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INTRODUCTION

- Clinical data is distributed across heterogeneous systems, including clinical databases, research repositories, electronic health records (EHRs), external data sources, and trial management platforms
- This proof-of-concept aimed to validate the model context protocol (MCP) as a standardized, secure, and reproducible interface for enabling artificial intelligence (AI) access to distributed HEOR and life sciences data sources

METHODS

- A proof-of-concept AI framework was developed to evaluate MCP as a unified interface for AI interaction within complex healthcare environments
- The system integrated with SharePoint to retrieve contextually relevant unstructured evidence (including dossiers, reports, PDF files for a specific disease area) via metadata-driven search
- In addition, the system was connected to databricks using MCP, enabling the secure execution of SQL and Python analyses directly within the platform to retrieve structured data
- A virtual assistant was integrated to synthesize information from the appropriate data sources and generate HEOR-relevant insights
- Generated insights were reviewed and validated by subject matter experts (SMEs) to ensure accuracy, relevance, clarity, and alignment with established HEOR evidence standards

RESULTS

Reduction in Evidence Retrieval Time

SME-Evaluated Prompts Across HEOR Domains

Source Traceability Across Queries

Tools Collapsed into a Single MCP Interface

- The SMEs evaluated the system using more than 50 prompts to assess integration performance. MCP-based integration reduced the effort required to identify relevant evidence across systems and minimize the cross-platform navigation compared to traditional manual workflows, resulting in faster insight generation
- The SMEs confirmed that the generated insights were relevant, interpretable, and offered transparent traceability to underlying data sources, demonstrating suitability for healthcare evidence generation and decision support

CONCLUSIONS

- This study demonstrated that MCP enables standardized and governed integration of structured and unstructured HEOR data sources, supporting efficient, consistent, and traceable evidence generation
- Furthermore, the MCP-enabled architecture is extensible, allowing for the incorporation of additional data sources and platforms while maintaining necessary governance controls and expert oversight

Figure 1: MCP-Enabled Workflow for AI-Driven HEOR Evidence Generation

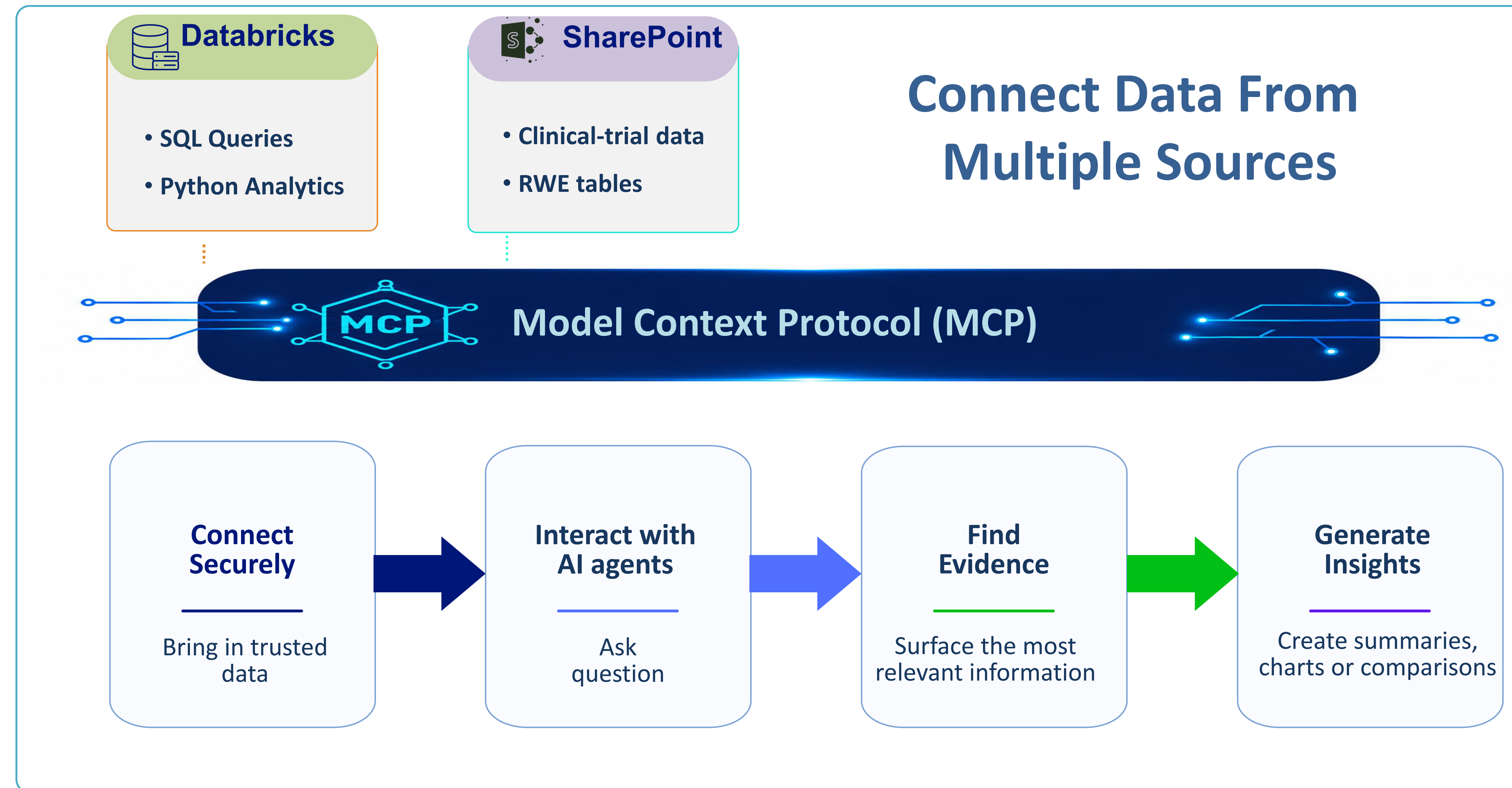


Figure 2: Multi-Source Healthcare Data Integration Through MCP

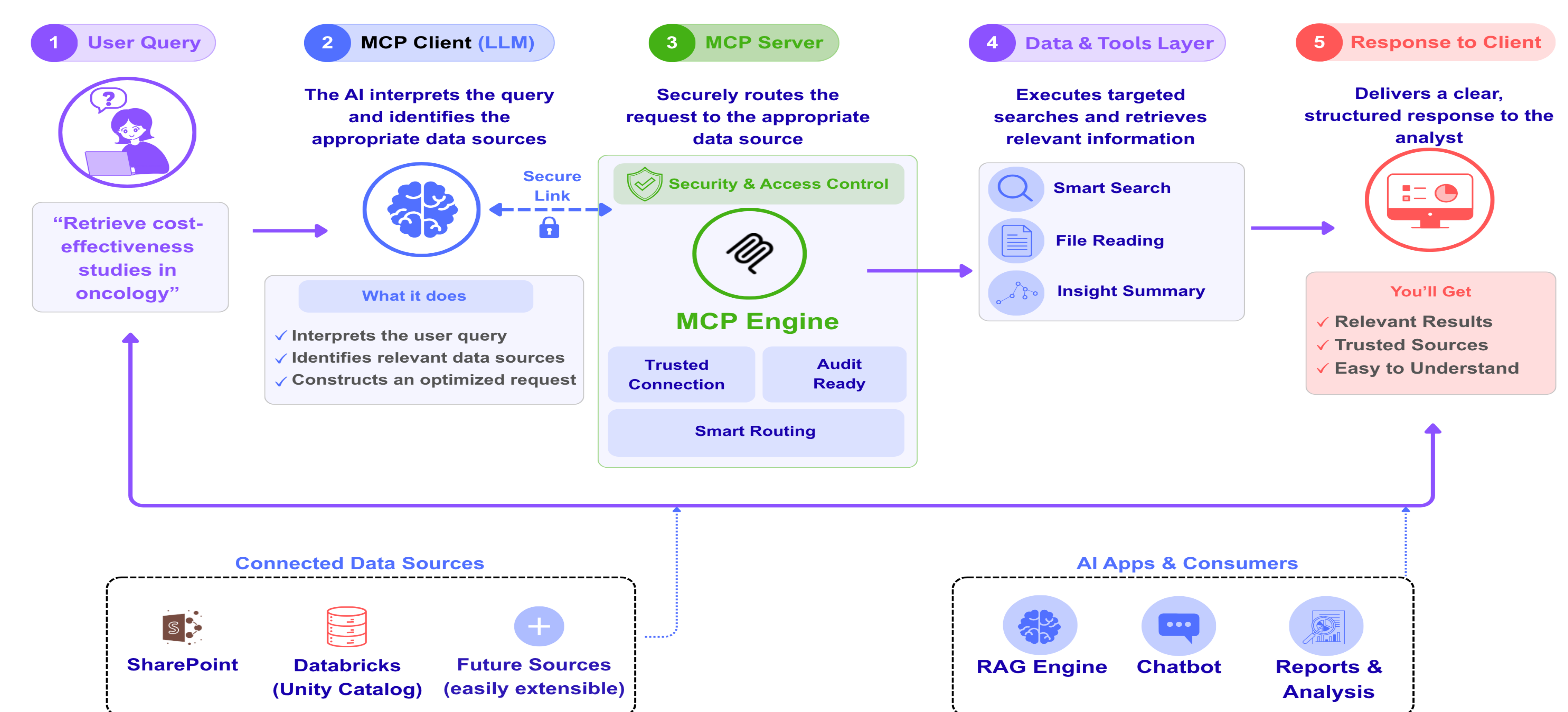


Figure 3: Key Value Drivers of MCP-Based Integration

