

CASE STUDY

Enhancing Efficiency in Childbirth Management with Birth Model

Birth Model is a transformative clinical decision support platform dedicated to transforming the world of childbirth in the healthcare industry. This innovative application is an important tool for hospital administrators, doctors, nurses, and billing departments of healthcare organizations, streamlining the process of delivering babies with extreme efficiency.

Birth Model's core functionality is its predictive power in estimating delivery times for pregnant women. By onboarding patients and recording data such as age, BMI, prior deliveries, dilation, effacement, baby position, fetal station, administrative cervical riping agents, and other medical conditions, the platform leverages the power of machine learning to train the model that offers accurate delivery time estimates.



Problem Statement

The Birth Model encountered significant challenges in optimizing childbirth management. The reliability of the machine learning model is contingent on the quality and relevance of patient data collected during onboarding, raising concerns about the accuracy of delivery time predictions.

The importance of addressing data security and privacy issues is emphasized due to the sensitive nature of the information. Integration issues were experienced on a large scale, requiring navigation through diverse healthcare settings and their unique protocols. The efficient handling of large data formats is further complicated by doctors' reluctance to navigate multiple systems and haphazardly record patient data, highlighting a common concern across healthcare providers.

Our Approach to the Project

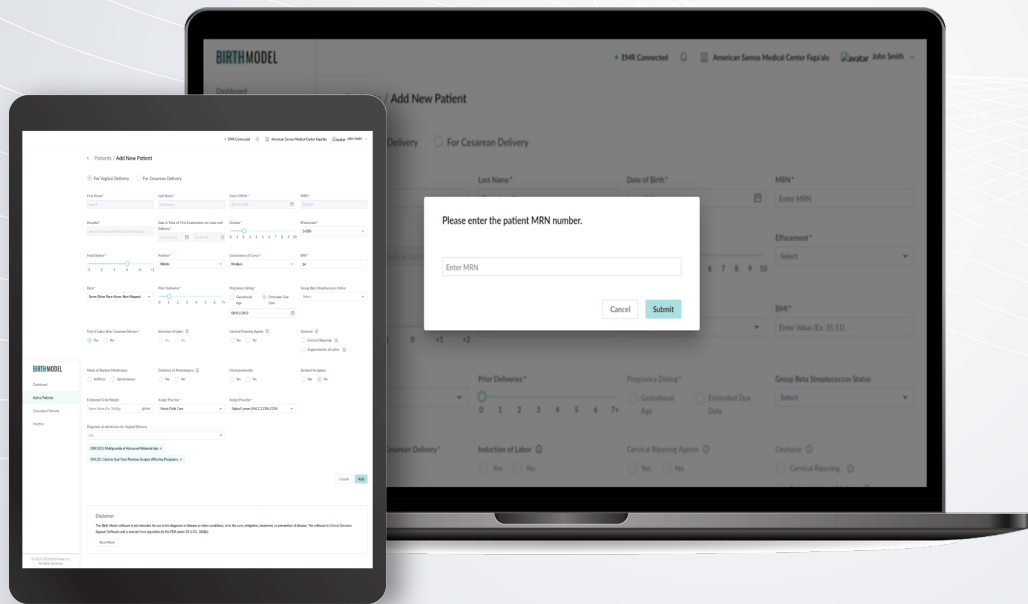
To address communication challenges and streamline the patient onboarding process, our experts tried to improve the overall patient care experience. We integrated the automated exchange of data directly from EHR (EPIC) to Birth Model through SMART-ON FHIR app launch, FHIR resources, and real-time HL7 messages, which ensures real-time updates and seamless data exchange. Our experts ideated the solution to empower healthcare providers with timely and comprehensive information for informed decision-making. The following outlines the key components and benefits of the implemented solution.

Automated Patient Onboarding and CPT Code Generation

Previously, communication about patient conditions was conducted verbally, leading to difficulties in data documentation. Birth Model addresses this by offering real-time notifications through its application and webpage, improving communication for healthcare providers. However, manual data entry posed challenges in managing large datasets and handling different systems.

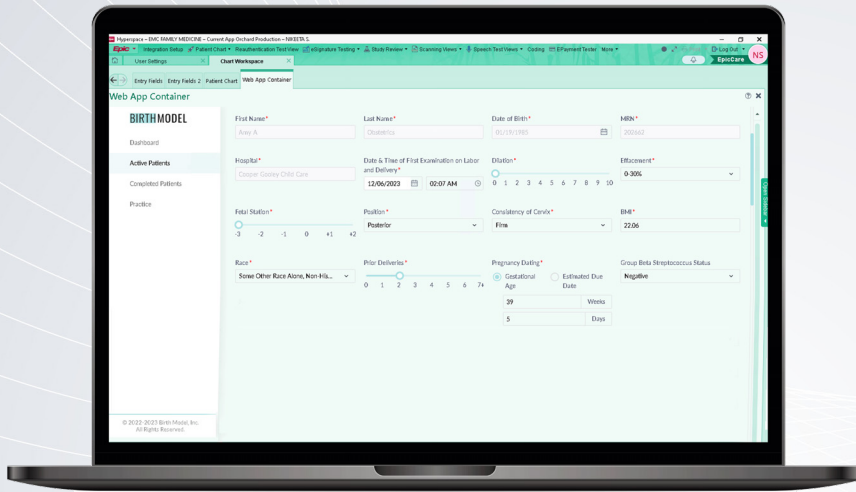
By integrating with EPIC, the Birth Model system makes things much easier for healthcare providers. The process eliminates the manual process of entering patient information. We onboarded the patient through the SMART-ON FHIR app launch, and data interoperability through FHIR resources and HL7 standards.

All the crucial information like health issues, prescriptions, and diagnoses can be easily transferred to the Birth Model platform with just a click. It simplifies the process for administration tasks and ensures that accurate and comprehensive information is available in real-time.



EPIC Integration for Streamlined Processes

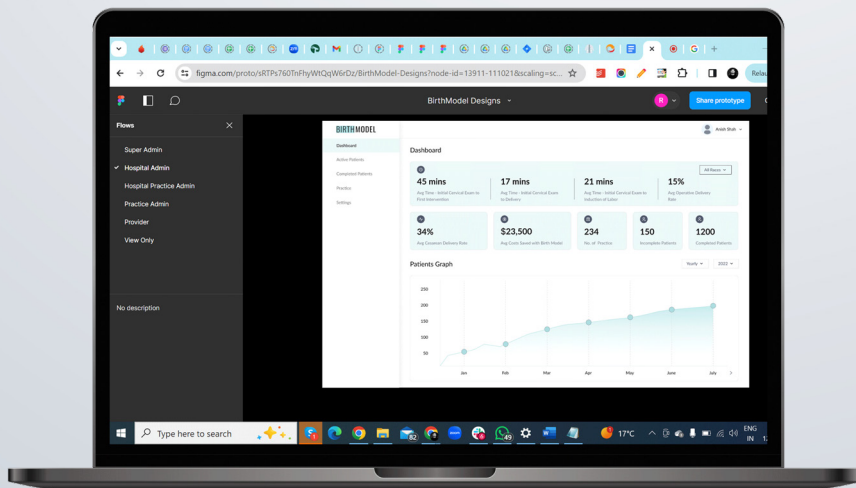
Birth Model has seamlessly integrated with EPIC, a widely-used system for patient health records, to streamline data entry processes. This integration empowers healthcare providers to directly input patient information through EPIC Hyperspace (SMARTON FHIR), eliminating the need for manual data recording and saving valuable time. With industry standards like HL7 and FHIR API, EPIC effectively communicates with the Birth Model, facilitating standardized and structured data exchange.

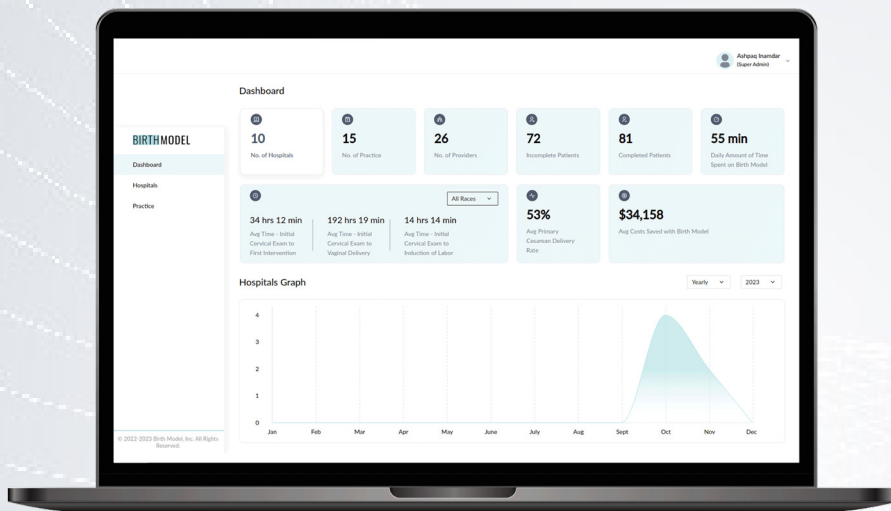


Post-Delivery Processes and Data Updating

After a patient gives birth, the Birth Model takes care of ensuring that they receive ongoing examinations and attention from healthcare providers. Once the patient's record is marked as complete, the Birth Model automatically collects additional important information from EPIC, such as infant birth date, gender, time of birth, weight of the baby, procedures performed, delivery complications, operative findings, and health condition.

This information is pushed back to EPIC, updating the patient's health records with the most updated and accurate information. The communication between Birth Model and EPIC helps healthcare providers stay informed about their patients' post-delivery progress and enables them to provide continuous and personalized care.





Data Exchange and Decision-making Support

Birth Model and EPIC communicate with each other using a set of rules called HL7 protocols. This ensures that the exchange of data between the two systems is structured and follows a standardized format. When healthcare providers update important clinical notes, delivery notes, and delivery records, this information is automatically and seamlessly pushed back to EPIC. This integration helps healthcare providers make informed decisions about their patient's care and improves the overall efficiency of managing childbirth. It's like having a smooth flow of information between the two systems, making it easier for healthcare providers to access and use the data they require.



Challenges We Faced While Implementing the Approach

1



Data Accuracy and Reliability

One of the main challenges faced by our experts in optimizing childbirth management is ensuring the accuracy and reliability of the machine learning model's results. This challenge arises from the fact that the machine learning model completely relies on the data collected while onboarding patients.

2



Data Security and Privacy

The data handled by the team for the solution was of a sensitive nature which included the personal and medical details of patients. It was indeed a challenge to protect the patient data to avoid potential security breaches, identity theft, unauthorized access to medical records, and breaches of confidentiality.

3



Interoperability Across Healthcare Settings

It was a crucial solution to integrate the Birth Model for healthcare settings. The solution led to interoperability challenges, adapting to different protocols, and having a seamless data exchange.

4



Handling Large Data Formats

The complexity and the reluctance of healthcare providers to navigate multiple systems resulted in a challenge in recording the data. As the whole data was managed and recorded manually in the Birth Model, providers resorted to shortcuts or omitting certain data points due to time constraints.

5



Integration with EPIC

While integrating EPIC offers different advantages, various challenges arise in configuring the integration to follow HL7 protocols and ensuring a smooth data exchange process. It required adherence to industry standards to carry out the secure exchange of healthcare information.

6



EPIC Sandbox Testing

The client provided us with the EPIC Sandbox patients which created more opportunities for challenges. Sandbox simulates real-world testing scenarios and interactions between the Birth Model and EPIC system in a controlled environment. These challenges were technical, functional, and operational. It created compatibility issues between both systems.

7



User Adoption

The successful implementation of the integration relies on healthcare providers embracing and effectively utilizing the new functionalities introduced by the Birth Model within this familiar environment. The challenges that arose in training healthcare providers to adopt the Birth Model and its integration with EPIC.

Tools and Technologies



Auth0



Azure Active Directory Connect



HL7[®] FHIR[®]



SMART



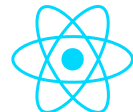
Firebase



React JS



python™



React Native

Learnings

1

The project highlights the intricacy of data variability during patient onboarding. Factors like variations in recording practices, differences in healthcare provider workflows, and evolving patient conditions established a need for a structured approach to data quality assurance. Data quality was assured through continuous monitoring and updates to machine learning models based on evolving patient data and healthcare practices.

2

The successful implementation of EPIC improved efficiency and emphasized the importance of aligning technological solutions with existing healthcare workflows. It minimized the disruptions, allowing healthcare providers to focus on patient care rather than navigating complex systems.

3

Dealing with sensitive patient data necessitates a comprehensive understanding of the healthcare privacy regulations. Compliance with standards such as HIPAA is a legal requirement and a fundamental element of building and maintaining trust with patients and healthcare stakeholders. Apart from compliance, implementing encryption measures and access controls ensures that patient data is protected from unauthorized access.

4

Streamlining data entry processes is a technical requirement also known as a user experience challenge. Understanding particular pain points of healthcare providers in data entry to address these challenges contribute to higher acceptance rates.

5

Addressing interoperability challenges requires a flexible approach to integration. Designing systems that can adapt to different healthcare settings with diverse protocols ensured the Birth Model can be seamlessly implemented across healthcare systems.

Key Benefits



15% of the average delivery rate was observed with the implementation of EPIC in the Birth Model.



34% of the average cesarean delivery rate was achieved.



\$23,500 was the average cost saved with the Birth Model.



234 no.of practices were performed with less time in administration.

About Mindbrowser

Mindbrowser stands out as a leading healthcare services provider, leveraging close to 15 years of expertise in digital transformation and product engineering. We offer 50+ pre-built solutions for seamlessly integrating 20+ major Electronic Health Records (EHRs), 100+ wearables, and ensuring secure Protected Health Information (PHI) data anonymization with comprehensive HIPAA compliance. Our clients save over 60% development cost and a significant 80% decrease in deployment time.

4

Locations

250M+

Livelihood Impacted

50+

Solution Accelerators

200+

In-House Experts

 Boston | Chicago | Dallas | Los Angeles | New York

5900 Balcones Dr, Ste 100-7286, Austin, TX 78731

Development Center - Pune, India