1. What is BLUE?

BLUE is the enterprise's integrated, flexible and interoperable platform that will anchor the *scale-up our data science and technology-enabled* clinical, pharma and provider businesses, and will be *the launch-pad for rapid incubation and growth of new capabilities*. BLUE emphasizes the integration of our proprietary payer, provider and clinical data linked with high-value, third party data assets and promotes the reuse of assets for efficiency and quality.

2. What are the differentiating factors of BLUE?

Enables new products and capabilities

- **Empowers** UHG to rapidly experiment, prototype, deploy and scale internal and market facing opportunities: BLUE is the platform incubator for emerging businesses and for incremental growth
- **Links best-in-class UHG data science capabilities with third-party assets**, such a weather, environment and vulnerability indices, considered key for growth in new Pharma Services, ESG services and bio-surveillance.
- **Enables a "Marketplace" to access** de-identified healthcare and environmental data & insights, to access UHG apps, analytics and APIs or to create custom models, products and services leveraging the power of UHG's data and technology assets.
- **Enhances customer data sets.** BLUE's Enterprise Logical Data Model (ELDM) empowers customers to adapt their data to the BLUE format. This facilitates integration and association of customer data with analogous data in BLUE's thereby producing richer, more comprehensive insights while offering more balanced training data for artificial intelligence.

Modern Technology Foundation

- **Large Language Models (LLMs).** A BLUE-LLM could be trained on UHG's Enterprise Logical Data Model (ELDM) to understand the structure, relationships and nuances of our complex data domains. One of the strengths of LLMs is processing natural language thus allowing users to create prompts that represent complex data inquiries. The LLM, familiar with the entirety of the ELDM can fetch, analyze and return the insights. For example, "*BLUE: identify trends in emergency department utilization in rural Tennessee*"
- **Healthcare Data Security and Privacy**. Dynamic de-identification, data protection and aggregation in compliance with privacy and policy will be applied to BLUE data prior to consumption by the user. (Low-latency, safe-harbor de-identification approaches are in use today at UHG). Furthermore, BLUE will layer security and data access rules with customer roles applied at the lowest atomic level - row and column. This provides parity with the security implementations in use across UHG.

Synthetic Populations and Imputed Data

- **Synthetic data** is information that has been artificially manufactured based on real-world data. **Imputed data** are estimates of unknown characteristics based on other, known predictors in real-world data. Both approaches use AI to create the outcome.
    - Synthetic data retains the same attributes, correlations and results as its source, regulated data and is useful when business, privacy and deidentification policies prohibit real-world data use – For example: *useful for Medicaid and other highly controlled real-world data sets*. Improvements in synthetic population generation, particularly micro-population generation, signify a lead toward more precise and representative data sets. By integrating these synthetic datasets, the 100M+ lives represented in UHG's data assets can be enriched: emphasizing segments that traditionally have been underserved or faced inequities.
    - Imputed data are predictions of missing characteristics of of a real-world data set, such as race, ethnicity or social determinants –*For example: useful for estimating these values when they are not self-reported.*

3. Why is BLUE different from our current approach to enterprise data and product development?

BLUE's primary purpose is to **drive and expedite growth through data science and technology enablement**. Although BLUE supports additional enterprise platform goals such as efficiencies through reuse, consistency and standardization of assets. To our knowledge, no current or previous initiatives were designed with this primary purpose in mind. BLUE's will not force overhaul or reconfiguration of existing capabilities that are already delivering value.

Furthermore, unlike current initiatives that are separated by line of business objectives, governance and investments, BLUE introduces an EMT-governed framework to prioritize business opportunities valued at $1B or more. Focused governance ensures strategies are properly aligned, provides prioritization clarity while facilitating fast- track decision making.

4. Why did these previous approaches not yield an enterprise capability?

We recognize previous visions and strategies toward creating enterprise platforms have had mixed results both at Optum and UHC. These efforts fell short of enterprise-wide success for a myriad of reasons:

- Inadequate senior G-level executive commitment
- Challenges in securing funding or demonstrating a clear ROI
- Underestimating technical and political complexities
- Simply waning after rollout of the first use cases or MVPs

Given the short and mid-term financial goals of UHG businesses, they cannot risk primary business outcomes on building an enterprise platform asset that may not meet time and ROI requirements. This leads to our current set of bespoke products and solutions tailored to specific business needs: our current technical debt, data sprawl and duplication, rebuilding versus reusing philosophy is a consequence.

5. Why is BLUE needed? What makes it differentiated and how can we think about growth enablement and ROI?

Several factors have contributed to UHG's growth to the one of the largest and most successful healthcare companies in the world: our unique acquisition strategy, diversification across the healthcare ecosystem, revenue growth from both Optum and UHC, increased earnings and higher market share. Today, economic uncertainty brought on by regulatory changes in Medicare and Medicaid reimbursement rates, increased legislative oversight for PBM, climate-change influencing investors and the ever-increasing healthcare cost require updates to UHG's growth strategies.

A better alignment of long-range plans (LRP) to enable business growth through leveraging existing assets is required. BLUE's governance framework provide cohesion across executive leadership and better transparency across LRPs.

Growth enablement is about creating the optimal conditions, systems and tools to increase revenue, customers and brand value. It requires platform infrastructure for innovations, asset reuse, resource optimization and agile delivery.

Internal research (performed by other teams) indicate that our primary data and analytics infrastructure is over $660M annually - divided by business service lines. We think this is underestimated. *By emphasis on reuse of assets and leveraging best-in class solution*s accounted for in our existing infrastructure, BLUE will minimize the need for large infrastructure investments to achieve ROI.

In the short-term, we believe that BLUE will be the launch pad for new businesses in OLS/Pharma Services, be the platform for strategic partnerships with CMS and be Optum's commercial marketplace for patient and population risk assessment tools.

6. What are examples of new services and businesses based on BLUE?

The size of the UHG dataset(100M + lives) for the US market, low-latency of data elements, and uniqueness of interconnected dimensions enables a range of business services that can be designed as software with license fees or full-service monitor and actioning capabilities with the competitive advantage of UHGs proprietary data.

- BLUE enables introduction of new revenue streams, for example, by **shifting business models from ownership to access** whereby customers could create their own AI and ML models and build products using BLUE's deidentified data.
- BLUE facilitates a **health system marketplace** where UHG apps, analytics and APIs can be accessed by consumers. For example, integrate UHG models of chronic disease prediction into care provider touchpoints.

Biological and Ecological Surveillance	Population Risk-Intervention Matching	Epidemiology and Clinical Impact	Environmental Impact Consulting and Solutions
Opportunity: Become the market leader in health-related surveillance and the factors impacting health outcomes and equity	***Opportunity: Go beyond monitoring to truly action and mitigate emerging risks with proactive intervention... based both on traditional medical risk but combined with external influences to drive priority***	***Opportunity: Significantly expand offerings in the pharmaceutical services revenue pool with relevant insights and targeting capabilities***	***Opportunity: Become the industry leader in mitigating the environmental impact of healthcare – turned internally and sold externally as a service***
$5B TAM	**$25B TAM**	**$25B TAM**	**$5-10B TAM**

7. Can BLUE reuse existing assets?

Multiple existing efforts and capabilities will provide the foundational building blocks for BLUE, emphasizing of not starting from scratch but leveraging and reusing best-in-class internal / external solutions.

BLUE will connect multiple activities currently underway across UHG. Development and operationalization of BLUE and associated commercial products / services will be in Ireland to leverage the incentives there.

BLUE will integrate our best thinking and assets including (not exhaustive):

- Data and product assets from Optum Insight/Change Health and Optum Life Sciences that will facilitate growth in pharma services and create new revenue opportunities in biosurveillance and health equity.
- Substantial insight and progress within Optum Health in platform scale-up, via OCM (Optum Care Manager) and core data services via Enterprise Clinical Data Hub, which provides consumption and persistence of standard clinical, patient and provider data.
- The Enterprise Logical Data Model (ELDM), a single representation of UHG data concept and the Healthcare Platform Catalog, the only Preferred solution for an Enterprise Data Catalog.
- The strategies and architectural considerations of the Optum Chief Data Office which has made significant progress in claims/payer data standardization, driven by UHC Claims and Benefit Operations. (We recommended actively engaging with Vasant's group (Chief Data Office) to effectively harness the value of enterprise data, centrally govern it (with decentralized provisioning), and democratize its use to accelerate business insights and capabilities.)

Technical partnerships with **Google and Microsoft** are pivotal as they supply the essential cloud and data services needed for BLUE. Additional partnerships with technology leaders in synthetic population generation would accelerate these capabilities.

8. What's a high-level plan and what is needed to get started?

End state: By 2028, Blue will provide data-on-demand to power experiences, journeys, insights, actionable outcomes, new businesses enabled by AI/ML and data. Blue will take in new data and derivations for immediate consumption – delivered by any skilled talent in our enterprise

We propose the following to get started (after validating support with Executive Management Team):

Phase 1: Analysis (2 months)

Partnerships with 'Big3' strategy consulting firm highly recommended to drive the first phase.

Two work streams in Phase 1:

1. Market Offering Working Team. GOAL: Formulate market offering and prioritize use cases.

This team will prioritize enterprise opportunities, services and use cases. Goals are to use market intelligence to prioritize use cases, construct the narrative to enable business cases for the BLUE platform. (In-person workshops recommended to create deliverables)

Led by: Consulting Firm

OLS/Pharma Services Leader (Millar)
Strategy/Growth Leader (Schumacher)
Optum Insight Strategy Leader (Emerson)
Optum Health/Optum Serve Leader (Horoho)
Optum Health VBC Innovation Leader (King)
UHC Strategy Leader (Thompson)
Sustainability Office Leader (Lewis)

2. Platform Team. GOAL: Platform architecture and technology enablement plan

Assemble platform leadership team from lead architects representing primary tech/data components, include data science capabilities enablement leader.. Goals are to create BLUE requirements document, conceptual architecture, create an estimated cost for feasibility phase and a high-level technical plan. (In-person workshops recommended to create deliverables.

Led by: Consulting Firm

Chief Data Officer Architect (Manohar)
Optum Health CTO Architect (Mosher)
Healthcare Platform CTO Architect (Shiltz)
Optum Insight Data Solutions Architect (Joshi)
Technology Enablement Architect (Bridges)

Phase 2: Feasibility and POC (3-4 months)

Partnerships with "Big3" consulting firm to drive plan and technology implementation firms for POC (Microsoft/Google).

1. Business planning. Create business strategy and plan.

Assemble team of internal subject matter experts (product and business) lead by consulting organization. Goals are to describe products/services, go-to-market strategy, create financial estimates include time to value, create funding request.

2. Platform POC build.

Assemble subject matter experts from component teams (Data, infrastructure and applications/services) assigned to implementation teams to build proof of concept for priority capabilities. Teams built of internal and partner resources. Goals are to create proof-of-concept and validate estimates.