

University of Rochester - Wilmot Cancer Institute's Hyperion

Category:

Best Digital Health Solution

Company Name:

University of Rochester - Wilmot Cancer Institute

Number of employees:

> 1000

Turnover and/or Funding:

N/A

Product/Solution Name:

University of Rochester - Wilmot Cancer Institute's Hyperion

Corporate Name:

University of Rochester - Wilmot Cancer Institute's Hyperion

Date of Approval:

N/A

Indications:

N/A

Therapeutic Areas:

N/A

General Information File Document upload:

N/A

Background information and need for drug / device:

Hyperion represents a pioneering leap in healthcare technology, integrating advanced

geospatial and genetic testing capabilities to transform data management and patient care. At the heart of this innovation are CANVAS and MARTHA, two cutting-edge systems that exemplify Hyperion's commitment to addressing critical health disparities and enhancing personalized treatment strategies.

CANVAS, Hyperion's geospatial software system, enables precise plotting and analysis of health data within Electronic Health Records (EHR). This capability was instrumental in identifying health disparities in New York, leading to the establishment of a new multi-million dollar healthcare facility targeting specific cancer rates in a region that it found to be under represented. By providing actionable insights through detailed geospatial analysis, CANVAS has significantly impacted public health initiatives, driving targeted interventions and resource allocation to improve the human condition.

MARTHA, the Molecular Assay Repository for Tumor Heterogeneity Assessment, is Hyperion's cutting-edge genetic testing suite. Named after pioneering geneticist Martha Chase, MARTHA seamlessly integrates next generation genetic testing data from external partners and internal resources, merging it with real-time EHR and Clinical Trial data. This real-time, automated data processing, devoid of extensive manual processes, ensures accuracy and efficiency. MARTHA's sophisticated integration capabilities is transforming the broader community by incorporating Social Determinants of Health metrics, enhancing AI capabilities, and refining data extraction techniques. Together, CANVAS and MARTHA exemplify Hyperion's innovative approach to data architecture, driving advancements in research, clinical care, and overall patient outcomes.

Background File Document upload:

N/A

History of the development of the solution/product:

The development of Hyperion began as a response to the challenges faced by academic healthcare organizations, in managing, processing, and utilizing complex and high-volume data such as the extremely important extensive genetic data. The WCI assembled a small, transdisciplinary team consisting of technical experts, healthcare IT professionals, and practicing clinicians with data science and technology backgrounds. The team was supported by executive leadership and enterprise IT structures.

The development process started with the identification and elaboration of key challenges the team wanted to address. They then designed and built a modular and scalable software package that would cater to data storage, validation, and processing needs, as well as data monitoring, access, and visualization. The Hyperion database architecture, Hyperion Data Manager, security module, and governance modules were designed and deployed in phases over a couple years of iterations and agile

development cycles.

The team adopted a unique structure to ensure the efficiency of the project, combining a co-directed model with a flattened decisional hierarchy and an emphasis on diversity of opinions and perspectives. They employed a rapidly iterative approach to problem-solving, borrowing concepts from both agile-based methodologies and traditional project management philosophies.

The modular extensible approach employed in the development of Hyperion not only reduced enhancement and update times but also allowed the software to be maintained by a single full-time equivalent (FTE). By leveraging a smaller team with cross-functional skillsets, the project managed to minimize personnel costs while maintaining flexibility and adaptability as the team scaled larger.

Innovation:

Hyperion epitomizes a paradigm shift in healthcare innovation, revolutionizing how organizations interact next generational data, clinical trials, and clinical data. By drastically lowering the skill barrier, it empowers leaner teams to proficiently manage vast, intricate data systems, reducing the reliance on extensive technical expertise. It is directly responsible for millions of dollars in investments in healthcare in the community by way the opening of new facilities, the significant improvement in clinical trial opening and accruals especially amongst minorities and the underserved.

The unique feature set offered by Hyperion is holistically integrated within the system, a feat often unattained by standard industry products. With just a few clicks, users can effortlessly integrate elements such as Ticketing, Security, Machine Learning, and Analytics packages. Even proprietary free items like D3, Pygwalker, and popular tools like Tableau and Qlik can be assimilated into the platform with remarkable ease.

The system facilitates seamless interfaces with Electronic Health Records (EHRs), research databases, clinical trial systems, and public health datasets via a user-friendly point-and-click system. Even with minimal technical knowledge, users can navigate this efficiently. Comprehensive auditing across all apps is automatically implemented, further enhancing the system's reliability.

Moreover, Hyperion opens up a new realm of possibilities for those proficient in Python, including researchers and clinicians. It provides direct access to code within its validated and curated datasets, linking to the security modules and enabling the creation of a dynamic application marketplace within the health system, fueled by unique, validated baseline data.

In essence, Hyperion transcends the conventional data warehouse model, offering an advanced solution several steps ahead of existing market offerings. It is akin to transitioning from driving a car to piloting an airplane - a leap in speed, efficiency, and functionality that signifies the future of healthcare data management.

Development File Document upload:

N/A

Why this drug or device is innovative, the broad implications for future research, and/or how it will improve the human condition:

Hyperion's integration of the CANVAS geospatial system and the MARTHA genetic testing suite represents a significant innovation in healthcare technology. CANVAS allows for the precise real-time geospatial plotting and analysis of health data within Electronic Health Records (EHR), providing critical insights into health disparities and guiding targeted interventions. This innovative approach enables healthcare providers to identify and address specific health issues in different communities, leading to the development of new facilities and resources where they are most needed. The result is a more equitable healthcare landscape, where interventions are data-driven and precisely targeted to improve overall public health outcomes.

The implications for future research are profound. By integrating real-time genetic testing data with EHR and Clinical Trial data through MARTHA, Hyperion creates a robust platform for advanced analytics and machine learning. This capability allows researchers to uncover new patterns and associations in genetic health data, leading to breakthroughs in understanding diseases and developing new diagnostic tools and therapies. The seamless, automated data processing facilitated by MARTHA ensures high accuracy and efficiency, making it possible to conduct large-scale studies and clinical trials with unprecedented speed and precision. Ultimately, Hyperion's innovations will lead to more personalized and effective treatments, improving patient outcomes and enhancing the quality of care on a global scale.

The Hyperion suite of applications is revolutionizing clinical and research workflows by providing tools that significantly accelerate the initiation of clinical trials. It enables clinicians and researchers to quickly and easily determine the number and location of eligible patients for any given study. Hyperion offers real-time, proactive insights with a strong emphasis on diversity, equity, and inclusion, ensuring that clinical trials are more representative and accessible.

Innovation File Document upload:

N/A

Please provide appropriate references (PubMed, Abstract, Website):

Technology & Innovation Group Website:

<https://www.urmc.rochester.edu/cancer-institute/research/informatics.aspx>

Peer Reviewed Initial Publication:

<https://journals.plos.org/digitalhealth/article?id=10.1371/journal.pdig.0000036>

CANVAS Walkthrough: https://www.youtube.com/watch?v=X9CudZGVH_Q

CANVAS Pub:

<https://cxotechmagazine.com/geospatial-analysis-changing-the-landscape-of-healthcare-informatics-by-moving-beyond-typical-business-intelligence-tools/>

Hypergen Walktrhough: <https://www.youtube.com/watch?v=wH6wyE1crqc>

References File Document upload:

N/A