

SCALING HEALTHCARE ACCESS THROUGH E-MINI HOSPITAL SYSTEMS

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Abstract

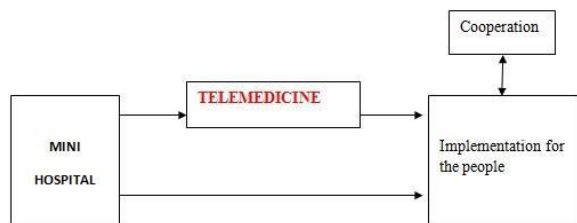
Biomedical Technology, Laboratory Equipment, it have been held through the state budget funds by the end of 2011, and will be ready to operate in early 2012. Equipment for implementation of telemedicine has been quite sufficient for student activities, but to training activities involving the target hospitals still required a set of systems that need to be prepared, readiness to be the complete package of coach. Still laboratory is needed a set of systems for Mini Hospital in order to connect to the existing system so that a complete and prospective. Objective, E-Mini Hospital will be used by UI students to improve practical competence in field; laboratory can be used in the framework of the training on the community so as to provide a wider range of benefits as well as the implementation of cooperation, activities will be assured continuity of laboratory life. Development, it was carried out by stages: first assessment, software development, checked tested and fourth assessment, by lecture, students, doctors and programmer. Result and Discussion, creating 12 pies of software, 5 Staff Module Training, 10 Mass Module training, so laboratory now is ready to implement with student, and mass as doctors, and Information and technology professional. There are 1 software in English is ready, but cooperation with UMST Sudan is fail to implement because lost contact. Software and modules can be made copy right, and Modules can be made ISBN (International Standard Book Number). Conclusion and Suggestion, software and modules that is created can made laboratory ready to serve students, mass and professionals for training. Need socialization to mass and professionals to know about readiness related to training of Biomedical Engineering Laboratory.

Keywords: *E-Mini Hospital, software, modules, trials, copy right, ISBN*

I. Introduction

1.1. Background

Biomedical Technology, laboratory equipment, have been held through the Government budget by the end of 2011, and will be ready to operate in early 2012. Equipment for implementation of telemedicine has been quite adequate for the student activities, but for training involving the target hospitals still required a set of systems that need to be prepared, readiness to be the complete package. Still required to set in order to connect a Mini Hospital on the existing system so that a complete and prospective. Described in detail can be seen as below.



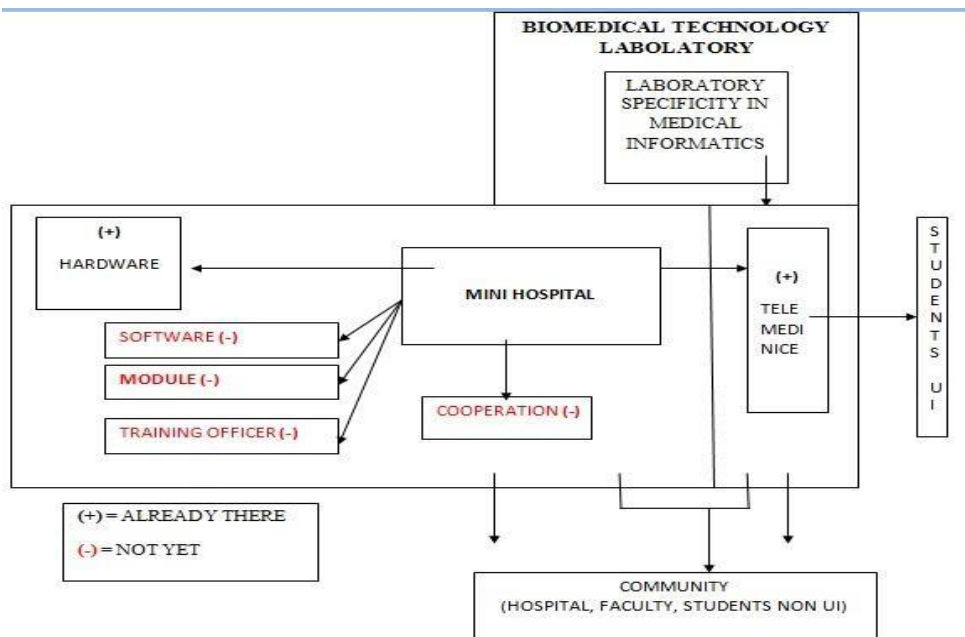
The picture above shows:

- 1) *Telemedicine* equipment that there will be more complete use of the community not only students; 2) Inside there is a Mini Hospital create software to help student, mass for taining.
- 3) Activities will enrich students in real circumstances on the field;
- 4) Cooperation activities with the initial impact would provide for a significantly internasionalization;
- 5) Activities will support the sustainability and life of labolatrrium;

Hence Laboratories Biomedical Technology development already underway and increase paid in Mini Hospital will enrich and complement the facilities so that more can meet the expectations of users are real.

1.2. Development

Development of Biomedical Technology in Medical Laboratory Informatics, only particulars of a live complement, because **existing hardware**, still 4 important things as a determinant for the passage of the process; 1) **software**, Disaster Medical Information System and hospital services; 2) **module**, module training that relevant, needed and give solution for solving a concern which can be solved with the help of information systems; 3) **officer training** as a technician and tutor who run training; 4) **cooperation** with other institutions; it is described as the following schematic.



Services developed outside activities for student practicum instructors include: 1) Journal;

- 2) Training;
- 3) Product;
- 4) Cooperation; as detail can be seen as below.

NO	SERVICES	DESCRIPTION
1.	Journal	Journal in Indonesian and English
2.	Training	1. Training in Laboratory 2. Training in hospitals and other health care institutions.
3.	Product based copy right	1. Book 2. Software 3. Training Module 4. Tool 5. Manual 6. Formula
4.	Cooperation	1. Product Development 2. <i>Workshop</i> 3. E-learning classes with other University 4. Seminar 5. Another institution.

1.3. Objectives

1. Development of Biomedical Engineering Laboratory Speciality in Medical Infoamtics need to E-Mini Hospital to complite Facilities.

2. E-Mini Hospital can be used by student to improve competence related to practical field
3. Laboratory can be used by mass for training to get more benefit to laboratory equipment..
4. To implement collaboration with UMST Sudan.
5. Activities can make sustainability of Laboratory.

1.4. Benefits

1. Laboratory with E- Mini Hospital can improve students competence because can study in real situation.¹²
2. Laboratory can be used by mass for training program.
3. As an effort to internationalism.
4. Laboratory activities with E-Mini Hospital support for sustainability.

II. Development

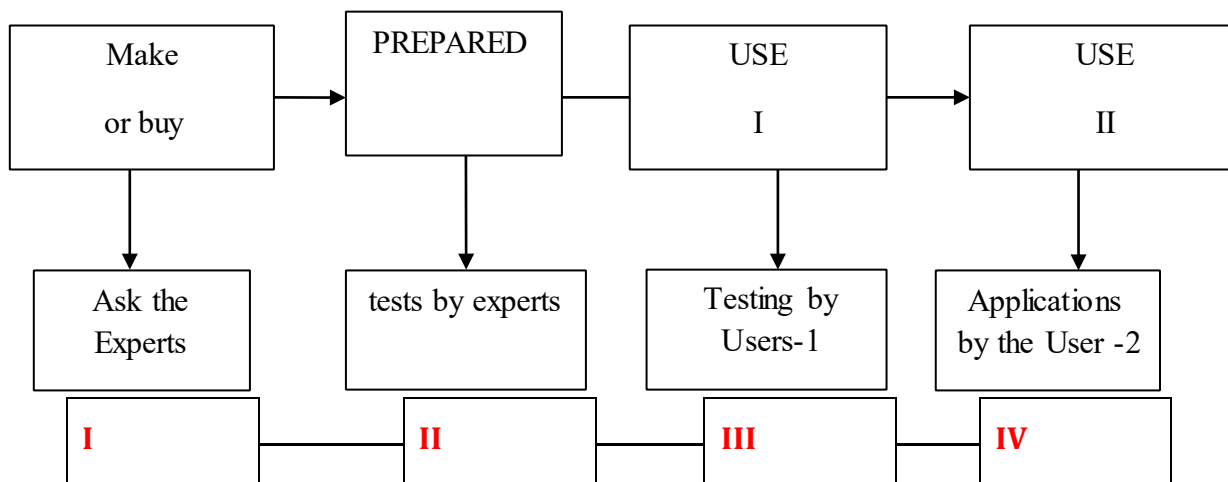
Phase I: Research Subject: Lecturers (2 persons), Student TBM UI (2 persons), Users from Hospital, Faculty, Student non UI (3 persons).

Phase II: Research Subject: Programmers (3 persons).

Stage III: Subject research: Users of Hospital (11), student (1)

Stage IV: Subject research: same as Phase I

Stages of research can be seen such as the following.⁽⁴⁾



Object Research such as the following, in Stage I, II, III, and IV for software and for modules related to research subject and object. It make by reach team are: Chairman; Boy Subirosa Sabarguna, MD, MHA, Ph. D, as coordinador and as mimbres: Anwar Yusuf Ibrahim, B. Sc, M. Sc, Prasandya Astagiri Yusuf, B. Eng, M.Eng. Research is done starting in April 2012 until finished in October 2012.

III. RESULTS and DISCUSSION

¹ Sabarguna, B.S, *Sistem Informasi Medis Bencana*, UI Press, 2012

² Research Proposal

3.1. Phase I

Research subject are: 2 lecturers, 2 students of Biomedical Technology, 1 from Hospital, 1 from Post Graduate Program, and 1 from students non University of Indonesia. Research in a book with explanation about:

Basic Reason, References and Development Method, with power point type. Questioners ask about Research Reason, Objectives, Standard Performance, Development Method, Subject and Object Research in close question: 5=Very Clear, 4=Clear, 2=Rare Clear and 1= Unclear. Questioner is added by columns for explanation answered. Research Results 74.2% for all categories and it is better to make software because in complexes and must be fit according fields.¹² Software are made in web based so it make easier for user.^(5a)

3.2. Phase II

The test in done in 12 software: 1) Disaster Medical Information System for Preparedness, 2) Early Warning Disaster Medical Information System and 3) Disaster Medical Information System during Disaster, 4) Quality Information Resource, 5) There are 8 Software for Hospital Services and 1 software in English, Test by

2 experts as person who knows about computer program.³ Test is done by using program and after that informant must be answered questioners in closed and open ended question. Scale 1= Not Clear, 2= Rare Clear, 4 = Clear and 5= Very Clear, every questioner have Text Boxes to put comment as open ended question. Question 1 about Flow of Design, Question 3 about Link and Question 3 about Appearance, there are two of them chose scale at 4, it means clear. No comment both two of informant. Question 2 about Aces and Question 3 about Execution Two of them chose scale at 4, it means clear, there are 2 comments: need to separate public menu and administration also need tooltip when mouse is over.

3.3. Phase III A. Software

There are 3 doctors related to disaster as user, trail the software, one student from Biomedical Informatics trail for Quality Information Resource, 8 Doctors as manager of Leader of Service Installation trail the software. Software in English about Nosocomial Infection Control⁴⁵⁶⁷ is failed to implement because lost contact with UMST Sudan. The result are clear and distribution of software is must be made by professional different with book maker, for more easier, user need special training so it is easier, fast and fun. According

¹ Sabarguna, B.S., *Atlas of Management Decision Skills*, UI-Press, Jakarta, 2006.

² <http://www.lina-shwab.dePubliationenz4.pdf.pdf>, p. 33, download on 19th Oct. 2012.

³ Sabarguna, BS, *Managing Information for Hospital*, Sagung Seto, Jakarta, 2008

⁴ Sabarguna, BS, *SBK Pengendalian Infeksi Nosokomial*, Konsorsium RSI Jateng & DIY, Yogyakarta, 2007, p.

⁵

⁶ min_2011-50-6_17036, download on 19th Oct. 2012.

⁷ <http://ccts.i.ucdenver.edu/RIIC/Pages/WhatIsTranslationalInformatics.aspx#Translational>, download 21th Oct. 2012

to professionalism in using software, it need more inter-disciplinary, multidisciplinary even trans-disciplinary to accommodate implementation.^(7a)

B. Staff Training Module

There are 5 modules for staff training: Telemedicine Management, Center for Copy Right, Centre for Research and Product Development, Management for Equipment Maintenance, Management of Laboratory. All 5 Modules are used by persons related to job of them, the result: modules are clear, can be done and need some improvement in words mistake.

V.5. Phase IV

Research subject of this phase as same as Phase I to follow what they think in Phase I to check concepts to be the real, so can be part of translational informatics.^(7b)

A. Software

There are 12 software; 3 Software for Disaster, 1 for Quality Resource Information, 8 Software for Hospital Service and 1 Software for Infection Control. Result: Software can be run, need training for more good application, Compact Disc of Program must be made by professional not by book maker. Software submits for Copy Right by name of Universitas Indonesia.¹

B. Staff Training Modules

There are 5 Staff Training Modules and result are: Modules is clear, can be done in training, must be fixed for words mistake. All 5 Modules have ISBN² and submit for Copy Right to Universitas Indonesia³.

C. Mass Training Modules

There are 10 modules: 1) Medical Robotic System; 2) Clinical Risk Management for Hospital⁴, 3) Hospital Information System Management, 4) Application of Biomedical Informatics for Medical Education, 5) Disaster Medical Information System for Early Warning, 6) Disaster Medical Information System for Preparedness, 7) The New Trend in Decision Support System for Hospital, 8) Decision Support System for Nosocomial Infection Control, 9) Information System for Patient Safety, 10) Management Skill based on Information System. Result: modules are clear, it can be done in training, it must be fixed in words mistake. All 10 Modules have ISBN⁽¹²⁾ and submit for copy right to Universitas Indonesia.⁵ About Disaster Medical Information System is potentially to get patent. In this case can be one of innovations.⁶ All of result can be seen in table below.

NO	ACTIVITIES	PHASE				OUTPUT	BENEFIT		
		I	II	III	IV		JUORNA	COPY RIGHT	PATEN

¹ On going process

² Number of ISBN

³ Submit to Universitas Indomesia

⁴ Sabarguna BS, *Manajemen Resiko Klinis untuk Rumah Sakit*, Sagung Seto, Jakarta, 2008, p. 35 ⁽¹²⁾ Number of ISBN

⁵ Submit to Univeresitas Indonesia.

⁶ min_2012-51-2_17435, download on 19Th Oct. 2012.

						L		T
1.	Preparation	-	-	-	-	Module =1	-	√
2.	Perangkat Lunak	√	√	√	√	Disaster =3	-	√
						Quality Information=1	-	√
						Hospital Services =8	-	√
3.	Staff Training	√	-	√	√	Module = 5	-	√
4.	Mass Training	√	-	-	√	Module =10	-	√
5.	Cooperation With UMST Sudan	√	√	-	-	Software in English =1	-	ada
				-	-	Cooperation = Fail	-	-
6.	Report					Report=1	√	-

IV. Conclusion and Suggestion

4.1. Conclusion

- Software has been made because it must be made in complex and specific, so has developed E-Mini Hospital with software to support Laboratory equipment, as: Disaster Medical Information System (3 programs), Quality Resource Information (1 program), Decision Support System for Hospital Service (8 programs), Nosocomial Infection Control (1 program), that ready for use.
- Staff Training Modules has been made in 5 modules that can improve staff to support students and mass in using laboratory.
- Mass Training Modules has been made in 10 Modules that is ready to make training for mass in using laboratory.
- About Cooperation with UMST Sudan is fail to implemented because last contact, but software in English in Nosocomial Infection Control is ready to use for others.
- By 12 software and 5 Staff Training Modules also 10 Mass Training Modules is ready to make training in 2013, so Laboratory can get income to sustainability of laboratory operation.

4.2. Suggestion

- Ready for training, so need promotion to Hospital, Education Institution, Industry and Research Institutions related to Biomedical Technology, beside that can improve more students.
- Duplication and distribution of Compact Disk (CD) for software must be done by professional not mane by books makers.
- Training for mass must be done immediately to get income for sustainability of laboratory.
- Need to prepare for cooperation with Japan and Italia.

References

Ciottone, G, R, at. All. *Disaster Medicine*, Elsevier Mosby, Philladelphia, 2006

Sabarguna,BS, *The New Trend of Decision Support System for Hospital*, Sagung Seto, Jakarta, 2008

Sabarguna, B.S, *Sistem Informasi Medis Bencana*, UI Press, 2012

Sabarguna, B.S., *Atlas of Management Decision Skills*, UI-Press, Jakarta, 2006

<http://www.lina-shwab.dePubliationenz4.pdf>, p. 33, download on 19Th Oct. 2012

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Sabarguna, BS, *SBK Pengendalian Infeksi Nosokomial*, Konsorsium RSI Jateng& DIY, Yogyakarta, 2007

Min_2011-50-6_17036, download on 19Th Oct. 2012

<http://cctsi.ucdenver.edu/RIIC/Pages/WhatisTranslationalInformatics.aspx#Translational>, download
21Th Oct. 2012 [10] Sabarguna BS, *Manajemen Resiko Klinis untuk Rumah Sakit*, Sagung Seto,
Jakarta, 2008 [11] min_2012-51-2_17435, download on 19Th Oct. 2012.