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BUSINESS INTELLIGENCE TOOLS ASSESSMENT AND EVALUATION IN THE ERA OF GEN AI

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Abstract: In this competitive market, organizations are highly dependent on data-driven decision-making to outperform others. In order to do this, they use advanced tools and technologies to obtain information and to draw insights. For a long time now to find a place in this process, Business Intelligence (BI) tools have occupied. A variety of BI tools have come up over the years, and they come with different features, capabilities and limits, and therefore it can be quite a tough process determining which tool is good for you. Some factors, such as business requirements, use cases, licensing costs, data security and scalability, are key to selecting it; while others, such as technical expertise and ease of use, also help make the decision. The generative AI (Gen AI) landscape has been rapidly expanding, and today's BI tools are increasingly moving beyond the scope of traditional analytics to leverage this new technology. BI is being boosted by Gen AI, which automates data preparation, creates natural language insights, facilitates conversational analytics and delivers predictive and prescriptive suggestions. These AI-driven enhancements are making the BI tools more accessible by removing the technical expertise requirement and speeding up the inception of insights many times over.

The present paper overviews multiple BI tools in the market and their important features, and the comparative criteria for evaluation. It also discusses how Gen AI is impacting BI tools, thereby making them much more intelligent, automated and user-friendly. Furthermore, it also provides a structured approach to choosing the right BI tool that fits the needs of an organization while staying aligned with the evolving AI-driven analytics capabilities.

Keywords: Business Intelligence (BI), Data mining, Predictive analytics, Statistical analytics, SaaS, Artificial Intelligence (AI), Generative AI.

1 INTRODUCTION

Business Intelligence (BI) refers to the process of analyzing data to uncover meaningful and actionable insights, which can then be used to make better informed decisions using technology, processes and strategies [1][2][3][4][5]. Business intelligence (BI) tools are used by businesses to collect and evaluate data from a variety of sources, including sales, finance and customer support, to enable them to measure their performance and inform their strategic planning [6][7]. The main aim of BI is to enable businesses to transform raw data into valuable insights, which in turn help to make decisions, spot opportunities, and avoid risks.

Traditionally, BI tools help extract, process and gather and analyze data from a variety of sources such as spreadsheets, databases and cloud-based applications [8]. These are techniques like data mining and predictive analytics that these tools apply, and statistical analysis to generate reports and dashboards [9][10][11][12]. Over the years, there have been several key benefits offered by BI, including [13][14][15]:

1.1 Benefits of Business Intelligence

- **Improved Decision-Making:** BI allows organizations to gain insights into operations, trends or performance and thus take more data-driven decisions [16][17].
- **Increased Efficiency:** BI automates the task of data collection, data analysis and data visualization on its own to save time and improve the workflow efficiency.
- **Enhanced Customer Experience:** BI is done by studying customer behavior, preference and needs to help businesses design products and services that are meant for better engagement [18].
- **Competitive Advantage:** BI helps organizations know the trends in an industry as well as their competitive intelligence so that they can stay ahead in the market.

1.2 The Role of AI and Gen AI in Business Intelligence

The BI landscape, however, is changing fast with the advent of artificial intelligence (AI) and machine learning (ML). These technologies have already improved traditional BI capabilities by automating data analysis, spotting trends and facilitating real-time insights [19][20]. But Generative AI (Gen AI) integration is making BI tools even more exciting [21][22].

Natural language querying, automated report generation, conversational analytics and AI-driven insights are being introduced to the Gen AI via natural language querying to the Gen AI making BI systems more intuitive and accessible [23][24]. Conversational interfaces are now making BI tools accessible to businesses where users can simply ask questions in natural language and get instant AI-generated answers to those questions. Gen AI also enhances predictive and prescriptive analytics and gives businesses predictions about future patterns and offers practical advice, but without the need for significant technical knowledge [25][26][27].

As Gen AI keeps advancing, its automated data analysis and decision support features will be hugely essential for businesses. BI tools are becoming smarter, more adaptive and more efficient through this transformation that makes it possible to derive insights faster and more accurately [28][29].

This paper will examine the BI tools' evolution and their traditional functionalities versus new AI-powered functionalities and will advise on how to select best best-suited BI tool for a company, looking at its needs as well as its level of AI readiness [30].

2 LITERATURE SURVEY

The selection of an effective Business Intelligence (BI) tool depends on a thorough assessment of both technical and organizational factors, according to the existing literature. The need for organizations to analyze their data needs, select the important factors such as data quality, ease of use, scalability, security, integration with the existing systems and choose the best solution depending upon these needs is highlighted in the prior research. Besides, user training, availability of support and organizational buy-in play a part in successful BI adoption to make sure that the implementation and the use of BI are seamless.

Traditional BI assessment studies have generally involved the comparison of BI tools with regard to reporting capabilities, visualization features, performance and cost effectiveness. But again, because of the swift development of artificial intelligence (AI) and generative AI (Gen AI), the criteria for evaluating BI solutions are changing as well. Emerging research highlights how AI-powered BI tools are shifting from static reporting to dynamic, automated, and conversational analytics, enabling businesses to derive insights faster and with greater accuracy.

From the available body of work on BI tool evaluation, it is observed that prior comparisons were often based on conventional parameters. However, this paper focuses on the top five market-leading BI tools and introduces new assessment criteria that align with the evolving needs of the IT industry, particularly considering Gen AI capabilities such as:

- Conversational BI (Natural Language Querying and AI-generated insights)
- Automated Data Preparation and Analysis
- AI-Driven Predictive and Prescriptive Analytics
- Scalability and Integration with AI-powered Data Platforms
- Adaptive Learning and Personalization in BI Tools

By incorporating these AI-driven evaluation metrics, this paper provides a modernized approach to BI tool selection, ensuring that organizations can choose future-ready BI solutions that align with the latest technological advancements.

3 MATERIAL AND METHODS:

This research gathers qualitative data to assess Business Intelligence (BI) tools, considering both traditional and AI-driven capabilities [31][32]. The evaluation framework includes four key classification factors that help in analyzing BI tools based on their applicability, usability, and technological advancements.

3.1 Classifying BI Tools

The classification of BI tools is based on four main factors:

3.1.1 Target Audience

Determining the necessary skill level and tool usability requires an understanding of the BI tools' intended audience [33]. BI solutions cater to a variety of users across different organizational functions, including:

- **Business Users:** Commercial marketing, sales, customer relationship management, and operations teams.
- **Finance & HR Professionals:** Accounting, billing, workforce management, and payroll teams [34].

- **Product & Service Teams:** Product managers, service analysts, and IT support.
- **Senior Management & Executives:** Decision-makers needing high-level dashboards and reports [35].

With the advent of Generative AI (Gen AI), BI tools are becoming more intuitive and accessible through natural language interfaces, reducing the skill barrier for non-technical users. AI-powered BI solutions allow users to ask queries in plain language, eliminating the need for extensive technical knowledge.

3.1.2 Visualization

The way data insights are presented significantly affects user adoption and effectiveness. Visualization tools in BI platforms can be classified into:

- **Web-Based BI Tools –** Accessible via browsers, typically cloud-hosted.
- **Mobile-Based BI Tools –** Optimized for smartphones and tablets, supporting real-time insights on the go.
- **Desktop-Based BI Tools –** Installed locally for advanced offline data analysis.

With Gen AI enhancements, BI tools now support:

- Auto-generated visualizations tailored to user queries.
- Adapts based on AI insights, creating dynamic and interactive dashboards.
- This is AI-assisted storytelling where the tool narrates the key trends and patterns.

3.1.3 Implementation

The BI tool is a must, but the second thing is that organizations have to choose the best deployment model for their BI tool to balance cost, scalability and security:

- **On-Premise BI –** Control and security through being installed on company-owned servers.
- **Cloud-Based BI –** In the cloud, hosted, thereby offering scalability and reduced infrastructure costs.
- **Hybrid BI Solutions –** A combination of both, so that flexibility in the way data is managed can be assigned.

Cloud adoption is being accelerated with the rise of AI-powered BI solutions because:

- Data processing sped up through the use of AI, without the expensive burden of heavy infrastructure costs.
- AI-driven anomaly detection and fraud prevention to increase data security.
- Seamless integration to AI/ML models for advanced predictive analytics.

3.1.4 Capabilities

The evaluation of the BI tools is based on the set of weighted criteria drawn into three major areas:

- **Functionality:** Advanced analytics, AI-driven insights, automated reporting, query capabilities.
- **Infrastructure:** Scalability, cloud compatibility, compatibility with AI platforms and security features.
- **Product-Related Criteria:** Cost effectiveness, ease of use, customizable and features AI-powered automation.

BI tools are being reshaped by Gen AI, automating workflows, improving data storytelling and offering intelligent recommendations in order to make BI platforms more intelligent and self-sufficient.

The classification framework is geared towards ensuring a complete evaluation of the BI tools, both traditional and AI-driven. Below are the capabilities of the BI tool:

Table 1: Capabilities of BI Tool

Data Exploration	The BI tool should support data exploration. It must be capable of utilizing both automatic and manual techniques, including data visualizations, charts, and preliminary reports.
Dashboards	A BI dashboard is a data visualization tool that shows the current state of key performance indicators (KPIs) and business analytics metrics on a single screen.
Collaboration	Does the BI tool support key primary collaboration features, for example, Collaborative Interaction, Information Enhancement, and Collaborative Decision Making.
Integration	The capacity to collaborate and interact with other systems is known as integration. BI tools integrate and work with the existing infrastructure and available data sources. Not every BI tool supports every system/data source.

Data Collection and Analysis	Data must first be gathered and examined. BI solutions do this by employing algorithms to swiftly sift unstructured data, eliminating mistakes and duplicate entries along the way.
Gen AI	AI-powered capabilities that enhance BI tools with natural language querying, automated insights, predictive analytics, and intelligent data storytelling. These features enable self-service analytics, making BI tools more accessible and reducing dependency on technical expertise.

4 RESULT AND DISCUSSION

4.1 Power BI

The Azure cloud-based Power BI package from Microsoft provides strong BI and analytics features. Authoring intricate data mashups utilizing on-premises data sources or using Power BI Desktop as a standalone, on-premises solution for individual users is both possible. Power BI offers interactive dashboards, AI-powered insights, data preparation, and data discovery all through a single design tool.

Pros

- Natural Language Querying (Q&A) for intuitive data exploration
- Seamless integration with Microsoft Office & Azure ecosystem
- Free developer license for easy onboarding
- Powerful combination of data manipulation, visualization, and AI-powered analytics
- Embedded Gen AI features for automated insights and anomaly detection

Cons

- Power BI Pro and Premium require Azure integration
- Advanced customization requires knowledge of DAX and M languages
- Limited SAP hierarchy and BW object reusability
- Map visual limitations (e.g., lack of interactive layers)
- Gen AI capabilities still evolving, requiring cloud-based infrastructure

4.1.1 Tableau

Tableau provides business users with a very engaging and user-friendly visual-based exploration experience. It offers low-code access to narrative, data processing, and analysis, integrating AI-powered features through Einstein AI (Salesforce) for advanced analytics.

Pros

- "Ask Data" tool enables AI-driven natural language queries
- Data Catalog & AI-powered recommendations for data discovery
- Automated data preparation & anomaly detection with Einstein AI
- Advanced visualizations with intuitive drag-and-drop features

Cons

- Limited drill-through capabilities inside charts
- Expensive compared to competitors
- SAP hierarchy limitations
- AI features are limited to Salesforce integration

4.1.2 QlikView / Qlik Sense

Qlik provides real-time data integration, associative analytics, and conversational AI-powered insights. With its Qlik Sense AI assistant, users can leverage natural language queries, predictive modeling, and automated pattern detection.

Pros

- AI-powered conversational analytics and predictive modelling
- Strong ETL capabilities for real-time data integration
- Native alerting and AI-driven anomaly detection
- Extensive API support for AI-based tool extensions

Cons

- Requires scripting for advanced chart customization
- Limited out-of-the-box report distribution via email
- Pixel-perfect responsive grid is lacking

4.1.3 Looker

Looker, now part of Google Cloud, is a modern BI platform focused on data exploration, modeling, and AI-powered insights. It offers deep integration with BigQuery AI models and supports natural language querying for ad-hoc analysis.

Pros

- AI-powered insights via Google Cloud AI/BigQuery
- Centralized semantic layer for consistent data governance
- Built-in version control through Git.
- Powerful APIs and AI-based alerting capabilities

Cons

- Code-heavy development may not be user-friendly for all
- Limited visualization customization compared to Tableau
- Performance is highly dependent on the underlying database

4.1.4 Amazon QuickSight

Amazon QuickSight is a fast, cloud-based BI tool with AI-driven insights, automated narratives, and real-time anomaly detection powered by Amazon Q and SageMaker.

Pros

- Native AWS integration (RDS, DynamoDB, Redshift, etc.)
- AI-powered forecasting and automated insights
- Affordable pricing model ($5/user/month)
- “SPICE” in-memory engine for lightning-fast data processing

Cons

- Limited visualization options compared to Power BI/Tableau
- Less intuitive data exploration and filtering options
- Cannot include multiple scenes in a single story

4.2 Gen AI Impact on BI Tools

With Gen AI, modern BI tools are shifting from static reporting to AI-powered, dynamic insights. The integration of natural language processing (NLP), predictive analytics, and AI-assisted decision-making is transforming how businesses interact with their data.

- Power BI & Tableau leverage AI-driven insights to detect trends and suggest visualizations.
- Qlik Sense & Looker focus on conversational AI for self-service analytics.
- Amazon QuickSight integrates SageMaker models for automated anomaly detection.

These AI-driven capabilities enhance decision-making, democratize data access, and reduce dependency on technical teams, making BI tools more intelligent and accessible.

4.3 Tool Assessment Summary:

Below is the assessment summary for BI tools. It has used Harvey Ball pattern. Harvey balls are circular ideograms that are used to convey qualitative information visually. With the help of these patterns are comparing different BI tools against multiple

parameters. Blank ball represents 0% (very poor) next balls are incrementally increased by 25%reaching to filled ball 100% (Excellent).

	Power BI	tableau	Qlik	Looke	amaz QuickS
GENERAL					
Ease of Implementation					
Consultant availability					
Flexibility and Limitations					
Interactivity/Users autonomy					
Roadmap defined and clear					

	Power BI	tableau	Qlik	Looker	amazon QuickSight
FUNCTIONAL					
Advanced Geospatial Representation					
Variety of Charts / Special Charts					
Multi-language					
Mobile Offline access					
Publishing capabilities (pdf, Office, ...)					

5 CONCLUSION

Selecting the right BI tool is a crucial decision for organizations aiming to leverage data-driven insights effectively. The selection process should begin with a clear understanding of the organization's needs, business goals, and data strategy. This paper has assessed various BI tools based on their functionality, usability, scalability, and cost-effectiveness, enabling organizations to determine which tool offers the best return on investment (ROI).

Four factors for BI tools classification are target audience, visualization, implementation and capabilities. These criteria assist organizations in aligning their BI strategy with business and data objectives and thereby choosing a tool that will meet technical as well as business requirements.

Examining the five BI tools offered an orderly guideline for judging other BI solutions. Learning about the benefits and drawbacks of each tool allows companies to pick one that will fit their goals. Further, this approach gives a uniform way to assess new or upcoming BI tools alongside top industry solutions.

As Gen AI becomes more involved in BI tools, companies are able to use AI insights, predictive tools, automated data reporting and NLP. With these steps, the organization can decide things more smoothly, independent users become less important for data access, and each employee can use data more openly. As a consequence, the methodology used here can be used to assess AI capabilities when picking the BI tool.

The process of evaluation should have input from business users, data analysts and IT professionals for the best results. Cooperative and repeated evaluation will discover any difficulties, ensure the tool fits company processes and make it more effective in helping with data-based choices.

Overall, with AI and automation BI tools are quickly progressing and the decision process is becoming more complex, but also more rewarding. Those companies that approach evaluation of BI tools in a structured, stakeholder-driven fashion will be favorably positioned to extract deeper insights, improve operational efficiency and advance business success in an AI-enabled future.

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