Terms of References for Trainers in Professional Short Courses in in e-Health

I. BACKGROUND AND JUSTIFICATION

E-health is one of the key areas on which the East African Community Regional Centre of Excellence in Biomedical Engineering, E-Health, Rehabilitation and Mobility Sciences (CEBE) is focusing. The CEBE aims to increase the knowledge and skills of e-Health workforce in Rwanda and other East African countries for improved healthcare service delivery and e-Health systems management, which is currently quite limited. As more and more health facilities acquire more equipment for diagnosis and treatment purposes, CEBE's target is to build the capacity of end users, managers, technical personnel and researchers who will design, develop, implement and evaluate e-health systems.

2. Overall Goal of the short course trainings

The purpose of this e-health capacity building trainings is to strengthen the knowledge and skills in Rwanda and in the Region for the development and management e-Health applications and systems under the national eHealth enterprise architecture.

3. **The specific objectives** of the e-health capacity building trainings are as follows:

3.1 Design teaching materials and upload them on the e-learning platform of the University of Rwanda. For any or all of the following five selected e-health short courses

a. Telemedicine applications
b. Security, privacy and legal framework of health information systems
c. Medical Coding
d. E-Health: Software Development and Implementation (EHSDI)
e. Electronic Medical Records use, Management and Health Information Systems

3.2 Deliver any or all of the five short courses as mentioned above and detailed in Annex 1.

ANNEX 1: PROFESSIONAL COURSES TO BE DELIVERED

Course and Objectives	Content	Requirements of the trainer
A. Telemedicine applications		
Objectives: On completion of the course trainees will be able to: • Identify available telehealth technologies and their appropriate uses • Explain the benefits of and barriers to implementing telehealth • Understand the business and financial aspects of telehealth • Analyse key legislative, regulatory and organizational policies that impact the use of telehealth • Identify data elements to collect to support quality improvement/quality assurance • Identify the roles and responsibilities of the telehealth coordinator • Communicate telehealth concepts to organizational members as well as to health care consumers • Identify elements of a successful telehealth encounter and quality telepresence • Develop efficient clinical telehealth workflows • Identify strategies that support effective telehealth program development • Draft organizational protocols to support telehealth • Identify strategies for measuring and communicating program successes and lessons learned • Consider language, culture and disability in using telehealth technologies	• Introduction to Telehealth • eICU and Telehealth Resources • Funding and Reimbursement • Policies that Impact Telehealth (Parts 1 and 2) • Telemental Health and Ethics • Quality, Outcomes and Data Collection • Telehealth in the Home and Remote Patient Monitoring • Starting a Chronic Diseases Telehealth Clinic and Unique Applications • Operational Considerations (Parts 1 and 2) • More Successful Uses of Telehealth; Telehealth Program Planning • Introduction to Telehealth Program Management (Parts 1 and 2) • The Advanced Telehealth Coordinator: Tying all Together	• Applicant should hold a PhD in Health Informatics, Computer Sciences, Public Health, or related field with minimum of 3 years in conducting training in Telemedicine Applications ***Or*** Master's degree in Health Informatics, Public Health, or related field with minimum of 8 years in conducting training in the allied field. • Good English communication skills • Ability to operate independently
B. Security, privacy and legal framework of health information systems		
Objectives: On completion of the course trainees will be able to: • Undertake Authentication, Authorization and Accounting (AAA) on e-health and m-health • Identity management on e-health and m-health	• Introduction to CIA in e-health and m-health • Security Models, Architecture, security on body area network, and Protocol for e-health and m-health • Access control: AAA, identity management,	• Applicants should hold a research PhD in Computer sciences, certified certificate in computer security with at least 3 years work experience application in e-Health security

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• Access control on e-health and m-health • Carry out cryptography on e-health and m-health • Detect intrusion on e-health and m-health • Design fault-tolerant e-health and m-health • Ensure security on body area network • Describe Security Models, Architecture, and Protocol for e-health and m-health • Perform security evaluation on e-health and m-health • Explain Ethics and regulations in e-health and m-health • Identify Policy regulatory requirements around medical record documentation • Interpret Policy and regulatory frameworks for information handling in health • Appraise National IT policies, strategies and programmes • Explain Policy regulatory requirements around medical record documentation • Carry out the strategy and policy implementation	cryptography techniques, IDS on e-health and m-health • Security policy on e-heath and m-health: Policy regulatory requirements around • medical record documentation, framework for information handling in health, ethics and regulation, fault tolerance, and security evaluation, confidentiality, consent form	system. • Good communication skills
C: Medical Coding		
Objectives: Upon completing the course, the trainees will be able to: • Define medical terminology and use of medical prefixes • Understand the purpose and use of ICD-10-CM, current procedural terminology(CPT), and Healthcare Common Procedure Coding System (HCPCS) coding and structure • Assign diagnosis and procedure codes from ICD-10-CM, CPT and HCPCS • Provide practical application of coding operative reports and evaluation and management services • Utilize appropriate coding, for example, in anaesthesia, cardiovascular, respiratory, musculoskeletal, surgery, radiology, pathology, and medical services • Solve CPT coding practice problems	• Medical terminology: basic principles of medical word building and medical vocabulary. • Coding conventions and guidelines: o List and explain coding conventions, o Apply general and chapter-specific coding guidelines when assigning codes to diagnoses, hospital diagnosis coding concepts, o Nomenclature and classification systems o Indicate the relationship between patient record documentation and accurate coding • International classification of disease (ICD): o An overview of the ICD and clinical modification coding classification system: ICD-9-CM, ICD-10-CM, and ICD-10-PCS coding	Applicants should hold a Masters in Health Informatics, Public health with strong experience in medical coding certification. • Experience in development of training materials and conducting hands on practice with set goals • Ability to develop and use various educational technology resources to achieve effective student learning outcome. • Strong verbal and written English communication skills • Ability to interact with people of

Course and Objectives	Content	Requirements of the trainer
• Interpret and understand medical documentation procedures, billing and auditing • Describe the reimbursement methodologies • Use computerized software to assign diagnoses and procedures	system. o Format and proper techniques for looking up diagnosis codes o Practice assigning diagnosis codes and validate coding accuracy according to the patient health record. o Structure of advanced ICD 10 PCS o Procedure-based payment systems o Importance of ethical coding and compliance. • Current procedural terminology (CPT): o Define key terms, format and content of CPT o Assign CPT procedure and service codes for outpatient care o Practical experience using CPT manuals and encoder software • Healthcare common procedure coding (HCPC): • List the HCPCS levels and their components • Assign HCPCS procedures and services codes • Identify situations in which both HCPS levels I and II are assigned • Assign claims to primary Medicare administrative contractors (MACs) or durable equipments MACs according to HCPCS level II code number • Reimbursement methodologies: • Introduction to the complete revenue cycle process • Importance of correct coding to avoid lost reimbursement • Prospective payment, managed care and other third party payers • Evaluation and Management • Explain and interpret CPT evaluation and management section guidelines, coding notes,	varied background • Aptitude in preparing and delivering lectures as well as seminars •

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	and modifiers • Select and assign codes for CPT evaluation and management levels of service for documented patient code	
D. E-Health: Software Development and Implementation (EHSDI)		
Objectives: Upon completing the course, the trainees will be able to: • Design, develop, customize, implement, and maintain electronic health records (EMR) software that are used in health care systems (e.g. OpenMRS, DHIS and their interoperability) • Assess the existing softwares to identify the bugs and fix them • Develop mobile health applications • Design the system users' manual, create a flow chart that shows the flow of information from the local level (local health care center) to the highest (national) level.	• Introduction to health informatics: principles of e-Health and HIS • Basics of Java programming: Language syntax, algorithms and object-orient programming • Web design: Building standards compliant web pages using PHP, HTML5, CSS, JavaScript and jQuery, etc. • Advanced Java Programming: Design patterns, regular expressions, multi-threading and JUnit testing, enterprise java programming, etc. Programming framework (Struts, Spring MVC, Grail on groovy) will be covered in this module • Open software for e-Health: OpenMRS, iHris, BAHMNI, DHIS, OpenHIS, OpenClinic, and OpenHospital • Interoperability of open softwares for e-Health • Mobile health applications (mHealth)	**1. <u>Electronic Medical Record (EMR) / Open MRS Developer and A trainer</u>** Senior Java (J2EE) Developer (Servlets/JSP on Oracle App Server, Apache/Tomcat) Jasper Reports, Spring, REST API (for Web Services), Hibernate, JavaScript/JQuery Familiar with (JDBC with Oracle, MySQL, AJAX, XML, XSLT, CSS Layout) Health Information System knowledge, HL7, ISO, CNIL Standards implementations Deployment application on Linux (CentOS) and Windows Client/Server Proof of Java software developed by the applicant Strong knowledge of Open MRS, Bahmni distribution and proof of a module(s) that works Being a Community Open MRS Senior Developer will be a strong asset The applicant should be able to develop and integrate Open MRS modules. Education: Master's degree in Computer Science, Statistics, Public Health or related discipline. Having PhD in Computer Science, Statistics,

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		Public Health or related discipline will be an added advantage. **2. <u>DHIS2 Developer Specialist & Trainer</u>** More than 5 years of experience in the development and operations of robust Health Information Systems (preference for all five years of DHIS2 knowledge and practical experience) including specific work supporting DATIM (Either with our JSI teams or country-level health and DHIS2 teams) to get the design of any customization or application right. Then test it in country and tweak it. Finally, leave behind local capacity to continue to customize and/or trouble shoot. Experience developing web-based and/or mobile applications, web-oriented programming language (e.g. Java, Java Script, PHP), and Unix/Linux system management. Expert in the use of database management systems (MS-Access and Visual Basic are vital, SQL language, SQL server or MySQL preferred) and in the operating environment of Microsoft. Demonstrated ability to work effectively and harmoniously in cross-cultural settings with other project staff, host country counterparts, USAID, consultants, other donors and international organizations Advanced degree (MPH, MS, MIS, MA, other) in computer science, informatics, public health or related

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		fields such as health systems or health information Experienced in applying user-centered requirements processes 3. **<u>Senior developer in OPEN CLINIC, RAPIDSMS, IHRIS</u>**, Senior Java (J2EE) Developer (Servlets/JSP on Oracle App Server, Apache/Tomcat) Jasper Reports, Spring, REST API (for Web Services), Hibernate, JavaScript/JQuery Familiar with (JDBC with Oracle, MySQL, AJAX, XML, XSLT, CSS Layout) Health Information System knowledge, HL7, ISO, CNIL Standards implementations Deployment application on Linux (CentOS) and Windows Client/Server Proof of Java software developed by the applicant Strong knowledge of Open Clinic distribution and proof of a module(s) that works Being a Community Open Clinic Senior Developer will be a strong asset The applicant should be able to develop and integrate Open Clinic modules. Good English communication skills
E. Electronic Medical Records use, Management and Health Information Systems		
Objectives: Upon completing the course, the trainees will be able to: • Describe the typical electronic health record (EMR) system, summarize the categories of data maintained on this type of system, and outline standard processes involved with entering,	• EMR introduction, applications and equipment • Introduction to EMR and benefits, EMR workflows, Entering and retrieving patient information, Performing clinical and administrative tasks and Integrated devices	• Doctorate degree in Biomedical Engineering, Biotechnology Biomedical laboratory, Biomedical sciences, or closely- related degree with 3 years' work experience. Or

Course and Objectives	Content	Requirements of the trainer
storing, manipulating, and retrieving patient information • Identify the different components of the Electronic medical record; describe the standards for maintaining electronic medical records. • Summarize the portions of the standard Privacy Rule dealing with protected health information (PHI), confidentiality, and disclosure, and describe the circumstances under which information may be released without patient consent • Navigate cloud-based EMR software systems and use them to enter new patient information, encounter notes, clinical information, decision support systems, and reporting. • Structure, design and analysis of principles of the medical record including notions of data quality, minimum data sets, architecture and general applications of the EMR • Describe the major EMR billing module and explain how to complete financial and administrative tasks. • Describe the opportunities available to trained medical records users at the health facilities, explain the typical job functions and ethical responsibilities related to this work, and contrast the roles of key players. • After ddcompleting the Electronic Health Records Management course, learners will be able to: • Describe the typical electronic health record (EMR) system, summarize the categories of data maintained on this type of system, and outline standard processes involved with entering, storing, manipulating, and retrieving patient information • Identify the different components of the Electronic medical record; describe the standards for maintaining electronic medical records. • Summarize the portions of the standard Privacy Rule dealing with protected health information (PHI), confidentiality, and disclosure, and describe the circumstances under which information may be released without patient consent • Navigate cloud-based EMR software systems and use them to	• EMR practice management • Introduction to HIS management, Streamlining patient flow, Training and support for EMR usage, editing and updating databases, monitoring and feedback, Codes and Clinical vocabularies • EMR Data Quality Assurance • Entering live data into EMR, Ensuring EMR completeness and accuracy, Assisting with charting functions, Identifying information errors, Importance of Data Quality Audits • EMR Regulatory compliance • Minimum standards for EMR functionalities, Standard privacy and Security, Guidelines and standard operating procedures for using and releasing information, Ethics in EMR • EMR and Billing • Entering coding, Billing, Diagnosis, Procedure information into an EMR, Translating diagnosis and procedures into numeric and alphanumeric codes, Generating reports, Posting payments and using bills • EMR in the context of HIV care • Professionals understand the use of EMR in HIV care; patient enrolment, patient care, scheduling, reports and clinical decision support systems.	Applicant should hold a Master's degree in Health Informatics, Computer Sciences, Public Health, or related field with minimum of 3 years in conducting training in EMR implementation. Having PhD is an added value. • Demonstrated educational and training management skills • Knowledge and ability to develop learning expectations reflecting students competency • Ability to Develop and update training materials to reflect training expectation to meet the student needs. • Extensive experience in supervision of laboratory practices and Extensive knowledge in preparing and delivering the course and program curriculum • Excellent English communication, Analytical and Interpersonal skills

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enter new patient information, encounter notes, clinical information, decision support systems, and reporting. • Structure, design and analysis of principles of the medical record including notions of data quality, minimum data sets, architecture and general applications of the EMR • Describe the major EMR billing module and explain how to complete financial and administrative tasks. • Describe the opportunities available to trained medical records users at the health facilities, explain the typical job functions and ethical responsibilities related to this work, and contrast the roles of key players.		

General Requirements

- Demonstrated experience as a lead for a minimum of three similar projects including design, develop, implement and evaluate ehealth systems.
- Strong data analysis expertise, including software and knowledge of significance testing and high level statistical analysis
- Previous experience working in Rwanda (or similar context) highly desirable
- Cultural sensitivity and strong inter-personal skills essential;
- Demonstrated facilitation and training skills required
- Management, planning, coordination, organization, and facilitation skills
- Flexibility and complete availability for the duration of the assignment
- Spoken and written fluency in English is a requirement; spoken and written French is an advantage
- Flexibility, tenacity and results-oriented approach essential for success.
- Experience of working in low resources settings

II. DESIGN OF TEACHING MATERIALS AND MODE OF COURSES DELIVERY

The training consultant will employ rigorous and varied methods of training and research to achieve this task. The mode of delivery shall ensure that there is transfer of skills to the trainees for sustainability purposes. The trainees should demonstrate the capacity to be future designers, developers, implementers, users and evaluators of e-health systems in Rwanda and the Region.

III. RESPONSIBILITIES

The consultant is expected to undertake the following tasks based on the CEBE approved objectives and content of the short courses:

1. Design teaching materials for the following short courses;
   - Telemedicine applications
   - Security, privacy and legal framework of health information systems
   - Medical Coding
   - E-Health: Software Development and Implementation (EHSDI)
   - Electronic Medical Records use, Management and Health Information Systems

2. Deliver the short courses mentioned above in collaboration with University of Rwanda lecturers

4. PERIOD OF PERFORMANCE

For each training, the start and the end date will be agreed between CEBE and the consultant. The consulting services will start from the date the contract becomes successful and will be based on the period in which a given assignment is to be delivered.

5. REPORTING REQUIREMENTS

A detailed work plan with clear deliverable and milestones must be submitted within 2 weeks of the service agreement. The consultant will be required to make a progress final reports of the performance according to the contract obligation.

6. SKILLS TRANSFER

The consultant will be an experienced expert in e-health like in the design, development, implementation and evaluation of ehealth innovations, and therefore will be required to transfer the skill to UR staff during the period of execution of the assigned task.