IP - 549

DEVELOPMENT OF WORLD CLASS UNIVERSITY AT UNIVERSITY OF INDONESIA

Kuliah Tamu Institut Teknologi Bandung

27 September 2019

Budiman Bela, Henki Ashadi, El Khobar Nazech

- **Loan Agreement**
  - Loan No. : JICA LOAN IP-549
  - Loan Signing : March 28, 2008
  - Loan closing date : March 28, 2018
  - Loan Amount : ¥ 14,641,000,000

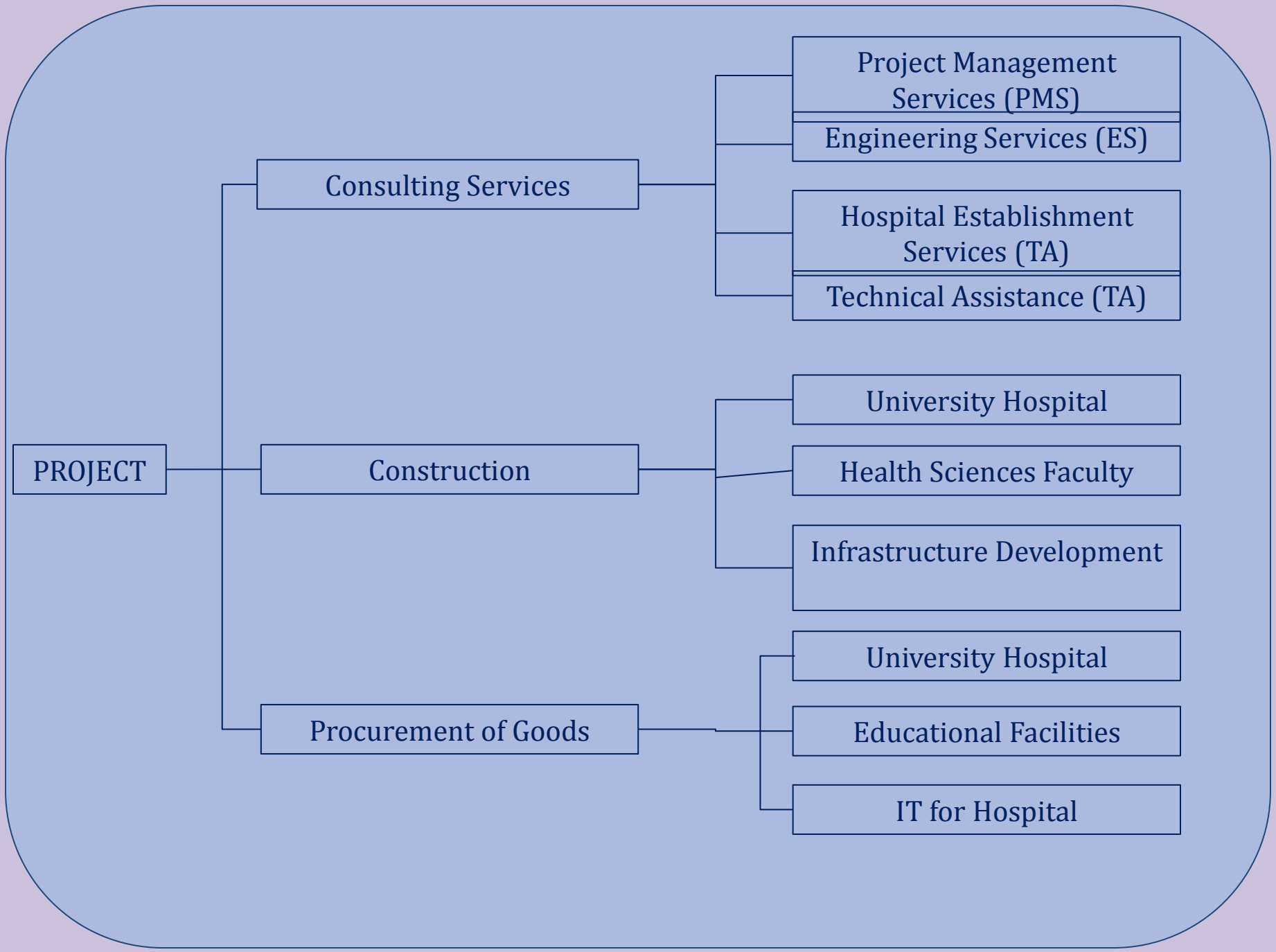
- **Objective**

  The project aims at enhancing educational and research capacity of the “Health Faculties” of UI which consist of medical, dentistry, nursing, and public health faculties through developing University Hospital and Health Faculties of UI with a view to contributing to improving quality of medical services in Indonesia through strengthening their collaboration with regional universities.

- **Qualitative Indicator**

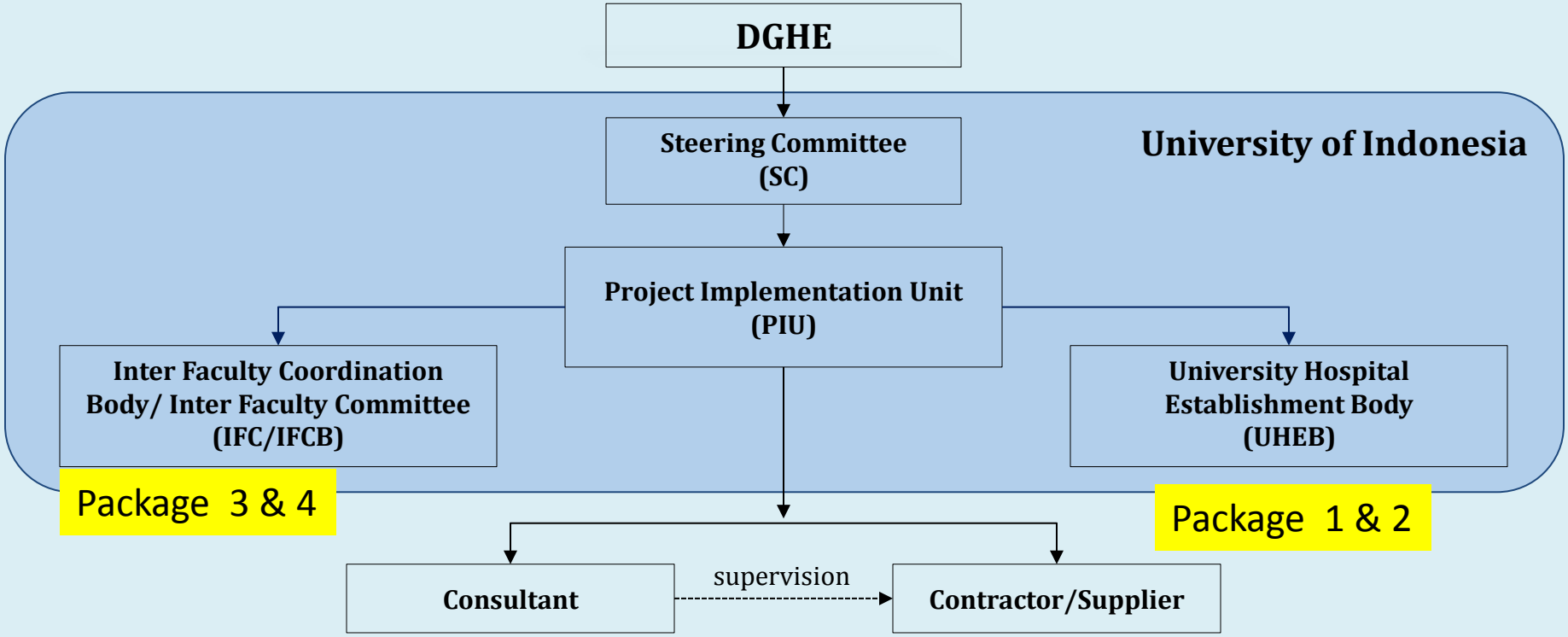
  Quality improvement of :

  - Clinical education
  - Health personnel graduation
  - Medical services
  - Research at health sciences faculty
  - Medical education at regional universities


PROJECT
Consulting Services
Project Management Services (PMS)
Engineering Services (ES)
Hospital Establishment Services (TA)
Technical Assistance (TA)
Construction
University Hospital
Health Sciences Faculty
Infrastructure Development
Procurement of Goods
University Hospital
Educational Facilities
IT for Hospital

Package 1.1	**Construction Works for University Hospital**
Package 1.2	Procurement of equipment & furniture for university hospital
Package 2	Procurement of equipment for IT in university hospital
Package 3	Construction works for faculty facilities
Package 4	Procurement of education equipment and furniture for faculties
Package 5	Construction works for infrastructure development & official staff quarter, and procurement of furniture for hospital and faculties

STRUCTURE AND FUNCTION ACCORDING TO PROJECT MEMORANDUM (MOD)



Steering Committee :
- Presided over by the Rector of UI, and composed of the Vice Rectors and Deans
- Setting up general policy and strategies
- Approves plans, financial program, financial and administrative by-laws

University Hospital Establishment Body :
- Prepare a business plan for the University Hospital (incl. personnel, financial, operation & maintenance).

Project Implementation Unit :
- Employment of the consultants
- Procurement of contractors/suppliers
- Supervision of the overall project implementation (management, direction & guidance)
- Officer : financial; academic program; construction; procurement; environment.

Inter Faculty Committee :
- Strengthen integration among the health sciences faculties and University Hospital
- Sharing common facilities
- Bridging function and comprehensive service between undergraduate and postgraduate, responding to the interdisciplinary approach in the research

Challenges in the beginning of the project

- Diversity in perception of how the project should be managed and implemented:
  - Who should play the biggest role and lead the project implementation????
  - What can be gained from the project (personal, group and institutional interests)?

→Major potential threat for the progress of the project due to conflicting interests

Challenges in the beginning of the project

- Representatives of stakeholders (owner) and project management team have not developed trust, common goals and understanding
- Questionable sense of ownership of involved parties
- Change of new management of faculties at UI:
  - *Components of project organization should represent the new management*

    versus

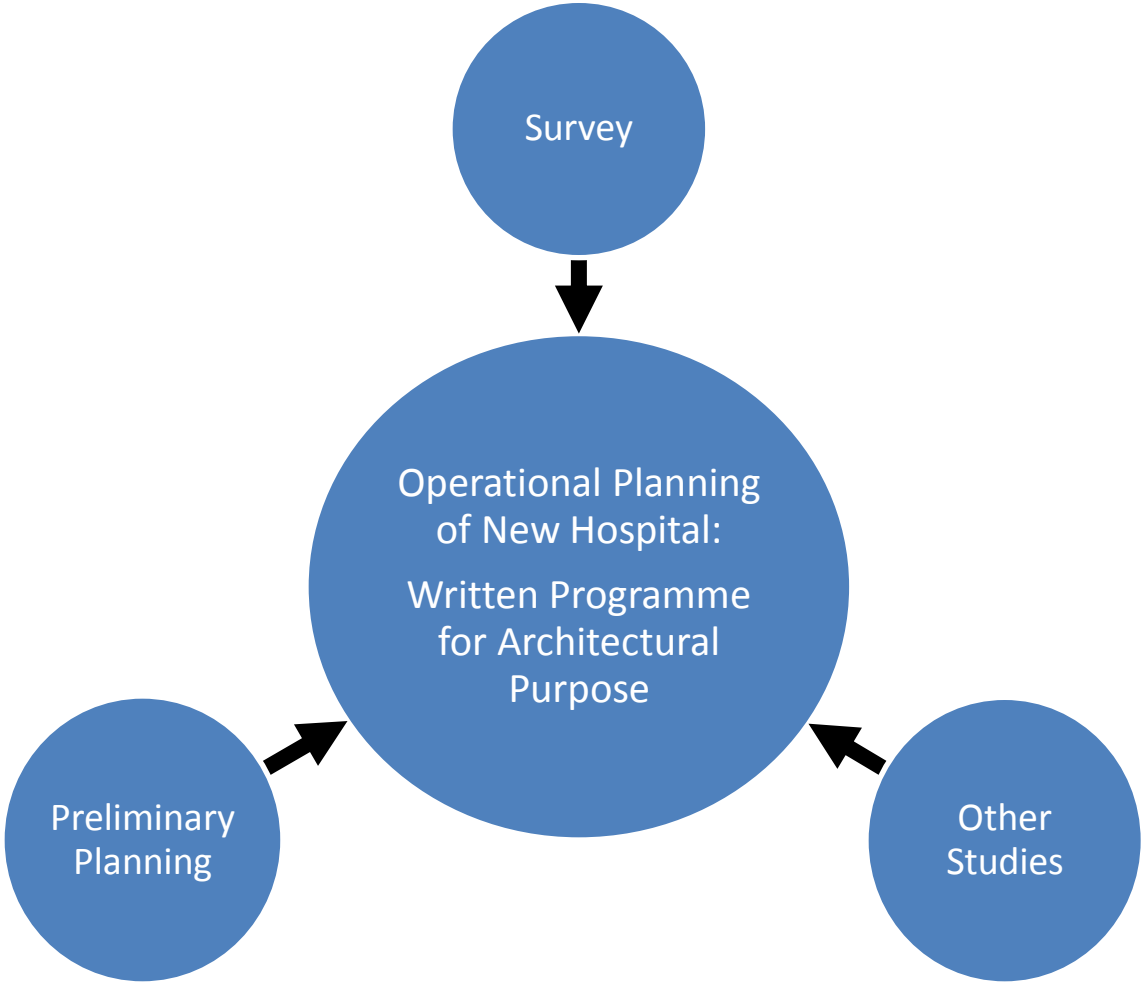
    available time that could be allocated for the project by authorities and leaders at faculties and university levels

Challenges in the beginning of the project

- Highly complicated nature of the Project:
  - Integrated facility for education of health professionals:
    - No available model in Indonesia
    - Concept of integrated education of health professionals has not been developed → difficulty to design the facilities
    - No previous experience of team work among the 5 faculties of health sciences → have not develop mutual respect and understanding
  - Hospital Building:
    - Hospital Building is a very complicated building
    - No previous experience in building a world class hospital building
    - Have not achieve common understanding and agreement in how a world class hospital building should be

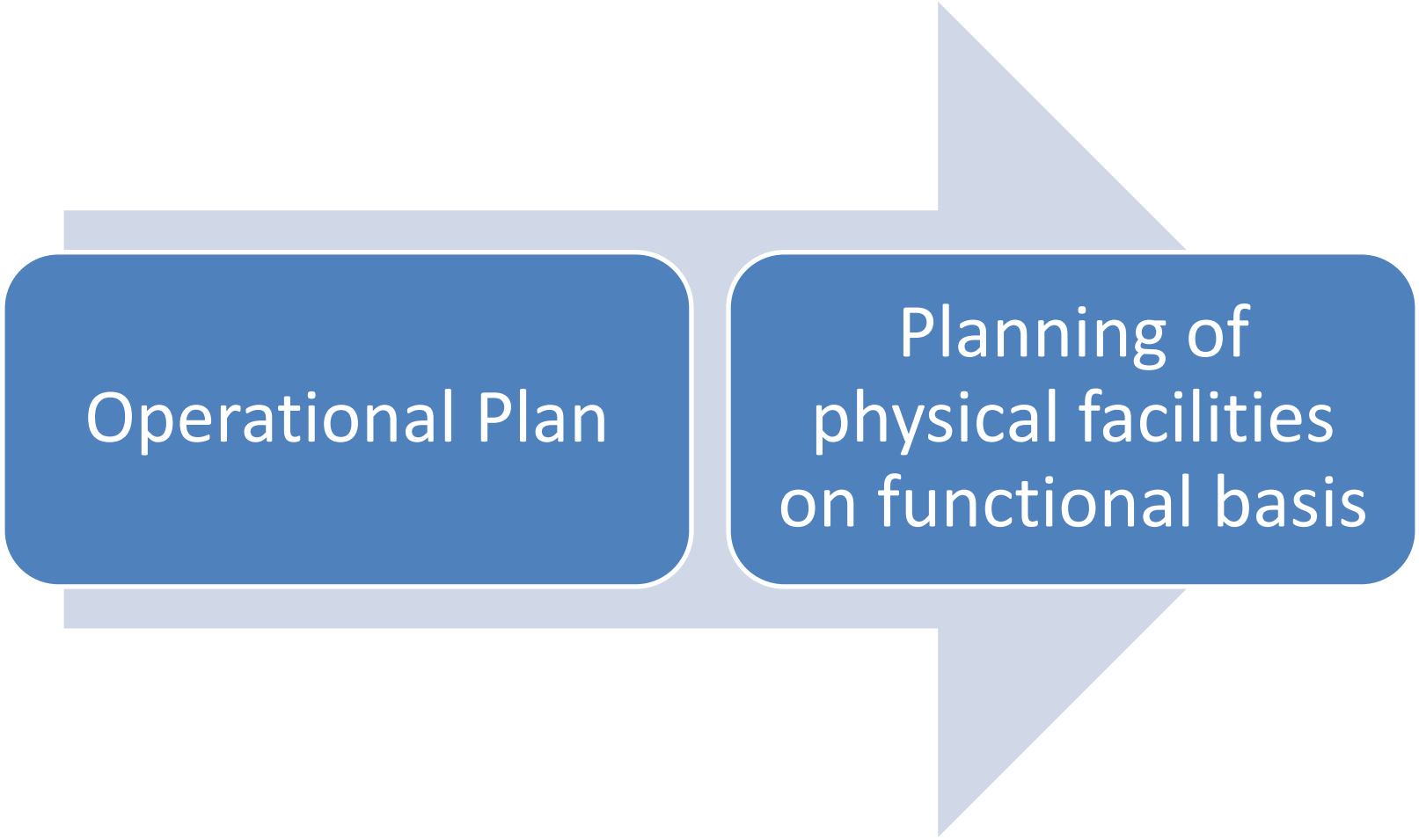
Hospitals: One of the Most Complex Building Types

Operational Plan and Functional Plan



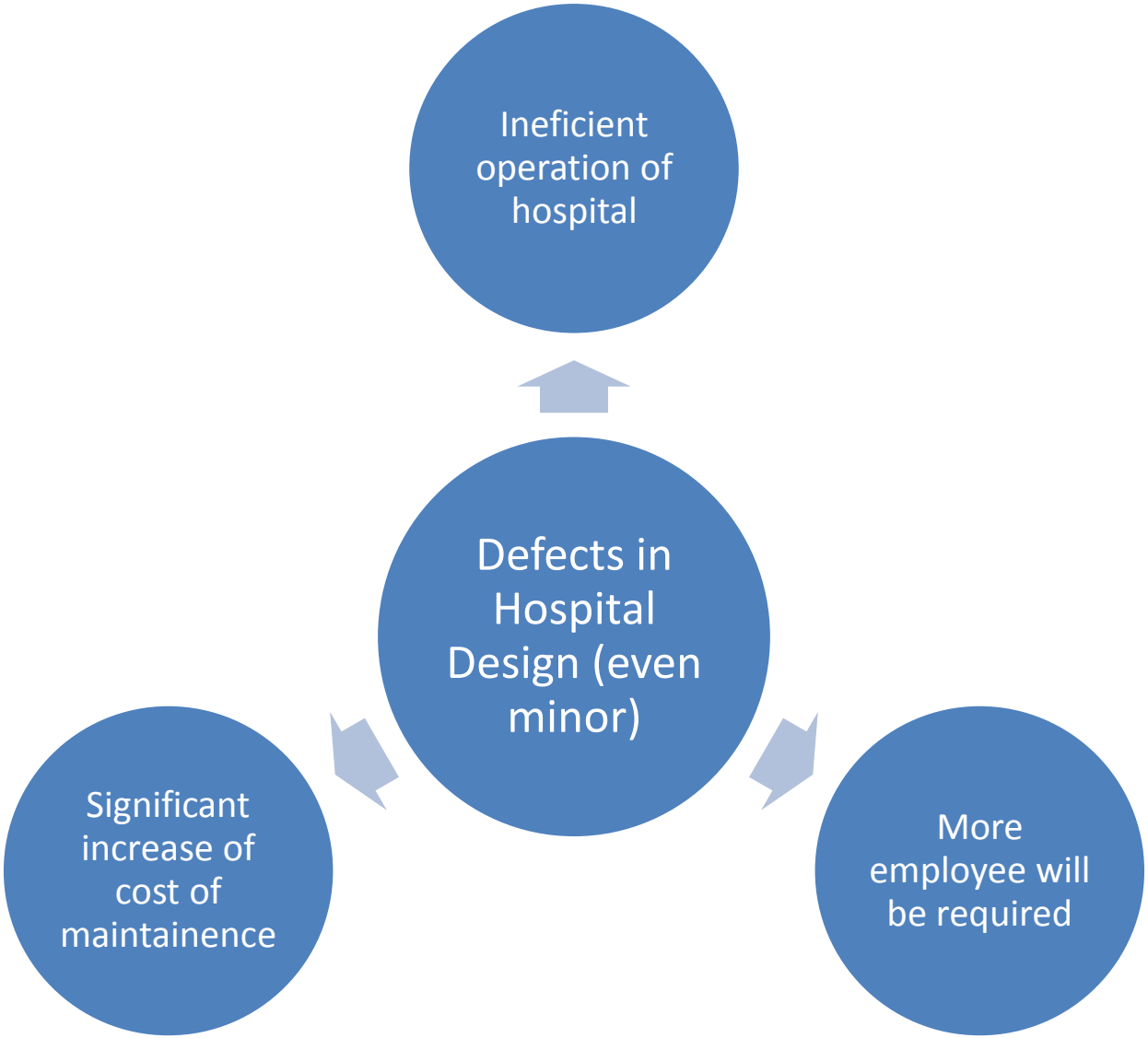

Written Programme for Architectural Purpose
Services to be provided
Number of beds
Departments
Major items of equipment
Space
Personnel
Relationships
Adjacencies

CRUCIAL STAGE:
PROMOTERS OF HOSPITALS ARE LIKELY TO MAKE THE WORST MISTAKE FROM NOT RECEIVING COMPETENT ADVICE AND GUIDANCE




Tempation:
Glamour of an outwardly beautiful edifice: an artist's concept that is no better than raising a structure
Purpose:
Clinical and administrative services to patients


Attractive but totally inefficient building
Efficient, Functional and Economical Hospital


Ineficient operation of hospital
Defects in Hospital Design (even minor)
Significant increase of cost of maintainence
More employee will be required

What should we do to avoid introducing defects in the design of our hospital?

(Actually this was not the question that we asked ourselves in the beginning. We just wanted to do the right thing with the hospital, but did not know what we should do. We only know that it should be a world class hospital)

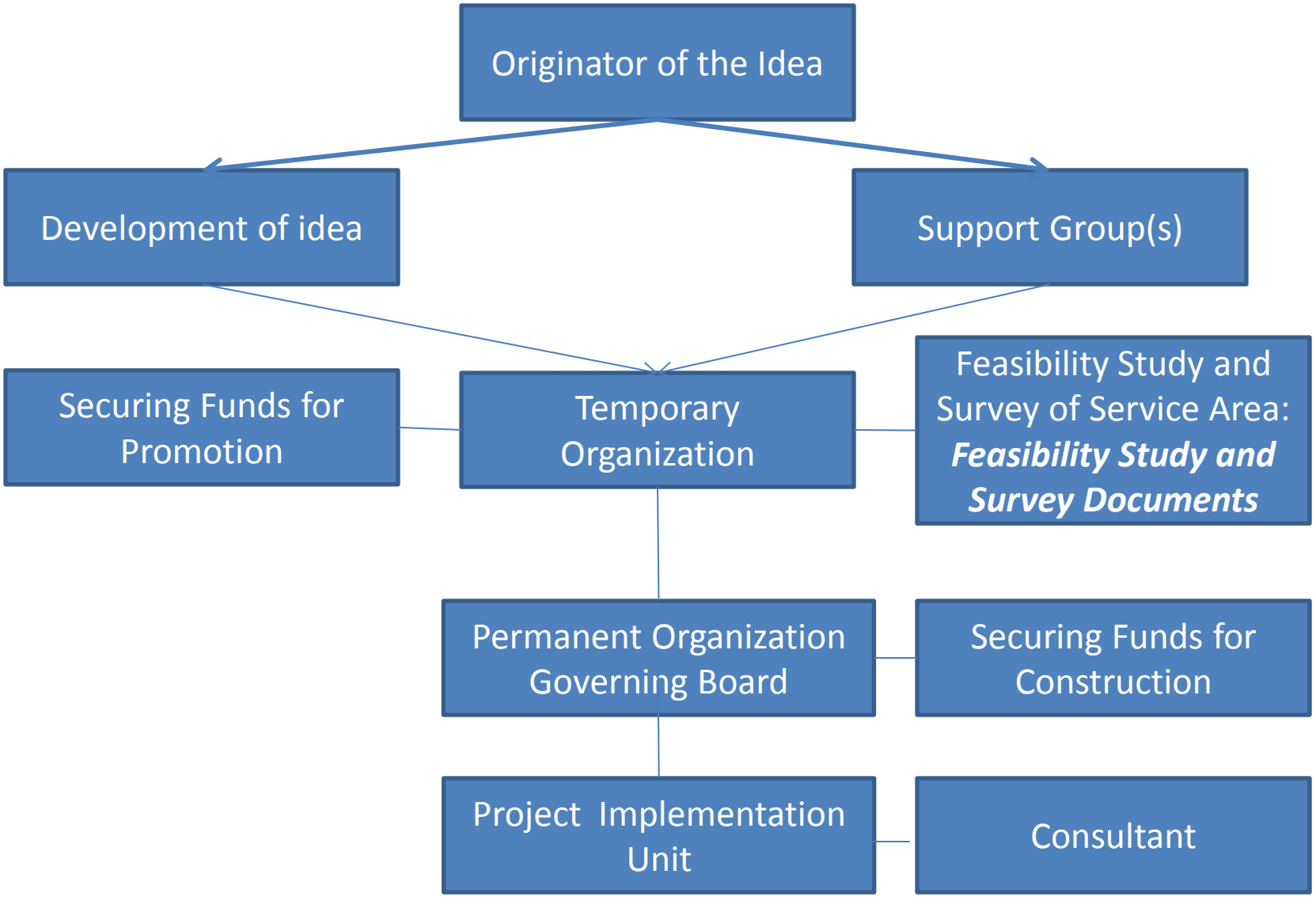
What did we do at the early stage of implementation?

- Get information!
  - Our first book:
    - International Building Code
    - American Architectural Institute
    - Hospitals Facilities Planning and Management
    - JCIA guidelines and publications
  - Internet
  - Regulatory Bodies (Indonesian Government, International Agencies, etc.)

- Obtain support from our existing experts:
  - Who are the experts to be involved?
    - Willingness to provide expertise with minimal reward? (sacrificial)
    - Source of expertise?
  - Are they willing to be involved to support the project?

- Choose the right consultant

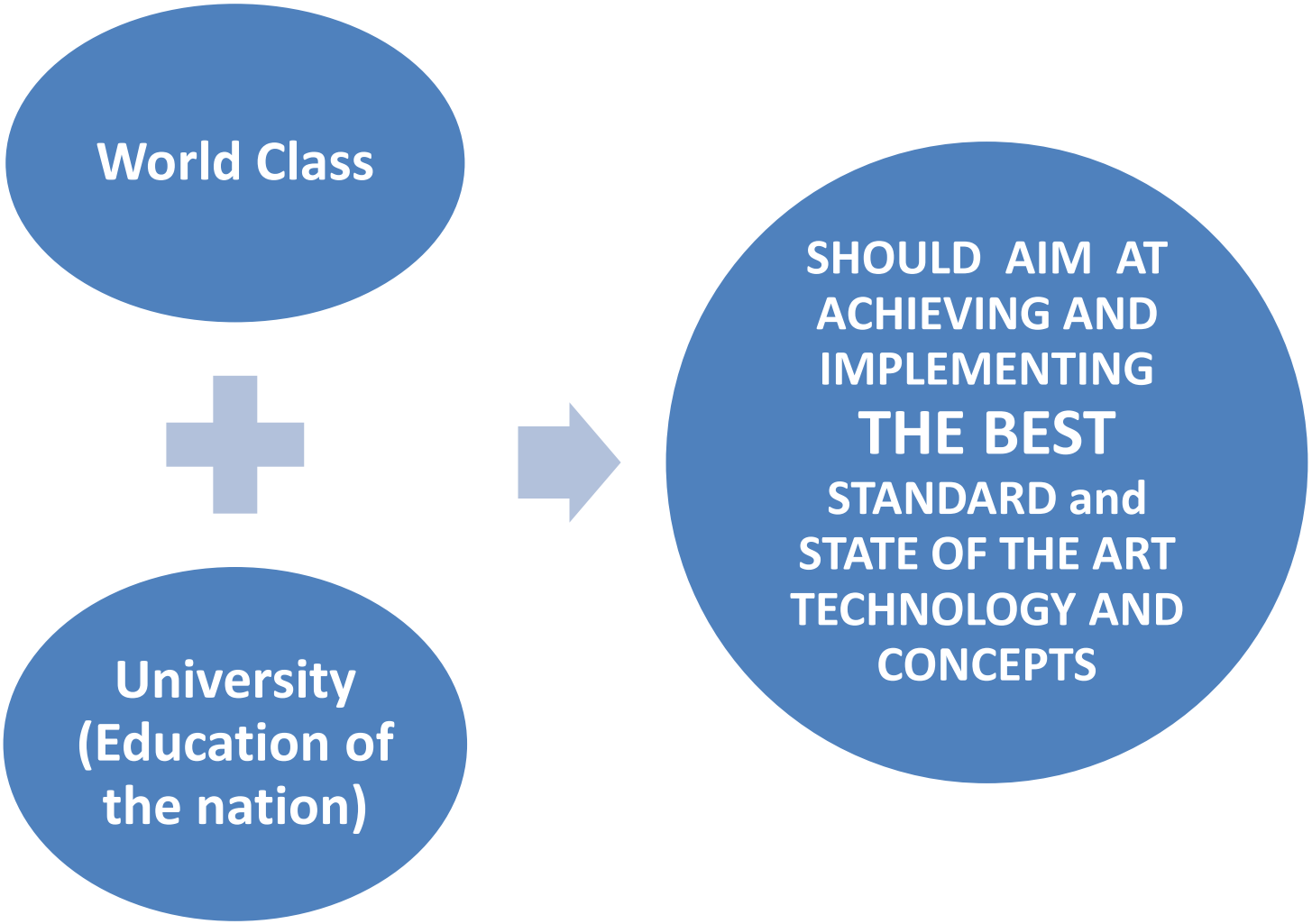
From Dream to Implementation



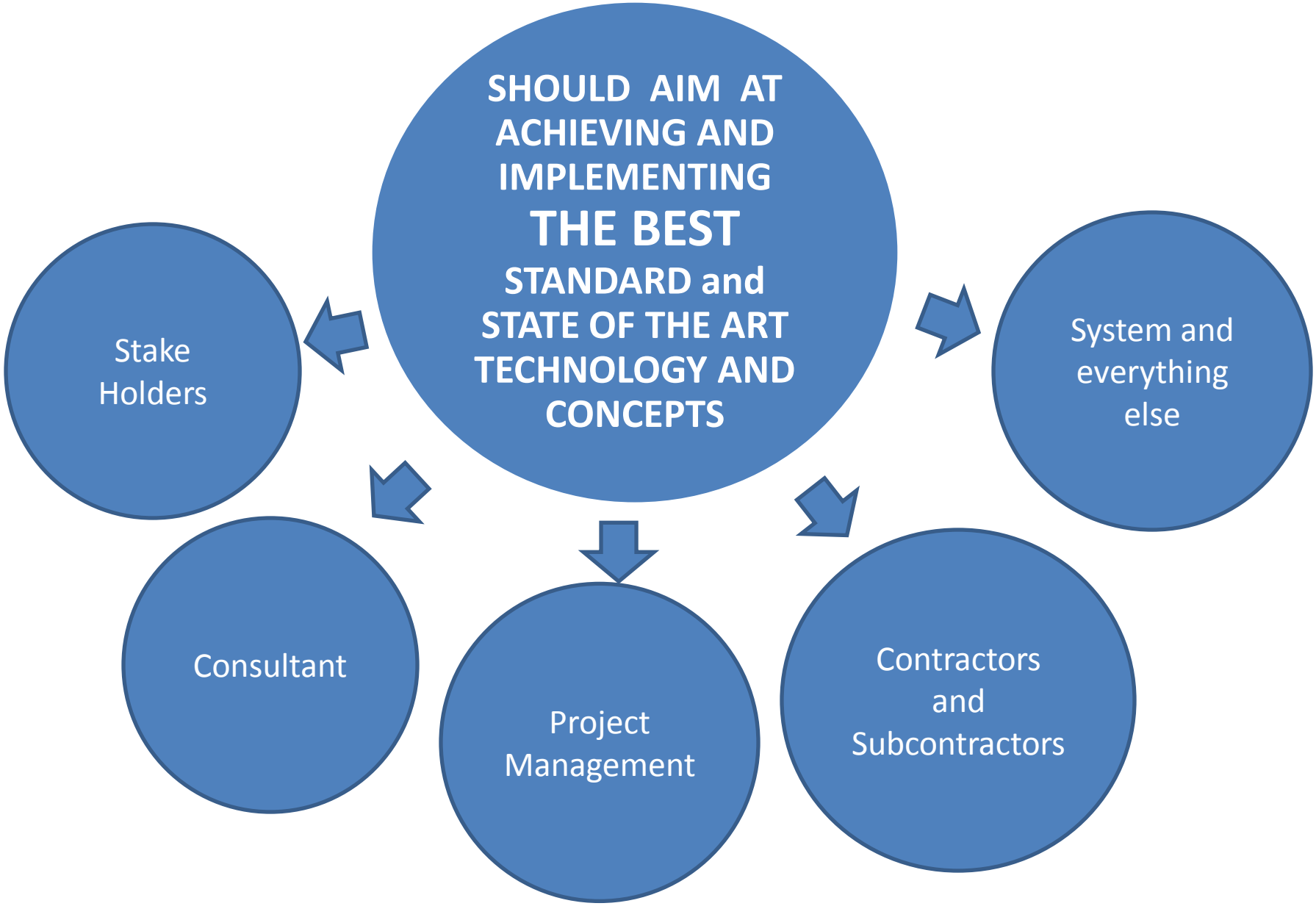
Maturation of Concept (Integrated Health Sciences)

- An interfaculty Coordination Body that later on becomes the Interfaculty Commmittee is established to strengthen integration among four health faculties at UI that later on became 5 health faculties:
  - Faculty of Medicine
  - Faculty of Dentistry
  - Faculty of Nursing
  - Faculty of Public Health
  - Department of Pharmacy → Faculty of Pharmacy
- University Hospital: Aimed at following JCIA standards in order to conform with the concept of World Class University

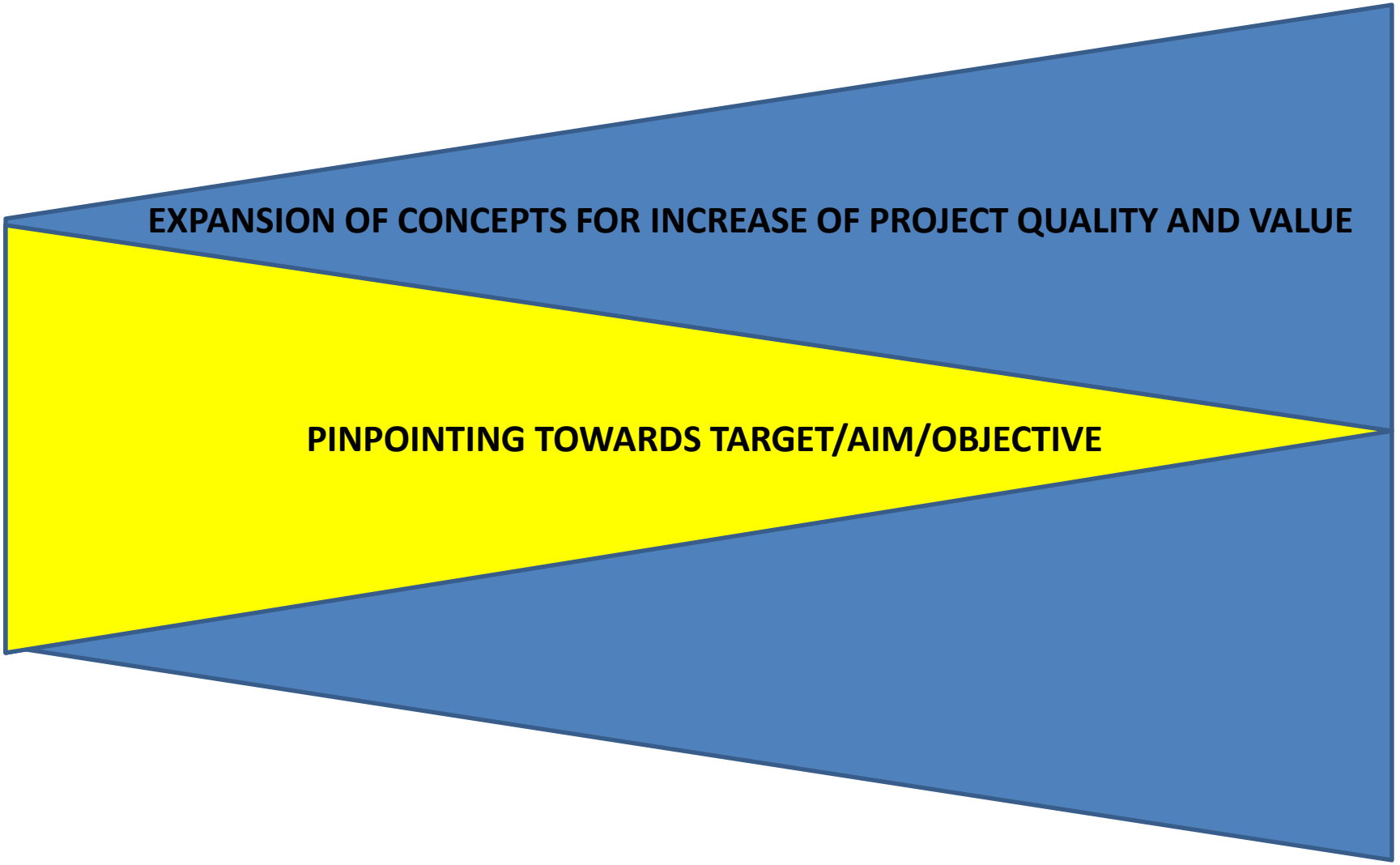
Development of World Class University



Important Concept that should be disseminated and promoted to influence every aspect of the project



- Agents of change should be recruited to achieve common perception that is essential for the **implementation** and **growing** of concepts for **quality** and **value** of the project:
  - Members of UHEB and IFC (the users)
  - Experts from the University
  - Active participation of University leaders (the owner)


EXPANSION OF CONCEPTS FOR INCREASE OF PROJECT QUALITY AND VALUE
PINPOINTING TOWARDS TARGET/AIM/OBJECTIVE

IMPLEMENTATION

1. Review the SAPROF and Project Memorandum (MOD) documents

a. Project location is Kampus UI Depok (as stated in SAPROF and MOD)

b. Additional Faculty (Pharmacy) to the Health Sciences Faculty

c. Additional floor area requirement to accommodate Pharmacy inclusion to the Health Sciences Faculty

d. Revised the Schedule plan and proposed an acceleration schedule (estimated finished period on 2016)

IMPLEMENTATION

1. Review the SAPROF and Project Memorandum (MOD) documents

e. Propose to conduct the following supporting works to be implemented on 2008 under GOI budget due to the acceleration program
   - Topographic Survey
   - Soil Investigation
   - Environmental Impact Assessment

f. Propose to separate Package 1 (Construction Works and Procurement of Equipment & Furniture for University Hospital) in to two packages due to the efficiency
   - Construction
   - Procurement of Equipment and Furniture

g. Revised the Term of Reference for Consulting Services based on the optimization.

* *The process including additional and revised scope of work needs for the review and approval from JICA*

Adjustments for Bidding

- **Clarify Major concepts to be implemented in the project:**
  - Integrated Health Sciences Faculty and University Hospital
  - Promotion of patient safety
  - Earthquake resistance structure and design that accommodate international standards for the disabled and provision for disaster (including outbreak of infection, fire, flood, wind, lightning protection, mass accident, and others)
  - Application of Green Design Philosophy on building design and waste management
  - IT based infrastructure
  - Low maintenance building
  - International hospital accreditation
  - Security system

Adjustments for Bidding

- Review of TOR:
  - Specifications need to be more detailed:
    - Consultant:
      - Experts :
        - » Specific qualification of experts were defined
        - » Experts were asked to write down essays on their relevant expertise to fulfill the major concepts to be implemented in the project
      - Technical Assistant
      - Academic content of consultant services:
        - » **Increase and Clarify the role of IFC and UHEB in the consultant services**
        - » Collaboration with overseas university (not necessarily from country of origin of the loan) → **consistency with aiming for the best**
        - » Inclusion of the Department of Pharmacy to become the Faculty of Pharmacy

Increasing the role of IFC and UHEB in the consultant services: the positive impact

- IFC and UHEB consists of representatives of the faculties of health sciences (users) → increased participation of stake holders
- Enrichment and quality improvement of initial concepts
- Enable the implementation of:
  - Form follows function in building design and construction
  - Procurement of equipments based on actual *post-procurement* operational needs

Hospital requires the implementation of Form follows Function Concept

- ❑ bed-related inpatient functions
- ❑ outpatient-related functions
- ❑ diagnostic and treatment functions
- ❑ administrative functions
- ❑ service functions (food, supply)
- ❑ research and teaching functions

Strategic Placement for the purpose of:

- Patient safety
- Security
- Infection Control
- Family amenities
- Staff efficiency
- Circulations of staff, public, other services
- Etc.

Hospital Zones

- **The first zone** – It consists of the OPD, emergency department, administration, main lobby with front and back offices.
- **The second zone** - It consists of the diagnostic services, laboratories.
- **The third zone** – This would be out of reach of the general public and would compromise the core of the healthcare facility. It includes the OT suites, intensive care units, labour/delivery department.

Hospital Zones

- **The nursing zone** – This will have all the in-patient beds with its associated nurse stations, and support areas.
- **The service zone** – The actual backbone of any successful healthcare facility. It consists of the electrical, fire, medical gas, plumbing, and other engineering areas. It also includes the location of the kitchen/dietary, housekeeping units.

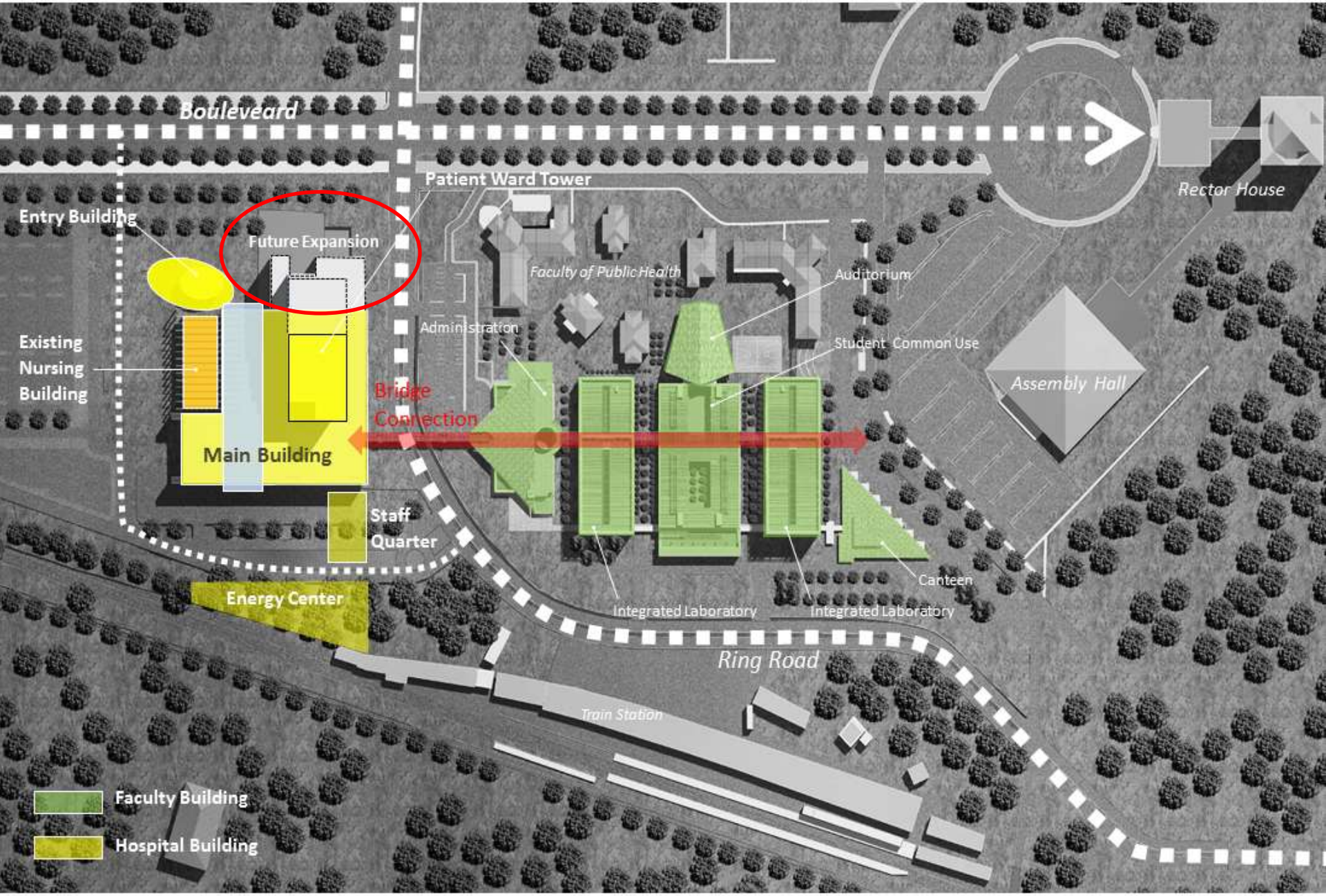
Examples of Form follows function

- Use and Flow of Natural Air
- Exposure to natural light
- Exposure to nature and outdoor (view)
- Allocation of land for future development → saving of land space → building volume to be achieved by vertical stacking

Use and Flow of Natural Air + Exposure to Natural Light

Space for future development

MASTER PLAN for a World Class University at the University of Indonesia >>> Faculty Complex + Teaching Hospital Design



MASTER COCEPT: > Function as "Medical Science Zone" > Unified as "Teaching Complex" > "Integration" with environment + people > Flexible to "Future Expansion"

Other concepts

- Health care facilities to be provided
- Level of Hospital: A, B C?
- Concepts for education of students of health sciences
- Colour:
  - Vibrant vs Calm

Other concepts

- Infection control:
  - Traffic flow:
    - Utilized and Infectious materials (wastes etc.)
    - Clean and Sterilized items
    - Traffic of patients with potential source for transmission of airborne infection
  - Zoning of services (lab, Central Sterilization and Supply Department, Kitchen, Mortuary) and patient care
  - Provision of Positive and Negative pressurised facilities with HEPA filtration

Other concepts

- Safety and security purposes:
  - Compartmentalization for fire safety
  - Access limitation to Restricted area (laboratory, Operation theatre, Pharmacy, Radiology, infectious patient care area, etc.)
  - IT system for security and safety (patient and equipment tracking system, CCTV placement etc.)

Other concepts

- Traffic flow:
  - Clean and sterilized vs dirty and infectious
  - Triple corridor concept for patient safety (noise reduction etc.)
  - Patient privacy
  - Public vs inpatient and hospital staffs area and corridors
  - Reducing distances between facilities and provision of infrastructure for transportation of materials between facilities (example: pneumatic tube system)

Other concepts

- Provision for family space (accommodating the current Indonesian)
- Provision of **adequate** facilities for personal needs of staffs and public (mushola, pantries, toilets)
- Preparedness for disaster:
  - Provide space close to the Emergency Facility
- Preparedness for the future:
  - Allocation of land for new building

Academic analysis for choice of colours

- Literature study on the effect of colours to health services :
  - Patient safety:
    - Avoid masking effects of colours that causes disturbance/inaccuracy of physical examination
  - Sense of well being:
    - Avoid colours that creates institutional sensantion (feeling of being in a hospital)
    - Colours that create warmth in contrast to gloom and melancholy
  - Wayfinding
  - Identification of facilities:
    - Colour blindness
    - Elderly people

Adjustments for Bidding

- Review of TOR:
  - Specifications need to be more detailed:
    - Building:
      - Building for integrated facilities and office of Deans of 5 faculties of Health Sciences
      - Hospital and Satellite Clinic to be made according to latest concept and state of the art technology
    - Equipment:
      - State of the art technology that is appropriate with the business plan of the hospital

PIU is involved in the Bidding Process

- Maintain and assure that bidding documents and process are constructed and exercised according to JBIC procurement guidelines
- In accordance with Loan Agreement signed by
  - Government of Japan (represented by JBIC later on becomes JICA)
  - Government of Indonesia (Represented by Director General of Debt Management Ministry of Finance)

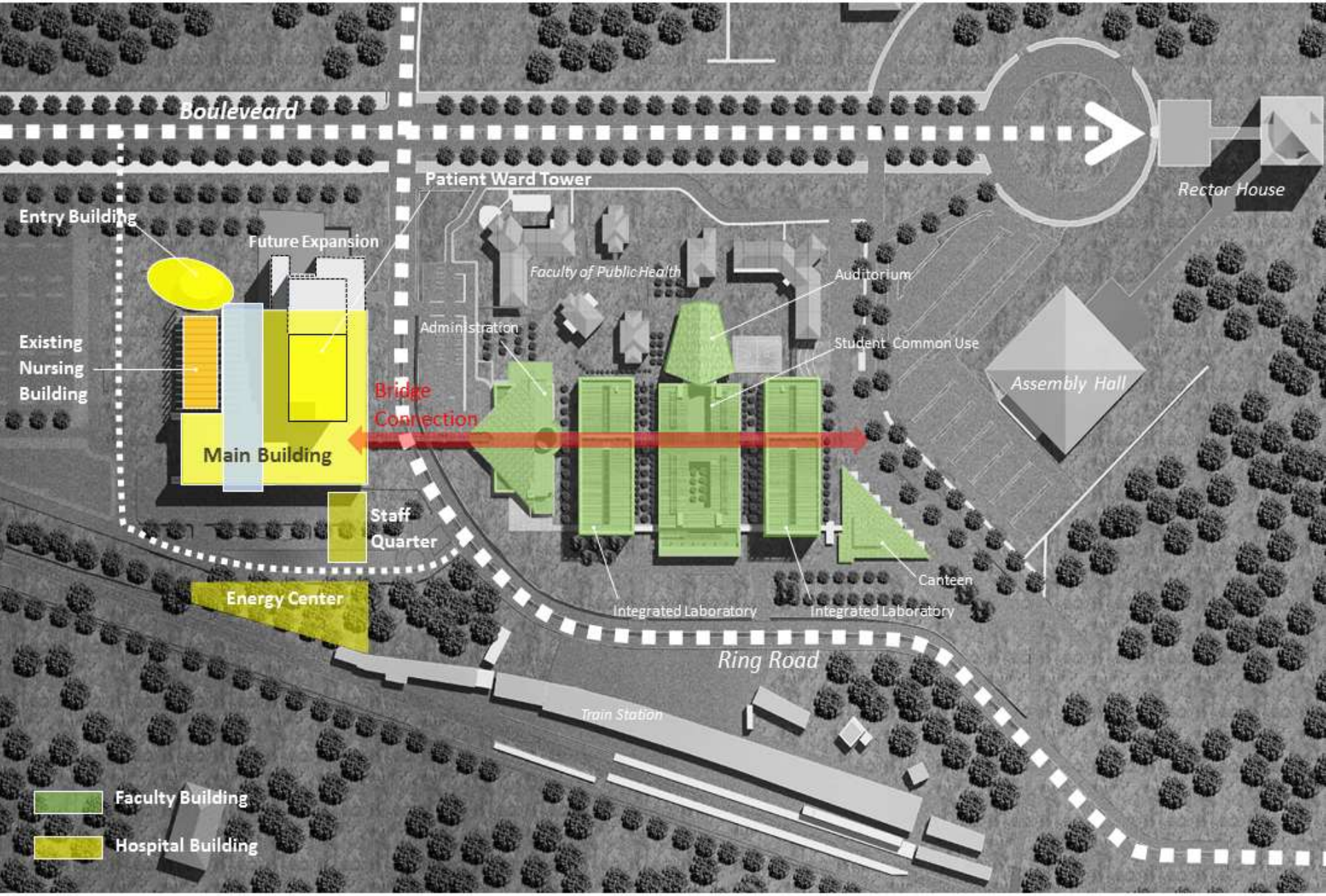
2. Concept Design Stage

a. Review the previous studies
b. Investigate the existing facilities (including the infrastructure)
c. Confirmation of the educational policy or program
d. Development of TOR and design requirements
e. Confirmation of the requirements (room area and functional space program)
f. Block plan design

ITEM	MOD	RFP	CONTRACT
Project Management Services	Pro – A = 63 MM Pro – B = 107 MM	Pro – A = 75 MM Pro – B = 169 MM	Pro – A = 77,5 MM Pro – B = 155 MM
Engineering Services	Pro – A = 176 MM Pro – B = 547 MM	Pro – A = 142 MM Pro – B = 318 MM	Pro – A = 98 MM Pro – B = 341,5 MM
Hospital Establishment Services	Pro – A = 51 MM Pro – B = 29 MM	Pro – A = 69 MM Pro – B = 24 MM	Pro – A = 93 MM Pro – B = 35 MM
Technical Assistance	Pro – A = 10 MM Pro – B = 24 MM	Pro – A = 14 MM Pro – B = 49 MM	Pro – A = 11,5 MM Pro – B = 28,5 MM
TOTAL	Pro – A = 300 MM Pro – B = 707 MM	Pro – A = 300 MM Pro – B = 560 MM	Pro – A = 280 MM Pro – B = 560 MM

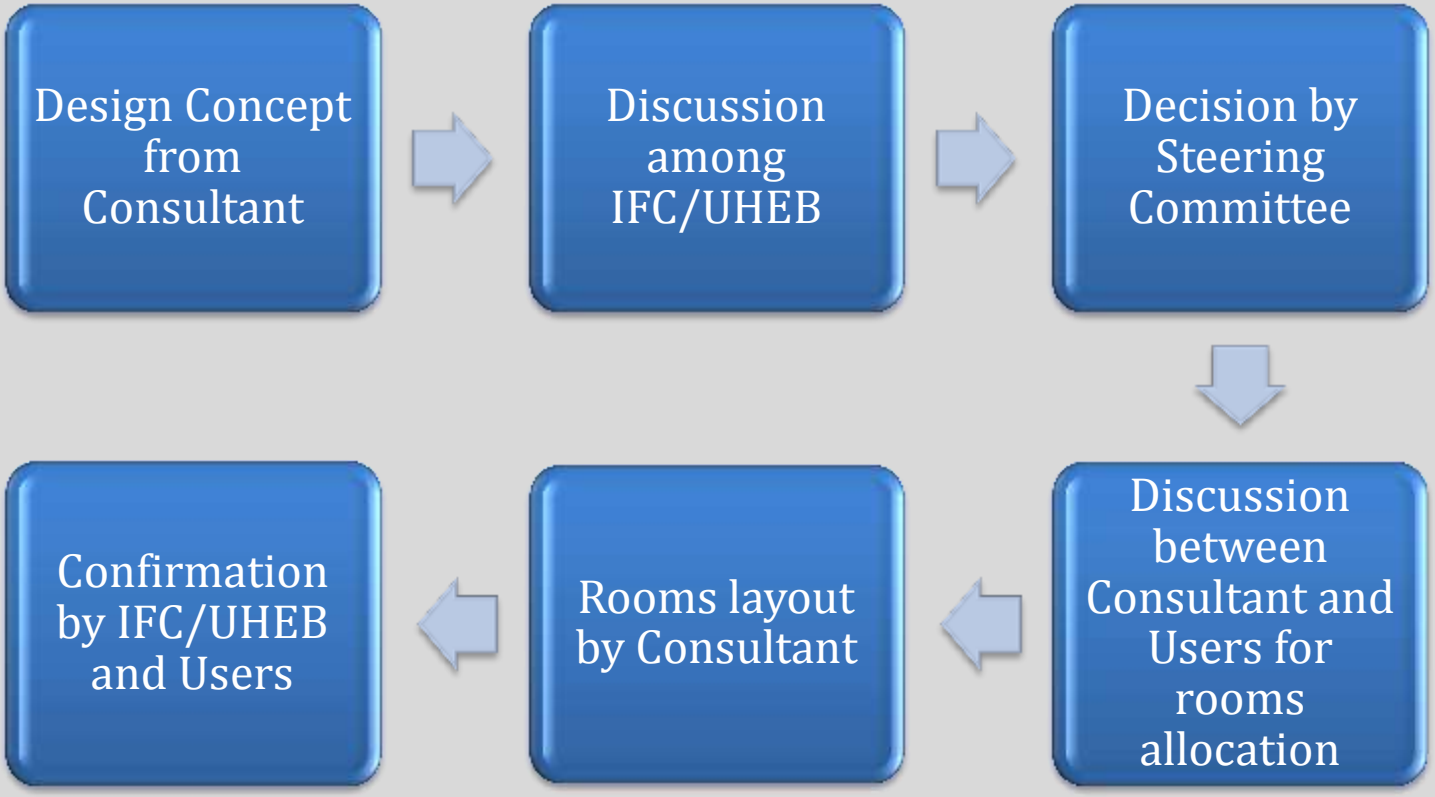
MOD	RFP	PROPOSED	CONTRACT
Foreign Portion JPY 845,900,000	**Foreign Portion** JPY 953,220,000	**Foreign Portion** JPY 1,063,857,602	**Foreign Portion** JPY 909,429,849
Local Portion Rp 46,637,850,000	**Local Portion** Rp 38,566,700,000	**Local Portion** Rp 41,258,478,250	**Local Portion** Rp 37,349,660,000
Total JPY 1,466,183,000	**Total** JPY 1,466,157,000	**Total** JPY 1,612,595,363	**Total** JPY 1,406,180,327

MASTER PLAN for a World Class University at the University of Indonesia >>> Faculty Complex + Teaching Hospital Design



MASTER COCEPT: > Function as "Medical Science Zone" > Unified as "Teaching Complex" > "Integration" with environment + people > Flexible to "Future Expansion"

3. Schematic and Detail Design Stage



INTER FACULTY COMMITTEE

FACILITY
- Determine list of laboratory equipment
- Determine list of furniture comply to the room layout
- Examine the information system concept

BUILDING
- Design concept
- Layout for classroom, laboratory & administration

ORGANIZATION
- Prepare the organization structure
- Prepare the list of task and duty of the organization personnel
- Manage the education and research
- Manage the use of facilities, human resources, and curriculum

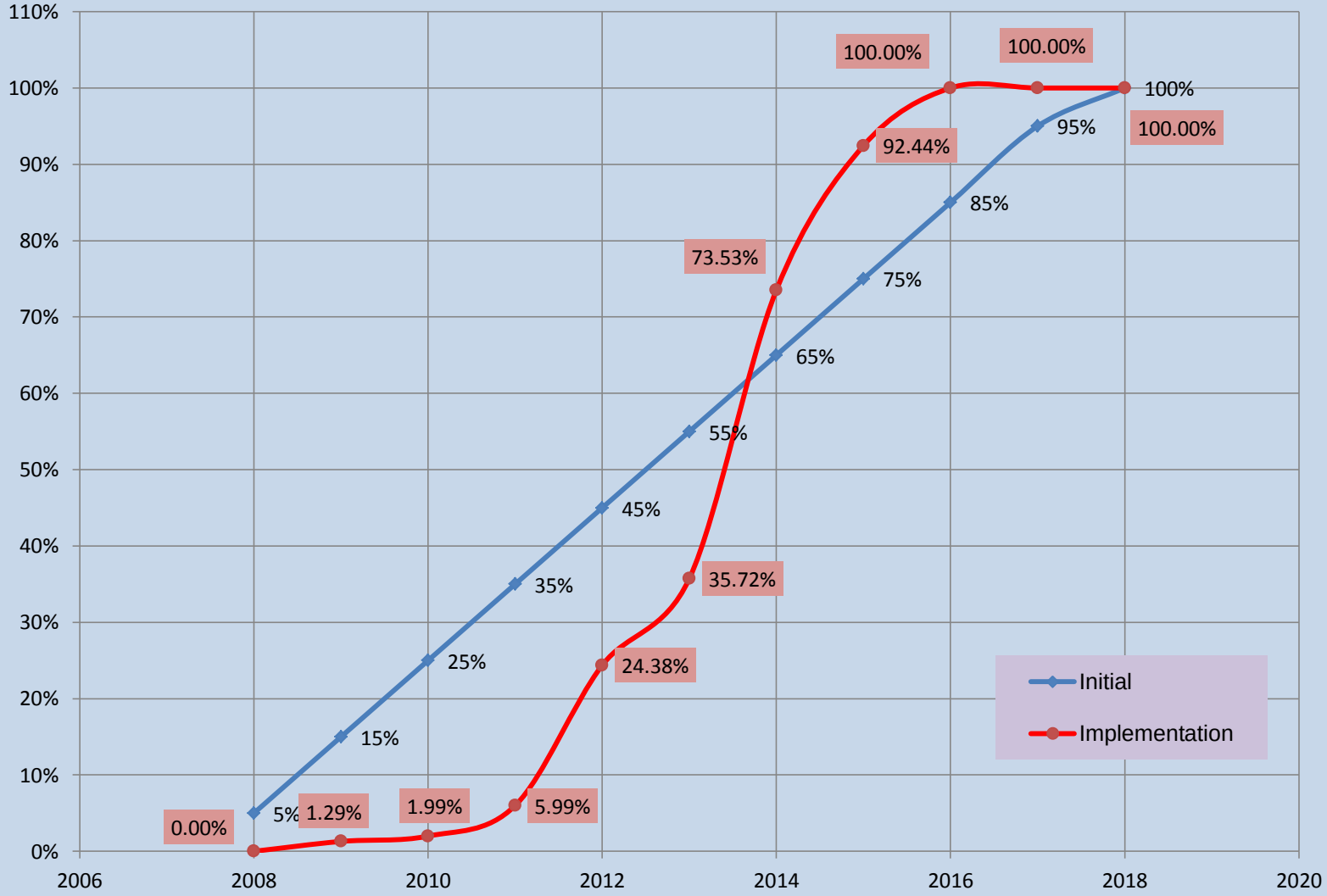
EDUCATION
- Integrated curriculum for first graduate student
- Teaching plan agenda (Buku Rancangan Pengajaran) and Integrated Curriculum Modul
- Training for the facilitator of integrated curriculum modul
- Preparation of the inter-professional learning

UNIVERSITY HOSPITAL ESTABLISHMENT BODY

ITEM	YEAR					
	2010	2011	2012	2013	2014	2015
Operational	v	v	v	v		
Personnel	v	v	v	v		
Maintenance		v	v	v		
Financial		v	v	v		
	Hospital functi-onal units	Hospital lay-out design	Hospital operational prep *(Policy/by-laws, System, SOP, budgeting, etc)* Operational plan & Business plan		Management recruitment	Soft opening
		Operational plan & Business plan			Staffs recruitment	Hospital accredita-tion (KARS, ISO)

No	Instansi/Pihak Terkait	Hasil yang ingin dicapai
1	Departemen FKUI-RSCM Rumah Sakit Gigi Mulut UI Keperawatan UI, Farmasi UI	Layout desain RS Perencanaan pengadaan alat Penentuan Jenis Pelayanan di RS UI dan Satelit Klinik
2	Pemda Depok dan Dinas Kesehatan kota Depok	Pengurusan izin dan kelengkapan dari RS UI Konsep satelit klinik dan penempatannya
3	Direktur Jenderal Bina Upaya Kesehatan Kemenkes RI	Diskusi tentang penetapan status dan konsep tipe RS UI
4	Jaminan Pemeliharan Kesehatan Masyarakat	Rencana operasional jamkesmas di rumah sakit
5	RSPAD Gatot Subroto RS. Hasan Sadikin RS. Airlangga	Diskusi pelaksanaan operasional RSPAD Diskusi pelaksanaan rujukan dari puskesmas/satelit klinik Studi banding konstruksi rumah sakit universitas
6	Direktur Medik dan Keperawatan RS. Persahabatan (Tim RS Pendidikan DIKTI)	Konsep rumah sakit pendidikan Pembuatan rencana strategis RS
7	Seluruh stakeholder	Perancangan Visi-Misi RS UI

S - Curve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25%
35%
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55%
65%
75%
85%
95%
100%
1.29%
1.99%
5.99%
24.38%
35.72%
73.53%
92.44%
100.00%
100.00%
100.00%
Initial
Implementation

Health Sciences Faculty	Floor Area (m^2)	
	MOD	Actual
Class Room	3.200	5.557
Laboratory	11.600	12.151
Administration	7.800	8.116
Supporting Facilities	5.300	3.092
Public Facilities	4.000	3.948
TOTAL	**42.000**	**57.127**

Health Sciences Faculty	Number of Goods	
	MOD	Actual
Medicine Faculty	1.262	790
Dentistry Faculty	2.297	640
Nursing Faculty	482	358
Public Health Faculty	68	94
Pharmacy Faculty	-	25
Wet Laboratory	-	718
Dry Laboratory	-	401
Animal House	-	410
TOTAL 1	**4.109**	**3.436**
Furniture	-	10.838
IT	-	7.648
TOTAL 2	**4.109**	**25.358**

Efficiency in Construction of Building with Integrated Facilities of Faculties of Health Sciences

- Package 3 of the Project
- Value of the building according to:
  - MOD (memorandum on development of world class university at University of Indonesia between JBIC and MOE and UI)
    - Total Value: JPY 2,793,000,000
    - Total Volume: 42,000 m^2
    - Value/m^2 : JPY 66,500
  - Project Implementation:
    - Total Value: JPY 2,758,949,105
    - Total Volume: 57,127 m^2
    - Value/m^2 : JPY 36,724
  - CPI (Cost Performance Index) = Budgeted Cost of Work Performed / Actual Cost of Work Performed = 66,500/36,724 = 1,8

University Hospital

No.	Department	Floor Area (m^2)		Remarks
		MOD	Design	
1	IP Clinic	500	750	
2	Out Patient	3,000	2,950	
3	Forensic Medicine	500	500	
4	Silent Mentor Program	300	71	
5	Physiology Test	400	597	
6	Pharmacy	500	1,205	
7	Emergency	600	1,130	
8	Medical Rehabilitation	700	750	
9	Hemodialysis	200	300	
10	Community Medicine	1,000	429	
11	Imaging	2,200	1,187	
12	Laboratory	1,400	1,800	
13	Blood Bank	300	89	
14	Central Operation	1,700	2,076	
15	Delivery	700	778	
16	NICU/PICU	100	1,035	*major increase
	• GCU		171	*additional programs
	• New Born Baby		63	*additional programs
17	ICU	1,200	1,321	
	• HCU		1,317	*additional programs
18	CSSD	900	973	
19	Laundry	800	542	
20	Kitchen	700	915	
21	Logistics	800	256	
22	Maintenance	200		
23	Inpatient VIP	3,500	2,079	

No.	Department	Floor Area (m^2)		Remarks
		MOD	Design	
24	Inpatient Class I	3,900	3,198	
25	Inpatient Class II	2,000	3,518	
26	Inpatient Class III	2,900	8,795	*major increase
27	Administration	3,400	3,418	
28	Others	300		
	• Chemo Therapy		292	*additional programs
	• Medical Check Up		424	*additional programs
	• Medical Record		440	*additional programs
	• Cardiology, cardiovascular clinic, and neurology clinic		1,010	*additional programs
	• Satellite Clinic	700	1,200	*major increase
	• Auditorium		561	*additional facilities
	• Bridge		281	*additional facilities
	• Entrance Mall		4,583	*additional facilities
	• Hospital Mall		804	*additional facilities
	• Machine Room/Utility		4,268	*additional facilities
	• Base Isolation Floor		9,283	*additional facilities
	• Tunnel/Main Trench		204	
	• Energy Center		2,539	*additional facilities
29	Dentistry :	4,600	2,580	
	Integrated Clinic	2,700		
	Pedodontic	1,100		
	Geriatric	300		
	Wing for VIP	500		
	TOTAL	**40,000**	**70,682**	**31,182**

Failure Mode and Effect Analysis (FMEA)

- We try to exercise FMEA from the beginning of the project
- This concept was obtained from JCI for implementation of patient safety concept (Health Failure Mode and Effect Analysis/HFMEA), although the concept was actually originated and implemented in the field of engineering

Failure Mode and Effect Analysis

- Continuous monitoring and evaluation of consultant services performance
  - Minimize cost in man months of non performing consultant services
  - Evaluate the need for mobilization and immobilization of consultant services

Failure Mode and Effect Analysis

- Design stage of each package:
  - intensive discussion with stakeholders (all of the packages)

- Implementation stage:
    - Weekly coordination meeting with stakeholders for construction packages
    - Daily monitoring of construction process and progress of equipment procurement

Failure Mode and Effect Analysis

- Experience in better implementation of FMEA is obtained during the progress of the project

Failure Mode and Effect Analysis Example: IT system

- Steps of Implementation of IT system procurement (hardware) through Hospital Construction package:
  - Agreement between PIU, UHEB, Consultant and Contractor concerning:
    - Basic concepts of the IT system (hardware)
    - Relevant components
    - Method for control, correction and supervision
    - Should be signed by all of the above representatives

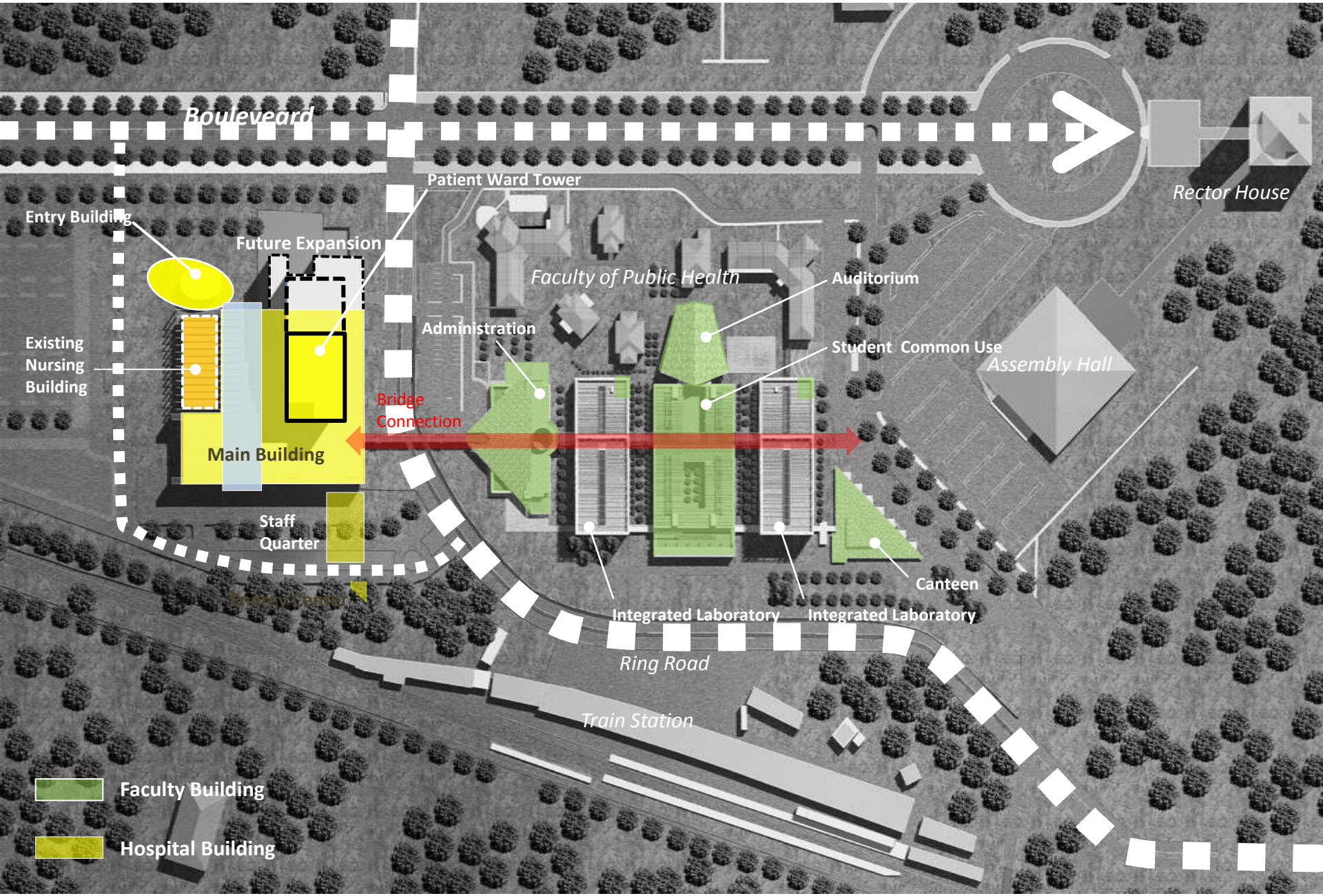
Failure Mode and Effect Analysis Example: IT system

- All of these steps/process should be consulted to and approved by experts from UI and the consultant to enable early correction for prevention of failure in function → the process can continue to the next step and disbursement will only be approved by PIU for execution after each step has been proven to be satisfactory
  - Determination of system components
  - Design (integration) of IT system hardware
  - Installation
  - Testing of functions (capacity and reliability)
  - Testing of overall performance during commissioning

Determining Steps for Monitoring and Control of Project Progress

- Early identification of potential failure in project implementation
- Whenever possible, effort should be made to enable flexibility for improvement of quantity and quality of items to be procured and the overall value of the project within the project limitations

MASTER PLAN for a World Class University at the University of Indonesia >>> Faculty Complex + Teaching Hospital Design



Paket 1.1 Rumah Sakit UI

Paket 1.1 Rumah Sakit Universitas Indonesia

INFORMATION :

- **A** BUILDING A - ENTRANCE BUILDING
- **B** BUILDING B – NURSING BUILDING REVITALIZED EXISTING BUILDING
- **C1** HOSPITAL BULDING C1
- **C2** HOSPITAL BUILDING C2
- **D** ENERGY CENTER BUILDING
- **F** SATELLITE CLINIC BUILDING
- **G** CONNECTING CORRIDOR (BRIDGE)

Perbandingan Luasan Area RS UI

- MOD = 40.000 m2
- Design = 74.043 m2

Persentasi Kenaikan Luasan = +85%

Design Criteria

- Faculty buildings
  - Earthquake reisistant steel composite Frame
  - Earthquake resistance 4 stories reinforced concrete frame

- Rumah Sakit Universitas Indonesia
  - Disaster resistant hospital : earthquake, floods, blackout
  - Patient safety, infection controlled hospital
  - Teaching hospital
  - Green hospital
  - Base Isolated 14th stories reinforced concrete building
  - ± 170 HDRB use in the building
  - B class hospital, 300 beds wards

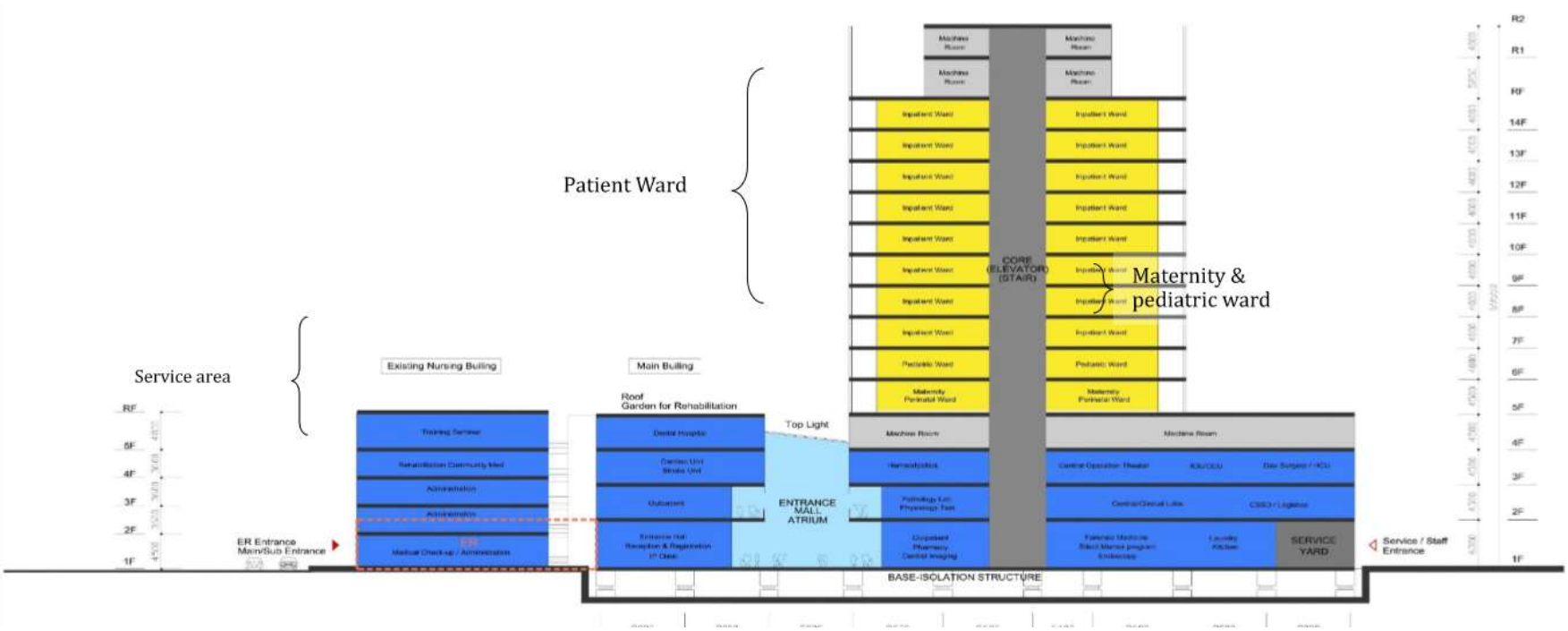
Why Base isolation

- No surrounding hospital fully function if a big earthquake stuck.
- Limit the attack of the earthquake.
- Decoupling the structure from ground motion.
- Structural response acceleration less than ground motion.
- Responses isolated structure (inter story drift, floor acceleration, and base shear) smaller than fixed base structure.
- Increase the natural period of structure, resonance is avoided

Hospital plan

- Teaching hospital
- 3 Coridors design
- Atrium with natural light
- Recycle water

UNIVERSITY HOSPITAL



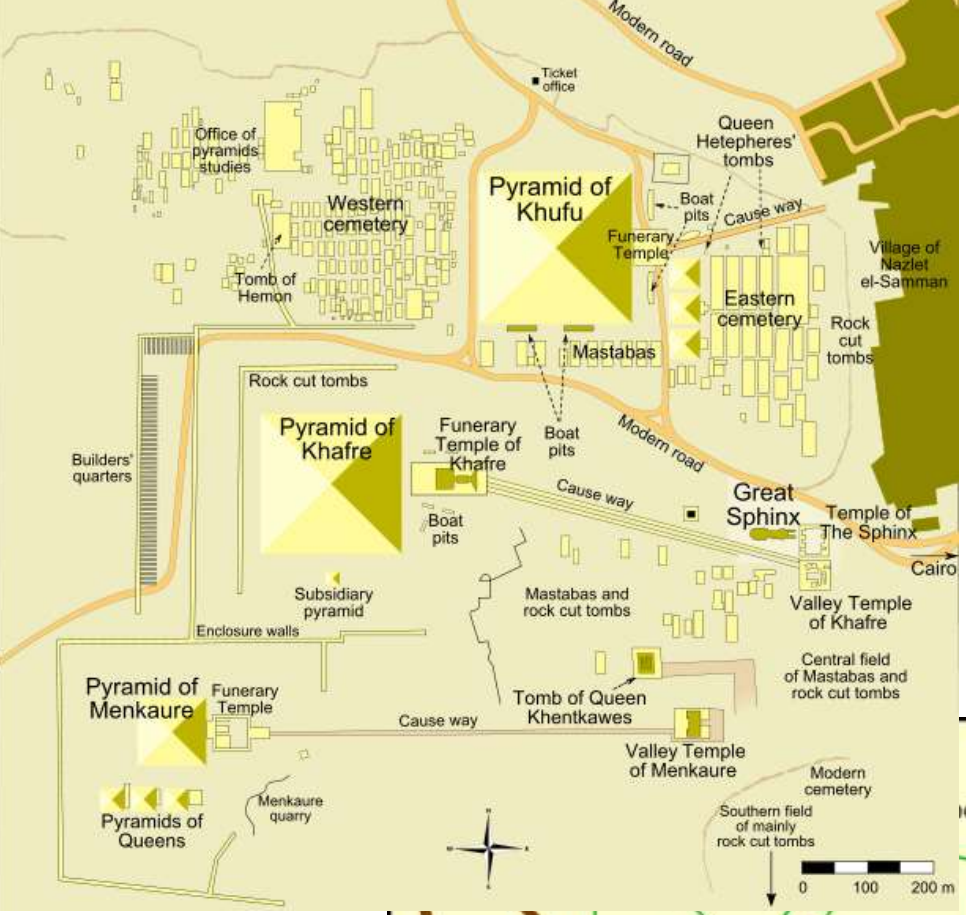
Infrastructure for safety

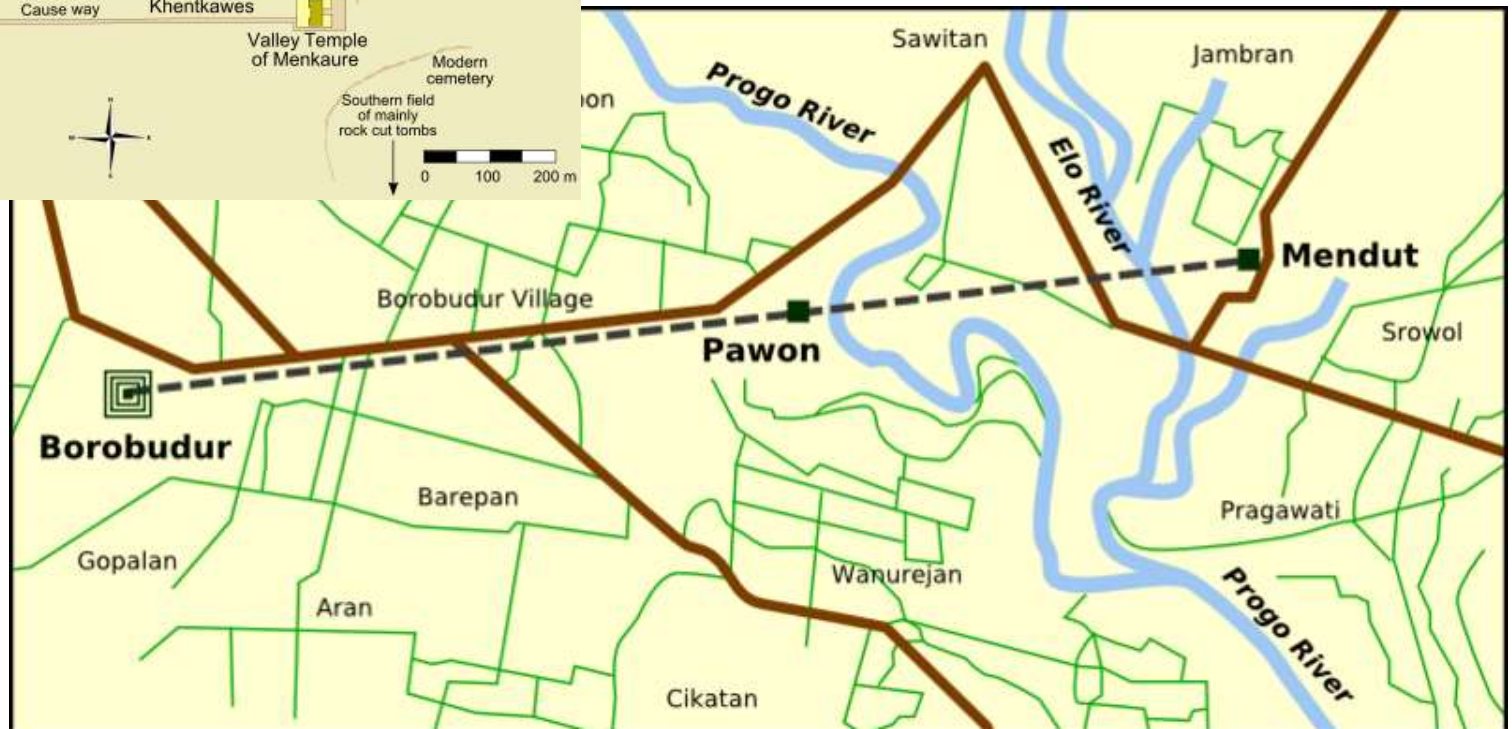
- Radiology wastes
- Laboratory wastes
- Pharmaceutical wastes
- Wastewater treatment

Provision for natural disaster

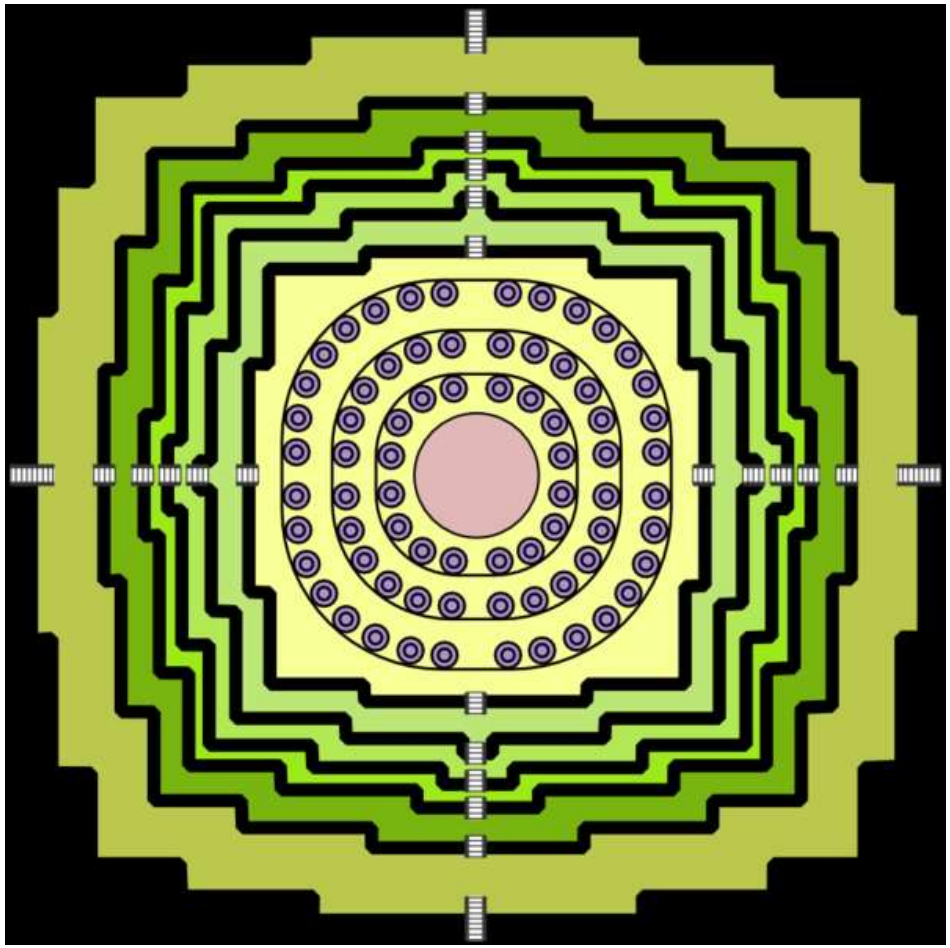
- Base isolation
- Electricity back-up system:
  - Solar storage with volume enough for electricity back-up for 7 days to anticipate isolation of hospital from supply system
- Space for patient management from disaster of massive scale

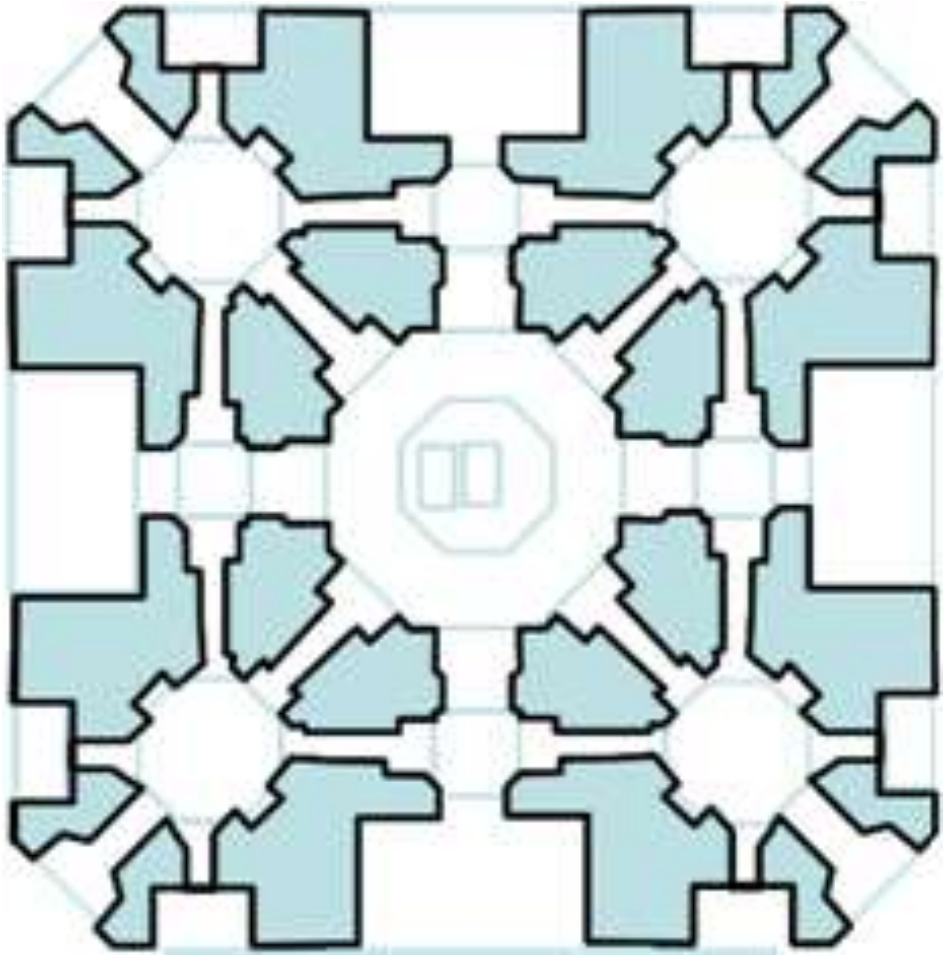
Building Prize





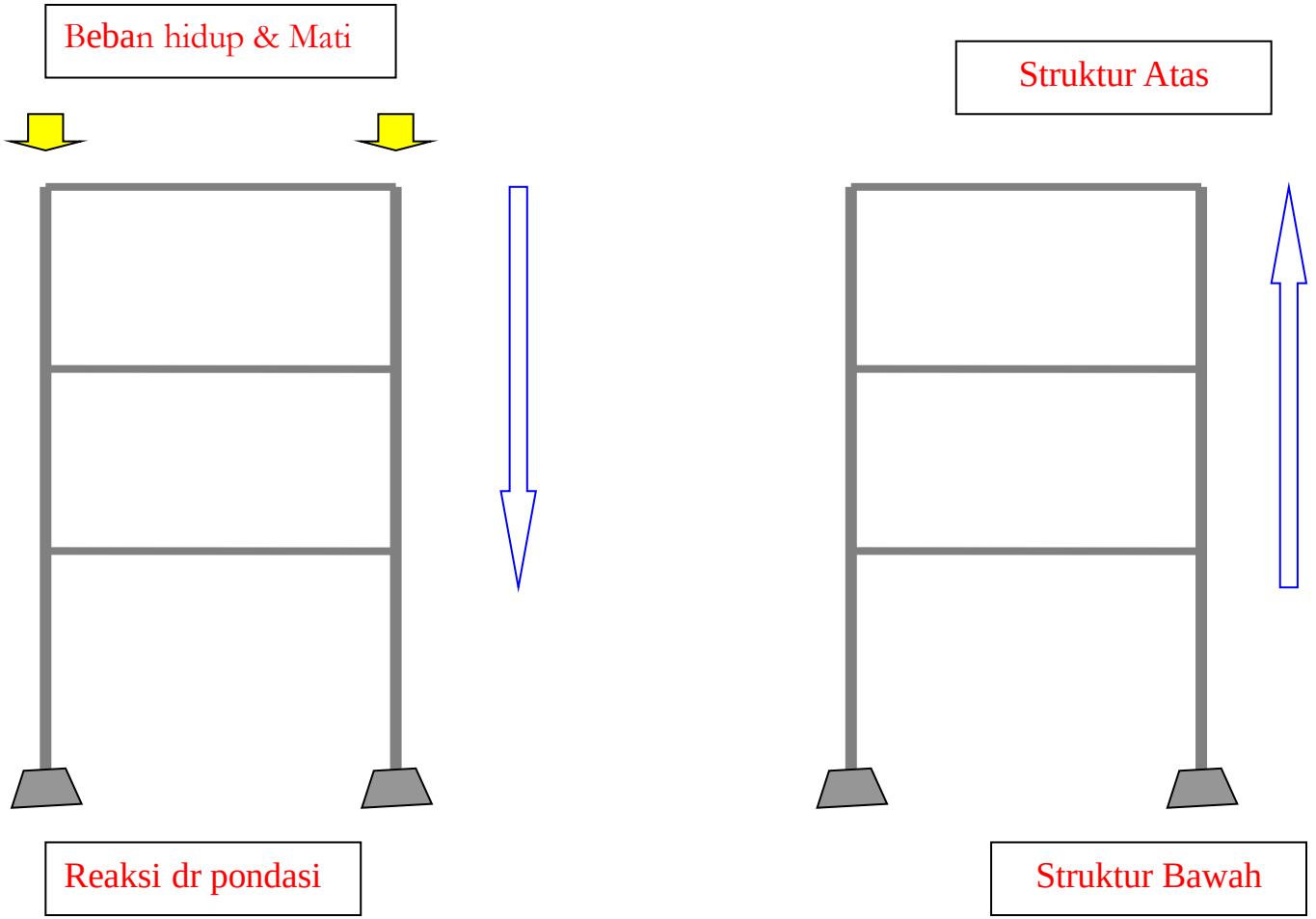
EIA
Topography
Soil mechanic
Orientasi arah





earthquakeproof

Maintenance & corridor


Beban hidup & Mati
Struktur Atas
Reaksi dr pondasi
Struktur Bawah

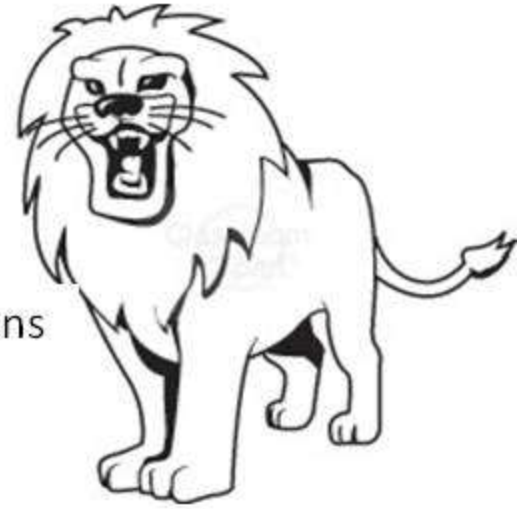
EPIC, signify the traits of ideal engineer:

DR. Za-Chiech Moh 22/04/99

E		Effective; Efficient; Excellent; ***Ethical***; Enterprising
P	is	Proper; Productive; ***Punctual***; Perfect; Persistent
I	for	Imaginative; Involved; Informed; Impact
C		Current; Compatible; Clear; Concise; Communicative

Overcome the Predators with the armour of Integrity

Focused on best achievements



Legal Documents

Justifications of actions
And decision

Faith and Confidence

Facts and Truth

Willingness to pay for the price of excellence

Conclusion

- Understand the purpose of the project in order to maturize the concepts of the project
- Include elements of authorities with sense of ownership and willingness to sacrifice for the project in order to provide support for ease of implementation
- Include the best and appropriate human resources available from the stake holder that have the sense of ownership that are dedicated and willing to sacrifice for the project (PIU/IFC/UHEB)
- Identify the strength and weaknesses of consultants and contractors and provide a back-up strategy to overcome the weaknesses
- Disseminate the need for excellence to achieve support from every parties/stakeholders involved

Conclusion

- Provide adequate time for the development of concepts and actual function and purposes of the items to be procured → made possible due to multi years duration of the project
- The strength of the country of origin in providing assistance for the project management secure the acceptability (transparency, clarity and appropriateness) of the procedures implemented in the procurement (JICA concurrence process)
- The technology available in the country of lending agency should be implemented appropriately based on the excellence of the country in the development of the relevant technology (Japan: earthquake resistance structure, high quality hospital building)

Conclusion

- Utilization of man months of both professional A (international) and B (local) should be under close monitoring and evaluation for efficient use
- The exercise of flexibility should be enabled for growth of concepts and quality of the project

We need more Indonesian Architects with Competence in State of the Art of Hospital Design

THANK YOU