

Development of Electronic Medical Record System

Case Study

Domain: Health Care

Type: Outsourced Product
Development (OPD)

*“A web based
comprehensive EMR
system to maintain the
electronic health record
of the students”*

B.A.T. to develop an Electronic Medical Record (EMR) System for the School based Health care providers

A project in the area of Health care allied with EMR. B.A.T. successfully offered Outsourced Product Development (OPD) services for the project.

Challenge

- To develop a **robust and secured system** that maintains comprehensive medical records of the students.
- To develop a system that provides an **integrated environment for school based healthcare center, school nurse and physicians.**
- To develop **easy to use software with Standardized Medical Procedures** that assist to provide the basic aid to the students when needed in the absence of a Doctor.

Solution

- B.A.T. developed an EMR system that offer **unlimited database capacity.**
- This **web based system** solved the problem of maintaining the health record of those students that frequently changes their schools or have relocated to some other district.
- The project involved **full PDLC with maintenance/ enhancement activity**

Assessing The Solution:

The client is an established name from North America, who provides software and product solutions in the Health care industry.

B.A.T. assiduously assessed the requirements of the client and recommended a solution of complete product development of a web based EMR system.

The customer being a leading global name in the field of Health care, B.A.T. had to ensure that robustness and quality of the development adhering their existing stringent standards.

Delivering The Solution:

Client approached B.A.T. for assistance. B.A.T. team assessed the exact requirement of the client and decided to follow “**B.A.T. Agile Process**”. This handled very well client’s immediate and expected future needs.

The client looked forward B.A.T. as a competent organization having expertise and experience in the area of Health care, to carry out their product development. The project involved complete PDLC as well as the maintenance and enhancements activity.

B.A.T. is equipped with Multidisciplinary skills; the experts of different streams required for the project were involved in the process of software development for accurate and professional delivery. B.A.T. worked closely with the client for perfect and timely delivery. The team included Domain experts, software developers, software testers etc.

Correct understanding of the application, the core software and end-user perspective is extremely critical to provide appropriated solutions, consequently B.A.T. handled this entire process very smoothly and professionally which was well appreciated by the client.

Proper configuration and setup specific to this project were duly taken care by B.A.T. to replicate the similar work environment at client’s location.

Methodology:

The product development process followed **phased approach** with smooth iterative incremental implementation of new software features and full compatibility between the phases. B.A.T. ensured that every new deliverable of the software that was implemented was compatible with previously installed deliverables or provided means to upgrade from the previous deliverable to the new version. Following were the steps:

Identifying The Problem:

This project began as a unique way to help school based Health care providers to offer exactly what was required by them. The key idea behind developing and designing this EMR system was to overcome the severe problem faced by the school based Health care providers i.e. ‘Difficulty in maintaining records of the students moving from school to school’.

Solution Proposed And Deployed:

B.A.T. developed a system which captured comprehensive medical data of the students. Due to its Modular design the system is fully adaptable and scalable to grow with the school based health centers. The system efficiently captures following features:

- A web based application to integrated environment for school based healthcare center, school nurse and physicians
- Ease of Use & Easy retrieval of history information
- Availability of student records for easy electronic transfer to all providers within and outside school districts.
- Provides verification system that will notify the staff of follow up visits to ensure proper medical attention is given to each student.
- Allows the reports to be generated in easy to read format that can be printed or transferred electronically.
- Standardized Medical Procedures that assist to provide the basic aid to the students when needed in the absence of a Doctor

Inception: All the board level requirements of client were vigilantly analyzed by the domain experts of B.A.T. With the health care extensive experience, B.A.T. defined and analyzed the requirements in detail. Consequently a requirement document was prepared.

Elaboration: At this stage all the applications were designed and the required architecture was developed according to Requirement Document.

Construction: The implementation was carried out in an iterative manner, i.e. identified modules were defined and integrated to form testable functionalities which could be delivered. B.A.T. employed following development strategy:

- i. Build a “Dummy” GUI first and add Functionalities incrementally
- ii. Build “The fast path” representing the main Business Cycle and Add functional enhancements to the modules in the main Business Cycle

Transition: Iterative development strategy was proposed; it helped in the development of new software components parallel with Verification of the previous components. A testing Strategy was proposed and used during this Transition Phase. Test plan included Verification and Validation:

- i. Verification included Reviews/ Walkthroughs for Requirements, Use Case Model, Sequence Diagram, Class Diagram, and Code as well as Unit, Integration, Function, and System Testing for Code
- ii. Validation included comparing the results with manual analysis and User Acceptance Testing

Product Release

Project Management: An imperative element of this project was its effective project management which included:

- i. MS-Projects for Scheduling & tracking activities and for Resource Assignments
- ii. Critical Chain Scheduling and Buffer Management technique used for planning the project
- iii. Flexible plans to easily accommodate delays due to parallel development at different geographical locations.

Maintenance and Enhancement:

- i. Maintenance scope was defined as Corrections of defects that were found in existing operational software
- ii. Enhancement scope was defined as Development of additional functions, features and or interfacing in the existing software, Enhancements & Change Requests
- iii. All the new enhancements were confirmed only after Regression Testing and Functionality Testing

Customer Support:

- i. Post sales support issues- The service deliverable consists of resolution of issues arising during operational life of the software, which may require appropriate explanations to the customers

Benefits:

- On-time project completion as per the Release Plan
- The client fulfilled their commitment to the customer without any major management and resource overheads.
- The expertise at B.A.T. reduced development and maintenance cost of client.
- OPD model helped client to provide continuous support to their customers globally.
- The client had access to diverse skills under one roof– B.A.T.
- B.A.T. worked as an extended arm to the client, which helped client to concentrate on Core Tasks.

Key Technologies:

- Platform: Microsoft .Net
- Environment: VS 2005
- Language: C#.Net, VB .Net
- Development Environment- VS 2005
- Automated Testing Tool: Test Partner