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AI-Driven Analysis of Key Determinants Shaping Integrated Business Planning: A Case Study of Haraz Dairy Company

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Abstract:

Integrated Business Planning (IBP) has become a strategic requirement for modern organizations seeking improved coordination, operational efficiency, and competitive advantage. With the rapid development of artificial intelligence (AI), data-driven analytical approaches provide new opportunities for enhancing IBP by identifying key drivers and predicting performance outcomes. This study aims to examine the influential factors shaping integrated business planning in the Haraz Dairy Company using an AI-enhanced analytical framework. Data were collected through a structured questionnaire measuring fifteen indicators related to data management, process optimization, decision-support capability, and strategic alignment. After preprocessing and scaling, an unsupervised clustering method (k-means) was applied to categorize organizational conditions into two overall IBP readiness levels. Cluster labels were subsequently used as outcome variables for predictive modeling. Decision Tree and K-Nearest Neighbors (KNN) algorithms were implemented to determine the extent to which each factor contributes to IBP classification. Model performance was evaluated using ten-fold cross-validation and multiple metrics, including accuracy, precision, recall, F1-score, and confusion matrix analysis. The results indicated that process optimization, decision-support capability, and data quality features had the strongest influence on IBP readiness. Among the predictive models, the Decision Tree classifier provided superior interpretability with competitive accuracy. These findings highlight the value of AI-based modeling for diagnosing organizational readiness and guiding managerial interventions toward integrated planning. Practical recommendations for enhancing IBP maturity in the dairy industry are also discussed.

Graphical Abstract

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1. Introduction

In today's world, where competition in global markets is more intense than in the past, using novel technologies like artificial intelligence to improve performance and business plan efficiency seems significant. Because of the exclusive capabilities of artificial intelligence, integrated business plans can make strategic decisions smartly and optimize various processes [1], and in the current era, artificial intelligence is considered one of the most important scientific and technological milestones. Artificial intelligence makes it possible to analyze big data and complex data through algorithms and computing models and contributes to intelligent and automated approaches for various problems. One field in which artificial intelligence can be used is integrated business plans. Integrated business plans are systems that make it possible to manage and control all aspects of organizational performance [2]. By coordinating and integrating processes, data, and organizational resources, integrated business plans help companies improve performance, increase efficiency, and facilitate strategic decisions [3].

Due to the importance of integrated business plans and the key role of artificial intelligence in organizational performance improvement, the research can help companies and managers make the best decisions about the selection, implementation, and improvement of integrated business plans and maximize organizational benefits [4], since in today's business world, integrated business plans based on artificial intelligence are considered one of the key tools for organizational performance improvement. However, there are some factors that influence the capability and efficiency of integrated business plans based on artificial intelligence that have not been fully identified and analyzed yet [5].

Based on the notes in the above paragraphs, the importance of exploring and identifying influencing factors in integrated business plans based on artificial intelligence is very high. Due to the gap in this research field and the importance of integrated business plans in improving organizational efficiency, research in Haraz Company can help companies and their managers identify the influencing factors on integrated business plans based on artificial intelligence and make better decisions about the implementation and improvement of such plans. In this research, qualitative and quantitative methods are used for data collection and conducting the required analysis. Haraz Company is considered one of the most important companies in the food industry, and it uses integrated business plans for process management, inventory, suppliers, and customers. Some questions in this research include the following:

1- What are the influencing and key components in integrated business plans based on artificial intelligence in Haraz Company?

2- How can we explain the artificial intelligence functions for the creation of competitive advantage in Haraz Company?

3- How much is the level of relationship and impact of interaction among artificial intelligence components and business performance

4- How is the current performance of the business plan in comparison with an integrated approach based on artificial intelligence in Haraz Company?

2. Theory Framework and Literature Review

In this section, some major concepts of research about artificial intelligence and its application in business plans are explained.

2.1. Artificial Intelligence

Artificial intelligence is considered a branch of computer science that studies and researches the creation of machines and intelligent systems that can perform tasks that require human knowledge. Artificial intelligence can make decisions by using algorithms, mathematical models, and neural networks, and can detect patterns, learn, and solve complex problems.

2.2. The Role of Artificial Intelligence in Performance Improvement and Efficiency of Business Plans

Artificial intelligence, as a novel technology, can significantly enhance the performance and efficiency of business plans. Such technology uses various techniques and tools like machine learning, natural language processing, neural networks, and artificial intelligence algorithms for performance improvement and efficiency of business plans [6].

Data analysis: Artificial intelligence can analyze big data and extract useful patterns that help businesses make better decisions.

Prediction and optimization: By using artificial intelligence, business plans can experience production improvement, process optimization, and productivity increase.

Automation: Artificial intelligence helps companies automate routine tasks and ensure efficiency

Customer experience: Using artificial intelligence, business plans can improve customer experience and provide better services.

2.3. Competitive Advantage

From Miller (1988)'s point of view, the differentiation approach aims to create a product or service that is unique from the customer's view [7]. The cost leadership approach requires that a company become one of the lowest-cost producers in its industry and finally seek to supply and feed a certain and limited sector of the market. Porter emphasizes that the focus approach may contain a balance between the differentiation approach and cost leadership, and can be a combination of both advantages or a tendency toward one of them. In summary, competitive advantage is an indicator for overcoming competitors [8], including service or product provision with low cost, distinction, or innovative characteristics [7]. From another point of view, competitive advantage includes a set of factors or capabilities that enable a company to perform better than competitors

[9]. Three main theoretical perspectives explain the sources of competitive advantage: the industrial-organization (market/industry) perspective, the resource-based perspective (firm resources and capabilities), and the Schumpeterian (innovation-driven/evolutionary) perspective [10].

Based on industrial organization theory, the tendency to market for achieving competitive advantage, and even sustainable competitive advantage, is another important resource. In this approach, industry structure is considered an influencing factor in achieving competitive capability. Another theory associated with competition is the resource-based view, which emphasizes the role of internal factors within the organization and industry. The pivot point of the resource-based point of view is that organizations include a set of resources that are very important in achieving competitive advantage and determine resource characteristics and the limits of their sustainability. The third view is the innovation-based point of view, which includes the capability of research and development and the capability of using information technology and knowledge management. This point of view can be considered a resource-based point of view since resources can be categorized as tangible and intangible, and creativity and innovation are considered intangible.

2.4. The Role of Artificial Intelligence in Achieving Competitive Advantage

Artificial intelligence, as a novel technology, plays a major role in gaining competitive advantage for businesses. This technology provides possibilities and exclusive tools that can help companies be distinct from competitors and improve and grow in the market. Using artificial intelligence, companies can experience performance improvement, productivity increase, cost reduction, and customer experience enhancement, which helps them gain a stronger competitive advantage in the market.

2.5. Business performance

The organizational environment can be categorized into the public and private sectors. The public environment is considered a milieu associated with company strategy, and it cannot be operationalized. Conversely, the private environment influences the company's business strategy and can be operationalized through customers, competitors, suppliers, and regulatory groups. The public environment includes macro forces that influence organizational activities directly [11]. Such factors include the following:

1-Economic

2-Political

3-Social

4-Cultural

5-Demographic

The private environment includes elements that influence the organization directly. These factors include:

1-Customers

2-Suppliers

3-Stockholders

4-Business unions

5-Competitors

6-Financial intermediaries

7-Governmental institutions

8-Labor unions [12].

Valker (2019) explores organizational business performance using financial efficiency, customer response level, variety and flexibility, market share, and product quality. He explores the impact of comprehensive information system implementation on a company’s competitive capabilities and, through it, the impact of information systems on business performance [13]. In this paper, it tries to collect a set of indicators provided by other researchers and present them in 2 dimensions: operational and external. These 2 dimensions include 10 common factors in organizational performance, as follows.

Operational dimensions include internal product quality, production cost, timely delivery, flexibility in production volume, and flexibility in production variety. External dimensions include market share, product quality, competitive position, service level to customers, and return on investment. Product quality is shared in both dimensions. Internal quality in this field includes the impacts of product quality inside the company and in qualitative discourses; its problem is internal failure. External quality refers to the impacts that product quality has on the organization's external environment, and in qualitative discourse, its problem is external failure [5].

2.6. Business Integration

Integration is considered shared use by 2 or more users of the same information with the same storage resource, and linking among the various and balanced sectors that include strategic direction, market focus, resources, skills, and culture. It creates a mutual relationship between internal teams and existing tasks. Integration also leads to the removal of information islands and informational modules, and the timely and complete provision of accurate information from the current system's overall situation. Such integration can be achieved across dimensions including operational data, data storage, information (processed data), organizational knowledge, processes, human resources and their responsibilities, organizational structure, business intelligence applications like data mining tools, research, market, reporting, and applicable software like statistical analysis software [1]. The most important results from such integration include reduction of information costs and managerial data, reduction of required time for creation of regulated reports, provision of significant analysis from organizational activities, real time access to data, and saving in access time to information and data mining, equipping the organization for cooperation and participation of various sectors, real time exploration of all financial flows in the organization. All of the above items can lead to increased efficiency, higher ROI, and, finally, competitive advantage. A factor that can lead to the integration of organizational processes is considered enterprise resource planning. Successful organizations in the 20th century have used ERP systems to make business processes consistent within their systems and emphasize the creation of interorganizational integration systems. Through such systems, organizations can achieve dynamic business models [14]. ERP include 3 below initial letter terms:

- Enterprise
- Resources
- Planning

So we can define ERP as long-term planning for all resources across an organization. The Institute of Inventory Control and Production of the USA defines ERP as a methodology for influencing control and planning for all required resources to receive, produce, transfer, and respond to customers' requirements in manufacturing, distributive, and service companies. ERP is a standard software package for integrating an organization's value chain, based on data and various modules for doing unique tasks. ERP creates a changeable and adjustable information system based on computers that can be used to integrate all processes, sectors, information, and resources using a database and provide real-time access to information in various fields and sectors based on the goal of resource-effective management [15]. The final goal of ERP application is that information is entered into the system only once [16]. ERP acts as a business management system and includes an integrated set of comprehensive software that can make all processes and business tasks consistent. Such a system can integrate all existing cooperative activities in the supply chain while keeping their independence based on common bases. ERP integration can be considered in internal and external dimensions. Internal integration is the integration of all processes inside the organization. External integration means consistency of processes between the company and other cooperative companies in the supply chain [17]. In ERP structure, 4 total categories of processes can be introduced that require integration in internal and external dimensions:

1- Manufacturing, operation and support: includes processes like production planning, material needs planning, inventory management, quality assurance, supplier and purchase evaluation, transportation and distribution, engineering and technical, maintenance.
2- Selling and marketing: includes processes like product management, division and selection of markets, market research, order management, sales planning, contracts, distribution channels, pricing, and after-sales service.
3- Financial: includes a set of processes like industrial accounting, profitability analysis, ledger, liquidity management, receivables and payables, investment, and budget allocation.
4- Human resources: includes processes like employee characteristics, education, wage, job categorization, human resource planning, payment statement, travel costs [6].

3. Methodology

The current research is applicable and is of a mixed type. To identify influencing factors, a deep study is conducted, and then, through a questionnaire, the factors are exposed to experts' judgment. Finally, to measure the influence of factors on business planning, a neural network is executed.

In total, the data collection method in the current research can be split into 2 categories:

1- Library method: by studying books, papers, and internet sources to gain awareness about literature and to collect secondary data
2- Survey (interview and questionnaire): for required data collection, the population in the sample can provide information. A total of 100 questionnaires were distributed to research participants in Haraz Company, and the required data were collected through interviews and the selection of new cases in detail. Some notes for interviews by the researcher include:

1- Before the interview, coordination with interviewees is done to determine an appropriate time
2- During the interview, people's speech is recorded with consent, and the researcher writes main notes or ambiguous ones
3- Each interview, based on its attraction level, lasts between 30 and 90 minutes.
4- Keeping the confidentiality of identity information for interviews during research is considered, and the researcher is committed to not publishing participants' characteristics and details of interviews.

The population of the research is managers and experts of Haraz Company in Mazandaran Province. Selected Experts in this research are people who have a bachelor's degree in a related field and at least 5 years' background. Due to population limitations, sampling was done using the counting method. This study utilized two distinct datasets with different methodological purposes. The expert survey (managers and specialists) was used only to identify and validate the conceptual factors of AI-based business integration. The clustering and predictive models, however, were applied to 6,215 operational records extracted from Haraz information systems over 12 months. These records represent production, inventory, distribution, and performance indicators mapped to the same constructs identified in the survey. Therefore, the difference between the number of human respondents and the number of system records reflects the mixed-method design of the study.

There are various methods for implementing and executing machine learning. One of the strong methods is CRISP. The methodology comprises system identification, data identification, data preparation, modeling, evaluation, and system development.

3.1. Reliability and Validity Assessment

Before conducting clustering and predictive modeling, the reliability and internal consistency of the questionnaire were evaluated. Cronbach's Alpha was calculated for all constructs, and the values exceeded the recommended threshold of 0.70, indicating acceptable to excellent reliability across the scales. Table 1 presents the Cronbach's Alpha values for each construct. Given that the questionnaire was researcher-developed, establishing internal consistency was essential to ensure measurement accuracy and construct reliability.

Table 1. Reliability statistics of research constructs (Cronbach's Alpha)

Construct	Number of Items	Cronbach's Alpha
Data Analysis (Q1-Q4)	4	0.87
Risk Prediction (Q5-Q6)	2	0.79
Process Optimization (Q7-Q9)	3	0.84
Decision Support (Q11-Q12)	2	0.82
Competitive Capability (Q13-Q15)	3	0.85
Total Scale	14	0.91

Cronbach's alpha values above 0.70 indicate acceptable internal consistency, values above 0.80 indicate good reliability, and values above 0.90 indicate excellent reliability. As shown in Table 1, all constructs exceed the recommended threshold, confirming the internal consistency and reliability of the measurement instrument.

3.2. Data Analysis

For data modeling, since there is no clear response, we first determine the response using a clustering method; the K-means clustering method is used. To reach the best number of clusters in this methodology, the Davies-Bouldin indicator is compared for 2 to 12 clusters. The Davies-Bouldin indicator is the ratio of the within-cluster observation distance to the distance between clusters. Therefore, values below this threshold indicate better clustering. For this task, we construct the response based on q-1 to q-12, which are representative of future categories, to create categorization models and predict future performance types for people. The findings for the best number of clusters based on the questions are shown in Figure 1 and Table 2:

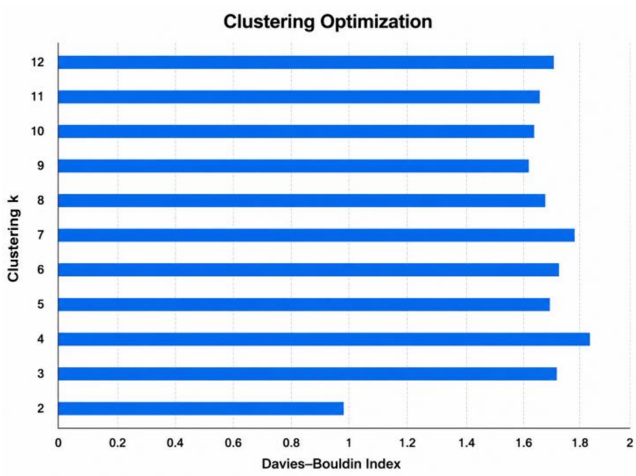

Figure 1. Davies-Bouldin indicator

According to the table above, 2 clusters indicate the most appropriate number for clustering based on questions q-1 to q-12, since the lowest indicator value shows the best clustering. 2 clusters as the best number for clustering can be seen in the information below on the dataset. (It is important to clarify that the standard Davies–Bouldin Index (DBI) is a non-negative metric (DBI ≥ 0). The negative values initially reported in Table 2 were the result of a normalized and inverted scoring mode automatically applied by the software. To avoid misinterpretation, the DBI values were recalculated using the standard, non-negative form of the index. The corrected DBI values confirm that the two-cluster solution remains the optimal structure.)

By obtaining the best clustering, we should examine whether each cluster is representative of its category. To reach this goal, we explore the level of differences for the Centroid in each cluster. Questions with different centroids have a higher impact on clustering, and, in fact, the characteristics of questions can create the characteristics of each cluster. Results of cluster comparison are indicated in Table 3:

Table 2. Findings of the Davies-Bouldin indicator

Clusters number	Davies-Bouldin indicator
2	-0.989584123
3	-1.729566753
4	-1.8329627
5	-1.712606639
6	-1.72694021
7	-1.776220166
8	-1.69659013
9	-1.627926684
10	-1.649545961
11	-1.663281633
12	-1.741171018

Table 3. Exploration centroid level

Characteristic	Cluster zero	Cluster one
Q_1	0.033	0.847
Q_2	0.035	0.858
Q_3	0.030	0.696
Q_4	0.029	0.645
Q_5	0.016	0.348
Q_6	0.015	0.269
Q_7	0.077	0.649
Q_8	0.023	0.261
Q_9	0.043	0.267
Q_10	0.005	0.093
Q_11	0.002	0.029
Q_12	0.000	0.014

In Figure 2, we can see that factors q-1 to q-4 and q-7 determine the questions in creation 2 various clusters. The questions are related to data analysis factors and information q-1 to q-4 and process optimization of q-7. The factors are categorized into 2 sections. Therefore, based on the above table and chart, and the nature of factors with high differences between both clusters, we can find that one cluster (cluster-1) is representative of data analysis and information, and the other cluster (cluster-0) is representative of process optimization. Therefore, based on the best clustering, the response is created as a bi-level variable whose levels include cluster 0 and cluster 1, which have 2151 and 4064 observations.

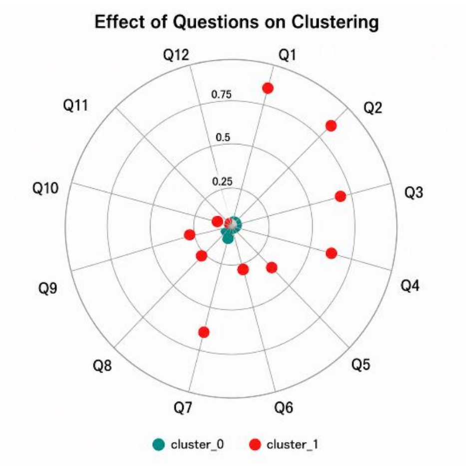

Figure 2. Level of question impact in cluster 0 and cluster 1

For fitting an optimal decision tree, both predictability and tree-size optimization measures (criterion and minimal gain) are used. The 4 criteria called gain ratio, accuracy, Gini index, and information gain, along with the value of minimal gain, directly influence the final prediction precision and tree size. By breaking the interval from 0 to 0.25 into intervals of 0.05 and considering various criteria, we can create the optimal tree. Figures 3 and 4 show the optimal decision tree.

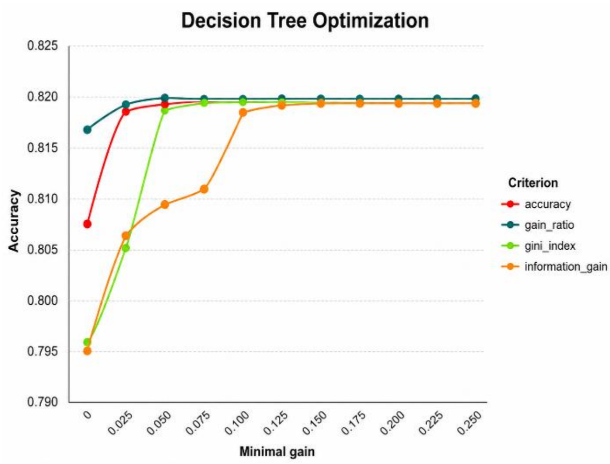

Figure 3. **Optimal decision tree**

Information related to Figure 4 is shown in Table 4:

Table 4. **Results for the optimal decision tree**

information_gain	0.225	0.819635118
information_gain	0.25	0.819634859

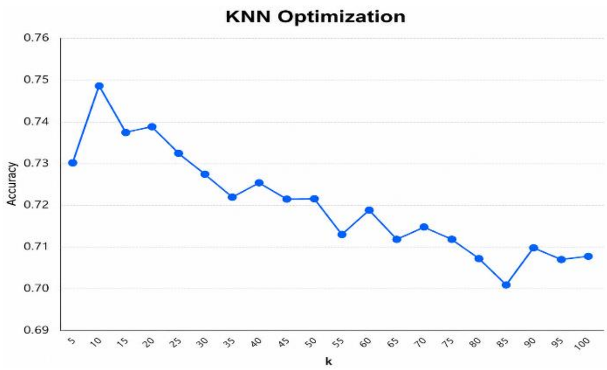

Figure 4. **Chart of fitted model measurement accuracy**

According to the findings in Table 3, the best tree in our work is the one that can be fit using gain ratio and with a minimal gain = 0.05. It should be noted that the accuracy values for the optimal tree selection process are calculated during the mutual evaluation process of 10-fold or 10-fold cross-validation. To explore the model's predictability, similar to the optimal model selection process, 10-fold cross validation is used, and its results are displayed in a confusion matrix in Table 5:

Table 5. **Results of decision tree prediction**

Summary of model statistical information		**True**		
		Data analysis	Process optimization	Class Precision
	Data analysis	2039	1007	%66.94
Predicted	Process optimization	112	3057	%96.47
	Class Recall	%94.79	%75.22	

In the confusion matrix, based on the prediction Column, we can argue that process optimization influences integrated plans based on artificial intelligence. On the one hand, the prediction percentage for data analysis is 0.6694, but for process optimization it is 0.9647. Since the percentage for process optimization is higher, the decision tree forecasts that process optimization can influence data analysis in business integration.

Table 6. Results of accuracy for various K

K	Accuracy	K	Accuracy
5	0.730	55	0.713
10	0.749	60	0.719
15	0.737	65	0.712
20	0.739	70	0.715
25	0.732	75	0.712
30	0.727	80	0.707
35	0.722	85	0.701
40	0.725	90	0.710
45	0.721	95	0.707
50	0.721	100	0.708

Table 6 shows the classification accuracy obtained by the KNN algorithm when varying the number of neighbors (K) from 5 to 100. The highest accuracy (0.749) was achieved at K=10, indicating this as the optimal value. As K increases beyond 10, the accuracy gradually decreases and fluctuates, suggesting that larger neighborhood sizes reduce the model's discriminative ability.

The validation results of the KNN model are presented in Table 7. This table shows that the model achieved acceptable accuracy with the optimal number of neighbors (K=10); however, the model's performance in predicting the "process optimization" category was considerably better than for "data analysis."

Table 7. Results of KNN model validation

Summary of model statistical information		True		
		Data analysis	Process optimization	Class Precision
	Data analysis	1362	772	%63.82
Predicted	Process optimization	789	3292	%80.67
	Class Recall	%63.32	%81.00	

4. Findings and Discussion

The findings of this study indicate that the two dimensions of data analysis and process optimization constitute the most influential drivers of integrated business planning based on artificial intelligence in Haraz Dairy Company. These results are strongly aligned with the theoretical foundations discussed in the literature.

4.1. The Role of Data Analysis in Business Integration

Cluster analysis revealed that items Q1–Q4—related to data volume, data quality, storage and transfer capabilities, and analytical tools—showed the greatest centroid variation, highlighting their central role in defining the structure of integrated business planning. This pattern reflects the view of Russell and Norvig [6], who emphasize that AI-driven systems depend fundamentally on the availability of high-quality, structured, and reliable datasets for effective learning and decision-making.

Further, studies such as Moreira et al. [1] and Hajipour et al. [3] underline that AI value creation stems largely from the capacity to extract actionable insights from large-scale, heterogeneous data sources.

4.2. The Role of Process Optimization in Integrated Performance

Decision tree and KNN models consistently showed higher predictive power for process optimization compared to data analysis, indicating that AI-driven integration in Haraz depends more strongly on streamlining operational workflows. This aligns with ERP-based theoretical frameworks, which highlight that true organizational integration is achieved when business processes become standardized, automated, and responsive to real-time information flows [5,14].

4.3. Interaction Between AI Components and Business Performance

The empirical models demonstrate that AI components influence business performance through two channels: (1) enhancing the depth and quality of business intelligence (data analysis), and (2) improving operational efficiency (process optimization). This is consistent with the Resource-Based View (RBV), which posits that sustainable competitive advantage emerges from rare, valuable, and hard-to-imitate resources such as proprietary datasets, optimized workflows, and advanced technological capabilities [10].

5. Conclusion

This study demonstrates that data analysis and process optimization are the two most critical factors driving integrated business planning based on artificial intelligence in Haraz Dairy Company. While robust data infrastructures constitute a necessary foundation, the findings show that process optimization exerts a stronger and more direct influence on achieving business integration. This conclusion is consistent with AI, ERP, and competitive-advantage theories, which collectively argue that data alone does not generate value unless it translates into streamlined, intelligent, and automated operations.

Based on these findings, three strategic priorities are recommended for Haraz:

1. Build a reliable data infrastructure: through enhanced data governance, centralized data architecture, and access to advanced analytical tools.

2. Embed AI in core operational processes: including production scheduling, inventory management, demand forecasting, and distribution optimization.

3. Integrate AI with managerial decision-making systems by implementing scenario analysis tools, risk-analysis modules, and intelligent dashboards.

Implementing these recommendations can help Haraz reduce costs, increase productivity, elevate product quality, and strengthen its competitive position in the dairy industry. Furthermore, the methodological framework presented in this study provides a transferable model for other organizations seeking to adopt AI-enabled integrated business planning systems.

6. Answer to the questions

Major question: What are the key factors in integrated business plans based on artificial intelligence in Haraz company?

In Table 8, the final criteria for integration of business plans based on artificial intelligence are indicated:

Table 8. Final criteria

Major factors	Questions
Data analysis	Data volume Q1
	Data quality Q2
	Storage and transfer capability Q3
	Data analysis tools Q4
Risk forecasting	Access to sufficient data for risk analysis Q6
Process optimization	Process identification exactly Q7
	Process flexibility Q8
Support for decision-making	Confidence in data and analysis Q11
	Flexibility in decision-making Q12
Competitive capabilities	Identification of market and competitors Q13
	Consistency with market change Q14
	Innovation and productivity in using from advanced technologies Q15

Minor question 1: How can we explain the functions of artificial intelligence in creating competitive advantage in Haraz company?

Using data analysis and clustering, a framework can be formed in which the most important influencing factors on the integration of business plans are identified through artificial intelligence. Then, using artificial intelligence prediction models, action is taken based on whether they are influential or not.

Minor question 2. How much is the Level of relationship and mutual influence between artificial intelligence factors and business performance?

According to results from both methodologies, the data analysis prediction is lower than the process optimization prediction; therefore, we can forecast that the process optimization influence on business plan integration is stronger than that of data analysis.

Minor question 3: How is the current performance of the business plan in comparison with the integrated approach based on artificial intelligence in Haraz Company?

Using process optimization through artificial intelligence in business plan integration can help Haraz Company achieve the required improvement in performance. There are several approaches for process optimization using artificial intelligence in Haraz Company.

Using artificial intelligence, we can predict inventory and optimize the supply and distribution process. This practice can lead to cost reduction and service improvement.

Using artificial intelligence, the distribution and production process can be coordinated with market needs and demand automatically. This can lead to increased productivity and reduced product supply time.

Using advanced artificial intelligence algorithms, we can analyze customers' behavioral patterns and predict their needs. This action can help Haraz Company make the required improvements in its products and services.

Using artificial intelligence, we can optimize the supply chain and make required improvements in the supply process and product distribution. This can reduce costs and improve product quality.

Using artificial intelligence, we can suggest more accurate and personalized approaches to customers. This action can be used to increase sales and customer satisfaction.

By applying such approaches and using artificial intelligence in process optimization, Haraz Company can achieve better performance, increase productivity, and improve its competitive capabilities.

7. Suggestions for Research are as follows

Identification and determination of influencing factors in integrated business plans based on artificial intelligence that are important for Haraz Company for determining evaluation measures and measurement factors for analysis.

Using data analysis methods and related tools for data analysis and pattern extraction can lead to qualitative and quantitative analysis to explain weaknesses and strengths in integrated business plans based on artificial intelligence.

According to the findings, applicable suggestions and approaches based on artificial intelligence for improving the performance and productivity of Haraz Company include providing appropriate strategies for increasing competitive capabilities and improving business performance.

By executing applicable suggestions, research can help Haraz Company implement the required improvements in an integrated business plan based on artificial intelligence and achieve better performance.

8. Statements & Declarations

8.1. Author Contributions

Conceptualization, H.R. and H.M.; methodology, H.R.; software, S.E.G.; validation, H.R., H.M. and A.A.; formal analysis, H.R.; investigation, H.M.; resources, S.E.G.; data curation, A.A.; writing—original draft preparation, H.R.; writing—review and editing, H.M. and A.A.; visualization, S.E.G.; supervision, H.R.; project administration, H.M.; funding acquisition, none. All authors have read and agreed to the published version of the manuscript.

8.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to the confidentiality of operational information from Haraz Dairy Company and privacy restrictions.

8.3. Funding

This research received no external funding from any agency, organization, or research institution. All costs associated with conducting this study were covered by the authors.

8.4. Acknowledgments

The authors have no acknowledgments to declare.

8.5. Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors used ChatGPT, developed by OpenAI, for language refinement, grammar correction, improvement of sentence structure, and enhancement of overall clarity and readability. After using this tool/service, the authors reviewed and edited the content as needed and took full responsibility for the content of the published article. The AI tool was not used to generate original scientific ideas, develop the research framework, design the methodology, conduct statistical analyses, interpret empirical findings, or formulate the discussion and conclusions. All theoretical development, data analysis, interpretation of results, and scholarly judgments were carried out exclusively by the authors.

8.6. Ethics Approval

This study was conducted based on operational data and expert opinions from Haraz Company and did not involve human or animal experimentation. Nevertheless, all ethical principles of research, including confidentiality of information, informed consent of participants, and privacy protection, were observed.

8.7. Informed Consent

Informed consent was obtained from all participants (managers and experts of Haraz Company). Participants were fully informed about the research objectives, confidentiality of information, and the exclusive scientific use of the data, and all individuals participated with complete awareness.

8.8. Consent for Publication

The authors consent to the publication of this manuscript. Additionally, the necessary consent was obtained from Haraz Company for the use of operational data in this research.

8.9. Conflicts of Interest

The author(s) declare no conflict of interest. This study was conducted independently and without any commercial or organizational affiliations.

9. References

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