it

reconciles the RBV with the argument that the combination of BI infrastructure and empowered human resources creates a dynamic capability that not only allows but also strengthens the performance of an organization to be flexible in responding to changes and its resilience against operational pressures.

Further developing empowerment theory explores the concept of informational empowerment and shows that access to real-time data can be used as a proxy for formal hierarchical power to enable self-directed and intrinsically motivated action when it comes to real-time task data. Empowerment in this sense is not only a direct result of delegated authority or social support, but also the redistribution of information resources strategically. Based on an RBV, BI infrastructure, and empowered human capital provides dynamic organizational capability which offers adaptability, resilience, and sustained performance as uncertain conditions arise.

To conclude, the questions depict the Palestinian banking sector as a constellation of factors that include technology, interpersonal interaction, and organizational power in order to operate effectively and sustainably.BI is the technological heartbeat that reflects performance; stakeholder interactions are the social factors that maintain trust and safety; and empowerment is the conversion function that transforms data transparency into drive and adjustment. When empowerment is hindered, organizations can alleviate operational concerns but may sacrifice the human element of flexibility and resilience. Thus, employee satisfaction is not a fixed emotional condition; it is a dynamic factor of the entire system, mirroring the engineered balance of power, collaboration, and autonomy that supports the sustainability of the organization's performance.

Although this study is situated in the Palestinian banking sector, it can be broadly applied in the bank-of-change world for banks that operate in volatile, regulated, or resource-constrained economies globally. It shares risks common in emerging markets, post-conflict economies, and highly regulated systems. The socio-technical theory that emerges here suggests that when BI systems are integrated with psychologically safe working spaces and empowerment-based governance, banks can increase resilience, regardless of the context. The results then provide direct hints for the digital bank transformation in a region such as the Middle East, Eastern Europe, Africa, and parts of Asia, in which institutional uncertainty is required through adaptive service-production systems.

6. Conclusion and Limitations

The authors of this study view the Palestinian banks as interlinked socio-technical systems. Thus, employee satisfaction and operational efficiency are a factor of the social and technical interactions. The findings pointed to BI and WE as the two major forces behind the positive influence on ES and POE, while EE was considered a partially mediating factor between BI and satisfaction. The study also established that employee's contentment is a result not just of the good office environment but also of the proper handling of such matters as data transparency, feedback, and employee's right to choose his/her own working pace.

Based on the empirical results, banks may implement empowerment-based BI in three steps. First, BI access needs to be clear yet flexible so that operational staff can observe performance metrics and not be limited to senior management, whose responsibility they are taking for the dashboard. Second, work environment reforms should institutionalize psychological safety through non-punitive error reporting, transparency in performance feedback, and participation in review meetings based on BI data. Third, empowerment should be established with the integration of BI insights into policy-defined delegated decision rights that allow staff to resolve process bottlenecks within defined thresholds.

These steps become part of the BI analytical framework, a socio-technical coordination bridge that is compatible with service production, project deployment, and human motivation.

Theatrically, this research expands the STS Theory by showing that informational autonomy through BI constitutes a new type of human-technology alignment that changes data visibility into psychological empowerment. It also adds to empowerment theory by defining informational empowerment as a major factor of intrinsic motivation in data-rich organizations. Besides, the study brings together BI and empowerment under the RBV and points out their synergy as a rare and unmatched capability that fosters organizational resilience in unstable situations.

In actuality, the research presents a structure for executives and decision-makers to synchronize digital investments with human-centered management. BI systems need to be transformed from static data stores into interactive decision-support ecosystems that both decentralize access and increase accountability through sharing. In addition to this, the management policies have to be in support of fairness, trust, and open dialogue in order to turn technical openness into employee participation. The results of this research also imply the need for policy changes: in developing and politically restricted economies, the transformation of the banking sector to a sustainable one will require both the upgrading of technology and the democratization of the organization, so that the empowerment and satisfaction of employees will be fairly distributed among the different levels of hierarchy.

While the study contributes to the existing literature, its cross-sectional design still prevents the drawing of definitive causal conclusions. In addition, the self-reported measures used in the study might have introduced common method bias; but, the statistical tests used indicated which common method bias was within acceptable limits. Future studies could adopt longitudinal and multiple methodologies to explore the evolution of BI maturity and empowerment effects. Connecting these constructs to performance measures, such as process efficiency, error rates, or project delivery times, could further validate the socio-technical model. Comparative studies in the Middle East or post-conflict economies could also show how contextual factors influence the critical relationships between technology, empowerment, and job satisfaction.

In summary, employee happiness in modern banks is not a whim but is the outcome of harmoniously functioning social and technical subsystems. By harmonizing data-supported control and people's power, the banking industry has been able to shift from reactive to adaptive organizations. They are resilient and have the capacity to generate and sustain performance and well-being.

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Institutional Review Board Statement

This study was reviewed and approved by the Research Ethics Committee of Palestine Ahliya University, Bethlehem, Palestine. The approval reference number is Ref. No. 15/10/AC.G. S/P.A. U/2025, dated 27 October 2025. The committee confirmed that the research complies with the ethical standards outlined in the Declaration of Helsinki, as well as with national and institutional guidelines for studies involving human participants. All respondents participated voluntarily after providing informed consent. Participation was anonymous, and no personal or identifiable data were collected. The Institutional Review Board concluded that the study posed minimal risk to participants and granted approval accordingly.

Declaration of Artificial Intelligence (AI) Tools

The author used QuillBot only for language editing and formatting assistance. The author reviewed and takes full responsibility for all content.

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