Successful Implementation of a Functional Health Information System (HIS)

Sabaoth Technologies Ltd
Health Informatics Solution Providers

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2/26/2012
Introduction

Your hospital has grown, it is time to improve service delivery and quality of care while increasing profitability and reducing expenses drastically.

In this proposal we discuss our approach to assisting your Hospital implement successfully a cost–effective, robust and connected electronic Health Information System.

We would highlight the objectives of the project and our approach fulfilling the objectives. We would also show what the benefits of our approach, the cost estimate and a timeline for the project.

Implementing electronic health Information systems can be fraught with many obstacles resulting in low returns on investment. However we would be using our skills and resources to ensure that this implementation is successful in every ramification, thus positioning your Hospital as a reference for the use of cutting edge technology in providing the best level of care in this environ.

We are committed to providing outstanding value in the execution of this project.

OBJECTIVES OF PROJECT

In implementing a successful cost-effective integrated Electronic Health Information System for your Hospital, our proposed objectives are:

1) To implement a solution that is time saving, cost effective and user dedicated for all stakeholders in your hospital.
2) To implement a solution that enables a transparent, performance driven work environment capable of monitoring inputs, procedures and outputs of processes in your hospital.
3) To implement a critical mission solution that is secure, reliable, scalable, easy to use, accessible everywhere and disaster recoverable.
4) To implement an integrated electronic health Information system software.
5) To ensure successful and effective utilization of the system by staff of your hospital.
6) To enable an effective and efficient intra and interdepartmental personnel communication platform.
7) To facilitate the development of an IT Support Unit and helpdesk.
8) To setup a process of moving present paper based medical records to a completely electronic platform both prospectively and retrospectively.
9) To provide a connected healthcare platform to support quality patient care across various care providers in your network.
ARCHITECTURE FOR Health Information System (HIS)

An understanding of the various components that make up the HIS architecture is necessary to appreciate the challenges and the requirements for a successful implementation of the Hospital Information System. It also makes it easy to plan financial for this critical undertaking by the hospital management.

Below is a pictorial representation of the architecture of the HIS followed by a brief explanation and its implication to the current implementation under consideration.

**USERS**

This is the most critical of the components of the HIS. Early engagement with end users, the necessity of studying and understanding their workflow as well as various interaction with other users and stakeholders is critical to the success of the Hospital Information System. There is need to do a training need assessment so as identify various Information Technology competencies and schedule appropriate training before the HIS implementation takes place. It is also necessary to engage the Users during development and customization by doing application demo so that their input would be reinforced. This also aids in building ownership among the users. The issue of ownership is critical to the functionality and utility of the application and thus the overall success of the HIS. Post development and customization training on the application is also required. We promote an on-the-job peer based training, wherein the user learn to use the application within the familiar
environment of their workplace. We seek to get every staff that would have access to the application within the unit to sign off on the training thus attesting to the fact that they have achieved the required basic competence according to their job role. Followup assessment is required to monitor and evaluate the performance of the application and its utility.

CLIENT DEVICE

Client devices provide a means of interaction between users of the application and the application itself. It includes computer, mobile devices like slates and smartphones, printers etc. The client devices are connected via the network to the servers on which the application runs.

Client device would form a large component of the cost for the implementation of the HIS. The purchase of client devices is one the major rate limiting steps in the implementation process. There is need to do adequate budgeting and availability of funding mechanism early on in the implementation as well as allow adequate lag time for purchase, delivery, setup and configuration of the client devices.

Also very critical is the choice of the client device to utilize in what environment bearing in mind the following consideration: cost, space constraint, mobility, security, ergonomics, utility fit and power.

It is also necessary to point out that the client devices would require some associated softwares to function effectively such as antivirus, browser, word processing application etc

NETWORK

The Network is the medium of connectivity between the client devices and the servers where the application is installed and runs from. Networks exist in two major forms, wired and wireless. The Network is required to be powered 24/7 for stability, reliability and excellent user experience.

The topography of the environment, the speed and reliability of the network would affect the design of the network. The network must also be secured from unauthorized access.

SERVERS

These are dedicated computers that are always on, hosting the application. It might be necessary to purchase one entry level servers with UPS as backup power, a storage solution would be required to store and archive medical images and documents. Accessory software such as the server operating system, the database software, antivirus would be required as well. We would recommend Dell servers.

POWER

Electrical power is critical to the success of the hospital information system. As the application is online on the intranet it implies therefore that power must be provided 24-hrs to power the network and the servers. The client end devices must have power as at when required. It would be worthwhile to consider the use of hybrid solar power and inverter system to cut down recurrent power cost.
THE APPLICATION

This is the hospital information system solution that runs on the server. It consists of various modules which work in an integrated fashion. The user management module forms the base module that is used to create and configure various entities in the application as well as users and their job roles. See APMIS brochure for details.

CLINICAL MODULES (15):

- USER MANAGEMENT
- HEALTH RECORDS
- CLINIC MANAGEMENT
- PHARMACY
- LABORATORIES
- RADIOLOGY
- WARD MANAGEMENT
- THEATRE
- BLOOD BANK
- COMMUNICATION
- PAYMENT
- INVENTORY
- CLINICAL DOCUMENTATION
- HEALTH INSURANCE
- TELEMEDICINE

The application runs on the intranet and is not dependent on the availability of the internet. Each module is customized to the functionality required by the department and their work processes as well as being able to generate various reports. There would be the need to nominate the Hospital Administrator for the application that would provide onsite configuration as the need arises.
INTERNET

The internet provides means for accessing resources in the World Wide Web, email etc. The gateway and management of the internet is located on a server which is dedicated to performing that function.

SERVER ROOM

It is important to have a dedicated location to serve as the server room. This location would house the servers as well as the power backup system for the server. If internet access is provided, this room would also house the internet gateway.

The room should have proper temperature control facility to keep the servers functioning optimally. It should have a fire retardant and fire prevention facility. Maximum security is required for the server room to protect the devices installed there.

The server room would have restricted access. Only the technical team and select members of the Information technology support team would have access to the server room. You would need to specify the server room location.

OUR APPROACH

We believe in a holistic approach to implementing the integrated Electronic Health Information System, in which a synergy exists by the integration of people, processes, and technology.

Phase 1: Creating Awareness and Understanding of IT implementation.
Deliverables: Presentation/symposia on implementing an Integrated Electronic Health Information system.
Time Frame: 1 day.

Phase 2: Data Collection and Process Documentation.
Deliverable: Presentation of report to management and feedback to Departments/Units
Time Frame: 2 days

Phase 3: Development of the Your Hospital Information Technology Blueprint and Policy documentation:
Deliverable: Your Hospital Information technology implementation blue print and Information Technology policy documents and Project plan documents.
Time Frame: Ongoing

Phase 4: Procurement.
Deliverable: Hardware and Network equipment and Software.
Time Frame: 2 days upon release of funds.

Phase 5: Installation.
Deliverable: Installed functional Electronic Health Information system.
Time Frame: one week
Phase 6: Digitization of existing medical records.
   Deliverable: Digital version of existing medical records.
   Time Frame: one month

Phase 7: Implementation/Training
   Deliverable: Trained staff utilizing the system with customization to suit hospital workflow.
   Time Frame: 3 months

Phase 8: User Support
   Deliverable: Experienced staff utilizing the system with high level of efficiency and understanding.
   Time Frame: 3 months

Phase 9: Establishment of IT Support Unit.
   Deliverable: Functional IT Support Unit and a tested disaster recovery plan.
   Time Frame: one week

Phase 10: Final Commissioning of Project- Go live!
   Deliverable: Media event celebrating your hospital transformation
   Time Frame: One day

Phase 11: Post Implementation Assessment and Training
   Deliverable: Evaluation report of system utility, difficulties and other needs.
   Time Frame: Daily x 3 month, Weekly x3 months, Monthly x3 months, Quarterly x 4 quarters.
HIS Implementation Workflow

- USER MGT
- DIGITIZATION OF RECORDS
- ELECTRONIC REGISTRATION
- COMMUNICATION
- PAYMENT
- PHARMACY
- LABS
- CLINIC MGT
- WARD MGT
- THEATRE
- RADIOLOGY
- BLOOD BANK
- CLINICAL DOCUMENTATION
- TELEMEDICINE
- HEALTH INSURANCE
**MODULE IMPLEMENTATION PROCESS**

![Diagram showing the implementation process steps]

**BENEFITS EXPECTED FROM OUR SERVICE.**

The suggested approach is a proven template for success.

University College Hospital, Ibadan, Nigeria’s largest tertiary hospital, a 955 bed Hospital where we are implementing a functional Hospital Information System is a testimony to this. After 12 years of struggling to implement various solutions and loosing over N350 million worth of investment, we are able to successfully turn around the implementation using our approach within six months.

All critical factors for successful implementation is incorporated to enable your Hospital, a hospital of repute, achieve its stated objectives of providing the best quality of care, and an efficient and effectively managed private healthcare institution while increasing profitability and patient satisfaction.

Our approach ensures that there is a collective ownership of the system and a collective desire to see its successful implementation.

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The approach also ensures that a holistic, well thought out plan is implemented, with adequate provision for continuity and other contingencies that may arise.

Our approach further ensures that the system and its implementation are continuously monitored against set benchmarks so that performance can be tracked and necessary modification and enhancement can be put in place.

Integrated into our approach is effective change management to ensure an effective cultural change in work attitude and ethics.

This approach ensures a cost-effective, reliable, scalable, secure, and accessible and disaster recoverable solution is implemented at the your Hospital.

Approaching the implementation of an Integrated Electronic Health Information System as recommended ensures a time-efficient roll out of the system.

This implementation would make your Hospital becomes the reference point and leader in Information Technology implementation in the healthcare sector.

It definitely enables the your Hospital to maintain and enhance its’ enviable position as a reputable private health service institution.
### Cost Structure

<table>
<thead>
<tr>
<th>S/NO</th>
<th>PHASE</th>
<th>DURATION</th>
<th>DELIVERABLES</th>
<th>FEE (₦)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Creating Awareness and Understanding of IT implementation.</td>
<td>1 days</td>
<td>Presentation/symposia on implementing an Integrated Electronic Health Information system.</td>
<td>TBD</td>
</tr>
<tr>
<td>2</td>
<td>Data Collection And Process Documentation.</td>
<td>2 days</td>
<td>1) Presentation of report to management.  2) Feedback to Departments/Units</td>
<td>TBD</td>
</tr>
<tr>
<td>3</td>
<td>Development of the Your Hospital Information Technology Blueprint and Policy documentation:</td>
<td>Ongoing</td>
<td>1) Your Hospital Information technology implementation blueprint.  2) Your Hospital Information Technology policy documents.  3) Project plan document.</td>
<td>TBD</td>
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<tr>
<td>4</td>
<td>Procurement*</td>
<td>2 days</td>
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<td><strong>Client Devices</strong></td>
<td></td>
<td>TBD</td>
<td></td>
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<tr>
<td>X Tablets @N200,000</td>
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<td></td>
<td></td>
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<tr>
<td>X Laptops @N200,000</td>
<td></td>
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<tr>
<td><strong>Accessory Client Device Applications:</strong></td>
<td></td>
<td>TBD</td>
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<tr>
<td>Antivirus X users @N3,000</td>
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<tr>
<td><strong>Network Equipment (Lot):</strong> Wireless routers, extenders, Cat 6 Cables, switches, POE etc.</td>
<td></td>
<td>TBD</td>
<td></td>
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<tr>
<td><strong>Servers</strong></td>
<td></td>
<td>TBD</td>
<td></td>
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<tr>
<td>X Dell Servers @N300,000</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>X TB storage solution</td>
<td></td>
<td></td>
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<tr>
<td><strong>Accessory Applications:</strong></td>
<td></td>
<td>TBD</td>
<td></td>
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<tr>
<td>1 x Windows 2008 server (X No of CALs) @75,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1 x MS Sql Server 2008 (X No of CALs) @ N50,000</td>
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<tr>
<td>Server Antivirus and Firewall</td>
<td></td>
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<tr>
<td><strong>Power:</strong> X no APC 3kVA UPS for servers</td>
<td></td>
<td>TBD</td>
<td></td>
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<tr>
<td>Health Card (X x N200/card)</td>
<td></td>
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<tr>
<td>Point of sales Equipment (X x N70,00)</td>
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<tr>
<td>Card Printer</td>
<td></td>
<td>TBD</td>
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<tr>
<td>Biometric device and barcode scanner</td>
<td></td>
<td>TBD</td>
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<tr>
<td><strong>Sub Total (Hardware)</strong></td>
<td></td>
<td>TBD</td>
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<tr>
<td>5</td>
<td><strong>HIS Application (Fifteen (15) Modules)</strong></td>
<td>Inpatient services: N60,000 x No beds Outpatient services: N1000 x Last 12 months Registered Patients</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><strong>Installation.</strong></td>
<td>2 days</td>
<td>Working Integrated Electronic Health Information System.</td>
<td>TBD</td>
</tr>
<tr>
<td>7</td>
<td><strong>Digitization of Medical Records</strong></td>
<td>1 month</td>
<td>Digitization of existing health records@ N50-N100/CASE NOTE X No CASENOTES</td>
<td>TBD</td>
</tr>
<tr>
<td>8</td>
<td><strong>Training</strong></td>
<td>1 day, ongoing.</td>
<td>On the job training for all cadres of staff and users.@N20,000/STAFF X No STAFF</td>
<td>TBD</td>
</tr>
<tr>
<td>9</td>
<td><strong>USER SUPPORT</strong></td>
<td>3 months</td>
<td>Experienced staff with great understanding of application and highly efficient in utilizing solution and</td>
<td>TBD</td>
</tr>
<tr>
<td>10</td>
<td><strong>Establishment of IT Support Unit.</strong></td>
<td>1 week</td>
<td>1) Functional IT Support Unit. 2) Develop and test disaster recovery plan.</td>
<td>TBD</td>
</tr>
<tr>
<td>11</td>
<td><strong>Final Commissioning of Project- Go live!</strong></td>
<td>1 day</td>
<td>Medial event.</td>
<td>TBD</td>
</tr>
<tr>
<td>12</td>
<td><strong>Post Implementation Assessment and Training</strong></td>
<td>Daily x3 months, Weekly x3 months, Monthly x3 months, Quarterly x3 quarters.</td>
<td>Evaluation report of system utility, difficulties and other needs.</td>
<td>TBD</td>
</tr>
<tr>
<td>13</td>
<td><strong>Total Project Cost</strong></td>
<td></td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td><strong>Project Management/Consultancy</strong></td>
<td>Expertise And Human Resource Deployment</td>
<td>10% of total project cost</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td></td>
<td>TBD</td>
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</tbody>
</table>

**Notes:**

- Software Maintenance priced at N1,000 per outpatient patient utility as service charge and N5,000 per in patient session utility. The hospital would never need to pay to support and maintain the application.
- Hardware and network equipment would be serviced every quarter (3 months) to ensure maximum efficiency at agreed pricing.
- We have partnership with third party financial institutions that are able to provide long term funding options for this project.
- As Dell Channel partners we are able to provide discounted academic/healthcare pricing for your IT requirements, and assisting to reduce your total cost of ownership.
- **Slate Specification:**
  
  Dell latitude ST Atom processor, 2GB, 32GB, wireless, dual CAM, 10", **WINDOWS 7 prof.**, bluetooth.
- **Laptop Specification:**
  
  Latitude E5420 laptop with 9-cell battery, **Intel Core i5-2430M, 750GB, 4GB RAM**, wireless, Camera, 14", **WINDOWS 7 prof.**, bluetooth. backlit keyboard.
- **Server Specification:**
  
  POWEREDGE T110II: Intel Xeon E3-1220 Processor (3.1GHz, 4C/4T, 8M Cache, 80W, Turbo), 4GB Memory (2x2GB Single Rank LV UDIMM) 1333MHz, 500GB SATA 7.2k 3.5" HD Cabled

**CONCLUSION**

We look forward to assisting Your Hospital provide the highest level of quality of care through effective utilization of information technology and to set it as the best healthcare facility within its environs.

We believe our approach detailed above would provide a successful platform for the implementation of the Electronic Health Information System. Above all we would be assisting Your Hospital provide exceptional value to their clients.

We are dedicated to our clients, providing health IT solutions as our only focus. We provide outstanding value far beyond our client expectation, delivering our solution within budget and deadline.

Please fill the questionnaire on the next two pages and email to dania@sabaottechnologies.com or call 08036648712 to schedule a pickup.

Let’s computerize your hospital now!

Thank you.

Dr Simpa Dania
Lead Consultant
Sabaoth Technologies Ltd
HOSPITAL IMPLEMENTATION INFORMATION REQUIREMENT

Dear Sir/Ma

In order to offer you the best and lowest price for your hospital, we need the following information. Please use one sheet per hospital you oversee. Please fill, scan and send to dania@sabaothtechnologies.com or call 08036648712 to schedule a pickup.

Hospital Name:

Address:

Expected commencement date:

1. In the hospital, how many:
   a. Wards:
   b. Consulting rooms:
   c. Registered patients:
   d. Average number of sheets/case notes:
   e. Pharmacy:
   f. Labs:
   g. Theatre
   h. Blood bank:
   i. Payment points:
   j. Radiology equipment:

2. Is your facility NHIS registered:

3. List top 5 HMO registered with whose clientele you serve:
   a.
   b.
   c.
   d.
   e.

4. What percentage of your clientele is non-insurance (ie cash paying):

5. What percentage of insurance is fee for service versus capitation:

6. Description of hospital building: bungalow / multiple floors / multiple buildings

7. Number of buildings x floors:

8. Availability of building plan: Yes/NO

9. Need independent power supply/support for 24x7 power:
10. Total Number of clinical staff / maximum total no per shift in hospitals:
   a. Doctors:
   b. Nurses:
   c. Pharmacist:
   d. Other clinical Staff:

11. Total number of Admin staff:

12. Total number of Support staff:

13. Dedicated IT support staff:
   a. Is your IT staff in-house or outsourced:

14. How would you want the costing for Software to be structured:
   a. One off plus yearly maintenance:
   b. Monthly Subscription:
   c. Quarterly subscription:
   d. Yearly subscription:
   e. % of patient revenue:
   f. % of insurance revenue:
   g. Service charge per patient utility:

15. How would you want the costing for Hardware and Network to be structured:
   a. One off:
   b. Spread payment over one year
   c. % of patient revenue

16. How would you want the costing for Digitization of existing records to be structured:
   a. One off:
   b. Spread payment over three months
   c. Spread payment over one year
   d. % of patient revenue.

17. How would you want the costing for implementation and training to be structured:
   a. One off:
   b. Spread payment over three months
   c. % of patient revenue:

18. Chief Medical Director name:
   a. Phone number: Email:

19. Lead IT Support Name:
   a. Phone no: Email:
DELL SLATE:
FUSING THE IPAD & YOUR LAPTOP

- Dell Slate = Ipad + Laptop!
- Built for the discerning professional.
- Replaces even your desktop or laptop
- Attach directly via USB: your flash drive, printer, projector, external hard drive, external keyboard, mouse, USB DSTV DRIFTA, external DVDWR etc.
- Connect your blackberry, iphone, Ipad!, Nokia etc and sync easily
- Comes with a pen: ready for handwriting recognition straight out of the box. Imagine writing by hand your notes and getting a typed-written document.
- Runs flash, silverlight etc
- Full fledge OS: Runs all your programmes on your laptop on the tablet form factor.
- Familiar Operating System: Hit the ground running with an OS interface you already know.

- Real world multi-tasking: run multiple programs concurrently
- Produce and edit business Documents on the go with the Latitude ST with Office 2010
- Powered by Intel® Atom™ processors and running Windows® 7.
- Independent, does not require another pc to be fully functional unlike the Ipad.
- More secure than Ipad: remote data wipe, antivirus
- CHEAPER THAN SIMILAR CONFIGURATION OF IPAD 3.
- Up to 128GB Solid State hard drive
- 3G connection using regular SIM Card
- Memory card slot
- upgradeable to Windows 8
- (2 GB Ram, 32GB, 64GB & 128GB SOLID STATE HARD DRIVE AVAILABLE.)

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daniasa@saatothechnologies.com
www.dell.sabaotttechnologies.com

Repayment Plan

<table>
<thead>
<tr>
<th></th>
<th>2 months</th>
<th>3 months</th>
<th>4 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>128Gb</td>
<td>97,125.00</td>
<td>66,291.67</td>
<td>50,875.00</td>
</tr>
<tr>
<td>64Gb</td>
<td>86,625.00</td>
<td>59,125.00</td>
<td>45,375.00</td>
</tr>
<tr>
<td>32Gb</td>
<td>78,750.00</td>
<td>53,750.00</td>
<td>41,250.00</td>
</tr>
</tbody>
</table>

For product update and special discount: like us on facebook.com/dellslate.nigeria
Videos: http://www.youtube.com/watch?v=PWdwNeBgdHs
http://www.youtube.com/watch?v=4kpHL501JcY