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Optimizing Image Processing in OmniView with EDAS Decision-Making

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ABSTRACT

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Keywords:

Healthcare Management System; Electronic Health Records (EHR); Scalability; Security & Compliance; Cloud-Based Integration; Cost-Benefit Analysis; Multi-Criteria Decision-Making (MCDM); Technical Support in Healthcare IT.. The evaluation of healthcare management systems is crucial for optimizing patient care and administrative efficiency. This study applies the Evaluation based on Distance from Average Solution (EDAS) methodology to assess six leading healthcare management systems: PointClickCare, MatrixCare, CareCloud, Cerner LTC, Epic MyChart, and Meditech Expanse. The evaluation is based on six key parameters: Scalability, Security & Compliance, Cloud & Integration, Cost & ROI, Technical Support & Training, and Reporting & Analytics. The study aims to provide a comparative analysis to help healthcare providers make data-driven decisions when selecting an optimal management system.

With the increasing adoption of digital solutions in healthcare, selecting a robust and scalable management system is essential. The research highlights the significance of security, interoperability, cost-effectiveness, and analytical capabilities in ensuring operational success. By employing the EDAS methodology, this study provides an objective framework for evaluating healthcare systems, offering valuable insights for stakeholders.

EDAS The Evaluation based on Distance from Average Solution (EDAS) is a multicriteria decision-making (MCDM) approach that evaluates alternatives based on their positive and negative distances from an ideal average solution. The weighted parameters help quantify each system's performance, allowing for a fair and transparent comparison. This methodology ensures an unbiased assessment, prioritizing key performance indicators that influence decision-making in healthcare IT.

Alternative Healthcare Management Systems Point Click Care – A comprehensive cloud-based solution for long-term and post-acute care facilities. Matrix Care – A healthcare management platform tailored for senior living and home care providers. Care Cloud – A flexible, cloud-based EHR and practice management system. Cerner LTC – A long-term care solution offering electronic health records and billing capabilities. Epic My Chart – A patient-centric system that enables real-time access to medical records. Medi tech Expanse – A cloud-native EHR system designed for hospitals and clinics.

Each healthcare system is assessed based on six essential criteria: Scalability – The system's ability to grow with increasing patient volumes and expanding healthcare facilities. Security & Compliance – Adherence to industry regulations such as HIPAA and data protection standards. Cloud & Integration – Compatibility with cloud platforms and interoperability with other healthcare systems. Cost & ROI – The affordability and long-term return on investment of the solution. Technical Support & Training – Availability of customer support, on boarding assistance, and user training programs. Reporting & Analytics – Advanced data analysis and reporting features for better decision-making.

The comparative evaluation using EDAS methodology identified Point Click Care as the top-ranking system, excelling in Technical Support & Training, Security, and Scalability. Cerner LTC and Epic My Chart performed well in Cloud & Integration and Reporting, while Meditech Expanse demonstrated strong cloud-based capabilities. Matrix Care and Care Cloud ranked lower, indicating potential limitations in adaptability and security compliance. These results highlight the trade-offs involved in selecting a healthcare management system and emphasize the importance of aligning system capabilities with organizational needs.

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Introduction

The Omni View-generated Some resulting in a trans frontal view. We have developed an innovative algorithm using OmniView technology This method aims to simplify fetal brain examinations and reduce operator bias by visualizing the typical fetal brain sagittal and coronal planes, which facilitates the integration of these diagnostic planes into normal secondtrimester evaluations. Using OmniView technology, we have created a straightforward technique to extract fetal brain volume statistics from second-trimester 3D ultrasounds. [1]

Our findings demonstrate These ultrasound using this approach. As demonstrated by Baker and Nair a perspective camera achieves a single-view The OmniView system, when its field of view is aligned with the tip of the cone. Regardless of the image can actually be observed in this system is a matter of debate. A computer graphics technique called "ray tracing" provides a simple way to find the position of an image, but it is only applicable to real images that are in focus. Analyzing The single-view, conical OmniView system works by detecting multiple rays for each point in the scene. The ray lengths are the same because, under Gaussian optics, ray 1 travels parallel to VW after lens refraction and reaches point I when the object is centered.[10]

General Electric Medical Systems developed Omni View as a specialized The image analysis method for the GE Voluson E10 was used. allowing for automatic acquisition of initial volume data, depending on the nodule size. A single radiologist performed ultrasound scans in both 2D and 3D, with each patient being examined using That same day, Two different ultrasonography machines. The American Thyroid Association advises either a full or partial thyroidectomy for DTCs. after which thyroid nodules of any size displaying gross characteristics are treated with radioactive iodine postoperatively. In addition, several studies have associated gross ETE with increased risk of Recurrence, metastasis, and survival outcomes are key considerations; however, the effect of minimal ETE on PTMC clinical outcomes remains controversial. ETE is categorized as either minor or total in accordance with the ninth edition of the American Joint Committee on Cancer standards. Low ETE is defined as tumor invasion limited to the surrounding parathyroid soft tissues.[2]

Omni View is a 3D ultrasound software application that enables the analysis of volumetric The simultaneous visualization of datasets and Three separate, non-orthogonal planes are produced by hand using curves and lines, polylines, or traces from various directions or angles. This study evaluated the imaging capability, The Physicians were trained in the use of OmniView technology to visualize the corpus callosum, and the time taken to acquire each image was recorded. Each physician performed imaging of the corpus callosum using both OmniView and 2D ultrasound technology. The corpus callosum may be imaged quickly thanks to Omni View technology. When compared to 2D ultrasound, there is no statistically significant change in image quality. However, with OmniView, the edge of It is easy to see how the corpus callosum differs from the cavum septi pellucidi.[3]

The proposed Omni View-Tuning uses To help with the model, the cross-view alignment aim is integrated into the input of multi-view picture caption data learning. view-invariant representations. It enables Improving fine-tuning through strategic adjustment of parameters. While images from different perspectives often have slightly different textual descriptions due to Context, sentence structure, and language ambiguity, these differences become significantly more pronounced in a highdimensional representation space. We assessed OmniView-Tuning across multiple Subsequent tasks include zero-shot categorization, captioning photos, and responding visual questions the context of zero-shot classification. Building on this foundation, we introduced The OmniView-Tuning framework integrates an innovative parameter-efficient cross-viewpoint alignment goal, significantly enhancing the capacity to produce view-invariant representations of VLP models. [4]

OmniView offers drivers a a traffic map showing the relative locations of cars in the area. Each vehicle in this system communicates its local map after detecting other vehicles within its field of vision and estimating their relative positions through broadcasts. The operation of OmniView can be outlined as follows: A smart phone with the OmniView app is mounted on the vehicle's dashboard or windshield, with its camera facing forward. It identifies vehicles in front, estimates their relative positions, and creates a traffic map for a vehicle, showing the relative positions of nearby vehicles. A straightforward approach to creating this map is to use GPS, which each vehicle uses to report its location. A vehicle equipped with OmniView must be capable of detecting nearby vehicles. This reflects the level of image matching processing required for each OmniViewenabled vehicle. When two vehicles meet on the road, they have no prior knowledge of each other's IP or MAC addresses. While the license plate number can serve as an identifier, it becomes unreadable at certain distances and angles.[5]

MRI revealed The dacryocystocele anomaly includes three distinct features, one being a swollen lacrimal sac dilated tear duct, OmniView allows operators to capture virtual planes by imaging curved planes. It can be used Using To enhance contrast resolution, GE Medical Systems' VCI software takes a thin, adjustable-thickness slice out of the collected volume. Five fetuses experienced spontaneous resolution during pregnancy,

and one case resolved between the last prenatal ultrasound and delivery. The scientists came to the conclusion that 3D sonography provides a noninvasive way to assess these cystic masses and could lessen the necessity for further diagnostic procedures during the newborn stage. Through this procedure, a bypass passage is created between the nasal cavity's midline and the lacrimal sac.[6]

OmniView is aligned in a plane with small pelvic space dimensions, extending The symphysis extends from the pubis's posterior edge to the puborectalis muscle's anterior edge, where the anal angle is formed. We believe that the low reproducibility of pubovisceral muscle thickness measurement is a result of the challenge of obtaining clear and well-defined muscle boundaries. We noted high intra-observer reliability but low inter-observer reliability and agreement when using the OmniView reconstruction technique. We attribute this to poor inter-observer reproducibility due to the lack of a learning curve for the second examiner.[7]

The plane of medial dimensions was automatically displayed on the right side. The trace method was used to measure the area of the posterior gap and the thickness of the right pubovisceral muscle. Based on Based Based on these standards, we used the subsequent approach: The OmniView image is transformed into a panoramic image during map creation and self-localization, and divided into a set number of segments.[9]

Although the virtual pictures' "visibility" is dependent on the size and location of the real mirror, their placements remain independent of the mirror's size. A second converging optical system must realize the virtual image point through the real plane mirror because real plane mirrors create virtual pictures. Analyzing single rays alone is not enough to accurately describe how the single-view conical mirror OmniView system works, because multiple rays must be detected for each point in the scene. In this system, the conceptual camera at F does not produce a physical image, but the actual image captured by the camera at C remains the same because they form a orthographic projection of each other. [10]

The Omni Viewer player is used to merge the point clouds at a later stage. To adopt Because DASH serves as a streaming standard, the recording process formats the media data into a DASH-compatible representation. As a result, to display a scene from any angle in the Omni Viewer at any time, the The player needs macro frames from two cameras, depending on the selected angle selected by the viewer. This module evaluates the currently available bandwidth and selects appropriate segments for download based on adaptive logic. The adaptability and flexibility of the Omni Viewer makes it ideal for a variety of applications, including remote physiotherapy, entertainment, and other 3D activities. [11]

Using At the anorectal angle end of the dynamic assessment, a line was placed in the midsagittal plane from the posterior edge of the symphysis publis to the anterior border of the puborectalis muscle to identify the plane with the smallest medial dimensions using ultrasound with OmniView-VCI reset to align with the plane of minimum gap dimensions. All lesions detected by OmniView-VCI are visible using the render technique. This high reproducibility was validated in symptomatic and asymptomatic women with It was regularly found that operators with different degrees of expertise have pelvic floor dysfunction. Women with and without symptoms of pelvic floor dysfunction can benefit from the OmniView-VCI technique, which offers a dependable method for evaluating the pelvic floor region in both static and dynamic evaluations.[12]

We are now working on omni directional image processing interpretation using neural networks. In order to enhance outdoor uses, a modified The purpose of the OmniView imaging system is to eliminate the robot's dependence on the camera's restricted viewing angle. A basic equation is provided to calculate how much two OmniView images differ in orientation. However, this equation cannot be completely validated for photographs of realworld scenes. Fourier phases appear to be more sensitive to noise, according to analysis and experimental findings.[13]

Identifying periodic events is more sensitive to small discrepancies in the baseline estimate, as even small variations can make a significant difference. The lack of a gold standard for comparison in computer analysis poses a challenge. However, one could argue that such a comparison is unnecessary until computer systems can accurately predict neonatal outcomes. During data analysis, it becomes clear that frequent anomalies are caused by periodic events with amplitudes and/or durations close to the cut-off values.[14]

The aorta is not visible In this view, the descending aorta becomes identifiable after stabilizing row 2, while The ductus arteriosus and pulmonary artery are still invisible. In the majority of cases, we think sonologists may successfully view the outflow tracts by employing the STAR approach. [15]

MATERIALS AND METHOD

Alternatives:

Point Click Care: Point Click Care is a cloud-based healthcare software solution designed for Extended care, skilled nursing centers, and senior residential communities. It provides an integrated platform that includes electronic health records (EHR), revenue cycle management, medication tracking, and care coordination tools. With real-time data access, compliance support, and interoperability features, Point Click Care helps healthcare providers improve efficiency, streamline workflows, and enhance patient outcomes.

MatrixCare: MatrixCare is a leading healthcare software solution designed specifically for long-term care and post-acute care providers. It offers advanced electronic health records (EHR) management, financial solutions, and clinical decision support to enhance patient care and operational efficiency.

Care Cloud: Care Cloud is a cloud-based healthcare management platform that Provides EHR, practice management,

and revenue cycle optimization solutions. It is widely used in outpatient settings and offers integrated billing, analytics, and patient engagement tools.

Cerner LTC: Cerner LTC is tailored for long-term care facilities, offering comprehensive EHR solutions that streamline clinical workflows, medication management, and regulatory compliance. It integrates with other Cerner healthcare solutions to ensure continuity of care across different settings.

Epic MyChart: Epic MyChart is a patient portal that enables individuals Allows patients to view medical records, book appointments, communicate with providers, and track their health information. It is widely adopted by hospitals and healthcare systems as part of the Epic EHR suite.

Meditech Expanse: Meditech Expanse is a web-based EHR system designed for hospitals, ambulatory care, and long-term care providers. It offers interoperability, mobile access, and advanced clinical decision support to improve healthcare delivery and patient outcomes.

Evaluation parameter:

Scalability: Scalability describes the ability of a system to manage growing workloads and expand seamlessly as an organization grows. An ideal healthcare solution should be capable of supporting more users, data, and facilities without compromising performance, ensuring long-term usability and adaptability.

Security & Compliance: Security and compliance are critical factors in evaluating healthcare solutions. The system should adhere to industry standards such as HIPAA, GDPR, and HITECH, ensuring data protection, patient privacy, and regulatory compliance. Strong encryption, access controls, and audit logs help safeguard sensitive information.

Cloud & Integration: Cloud capabilities and integration determine how well a system connects with other healthcare applications, including EHRs, billing platforms, and third-party tools. A cloud-based solution offers remote accessibility, automatic updates, and improved interoperability, enhancing operational efficiency and data-sharing capabilities.

Cost & ROI: Cost and return on investment (ROI) are key considerations when selecting a healthcare platform. Organizations should assess The overall cost of ownership, which includes licensing, implementation, maintenance, and training costs, while evaluating the potential financial and operational benefits the system provides.

Technical Support & Training: Reliable technical support and thorough training are key to seamless adoption and lasting success use of any healthcare system. Providers should ensure the availability of 24/7 support, onboarding assistance, user training programs, and documentation to maximize efficiency and reduce downtime.

Reporting & Analytics: Robust reporting and Analytical capabilities allow organizations to derive valuable insights from

data. A system with customizable dashboards, predictive analytics, and automated reporting helps healthcare providers make informed decisions, track performance metrics, and enhance patient care.

EDAS

The first to employ EDAS for industrial robot selection. This study aims to illustrate the EDAS approach's applicability and effectiveness in contrast to the existing MCDM approaches for resolving industrial robot selection issues. In this regard, four sample issues that are frequently utilized in the literature were resolved, and the outcomes of the EDAS method were contrasted with the approaches taken to handle these samples. One of the four scenarios is selected using the EDAS approach, which is evaluated. The EDAS method was chosen for robot ranking because it is a new approach with a wide range of applications and lower computational cost than previous MCDM techniques. EDAS eliminates the possibility of experts unfairly biasing towards alternative solutions, as its solution is obtained. The average solution. The most important features of the EDAS method are its simplicity and the reduction in the number of calculations required. The proposed hybrid BW-EDAS method can be applied to various qualitative and quantitative parameters to rank the preferences of robots. Any industrial selection problem with limited selection criteria can be solved with the help of the proposed technique, which is a general procedure. In the future, we will use the FUCOM approach to determine the weights and compare our proposed way for the ranking process with EDAS methods. It is possible to extend the work to the fuzzy environment. On the contrary, the use of fuzzy EDAS can be seen in achieving vulnerable solutions.

MCDM is a well-established decision-making framework that, when combined with fuzzy logic, effectively manages uncertainty in complex decision-making situations. The use of fuzzy MCDM approaches in energy decision-making and policymaking offers several advantages, including the ability to integrate many different and sometimes conflicting criteria into parameters, improving the evaluation process by making it more flexible, unbiased, and adaptable to various alternatives. EDAS is a distance-based method that ranks the available options using both positive and negative distances from the average solution. The types of advantageous and non-beneficial criteria were. Because of its ease of use and capacity to take into account an infinite number of options and criteria throughout the decisionmaking process, EDAS is an excellent tool. As a result, the current approaches typically involve intricate calculations and provide decision-makers with rigid answers. In light of this problem. As was previously said, the EDAS approach is one of the MCDM techniques. This relatively recent and successful method was developed by Keshavarz Gorbea. This study proposes an extension of the EDAS to effectively handle the stochastic MCDM problems, based on the significance of the normal distribution, its properties, and the EDAS approach. The suggested strategy is unique, as the EDAS method has never been applied or expanded for stochastic MCDM issues. The suggested method can be used to solve a wide range of real-

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world issues in science, management, and engineering, even though it was used in this study to evaluate bank branches. We use the stochastic EDAS approach to evaluate a bank branch as an example. In this section, we also do a comparison and a sensitivity analysis to show the validity and dependability of the stochastic' EDAS results. Conclusion and future research directions. Therefore, we can say that using the proposed stochastic EDAS approach can assist decision-makers in taking data uncertainty into account when evaluating options. In order to address MCDM problems with normally distributed data, we have suggested a stochastic modification of the EDAS approach. We have established optimistic and pessimistic values for a few of the suggested approach's parameters in order to account for data uncertainty during the evaluation process. By employing This study extends the EDAS (Estimation Based on Distance from Average Solution) method by incorporating interval-valued Pythagorean fuzzy numbers to solve fuzzy multi-criteria group decision-making problems with a wider membership domain and increased flexibility. An illustrative example of a car selection problem demonstrates the effectiveness and applicability of the model, with results compared to the intuitive interval-valued fuzzy EDAS method. In addition, sensitivity analysis is conducted to assess the impact of weight variations on the alternative rankings.

RESULTS AND DISCUSSION

TABLE1

	Scalability	Security & Compliance	Cloud & Integration	Cost & ROI	Technical Support & Training	Reporting & Analytics
PointClickCare	250	720	650	564	5860324	560
MatrixCare	324	880	250	245	251	352
CareCloud	351	950	450	357	512	314
Cerner LTC	750	854	650	248	250	256
Epic MyChart	710	820	235	645	425	254
Meditech Expanse	650	720	954	235	365	235

Scalability Epic My Chart (710) and Cerner LTC (750) are among the most scalable solutions, making them well-suited for growing organizations with expanding patient bases. Meditech Expanse (650) and Care Cloud (351) offer moderate scalability, while Point Click Care (250) and Matrix Care (324) may be more suitable for smaller or medium-sized healthcare providers. Security & Compliance Care Cloud (950) leads in security and compliance, indicating strong adherence to industry regulations and data protection standards. Matrix Care (880) and Cerner LTC (854) also demonstrate high security measures. Epic My Chart (820) and Point Click Care (720) offer solid security features, while Meditech Expanse (720) provides reliable but slightly less robust compliance capabilities. Cloud & Integration Meditech Expanse (954) excels in cloud and integration capabilities, making it a strong option for organizations seeking interoperability. Point Click Care (650) and Cerner LTC (650) also offer strong cloud-based functionalities. CareCloud (450) and Epic My Chart (235) have moderate integration support, while Matrix Care (250) may have limited cloud compatibility. Cost & ROI Epic My Chart (645) offers the highest costeffectiveness and return on investment, making it a financially sound choice. Point Click Care (564) and Care Cloud (357) also provide good ROI. Matrix Care (245) and Cerner LTC (248) have relatively lower ROI potential, while Meditech Expanse (235) may have the least favorable cost-benefit balance. Technical Support & Training Point Click Care (5,860,324) stands out with exceptional technical support and training resources, ensuring comprehensive assistance for users. Care Cloud (512) and Epic MyChart (425) offer moderate support, while Meditech Expanse (365) and Matrix Care (251) may provide more basic support. Cerner LTC (250) ranks the lowest in this category, suggesting limited training or technical assistance. Reporting & Analytics Point Click Care (560) leads in reporting and analytics, making it a strong choice for datadriven decision-making. Matrix Care (352) and Care Cloud (314) offer moderate reporting capabilities, while Cerner LTC (256) and Epic My Chart (254) provide basic analytics features. Meditech Expanse (235) has the least extensive reporting and analytics tools





FIGURE 1

Figure 1 presents a line graph representation of the performance metrics of six healthcare management systems: PointClickCare, Matrix Care, Care Cloud, Cerner LTC, Epic My Chart, and Meditech Expanse. The evaluation is based on key parameters such as scalability, security & compliance, cloud integration, cost & ROI, technical support & training, and reporting & analytics. PointClickCare exhibits a significant peak, indicating a substantially higher value in one of the

evaluation parameters, particularly technical support & training. All other systems remain relatively flat, showing consistent performance across various parameters but without significant spikes or variations. The drastic variation in Point Click Care's performance suggests that it excels in a specific area where others show little to no deviation. The remaining systems appear stable, indicating uniform performance across the measured criteria without major strengths or weaknesses.

	Positive Distance from Average (PDA)					
	Scalability	Security & Compliance	Cloud & Integration	Cost & ROI	Technical Support & Training	Reporting & Analytics
PointClickCare	0.000	0.000	0.223	0.475	4.998	0.705
MatrixCare	0.000	0.068	0.000	0.000	0.000	0.072
CareCloud	0.000	0.153	0.000	0.000	0.000	0.000
Cerner LTC	0.483	0.036	0.223	0.000	0.000	0.000
Epic MyChart	0.404	0.000	0.000	0.687	0.000	0.000
Meditech Expanse	0.285	0.000	0.795	0.000	0.000	0.000

TABLE 2

Scalability Cerner LTC (0.483) and Epic MyChart (0.404) demonstrate significant positive deviations from the average, indicating their strong scalability advantages. Meditech Expanse (0.285) also surpasses the average, making it a solid choice for

growth-oriented organizations. PointClickCare, MatrixCare, and CareCloud all show no positive deviation, suggesting they perform at or below the average in scalability. Security & Compliance Care Cloud (0.153) leads in security and

compliance deviation, showing it performs significantly better than the average. MatrixCare (0.068) and Cerner LTC (0.036) also have slight positive deviations, suggesting above-average compliance measures.

PointClickCare, Epic My Chart, and Meditech Expanse all show no deviation, indicating their security features align closely with the industry average. Cloud & Integration Meditech Expanse (0.795) stands out with the highest positive deviation in cloud and integration, showcasing its superior capabilities in this domain. PointClickCare and Cerner LTC (both 0.223) also exceed the average, making them viable options for cloud-based solutions. Other solutions like Matrix Care, Care Cloud, and Epic My Chart show no positive deviation, suggesting they are at or below the average in cloud and integration features. Cost & ROI Epic My Chart (0.687) and PointClickCare (0.475) significantly exceed the average in cost-effectiveness, indicating a high return on investment. Other solutions, including Matrix Care, Care Cloud, Cerner LTC, and Meditech Expanse, show no positive deviation, meaning their cost-effectiveness is either average or below average.

Technical Support & Training PointClickCare (4.998) shows an extraordinary positive deviation, emphasizing its industry-leading technical support and training resources. No other solution shows positive deviation in this category, suggesting they provide either average or below-average support in comparison. Reporting & Analytics PointClickCare (0.705) leads in reporting and analytics, indicating that it provides significantly better data insights than competitors. Matrix Care (0.072) has a minor positive deviation, while other solutions, including Care Cloud, Cerner LTC, Epic My Chart, and Meditech Expanse, show no deviation, indicating their analytics capabilities remain at or below the industry average.

		Negative Distance from Average (NDA)				
	Scalability	Security & Compliance	Cloud & Integration	Cost & ROI	Technical Support & Training	Reporting & Analytics
PointClickCare	0.506	0.126	0.000	0.000	0.000	0.000
MatrixCare	0.359	0.000	0.530	0.359	1.000	0.000
CareCloud	0.306	0.000	0.153	0.066	0.999	0.044
Cerner LTC	0.000	0.000	0.000	0.351	1.000	0.221
Epic MyChart	0.000	0.005	0.558	0.000	1.000	0.227
Meditech Expanse	0.000	0.126	0.000	0.385	1.000	0.285

TABLE 3

Scalability PointClickCare (0.506) has the highest negative deviation in scalability, indicating it falls significantly below the average in its ability to scale. Matrix Care (0.359) and Care Cloud (0.306) also have notable negative deviations, suggesting they may struggle with expansion and high-demand usage. On the other hand, Cerner LTC, Epic My Chart, and Meditech Expanse show no negative deviation, meaning they meet or exceed scalability expectations. Security & Compliance PointClickCare (0.126) and Meditech Expanse (0.126) show the most significant negative deviation in security and compliance, indicating they may lag in meeting industry standards.

Epic My Chart (0.005) has a minimal deviation, while Matrix Care, Care Cloud, and Cerner LTC show no negative deviation, suggesting they meet or exceed the security and compliance benchmarks. Cloud & Integration Epic MyChart (0.558) has the most substantial negative deviation in cloud and integration, implying it may lack strong cloud-based functionalities. MatrixCare (0.530) and CareCloud (0.153) also have notable negative deviations, suggesting potential limitations in their integration capabilities. PointClickCare, Cerner LTC, and Meditech Expanse show no negative deviation, meaning they perform at or above the average in this category. Cost & ROI Meditech Expanse (0.385), Cerner LTC (0.351), and Matrix Care (0.359) show notable negative deviations in cost and return on investment, suggesting they may not provide the best financial value. Care Cloud (0.066) has a minor negative deviation, while PointClickCare and Epic My Chart show no negative deviation, indicating they meet or exceed cost-effectiveness expectations.

Technical Support & Training Matrix Care, Care Cloud, Cerner LTC, Epic My Chart, and Meditech Expanse all have the highest negative deviation (1.000), indicating significant shortcomings in technical support and training. In contrast, PointClickCare shows no negative deviation, reinforcing its strength in this area. Reporting & Analytics Meditech Expanse (0.285) and Epic My Chart (0.227) exhibit the highest negative deviation in reporting and analytics, suggesting their data analysis capabilities are below average. Cerner LTC (0.221) and CareCloud (0.044) also have negative deviations, though less severe. PointClickCare and MatrixCare show no negative

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Weight 0.166667

deviation, indicating they meet or exceed the reporting and ar TABLE 4

The weight values presented in Table 4 indicate an equal distribution across all six evaluation parameters: Scalability, Security & Compliance, Cloud & Integration, Cost & ROI, Technical Support & Training, and Reporting & Analytics. Each parameter has been assigned a uniform weight of 0.1667 (16.67%), meaning no single factor is prioritized over another. This equal weighting approach suggests a balanced evaluation framework where all parameters are considered equally important in assessing the overall performance of different

healthcare management systems. It ensures that no aspect, whether scalability, security, or cost-effectiveness, disproportionately influences the final decision. By maintaining a uniform weight distribution, this model provides an unbiased and holistic assessment, making it ideal for comparative analysis across different solutions without favoring any specific criteria. Organizations leveraging this framework can make wellrounded decisions, ensuring all critical areas are adequately addressed when evaluating healthcare software solutions.

TABLE	5
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		Weighte	d PDA			SPi
0.00000	0.00000	0.03716	0.07919	0.83303	0.11745	1.06683
0.00000	0.01133	0.00000	0.00000	0.00000	0.01192	0.02325
0.00000	0.02549	0.00000	0.00000	0.00000	0.00000	0.02549
0.08045	0.00607	0.03716	0.00000	0.00000	0.00000	0.12368
0.06727	0.00000	0.00000	0.11450	0.00000	0.00000	0.18177
0.04750	0.00000	0.13249	0.00000	0.00000	0.00000	0.17999

The weighted Positive Distance from Average (PDA) values presented in Table 4 provide an adjusted representation of each evaluation parameter's deviation from the average performance. The SPi (Summed Performance Index) is calculated as the sum of these weighted PDA values, offering a cumulative measure of each system's strength in comparison to the benchmark. PointClickCare exhibits the highest SPi score (1.06683), driven mainly by its exceptional performance in Technical Support & Training (0.83303), indicating strong user

support and training resources. Matrix Care and Care Cloud have relatively low SPi values (0.02325 and 0.02549 respectively), showing minimal positive deviation from the average across all parameters. Cerner LTC and Epic My Chart show moderate performance, with Cerner LTC (0.12368) performing better in Scalability and Cloud & Integration, while Epic My Chart (0.18177) stands out in Cost & ROI. Meditech Expanse (0.17999) demonstrates notable strength in Cloud & Integration (0.13249), which suggests strong cloud capabilities.

analytics standards.

Weighted NDA					SNi	
0.08429	0.02104	0.00000	0.00000	0.00000	0.00000	0.10533
0.05991	0.00000	0.08827	0.05987	0.16662	0.00000	0.37467
0.05102	0.00000	0.02556	0.01104	0.16658	0.00736	0.26155
0.00000	0.00000	0.00000	0.05856	0.16662	0.03678	0.26197
0.00000	0.00081	0.09298	0.00000	0.16659	0.03780	0.29818
0.00000	0.02104	0.00000	0.06423	0.16660	0.04744	0.29930

TABLE 6

The Weighted Negative Distance from Average (NDA) values reflect the extent to which each system deviates negatively from the average performance. The SNi (Summed Negative Index) aggregates these values to provide an overall measure of relative weakness across evaluation parameters. PointClickCare has the lowest SNi score (0.10533), indicating minimal negative deviation, particularly excelling in Cloud & Integration, Cost & ROI, and Technical Support & Training, where it shows no negative deviation. Matrix Care (0.37467) and Care Cloud (0.26155) show moderate weaknesses,

particularly in Cloud & Integration and Cost & ROI, suggesting room for improvement in these areas. Cerner LTC (0.26197) has a notable negative deviation in Cost & ROI and Reporting & Analytics, implying potential drawbacks in financial returns and analytical capabilities. Epic My Chart (0.29818) and Meditech Expanse (0.29930) have the highest SNi scores, with weaknesses primarily in Cloud & Integration and Technical Support & Training, suggesting potential issues with cloud adoption and user support.

TABLE '	7
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	Spi	Sni
PointClickCare	1.00000	0.71888
MatrixCare	0.02179	0.00000
CareCloud	0.02389	0.30192
Cerner LTC	0.11593	0.30082
Epic MyChart	0.17039	0.20417
Meditech Expanse	0.16871	0.20116

Table 7 presents the SPI (Summed Positive Index) and SNI (Summed Negative Index) for different healthcare management systems, offering a comparative assessment of their strengths and weaknesses. PointClickCare has the highest SPI score (1.00000) and a relatively high SNI (0.71888), indicating strong positive attributes but also some areas of concern. Despite its leading position in strengths, it has notable negative deviations, suggesting potential areas for improvement.MatrixCare has the lowest SPI (0.02179) but zero SNI (0.0000), meaning it does

not exhibit significant negative deviations but also lacks strong distinguishing positive features.CareCloud (SPI: 0.02389, SNI: 0.30192) and Cerner LTC (SPI: 0.11593, SNI: 0.30082) demonstrate a balance of moderate strengths and weaknesses, with both systems having room for enhancement in performance areas.Epic MyChart (SPI: 0.17039, SNI: 0.20417) and Meditech Expanse (SPI: 0.16871, SNI: 0.20116) have similar profiles, reflecting a mix of moderate strengths with lower negative deviations.

TABLE 8

	ASi
PointClickCare	0.85944
MatrixCare	0.01090
CareCloud	0.16291
Cerner LTC	0.20837
Epic MyChart	0.18728
Meditech Expanse	0.18494

Table 7 presents the ASi (Aggregate Score Index) for different healthcare management systems, providing a consolidated measure of their overall performance by balancing both positive and negative attributes. PointClickCare has the highest ASi score (0.85944), indicating its strong overall performance and ability to deliver high value across multiple evaluation parameters. This suggests that PointClickCare is a well-rounded solution with superior advantages compared to other systems. Matrix Care has the lowest ASi (0.01090), reflecting minimal positive differentiation. This implies that while it does not exhibit significant negative traits, it also does not stand out in terms of strengths. Cerner LTC (ASi: 0.20837) and Care Cloud (ASi: 0.16291) demonstrate moderate aggregate performance, balancing their strengths and weaknesses. These systems may cater to specific use cases where certain features are prioritized. Epic My Chart (ASi: 0.18728) and Meditech Expanse (ASi: 0.18494) exhibit similar scores, reflecting their relatively balanced performance. They offer a mix of strengths but do not dominate across all parameters.

TABLE	9
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	Rank
Point Click Care	1
MatrixCare	6
Care Cloud	5
Cerner LTC	2
Epic MyChart	3
Meditech Expanse	4

Table 9 presents the ranking of healthcare management systems based on their overall performance, derived from their Aggregate Score Index (ASi) and other evaluation parameters. The ranking helps identify the most effective and well-rounded solutions in the industry. Point Click Care is ranked 1st, indicating its superior performance across multiple parameters. Its strong scalability, compliance, cloud integration, and technical support make it the most reliable and efficient choice. Cerner LTC secures the 2nd position, reflecting a well-balanced system with notable strengths in security, compliance, and integration capabilities. Epic My Chart ranks 3rd, showing competitive performance, particularly in cost-effectiveness and usability, making it a viable alternative for healthcare providers. Meditech Expanse is placed 4th, demonstrating strong cloud integration but lagging slightly in other key areas. Care Cloud holds the 5th position, indicating moderate capabilities but facing challenges in some performance aspects compared to the higher-ranked solutions. Matrix Care ranks 6th, suggesting that while it has certain benefits, it falls behind in overall functionality, scalability, and impact.

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FIGURE 2

Figure 2 presents a bar chart representation of the rankings of various healthcare management systems based on their overall performance and effectiveness. The rankings are determined using multiple evaluation parameters, including scalability, security and compliance, cloud integration, cost and ROI, technical support and training, and reporting and analytics. Point Click Care (Rank 1) is the highest-ranked system, indicating its superior overall performance and reliability in

CONCLUSION

The comparative analysis of various healthcare management systems highlights the strengths and weaknesses of each solution based on key performance parameters. PointClickCare emerges as the leading system, demonstrating superior performance in technical support & training, while other systems such as Cerner LTC, Epic My Chart, and Meditech Expanse show balanced capabilities across multiple criteria. Despite Matrix Care and Care Cloud ranking lower in the overall evaluation, they may still serve specific use cases

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healthcare management. Cerner LTC (Rank 2) follows closely, demonstrating strong functionality and integration capabilities. Epic MyChart (Rank 3) and Meditech Expanse (Rank 4) perform moderately well, offering competitive features but slightly lagging behind the top contenders. Care Cloud (Rank 5) and MatrixCare (Rank 6) rank lower, indicating room for improvement in key operational areas.

depending on organizational needs. This study underscores the importance of scalability, security, cloud integration, costeffectiveness, and reporting capabilities in selecting an optimal healthcare management solution. The findings provide valuable insights for healthcare providers, enabling them to make informed decisions that align with their operational requirements and long-term objectives. Ultimately, the choice of a healthcare management system should be guided by a comprehensive assessment of its features, adaptability, and ability to enhance overall efficiency in patient care and administrative workflows.

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