Assuring the long-term usefulness and performance of healthcare facilities

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We understand that, like cities, hospitals are never finished

But we basically don't know how to think about this…it's a new challenge.

… and is a subject of interest on an international level….

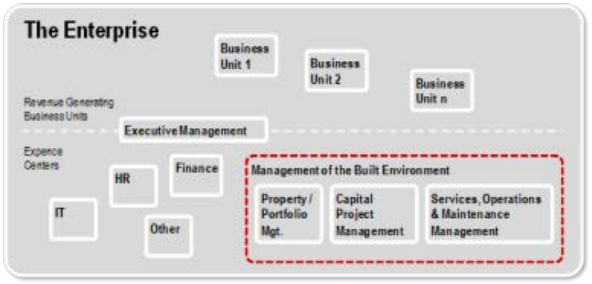
Understanding **Permanence and Change**

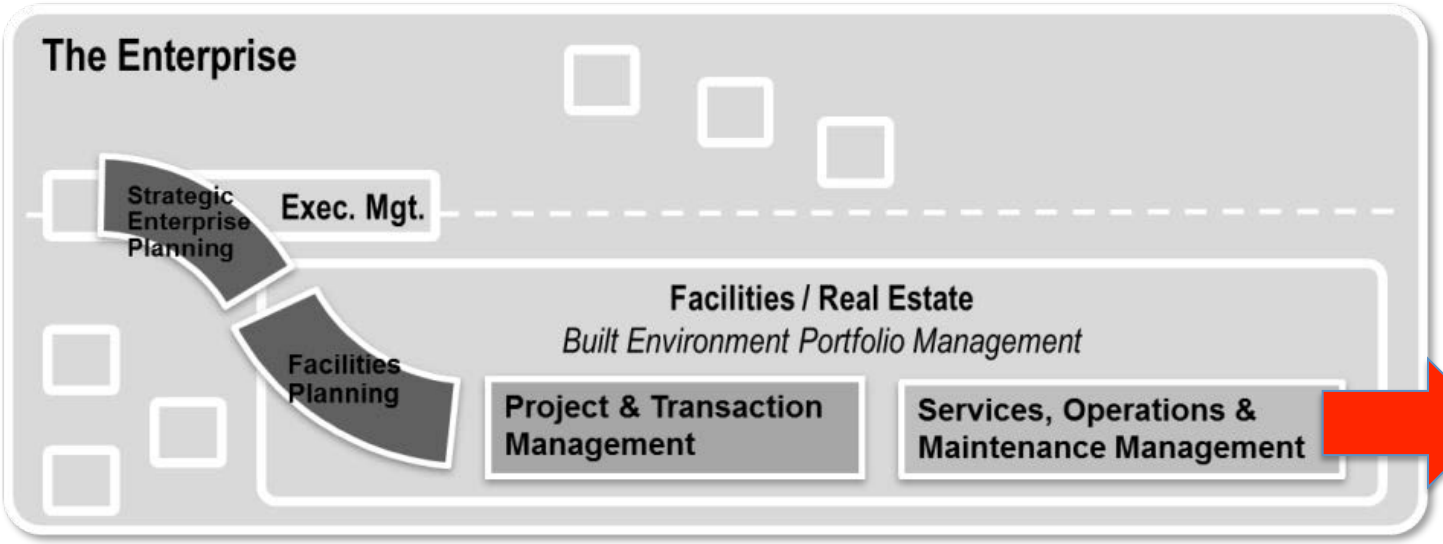
- **The city structure is permanent to the urban design**
- **The neighborhood is permanent to the building**
- **The building is permanent to the fit-out**
- **The fit-out is permanent to the equipment**

When recognized in our planning, this hierarchical structure helps us manage change

Our subject needs to be the organization and distribution of decision-making – OVER TIME – Most diagrams on FM and facility design decisions put their emphasis on getting the building built. Then the rest of the history of that facility is lumped into a box called O&M, and that is the end of the diagram.

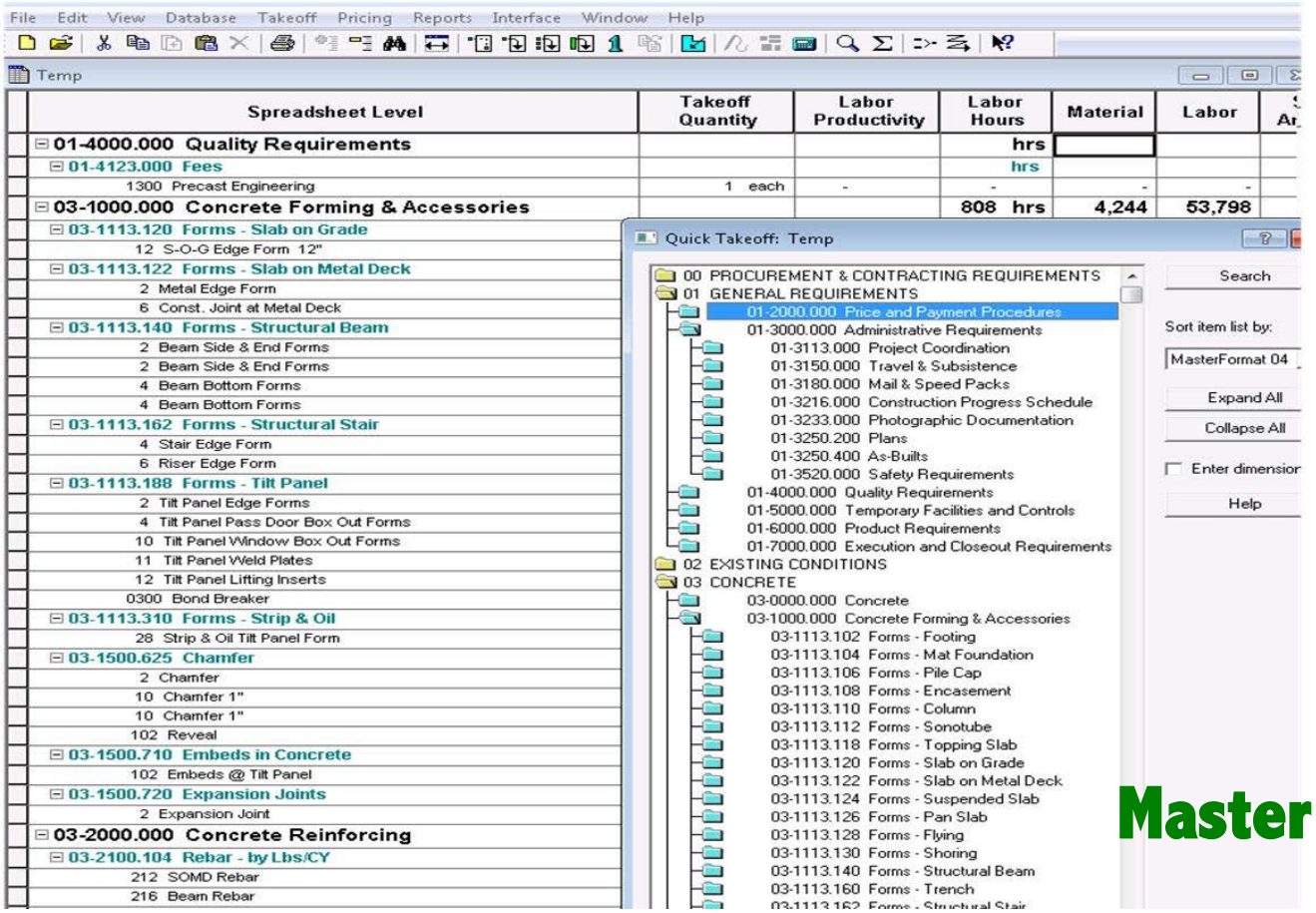
WHAT GOES IN THE O&M BOX IS THE KEY POINT and teaches us that we need to rethink our upstream decision-making to be ready for long-term asset sustainability.





Performance Measurement in Facility Management: The Environment Management Maturity Model BEM3
Authors: Thomas Madritsch, Matthias Ebinger, www.researchjournals.co.uk

As technical experts, we tend to think about complex facilities as made up of thousands of parts, each specified and given a cost;



Master Format

So we group the technical parts and activities into TECHNICAL CLASSES:

Structural systems
Mechanical systems
Partition systems
Façade systems
Etc.

Planners group activities in FUNCTIONAL CLASSES (with associated equipment):

Intensive Care
Operating Suites
Pharmacy
Emergency
Laboratory
Inpatient beds
MRI
Etc.

PROBLEM!

The view of buildings as unchanging became enshrined in "functionalism." With enough scientific measurement, we could finally have the evidence to "get it right". Architects – and clients - sought legitimacy in scientific evidence…

The detailed "architectural program" became the necessary first step to design… we didn't know how to make decisions without that information…

We then put all the parts and functions into one document that attempts to be comprehensive,

1. Component DEF (TMA)	FY 2011 MILITARY CONSTRUCTION PROJECT DATA			2. Date FEB 2010
3. Installation and Location: Lackland Air Force Base, Texas		4. Project Title: Ambulatory Care Center, Phase 2		
5. Program Element 87717D	6. Category Code 550	7. Project Number 72752	8. Project Cost ($000) 162,500	

9. COST ESTIMATES

Item	U/M	Quantity	Unit Cost	Cost ($000)
PRIMARY FACILITIES				123,869
Diagnostic, Surgical, Therapeutics Center	SF	298,747	373.14	(111,474)
Expand Mechanical/Electrical Plant	LS	--	--	(3,036)
Special Foundations	LS	--	--	(3,045)
SDD and EPAct05	LS	--	--	(6,314)
SUPPORTING FACILITIES				8,716
Electric Service	LS	--	--	(1,994)
Water, Sewer, Gas	LS	--	--	(107)
Steam And/Or Chilled Water Distribution	LS	--	--	(976)
Paving, Walks, Curbs And Gutters	LS	--	--	(1,553)
Storm Drainage	LS	--	--	(562)
Site Imp (1,910) Demo ( )	LS	--	--	(1,910)
Antiterrorism Measures	LS	--	--	(278)
Other	LS	--	--	(1,336)
ESTIMATED CONTRACT COST				132,585
CONTINGENCY PERCENT (5.00%)				6,629
SUBTOTAL				139,214
SUPERVISION, INSPECTION & OVERHEAD (5.70%)				7,935
CATEGORY E EQUIPMENT				15,351
TOTAL REQUEST				162,500
TOTAL REQUEST (NOT ROUNDED)				162,500
INSTALLED EQT-OTHER APPROPRIATIONS				(0)

10. Description of Proposed Construction:
Construct the second phase of a multi-story ambulatory care center on special foundations. This phase will provide a new Diagnostic, Surgical, and Therapeutic Services Center and associated support spaces. The mechanical/electrical plant will be expanded. The existing Wilford Hall Medical Center will be demolished in a later phase. Supporting facilities include utilities, site improvements, surface parking, and access roads. The project will be designed in accordance with the criteria prescribed in Unified Facilities Criteria UFC 4-510-01 (MIL-HDBK-1191), DoD Minimum Antiterrorism Standards for Buildings UFC 4-010-01, Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (ADA/ABAAG), and applicable energy conservation legislation. Commissioning, operations and maintenance manuals and Comprehensive Interior Design will be provided. Air Conditioning: 1,200 Tons.

11. REQ: 645,400 SF ADQT: 81,685 SF SUBSTD: 1,446,470 SF

PROJECT:
Construct Diagnostic, Surgical, Therapeutics Center (Phase 2)-of-an Ambulatory Care Center. (CURRENT MISSION)

REQUIREMENT:
Provide a modern and appropriately sized Ambulatory Care Center to support 57,000 healthcare beneficiaries at SAMMC – South.

PHASING PLAN:
Multiple phased projects will ultimately replace Wilford Hall Medical Center (WHMC) to provide an Ambulatory Care Center of sufficient size and capacity at San Antonio Military Medical Center - South Campus (SAMMC-S) for the care of over 57,000 enrollees and a training platform for Graduate Medical Education (GME) in the San Antonio

DD FORM 1391, JUL 1999

- **Not a sound business view…**
- **Against the realities of change**
- **Against decision flexibility**

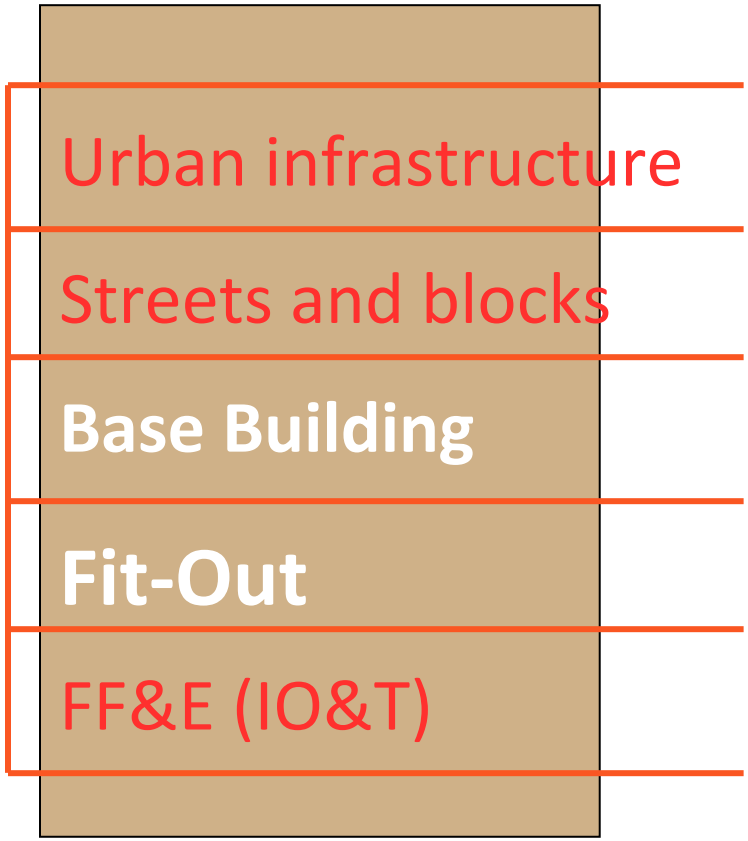
THIS MAKES NO SENSE AT ALL!

e.g. DoD Form 1391

AN ALTERNATIVE:

LEVELS of INTERVENTION can organize our work

Levels have important dependency relations between them, and define the relationship between parties operating on these levels.
"Higher" levels set the stage for "lower" levels; e.g. fit-out can change without forcing the base building to change…etc.



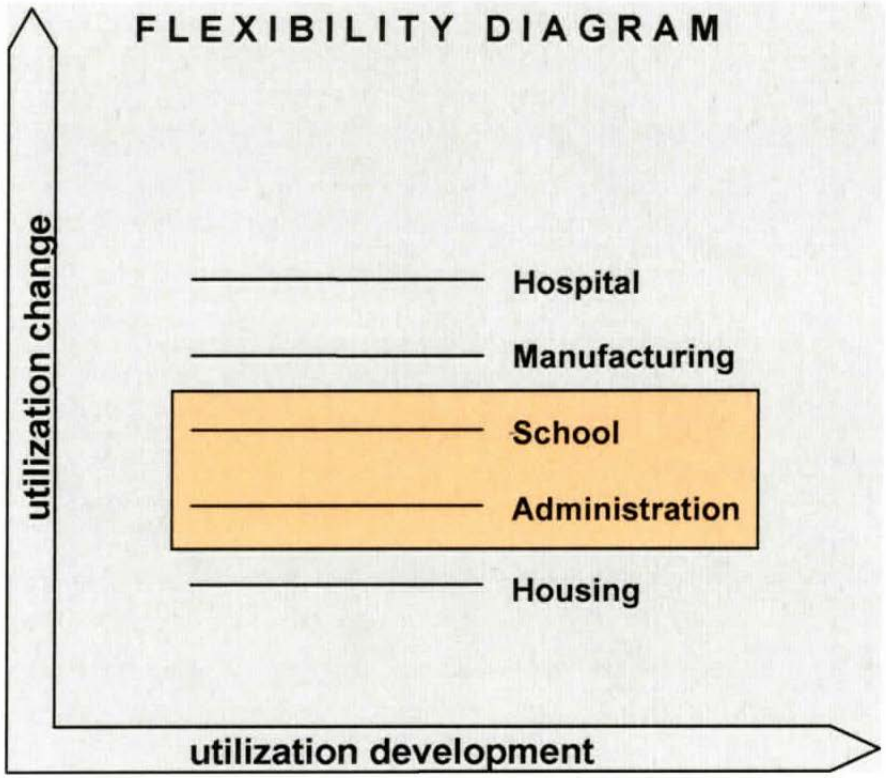
A business view organizes the thousands of parts and functions into decision "levels."

Office buildings are designed for variably paced "churn"

- **architects design empty base buildings**
- **other architects or interior architects design the tenant spaces**
- **specialized contractors and suppliers are involved at each level of work**

Portfolio Management

Definition of the capacity of possible utilization



Source: OPB Bern

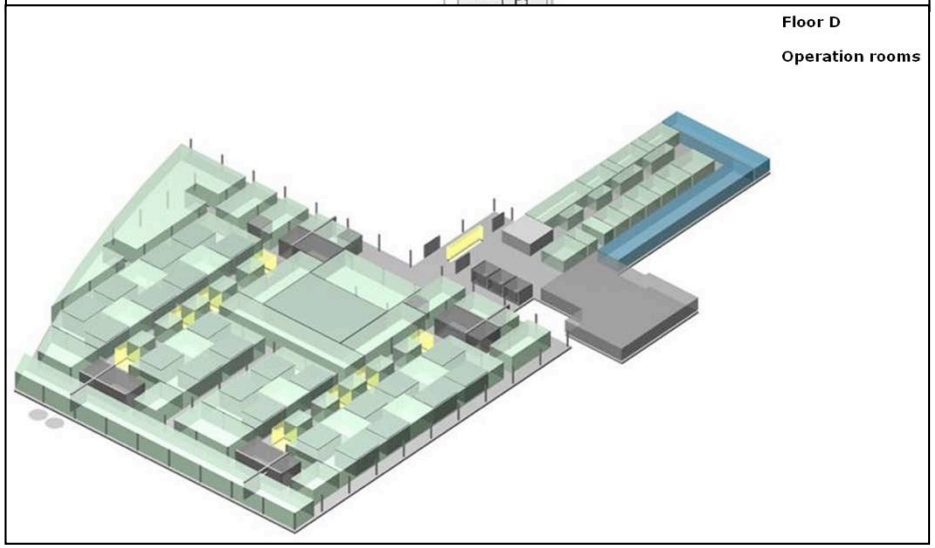
This diagram shows that "capacity" of a facility means it can accommodate change OF use (utilization change, e.g. from a school function to an administrative function) and change WITHIN a use (utilization development).

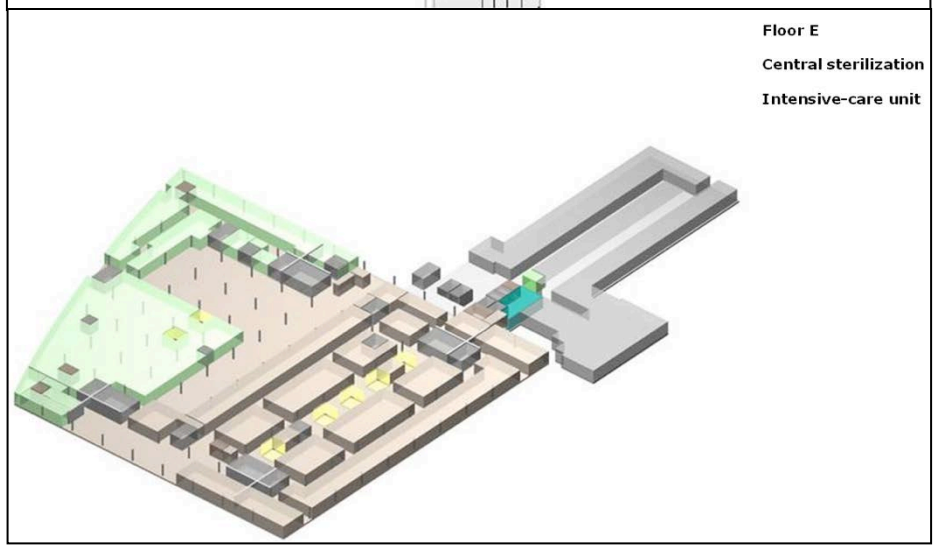
CAPACITY:

A variety of functional layouts are possible on one typical floor of a well-designed base building.

Each layout here is a proposal from one of the firms competing for the Secondary System design of the INO hospital in Bern.

The firm selected for the Secondary System had to accept the Primary System as its "site".

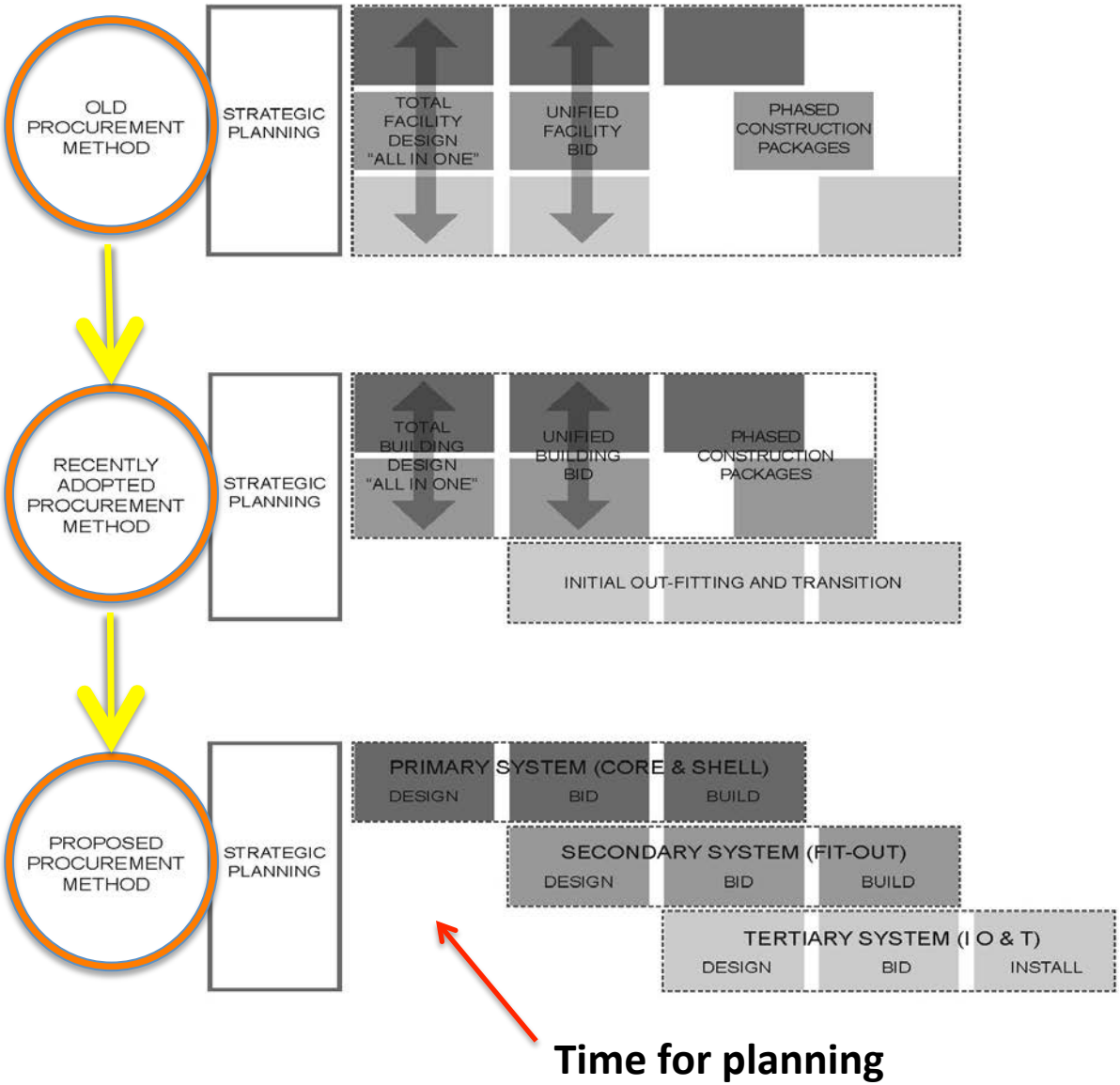




Floor D - operation clusters

Floor E - laboratories / intensive care

Insel Hospital Campus, Bern, Switzerland

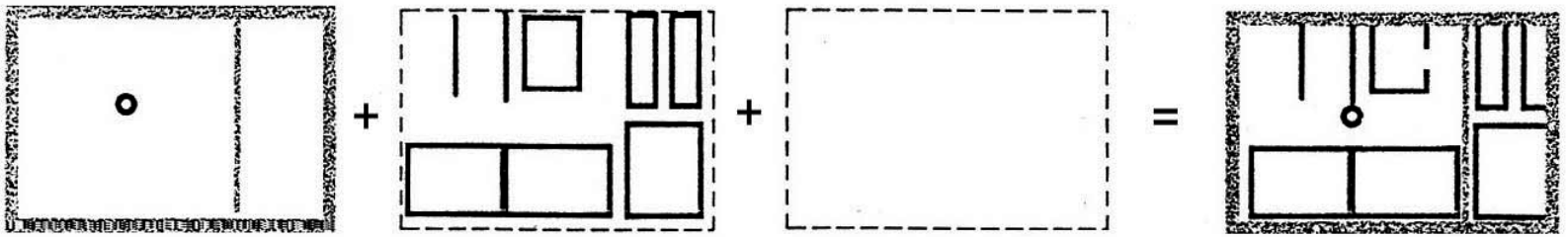


A proposed serial decision- making process

…transitioning from a process (top diagram) that attempts to specify everything at once to a process that sets up a facility with long-term value (prepared for change) by deferring functional decisions closer to the time of occupancy….

SPATIAL ORGANIZATION

System Level 1 + System Level 2 + System Level 3 =



Primary system, fixed:

Site logistics
Building envelope
Structure system
Interior logistics

Secondary system, adjustable:

Interior walls
Floor covering
Ceilings

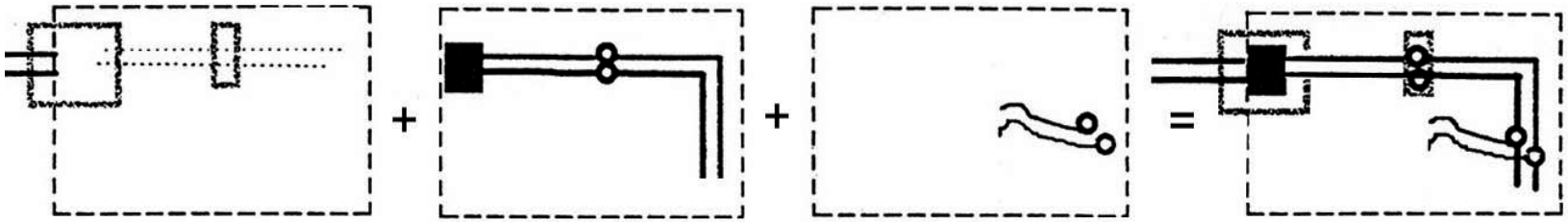
Tertiary system, flexible:

Furniture
Mechanical equip
Hospital supplies

Composite system

TECHNICAL SYSTEM ORGANIZATION

System Level 1 + System Level 2 + System Level 3 =



Primary system, fixed:

Electronics
Location of head offices
Installation structure

Secondary system, adjustable:

Equipment for head offices
Installations
Illumination

Tertiary system, flexible:

Ports for apparatus
Room specific installations

Composite system

Source: OPB Bern

This diagram begins to define what belongs to which system level

Meeting the sustainability agenda

Primary System
Life cycle: 50-100 years
long-term investment, unchangeable

BASE BUILDING

Secondary System
Life cycle: 5-20 years
medium-term investment, adjustable

TENANT WORK or FIT-OUT

Tertiary System
Life cycle: 2-5 years
Short-term investment, changeable

Image Source: Canton Bern (CH) Office of Properties and Buildings

FF&E (Furnishings, Fixtures and Equipment) or IO&T

Summary

1. "Flexibility" or capacity requirements cut across lines of authority in client organizations
2. Scenario planning and cost modeling are needed
3. Design submittal requirements must coincide with serial decision-making and demonstrate capacity for change
4. Vigilance and compliance monitoring by the client is vital