

Academic Performance and Satisfaction with AI-supported Problem-solving Activities in a Course on Management Information Systems in an Industrial Engineering Program.

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Abstract

In recent years, there has been a significant shift in how technology is integrated into education, especially in higher education. The adoption of advanced digital tools, such as Artificial Intelligence (AI), has become increasingly important to enhance the quality of teaching and learning. In information systems, it is essential to incorporate innovative pedagogical strategies that simulate real-world challenges and provide students with hands-on experience. Using AI-based tools in educational environments is key to bridging the gap between theoretical knowledge and practical application and improving students' readiness for future roles in the ever-changing technological landscape.

This article addresses the impact of using Artificial Intelligence (AI) to learn and manage information systems in a course within the Industrial Engineering program at Universidad Andrés Bello in Santiago, Chile. The study was conducted in an Information Systems course with 38 students, divided into experimental and control groups. The experimental group used AI tools, while the control group followed the traditional curriculum.

The central issue addressed is how incorporating AI-based assistants can improve efficiency in decision-making, code generation, platform evaluation, and the definition of evaluation parameters within the context of teaching information systems. By automating complex tasks, students are expected to evaluate alternatives more accurately and optimize processes in simulated environments.

This study aims to measure AI's impact on academic performance, satisfaction with the learning process, and the ability to apply knowledge to solve real-world problems. Two groups were implemented with a quasi-experimental methodology, and their results were evaluated through knowledge tests, satisfaction surveys, and the analysis of practical assignments. An ANOVA correlation analysis was conducted on the explored variables between the groups.

The results indicate a significant difference in academic performance between the groups and a notable preference for a more structured and practical educational approach, especially among students with a more robust foundational knowledge. This highlights the relevance of personalized and applied teaching methods in real-world contexts.

This approach examines how AI tools can be effectively integrated into an educational environment, preparing students to face future technological challenges with an innovative perspective on information systems management.

Keywords: Artificial Intelligence (AI), Information Systems (IS), Alternative Evaluation, Automatic Code Generation, Operational Efficiency, Decision Making, Automation, AI Ethics, Information Management, AI Tools.

Introduction

In the digital era, Artificial Intelligence (AI) has become an indispensable tool for optimizing Information Systems (IS) across multiple sectors, including education and industry. As organizations strive to enhance their competitiveness through automation and data-driven decision-making, AI emerges as a key catalyst for innovation in the management and operation of IS. The effective application of AI in IS management increases operational efficiency and improves the quality and accuracy of strategic decisions. However, implementing these technologies is not without challenges, particularly concerning ethical and technical issues such as algorithmic bias and the transparency of automated processes. These challenges underscore the need to address AI's technological and human aspects in IS.

This study offers a holistic view of the benefits and limitations of AI in educational and business environments by analyzing how AI can be effectively integrated into IS. Thus, it provides a teaching and management model that prepares future professionals for the challenges of the digital environment. The significance of this research lies in its potential to make a substantial contribution to the existing body of knowledge, proposing practical solutions for the realistic implementation of AI in IS management and outlining guidelines for its responsible and effective adoption. Therefore, this study focuses on three fundamental areas in which AI significantly impacts: alternative evaluation, automatic code generation, and setting evaluation parameters. Appendix 4 details the performance of the Gemini, ChatGPT, and Perplexity AI tools in these tasks, providing practical examples of their capabilities. Through a mixed-methodology approach that includes a literature review, case studies, and practical experimentation, this research explores how AI can optimize these areas and develops a theoretical and practical framework that guides its effective and ethical implementation.

Research Objectives

The primary purpose of this study is to explore and assess the impact of Artificial Intelligence (AI) on the management and operation of Information Systems (IS) within educational and business environments. Specifically, the research aims to:

1. Evaluate how AI can improve operational efficiency in information system management through task automation and decision-making process optimization.
2. Examine the effect of AI on the quality and accuracy of strategic decisions in information systems, using predictive and prescriptive analytics to facilitate data-based decisions.
3. Identify and propose solutions to the ethical and technical challenges of implementing AI in information systems, focusing on algorithmic bias and data privacy issues.
4. Develop a theoretical and practical framework for effectively integrating AI into information systems, which IS managers and educators can utilize to enhance teaching and professional practice.
5. Recommend adopting AI in academic programs and business contexts, preparing future professionals to face and manage the challenges of the current and future digital environment.

Research Methodology

This study adopts a mixed-methods approach, combining quantitative data analysis gathered through questionnaires and qualitative analysis of interviews and case studies to gain a deep understanding of the applications and challenges of AI in Information Systems (IS). Mixed methods are particularly useful when integrating results from multiple sources is required to address a complex problem [1]. In this case, the methodology includes a literature review, case studies, and practical experimentation. The Technology-Organization-Environment (TOE) model was used [2], which provides a conceptual framework for analyzing the factors that influence the adoption of technologies in organizations in three dimensions: technological, organizational, and environmental. The AI tools used in this study were Gemini, ChatGPT, and Perplexity. They were selected based on popularity and availability and evaluated for specific tasks such as code generation, alternative evaluation, and platform analysis.

Literature review

Artificial Intelligence (AI) use in information system management has seen significant growth over the last decade, driven by advances in machine learning, natural language processing, and automation. According to [3] AI has evolved from an experimental technology to an integral component in optimizing information systems and enhancing efficiency and the quality of decisions across various sectors. This has enabled companies' digital transformation, providing advanced tools for information management and process handling.

Alternative evaluation with AI in decision-making and automatic code generation

Alternative evaluation is a critical function in decision-making within information systems. Recommendation systems and predictive models are key to optimizing alternative selection in business contexts. [4] AI allows for analyzing large volumes of historical and current data, generating accurate predictions that help organizations make more informed decisions and reduce risks. For example, supervised learning models are commonly used to classify options and prioritize strategies, adapting to environmental changes in real-time.[5]. In software development, automatic code generation with AI has revolutionized how applications are created. According to [6], models based on neural networks, such as transformers and LSTMs, have successfully generated source code from natural language descriptions. This technology enhances developers' productivity and introduces new ways of solving complex problems, facilitating the maintenance and scalability of applications [7]. As the models are trained on large code repositories, they become more accurate in generating and adapting to specific contexts.

AI Applications in Business Process Optimization

AI is also central to optimizing business processes, from automating administrative tasks to advanced supply chain management. Classical authors in this field [8] Emphasize that AI enables real-time decision automation, improving resource allocation, logistics, and operational planning. Organizations that adopt AI in their information system management can anticipate demands, optimize inventories, and enhance customer service through predictive and prescriptive analytics.

[9] Describe how AI can evaluate enterprise platforms by creating automated parameters based on key metrics such as operational efficiency and platform security. They indicate that AI's ability to generate and adjust parameters is key for continuously improving information systems.

Practical Application in Educational Environments

Integrating artificial intelligence (AI) into higher education, particularly in courses related to information systems management, presents both opportunities and challenges. A significant challenge identified is the lack of comprehensive studies that detail effective pedagogical implementations of AI tools within curricula. While existing research has explored the broader impacts of digital technologies in education, specific investigations into integrating AI as a teaching and assessment tool remain sparse. Research indicates that AI can transform educational practices by enhancing learning experiences and improving assessment methods. For instance, Slimi's systematic review highlights AI's impact on academic quality and assessment methodologies, emphasizing its role in personalizing learning experiences and streamlining administrative tasks. [10]. Furthermore, Capinding discusses the development of assessment tools that leverage AI to evaluate its impact on student learning, suggesting that AI can provide adaptive assessments tailored to individual learning needs [11]. This aligns with findings from Singh, who notes that AI can optimize digital learning resources and enhance student engagement through personalized learning paths [12]. Moreover, the potential of AI to support critical skill development in managing complex systems is underscored by Anuyahong, who explores how AI facilitates personalized learning and adaptive assessments, thereby fostering essential competencies in students [13]. This is crucial in information system management, where understanding complex systems is vital. Thus, integrating AI tools can enhance teaching methodologies and serve as a formative assessment mechanism that aligns with contemporary educational goals.

Ethics and Governance of AI

The implementation of AI in information systems is not without challenges. At a technical level, the need for robust infrastructure and trained personnel continues to be a barrier for many organizations [14]. Additionally, ethical challenges related to algorithmic bias, data privacy, and transparency in decision-making processes have sparked significant debate in the literature. [15]. Companies must establish clear policies and governance frameworks that ensure AI's responsible and ethical use in their information systems. Finally, although the ethical challenges of AI, such as bias and transparency, have been widely discussed, implementing effective governance frameworks that can guide the ethical practice of AI in information system management is still in its infancy. Further research is needed to develop and validate these frameworks in operational practices, ensuring that adopting AI improves efficiency and adheres to fundamental ethical principles. AI governance is not just about mitigating risks but also about maximizing the opportunities it offers. An effective governance approach can foster innovation, build trust, and ensure that AI is used for the benefit of society. [16].

Study design

The study design included a pedagogical intervention for senior industrial engineering students in a Management Information Systems course. The intervention consisted of implementing case studies, a flipped classroom methodology, and Problem-Based Learning (PBL) to compare outcomes and student perceptions between the course section that experienced the intervention and the control section that continued with traditional teaching methods.

Population and Sample

The target population was students enrolled in the Management Information Systems course at Andrés Bello University in Santiago, Chile. The final sample consisted of 38 students divided into two groups: an experimental group and a control group. The participants were selected voluntarily, provided they were willing to engage in the intervention activities and complete the assessment instruments.

Data Collection Instruments

Three main instruments were used for data collection:

- Demographic Characterization Questionnaire (Appendix 2): This questionnaire collects participants' demographic characteristics, including age, gender, and prior work experience.
- Grades from activities were collected, and results were compared between the intervention and control groups. The ANOVA (the percentage difference between both groups) is obtained.
- A survey on the tool's perceived utility. The questions cover topics such as the tool's acceptance and use, the amount of information provided by the teacher, the frequency with which students carried out the proposed activities, and their overall evaluation of the course.

Procedures

The pedagogical intervention was carried out over an academic semester. Students in the experimental group actively used Artificial Intelligence (AI) in learning activities based on case studies and Problem-Based Learning (PBL), while the control group continued with the traditional format to solve the presented problems. At the end of the semester, all participants completed the questionnaires.

Participants

The study was conducted with students from the Management Information Systems course at Andrés Bello University in Santiago, Chile. The sample consisted of senior industrial engineering students selected to participate voluntarily. Participants were informed about the study's objectives and the teaching methodology that would be implemented, and they were assured that their participation was completely voluntary and that they could withdraw at any time without consequences. The selection of participants was conducted as follows:

- Group 1 (with AI): Included 19 students, representing 50% of the total sample. Most of these students were in the age range of 25 to 35 years. All students in this group agreed to participate in the surveys and interviews.

- Group 2 (without AI): Nineteen students were included, constituting 50% of the sample. Their ages ranged between 25 and 36, and all agreed to participate in the surveys and interviews.

The gender distribution among the participants was 39.47% female students and 60.53% male students, reflecting the typical demographics of industrial engineering programs in the region. Both groups are evening students.

Data analysis

The evaluation of the results obtained by using AI to solve Information Systems (IS) problems, plus the students' perception of the effectiveness of using AI compared to traditional methods, was conducted using an Analysis of Variance (ANOVA) to identify statistically significant differences between the groups of students participating in the study. The qualitative data, collected through semi-structured interviews with a subsample of participants, were analyzed using thematic analysis to delve deeper into student perceptions and challenges. The ANOVA analysis (Appendix 2) was applied to compare academic performance between Group 1, which used AI to solve the assignments, and Group 2, which solved them using traditional research methods, including class notes and course bibliography.

Main Results

The analysis revealed that the group that used AI to solve the problems presented during the course showed an average performance improvement of 14.7% compared to the group that did not use AI. Furthermore, when interviewing students from Group 1, 100% indicated that it was easier to solve the problems once they learned how to use the AI prompt. Comparing the results of the assessments, Group 1 achieved an average score of 5.9, representing a 15.24% increase over Group 2, which averaged a score of 5.0 in their evaluations. Since both groups are evening students, those who used AI could use the tool in their respective daily tasks at the companies where they work, reporting an increase in efficiency in the development of their work. These students, who typically have work experience, reported significantly improving their daily activities in their respective work environments.

The results indicate that using AI in tasks such as platform evaluation, automatic code generation, and parameter setting for evaluation is more effective and reduces the time required. The grade distribution chart shows that Group 1 performs better than Group 2 (Fig. 1).

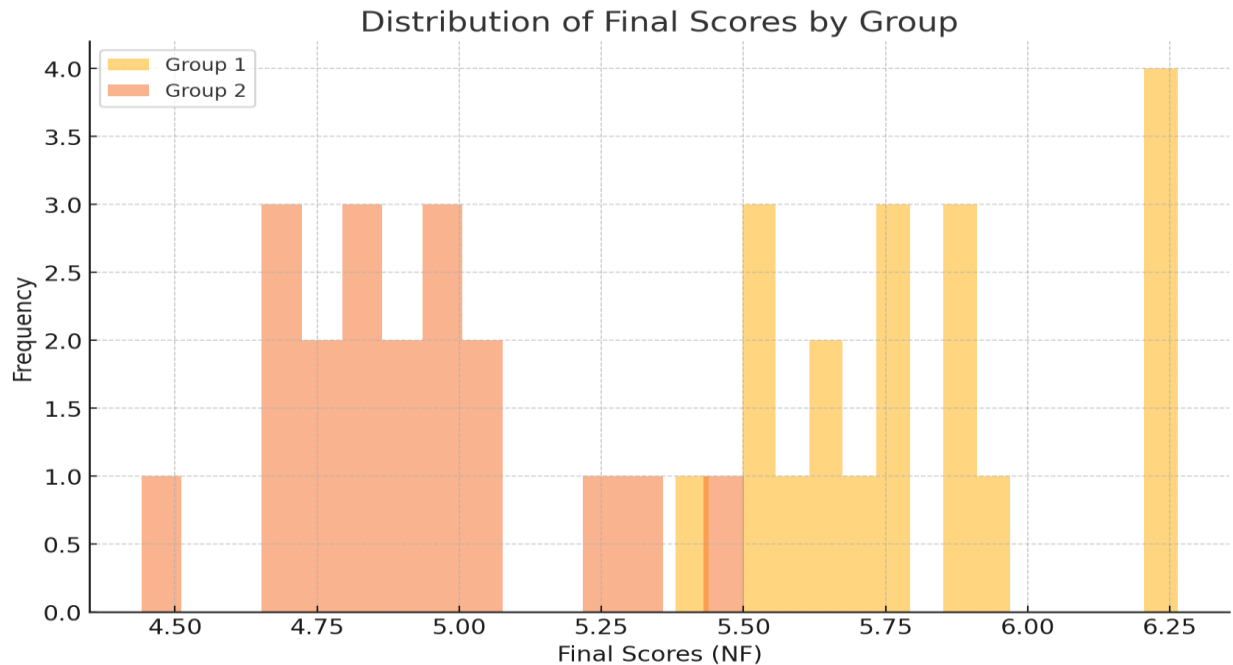


Fig 1. Distribution of final scores by group.

Group 1 tends to cluster its grades in a higher range compared to Group 2. Group 2 exhibits greater dispersion in grades, with a concentration in lower marks. The average difference in final grades between Group 1 and Group 2 is approximately 0.90 points, with Group 1's average being 5.81 and Group 2's being 4.91. This indicates that, on average, Group 1 achieved higher grades than Group 2.

Applying ANOVA to compare performance (final grade) between Group 1 and Group 2 yields an F-statistic value of 116.8963 and a p-value of approximately 7.411684×10^{-13} . The p-value is extremely low (much lower than any standard significance threshold, such as 0.05), indicating a statistically significant difference between the two groups' final grades. This suggests that academic performance (measured by final grade) significantly differs between Group 1 and Group 2.

Analysis of Students' Work Experience

Both groups belong to the evening session, mainly consisting of students working during the day. Additionally, 48.89% of this group reported working experience from their entrepreneurial ventures lasting between 2 and 6 years. The analysis also showed that 40.79% have work experience ranging from 6 to 10 years, and 10.32% of the students reported having more than 10 years of work experience (**Fig. 2**).

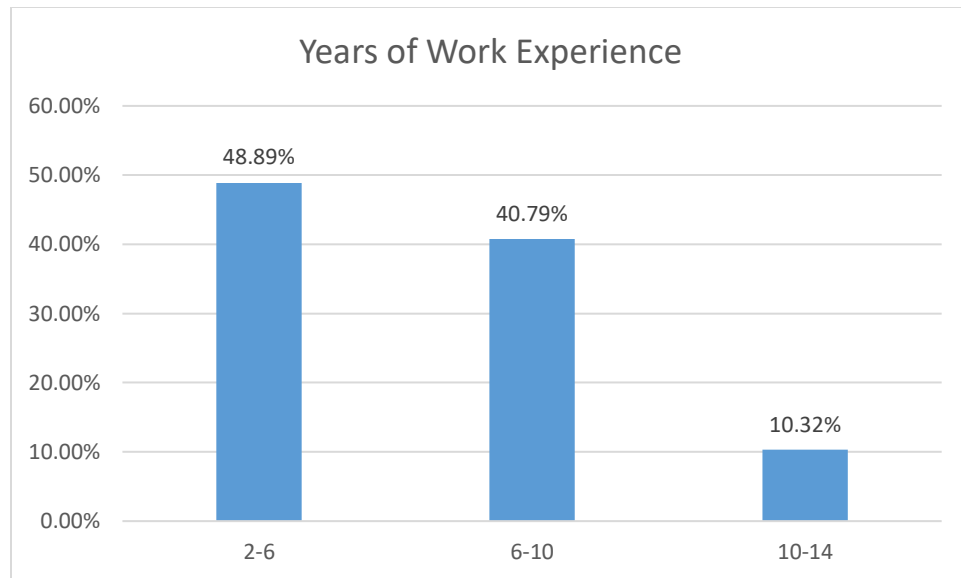


Figure 2: Students' years of work experience.

Student Perception Survey Analysis

The survey results on students' perceptions regarding using the educational tool revealed positive evaluations in several aspects. Regarding the tool's effectiveness in improving the learning experience, 84.21% of the students rated it as 'excellent,' while 15.79% considered it 'very good.' All respondents, 100%, would recommend using this tool to other students and stated that adapting to its use was 'very easy.' Additionally, all participants agreed that the tool significantly facilitates learning and considered it 'very useful.'

Concerning the frequency of use, 84.21% indicated that they used the tool 'every day' and 15.79% 'several times a week'. All students used the tool during classes and personal time, highlighting its applicability in academic and professional settings. Moreover, 100% of the students felt that the amount of information and resources provided by the teacher to use the tool was adequate.

The students' overall perception of the tool was highly positive. They reported a notable improvement in their learning experience and effective integration into their daily workplace tasks.

Discussion

This study has demonstrated how implementing Artificial Intelligence (AI) in teaching Management Information Systems can significantly improve students' operational efficiency and academic performance. The results show a substantial improvement in the academic performance of students who used AI tools compared to those who did not, supporting the hypothesis that AI can be a catalyst for optimizing education in information systems.

Comparison with Previous Studies

The findings of this research align with previous studies, such as those by [3], which highlights the evolution of AI from an experimental technology to an integral tool for process optimization. The significant use of AI in alternative evaluation and automatic code generation [17], is reflected in our research, where AI has enabled more informed and precise decision-making.

Interpretation of Results

The ANOVA analysis reveals that the differences in academic performance between groups that use and do not use AI are statistically significant, underscoring the effectiveness of AI in enhancing learning and practical application in real-world environments. These results testify to AI's potential to facilitate theoretical learning and improve students' practical skills, better preparing them for real-world challenges.

The AI tools evaluated in this study, Gemini, ChatGPT, and Perplexity, demonstrated distinct strengths in the assigned tasks. ChatGPT excelled in automatic code generation due to its precision and speed in transforming natural language descriptions into programmable solutions. Gemini stood out in alternative analysis, providing solid and adaptable recommendations for complex scenarios. Lastly, Perplexity proved particularly useful in evaluating enterprise platforms, showing high precision in identifying key metrics such as security and compatibility. These findings, detailed in the practical examples in Appendix 4, highlight the importance of selecting the appropriate tool based on the specific task.

In summary, AI enhances precision and efficiency in problem-solving and facilitates the integration of these technologies into academic and professional settings, preparing individuals to face the challenges of the current job market.

Reflections on Practical Implementation

The positive experience reported by students regarding using the AI tool reinforces the idea that when AI is adequately integrated into curricula, it can significantly enhance the learning experience. This successful integration benefits students academically and professionally, as reflected in their ability to apply what they have learned in their work environments. This finding underscores the importance of designing pedagogical interventions that not only implement advanced technology but also align with the needs and expectations of students.

Limitations and Future Considerations

Despite the positive results, this study is not without limitations. The sample used, while adequate for an initial analysis, could be expanded in future studies to include a broader range of educational and business contexts. Additionally, measuring the long-term impact of AI integration in education could provide deeper insights into these technologies' sustainability and long-term effectiveness in teaching.

Conclusions and projections

This study has demonstrated how integrating Artificial Intelligence (AI) into the teaching of Management Information Systems significantly enhances students' academic performance and operational efficiency. Statistical analyses, including ANOVA, revealed that students who utilized AI tools achieved 14.7% higher academic performance than those who did not. This improvement is reflected in the automation of repetitive tasks, enhanced decision-making, and platform analysis.

Regarding the performance of the tools used, ChatGPT stood out as the most efficient AI for code generation, thanks to its ability to accurately and quickly transform natural language descriptions into programmable solutions. Gemini, on the other hand, excelled in alternative analysis, providing well-founded recommendations adaptable to complex scenarios. Lastly, Perplexity proved particularly effective in evaluating enterprise platforms, demonstrating high precision in identifying key metrics such as security and compatibility. These findings highlight the importance of selecting the appropriate AI tool based on the specific nature of each task, as detailed in the practical examples in Appendix 4.

This study emphasizes the importance of a reflective and responsible adoption of emerging technologies, underscoring the need to balance operational benefits with ethical integrity. The implementation of AI should be accompanied by a constant commitment to improving educational and business practices, preparing professionals not only to face the challenges of the current job market but also to lead in the ethical and sustainable adoption of new technologies. In conclusion, while AI is a powerful tool for innovation and efficiency, its ultimate success and acceptance will depend on how we address these interconnected challenges toward an inclusive and technological future.

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Appendix 1: ANOVA

Source of Variation	Sum of Squares	Degrees of Freedom	F-Statistic	P-Value
Between Groups (C(GRUPO))	7.7041	1	116.8963	7.411684e-13
Residual	2.3726	36	N/A	N/A

Appendix 2: Characterization Survey

Characterization Survey

Name: _____ **ID:** _____ **Course:** _____ **Professor**

a. Which semester are you currently enrolled in?"	
b. Which session do you study in (daytime, evening)?	
c. Gender: Female, Male ?	
d. How old are you ?	
e. Do you have work experience?	
f. Years of experience	
g. Do you have your own startup? (Yes/No)	

Appendix 3: Perception Survey on the Usefulness of the AI Tool.

Your feedback is crucial for us. Please take a few minutes to complete this survey, which will help us assess and improve the effectiveness of the tool used in the course.

Tool Acceptance

How easy was it for you to adapt to using the tool?

- Very easy ____
- Somewhat easy ____
- Neither easy nor difficult ____
- Somewhat difficult ____
- Very difficult ____

How much do you feel the tool facilitated your learning?

- A lot ____
- Quite a bit ____
- Moderately ____
- A Little ____
- Not at all ____

Tool Usage

How often did you use the tool during the course?

- Every day ____
- Several times a week ____
- Once a week ____
- Less than once a week ____
- Never ____

Did you use the tool only during class sessions or in your own time?

- Only in class ____
- Mainly in class, occasionally in my own time ____
- Equally in class and in my own time ____
- Mainly in my own time ____

Support and Resources Provided by the Instructor

Do you think the amount of information and resources provided by the instructor on how to use the tool was adequate?

- Excessive ____
- Sufficient ____
- Insufficient ____
- No information was provided ____

How useful were the resources provided for understanding and using the tool?

- Very useful ____
- Useful ____
- Neither useful nor useless ____
- Not very useful ____
- Useless ____

Overall Course Evaluation

Overall, how would you rate the tool's effectiveness in enhancing your learning experience?

Excellent ____
Very Good ____
Good ____
Fair ____
Poor ____

Would you recommend the use of this tool to other students?

Definitely yes ____
Probably yes ____
Not sure ____
Probably no ____
Definitely no ____

We appreciate your comments and suggestions for improving the tool and the course:_____

Appendix 4: Examples of AI applications

Example 1: Code Creation (Macro in Excel)

Prompt:

Write a macro for Excel to validate a RUT using the modulo 11 method for Chile.

Answer:

Here is a macro in VBA (Visual Basic for Applications) to validate a Chilean RUT using the modulo 11 method. This macro allows you to verify if an entered RUT is valid and returns a message indicating the result.

VBA Code to Validate a RUT in Excel:

1. Open your Excel file.
 2. Press **Alt + F11** to open the VBA editor.
 3. Go to **Insert > Module** to create a new module.
 4. Copy and paste the following code:
-

```
Function ValidarRUT(RUT As String) As Boolean
```

```
    Dim RutNumerico As String
    Dim DigitoVerificador As String
    Dim Suma As Integer
    Dim Multiplicador As Integer
    Dim Resto As Integer
    Dim DVCalculado As String
    Dim i As Integer
```

```
    ' Remove dots, hyphens, and spaces from the RUT.
```

```
    RUT = Replace(RUT, ".", "")
    RUT = Replace(RUT, "-", "")
    RUT = Replace(RUT, " ", "")
```

```
    ' Verify that the RUT has at least 2 characters.
```

```
    If Len(RUT) < 2 Then
```

```
        ValidarRUT = False
        Exit Function
    End If
```

```
    ' Separate the numeric RUT from the verification digit.
```

```

RutNumerico = Left(RUT, Len(RUT) - 1)
DigitoVerificador = Right(RUT, 1)

' Validate that the numeric RUT is a number.

If Not IsNumeric(RutNumerico) Then
    ValidarRUT = False
    Exit Function
End If

' Calculate the verification digit using the modulo 11 method.

Suma = 0
Multiplicador = 2

For i = Len(RutNumerico) To 1 Step -1
    Suma = Suma + CInt(Mid(RutNumerico, i, 1)) * Multiplicador
    Multiplicador = Multiplicador + 1
    If Multiplicador > 7 Then Multiplicador = 2
Next i

Resto = 11 - (Suma Mod 11)

Select Case Resto
    Case 11
        DVCalculado = "0"
    Case 10
        DVCalculado = "K"
    Case Else
        DVCalculado = CStr(Resto)
End Select

' Compare the calculated verification digit with the entered one.

If UCase(DigitoVerificador) = UCase(DVCalculado) Then
    ValidarRUT = True
Else
    ValidarRUT = False
End If
End Function

```

How to Use the Function in Excel

1. Save and close the VBA editor (**Alt + Q**).
2. In an Excel cell, enter the RUT (e.g., 12345678-9).

3. Use the function in an Excel cell as:
`=ValidarRUT(A1)`
Where A1 is the cell containing the RUT.
4. The function will return TRUE if the RUT is valid or FALSE if it is not.

Example 2: Platform Evaluation

Prompt

"Assume you are a researcher specializing in ERP systems, and you need to create a comparative table between various open-source alternatives. Define the parameters that should be used to evaluate the platforms."

Answer

When creating a comparative table for different open-source ERP systems, it is essential to define clear parameters that enable an objective and relevant evaluation of each platform. Here are several criteria that may be useful for comparing these alternatives:

1. **Ease of Implementation:** Evaluate how easy it is to install and configure the system, as well as the availability of documentation and learning resources for users and developers.
2. **Functionality:** Include key modules such as finance, procurement, sales, CRM, HR, production, and inventory management. It is important to verify how comprehensive and adaptable these modules are to different types of businesses.
3. **Customization and Scalability:** Consider the system's ability to adapt and scale according to the specific needs of a business. This includes the ease of modifying the source code and adding new functionalities.
4. **User Community and Support:** Assess the size and activity of the ERP user community. A large and active community can be a good indicator of continuous support and software development. It is also important to consider the availability of professional technical support options.
5. **Integration with Other Systems:** Review how well the ERP integrates with other systems and technologies, including e-commerce platforms, marketing tools, and other enterprise software.
6. **Security:** Analyze the security features offered, such as access management, data encryption, and compliance with data protection regulations (like GDPR).
7. **Total Cost of Ownership:** Even if the software is open-source and free, consider other associated costs such as customization, implementation, maintenance, and updates.
8. **Performance and Stability:** Evaluate the system's efficiency in terms of processing speed and operational stability under different workloads.

9. **Mobile and Multi-Platform Compatibility:** Check if the ERP offers mobile solutions and whether it is compatible with various operating systems and devices.
10. **User Experience (UX):** Consider the system's usability, interface intuitiveness, and overall user experience.

Based on these parameters, you could analyze and compare different open-source ERP systems such as Odoo, ERPNext, Dolibarr, Tryton, among others. Each has its strengths and weaknesses, and the choice will depend on the specific needs and context of each company.

Prompt:

Using these criteria, construct a comparative table between Odoo, ERPNext, Dolibarr, and Tryton, and recommend one of them.

Answer:

To create a comparative table between Odoo, ERPNext, Dolibarr, and Tryton based on the mentioned criteria, I have gathered information about each ERP system. Below is a general summary to help you decide which one might be most suitable for your business or project:

Criteria	Odoo	ERPNext	Dolibarr	Tryton
Ease of Implementation	High	Medium-High	High	Medium
Functionality	Very Complete	Complete	Moderate	Moderate
Customization and Scalability	High	High	Medium	High
Community and Support	Very Active	Very Active	Active	Moderately Active
Integration with Other Systems	Excellent	Good	Good	Good
Security	High	High	Medium	High
Total Cost of Ownership	Medium-High	Medium	Low	Medium
Performance and Stability	High	High	Medium	High
Mobile and Multi-Platform Compatibility	Excellent	Good	Moderate	Good
User Experience (UX)	Very Good	Good	Good	Medium

Analysis and Recommendation

- **Odoo:** Ideal for companies seeking a highly customizable ERP system with a wide range of functionalities. Its very active community makes it easier to obtain support and resources. However, it may be more costly in terms of implementation and maintenance.
- **ERPNext:** Suitable for companies needing a robust system with good customization capabilities and at a lower cost than Odoo. Its community is also very active, and the software is relatively easy to implement.
- **Dolibarr:** More suitable for small businesses or freelancers who need a cost-effective solution with more basic functionalities. It is easy to use and implement, but may not scale well for large organizations.
- **Tryton:** A good option for businesses that need a highly scalable system and do not require a very advanced user interface. Its community is not as large as those of Odoo or ERPNext, which might limit the available support.

Recommendation

If you are looking for an ERP system that is flexible, highly functional, and supported by a large community, Odoo might be the best choice. It is particularly suitable for medium to large companies that need software adaptable to complex and diverse business processes. Although it has a higher cost, its robustness and scalability justify the investment. However, for small businesses seeking cost efficiency and basic functionalities, Dolibarr could be more appropriate.