Journal for Social Science Archives

Online ISSN: 3006-3310
Print ISSN: 3006-3302
Volume 3, Number 1, 2025, Pages 1030 – 1046
Journal Home Page
https://jssarchives.com/index.php/Journal/about

Exploring the Effectiveness of AI in Project Risk and Overall Return Management; How Project Managers Can Facilitate the Changes

Dr. Sohaib uz Zaman[1] & Rehad Khan[2]

[1]*Assistant Professor, Karachi University Business School, University of Karachi, Email: Sohaibuzzaman@uok.edu.pk*
[2]*Karachi University Business School, University of Karachi, Email: Rehad.khan88@gmail.com*

ARTICLE INFO

Article History:

Received:	*February*	*02, 2025*
Revised:	*February*	*28, 2025*
Accepted:	*March*	*04, 2025*
Available Online:	*March*	*06, 2025*

Keywords:

Effectiveness, AI, Project Risk, Overall Return Management, Project Managers, Facilitate, Changes

Corresponding Author:
Rehad Khan
Email:
Rehad.khan88@gmail.com

ABSTRACT

The study has investigated the process of operational returns by understanding the stakeholders' role and the collaborative efforts of the project managers to explore AI-driven solutions in an actionable form. The study aims to review the effectiveness of AI in project risk and overall return management. The study's purpose is to analyse how project managers can facilitate the changes. PLS Smart software has been used with a set of 100 samples. The data has been investigated in the positivism support. It has been found that all 11 hypotheses are proved as positive because the data narrates practical implementation in the outline of justification. The study concludes by recommending the project managers about the application of AI implementation in the handling of projects and make sure that data has been facilitated in the paradigm of working efficiency to increase the overall returns.

OPEN ACCESS

Introduction

Artificial intelligence plays an important role in the transformation of working friends and making sure that it is effective in project risk in addition to project management for dealing with the context of return management. Risk identification helps handle the challenges of project management where AI support the managers in proactively dealing with the risk identification by analyzing the previous timelines (Hossain et al., 2024). AI plays an essential role in this context where it explores the internal and external parameters not only in the identification of risk but also in the application of pattern recognition. Here project management can be helpful because it offers a broader perspective in supporting the idea of how the AI solutions for instance predictive

analytics can help researchers in fostering better solutions and scheduling delays and resource shortage issues.

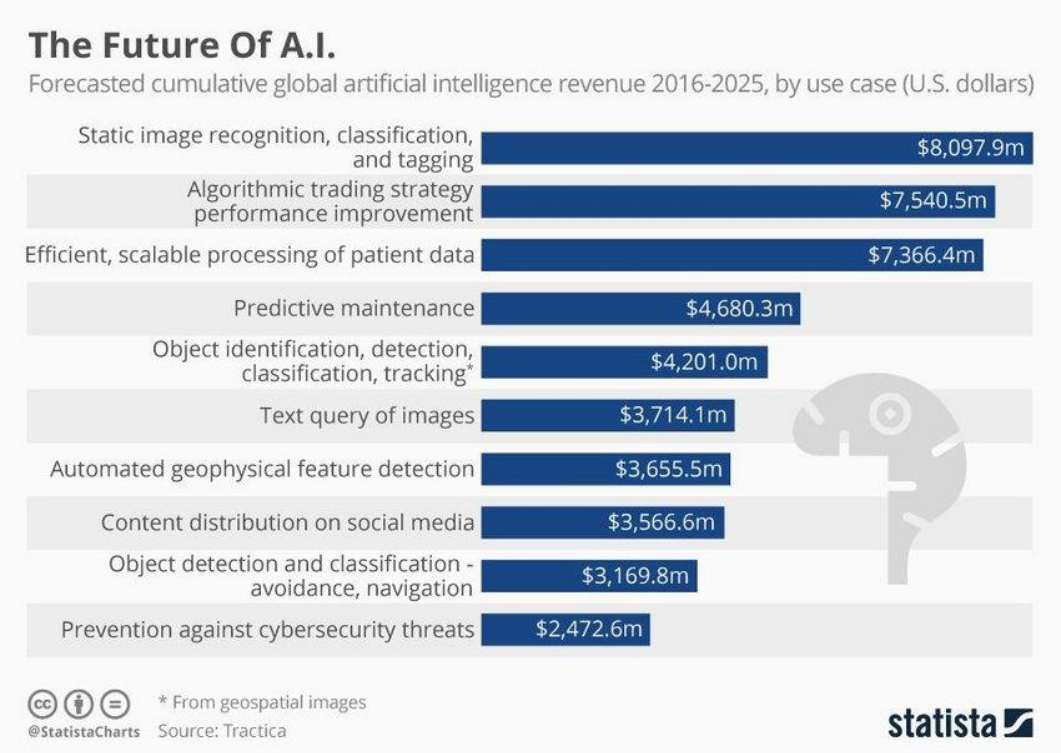

Figure 1: Increasing AI use in future (Jain, 2019)

Jain (2019) added that AI use has increased and is forecasted to be there in project management in future. AI can do this however the role of the project manager can decrease the chances of risk because real-time risk monitoring is possible when the AI power tools are continuously employed in handling the status of the project life cycle (Yang, 2023). This ideally implements the dynamic risk management dashboards where the Internet offers technology devices and sensors that can help the project managers deliver real-time updates and offer project performance tests. The role of the project manager can facilitate the process of AI in risk assessment and ensure the optimization of returns with the help of a cost-effective analysis and resource annotation analysis (Tran et al., 2024). The professional role of return analysis can be helpful when AI is evaluating the project's expected benefits and outweighs its costs and risks with the help of forecasting models and predictive future cost solutions implementation.

The project manager can help in this perspective where post-project learning is possible. They ideally explore the effectiveness of AI in project risk because they can modify the plans with the help of lessons learned from previous opinions and recreate the repository with the best available practices (Hossain et al., 2024). The role of the project manager in collaboration with AI integration can be supported where the provision of domain expertise and context of AI tools can be productive. It also promotes the idea that how the implementation of AI-driven strategies can be helpful for the implementation of skilled efforts and understanding the needs of the organizational goals by interpretation of AI insights. Using the phenomenal approaches of decision support and mitigation strategies, project managers can genuinely overcome the chances of risk and increase returns.

Problem Statement

The world is rapidly exploring AI with the support of complex project environments, which allows the optimization of overall returns and management the project risk by supporting the decision-making approaches and application of manual processes to handle dynamic project uncertainties. Artificial intelligence has emerged as a true tool to enhance the project risk and identify the issues in the timeline of potential organizations (Hossain et al., 2024). This explores how AI-driven solutions can help handle return management and deal with collaborative approaches where project managers play an important role in the application of AI capabilities. It is essential to address the issues of decision-making to reduce the project risk and ensure the maximum financial recovery for the improvement of overall return management.

The study has investigated the process of operational returns by understanding the stakeholders' role and the collaborative efforts of the project managers to explore AI-driven solutions in an actionable form. A literature gap has been identified to study this phenomenon of AI for the overall returns in the project. The study has also reviewed it with the help of a primary quantitative analysis to understand the static tools and historical data implementation for revealing the role of project managers in post-project learning. It is important to understand the role of virtual assistants but it is also essential to support the idea that project managers can facilitate the process to enhance the effectiveness of AI and increase the chances of overall returns (Sobieraj & Metelski, 2022). The study has collaborated the two instruments and has seen the impact of one another with the help of some mediating variables to understand the real-time risk monitoring processes.

Aim and Objectives

The study aims to review the effectiveness of AI in project risk and overall return management. The study's purpose is to analyse how project managers can facilitate the changes. The main objectives are:

1. To review the effectiveness of AI in project risk
2. To analyse the overall return management in projects under AI
3. To review the role of project managers in the facilitation of changes under AI

Research Questions

1. What is the effectiveness of AI in project risk?
2. What is the overall return management in projects under AI?
3. What is the role of project managers in the facilitation of changes under AI?

Hypothesis

The study has outlined the following hypothesis based on the conceptual framework outlined in the support of the variables:

- **H1:** Project risk failure can decrease the overall returns
- **H2:** Project risk of financial loss can decrease the overall returns
- **H3:** Project list of accidents can decrease the overall returns
- **H4:** Advanced technology robotics use can increase the overall returns
- **H5:** Advanced technology data analytics can increase the overall returns
- **H6:** Advanced technology machine learning can increase the overall returns

- **H7:** Resource utilization has a positive impact on sales rise
- **H8:** Resource utilization has a positive impact on cost support
- **H9:** Resource utilization has a positive impact on human resource capital optimization
- **H10:** Resource utilization has a positive impact on ratio income
- **H11:** Resource utilization has a positive impact on capital gain

Scope of Study

The study has interrogated the application of AI tools in project risk assessment that has been helpful to the project managers and people operating in the digital world to emphasise machine learning and understanding how the overall returns can be high when the resource utilization has a direct and positive influence on the human resource capital optimization and capital gains in addition to the ratio income. The research has huge stuff because it supports the idea of how the literature gap has been met to offer a comprehensive peace offer primary quantitative research for justifying the application of AI for privilege support of risk management.

Definition of Terms

- **Project risk:** project risk is defined as any event that are driving agent for decreasing the better outcomes of the project. The events may impact the project deliverable in addition to its timeline support and budget activities (Afzal et al., 2021)
- **Overall returns:** overall returns are defined as the specific metric mentioning the total returns based on the returns for the investment in addition to capital gains and financial rewards for any activity (Sobieraj & Metelski, 2022).
- **Advanced technology:** what is the combination of digital and physical features to use modern technology applications for generating better efficiency in the world, for instance, artificial intelligence (AI) (Ambilkar et al., 2022)?
- **AI:** AI is the application of a set of operations and principles that are other than human activities and involve the unique role of intelligence generated based on artificial support under the privilege of IT setup (Sobieraj & Metelski, 2022).

Literature Review

Project risk has a collaborative link with the context of AI applications that can help to solve these operations and support the project manager to do better as compared to previous situations (Afzal et al., 2021). Keeping in view the productive role of project managers, AI can support them in assistive form by dealing with the challenges and risks in the project success. The overall returns play an essential role in reviewing the success of any project. This is why AI applications can be helpful in the prospect of applying the growing timelines of various projects and dealing with the challenges in a better way (Sobieraj & Metelski, 2022). The literature has contrasted the opinions of various authors from the previous analysis to justify how AI has been continuously supporting meeting the challenges and conducting risk assessment. The role of various project manager has also been judged from the lens of risk handling to understand their success rate and facilitated support of AI in the long run.

Project Risks

There is a wide range of project risks that are accountable for the lack of success of the projects. They increase the chances of failure of the projects because they fail to achieve the goals and the

scope of the project decreases because cost-effectiveness and overall success have been lacking. The project risks may vary from project to project and activity to activity, however, some common issues are always dominant in the projects and need to be addressed with the help of project management to ensure proactive management and handling of risks. Yang et al. (2023) clarify that the popular categories of project risks including failure, financial loss and accidents may exist in most of the projects as a dominant concern.

Afzal et al. (2021) agree with the opinion of Hossain et al. (2024) for elaborating the rising risks in project handling in the context of risks. The risks are high and they need to be addressed using various ideas of management for the project managers. The major risk is in the context of a failure of the projects which is a strategic risk where misalignment has been traced between the project goals and the organization's strategic objectives. Ambilkar et al. (2022) claim that artificial intelligence can lead to some misconceptions in this regard when it fails to understand the strategic position of the organization and probably the schedules might not be adjusted correctly. There is a high risk of failure when the resource risk exists in the organization. It can be in the form of a lack of resources or over-allocation of resources in most of the cases that can be the driving agent for burnout. The role of the risks in this context can be operational because if the inefficiencies and failures have been traced then probably the failure is based on the task execution and quality issues.

The other risk in the project is the financial context that is based on the project budget allocation and financial resources allocation. The risk emerged due to budget overrunning in most of the cases when inaccuracies have been traced in the cost estimation processes (Sobieraj & Metelski, 2022). This happens in most cases due to the unexpected use of the costs in labour rates and material prices mishandling. There is a need to understand that the cash flow constraints should be traced in a timely and if there is a low-level risk then it should not reach the higher one otherwise the companies will be facing high risks. Ambilkar et al. (2022) added that this will lead to the loss of the gross output at the end which is due to the lack of planning in the availing of relevant financial resources of the organization.

Another risk that is dominant in the project is the risk of any miss happening or accident that should be handled accordingly because AI fails to trace the accident chances and forecast it as a general concern (Sobieraj & Metelski, 2022). The risk of an accident can be in the context of technology and operational risk handling there the technology can fail technical systems and outdated technology use. The risk of the operational context includes the process's lack and workflow issues that can be based on ineffective communication and chances of quality issues that are driving agents for the loss of company growth. All kinds of risks are critical because if they are not addressed timely and the mitigation strategies are not adopted even in the lack of leverage of the AI tools, surely, the later predictive analytics and real-time monitoring will not be able to cover the gap.

Overall Returns

Overall returns include all kinds of benefits that are received in the project including sale price, ratio income, cost support, human capital optimization and capital gain. The sale price is comprised of the financial returns that are based on the profit for the organization including the net present value that is showing the difference between the present value of cash flows and the outflows later. Ambilkar et al. (2022) add that the same rise helps understand how the organization is able to meet operational challenges and improve the productivity of items. It is also a

justification when resource utilization has a positive impact on the overall returns and the sales have been raised. The productive role of the market share growth can be a connective agent in this regard where the innovation has been employed as a tool in processing and production using new technology applications and dealing with the challenges for gain in the market.

Another category of the overall return includes ratio income which is the contrast to the return on investment where net profit has been compared with the project cost to find the value percentage-wise growth in the market. The ratio income is also helpful in revealing how the organization can optimize resource allocation and manage cost-effectiveness while dealing with challenges. It also narrates how the sale price has been dealt with with the ratio support and cost support for meeting the challenges of growth and predicting project performance while dealing with the outcomes in the advanced analytics applications (Ambilkar et al., 2022). Cost support has been supporting the outline where attribution issues have been sorted by using the overall business performance and making sure that the organization can meet the challenges before project completion.

Human capital optimization is an essential concern because no organization can ignore the importance of human resources and its handling while dealing with the various challenges and risks inside the organization. Human resource management has been tackled with the help of skilled social impact that makes sure that the positive outcomes of the organization have been valued by increasing the productivity and motivation of employees (Yang et al., 2023). Resource utilization has a positive impact on the company outline and growth then it is sure that the human capital has been on the right path by taking the strategic returns and ensuring the competitive advantage of the organization in the market. Capital gain cannot be ignored in any case because it is a major return that is going to play an important role in the overall progress of the organization. Its estimation is possible by reviewing the operational efficiency returns and taking out the analysis that how the organization can reduce the operational cost and increases the project outcomes.

Advanced Technologies

Advanced technology application is the role of AI in handling the optimization operations for increasing the overall returns and making sure that the company is using AI boost returns tools application. The advanced technology includes robotics, data analytics and machine learning activities to improve resource allocation and optimize resources to enhance efficiency and increase productivity (Spirito, 2024). Advanced technology plays an essential role where it enhances the risk management activity by understanding the use of scenario planning which stimulates the chances of risk management and applying the mitigation strategies in advance. It also allows the project managers to improve the resource allocation plans and make sure that the AI-driven optimization can apply robotics where the chances of accidents are high. Robotics are also helpful in handling various challenges of the workplace by allocating the right talent and covering the issues of critical plans.

The other idea is to explore the handling of data analytics by smart operations of predictive analysis and other categories where big data analytics has been handled with the help of AI-forward dashboards. Using data analytics helps handle sentiment analysis and deal with the stakeholders where potential conflicts may exist that can be handled with the help of portfolio management and decision support systems. Afzal et al. (2021) review that the idea is exploring how the project managers can explore the data analytics for AI-generated reports forecasting the project outcomes so the stakeholders will be kept informed. It is also important to understand how

risk communication can be done using predictive analytic reports and dealing with the challenges of collaboration on various platforms for instance cloud cloud-based tools to share real-time updates of the activities.

Machine learning is another category of leveraging AI and advanced technology. It explores how high returns are possible by increasing cost controls and improving efficiency with the help of AI-driven scheduling that ensures the timely completion of projects and enhances the automation that accelerates the workflow (Brown, 2019). Keeping in view the use of the implementation consideration and integration of machine learning, relevant training can help the project managers to meet the challenges and maximize the returns based on the crucial steering of the technologies and aligning the project goals with the ethical and effective useful activities. The idea is also helpful when they clearly understand the needs of the projects with the help of relevant tools and applications and maximise the returns for aligning the project goals with the effective use of technology including AI with high effectiveness.

Theoretical Framework

Some theories in this context can help to outline the theoretical framework. In a study, Nisula (2018) claims that adaptive intelligence risk management theory plays a professional role in identifying predictive risk analytics in real-time. It supports the idea that how dynamic adaptations for continuous learning and improvement with the application of risk strategies are possible under human and AI collaboration. The theory is applicable in system integration where core tools are applied for risk management and AI data-driven systems. Brown (2019) at least to the opinion of the previous author where the theory is applicable in AI-driven projects for supporting the project managers in meeting risk identification and handling. The theory seems applicable in the current example where the project manager has been reviewed for the facilitation of projects under the privilege of AI plans.

Addy et al. (2024) added a theory of predictive risk management as a model where AI uses historical data to handle predictive models and deal with the probability and results of the risks in the long term. The theory seems applicable in the current example where predicting market volatility can be judged by the device failures and it is understandable for reviewing the speed and efficiency of AI processes and data fostering. The theory seems to be proactively applicable to understanding the transformation of traditional risk management systems to modern ones under the privilege of technology. The theory has been tested in the current study to address the risk effectiveness and dynamic considerations to use the oversight of project management in handling concerns.

Conceptual Framework

The conceptual framework is based on the variables identified in the study. The connection between the project risks and overall returns in collaboration with the application of advanced technology. It has been supported with the help of resource utilization effects and cost minimization in collaboration with the credibility applications in the project's success. The impact of project risks has been checked on the overall returns in an organization under the privilege of AI applications. The risks are tested for failure and financial loss; further accident risks are also tested to see their impact on the overall returns. Resource utilization has been checked as a mediating variable to see the impact on the overall returns. The overall returns have been checked with the context of advanced technology application to see their progress or failure. The advanced

technology has been reviewed for the impact of robotics, data analytics and machine learning processes in the outline of AI and technological implementation for supporting the project managers. Overall the returns have been reviewed to understand how the impact of the various variables has been there on the maximization or minimization of the effective use of technology.

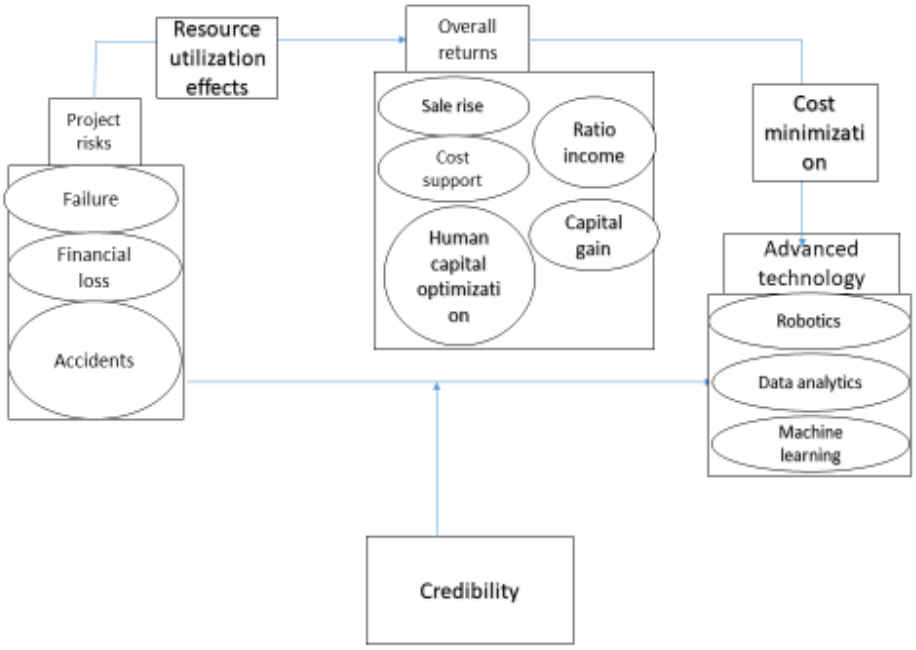

Figure 2: Conceptual Framework

Literature Gap

A literature gap is identified during the review of the literature for understanding the variables and topic specifications. It is a primary quantitative strategy however a literature review has been done to understand the basic idea and support the evidence to see the previous analysis done by various authors in relevance to the keywords of the study. It has been found that most of the authors have focused on the link between project management and risk assessment in collaboration with AI and advanced technology applications only. It is essential to understand the overall returns which have been reviewed by some of the authors previously and there is a need to add more literature on this perspective to check the correlation between the variables of project risk and advanced technology in collaboration with the overall returns. The study has outlined some sub-variables of the overall returns to support the evidence and make sure that the literature gap has been met with the help of the results of the study.

Methodology

Research Design

The study has adopted a primary quantitative design because data has been collected from the online survey user Google survey form. Pandey and Pandey (2021) think that the positivism philosophy is suitable for reviewing the content under the context of a quantitative primary research design because it helps the researcher to comprehend the items mentioned by the

respondents. Davidavičienė (2018) also agrees with the opinion of the previous author because the questionnaire review has been helpful where the closed-ended questionnaire is utilized under a liquid scale to support the comfortable feedback and make sure that respondents are submitting the responses according to the limited closed-ended feedback to be reviewed. It also helps the researcher to justify the existence of dependent and independent variables where a deductive approach has been added to support the interpretation of results.

Davidavičienė (2018) recommends the use of a deductive approach instead of an inductive one while comprehending the statistical data in the quantitative paradigm because it helps to enhance the reliability and availability of parameters by offering a comprehension process while avoiding the expansion of the research area to irrelevant opinions. Keeping in view the recommendations by various authors and the support of the quantitative paradigm with the application of a relevant deductive approach and positivism philosophy, the researcher can emphasise the application of relevant tools while dealing with the small size of the sample and avoiding the descriptive results. The results have been based on the numerical data which has been further outlined with the help of smart PLS software where variables are contrasted and the results are taken out with the support of statistical operations. Operations

Sample

The researcher has specified the whole population and made sure that the sample is based on the correct process of sampling to choose the relevant people from the whole population (Dubey et al., 2022). This has been supported by the sampling process and purposes sampling under the context of probability facilitation has been utilized where specific members are chosen to understand their willingness to give feedback and make sure that they are clear about the inner objectives of the study. A sample size of 100 has been feasible in the present study because it enabled the researcher to review the content according to the relevance of the study and make sure that relevant content has been aligned under the privilege of better approaches. It was made sure that the consent form has been shared to ensure ethical considerations application as per university policy so the respondents will be confident while delivering the data to the researcher.

Measurement

The data has been taken with the help of respondents and an Excel sheet has been generated collaboratively to measure the impact of various variables as mentioned according to the hypothesis. The data has been further categorized according to smart PLS requirements where it has been encouraged that the access sheet has been aligned to review the various parameters application and check the risk assessment in the project management activities and dealing with the project managers (Dubey et al., 2022). The other variables of the output checker by seeing the returns and the implementation of AI technology have been discussed according to the conceptual framework mentioned previously. The results of PLS software have been helpful in enhancing the reliability of the results and offering standardized metrics to justify the output.

Analysis

Smart PLS software has helped the researcher to explore the comparative analysis and avoid bias because the Excel sheet has been executed properly and the robust tool of software applications has been applied to ensure quality output. The software is helpful while the limited data set has been there This is why it is found to be supportive in the current study when the limited number of samples only 100 has been reviewed to collect the data due to limited offer time and resources

(Pandey & Pandey, 2021). The data set has been facilitated by various latent constraints and hypothesis relationships generated based on the structural model of smart PLS we are exploring the value of Cronbach alpha and HTML has facilitated the researcher to understand the link between various variables.

Validity

The validity operations are justified under the structural model used for the PLS software and construct validity has been supported to check the accuracy under the privilege of convergent and discriminate validity features of HTMT. The ideal approach has outlined how the software has compensated the structural form of internal and external variables in describing the needs of the study and making sure that the validity is based on the feedback taken from the respondents. The risks are tested for failure and financial loss; further accident risks are also tested to see their impact on the overall returns. A validity check has been done for resource utilization, it has been checked as a mediating variable to see the impact on the overall returns. The overall returns have been checked with the context of advanced technology application to see their progress or failure.

Assumptions

Various assumptions exist for reviewing the construct validity and it has been found that the hypothesis that has been reviewed in the earlier stage of the research has been justified with the claims given in the feedback of the respondent (Dubey et al., 2022). Further, it has been found that the data set has been aligned in the relationships where variables are supporting the additive model application and ensuring that how the constructs are collaborating with the impact of risk handling under the privilege of AI and modern data technology. A positive impact has been developed between the variables where statistical output has provided a significant value of above 0.7 in most of the cases. This is ideally implementing the facilitative impact of the research use and making sure that software help has gained the value because of researcher can incline towards less generalizability and by chance in the research.

Results

The results show statistical data in addition to demographical data and justifications to support the conceptual framework based on various variables.

Statistical Results

Table 1: Path coefficient

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
CD -> AT	0.792	0.801	0.049	16.338	0.000
CM -> AT	0.141	0.135	0.080	1.773	0.076
OR -> CM	0.877	0.878	0.027	32.192	0.000
PR -> AT	0.092	0.092	0.057	1.612	0.107
PR -> RUE	0.802	0.806	0.039	20.345	0.000
RUE -> OR	0.977	0.977	0.005	195.110	0.000

Notes: CD: credibility, CM: cost minimisation, PR: project risk, AT: advanced tech, RUE: resource utilisation effects, OR: overall returns.

The path coefficient shows a high value for most of the variables however the peak value has been recorded for RUE -> OR. It is narrating that the top value has been justified.

Table 2: Outer loading

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AT 1 <- AT	0.833	0.829	0.037	22.729	0.000
AT 2 <- AT	0.879	0.877	0.026	34.407	0.000
AT 3 <- AT	0.869	0.868	0.027	31.841	0.000
AT 4 <- AT	0.852	0.851	0.038	22.314	0.000
AT 5 <- AT	0.825	0.822	0.045	18.323	0.000
CD 1 <- CD	0.871	0.867	0.034	25.260	0.000
CD 2 <- CD	0.911	0.909	0.021	42.382	0.000
CD 3 <- CD	0.895	0.893	0.023	38.261	0.000
CM 1 <- CM	0.842	0.840	0.044	19.067	0.000
CM 2 <- CM	0.781	0.773	0.056	13.921	0.000
CM 3 <- CM	0.869	0.867	0.030	29.271	0.000
CM 4 <- CM	0.831	0.830	0.038	22.135	0.000
CM 5 <- CM	0.895	0.896	0.017	53.856	0.000
OR 1 <- OR	0.867	0.865	0.032	27.492	0.000
OR 2 <- OR	0.909	0.908	0.024	38.542	0.000
OR 3 <- OR	0.806	0.804	0.040	20.002	0.000
OR 4 <- OR	0.915	0.915	0.016	58.312	0.000
OR 5 <- OR	0.910	0.910	0.018	49.769	0.000
PR 1 <- PR	0.788	0.787	0.043	18.382	0.000
PR 2 <- PR	0.874	0.875	0.033	26.676	0.000
PR 3 <- PR	0.860	0.858	0.030	28.363	0.000
PR 4 <- PR	0.869	0.869	0.021	41.710	0.000
PR 5 <- PR	0.893	0.892	0.023	39.632	0.000
RUE 1 <- RUE	0.826	0.824	0.038	21.696	0.000
RUE 2 <- RUE	0.945	0.945	0.010	95.464	0.000
RUE 3 <- RUE	0.922	0.922	0.015	61.622	0.000

CD 2 <- CD is showing the top value above 0.9 where another top value has been recorded for RUE. The two variables are dominant in collaboration.

Table 3: R square

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AT	0.950	0.952	0.009	104.892	0.000
CM	0.770	0.771	0.047	16.254	0.000
OR	0.955	0.955	0.010	97.661	0.000
RUE	0.644	0.651	0.063	10.233	0.000

R square shows a dominant value for two variables including AT and OR.

Table 4: R square adjustment

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AT	0.948	0.951	0.009	101.737	0.000
CM	0.767	0.769	0.048	16.052	0.000
OR	0.954	0.955	0.010	96.687	0.000
RUE	0.640	0.648	0.064	10.082	0.000

R square adjustment is showing the top value again for AT and OR.

Table 5: RHO c

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AT	0.930	0.928	0.014	64.344	0.000
CD	0.921	0.919	0.018	51.979	0.000
CM	0.925	0.924	0.015	63.236	0.000
OR	0.946	0.946	0.009	100.928	0.000
PR	0.933	0.932	0.011	87.065	0.000
RUE	0.926	0.926	0.012	75.209	0.000

Rho is showing a high value for most of the variables which is about 0.9 to justify the significance however the peaking value is recorded for OR.

Table 6: RHO a

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AT	0.910	0.909	0.019	47.794	0.000
CD	0.873	0.869	0.031	28.058	0.000
CM	0.903	0.902	0.019	46.611	0.000
OR	0.930	0.930	0.012	76.706	0.000
PR	0.913	0.915	0.014	65.425	0.000
RUE	0.889	0.890	0.018	48.191	0.000

Here it is again showing the maximum value for most of the variables which precedes the top value for OR again.

Table 7: Cronbach alpha

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AT	0.906	0.903	0.021	43.126	0.000
CD	0.872	0.868	0.032	27.100	0.000
CM	0.899	0.896	0.022	41.070	0.000
OR	0.928	0.927	0.013	69.444	0.000
PR	0.909	0.909	0.016	58.346	0.000
RUE	0.880	0.879	0.022	39.545	0.000

Cronbach alpha is showing a significant value for all of the variables because they are above 0.8 however the peaking value has been recorded for PR as compared to other variables.

Table 8: HTMT

	Original sample (O)	Sample mean (M)	2.5%	97.5%
CD <-> AT	1.075	1.079	1.041	1.140
CM <-> AT	0.950	0.950	0.898	0.995
CM <-> CD	0.917	0.917	0.817	0.991
OR <-> AT	0.908	0.907	0.839	0.959
OR <-> CD	0.849	0.848	0.747	0.928
OR <-> CM	0.956	0.957	0.900	1.002
PR <-> AT	0.778	0.780	0.683	0.864
PR <-> CD	0.703	0.705	0.573	0.828
PR <-> CM	0.865	0.870	0.772	0.946
PR <-> OR	0.892	0.894	0.816	0.957
RUE <-> AT	0.918	0.917	0.828	0.984
RUE <-> CD	0.869	0.867	0.760	0.951
RUE <-> CM	0.959	0.959	0.896	1.012
RUE <-> OR	1.079	1.080	1.052	1.118
RUE <-> PR	0.893	0.894	0.808	0.964

The value of HTML has been recorded above 0.8 for the maximum variable in comparison to justify the reliability however maximum value has been recorded for a combination of RUE <-> OR and CD <-> AT.

Demographic data

The demographic data shows the comparison for gender data first which shows that the maximum number of respondents are males. They comprise 88.8% as compared to the females which are comprising 12.2%.

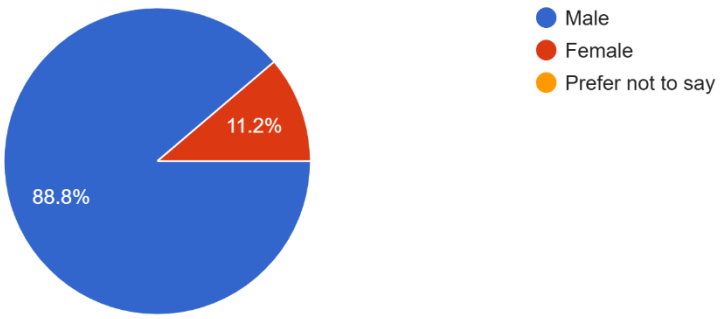

Figure 3: Gender data

The data on educational support has shown that the maximum number of respondents are graduates which are comprising 50.5% however they are preceded by master's degree holders for only 39.3%. The rest of the groups cover meagre levels.

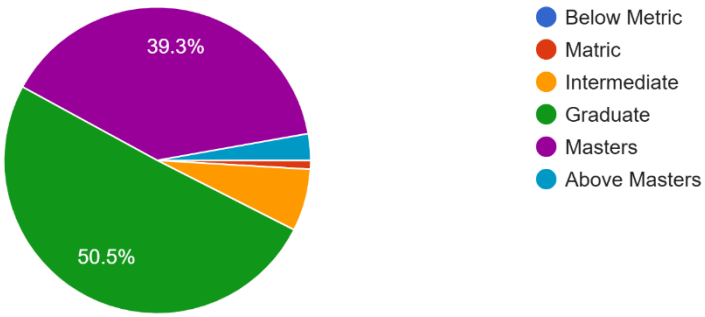

Figure 4: Educational data

Experience of the respondents has been checked where it has been found that the maximum number of respondents are from experience to with high level comprising 63.6%. Experience with a high level comprising 63.6 about 19.6% is at entry level where whereas a meagre amount of 16.8% 16.8% has been recorded for the highly experienced respondents.

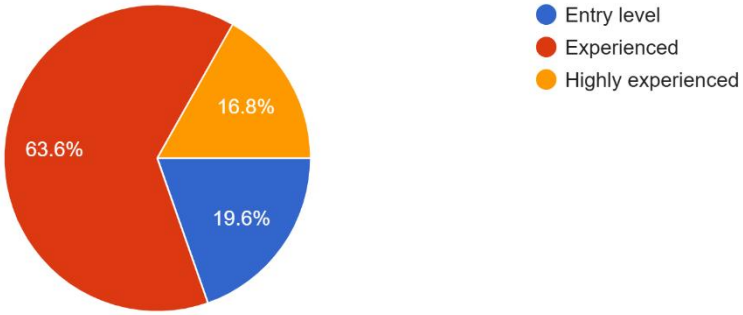

Figure 5: Experience data

Discussion

The discussion has covered the hypothesis justification answered the research questions in sequence to some of the main opinions and discussed the implications.

Hypotheses Prove

There are about 11 hypotheses and the first hypothesis reviews H1: Project risk failure can decrease the overall returns. This has been outlined where PR value has been found in support of the collaboration for or in path coefficient. The events may impact the project deliverable in addition to its timeline support and budget activities (Afzal et al., 2021). The other review shows H2: Project risk of financial loss can decrease the overall returns. This claim has also been approved positively based on the data from the literature and respondents. Proceeding with H3: Project list of accidents can decrease the overall returns. The path coefficient shows a high value for most of the variables however the peak value has been recorded for RUE -> OR. It is narrating that the top value has been justified.

The other hypothesis is H4: Advanced technology robotics use can increase the overall returns. It has been outlined based on the advanced technology applications for understanding the increase in

the overall returns which has been proved positive another time. Next is H5: Advanced technology data analytics can increase the overall returns. This has been justified based on the content from the literature and responses. Cronbach alpha is showing a significant value for all of the variables because they are above 0.8 however the peaking value has been recorded for PR as compared to other variables. The other one is H6: Advanced technology machine learning can increase the overall returns. It also supports evidence-based content proceeded by the literature for justification of ML's importance. It also allows the project managers to improve the resource allocation plans and make sure that the AI-driven optimization can apply robotics where the chances of accidents are high. Robotics are also helpful in handling various challenges of the workplace by allocating the right talent and covering the issues of critical plans.

H7: Resource utilization has a positive impact on sales rise. It is agreed as well. H8: Resource utilization has a positive impact on cost support, is also proved positive. The project risks may vary from project to project and activity to activity, however, there are some common issues that are always dominant in the projects and need to be addressed with the help of project management to ensure proactive management and handling of risks. H9: Resource utilization has a positive impact on human resource capital optimization showing positive support whereas R square shows a dominant value for two variables including AT and OR. H10: Resource utilization has a positive impact on ratio income. Yang et al. (2023) clarify that the popular categories of project risks including failure, financial loss and accidents may exist in most of the projects as a dominant concern. H11: Resource utilization has a positive impact on capital gain. Both are proven as positive and productive.

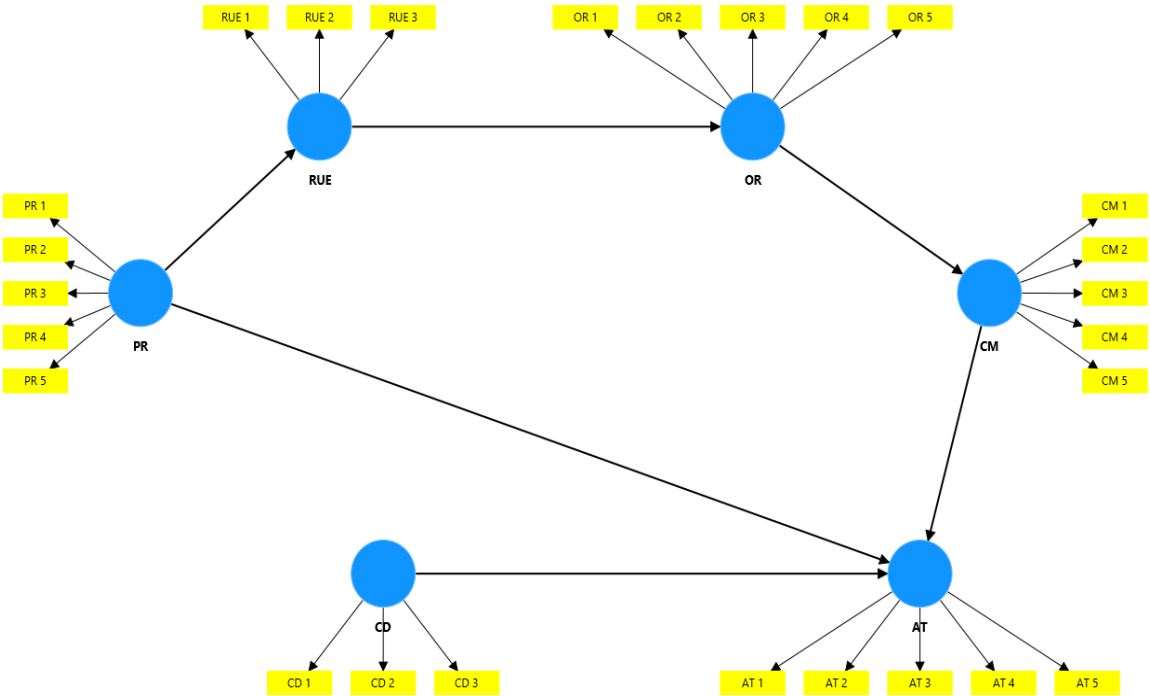

Figure 6: Diagrammatic review

Theoretical Prove

Nisula (2018) claims that adaptive intelligence risk management theory plays a professional role in identifying predictive risk analytics in real-time. This has been proved positive for it supports the idea that how dynamic adaptations for continuous learning and improvement with the application

of risk strategies are possible under human and AI collaboration. The theory is applicable in system integration where core tools are applied for risk management and AI data-driven systems as per hypotheses. In a study, Brown (2019) at least to the opinion of the previous author where the theory is applicable in AI-driven projects for supporting the project managers in meeting risk identification and handling. This has also proved as positive.

Conclusion

Findings

The main findings justify that it is important to apply the role of relevant variables as discussed because AI collaboration is helpful in handling the scenario and meeting the challenges for the managers. Hence prove that it is increasing the overall returns and justifying it on the base of hypothesis and theoretical review.

Recommendations

It is highly recommended that managers use modern technological applications in the context of AI collaboration to meet the challenges at the workplace and make sure that overall returns have been increased. Advanced technology plays an essential role where it enhances the risk management activity by understanding the use of scenario planning which stimulates the chances of risk management and applying the mitigation strategies in advance for management.

Implications

The study is guiding project managers and decision-makers to reveal the fact that how AI-driven technological applications can not only help them in decision-making but also smoothen working efficiency. The output of the research has met the literature gap identified in the earlier stages and the aim is met so it is helpful to the project managers and policymakers to align the facilitation of advanced technology to meet the challenges of management activities and decrease the chances of risks.

References

1. Addy, W. A., Ugochukwu, C. E., Oyewole, A. T., Ofodile, O. C., Adeoye, O. B., & Okoye, C. C. (2024). Predictive analytics in credit risk management for banks: A comprehensive review. *GSC Advanced Research and Reviews*, *18*(2), 434-449. https://doi.org/10.30574/gscarr.2024.18.2.0077
2. Afzal, F., Yunfei, S., Nazir, M., & Bhatti, S. M. (2021). A review of artificial intelligence-based risk assessment methods for capturing complexity-risk interdependencies: Cost overrun in construction projects. *International Journal of Managing Projects in Business*, *14*(2), 300-328.
3. Ambilkar, P., Dohale, V., Gunasekaran, A., & Bilolikar, V. (2022). Product returns management: a comprehensive review and future research agenda. *International Journal of Production Research*, *60*(12), 3920-3944. https://doi.org/10.1080/00207543.2021.1933645
4. Brown, Z. T. (2019). Adaptive Intelligence for an Uncertain Age. *Washington: National Intelligence University*, 15-188.
5. Davidavičienė, V., 2018. Research methodology: An introduction. Modernizing the academic teaching and research environment: Methodologies and cases in business

research, pp.1-23. https://doi.org/10.1007/978-3-319-74173-4_1
6. Dubey, U.K.B. & Kothari, D.P., 2022. *Research methodology: Techniques and trends*. Chapman and Hall/CRC. https://doi.org/10.1201/9781315167138
7. Hossain, M. Z., Hasan, L., Dewan, M. A., & Monira, N. A. (2024). The Impact of Artificial Intelligence on Project Management Efficiency. *International Journal of Management Information Systems and Data Science*, *1*(5), 1-17. https://doi.org/10.62304/ijmisds.v1i05.211
8. Jain, V. N. (2019). Artificial Intelligence (AI) for Supply Chain Industries and the Future It Holds! *Mind*, *59*, 433-460.
9. Kübar, A., & Skol, P. (2024). Expectations and Perceptions on Artificial Intelligence and Innovation in the AEC Sector: A Case Study on Project Managers. https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1868781
10. Nisula, J. M. (2018). *A risk management framework for a complex adaptive transport system* (Doctoral dissertation, Université Paul Sabatier-Toulouse III). https://theses.hal.science/tel-02078295/
11. Obiuto, N. C., Adebayo, R. A., Olajiga, O. K., & Festus-Ikhuoria, I. C. (2024). Integrating artificial intelligence in construction management: Improving project efficiency and cost-effectiveness. *Int. J. Adv. Multidisc. Res. Stud*, *4*(2), 639-647. https://www.multiresearchjournal.com/admin/uploads/archives/archive-1711453341.pdf
12. Pandey, P. & Pandey, M.M., 2021. *Research methodology tools and techniques*. Bridge Centre. http://dspace.vnbrims.org:13000/jspui/bitstream/123456789/4666/1/RESEARCH%20METHODOLOGY%20TOOLS%20AND%20TECHNIQUES.pdf
13. Sobieraj, J., & Metelski, D. (2022). Project Risk in the Context of Construction Schedules—Combined Monte Carlo Simulation and Time at Risk (TaR) Approach: Insights from the Fort Bema Housing Estate Complex. *Applied Sciences*, *12*(3), 1044.
14. Spirito, C. (2024). Artificial Intelligence applications in Reverse Logistics, how technology could improve return and waste management creating value (Doctoral dissertation, Politecnico di Torino). https://webthesis.biblio.polito.it/31999/
15. Tran, H. V. V., & Nguyen, T. A. (2024). A Review of Challenges and Opportunities in BIM Adoption for Construction Project Management. *Engineering Journal*, *28*(8), 79-98. https://doi.org/10.4186/ej.2024.28.8.79
16. Yang, J. (2023). Portfolio Risk-Return Decision Optimization Using AI. https://etd.auburn.edu/handle/10415/9066