

Wings of Change: Embedding Eagle Performance System for Investment Management

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Abstract

The fast development of the field of artificial intelligence has also had a considerable impact on the field of medical image analysis which provided the valuable tool to diagnose the disease, segment it and classify this class. Of them, the federated learning has become a new potential approach to preserve privacy: this learning technique allows training a shared model with decentralized datasets, instead of transferring sensitive patient information. This review gives a broad analysis of federated learning architecture with other machine learning based approaches used in medical imaging. We investigate the modern issues (data heterogeneity, communication overhead, lack of convergence of the model) and analyze possible solutions to those problems and the recent breakthroughs in that direction. Future research directions to improve model robustness, scalability and applicability in clinical practice are described at the end of the paper.

Keywords: Federated learning, medical image analysis, artificial intelligence, deep learning, privacy-preserving models, collaborative computing, convolutional neural networks, healthcare data security, diagnostic imaging, distributed machine learning.

1.Introduction

Portfolio performance measurement is the quality control of the investment decision process providing the necessary information to enable asset managers and clients to assess exactly how the money has been invested and the results of the process(1).

Investment Performance Measurement techniques quantify how much return we earned, how we earned it, and what risks we took along the way. Performance measurement is a backward-looking, or ex-post, undertaking.

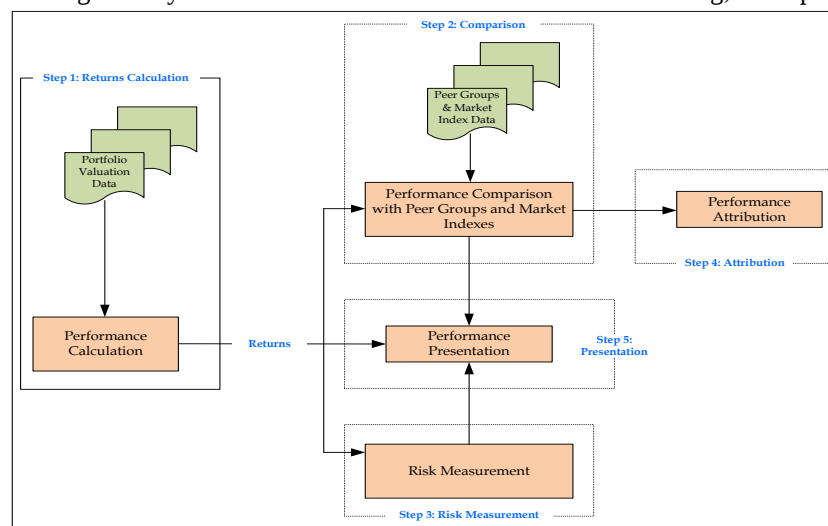


FIGURE 1 Performance Measurement Process

Performance measurement begins with the valuation of the assets within the portfolio. We take the actual portfolio positions, prices, transactions, and other inputs and then:

Step 1: Calculate Portfolio Returns

Begin by computing the overall return of the investment portfolio over the specified period. This involves measuring the change in the portfolio's value, including income received (such as dividends or interest) and capital gains or losses(2).

Step 2: Benchmark Comparison

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Next, compare the portfolio's performance against relevant benchmarks, including peer funds, market indices, and other performance standards. This helps determine how effectively the portfolio has performed relative to its competitors and the broader market.

Step 3: Assess Risk and Manager Skill

Evaluate both absolute risk (the total volatility of returns) and relative risk (the risk taken compared to the benchmark). Using this information, calculate key performance statistics that measure the fund manager's skill, such as the Sharpe ratio, Information ratio, and alpha. This step examines how the manager's decisions influenced returns relative to the level of risk assumed.

Step 4: Identify Sources of Return

To understand what drove performance, analyze the returns of individual securities and portfolio segments. Determine each component's contribution to total return, and compare these contributions to those of the benchmark(3). This performance attribution process separates the value added by asset allocation (how the manager distributed investments across asset classes) and security selection (which specific securities were chosen).

Step 5: Reporting and Presentation

Finally, compile and present the risk and return results following industry and regulatory standards. This includes aggregating performance data across all client accounts and funds managed under the same strategy to form composites. These composites are then used for performance reporting and marketing purposes, showcasing the manager's investment capabilities to prospective clients.

2.Eagle performance

Eagle Investment Systems, a subsidiary of BNY Mellon, delivers advanced financial technology solutions designed to support data management, investment accounting, and performance measurement for financial institutions. The company offers Eagle ACCESS(SM), a secure cloud-based platform, along with a suite of managed services that enable clients to efficiently manage assets, enhance operational performance, and mitigate risk.

Eagle's performance measurement solution is a fully integrated system that encompasses data consolidation, portfolio and retail fund return calculations, performance attribution, benchmark management, analytical tools, and comprehensive reporting capabilities. The Eagle Performance Suite provides an enterprise-wide framework that centralizes and streamlines the entire performance measurement process, ensuring accuracy, consistency, and transparency across all levels of investment operations.

With Eagle Performance you can:

- Conduct comprehensive segment performance analysis by grouping securities into customized segments such as sectors, industries, or countries. The system allows you to create and manage an unlimited number of segments and segment groups for detailed performance insights.
- Identify the true drivers of returns through both equity and fixed income attribution analysis, revealing how investment decisions contributed to overall portfolio performance.
- Enhance return accuracy by calculating and linking sub-period returns around major cash flows, using thresholds defined as a percentage of the portfolio's market value.
- Evaluate risk-adjusted performance using ex post risk metrics such as Tracking Error, Sharpe Ratio, and Treynor Ratio, helping to better understand the relationship between risk and return.
- Integrate historical performance data from external sources at any level total portfolio, segment, or security and link it seamlessly with new returns generated by Eagle Performance.
- Incorporate exchange rate data from multiple sources to produce multi-currency performance reports, supporting performance measurement and analysis across an unlimited number of currencies.
- Assess security-level performance to determine how each individual investment contributes to both segment-level and total portfolio results.
- Create, manage, and maintain an unlimited number of composites, each containing any number of portfolios, with a complete audit trail documenting all changes in composite membership.
- Benchmark portfolio performance against market-based or custom benchmarks at any level ranging from individual securities to the total portfolio including blended, carve-out, linked, and floating benchmarks.

- Calculate both pre- and post-tax returns, and present after-tax performance at the portfolio, segment, and security levels to provide a more accurate view of realized investor value.
- Generate extensive, customizable performance reports and GIPS-compliant presentations, allowing users to choose specific segments, securities, time periods, and data fields to meet reporting needs.
- Calculate mutual fund returns in full compliance with SEC regulatory requirements, ensuring transparency, consistency, and accuracy in fund performance reporting.

2.1 Performance Workflow:

The diagram illustrates the workflow that surrounds Eagle Performance.

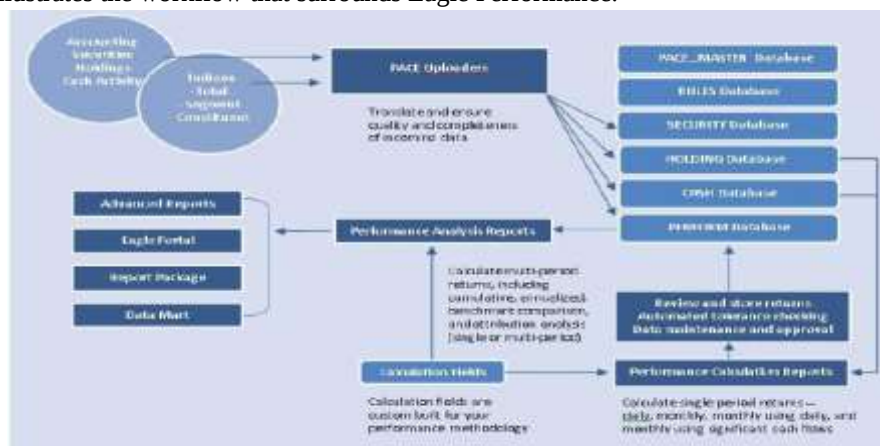


FIGURE 2 Eagle Performance Workflow

BASIC STEPS:

1. Gather requisite data
2. Build and schedule uploaders
 - 2.1 Massage data to fit methodology
 - 2.2 Translate data if needed
3. Configure and schedule calculation reports
 - 3.1 Compute single period returns
 - 3.2 Determine periodicity
 - 3.3 Determine return "flavor"
4. Store returns
 - 4.1 Server side process
 - 4.2 Tolerance Checking
 - 4.3 Manual Process
5. Configure and schedule analysis reports
 - 5.1 Compute Multi Period returns
 - 5.2 Compare Fund and Benchmark returns
 - 5.3 Conduct Risk Analysis
 - 5.4 Conduct Attribution Analysis
6. Publish reports
 - 6.1 Advanced Reporting
 - 6.2 Eagle Portal
 - 6.3 Archiving
 - 6.4 Report Packages
 - 6.5 Websites
 - 6.6 Data Mart

The Eagle Performance system is a robust performance measurement and attribution system that features:

- Multiple attribution models tailored for multi-currency equity and fixed-income portfolios, providing detailed insights into performance drivers across asset classes.
- A wide range of industry-standard performance calculations, such as the Modified Dietz method and Internal Rate of Return (IRR), enabling accurate monitoring of both returns and associated risks.

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- Measurement of absolute and relative returns across multiple levels including composite, country, region, and sector for a complete view of investment performance.
- Support for custom benchmarking and indexing, allowing performance comparison at both the security and fund levels.
- Fully GIPS-compliant composite functionality, ensuring adherence to global performance reporting standards.
- Comprehensive performance and attribution reporting packages designed for clear communication and analysis of results.
- A flexible implementation toolkit that facilitates quick and efficient deployment of new systems and configurations.

2.2 Leveraging Eagle PACE:

Eagle Performance is a performance calculation and presentation tool built on the core Eagle PACE portfolio management system. By leveraging Eagle PACE, you take advantage of the flexibility of the system(4).

Many functions of Eagle PACE are used throughout the performance workflow. These functions include:

- Uploaders: custom-based characteristics of the accounting system.
- Data Steward: monitor, repair, and reprocess data.
- Reporting: the calculation, maintenance, and storing of performance data.
- Advanced reporting: client-ready presentation of performance(5).

Displayed below is a diagram gives a task-based overview of Eagle Performance and the PACE components you can use throughout the performance workflow:

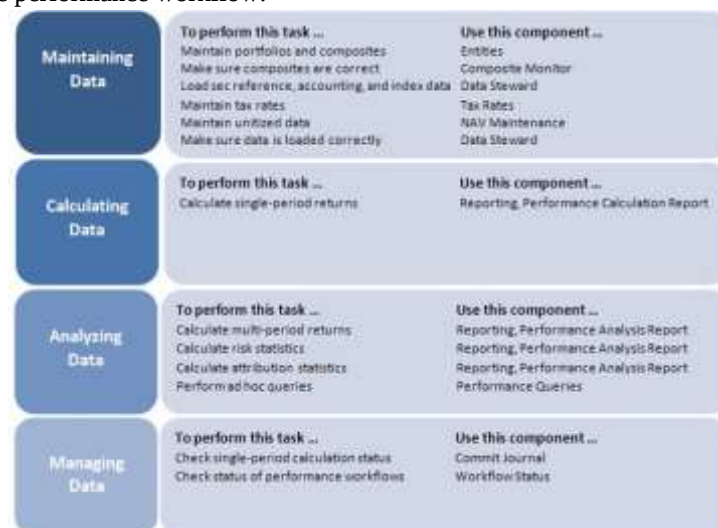


FIGURE 3 Leveraging Eagle PACE

3. Implementation Process

A PACE Performance Implementation is broken up into a requirements phase and a development/implementation phase. A specifications document and the project plan are deliverable from the requirements p(6).

3.1 Requirements Phase

Each of the items listed below are crucial in properly getting your project off the ground.

3.1.1 Requirements Project Kickoff

- Identify the performance implementation project team and skill sets required.
- Setup meeting schedules and reporting.
- Identify goals and projects phasing. For example, rollout by office or by strategy.

3.1.2 Performance Calculation

- Entity: mutual funds, separate accounts, commingled products, fund of funds, composites.
- Entity Level: total level uses unit price returns, sector level uses IRR.
- Determine frequency of return calculation by entity type.
- Performance statistics to calculate and store, i.e. Return, Return excluding management.

- Fees, market value plus income, etc.
- Identify composite and sub-portfolio breakout types.

3.1.3 Reporting

- Specify initial reports required: content, frequency, periods, rollup level of reporting.
- Specify extract and export requirements.

3.1.4 Accounting Data

- Based on calculation and reporting requirements.
- Identify accounting data sources and timing.
- Identify reference data sources, including benchmarks and analytics.
- Identify source and format of performance history.

3.1.5 Reference Data

- Based on calculation and reporting requirements.
- Identify reference data sources, including benchmarks and analytics.
- Identify required security definition dictionaries.
- Identify users and security scheme.

3.2 Implementaion Phase

The deliverable from this phase is a production-ready system. Each of the components required are listed below, including system configuration and testing(7).

3.2.1 System Configuration

- Map data uploaders/exporters for Performance to PACE database.
- Develop and test customized development items.
- Configure mapping of accounting events to cash flow treatment.
- Configure calculation functions/inference rules for Performance audit.
- Build reports/report packages.
- Setup entities including composite definition.

3.2.2 Parallel testing

- Procedures and controls development.
- Parallel test.
- Production cutover.

4.Conclusion

This paper concludes by giving a decent overview of all the possibilities to implement the Eagle Performance system to calculate returns and risks. The research conducted through comparative analysis of Eagle Performance System brings to the fore the deviations in their performance, dynamism of risk-return and other strategies that are critical in determining investor behavior.

Selection of the Performance project scope, goals and priorities is important to success. I recommend a phased approach in order to implement a working end-to-end system producing useful output as soon as possible and to shake out any issues. A parallel period is recommended for conversions of at least one full performance cycle for each type of entity. Projects can be phased by entity type, composite, asset class, reporting requirements, office location, or frequency (monthly/daily). Organizations with multiple accounting systems can phase by system, etc. In conclusion, this article reiterates that Eagle Performance, when supplemented with quality knowledge, technological means and investing principles, can become a revolutionary force when it comes to building wealth and the financial system as a whole.

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Conflicts of interest

The authors have no conflicts of interest to declare

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