

**FORTIS**  
INNOVATIONS



# Sanitas ERP for Healthcare Facilities

ISSUED BY

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# 1. Preamble

- a) This document seeks to provide a preliminary proposal to implement a Comprehensive Hospital Management Information System (CHMIS) for any interested party seeking to knowing more about our comprehensive HMIS offering.
- b) It goes ahead to give a clear picture of what the overall project activities entail together with the timelines. In regard to this, it also highlights the roles and responsibilities of the Fortis staff that will be involved in the course of the project's life cycle.
- c) The system "Sanitas HMIS" provided by Fortis Innovations Ltd, wishes to principally provide automation for all the hospital administration and patient care processes, with the objective of streamlining the day-to-day activities at the health facility.
- d) This proposal represents a common understanding of the project for the purpose of facilitating communication among the stakeholders and for setting authorities and limits for the project manager and team. The proposal's statement of the business vision helps ensure traceability in the project and includes (or will inevitably include); relating the project to business objectives, defining the boundaries of the project in multiple dimensions such as approach, deliverables, milestones, and budget. Ultimately, the purpose of this document is to provide a vehicle for documenting the initial planning efforts for the project.





## 2. Executive Summary

Fortis Innovations, as a healthcare IT solutions partner is committed to preparing hospitals to meet future challenges – and enhance their service offering to patients, referral sources and staff by means of a standardized Hospital Management Information System (HMIS). Leveraging upon a dedicated healthcare practice group, Fortis Innovations has developed Sanitas – a next generation HMIS that is powerful, flexible and intuitive. Sanitas is a Health Facility Management Software that transforms a healthcare facility (regardless of its size) from a paper-based operation to a paperless operation, thus providing tangible benefits such as marked increase in revenue collection, enhanced patient care experience, superior reporting on operations and measurable expense reduction.

It has been designed and developed to deliver real conceivable benefits to hospitals. The HMIS is conceived by a blend of seasoned professionals with rich and relevant experience both in the healthcare industry and the information technology industry. The system incorporates the best healthcare practices and is designed to deliver key tangible results to clients across the globe. Sanitas HMIS provides the benefits of streamlined operations, enhanced administration and control, superior patient care, strict cost control and improved profitability, while maintaining compliance with regulatory bodies and quality processes.

Sanitas HMIS addresses all the major functional facets of a hospital. Access to the right information and automation of complex tasks and workflow is the key focus of the HMIS, thereby freeing the staff to address their core responsibilities and extending the reach of services. At Fortis we believe that a HMIS should be precise and must result in cost reduction, process improvement and efficient management. In regard to that belief, we have developed a HMIS system that is methodical in approach and suits all environments including large, medium or small hospitals/clinics. The HMIS is designed to cover a wide range of hospital administration, clinical and management processes. At the core, the HMIS offers unparalleled flexibility and scalability, comprehensive report types, easy customization, intuitive visuals and interactive graphics that simplify complex data, dashboard-supported quality initiatives and comprehensive drill down capabilities. With technology expertise garnered for over a combined three decades and specialists drawn from diverse fields of professional disciplines, we help hospitals provide better managed care through the state-of-the-art HMIS solution.





The HMIS provides an effective solution to hospitals that plan to:

- Improve responsiveness to patient care
- Reduce cost of administration and clinical transactions
- Enhance decision making processes
- Streamline operations

Sanitas HMIS not only provides an opportunity for hospitals to enhance their patient care but also guarantees increase profitability of the health facility. The guaranteed ROI coupled with enhanced image and a competitive advantage of the hospital and also act as drivers for healthcare providers to invest in the HMIS that will keep all the stakeholders in tune with the operations of the organization.





## 3. Company Profile

### 3.1. Background

Headquartered in Nairobi, Fortis Innovations provides superior software development services for a variety of clients ranging from private based organizations, non-governmental organizations and government agencies. Fortis, previously operating under the iPress Systems banner was founded in the year 2006 with the vision of creating and maintaining innovative solutions that aid organizations to leverage technology, to attain long and short term objectives with bottom line impact. Fortis has however since 2011 focused on the healthcare Industry with the core goal to ensure that information technology is transformed into a tangible asset for health facilities in Kenya and Africa at large.

### 3.2. Who we are

We are a group of young men and women who are passionate about technology and creating solutions that positively impact the world. Together, we all form the dynamic and modern software development enterprise with a commitment for delivery and creativity. Invariably, we are valued for our ability to positively impact the delivery of quality end-to-end ICT solutions and offering continual functional and technical support. Our team's extensive business and technical skills encompass all aspects of operation and implementation, including business requirements definition (BRD), system concept design, and guiding development teams customizing software to work with diverse client needs. With the foregoing in-depth understanding of what entails successful and effective software, we leverage from the vast experience of building modern software that complement our client's core competencies and the unchanging ethos of always exceeding our client's expectations. Utilizing state-of-the-art infrastructure and world-class technology we offer business-aligned services to achieve streamlining of business processes, enhance competitiveness and increase profitability.





### 3.3. Mission

At Fortis Innovations Ltd, we will endeavor to ensure that information technology is an asset for our clients and partners, by paying the highest possible attention to the delivery of relevant healthcare IT products and solutions, with a touch of uniqueness that will go a long way to sustain the competitive advantage and realize tangible benefits. The strategies employed will be economical, efficient, durable, and flexible to aid organizations to respond rapidly to community, customer and market needs.







## 4. About Sanitas HMIS

### 4.1. Product Overview

**Sanitas HMIS** (Hospital Management Information System) is an automated web based solution that addresses the core operations of a healthcare facility. The solution has been designed in the context of the Kenyan Health Care System, which is similar to that in other countries in Sub-Saharan African Region. The platform, being a web-based application, can be accessed from low cost desktop computers and/or mobile devices thus eliminating lengthy paper trails by having clinicians easily update patient records electronically while making their rounds. It has been implemented in a modularized approach to handle the various clinical processes such as Patient registration; Physician encounter; Drug dispensation and Inventory Management; Accounting including Patient billing and Insurance, In-Patient & Out-Patient Care processes such as Radiology & Imaging, Laboratory Investigations amongst many others.

The system provides the benefits of streamlined operations, enhanced administration & control, superior patient care, strict cost control and improved profitability. It is powerful, flexible and easy to use and is designed and developed to deliver real conceivable benefits to hospitals and clinics. More importantly it is backed by reliable and dependable product support.

The platform has been designed for both single and multi-specialty hospitals and clinics, to cover a wide range of hospital administration and management processes. Built with the ability to support single and even chain of healthcare facilities, the integrated end-to-end HMIS that provides relevant information across the hospital to support effective decision making for patient care, hospital administration and critical financial accounting, in a seamless flow.

The platform provides an improved quality of patient care by maintaining up to date medical records that can be accessed by clinicians from various locations. With patient biometric identification, Sanitas allows a secure and convenient way for patients to identify themselves and receive the care that they seek. Follow up care of patients is also greatly improved by the appointment and medication collection reminders that can be automatically sent via Short Message Service (SMS).





The system comes pre-packaged with the following modules:

- |  |  |
|--|--|
| <b>a.</b> Patient registration & administration              | <b>h.</b> Radiology & Imaging              |
| <b>b.</b> Ward management                                    | <b>i.</b> Pharmacy                         |
| <b>c.</b> Accounting (Including Patient billing & Insurance) | <b>j.</b> Nursing Care                     |
| <b>d.</b> Reporting & Business Intelligence                  | <b>k.</b> System Administration            |
| <b>e.</b> Inventory & Store Management                       | <b>l.</b> Payroll                          |
| <b>f.</b> Clinician (Outpatient management)                  | <b>m.</b> Asset Register                   |
| <b>g.</b> Inpatient & Theater management                     | <b>n.</b> Customer Relationship Management |
|  | <b>o.</b> Sales & Marketing                |

## 4.2. The Platform's Key Highlights

1. User friendly, intuitive and easy to use web-based application.
2. The system has been designed with a patient centered approach.
3. Adherence to international health standards such as DICOM, ICD-10, CPT Codes and HL7.
4. Sanitas HMIS is a revolutionary solution with end-to-end features for simplifying hospital management – all at a cost that provides the fastest ROI.
5. The HMIS is designed to cover a wide range of hospital administration and management processes.
6. The HMIS features unparalleled flexibility & scalability, comprehensive report types, easy customization, intuitive visuals and interactive graphics that simplify complex data, dashboards-supported quality initiatives and comprehensive drill-down capabilities.
7. The system incorporates the best healthcare practices and is designed to deliver key tangible benefits to clients across the globe.
8. Fortis believes that every hospital is unique in terms of its requirements and priorities, thus, flexibility has been built into the HMIS to allow easy customization.
9. Access to the right information and the automation of complex tasks & workflow is the key focus of the HMIS, enabling freeing the staff to spend more time on caring for patients and extending the reach of services.





10. With technology expertise garnered for the 8 years and specialists drawn from diverse fields of medicine, we help hospitals provide better-managed care through a state-of-the-art HMIS solution.
11. The HMIS has been conceived by a blend of seasoned professionals with rich and relevant experience in the healthcare industry.
12. Robust system architecture designed to work with a wide spectrum of relational databases from open source ones i.e. MySQL, PostgreSQL, to proprietary ones such as Oracle DBMS and MS SQL.
13. The platform has been designed from the ground up to harness the power and flexibility of cloud computing with its multi-instance (multiple branches) capability.
14. Management, operational and MOH reports at the click of a button, to aid in faster decision making.





## 5. Here's Our Promise & Assurance

For over 10 years, the Fortis technical and support teams have tirelessly continued to build the best user experience so that healthcare professionals can focus on providing the best care services to their clients.

Sanitas provides an effective solution to hospitals that plan to reduce the costs of administrative and clinical transactions, and at the same time, provide better service to their consumers. The benefits of the HMIS include:

### Superior clinical decision-making

The advanced EMR enables the care providers to view the patient's care records, clinical documents, investigation results, prescriptions, diagnosis; enabling superior clinical decision making.

### Reduced operating cost and positive ROI

Sanitas will aid the hospital in reducing the operating cost and achieve a positive ROI by:

- Reduction / Elimination of duplication of work.
- Improved flow of information and hence Faster decision-making
- Increased productivity.
- Greater control over patient management, improvement in services offered.
- Cost saving / higher revenue generation as a result of overall improvement in almost all areas of Hospital management.

### Patient Satisfaction Improved Profitability

The completely integrated application ensures seamless flow of data thus helping the management to collect, disseminate and analyze the information and provides cash flow reports. The application also aids in doctor-patient interaction and improves the patient communication with the doctors and vice versa.

### A Partner Working With You, Not Just For You

When you work with Fortis Innovations HMIS Solutions, you enter into a relationship with two-way communication. Beyond simply development services, we work with you and your staff hand in hand to increase your efficiencies. We provide you continuous feedback that improves your front-end processes and increases your overall operations success.





## Lower Cost of Ownership

Sanitas provides substantial operational efficiency gains from exception-based workflow resulting in a need for fewer Full Time Equivalents. The intuitive presentation reduces the time needed to train staff. In addition to that, the system's technology stack but can be easily scaled to support very large multi-site healthcare facilities.

## Seamless Integration to Other Systems

Acquiring Sanitas saves you from the cost of integrating to other external platforms and systems. We are always actively integrating to other platforms in the healthcare ecosystem such as DHIS2 (reporting), SMART (insurance), Savannah Informatics (insurance) and MPESA (payments).

Further to this, we also interface with laboratory and imaging equipment through standardized communication protocols such as HL7 and DICOM.

Other salient benefits that come with using Sanitas are:

1. Value addition to the patient experience through efforts such as SMS based reminders for prescription and appointments and also biometric identification.
2. Better inventory management of hospital supplies by enforcing controls and accountability hence reduces wastage and unaccounted for loss of supplies.
3. Our revenue cycle solutions are designed with one purpose in mind: deliver revenue to the bottom line today and going forward. Our system delivers results, not just reports.
4. Easy compilation of highly accurate regulatory reports for the government such as morbidity, mortality reports & IDSR Reports.
5. Increased revenue collection due to proper monetary accountability.
6. Elimination of work duplication hence meaning that productivity is increased.
7. Management timesaving through single window monitoring.
8. Efficiency in billing through single point cash management.
9. Faster patient discharge summaries through integrated department management.
10. High patient satisfaction due to less wait time at point of sale counters.
11. Monitor departmental and doctor cost and profitability.
12. EMR / paper saving through efficient recording of patient medical records.
13. Higher department collection through integrated outpatient consulting.
14. Easy and quick medical insurance claims processing.
15. Highly improved patient turnaround time due to the efficient & intuitive queue manager.
16. Easily accessible patient historical information due to the structured EMR.
17. Comprehensive accounting that follows international accounting standards



## 6. Featured Case Studies

### 6.1. Bungoma County Referral Hospital

01	COUNTY	BUNGOMA COUNTY
02	AVERAGE NUMBER OF STAFF	500
03	NUMBER OF SYSTEM USERS	330
04	AVERAGE MEDICAL PRACTITIONERS	90
05	AVERAGE NUMBER OF NURSES	180
06	AVERAGE DAILY OP VISITS	310
07	AVERAGE DAILY IP COUNT	200
08	NUMBER OF WARDS	7
09	NUMBER OF BEDS	216
10	NUMBER OF COTS	7
11	SERVICES	Antiretroviral Therapy, Curative In-patient Services, Family Planning, HIV Counseling and Testing, Immunization, Laboratory, Dental Care, Imaging Services, Palliative Care, Maternal Care, Pediatrics Care, Major & Minor Surgeries, Physiotherapy, Eye Clinic, Orthopedics

Bungoma County Referral Hospital is situated in the western part of Kenya in Bungoma County. The hospital is a level 4<sup>1</sup> facility serves as a referral facility to a population of more than 1,375,063<sup>2</sup> county citizens. The facility was Fortis' maiden client that took up Sanitas HMIS and they played a big role in shaping up & bringing the system to its maturity by sharing the initial core requirements. The Fortis worked closely with the team of healthcare professionals & staff in the facility in crafting a system that would provide the best user experience that matches the hospital processes in an African context. Upon the system go-live the teams in the facility witnessed an improvement in operations such as records management, automation of mundane tasks such as report generation & improved accountability in supplies consumption and revenue.

<sup>1</sup> Healthcare in Kenya - [https://en.wikipedia.org/wiki/Healthcare\\_in\\_Kenya](https://en.wikipedia.org/wiki/Healthcare_in_Kenya)

<sup>2</sup> Kenya Census 2009 - <https://www.scribd.com/doc/36672705/Kenya-Census-2009>



## 6.2. PCEA Chogoria Hospital

01	COUNTY	THARAKA NITHI COUNTY
02	AVERAGE NUMBER OF STAFF	400
03	NUMBER OF SYSTEM USERS	380
04	AVERAGE MEDICAL PRACTITIONERS	75
05	AVERAGE NUMBER OF NURSES	150
06	AVERAGE DAILY OP VISITS	290
07	AVERAGE DAILY IP COUNT	280
08	NUMBER OF WARDS	7
09	NUMBER OF BEDS	320
10	NUMBER OF COTS	12
11	SERVICES	Antiretroviral Therapy, Curative In-patient Services, Family Planning, HIV Counseling and Testing, Immunization, Laboratory, Dental Care, Imaging Services, Palliative Care, Maternal Care, Pediatrics Care, Major & Minor Surgeries, Physiotherapy, Eye Clinic, Orthopedics

P.C.E.A Chogoria hospital is situated in the Eastern part of Kenya in Tharaka-Nithi county. The facility is a faith based healthcare facility that operates under the CHAK<sup>3</sup> framework and it compliments services offered by other Level 4 facilities in the region as well as acting as a referral facilities to other facilities in the Meru region.

After going through a rigorous tender process, the Chogoria Hospital made a bold decision to acquire Sanitas HMIS from Fortis despite being a recent entrant into the eHealth space in the country at that point in time. Chogoria had dealt with a myriad of issues with their previous issues with their previous system which upon tracing were rooted to poor vender support services. This in turn reflected in the heavy losses the the organisation made.

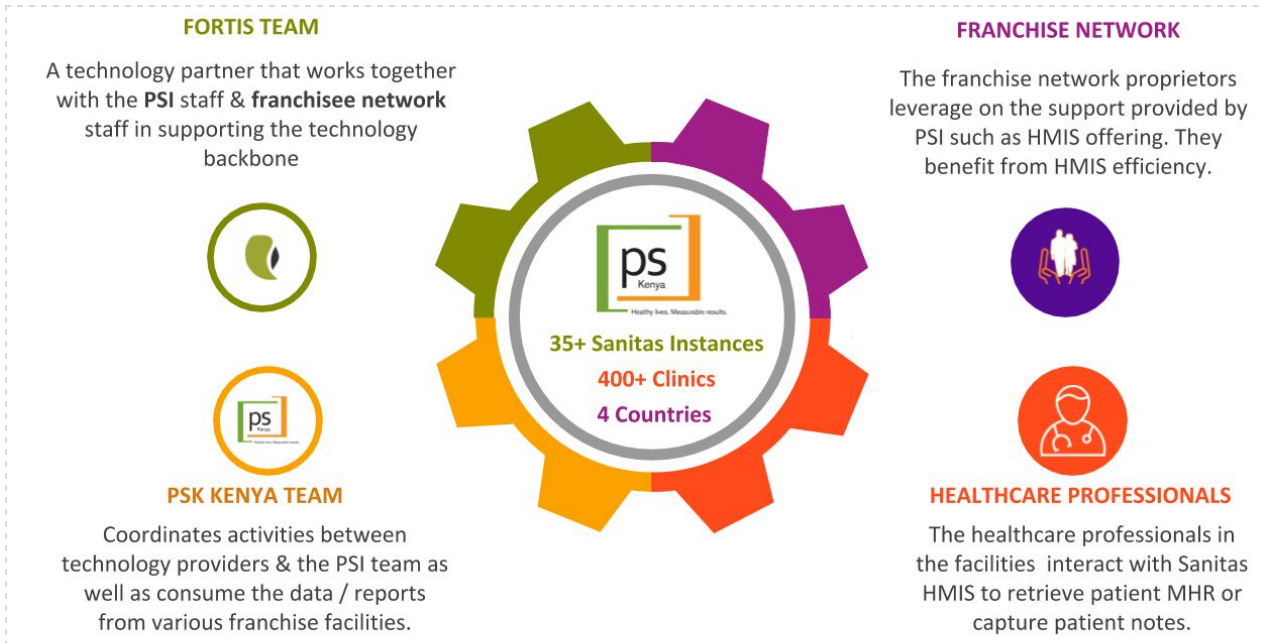
On the first month of implementing Sanitas, the facility immediately witnessed reduced wastage of supplies & funds due to improved accountability as a result of the air-tight controls implemented in Sanitas. This being the first private facility that was taking up Sanitas, some organization operations that are nuanced from how governmental facilities operates emerged and this gave the Fortis team the opportunity to further shape up and mature the system.

<sup>3</sup> Church Health Association of Kenya (CHAK) - [https://www.chak.or.ke/cmsviewpage.php?CMS\\_Menu\\_Id=5](https://www.chak.or.ke/cmsviewpage.php?CMS_Menu_Id=5)



### 6.3. Tunza Clinics

Tunza Clinics is a social franchise healthcare network operated by PS Kenya with over 400 facilities across Kenya. Tunza's core focus is to empower healthcare providers that serve the bottom of the pyramid to improve the quality of care hence better outcomes. They achieve this by providing training, business support, outreach, supplies and equipment.



Fortis / PS Kenya Partnership Organization Chart

Our journey with Tunza began mid 2016 and this was necessitated by the fact that PSI needed to a more efficient way of monitoring & evaluating the franchisees in their network. Besides that, it was also in their best interest to improve the day to day operations of the franchisees by proven modern methods of automating information management in healthcare facilities. To be able to make prompt & clear cut impactful decisions the PSI needed a system that would aggregate and relay information from the facilities to one central data repository in real time, on demand or at scheduled periods.

The Fortis team together with the PS team in conjunction with the franchisees held various intensive workshops with the goal of defining a clear & robust implementation strategy that would ensure successful rollout of the Sanitas HMIS across their network. In 2017 we began the rollout in Malawi, Uganda & Finally Kenya in 2018. To date we have over 35 franchisees in the Tunza network. The feedback from the franchisees all across the country has been positive - all the franchisees share one view, that they are able to focus more on giving care and worry less about the mundane tasks that have since been automated. The PSI team is also elated by the speed at which they are able to get the data they need with less human intervention.





# 7. System Modules in Sanitas

## 7.1. High Level Overview of the Offering





## 7.2. Modules High Level Functionality Index (Brief)

7.2.1 Administration	7.2.2 Patient Registration
<ol style="list-style-type: none"><li>1. User creation.</li><li>2. User privilege configuration.</li><li>3. Role creation.</li><li>4. Role privilege configuration</li><li>5. Approval mandates configuration.</li><li>6. Branch creation and configuration.</li><li>7. Department creation and configuration.</li><li>8. Clinic creation and configuration.</li><li>9. Medical scheme creation and configuration.</li><li>10. Login audits.</li><li>11. Backup audits.</li><li>12. Integrated system configurations.</li></ol>	<ol style="list-style-type: none"><li>a. Patient registration.</li><li>b. Edit of registration details.</li><li>c. Outpatient queue.</li><li>d. Queue management system (with customizable tokens)</li><li>e. Visit profile.</li><li>f. Current admissions listing.</li><li>g. Appointment registers.</li><li>h. Appointment reminder setup (SMS).</li><li>i. User created visit types.</li><li>j. User created registration fields.</li><li>k. Mortalities listing.</li><li>l. Biometric enrolment and verification.</li><li>m. Clinical reports:<ol style="list-style-type: none"><li>1. Diagnosis summary.</li><li>2. Lab tests summary.</li><li>3. ISDR weekly epidemic monitoring report (MOH 505).</li><li>4. Under 5 years daily outpatient morbidity.</li><li>5. Over 5 years daily outpatient morbidity.</li><li>6. Monthly workload report.</li><li>7. Injections ordered and administered.</li><li>8. Monthly Inpatient and outpatient statistics.</li></ol></li></ol>





## 7.2.3 Managerial Accounting

1. Chart of accounts management.
2. General Journal.
3. General ledger Management.
4. Payment mode management
5. Budget setup & management
6. Bank deposits & reconciliation management
7. Price list / Service list setup & management
8. Service packages configuration
9. Vendor & Supplier management
10. Medical scheme service exclusions setup
11. Consultant fee management
12. Debtor management
13. Invoice / Voucher Settlement
14. Project Accounting
15. **Reports**
  - a. Daily Collection
  - b. Daily Payment
  - c. Receipt Summary
  - d. Payments Summary (By payment mode)
  - e. Debtor Statement
  - f. Debtor Ageing Report
  - g. Creditor Ageing Report
  - h. Insurance Allocation Report
  - i. Insurance Settlement Report
  - j. Collections Analysis Chart
  - k. Unposted Revenue
  - l. Cash Flow Breakdown
  - m. VAT 3a Analysis

## 7.2.4 Payment

1. **Receivables Management**
  - a. Sale Invoice Management
  - b. Claim Schedule Management
  - c. Payment Receipt
  - d. Refund Management
  - e. Client Funds Deposits Management
  - f. Patient Medical Cover Management
  - g. Quotation Creation
2. **Payables Management**
  - a. Voucher Management
  - b. Payment Processing
  - c. Payments Listing
  - d. Pre-Payment Management
3. **Petty Cash Management**
  - a. Cashier Collection Summary
  - b. Receipts Summary
  - c. Billing Audit
  - d. Current Inpatient Summary
  - e. Price List Enquiry Lookup
4. **Reports**
  - a. Petty Cash Request
  - b. Payment Request
  - c. Imprest Request
  - d. Staff Advance Request
  - e. Processed Payment Summary



## 7.2.5 Reporting

### 1. Operations Analysis

- a. Patients Visit Analytics Dashboard
- b. Patient Visits Summary & Chart
- c. Clinical Processes Summary Charts
- d. Inventory Trail Summary

### 2. Collections Analysis

- a. Unit Monthly Summary
- b. Payment Mode Summary
- c. Cashier Collection
- d. Debtor Collection
- e. Categorised Collection Analysis Chart

### 3. Revenue Analysis

- a. Revenue From Billable Items
- b. Revenue by Department / Units
- c. Inpatient / Outpatient Revenue
- d. Staff Revenue Linkage

### 4. Performance Analysis

- a. Individual Performance
- b. Unit Monthly Performance

### 5. Financial Statements

- a. Trial Balance
- b. Income Statement
- c. Balance Sheet
- d. Statement of Cash Flows

### 6. Inventory Reports

#### Stock Movement Reports

- a. Detailed Stock Movement
- b. Summarized Stock Movement
- c. Stock Adjustment Report
- d. Product Consumption Trend

### Store Inventory Reports

- a. Store Product Levels
- b. Stock Replenishment Report

### Store Operation Reports

- c. Purchase Deliveries
- d. Spot Check Tracking

### 7. Medical Clinical Reports

#### Clinical Statistics Reports

- a. Diagnosis Summary
- b. Inpatient Diagnosis Summary
- c. Performed Laboratory Tests
- d. Monthly Visits by Visit Type
- e. Children Vaccination Register)
- f. Pregnant Women Vaccination Register
- g. Diagnosis Register

#### Ministry of Health Reports

- a. IDSR Weekly Epidemic Monitoring Form
- b. Under 5 Years Outpatient Daily Morbidity (705 A)
- c. Over 5 Years Outpatient Daily Morbidity (705 B)
- d. Integrated Summary Report Form (711)
- e. National AIDS & STI Control Form NASCOP (731)
- f. Clinical Chemistry Report
- g. Parasitology Report
- h. Monthly Workload Report (717)
- i. Injections Ordered & Administered
- j. Monthly Inpatient & Outpatient Statistics
- k. Monthly Vaccination Report
- l. Monthly Weight / Height Summary (MOH 713)
- m. Health Unit Outpatient Monthly Report (108)
- n. Health Unit Weekly Epidemiological Surveillance Form



## 7.2.6 Inventory

### 1. Inventory Management

- a. Inventory items management
- b. Inventory units management

### 2. Store Management

- a. Storage areas
- b. Store requisition
- c. Internal consumption requisition
- d. Direct store sales management
- e. Store receipting management
- f. Stock level adjustment
- g. Batch items & expiry management

### 3. Purchase Management

- a. Purchase requisition
- b. Purchase order processing
- c. LSO requisition
- d. LSO processing
- e. Supplier details management
- f. Supplier / vendor category management
- g. Supplier / vendor records management

### 4. Reports

#### Stock Movement Reports

- a. Detailed stock movement
- b. Summarized stock movement
- c. Stock adjustment report
- d. Product consumption trend

#### Store Inventory Reports

- a. Store product levels
- b. Stock replenishment report

#### Store Operation Reports

- a. Purchase deliveries
- b. Spot check tracking

## 7.2.7 Asset Management

### 1. Asset Management

- a. Asset register management

### 2. Asset Register Configuration

- a. Asset locations management
- b. Asset categories management
- c. Asset make management
- d. Asset model management



## 7.2.8 Outpatient Care

- 1. Clinic Queue & Encounter Management**
  - i. Encounter Management**
    - a. Capture Chief Complaints
    - b. Capture History of Presenting Illness
    - c. Capture Physical Examination Details
    - d. Capture Patient Management Notes
    - e. Capture Clinical Profile
    - f. View Vitals & Triage Charts
    - g. Order Lab & Imaging Investigations
    - h. Capture Diagnosis
    - i. Treatment Management
    - j. Order Prescription
    - k. Order Minor Procedures
    - l. Order Family Health Procedures
    - m. Order Ancillary Care Treatment
    - n. Capture Treatment Instructions
    - o. Admission Forms (Adult & Paeds)
    - p. Appointment & Referral Management
  - ii. Patient MHR**
    - a. Paediatric Growth Charts
    - b. Complete Medical History Report
- 2. Major Procedures Queue Management**
  - a. View Major Theater Procedures Queue
  - b. Request Major Theater Procedures
  - c. Theater Schedule Management
  - d. Capture Pre & Post Operations Notes
  - e. View Pre & Post Theater Checklist
  - f. View Nursing Care Summary
- 3. Reports**
  - a. Clinical Statistics Reports
  - b. MOH Reports

## 7.2.9 Inpatient Care

- 1. Current Admission & Encounter Management**
  - i. Admissions Encounter Management**
    - a. View Nursing Care Notes
    - b. Capture Chief Complaints
    - c. Capture History of Presenting Illness
    - d. Capture Physical Examination Details
    - e. Capture Patient Management Notes
    - f. Capture Clinical Profile
    - g. View Vitals Charts Dashboard
    - h. Order Lab & Imaging Investigations
    - i. Capture Diagnosis
    - j. Treatment Management
    - k. Order Prescription
    - l. Order Minor Procedures
    - m. Order Family Health Procedures
    - n. Order Ancillary Care Treatment
    - o. Capture Treatment Instructions
    - p. Appointment & Referral Management
    - q. Rollback Admission & Discharge Patient
  - ii. Patient MHR**
    - a. Paediatric Growth Charts
    - b. Complete Medical History Report
  - iii. Labour Monitoring (Partograph)**
  - iv. Mortality Case management**
  - v. Theater Queue & Schedule Management**
  - vi. Blood Transfusion Management**
- 2. Major Procedures Queue & Schedule Management**
- 3. Reports**
  - a. Clinical Statistics Reports
  - b. MOH Reports



## 7.2.10 Nursing

### 1. OutPatient Care

- a. Triage & patient queue management
- b. Prescription queue management
- c. Minor procedures queue management
- d. Vaccination queue management
- e. Family health queue management
- f. Ancillary care queue management

### 2. InPatient Care

- a. Nursing Care
  - i. View MHR
  - ii. Vitals dashboard
  - iii. Labour monitoring
  - iv. Treatment form
  - v. Admin / rollback admission
  - vi. Capture nursing care plan
  - vii. Capture cardex
  - viii. Capture vitals
  - ix. Input / output fluid balance chart
  - x. Order lab tests
- b. View & capture shift summary
- c. Prescription queue management
- d. Minor procedure queue management
- e. Theater patient queue management
- f. Blood transfusion queue management

### 3. Reports

- a. Clinical Statistics Reports
- b. MOH Weekly Reports
- c. MOH Monthly Reports

## 7.2.11 Ward Management

### 1. Admission Queue Management

- a. Receive patient to ward
- b. Roll back admission
- c. Approve admission
- d. View session medical history

### 2. Bed & Bill Allocation

- a. Adjust patient patient billable services
- b. Change patient bed / ward / room

### 3. Direct patient admission management

### 4. Current patient admissions management

### 5. View admitted patients billing audit

### 6. Ward Configuration Management

- a. Ward Category
- b. Wards
- c. Room
- d. Bed

### 7. Default Inclusions Management

- a. Ward billables
- b. Bed billables
- c. Admission billables



## 7.2.12 Laboratory

- 1. Lab Test Request Queue Management**
  - a. View Ordered Lab Tests
  - b. Order Lab Tests
  - c. Receive / Reject Specimen Sample
  - d. Generate & Print Specimen Barcode Label
  - e. Record & Submit Lab Test Results
  - f. Print Lab Test Results
  - g. View Patient Medical History
  - h. Laboratory equipment interfacing for seamless and accurate results.
- 2. SMS Messaging Alerts for Ready Tests**
- 3. Lab Test Configuration Parameters**
  - a. Available Tests
  - b. Test Categories
  - c. Test Result Types
  - d. Remark Templates...etc
- 4. Blood Transfusion Management**
  - a. Blood group compatibility matching
  - b. Blood bank management
  - c. Blood Transfusion Validation
- 5. Reports**
  - a. Analysis Reports**
    - i. Performed Tests Summary
    - ii. Individual Tests & Results Summary
    - iii. Lab Test Results Statistics
  - b. Workload Summary Report
  - c. Ward Lab Tests Summary
  - d. Results Amendment Audit
  - e. Rejected Samples Summary
  - f. Outsourced Tests Summary
  - g. Turn Around Time
  - h. MOH Reports

## 7.2.13 Imaging

- 1. Imaging Request Queue Management**
  - a. View Ordered Imaging Requests
  - b. Order Imaging Requests
  - c. Record & Submit Radiology Findings
  - d. Print Radiology Findings
  - e. Search and view DICOM studies from PACS
- 2. SMS Messaging Alerts for Ready Requests**
- 3. Imaging Configuration Parameters**
  - a. Available Imaging Services
  - b. Imaging Categories
  - c. Imaging Results Templates
  - d. Wellness Examination
  - e. Questionnaires
- 4. Reports**
  - a. Analysis Reports**
    - i. Daily Imaging Summary
  - b. Workload Summary Report
  - c. Billing Audit





## 7.2.14 Pharmacy

### 1. Point of Sale

- a. View patient prescription queue
- b. Search & order drugs based on the prescribed pharmacological ingredients or specific drug
- c. View available drugs in stores
- d. Dispense drugs
- e. Print prescriptions
- f. Link SMS based patient prescription reminder
- g. View patient MHR
- h. Bulk drug dispensation (Handy for inpatient prescriptions ordered from wards)
- i. View prescription reminders list

### 2. Store & Inventory Management

- a. View inter-unit store requisitions
- b. Service inter-unit store requisitions
- c. Print out requisitions checklist
- d. Create inter-unit store requisitions
- e. Stock Management
- f. View stock levels of products linked to pharmacy stores
- g. Adjust stock levels of products in stores
- h. Manage batch items & link expiry dates
- i. View batch items which are about to expire

### 3. Reports

- a. Monthly pharmacy workload summary
- b. Monthly pharmacy revenue summary
- c. Pharmacy client count summary
- d. Drug consumption summary
- e. Batch expiry summary
- f. Billing audit

## 7.2.15 Morgue Management

### 1. Morgue Admissions

#### a. Morgue register management

- i. View Current Morgue Admissions
- ii. Receive deceased
- iii. Rollback admissions / releases
- iv. Release for disposal

#### b. Cabinet & Bill Allocation

- i. Adjust deceased billable services
- ii. Change deceased cabinet

### 2. Morgue Configuration Parameters

- a. Cabinets
- b. Daily cabinet billables
- c. Morgue admission default billables

### 3. Reports

- a. Mortalities Reports



## 7.2.16 Human Resources

- 1. Employee Personal Info Management**
  - a. Employee details register
  - b. Employee tenure management
  - c. Employee conduct case management
  - d. Employee probation period management
- 2. Leave Management**
  - a. View & approve leave requests
  - b. View employees on leave
  - c. Leave adjustment
  - d. View leave employees entitlement
- 3. Training Management**
  - a. View, create & approve training schedules
  - b. Manage employee training invitations
  - c. Training material management
- 4. Performance Management**
  - a. Schedule performance review
  - b. View performance review reports
  - c. Manage KPI categories
  - d. Manage KPIs per Job Title / Role
  - e. Create & Manage KPI templates
- 5. PIM parameters configuration**
- 6. Leave parameters configuration**

## 7.2.17 Payroll

- 1. Payroll Processing**
  - a. Payroll period processing
  - b. Bank payment schedule management
  - c. View & print payment deduction summary
  - d. Payslip print out
- 2. Earnings Configuration**
  - a. Earnings & benefits management
  - b. Earnings category management
  - c. Ledger linkage management
  - d. Job group / scale management
  - e. Staff earning configuration
- 3. Deductions Configuration**
  - a. Deduction entries management
  - b. Deduction category management
  - c. Ledger linkage management
  - d. Staff deduction configuration
  - e. View, track and print employee repayment
- 4. Relief Configuration**
  - a. Personal relief management
  - b. Insurance relief management
- 5. Reports**
  - a. Tax deduction card
  - b. Payroll aggregate
  - c. Earning matrix



## 7.2.18 CRM

- 1. SMS Messaging**
  - a. Compose message and send to target groups & contacts
  - b. View and manage queue messages
  - c. View sent messages
- 2. Contact Management**
  - a. View, create & manage contacts
  - b. View, create & manage target groups
- 3. Bulk SMS Management**
  - a. Purchase bulk SMS credit
  - b. View current balance & purchase history

## 7.2.19 Sanitas Board

1. View organisation-wide announcements
- 2. Requests Management**
  - a. View, manage & make payment requests
  - b. View, manage & make imprest requests
  - c. View, manage & make staff advance requests
  - d. View, manage & make transport requests
- 3. Requisitions Management**
  - a. View, manage & make store item requests
  - b. View, manage & make purchase requisitions
  - c. View, manage & make LSO requisitions
  - d. View, manage & make patient billable items requests
  - e. View, manage & make departmental store items requisition for internal consumption
- 4. Human Resources & Payroll**
  - a. View & print previous personal payslips & P9 forms
  - b. View personal payroll earnings, deductions & relief
  - c. View, & manage personal leave requests
  - d. Approve leave requests made by other direct reporting staff
  - e. View personal leave entitlement
  - f. View training invitations
  - g. View & respond to performance reviews
  - h. View training materials
  - i. View personal bank accounts as set up in the payroll system
5. Profile Management
6. Sanitas Helpdesk & Tutorial



# 8. Solution Delivery

## 8.1. Activity Timelines

### ONSITE NETWORK SURVEY

The main goal of this task is to evaluate the effort that will be required in setting up or revamping the network connectivity in the hospital so as to ensure flawless running of the system in all points within the facility.

1 DAY

1 DAY

### INFRASTRUCTURE ASSESSMENT

This task aims at evaluating the availability hardware equipment that will be required at various points i.e. Network Points, computers, printers etc.

5 WEEKS

### NETWORKING

This exercise depends on whether the facility has been networked or not. It entails setting up the actual network and testing. A maximum of 5 weeks will be required if the network has not been set up. In the event that the implementation team finds it necessary to rework some of the connectivity then this will be communicated to the steering committee accordingly. However, this task will not be deemed relevant if the implementation team gives the networking a clean bill of health.

2 DAYS

### COMPUTER SETUP

This entails setting up and the Server environment and tuning it. It also entails making sure that all the computers within the facilities network can access the Sanitas HMIS.

1 - 5 WEEKS

### TRAINING

Training all cadres of staff including but not limited to nurses, clinicians, doctors, consultants, clerks, radiologists, accountants and lab technicians. Training period ranges based on the facility size.

1 - 3 WEEKS

### SYSTEM TESTING (UATs)

This exercise entails conducting mock tests with users and also gets to evaluate the system readiness by conducting and reviewing the user acceptance tests. This involves testing the whole life cycle of a patient in the hospital and other back office processes as well, such as procurement and accounting operations. Only after a majority of the users give the system an "ok to go live" clearance will the system leave this stage. This phase is done in parallel with the training exercise.

1 - 3 WEEKS

### GO LIVE & MONITORING

This entails the actual go-live of the system in phases starting without patient & back-office operations and then a staggered deployment in the wards.

1 - 3 WEEKS

### SYSTEM HANDOVER

This task entails handing over the system to the IT manager. It involves teaching the IT staff on various user issues and how to resolve them, how to conduct system backups and how to restore the backups & system monitoring and configurations.






# 9. System Hardware Specification

## 9.1. Recommended Server Specifications & Setup

Three server environments will be required:

1. The Live Environment.
2. The Test Environment.
3. Disaster Recovery Environment.

The table below highlights the minimum requirement for each server machine environment and also explains the relevance of each environment.

LIVE ENVIRONMENT	STAGING ENVIRONMENT	DR ENVIRONMENT
 <p><b>PROCESSOR</b> Intel Xeon E5 3.1 GHz Quad core</p> <p><b>RAM</b> Minimum 32GB RAM</p> <p><b>HARD DISK</b> 4 * 500 GB (RAID 6 or RAID 10)</p>	 <p><b>PROCESSOR</b> Intel Xeon E5 3.1 GHz Quad core</p> <p><b>RAM</b> Minimum 12GB RAM</p> <p><b>HARD DISK</b> 500 GB</p>	 <p><b>PROCESSOR</b> Intel Xeon E5 3.1 GHz Quad core</p> <p><b>RAM</b> Minimum 12GB RAM</p> <p><b>HARD DISK</b> 2 * 500 GB (RAID 1)</p>
<p>This will be the primary server that will host the application and database.</p>	<p>This environment will be required for training purposes and also testing new changes and feature requests before being moved to the live environment.</p>	<p>This server is a replica of the primary server and it ensures business continuity in the event that the main server is unavailable to any unforeseen incidents.</p>








## 9.2. Client Machine Requirements

The following are the specifications that we recommend for the client / end user machines. The number of these computers will always be specified on a need basis based on the size of the health facility and the operations it wants to automate.

Since Sanitas is a web-based system, this means that it can be accessed from any operating system so long as it has a standard universal browser. The browsers that we recommend are Mozilla Firefox, Google Chrome and Safari Browser. Below are our minimum requirements and recommendations for the client machine depending on the end user's preference of the operating system.

OS	RECOMMENDED SPECIFICATIONS
<p>Linux</p> 	<ul style="list-style-type: none"><li>• Ubuntu 16.04 or later</li><li>• Google Chrome; Mozilla Firefox</li><li>• 512MB of RAM (1GB recommended)</li></ul>
<p>Windows</p> 	<ul style="list-style-type: none"><li>• 1.4GHz Intel Pentium 4 or faster processor (or equivalent) for Microsoft Windows XP or Windows 7</li><li>• 2GHz Pentium 4 or faster processor (or equivalent) for any later version of Windows XP or any later version</li><li>• 512MB of RAM (1GB recommended) for Windows XP or Windows 7; 1GB of RAM (2GB recommended) for any later version.</li><li>• Mozilla Firefox; Google Chrome</li></ul>
<p>Mac OS</p> 	<ul style="list-style-type: none"><li>• 1.83GHz Intel Core™ Duo or faster processor</li><li>• Mac OS X, 10.5, 10.6 or 10.7.2 (Intel)</li><li>• 512MB of RAM (1GB recommended)</li><li>• Mozilla Firefox; Google Chrome; Safari</li></ul>



# 10. Appendix

## 10.1.1. 1st Recommendation Letter - PCEA Chogoria Hospital



### P.C.E.A CHOGORIA HOSPITAL

P .O. Box 35-60401 Chogoria, Kenya. Tel: 254 064 22620,  
Fax: 254 064 22123 Hotline: 0713 656186, 0734 192208

Email: [info@pceachogoriahospital.org](mailto:info@pceachogoriahospital.org) Website: [www.pceachogoriahospital.org](http://www.pceachogoriahospital.org)



15<sup>th</sup> March 2014,

To Whom It May Concern:

#### Fortis Innovations Limited

I am happy to provide a reference for Fortis Innovations Limited, an IT firm that has provided a hospital-wide automation solution to P.C.E.A Chogoria Hospital both in outpatient and inpatient operations. The Fortis team and my team have both worked well from the inception of the project, planning and finally to go-live. After going through a rigorous process in identifying the right technology partner who would address our information management & process flow automation needs, we settled on Fortis Innovations as they came forth by undoubtedly proving they had what it takes to deliver a reliable world class solution for the hospital at an affordable rate.

Their outstanding advisory role in matters of hospital automation has by and large enabled us to make informed decisions when it comes to investing in our IT infrastructure. Despite a few unforeseen challenges such as different uptake speeds of different staff, they have shown their dedication in making sure that everyone does indeed understand how to use the system by offering fulltime onsite support. Both Fortis and Chogoria team have worked tirelessly to see the full automation of the following core areas: Patient Records & Queue Management, Doctor EMR for both OP & IP, Pharmacy, Lab Tests, X-Ray, Accounting, Stores Inventory Management & Procurement Processes.

Upon the rollout of their Integrated Hospital Management System (Sanitas) in December 2013, the hospital has since witnessed some of the immediate benefits, which include; Fast & controlled access to information, improved process flows, and improved accountability. They have always been forthright with costs and hours billed, and they've even worked with me on payment arrangements. With all their dependability, straightforwardness and honesty, I'm happy to recommend them to any healthcare institution seeking a reliable information technology partner.

Sincerely,


Mrs. Catherine Munene,


Ag. Chief Executive Officer



## 10.1.2. 2nd Recommendation Letter - Bungoma County Referral Hospital

**MINISTRY OF HEALTH**

Telegrams: "MEDICAL", BUNGOMA  
Telephone: (055) 20345/6/7/8 Fax:  
(055) 30650  
E-mail: please quote



MEDICAL SUPERINTENDENT  
BUNGOMA COUNTY REFERRAL  
HOSPITAL,  
P.O. BOX 14,  
BUNGOMA

Ref: BDH/FIS/3/16/(12)

DATE: 14th April , 2014

**To Whom It May Concern:**


This is a letter of recommendation for Fortis Innovations Limited which is a Kenyan software development company that develops and maintains Health Information Management Systems. Our relationship with Fortis Innovations Limited dates back to the year 2011 when we contracted them to provide a Health Information Management System during the computerization of our facility. The software that they provided was *Sanitas* which is a system that they have developed and continue to maintain it to date.

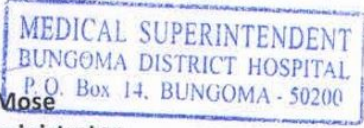
Among the objectives that Fortis Innovations Limited helped us to achieve was the wall to wall automation of the various operations touching both outpatient and inpatient. The modules we were supplied with and which we are using include electronic medical records, drug ordering and dispensing, cash collection, imaging, laboratory, budgeting, inventory management, dynamic reporting of both financial and MOH standard reports .

Fortis Innovations limited also offer support and after sales services whenever needed, in good time.

For the period we have been in contract with Fortis Innovations Limited because they have been cooperative and reliable hence we have no hesitation in recommending them to any interested organization.

**Yours truly,**

  
**Mr. Robert Mose**  
Hospital Administrator

  
MEDICAL SUPERINTENDENT  
BUNGOMA DISTRICT HOSPITAL  
P.O. Box 14, BUNGOMA - 50200





### 10.1.3. 3rd Recommendation Letter - Busia County Referral Hospital

REPUBLIC OF KENYA



## MINISTRY OF HEALTH

Telegrams: "MEDICAL", Busia,  
Telephone: 055 22127 / 22216  
Fax: 055 22136  
Email: busiahospital@gmail.com

OFFICE OF THE MEDICAL  
SUPERINTENDENT  
BUSIA COUNTY REFERRAL HOSPITAL  
P.O BOX 87,  
BUSIA (K).

#### To Who It May Concern

It is my pleasure to write this letter of recommendation on behalf of Fortis Innovations Ltd, a valued technology partner that has greatly helped our organization attain its vision of rolling out a standard EMR and information management platform.

Busia County Referral Hospital contracted Fortis in an effort to streamline its patient care and administrative operations, through the use of a modern software platform. Fortis has proven to be an invaluable partner from the outset in regards to that objective. Their professionalism and competence has seen the facility successfully rollout, an impressive platform (Sanitas HMIS) to manage all aspects of service delivery and management processes. Their commendable project execution of providing a dedicated implementation engineer on-site has ensured that the hospital staff gets to learn the system in a systematic and relatively quick manner.

Thanks to Fortis, the care givers here at the hospital, now spend more time focusing on delivering quality healthcare services to its clientele. It is my hope that the cordial and professional services that they have accorded us, will continue well into the future. To that end, I would not hesitate to recommend Fortis to any other health facility that might require their services.

Sincerely,

MEDICAL SUPERINTENDENT  
BUSIA DISTRICT HOSPITAL

DR. JANEROSE AMBUCHI  
MEDICAL SUPERINTENDENT  
BUSIA COUNTY REFERRAL HOSPITAL

08.09.2015



## 10.2. Certificate of Incorporation (Appendix C)





### 10.3. Contact Information (Appendix D)

**EMAIL:** info@fortisinnovations.com

**WEB:** www.fortisinnovations.com

**P.O BOX:** 6704 – 00200,  
NAIROBI, KENYA.

**PHONE:** +254(736) – 656 452  
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