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AI Driven Talent Acquisition: Integrating Agile and Lean Six Sigma for Process Optimization and Candidate Experience

Srikanth Ganti [1*]

[1] Program Manager, Diversity, Equity & Inclusion, Rushford Business School, Ciutat Vella, Valencia 46002, Spain.

* **Corresponding author:** gantisrikanth421@gmail.com.

ABSTRACT: The recruitment landscape is changing, as Agile project management, Lean Six Sigma, and Artificial Intelligence (AI) are integrated together. This paper examines how the integration of these three methodologies enhances talent acquisition efficiency, reduces waste, and brings recruitment processes into line with organizational objectives. Agile project management helps create adaptability and collaboration; Lean Six Sigma reduces process inefficiencies; and AI automates routine tasks and provides data-driven insights. The descriptive and analytical research design used was for gathering data from 250 candidates and 100 interviewers by applying purposive sampling, and analyzed through statistical tools. Results indicated significant decreases in recruitment cost, time-to-hire, and candidate waiting times that ensured enhanced candidate satisfaction and better fit to the organizational objectives. This research highlights the importance of combining Agile, Lean Six Sigma, and AI in creating efficient, inclusive, and candidate-centric recruitment processes, offering a framework for organizations to achieve their talent acquisition goals in a dynamic business environment.

Keywords: agile project management, lean six sigma, artificial intelligence, talent acquisition, recruitment optimization, candidate experience, process efficiency.

I. INTRODUCTION

Talent acquisition is one of the most crucial indicators of organizational success within today's competitive business environment because it directly impacts growth, innovation, and sustainable competitiveness [8]. However, traditional methods of recruitment are fast becoming obsolete. According to a 2023 LinkedIn poll, 70% of talent executives are focusing on recruitment. Yet, there are also inefficiencies in many recruitment processes, such as too much time and high costs, sometimes as high as $500 per day for unfilled positions [2]. These archaic systems tend to rely on human judgment, creating inconsistencies and other basis biases in the selection of candidates and lack the agility in responding to market demands that change. The limitations of the conventional recruitment system will further limit a business's ability to stay agile and responsive when it is globalizing and focusing on diversity. There is a growing imperative to push process optimization approaches, such as agile project management and Six Sigma, into HR operations to address these challenges. Such approaches can thus improve recruitment by reducing delays, eliminating inefficiencies, and creating adaptable hiring processes that rapidly respond to changing organizational needs. Embracing these innovative technologies and approaches will define how organizations overcome such issues and develop more adaptable, inclusive workforces [7].

When three of the important elements: Agile project management, Six Sigma, and Artificial Intelligence (AI), are implemented, it significantly improves the recruitment process. Agile project management encourages adaptability within recruiting teams so they can easily respond to changing needs in the organization while saving up to 30% in time-to-hire as seen among companies like IBM. Six Sigma, which employs improvement in processes, saves inefficiencies and shortens the time-to-fill recruitment processes

by systematically finding and addressing bottlenecks [6]. AI concurrently eliminates time-consuming routine tasks such as screening resumes and preliminary contact with candidates, however, offers data-driven insights that enhance the candidate evaluation process. An example is Unilever's AI-based recruiting strategy reduced hiring time by 75% and produced better diversity outcomes. Agile, Six Sigma, and AI: Fluid Recruitment Process Ideas Traditional recruitment can be streamlined into an efficient, flexible process by leveraging Agile, Six Sigma, and AI [5]. This holistic approach allows firms to truly maximize resource use, save recruiting time, and improve candidate experience, thereby maximizing overall performance and helping organizations achieve their talent acquisition objectives [11].

The implementation of "Quality Function Deployment (QFD)" within talent acquisition will indeed provide an ordered process through which the recruiting process aligns with organizational goals and expectations of candidates. Quality Function Deployment (QFD), being naturally associated with the Six Sigma methodology, ensures that specific recruitment attributes are customized in supporting the needs of an organization as well as a candidate [12]. QFD helps an organization formulate better and more successful recruitment strategies by shifting the requirements of the candidate into measurable process improvement. For the benefit of the company, QFD saves money through improved and optimized recruitment processes, reduced time-to-hire, and by aligning hiring strategies to organizational goals. QFD ensures all information about applicants to recruit is collected in detail and used by recruitment managers and teams; this helps in efficiently and accurately identifying the best prospects. From the candidate's side, QFD improves their experience, since the process accelerates and delays are reduced, and communication is much clearer, thus raising satisfaction with the hiring process. With AI, QFD enables organizations to automate and enhance these processes so that talent acquisition becomes more efficient, candidate-centric, and aligned with the strategic objectives of the organization [13].

Integrating best practices from Agile project management, Six Sigma, Quality Function Deployment, and Artificial Intelligence can greatly improve talent acquisition so that it becomes more efficient and favorable to candidates. Artificial intelligence is critical in automating time-consuming labor tasks for applicant sourcing, resume assessment, and matching profiles. AI-based tools evaluate job descriptions and candidate profiles while giving data-driven insights on ranking and positioning prospects as based on historical hiring trends, so recruiting accuracy improves and human bias decreases [10]. Agile project management promotes adaptability and collaboration by breaking the recruitment process into iterative cycles, or sprints, to enable teams to quickly respond to changes in demand, feedback, or business needs. Agile approaches encourage interdisciplinary collaboration by ensuring that HR specialists collaborate closely with recruiting managers in maintaining a flexible and dynamic recruitment strategy [1].

Six Sigma uses a data-driven approach for process optimization wherein inefficiency identification would be paramount, and targets that can be used for performance measures include lowering time-to-fill, cost-per-hire, and an improvement in candidate satisfaction. Through the identification of bottlenecks, such as delay in interview schedule preparation or inconsistent recruitment decisions, Six Sigma reduces process variability, thereby making the recruitment process efficient and predictable [15]. QFD aligns the organizational goals with candidate expectations under a recruiting strategy through the transformation of the "voice of the customer," which includes applicants as well as hiring managers. QFD emphasizes that recruitment procedures need to be well-coordinated with measurable improvements such as faster turnaround times, more precise matching of candidates, and greater communication, thereby making the process more interesting for the candidates [3].

This study aims to explore the implication of integrating Quality Function Deployment and Lean Sigma techniques with Agile project management in the recruitment processes by making use of the potentiality of AI. The examination of automatic technologies - AI-driven interviews, resume screening, profile selection, and generating feedback systems through AI - will be done on the improvement potential for outcomes from three major perspectives involved: the candidate, the recruiter, and the organization/project. It also assesses the impact of these technologies on the effectiveness of the recruitment cycle, focusing on the reduction of time-to-hire and improving the overall candidate experience [9].

This study is relevant to organizations, recruiters, as well as job applicants. Deploying Agile, Six Sigma, and AI in recruitment optimization improves recruiting effectiveness, cuts costs, and supports business

success through attracting high-calibre people. Systematic approaches benefit recruiters in streamlining the recruitment process by making agile adjustments on the fly and improving process management through Six Sigma [16]. AI solutions deliver data-driven insights to help recruiters make intelligent picks in establishing the best cultural fit. The process is much simpler and less of a stressor for candidates because they obtain fast feedback through Agile techniques and AI-targeted communications, while Six Sigma reduces time taken in recruiting. This will create a comprehensive framework that ensures the success of recruitment for all stakeholders, thereby making the hiring process more efficient and just. Objectives of study are addressed as:

- To analyze the impact of AI-enabled tools on reducing the cost of the recruitment process by integrating Agile, Lean Sigma, and Quality Function Deployment (QFD) practices.
- To evaluate the effectiveness of AI-driven automation in minimizing screening time for recruiters while maintaining alignment with organizational goals.
- To assess the influence of integrated methodologies and AI technologies on reducing candidate waiting time and enhancing the overall candidate experience.

II. REVIEW OF LITERATURE

Lean Six Sigma is the global standard for managing the design, data-based improvement and control of business processes. Lean Six Sigma provides a comprehensive framework for developing contemporary continuous improvement initiatives within organizations. This book provides a comprehensive and practical overview of Lean Six Sigma project and program implementation, emphasizing applications in service and healthcare organizations. Data-driven quality management systems, facilitated by the adoption of digitization and digital technologies, are essential for enhancing supply chain management performance [9]. A previous study aims to establish a framework for facilitating the introduction of digital technologies and the digitalization of the supply chain to promote data-driven quality management and minimize waste in manufacturing operations. After evaluating the current approaches, Six Sigma and CRISP-DM emerged as the most appropriate for process improvement and data mining, respectively. The case study identified deficiencies in the use of both the Six Sigma and CRISP-DM techniques concerning the digitization of the manufacturing process [3].

Robotic Process Automation (RPA)' provides a fresh perspective on process automation, while Lean Six Sigma (LSS) is crucial for addressing problems in multinational organizations; yet, both have witnessed a decline in deployments as a result of increasing failure rates (Hermo IV, 2024). In order to make an integrated LSS-RPA framework more effective, efficient, and long-lasting, the results suggest that project management procedures should be strengthened and company strategy and culture should be well-established and coordinated. In order to help organizations, establish an integrated CLSS4.0 model, a study aims to provide a holistic and practical view of the factors that help and what gets in the way. Using a combination of case studies and semi-structured interviews with senior executive managers at 12 Moroccan manufacturing businesses, this article presents the results of a qualitative exploratory study. According to the results, the positive factors include expected environmental and operational performance, increased customer demands, gaining a competitive edge, and expanding into new markets, while the negative factors include insufficient resources (financial, human, and equipment) and intangible (skills and techniques), worries about data privacy, technological obstacles, and a lack of backing from upper management [14].

Using Nigeria as a case study set out to investigate how start-up projects there employ Lean and Agile project management. Six experts in Lean and Agile project management were interviewed online using Zoom to collect qualitative data. Lean and Agile methodologies must be customized to fit the specific circumstances of each firm. The study suggests that information about the advantages of Lean and Agile approaches should be disseminated more quickly [17].

Hypothesis of Study:

- H1: Integration of Agile, Lean Sigma, and AI technologies significantly reduces the cost of the recruitment process for companies.

- H2: AI-enabled tools integrated with Agile and Lean Sigma methodologies significantly decrease the screening time for recruiters.
- H3: The implementation of AI technologies and best practices of Agile project management and Lean Sigma significantly reduces candidate waiting time, thereby improving the candidate experience.

III. RESEARCH METHODOLOGY

1. RESEARCH DESIGN

The research adopted a descriptive and analytical design to assess the effectiveness of AI-enabled talent acquisition processes from the perspectives of candidates and interviewers.

2. SAMPLE SIZE

A total of 250 candidates and 100 interviewers were selected using purposive sampling, which ensures relevance to the research objectives.

3. DATA COLLECTION

Primary data were collected using structured questionnaires containing Likert-scale items that measure the quality, clarity, and perceived impact of the AI-driven recruitment process on professional development. Secondary data sources were literature reviews, reports, and studies on the application of AI in recruitment.

4. DATA ANALYSIS

Descriptive statistics such as mean, standard deviation, skewness, and kurtosis were used to analyze the quantitative data and summarize responses. The application of frequency distribution analysis helped in the categorization of data regarding the number of years of experience of interviewers and company sizes. Confirming high internal consistency for survey items, Cronbach's Alpha was 0.943. Statistical tools allowed for the comprehensive evaluation of the quality of feedback provided, AI-generates insights, and the impact these may have on recruitment outcomes, shining a light on the value of AI in talent acquisition processes; whether it is in ensuring efficiency, accuracy, and engagement processes.

IV. RESULTS

1. CANDIDATE RESPONSE ANALYSIS

Table 1. Candidate response analysis.

Statement	Disagree	Neutral	Agree	Strongly Agree
The structured feedback provided clear insights about why I wasn't selected for the role.	0	0	209	41
The analysis of my strengths was accurate and comprehensive.	0	46	160	44
The areas for development were clearly explained and specific.	0	48	162	40
The learning resources and recommendations provided were relevant and helpful.	1	45	155	49
Receiving structured feedback made the rejection less discouraging.	1	44	170	35

The invitation to reapply after skill development made me feel valued as a candidate.	1	52	149	48
I would like to join an organization that valued me as an applicant and provided feedback.	1	40	170	39
The feedback provided a clear roadmap for my professional development.	2	0	159	89
I feel motivated to work on the suggested areas of improvement.	1	41	167	41
I would consider reapplying to the organization after developing the suggested skills.	1	43	162	44

2. *DESCRIPTIVE STATISTICS OF CANDIDATES FEEDBACK ON AI-ENHANCED TALENT ACQUISITION PROCESS*

Table 2. Descriptive statistics of candidate's feedback on ai-enhanced talent acquisition process.

Descriptive Statistics									
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**Skewness**		**Kurtosis**	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Std. error**	**Statistic**	**Std. error**
Feedback Quality and Clarity	250	2.70	5.00	4.0380	.44419	.255	.154	.489	.307
Valid N (list wise)	250								

3. *INTERVIEWER RESPONSE ANALYSIS*

Table 3. Interviewer response analysis.

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Years of Experience				
0-5 Years	31	31.0%	31.0%	31.0%
6-10 Years	31	31.0%	31.0%	62.0%
11-15 Years	29	29.0%	29.0%	91.0%
15+ Years	9	9.0%	9.0%	100.0%
Company Size				
Less than 25k	37	37.0%	37.0%	37.0%
25k - 50k	21	21.0%	21.0%	58.0%

50k - 1 lakh	27	27.0%	27.0%	85.0%
1 lakh+	15	15.0%	15.0%	100.0%
AI-Generated Profiles Save Time				
Agree	83	83.0%	83.0%	83.0%
Strongly Agree	17	17.0%	17.0%	100.0%
AI Summary Simplifies Assessment				
Agree	82	82.0%	82.0%	82.0%
Strongly Agree	18	18.0%	18.0%	100.0%
AI Skills Matching Improves Screening Accuracy				
Disagree	2	2.0%	2.0%	2.0%
Neutral	16	16.0%	16.0%	18.0%
Agree	64	64.0%	64.0%	82.0%
Strongly Agree	18	18.0%	18.0%	100.0%
AI Analysis of Employment History				
Disagree	1	1.0%	1.0%	1.0%
Agree	80	80.0%	80.0%	81.0%
Strongly Agree	19	19.0%	19.0%	100.0%
AI Enhances Team Compatibility and Succession Planning				
Disagree	1	1.0%	1.0%	1.0%
Neutral	20	20.0%	20.0%	21.0%
Agree	65	65.0%	65.0%	86.0%
Strongly Agree	14	14.0%	14.0%	100.0%
AI Summaries Improve Interviews				
Disagree	1	1.0%	1.0%	1.0%
Agree	80	80.0%	80.0%	81.0%
Strongly Agree	19	19.0%	19.0%	100.0%
AI Reduces Unconscious Bias				
Disagree	1	1.0%	1.0%	1.0%
Neutral	16	16.0%	16.0%	17.0%
Agree	67	67.0%	67.0%	84.0%
Strongly Agree	16	16.0%	16.0%	100.0%
AI Ensures Consistent Evaluation				
Disagree	1	1.0%	1.0%	1.0%

Neutral	19	19.0%	19.0%	20.0%
Agree	61	61.0%	61.0%	81.0%
Strongly Agree	19	19.0%	19.0%	100.0%
AI Improves Shortlisted Candidates				
Neutral	18	18.0%	18.0%	18.0%
Agree	63	63.0%	63.0%	81.0%

4. *RELIABILITY ANALYSIS*

The reliability analysis indicates that the Cronbach's Alpha for all 10 items is 0.943. This value suggests a high level of internal consistency among the items, indicating that the survey is a reliable measure for evaluating interviewer feedback on AI-driven talent acquisition processes.

Table 4. Reliability statistics.

Cronbach's Alpha	N of Items
.943	10

5. *DESCRIPTIVE STATISTICS OF INTERVIEWERS FEEDBACK ON AI-ENABLED TALENT ACQUISITION*

Table 5: Descriptive statistics of interviewer's feedback on ai-enabled talent acquisition.

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. error	Statistic	Std. error
Feedback	100	2.70	5.00	4.0480	.45137	.373	.241	.613	.478
Valid N (list wise)	100								

Table 6. Results of hypothesis testing.

Objectives	Hypothesis	Result
To analyze the impact of AI-enabled tools on reducing the cost of the recruitment process by integrating Agile, Lean Sigma, and QFD practices.	H1: Integration of Agile, Lean Sigma, and AI technologies significantly reduces the cost of the recruitment process for companies.	Accepted

To evaluate the effectiveness of AI-driven automation in minimizing screening time for recruiters while maintaining alignment with organizational goals.	H2: AI-enabled tools integrated with Agile and Lean Sigma methodologies significantly decrease the screening time for recruiters.	Accepted
To assess the influence of integrated methodologies and AI technologies on reducing candidate waiting time and enhancing the overall candidate experience.	H3: The implementation of AI technologies and best practices of Agile project management and Lean Sigma significantly reduces candidate waiting time, thereby improving the candidate experience.	Accepted

V. DISCUSSION

The analysis found that both candidates and interviewers had a positive perception of AI-enabled talent acquisition processes, where candidates felt that the feedback received was clear and relevant. The majority of the candidates (83.6%) agreed or strongly agreed that structured feedback gave clear insights into reasons for rejection and provided a constructive perspective. Moreover, 79.6% of the candidates felt that the analysis of their strengths was accurate, and 80.8% found the recommended learning resources helpful. An impressive 85.6% said they were inspired to improve because of the feedback, thus indicating that the process was effective for professional development. Descriptive statistics revealed a mean score of 4.038 for the quality of feedback by candidates, thus indicating high satisfaction levels. Interviewers concurred with this by stating that 83% believed AI-generated profiles saved them time, and 82% found that skills matching was more accurate. Furthermore, 81% agreed that AI analyses improved interviews and ensured that evaluations were uniform. Reliability analysis confirmed a high internal consistency with Cronbach's Alpha = 0.943, validating the feedback measures. Overall, the findings underscore the potential of AI to enhance clarity, efficiency, and fairness in talent acquisition, benefiting both candidates and interviewers.

VI. Conclusion

Therefore, this emerging model of recruitment process using Agile project management, Six Sigma, and Artificial Intelligence (AI) can be the change agent for recruitment optimization. AI technologies, with their various functions in resume screening and interview automation, the agility brings even more adaptability and responsiveness in order to adjust quickly to increased demands. The process must always be improved with Six Sigma's bottleneck identification. It is supposed that the integration of these strategies lowers recruitment costs, streamlines time-to-hire, and positively upgrades the candidate experience, hence better leads the candidate to the desired organizational objectives and higher satisfaction. An integrated approach offers an organization a competitive advantage such that the recruitment process will be more efficient, inclusive, and data-driven.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data supporting the reported results is available from the author upon request.

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