

PPP Hospital IT Operations

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PPP Hospitals in Turkey



- 38 Planned City Hospitals
- 3 Hospitals (3000+ beds) operational
- Public Private Partnership Model (PPP)
- Total of 30,000 beds



PPP Hospitals in Turkey

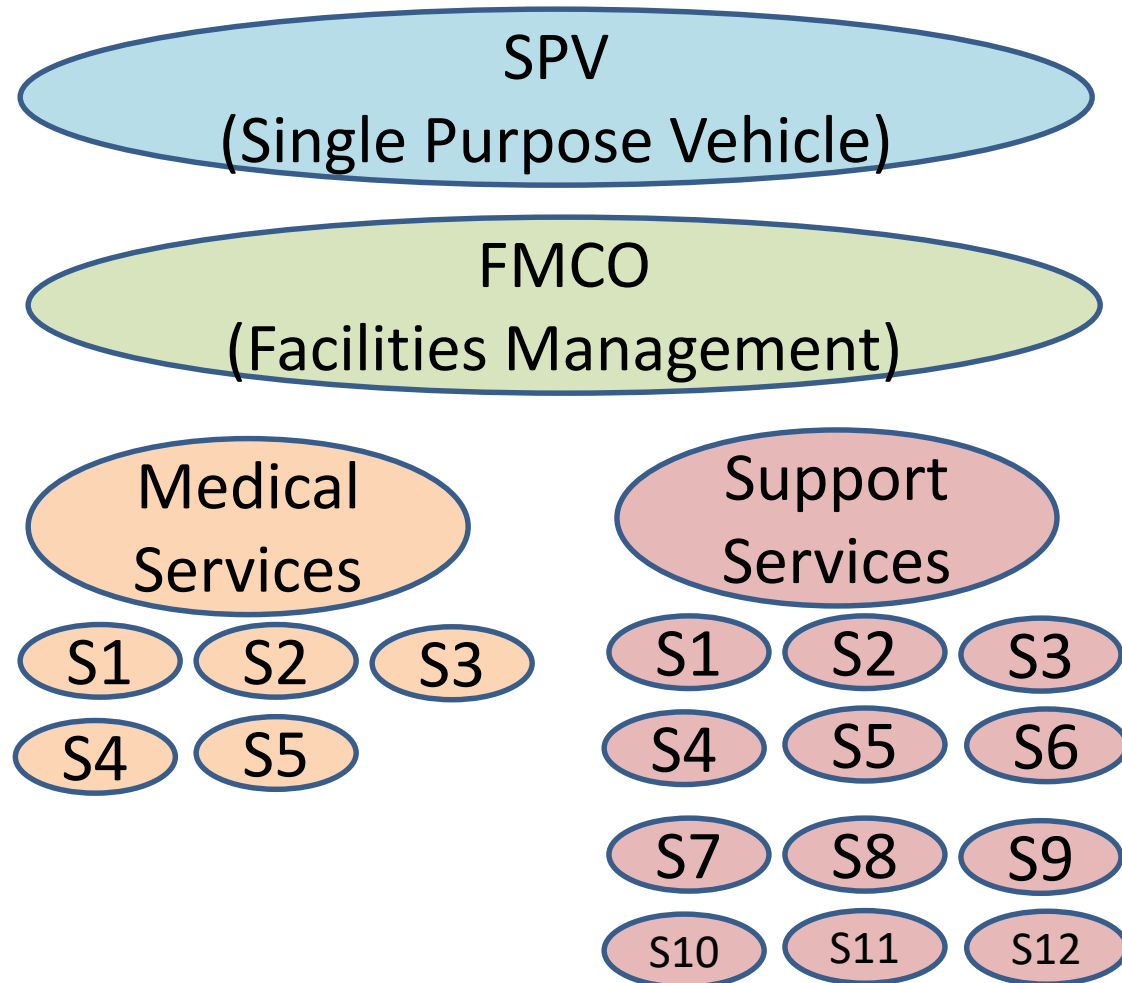
Goals

- Centralize Healthcare in each province
- Government focuses on medical services only
- Central Service Provider (SPV) and sub contractors responsible for hard AND soft services
- Monthly payments as rent and service fees, no upfront payments
- Contracted for 25 years



PPP Hospitals in Turkey

PPP Model



- SPV
 - Lasts for 25 years, No operations
- FMCO
 - Broker for all Services provided, can provide some of the services
- Medical Services
 - Imaging, Sterilization, Lab etc
- Support Services
 - Catering, Cleaning, Waste Disposal etc



PPP Hospitals in Turkey

Top level Stakeholders

Ministry of
Health (MoH)

Focus: Citizen Welfare

SPV

Focus: Minimize Penalties

Regional
Healthcare
Trusts

Focus: Healthcare
Professionals

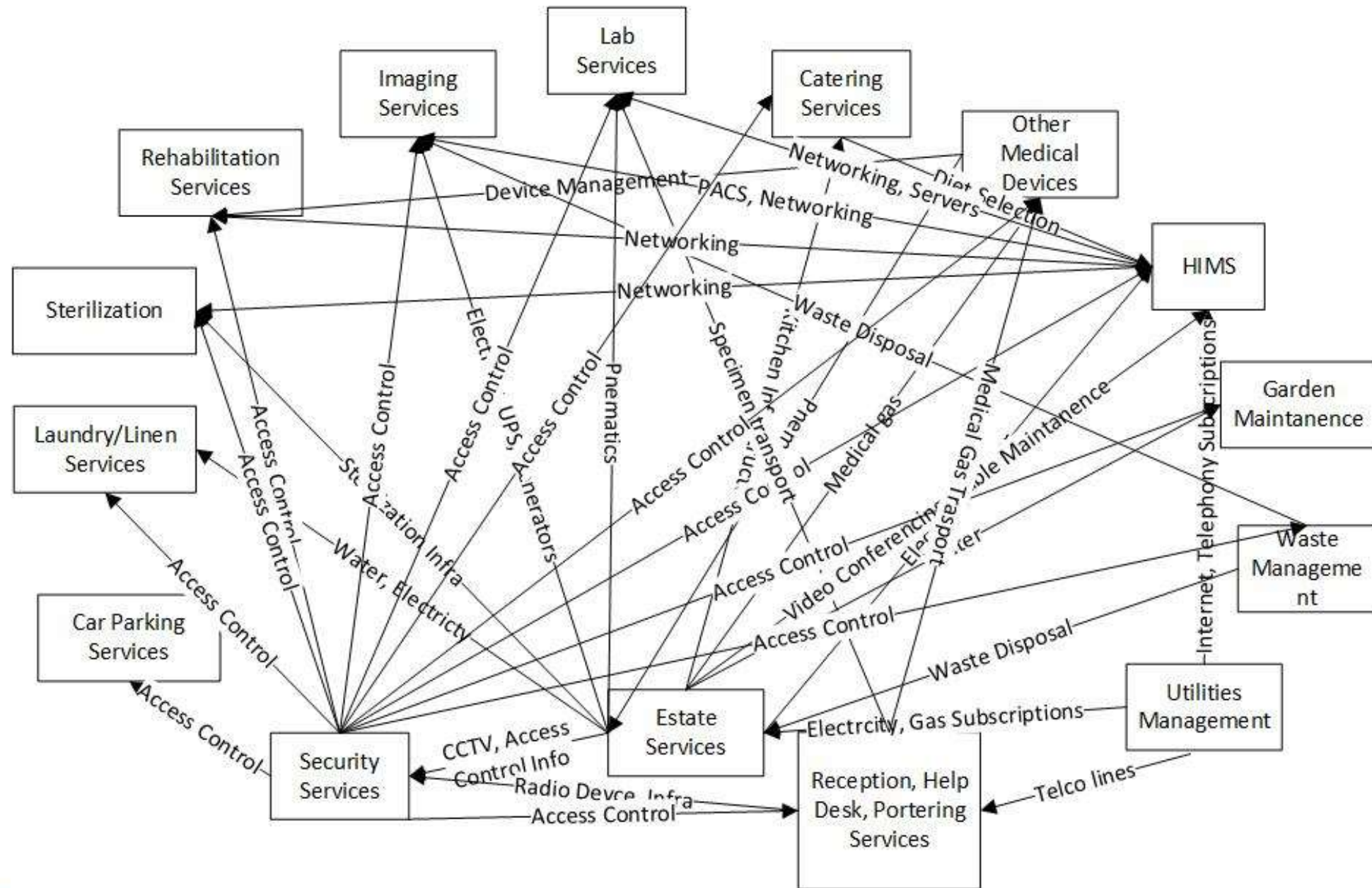
Financers

Focus: Regular Payments



PPP Hospitals in Turkey

Why is PPP Hospital IT different?





PPP Hospitals in Turkey

Why is PPP Hospital IT different?

- Too many device types
 - **Typical:** Desktops, Printers, Network Equipment (Wired AND wireless), Servers, Telephony
 - **Not so typical:** barcode/RFID readers-printers, Passive RFID readers, Access Control Systems, Security Cams, Radio Infra
 - **Hospital Specific:** Nurse Calling Systems, Medical Imaging Systems, Lab equipment, Medical PC's, Medical Displays, Medical Operation Cameras



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Why is PPP Hospital IT different?

- Too many Service Level Agreements
 - SPV needs to fulfill 650+ performance parameters monthly
 - 64 IT related very strict performance parameters
 - Ex: HIMS Application needs to display first page of information in 4 seconds on ALL end user devices
 - Fines are deducted from monthly fees (huge impact)



PPP Hospitals in Turkey

Why is PPP Hospital IT different?

- Medium Sized Hospital
 - 350,000+ m²
 - 8000+ rooms
 - 4 Interconnected buildings
 - 1500 Beds, 15,000 daily visitors





PPP Hospitals in Turkey

Why is PPP Hospital IT different?

- Large Sized Hospital
 - 1,000,000+ m²
 - 24,000+ rooms
 - 7 Interconnected buildings
 - 3750 Beds, 80,000 daily visitors
 - Municipality had to revise city plan to accommodate daily traffic



In office environments, when IT fails, company loses money...

In hospital environments people
can lose their lives!



Medical professionals save
lives, work 24x7...



They do not feel need to adapt for
Information technology culture



PPP Hospitals in Turkey

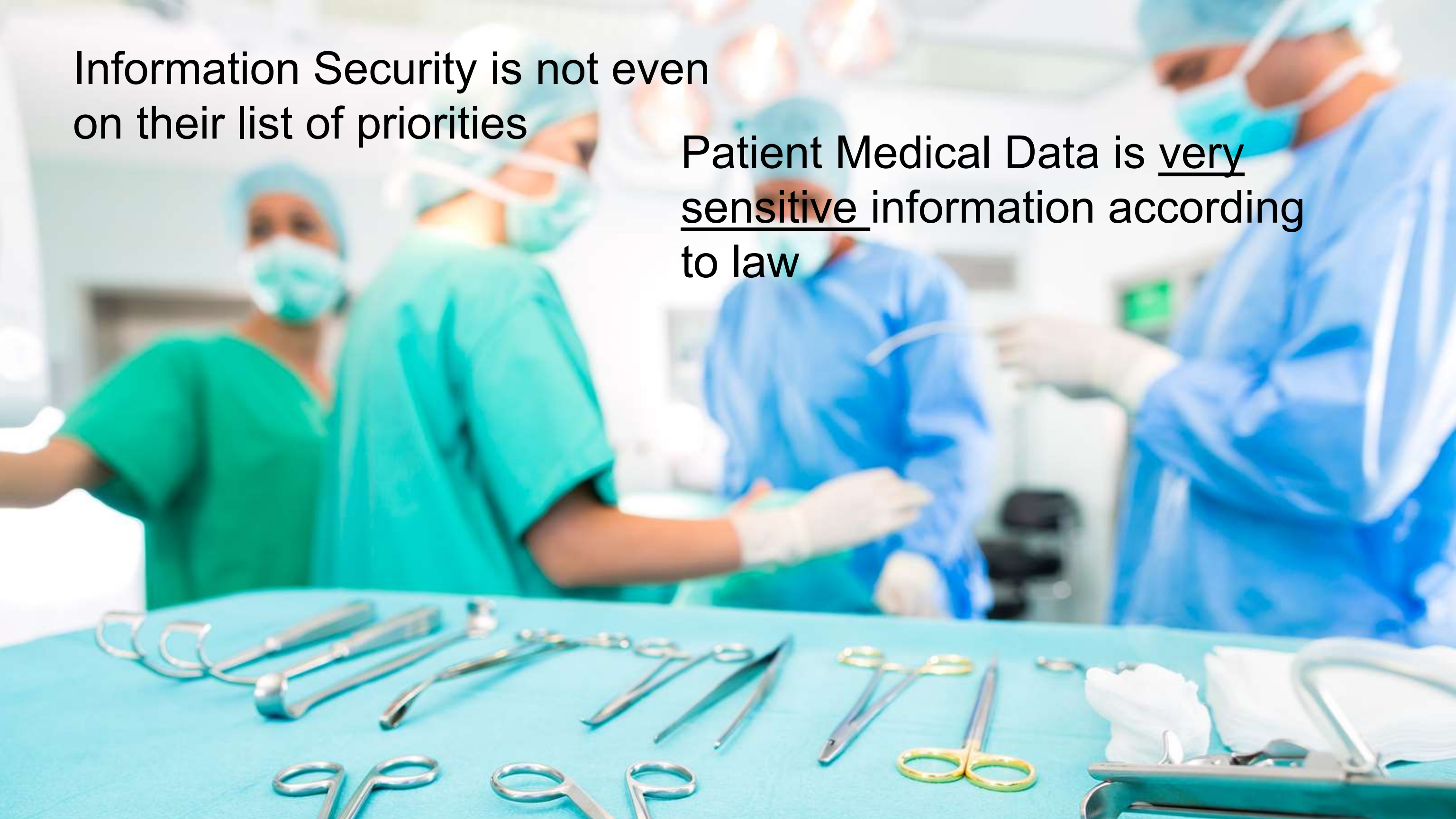
Why is PPP Hospital IT different?



- Hospital Paradigms
 - If an IT device fails, quick replace might not be possible

Information Security is not even on their list of priorities

Patient Medical Data is very sensitive information according to law



PPP Hospital IT Planning

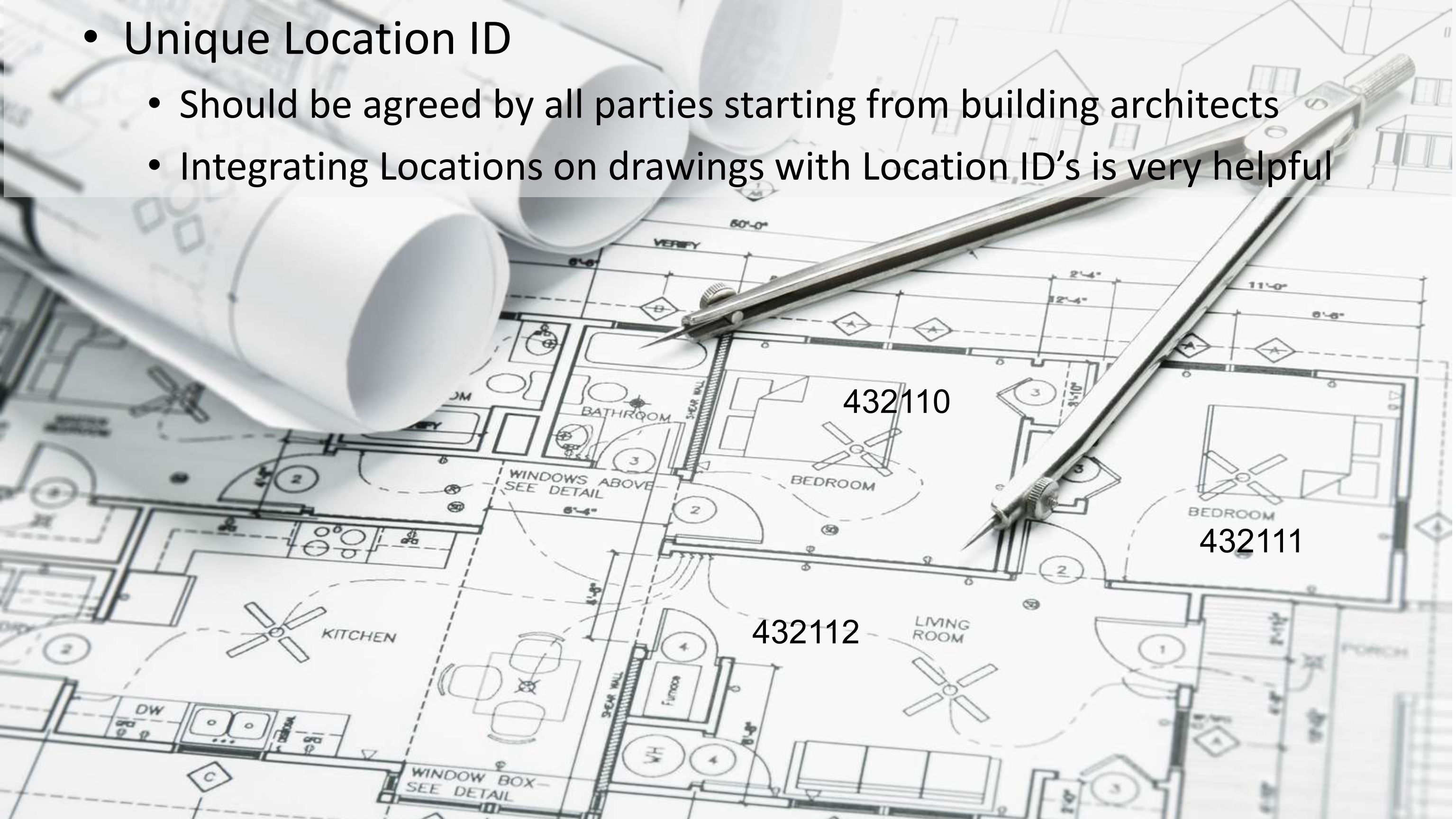
“The general who wins the battle makes many calculations in his temple before the battle is fought.”

Sun Tzu



- Unique Location ID

- Should be agreed by all parties starting from building architects
- Integrating Locations on drawings with Location ID's is very helpful





PPP Hospital IT Planning

Building Recommended Practices

- Unique Location ID
 - There should be a centralized repository with change management process in place.
 - ISO 14763-2-1 or TIA 606B can be used
 - Ex: AD02+6F_02:01 (AD-02 Cabinet, 6th row, 2nd chassis, port 1)
 - Needs extending for non-networking scenarios



PPP Hospital IT Planning

Building Recommended Practices

- Unique Device ID
 - RFID ID's can be used (EPCGlobal Gen 2 Version 2)
 - Randomly created numerical IDs easier to handle
- Recommendations
 - Using categorical naming in front of ID does not scale
 - Using Location as part of ID brings maintenance cost
 - Vendor Serial ID's seen to collide



PPP Hospital IT Planning

Building Recommended Practices

- Unique Asset Classification ID
 - Use same classification for ALL Devices in Facility
 - Omniclass, Uniclass can be used but needs extending
- Recommendations
 - Some regulations require local or other Healthcare oriented standards (UMDNS, GUIDID etc)
 - Maintaining Mapping between classifications is a large maintenance cost



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Building Recommended Practices

- Unique Manufacturer, Model ID
 - Manual entries create mistakes hard to find (Compaq, Compac)
- Recommendations
 - Create your own table for vendor IDs and models with descriptions if possible



PPP Hospital IT Planning

Building Recommended Practices

- Recommendations (less than 1000 assets)
 - Use Spreadsheet software to manage your assets
 - Fix your columns and limit acceptable entries
 - Make sure everybody in the team fills the data properly
 - Device IDs can be rule based (class or locations)
 - Ex: SB01L02T3-48 (Switch in Building 1, Leve 1, Telecom room 3, 48 ports)
 - Use manual entry for Manufacturer and Model identifiers
 - Use manual entry for Asset Status (Operational, stock etc)



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Building Recommended Practices

- Recommendations (more than 1000 assets)
 - Use centralized Asset Management Software
 - Assign Unique Device ID (Random, EPC)
 - Use Separate Location ID linked to Device ID (ISO 14763-2-1, TIA 606B or other)
 - Use Separate Category ID linked to Device ID (OmniClass etc)
 - Use Separate Manufacturer, model IDs linked to Device ID



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Building Recommended Practices

- Recommendations (more than 1000 assets)
 - Integration with other management systems is inevitable
 - Engage early and agree on data exchange standards, frequency
 - Do not use Unique ID's from other parties as your own



PPP Hospital IT Planning

Building Recommended Practices

- ESS network
 - Separation of ESS and IT networks physically is recommended
 - Anything that does not need to scale with usage should be in ESS
 - Patient data should not pass through ESS network
 - Cabling is dependent on many factors, lots to consider
 - BICSI 005 ESS is very good resource for ESS planning



PPP Hospital IT Planning

Building Recommended Practices

- IT network Planning
 - Variable bandwidth communications (ex: Wi-Fi) and end-user devices
 - Cat-6A cabling should be minimum requirement, Shielded Cat-7 is recommended for medical imaging equipment
 - Perform rigorous cable tests



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Building Recommended Practices

- Telecommunication and Equipment rooms
 - Generally shared for ESS and IT networks
 - Treat these rooms as public spaces!
 - Secure all cabling in trays and while entering cabinets
 - Secure grounding connections
 - Use per-cabinet inline UPS's even if there is a building UPS
 - Centrally monitor temperature, humidity, power inside EACH cabinet
 - Inspect rooms regularly during operations



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Building Recommended Practices

- Building Cabling
 - Ensure all cable pathways are secured
 - Follow best practices for cable placement (BISCI 002 is recommended)
 - When using newer PoE devices (60W+) use CAT 7 or above, if you can't, prepare for cable heating



PPP Hospital IT Planning

Datacenter Recommended Practices

- Data Center Placement
 - 2 Active-Active Data Centers were required for Hospitals in Turkey
 - Make sure technical personnel can reach to both DCs in less than 5 minutes
 - Make sure large equipment can be transported inside the hospital to and from data centers



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Datacenter Recommended Practices

- Data Center Placement
 - Make sure Data Center
 - is NOT above, below or alongside car parks
 - is NOT near strong electromagnetic devices (Imaging equipment, Transformers etc)
 - Is NOT adjacent to piping on from sides and inside walls
 - DO NOT share NOC space with Data Center support spaces



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Datacenter Recommended Practices

- Data Center Equipment
 - Ventilation
 - Plan positive air pressure at all times inside Data Centers
 - Make sure External Air inlets are separate from hospital ventilation system and away from exhaust system.
 - Exterior Air Conditioning units should be secured from tampering
 - Fire Suppression
 - Separate gas exhaust system should be considered since fire suppression agents can be harmful for patients



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Datacenter Recommended Practices

- Data Center Equipment
 - Cabinets and Server Placement
 - Different service providers may need to put equipment inside Data Centers
 - Avoid physical devices not controlled by Hospital IT if possible
 - Provide separate cabinets or aisle containments with access control

PPP Hospital IT Commissioning





PPP Hospital IT Commissioning

Building Recommended Practices

- Timelines
 - Not every part of the hospital will be ready for operation at the same time
 - Start from core (typically one of data centers) extend outwards



PPP Hospital IT Commissioning

Building Recommended Practices

- Data Center
 - Be sure to maintain physical security during construction
 - Do not expect clean electricity if you are under time pressure
 - Having UPS does not mitigate all electricity problems
 - Building network cable performance may be unreliable before operation
 - Maintain positive air pressure at all times inside Data Centers



PPP Hospital IT Commissioning

Building Recommended Practices

- Pre-Commissioning Considerations
 - Equipment testing takes time and planning
 - Every service provider tests their own equipment
 - What needs to be tested for integrated operation?
 - End-User Device Placement
 - Be ready to change end user device locations considerably
 - Placed and tested end user equipment will not stay that way



PPP Hospital IT Commissioning

Operational Recommended Practices

- Identity Management is key!
 - Centralized ID management is a must
 - Who owns identity management?
 - Use Unique User IDs
 - Plan carefully for central identity management and distributed access controls



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Operational Recommended Practices

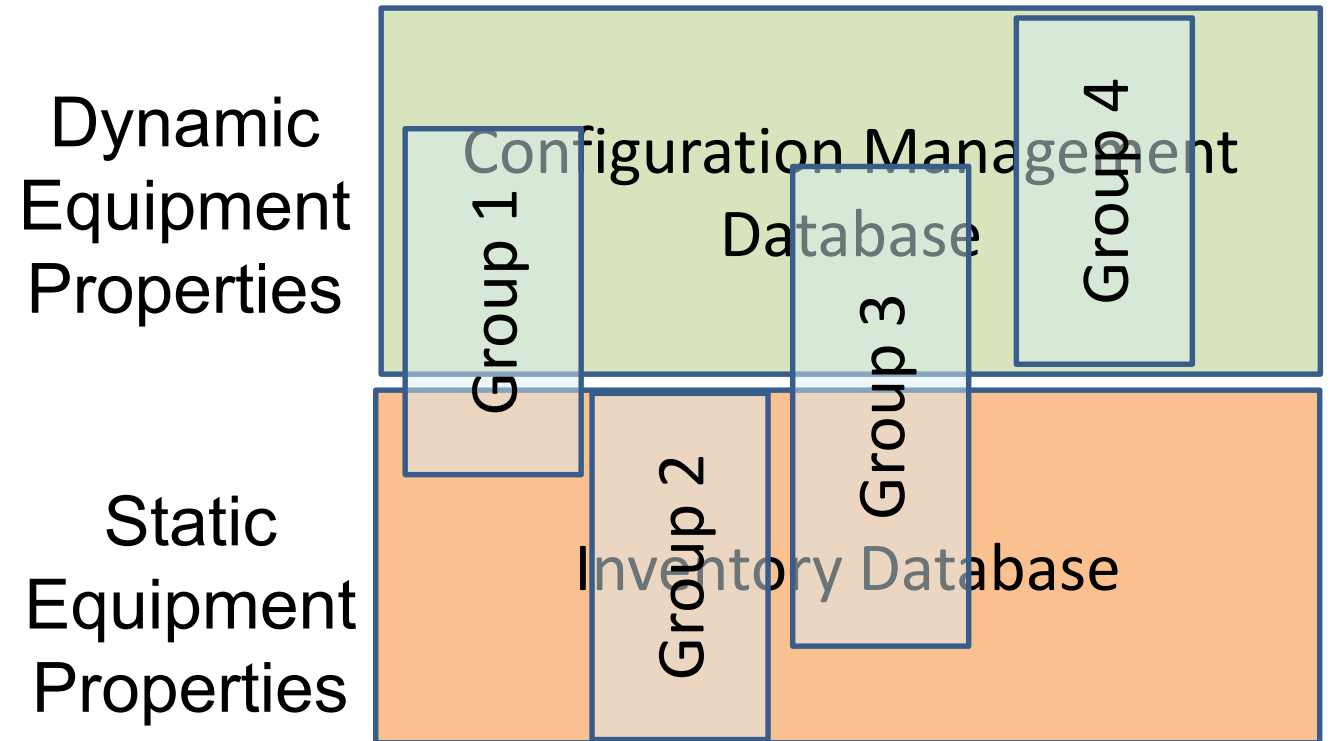
- Time Source
 - There is a status 2 Atomic Clock requirement in RFP
 - Synchronize all clocks from a central source
 - IT equipment
 - Security Cameras
 - CRAC Units
 - Access Control
 - Intrusion Detection Systems



PPP Hospital IT Operations

Operational Recommended Practices

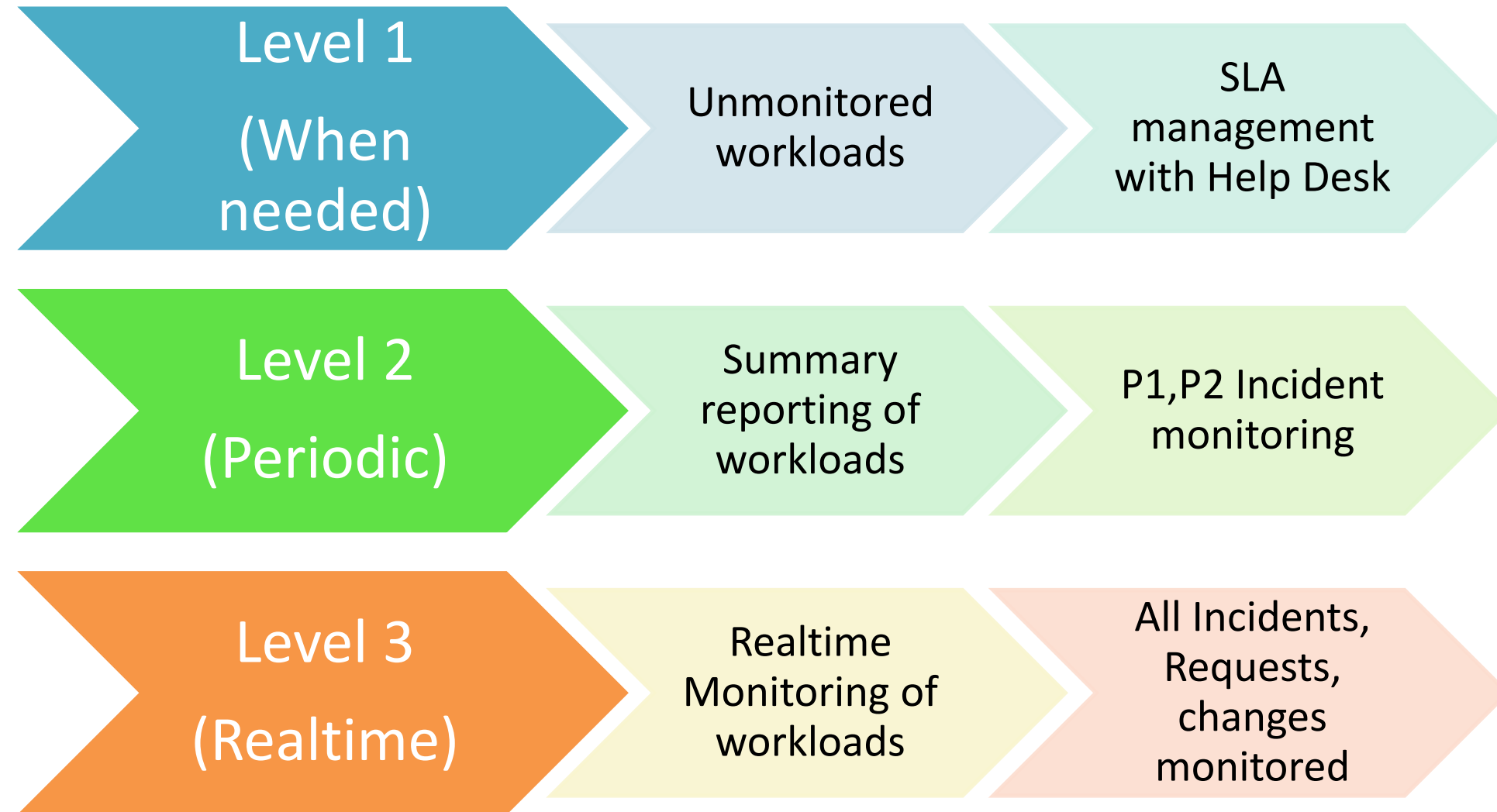
- **Asset Management**
 - Used for Vendor Management, Maintenance planning
- **Configuration Management**
 - Used for change management
- Different group of assets will need to be managed in two perspectives





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Monitoring Recommended Practices





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