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Business Operations through Artificial Intelligence: Applications and Innovations across All Departments

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Abstract. *The present paper explores some of the possible applications and innovations in some of the departments of a business, showing out the ways and potential to improve efficiency, management of innovation and the process of decision making. Artificial intelligence can be consider a disruptive force in this instance because is changing the ways business is done. The comprehensive examination of the literature shows an interest in this domain, but lacks a holistic view of a integration of AI across all the departments. The research methodology used in this paper is both quantitative and quantitative, the collection of data was made by utilizing questionnaires to collect data and were analyzed using SPSS statistical software. Some of the main questions were the following: the use of AI in the departments improves reduces costs, which is the main concern of the business nowadays, improving efficiency and decision-making. The analysis of key variables on human resources, marketing, logistics and finances before and after the use of AI we can show how AI can intervene and improve these variables. Also, we discuss some of the challenges and some of the best ways to use AI in business to provide a comprehensive view of AI and its role in transforming the operations of businesses. This paper's contribution is to raise awareness about the need of a holistic approach in the use of AI in business departments. This paper aims to be a starting point for future managers and researchers to understand the effects of AI in businesses and to know how to manage the use of AI as an integrated part of business operations.*

Keywords: Artificial intelligence, Business departments, Improve, Impact, Operations.

Introduction

Businesses have now started to use AI tools to solve complex tasks, improving operational efficiency, this use of AI in business is becoming an increasingly demanding necessity rather than a advantage to protect itself from competition. The applications of artificial intelligence are starting to gain even more usage as advancements have been made in natural language processing and in machine learning, these tools reducing costs and creating personalized customer experiences.

This paper aims to analyze the potential innovations and uses of artificial intelligence in some of the departments of a business. Also this paper wants to be a foundation for the next generation of managers for them to understand the applications and the use of AI in the departments and how this tool can improve some of the business variables. The questions that this paper aims to answer are: What are the departments in which AI is used, what is it used for, and how does this impact the business? Also, does the use of AI improve efficiency, reduce costs, and enhance decision-making? This paper seeks to be a bridge between the use of AI in departments individually and the use of AI in all the departments as a holistic view that is missing in the current literature.

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Literature review

The subject regarding the use of artificial intelligence in business operations has become a major trend in current research subjects. The use of AI technologies is restructuring traditional ways of solving problems, the use of AI tools are offering new solutions to old problems. The standard processes of decision-making are starting to get automated, and AI is starting to transform organizational tasks with the purpose of achieving the highest rates of efficiency and effectiveness. Authors like Russel and Norving (2021) are defining artificial intelligence as the simulation of human intelligence processes by machines, particularly computer systems. These processes can be learning, self-correction, and reasoning. In businesses AI is now used to assist decision making corelated task like improving operational efficiencies, enhance customer experiences, and develop predictive analytics to forecast future trends (Chui, Manyika, & Miremadi, 2018). According to Brynjolfsson and McAfee (2017), automation reduces human intervention in repetitive and mundane activities, allowing employees to focus on higher-order tasks that require creativity and critical thinking. An lectured example of using AI is Robotic Process Automation (RPA), which can handle tasks such as invoice processing, data entry, and inventory management across various industries (van der Aalst, 2016).

AI innovations across departments

The extent of AI implementation is seen in all the departments. In the marketing department, AI is used to enable personalized customer engagement. Studies by Davenport and Ronanki (2018) show how AI tools can analyze customer preferences and predict behaviors, leading to personalized marketing strategies based on their preferences and behaviors .

In human resources, AI has revolutionized recruitment processes by employing natural language processing (NLP) and machine learning algorithms to analyze resumes and correlate candidates (Boehm, 2018). The use of AI tools ensures that the hiring process focuses on qualifications and experience rather than subjective judgment.

AI applications in the finance department, such as fraud detection systems are reshaping traditional operations. According to Ngai et al. (2011), machine learning algorithms identify anomalies in transaction patterns, mitigating risks and preventing financial fraud. Similarly, AI models in supply chain management optimize inventory levels, predict demand, and reduce operational costs (Waller & Fawcett, 2013).

Research gap and contribution

The literature on AI applications in business is extensive, but unfortunately, it is limited in integration of AI across all organizational departments. Most research focuses on individual departments such as marketing or finance. This paper aims to address this gap and examine the implementation of AI in the organization, highlighting its potential to innovate.

Methodology

As mentioned before, the methods of research used were qualitative and quantitative. The first data set is IBM HR Analytics (1,470 records), this data set was created by IBM for employee turnover analysis without a specified collection period. The second data named as Bank Marketing data set was created by a Portuguese Bank and contains data about a marketing telephone campaign conducted from 2018 to 2020 to promote deposits (45,211 records). The last data set named Default of credit card clients contains data about an analysis of credit defaults based on financial data collected from April to September 2023.

The main hypotheses of this research are:
1. Does artificial intelligence significantly improve efficiency in business departments?
2. Does the application of artificial intelligence reduce operational costs and improve decision-making in business?

The primary tool for analyzing the data was Statistical package for social sciences or SPSS. This tool is used for this research because it can perform descriptive statistics, correlation analyses, regression analyses, crosstabulations, chi-square tests and paired simple tests. To analyze all the data and get some comprehensive conclusions we need to use SPSS for analyzing the pattens, relationships and the statistical significance in the datasets. But firstly, we need to do a review of the relevant literature to identify if the if the main purpose of this paper is meet. We need to specify that we used the IBM SPSS program because of its powerful data processing capabilities.

Results and discussions

1. Artificial intelligence in Human Resources Department

When I took my first management courses I was told that the most important resource of a business is the workforce. So, continuing this subject, managers look through hundreds of CVs in the search for the most qualified candidates and this activity consumes time and money so this repetitive task can be automated by applying AI pre-made profiles for this job. By correlating through AI the candidate profiles, it can identify the best candidate for the job.

Another subject regarding the workforce is about their motivation and retention, by using real-time AI chat-bots this can provide real-time support for the employes.

Another problem faced by the managers is the need of continue training for the employees, a solution comes in the form of AI powered personalized training programs like Virtual Reality and Augmented Reality, which can offer immersive training programs.

Unfortunately, data sets about how companies implement AI in their human resources department are not available for the public, maybe because of security concerns and confidentiality, but there are some data sets that can be used for educational purposes to simulate real-world scenarios. One of these datasets is the IBM HR Analytics Employee Attrition & Performance dataset, which can be analyzed using IBM SPSS for insights in the HR department (Pavan S., 2023).

Table 1. Descriptive statistics for Job Satisfaction, Monthly Income and Work Life Balance

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
JobSatisfaction	1470	1	4	2.73	1.103
MonthlyIncome	1470	1009	19999	6502.93	4707.957
WorkLifeBalance	1470	1	4	2.76	0.706
Valid N (listwise)	1470				

Source: SPSS analysis.

For the first data set, when applying the descriptive analysis, we can see that employes have a moderate satisfaction rate, with a score of 2.73 on a scale from 1 to 4, the income has a very big gap between the maximum of 19,999$ and a minimum of of 1,009$ with an calculated average of 6,502.93$. The work-life balance does not go with much over the satisfaction score with a 2.76 score. This analysis shows an HR department that should focus on transparent pay methods and good engagement programs.

Table 2. Correlations analysis between Job Satisfaction and Work Life Balance

Correlations			
		JobSatisfaction	**WorkLifeBalance**
JobSatisfaction	Pearson Correlation	1	-0.019
	Sig. (2-tailed)		0.456
	N	1470	1470
WorkLifeBalance	Pearson Correlation	-0.019	1
	Sig. (2-tailed)	0.456	
	N	1470	1470

Source: SPSS analysis.

Doing some correlations between the Job satisfaction variable and Work-life balance, we wanted to verify if the employees with an better Work-life balance are also having a bigger satisfaction, but unfortunately the Pearson correlation is very low at -0.019 with a significance level of 0.456, this indicates that there is no significant statistical relationship, this indicates that improving one variable will not impact the other.

Table 3. Risk

Risk			
Estimate		Std. Error	
0.161			0.010
Growing Method: CHAID Dependent Variable: Attrition			
Classification			
	Predicted		
Observed	No	Yes	Percent Correct
No	1233	0	100.0%
Yes	237	0	0.0%
Overall Percentage	100.0%	0.0%	83.9%
Growing Method: CHAID Dependent Variable: Attrition			

Source: SPSS analysis.

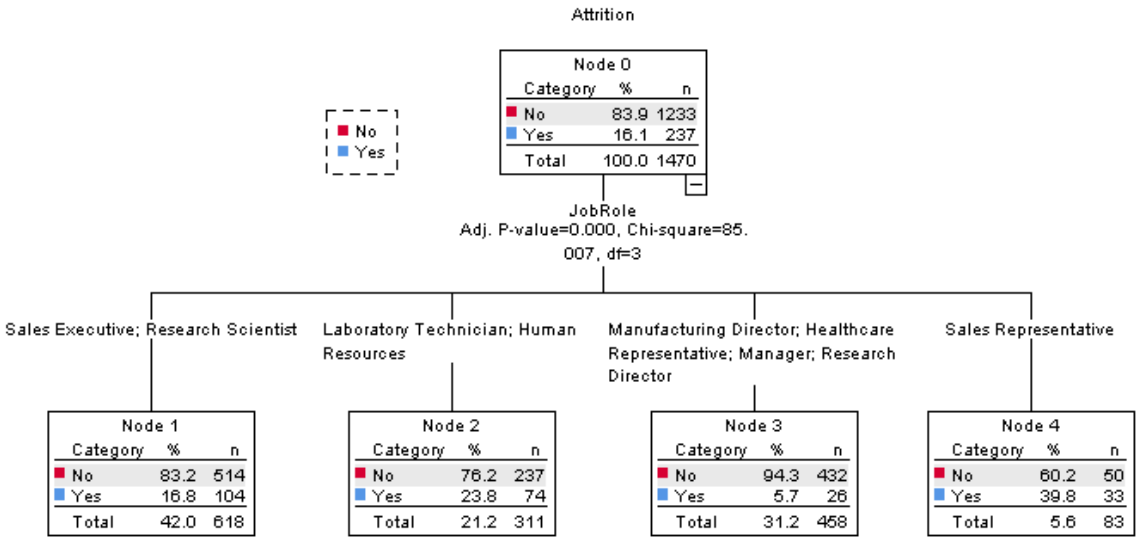

Figure 1. Classification Tree

Source: SPSS analysis.

Another significant analysis that needs to be done for this data set is that about the attrition rates among employees. The analysis shown on the upper page shows that. „Sales representatives" have the highest attrition rate at 39.8% in node 4, followed by the „Laboratory technicians" and „Human resources" with a moderate attrition rate of 23.8% in node 2. Sales Executives and „Research scientists" also have a moderate attrition rate of 16.8% in node 1, while the lowest attrition is encountered among „Manufacturing directors", „Managers", and „Research directors", at 5.7% in node 3. These results show that the HR department should focus on retention efforts on the nodes with low percentages.

Table 4. Simulated AI increase

Case Processing Summary			
Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	1470	100.0
	Missing Cases	0	0
	Total	1470	100.0
Unselected Cases		0	0
Total		1470	100.0

Dependent Variable Encoding	
Original Value	Internal Value
No	0
Yes	1

Classification Table[a,b]					
			Predicted		
			Attrition		
	Observed		No	Yes	Percentage Correct
Step 0	Attrition	No	1233	0	100.0
		Yes	237	0	0.0
	Overall Percentage				83.9
Variables in the Equation					

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.649	0.071	540.645	1	0.000	0.192

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	JobSatisfaction_Sim	15.171	1	0.000
	Overall Statistics		15.171	1	0.000

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	14.768	1	0.000
	Block	14.768	1	0.000
	Model	14.768	1	0.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1283.815[a]	0.010	0.017

Classification Table[a]

			Predicted		
			Attrition		
	Observed		No	Yes	Percentage Correct
Step 1	Attrition	No	1233	0	100.0
		Yes	237	0	.0

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	JobSatisfaction_Sim	-0.248	0.064	14.956		1
	Constant	-0.961	0.186	26.709		1

Source: SPSS analysis.

To test the main hypothesis of this paper we simulated an increase in Job satisfaction with the use of AI, this increase has an significant effect on reduction in employee attrition, the regression analysis indicates that Job satisfaction has a strong negative impact on attrition ($B = -0.248$, $p < 0.001$), with an odds ratio ($Exp(B) = 0.781$). The results show that for every unit increase in Job satisfaction variable the attrition variable reduces with more or less of 22%. These results are important for the groups that had significant attrition rates like those in the Sales department and the technicians

This AI increase can be done by providing flexible work policies through AI driven schedules, availability and individual strengths. Also using feedback through chatbots can identify the recurring problems and help lower the attrition rates.

2. Artificial intelligence in the Marketing Department

The simplest definition of marketing known by me is that: „Marketing is the art of selling", this can be helped by AI, using AI the targeting campaigns can be more accurate, and it can achieve higher engagement rates.

Using some AI tools like recommendation engines can enhance customer loyalty and combined with behavioral analytics sentiments and sentiment analysis can provide insight into customer preferences. By creating, for example automated AI algorithms, the Marketing department can also identify trends and optimize the content strategies, the grueling task of creating content can be assisted by AI.

As in the case of the first data set, there are no one's publicly available with an implementation of AI strategies, The data set chosen for simulation in this case was from a marketing campaign of a Portuguese bank named "A Data-Driven Approach to Predict the Success of Bank Telemarketing," that was published in the journal Decision Support Systems in 2014 and can be downloaded from the site: „UC Irvine Machine Learning Repository". The dataset contains information about customers, demographics, responses to previous campaigns, and other variables that can be used to analyze the marketing campaign and simulate the impact of AI. (Sérgio M., Paulo C. & Rita P., 2014)

Table 5. Frequency Table for the Job, Marital and Education variable

job					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	admin.	5171	11.4	11.4	11.4
	blue-collar	9732	21.5	21.5	33.0
	entrepreneur	1487	3.3	3.3	36.3
	housemaid	1240	2.7	2.7	39.0
	management	9458	20.9	20.9	59.9
	retired	2264	5.0	5.0	64.9
	self-employed	1579	3.5	3.5	68.4
	services	4154	9.2	9.2	77.6
	student	938	2.1	2.1	79.7
	technician	7597	16.8	16.8	96.5
	unemployed	1303	2.9	2.9	99.4
	unknown	288	0.6	0.6	100.0
	Total	45211	100.0	100.0	
marital					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	divorced	5207	11.5	11.5	11.5
	married	27214	60.2	60.2	71.7
	single	12790	28.3	28.3	100.0
	Total	45211	100.0	100.0	
education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	primary	6851	15.2	15.2	15.2
	secondary	23202	51.3	51.3	66.5
	tertiary	13301	29.4	29.4	95.9
	unknown	1857	4.1	4.1	100.0
	Total	45211	100.0	100.0	

Source: SPSS analysis.

When analysis the data set we saw that applying the frequency analysis to understand the customer demographics we can see that the most of the bank customers are blue-collar workers (21.5%) which is understandable for an growing economy as that of Portugal, management (20.9%) roles, with technicians (16.8%). The marital status indicates that the majority are married (60.2%), followed by single (28.3%) and divorced (11.5%). The education analysis shows that the majority have secondary (51.3%) and tertiary (29.4%) levels, while 15.2% have primary education.

Table 6. Descriptive Statistics table for balance, age and duration

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
balance	45211	-8019	102127	1362.27	3044.766
age	45211	18	95	40.94	10.619
duration	45211	0	4918	258.16	257.528
Valid N (listwise)	45211				

Source: SPSS analysis.

The diversity of customers with different financial situations shown by descriptive analysis with account balances ranging from -8,019 to 102,127, has an average of 1,362.27. There are different age groups ranging from 18 to 95 years. This data shows that there is potential for targeted marketing campaigns because of the various account balances and ages.

Table 7. The Chi-Square test

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
job * y	45211	100.0%	0	0.0%	45211	100.0%
marital * y	45211	100.0%	0	0.0%	45211	100.0%

job * y Crosstabulation

Count

		y		
		no	yes	Total
job	admin.	4540	631	5171
	blue-collar	9024	708	9732
	entrepreneur	1364	123	1487
	housemaid	1131	109	1240
	management	8157	1301	9458
	retired	1748	516	2264
	self-employed	1392	187	1579
	services	3785	369	4154
	student	669	269	938
	technician	6757	840	7597
	unemployed	1101	202	1303
	unknown	254	34	288
Total		39922	5289	45211

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	836.105[a]	11	.000
Likelihood Ratio	747.276	11	.000
N of Valid Cases	45211		

marital * y Crosstabulation

Count

	y		
	no	yes	Total

marital	divorced	4585	622	5207
	married	24459	2755	27214
	single	10878	1912	12790
Total		39922	5289	45211

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	196.496[a]	2	0.000
Likelihood Ratio	189.996	2	0.000
N of Valid Cases	45211		

Source: SPSS analysis.

For a better understanding of the data set we run the Chi-Square test to identify the type of relationships between job, marital status and the target variable (y), for the variable "Job," the Chi-Square value is 836.105 with a p-value of 0.000, confirming a strong relationship between job and subscription status. The Chi-Square value for marital status is 196.496 with a p-value of 0.000, showing a significant association between marital status and subscription behavior. These results show that the customers with a job and married are more likely to subscribe for a deposit.

Table 8. Correlation between Job and Balance

Correlations

		age	balance
age	Pearson Correlation	1	0.098**
	Sig. (2-tailed)		0.000
	N	45211	45211
balance	Pearson Correlation	0.098**	1
	Sig. (2-tailed)	0.000	
	N	45211	45211

Source: SPSS analysis.

If we analyze the correlation between age and balance, we can see that there is a weak connection because the of the Pearson correlation coefficient of 0.098 (p-value = 0.000). This shows that here is little statistical significance.

Table 9. Model Tree Classifications Summary

Model Summary

Specifications	Growing Method	CHAID
	Dependent Variable	y
	Independent Variables	duration
	Validation	None
	Maximum Tree Depth	3
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	duration
	Number of Nodes	11
	Number of Terminal Nodes	10
	Depth	1

Source: SPSS analysis

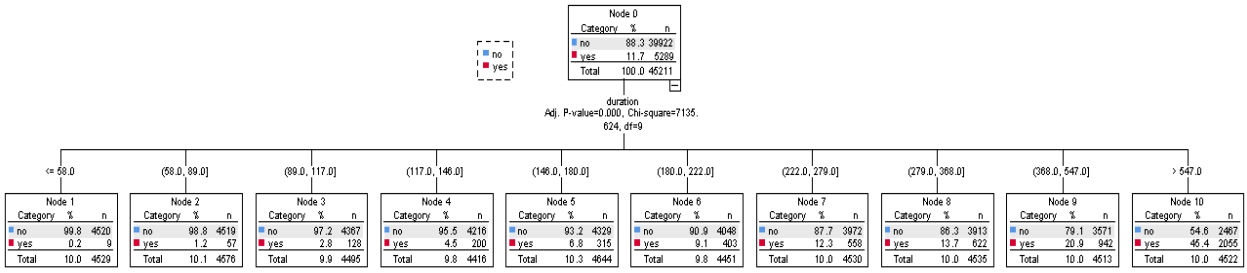

Figure 2 Classification Tree

Source: SPSS analysis.

Table 10. Risk

Risk			
Estimate		Std. Error	
.117		0.002	
Growing Method: CHAID Dependent Variable: y			
Classification			
	Predicted		
Observed	no	yes	Percent Correct
no	39922	0	100.0%
yes	5289	0	0.0%
Overall Percentage	100.0%	0.0%	88.3%
Growing Method: CHAID Dependent Variable: y			

Source: SPSS analysis.

Using the decision tree option from SPSS program we can see that customers with the longest calls like those that are over 547 seconds have a higher chance of subscribing (45.4%) and the persons with calls duration under 68 seconds have a low chance of subscribing (0.2%). The model shows an accuracy of 88.3%, indicating that call engagement is one of the most important variables regarding subscribing.

3. Artificial intelligence in the Logistic Department

The biggest companies that exist nowadays have huge supply chains with thousands of products, huge warehouses and these can sometimes lead to loses or shortages because of defectous logistics strategies, managing these problems is an even bigger challenge. So, by using AI, the company can predict demand based on trends, manage inventory and reduce the risk of shortage. The data set was created by the authors of the paper that models the logistics of a business. It simulates the impact of AI on improving logistics.

Table 11. Descriptive Statistics for Shipping Cost and AI Optimization Impact

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Shipping_Cost	500	5.01	49.90	26.8875	12.90043
AI_Optimization_Impact	500	1.01	10.00	5.4487	2.58186
Valid N (listwise)	500				

Source: SPSS analysis.

The average cost of shipping is $26.89, with variability regarding the volume and location. The results after the AI optimization shows a mean of $5.45. These results shows that using AI we can reduce the shipping cost.

Table 12. Frequency Statistics

Statistics				
		Shipping_Method	Warehouse_Location	Delivery_Status
N	Valid	500	500	500
	Missing	0	0	0

Shipping_Method					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Expedited	261	52.2	52.2	52.2
	Standard	239	47.8	47.8	100.0
	Total	500	100.0	100.0	

Warehouse_Location					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	East	116	23.2	23.2	23.2
	North	128	25.6	25.6	48.8
	South	117	23.4	23.4	72.2
	West	139	27.8	27.8	100.0
	Total	500	100.0	100.0	

Delivery_Status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Delayed	101	20.2	20.2	20.2
	On-Time	399	79.8	79.8	100.0
	Total	500	100.0	100.0	

Source: SPSS analysis.

When analyzing the frequency statistics table, we can see that the percentage of expedited shipping is bigger (52.2%) than the standard shipping (47.8%). The extremities show that the West warehouse handles the most of the deliveries and the East one the least, this results shows where is need of optimization in this case, the East warehouse.

Table 13 Paired Samples Statistics

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Shipping_Cost	26.8875	500	12.90043	0.57692
	Projected_Shipping_Cost	25.4297	500	12.22948	0.54692
Pair 2	Delivery_Date	07/12/2023 18:40:56.555	500	102 14:18:48.202	4
	Projected_Delivery_Time	13908561056.9513	500	8880056.52808	397128.20082

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Shipping_Cost&Projected_Shipping_Cost	500	0.998	.000
Pair 2	Delivery_Date&Projected_Delivery_Time	500	1.000	.000

Paired Samples Test

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		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Shipping_Cost - Projected_Shipping_Cost	1.45783	1.03380	0.04623	1.36700	1.54867	31.532	499	0.000
Pair 2	Delivery_Date - Projected_Delivery_Time	00:00:05.44871	00:00:02.58186	00:00:00.11546	00:00:05.22185	00:00:05.67557	47.190	499	0.000

Source: SPSS analysis.

After we applied the AI optimization and ran a paired samples t-test we saw that there is a significant reduction in shipping costs, the mean regarding the shipping costs is 1.46, and the difference is significant ($p < 0.001$), Also, the projected delivery times indicate an optimization with a mean reduction of 5 seconds ($p < 0.001$). This shows that using AI for logistics can reduce the shipping costs and improve delivery time.

4. Artificial intelligence in the Finance Department

When speaking about the finances of a business we need to think about all the decisions that are about the distribution of the business funds. The tools used through AI will be used to enable quicker scenario analysis, budgeting, and risk management. The data set used in this part of the analysis is about default of credit card clients which contains data about an analysis of credit defaults. (I-Cheng Y. & Che-hui L., 2009). In this case the use of AI in the financial department will analyze transaction patterns and detect any illicit transactions, reducing the rate of financial fraud.

Tabel 14. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
LIMIT_BAL	30000	10000	1000000	167484.32	129747.662
BILL_AMT1	30000	-165580	964511	51223.33	73635.861
PAY_AMT1	30000	0	873552	5663.58	16563.280
Valid N (listwise)	30000				

Source: SPSS analysis.

The data set analyzed through the descriptive option of SPSS is showing a variability among the customers of the bank and the analysis shows and credit limit of 167,282.32 with a standard deviation of 129,747.66. The analyzed bill amount is about 51,223.33 and the deviation is about 73,635.86. The payment amounts have a range between 0 and 873,552, a standard deviation of 16,653.28, and an average of 5,663.58.

Table 15. Crosstabulation

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SEX * default payment next month	30000	100.0%	0	0.0%	30000	100.0%
AGE * default payment next month	30000	100.0%	0	0.0%	30000	100.0%
EDUCATION * default payment next month	30000	100.0%	0	0.0%	30000	100.0%

Source: SPSS analysis.

The financial habits off men and women are not some stereotype in the real world, the data analysis is confirming it, it shows that males group have slightly better defaults rates (24.17%) compared to females (20.78%), the analysis also shows that the age group of 22-35 have higher default rates, while older groups have relatively fewer default rates. The education variable indicates that individuals with higher education significantly contribute to defaults.

Table 16. Case Processing Summary

Case Processing Summary						
Unweighted Cases[a]			N	Percent		
Selected Cases	Included in Analysis		30000	100.0		
	Missing Cases		0	.0		
	Total		30000	100.0		
Unselected Cases			0	.0		
Total			30000	100.0		
Dependent Variable Encoding						
Original Value			Internal Value			
No Default			0			
Default			1			
Classification Table[a,b]						
			Predicted			
			default payment next month			
	Observe		No Default	Default	Percentage Correct	
Step 0	default payment next month	No Default	23364	0	100.0	
		Default	6636	0	0	
	Overall Percentage				77.9	
a. Constant is included in the model.						
b. The cut value is .500						
Variables in the Equation						
		B	S.E.	Wald	df	Sig.
Step 0	Constant	-1.259	0.014	8187.811	1	0.000
Variables not in the Equation						
			Score	df	Sig.	
Step 0	Variables	LIMIT_BAL	707.051	1	0.000	
		BILL_AMT1	11.577	1	0.001	
		PAY_AMT1	159.561	1	0.000	
	Overall Statistics		790.328	3	0.000	

Omnibus Tests of Model Coefficients					
			Chi-square	df	Sig.
Step 1		Step	971.236	3	0.000
		Block	971.236	3	0.000
		Model	971.236	3	0.000

Model Summary				
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square	
1	30734.118[a]	0.032	0.049	

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Classification Table[a]					
			Predicted		
			default payment next month		
Observed			No Default	Default	Percentage Correct
Step 1	default payment next month	No Default	23364	0	100.0
		Default	6636	0	0
	Overall Percentage				77.9

a. The cut value is .500

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	LIMIT_BAL	0.000	0.000	547.267	1	0.000	1.000
	BILL_AMT1	0.000	0.000	57.165	1	0.000	1.000
	PAY_AMT1	0.000	0.000	101.928	1	0.000	0.474
	Constant	-0.747	0.023	1037.936	1	0.000	0.474

a. Variable(s) entered on step 1: LIMIT_BAL, BILL_AMT1, PAY_AMT1.

Source: SPSS analysis.

The upper table shows that the higher the credit limits are, the possibility of default decreases and higher billing amounts increase this risk $p < 0.001$).. The model significantly improves over the baseline (chi-square = 971.236, $p < 0.001$) and explains 4.9% of the variance in defaults (Nagelkerke $R^2 = 0.049$).

Table 17. Default payment next month

default payment next month					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Default	23364	77.9	77.9	77.9
	Default	6636	22.1	22.1	100.0
	Total	30000	100.0	100.0	

Source: SPSS analysis.

The default rate is 22.1%, with 77.9% of customers not defaulting. The most know and used application of AI in the financial department is the use of virtual assistants. This use of virtual assistants will make the understanding of customer intentions even more precise and this will asses the satisfaction levels and the areas that should be improved. The customer and its satisfaction should be the main priority of every business.

Challenges and Best Practices

In theory, integration of AI and its benefits are simple and very attractive for businesses but are some challenges that need to be tackled with like the concerns about privacy and security. The new

employee maybe know how to use AI but the old employees face a skill gap, and for non-flexible business structures these AI implementations have the potential to be a high cost.

The challenges can be overcome if the businesses invest in employee training and use the help of AI technology providers and look at the benefits of implementing AI on the long term. The AI industry will develop continuously from now on and this will provide solutions to enhance sustainability, improve resource utilization, and reduce waste. AI is a disruptive force in the business landscape now and will redefine jobs and leverage AI algorithms to deliver more personalized customer experiences

Conclusion

Now, writing the conclusions we can see that the main hypothesis where confirmed and that AI implementation can enhance efficiency, decision-making, and innovation as listed below. Analyzing each department we can see with the data analyzed that AI simplifies the recruitment process by automating resume analysis, increases employee retention through real-time support systems, and creates personalized training programs.

Continuing with the Marketing department we can see that using AI's use in predictive analytics and sentiment analysis enables personalized campaigns and improves resource allocation, with variables like call duration and customer demographics. Logistics department, the benefits of AI include optimizing inventory, predicting demand, and improving delivery performance, as evidenced by cost reductions and improved efficiency in shipping. In the Finance department, the main applications of AI include fraud detection and financial planning models to reduce risks and enhance decision-making processes, all these conclusions mentioned in the upper pages, but there are some limitations regarding the studied data sets like lack of real-time updates of the datasets and its reliance on secondary data from collected reports; there may be inconsistencies in the collection methods across different sources. Additionally, the datasets might not fully represent the different industries, regions, and businesses. As mentioned in the beginning of the study this paper may serve as a foundation for future research, which should focus on analyses to better understand AI’s long-term impact by using cross-sectional analyses over an extended period in different industries and countries, utilizing real-time data collection methods on employees and AI performance tracking methods.

The adoption of AI in all business departments is in its early stages, but the potential for innovation and change is enormous.

References

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Barta, G., & Görcsi, G. (2021). Risk management considerations for artificial intelligence business applications. *International Journal of Economics and Business Research, 21*(1), 87–106. https://doi.org/10.1504/IJEBR.2021.112012

Boehm, M. (2018). AI in HR: The new wave of recruitment. *Journal of Human Resources Management, 45*(3), 215–229.

Buntak, K., Kovačić, M., & Mutavdžija, M. (2021). Application of artificial intelligence in business. *International Journal for Quality Research, 15*(2), 403–416. https://doi.org/10.24874/IJQR15.02-03

Chui, M., Manyika, J., & Miremadi, M. (2018). AI, automation, and the future of work. *McKinsey Quarterly, 12*(3), 6–11.

Davenport, T., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review, 96*(1), 108–116.

Ngai, E. W. T., Hu, Y., Wong, Y. H., Chen, Y., & Sun, X. (2011). The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature. *Decision Support Systems, 50*(3), 559–569.

Njeru, F. (2023). A review of artificial intelligence and its application in business. *Journal of Enterprise and Business Intelligence, 3*(1), 44–53. https://doi.org/10.53759/5181/JEBI202303005

Meghișan-Toma, G.-M., Puiu, S., Florea, N., Meghișan, F., Bădîrcea, R., & Manta, A. (2022). Sustainable transformation of Romanian companies through Industry 4.0, green production, and environmental commitment. *Amfiteatru Economic, 24*(59), 46–60. https://doi.org/10.24818/EA/2022/59/46

Ruiz-Real, J. L., Uribe-Toril, J., Torres, J. A., & De Pablo, J. (2021). Artificial intelligence in business and economics research: Trends and future. *Journal of Business Economics and Management, 22*(1), 98–117. https://doi.org/10.3846/jbem.2020.13641

Loureiro, S. M. C., Guerreiro, J., & Tussyadiah, I. (2021). Artificial intelligence in business: State of the art and future research agenda. *Journal of Business Research, 129*, 911–926. https://doi.org/10.1016/j.jbusres.2020.11.001

Waller, M. A., & Fawcett, S. E. (2013). Data science, predictive analytics, and big data: A revolution that will transform supply chain design and management. *Journal of Business Logistics, 34*(2), 77–84.

Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future.* W.W. Norton & Company.

Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.

Tornatzky, L., & Fleischer, M. (1990). *The processes of technological innovation.* Lexington Books.

Van der Aalst, W. (2016). *Process mining: Data science in action.* Springer.

Runyue, H. (2021). Artificial intelligence in business-to-business marketing: A bibliometric analysis of current research status, development, and future directions.

Neamţu, D. M. (2023). *Education and economic development: A social and statistical analysis.* Springer. https://doi.org/10.1007/978-3-031-20382-4

IBM HR Analytics Employee Attrition & Performance Dataset. (n.d.). *Kaggle.* Retrieved from https://www.kaggle.com/datasets/pavansubhasht/ibm-hr-analytics-attrition-dataset

UCI Machine Learning Repository. (n.d.). *Bank Marketing Dataset.* Retrieved from https://archive.ics.uci.edu/dataset/222/bank+marketing

UCI Machine Learning Repository. (n.d.). *Default of Credit Card Clients Dataset.* Retrieved from https://archive.ics.uci.edu/dataset/350/default+of+credit+card+clients