2022-2023 Educational Webinar Series

Staffing Models and Justification to Management

March 09, 2023

Panelists

Nader Hammoud, MBA, CHTM

Manager, Clinical Engineering

John Muir Health

Angela Bennett, CHTM, BS

Sr. Site Manager, Clinical Engineering

TRIMEDX

Roberto Torres, Jr., MBA

Director, Clinical Engineering

Stanford Children's Health

About the Moderator

Mike Powers, MBA, AAMIF, CHTM, CDP

Mike Powers is the System Director for Field Service in the Healthcare Management Department at Intermountain Healthcare, headquartered in Salt Lake City, Utah.

He co-leads a task group for Health Sector Coordinating Council on Legacy Medical Device Cybersecurity. He is a vice chair of the AAMI Healthcare Technology Leadership Committee.

Prior to Intermountain, he was the Clinical Engineering Quality Manager at ChistianaCare Health System. He has an MBA in Healthcare Administration from Wilmington University and is a Certified Diversity Professional.

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Logistics

❖All attendees have their <u>microphones muted</u> during the presentation.

❖Questions to the panelists must be submitted via the <u>"Q&A" feature</u> in Zoom at any time. They will be addressed at the Q&A portion.

❖If there is any <u>urgent</u> issue, please use the "chat" feature to communicate with the host/moderator.

❖Please remember to complete the webinar evaluation after attending. A link will be provided at the end.

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About the Speaker

Nader Hammoud is currently the Biomedical Engineering Manager, at John Muir Health.

- Biomedical Engineer with 3 degrees in Biomedical Engineering and an MBA

- International Experience

- Active member of the HTM community

- Member of the Technology Management Council at AAMI

- California HTM of the year for 2018

- Recognized by ECRI and FDA for efforts in the domain

Nader Hammoud, BE, MBA, CHTM

About the speaker

Angela is currently a Sr. Site Manager with Trimedx for FMOL Our Lady of the Lake Baton Rouge market.

- Bachelors of Science in Biomedical Electronics
- Certified Healthcare Technology Management acquired in May 2022.
- AAMI HTLC under 35 Committee member
- ACCE Education committee Member
- AAMI Young Professional Award Recipient
- TechNation 40 Under 40
- United States Army Veteran-68A BMET
- Published articles in HTM magazines as well as a few outside of HTM
- HTM on the line guest speaker
- Guest Speaker at AAMI Exchange with ACCE: The 3 R's
- Previous President of the West Michigan Biomed Society.

Angela Bennett, CHTM, BS

TRIMEDX

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About the speaker

Roberto is currently the Director of the Clinical Technology and Biomedical Engineering Department at Stanford Medicine Children's Health.

- B.S. Biomedical/Electrical Engineering with an MBA

- 31 years in industry

- Active member of the HTM community

- Past board member of LA Chapter CMIA

- Past speaker at AAMI, HIMSS, ACCE and Epic UGM events

- Past contributor to Tech Nation articles

Roberto Torres, Jr. MBA

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Session Topics

- Staffing models for HTM field
- Different HTM role job descriptions
- How to get new positions approved through management using quick tips for justification.
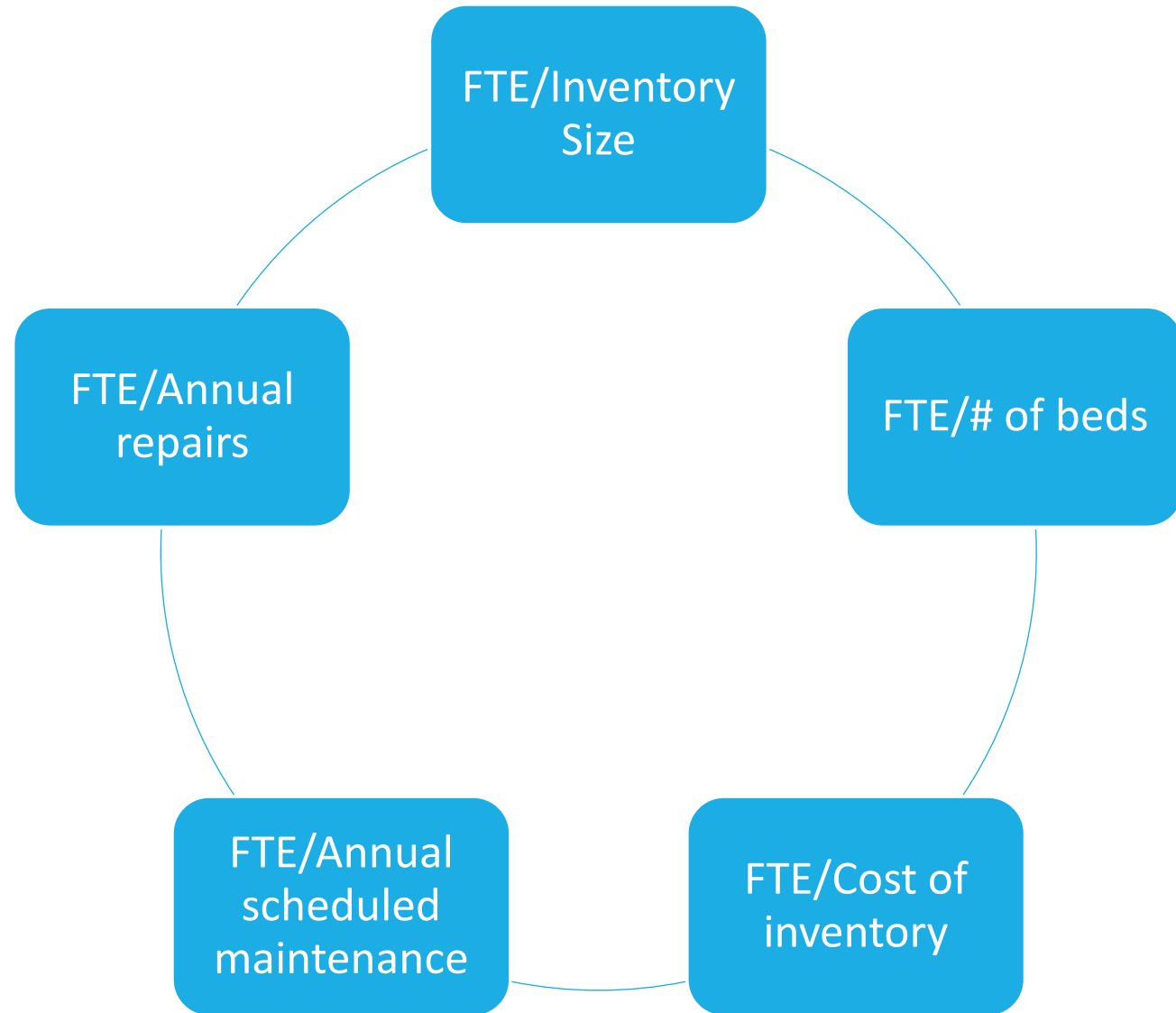
Staffing Models

The age-old question:
- How many resources do I need to run my HTM program successfully and efficiently?

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Staffing Models

Here are just a few traditional models that have been used over the years. There are others but these tend to be the most popular.

- FTE/Inventory Size
- FTE/# of beds
- FTE/Cost of inventory
- FTE/Annual scheduled maintenance
- FTE/Annual repairs

Staffing Models

These staffing models may fall under several categories:
- Operational
- Financial
- Productivity

The staffing model is important because it can help you not only justify the number of resources you are requesting but show the value of the services being provided.

Staffing Models

Whichever staffing model you choose your must be prepared to present your request to hospital leadership and be able to defend your request not just initially but to adjust as the hospital evolves, grows and become more technologically intense.

You will be required to present justifications each time you request an additional resource in the years to follow.

Your presentation may include things like trending information over the past few years. Here is a sample slide that can show value improvement over the years.
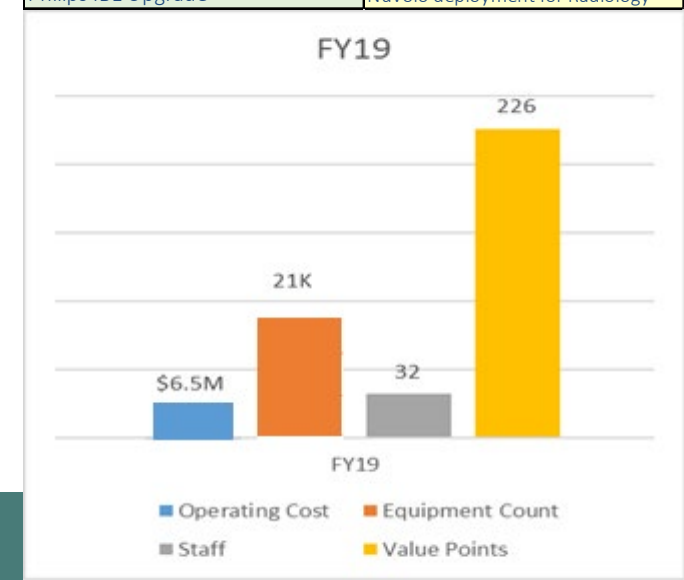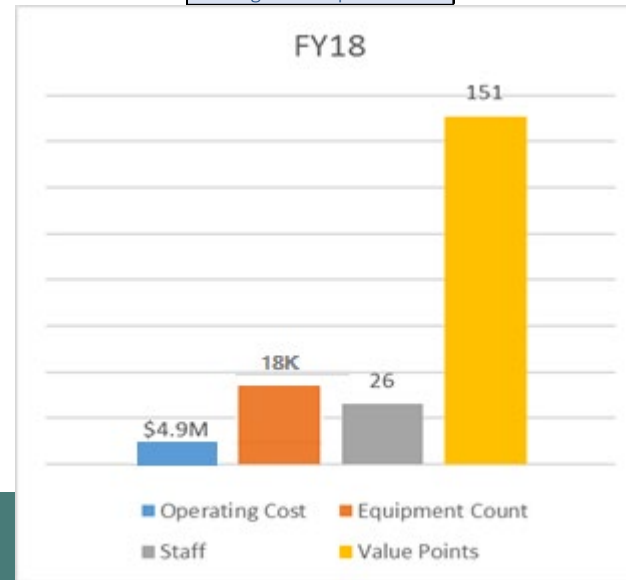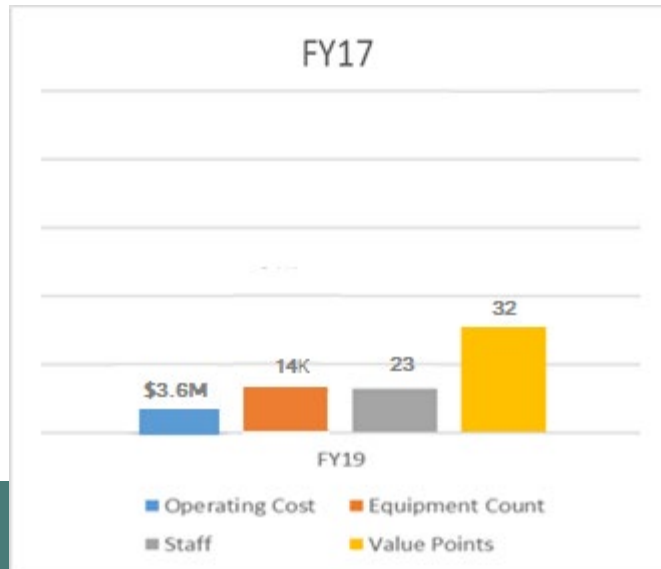
FY17 | FY18 | FY19

Value	Value Points
New System with New Functionality	10
New System with Existing Functionality	5
Existing System with New Functionality	7
Major Enhancements	2

FY17

- Philips iECG Deployment
- Philips PIICiX Deployment
- CTBE Refresh for 2017
- Medical Devices on IS Network

FY18

- SSID Consolidation project
- Smiths Medical Security
- Philips WMTS Layer 3
- West Bldg ISE Conversion
- Patch planning impl.
- Zoll Rescue Net
- Citrix Migration /Med. Dev.
- St. Jude – Deployment/Video
- Intellispace Perinatal
- Philips Data warehouse
- Merge – Deployment/Video
- Carto – Deployment/video
- Masimo Rainbow
- West Bldg DNS_DHCP
- Synaptive ImageDrive
- Main Bldg & OR Opening
- Stryker OR Integration
- MGC Diagnostics BreezeSuite
- Brainlab Deployment
- Neuwave ablation
- Z-Scores for Cardiology
- SpaceLabs Sentinel
- Altos Oaks opening
- CTBE Refresh for 2018
- Moberg Citrix Impl.

FY19

Ventilator Integration	Servers 2008 Upgrades
Telesurgery /Stryker	Zoll Defib dashboard 2.0
Laborie Solar GI	Switch IOS Upgrade
CMDB Project	RTLS Integration to Nuvolo
Server Migration to PSR	Quarterly Security Patching
West Bldg PACU_OSC	Perfusion Integration Depl.
F2 292 Maternity – ISP Exp.	Packard 2.5
Synaptive/Solais tissue analyzer	Nonin NIRS integration
PCU350 Maternity	Natus EMG/EEG Implementation
Nuvolo CMMS Deployment	West Building Refresh
Med. Device Risk with SOM	Maternity 374
PCU360 Acute Care Opening	DR Planning
NICU 260 Deployment and Opening	Capital Refresh
EEG Research Impl.	Braincare Deployment
Cadwell EEG (integration with SHC)	BD CareFusion Alaris Upgrade
PCU380 Acute Care	West GI
Alarm Mitigation / VIP	Sunnyvale Power
Philips FocusPoint	CPMC Move
Philips IBE Upgrade	Town and Country move
	Marin Clinic move
	Firewall change
	Uprade El Camino Telemetry
	Nuvolo deployment for Radiology

FY17 chart: Operating Cost $3.6M, Equipment Count 14K, Staff 23, Value Points 32

FY18 chart: Operating Cost $4.9M, Equipment Count 18K, Staff 26, Value Points 151

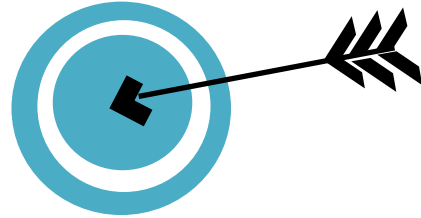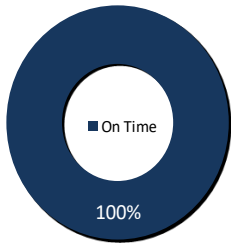FY19 chart: Operating Cost $6.5M, Equipment Count 21K, Staff 32, Value Points 226

QUICK LOOK

1,300
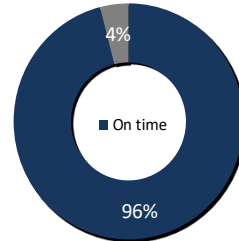Total monthly work orders

EFFICIENCY

All incidents addressed within 15 minutes of call received

PREVENTIVE MAINTENANCE (PM) COMPLETION

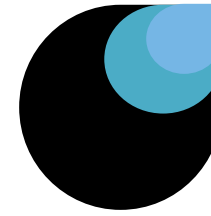100% on-time high risk PM completion

96% on-time non-high risk PM completion

On Time 100%

4%
On time
96%

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WORK ORDER DETAIL
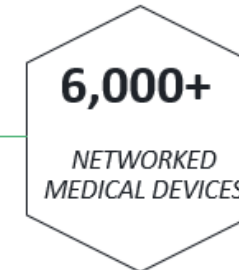
300 monthly incidents
800 preventive maintenance work orders
200 monthly repairs, projects, etc.

REGULATORY

100%
Regulated Environment

THE JOINT COMMISSION

FDA

CENTERS FOR MEDICARE AND MEDICAID (CMS)

DEVICE INVENTORY

20,000+ TOTAL MEDICAL DEVICES

6,000+ NETWORKED MEDICAL DEVICES

40% SEND DATA TO EPIC EMR

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Staffing Models

Some of the older staffing models especially under the operational or productivity category were easier to implement before when equipment was not as intense to support.

e.g. FTE/Inventory size – this staffing model has varied over time. Variations anywhere from 700 devices per FTE to more aggressive counts of about 1300 devices per FTE.

Or FTE/annual repairs – add up the total # of hours for the year and determine how many hours per FTE needed.

Considerations in this model is to keep in mind the complexity of the devices being supported.

Staffing Models

As devices have evolved (become smarter) and require different skills to support the traditional staffing models may not be the best approach.

Today, our teams support not just hardware but the back-end of those devices that produce data (network, application, servers, etc.).

The skillsets of the team has also become more complex.

Staffing Models

Some points to consider:
- Lower risk devices may not require as many hours for annual services but may require higher number hours for ongoing repairs.
- Higher end/higher risk devices may require much more time for annual services but not at many service repair events.

You will need to be very familiar with the mix of medical devices in your inventory to have not just the correct number of staff but the correct expertise to support your HTM program.

Staffing Models

Other considerations.

Your staffing model should account for:

- Devices supported under service agreements. You'll need resources to manage those service visits by the vendor.
- Time needed to support vital function of your department:
    - Ordering parts
    - Managing your CMMS
    - Looking for missing equipment
    - Ongoing cleaning exercises
    - Adverse event investigations
    - Upgrades/recalls

Staffing Models

You presentation to leadership should also include implications of not hiring the resources requested.

e.g.

- Services to clinical areas may not meet the demand
- Potential of falling short of TJC expectations of completing Preventive Maintenance on time.
- Customer service may be impacted

Along with these implications there should also be an alternate solution if the FTE is not approved.

e.g.

- The requested support will be completed by hiring contracted help which can be costly.
- OT may be required to meet the demands which can also increase costs.

Staffing Models

You may showcase several areas to highlight the reason for the requested resources.

Justifications may include:
- Cost reduction/ROI
- New services/New technology
- Inventory Growth
- Business continuity/growth
- Technology expansion
- Expansion of hours of coverage

New Staffing Models

- Staffing Models have evolved over the years for HTM

- You might think that the higher role of HTM professional, the more equipment they can take on. Although the ability to take on more might be true based on tech experience and knowledge, the availability of the techs time would prove otherwise based on the equipment they service or specialize in.

- Now the higher the specialty the fewer devices they should be assigned. The general to no specialty techs have the larger quantity of general equipment.

- Its hard to put a number or limit on staffing models because every tech will be different and every team will have different needs.

Examples of New Staffing Model

- Specialties such as Ventilators, patient monitoring*, High End/Life Support Devices in the OR, Lab, Imaging, etc. require more time and focus for service. Therefore should have fewer devices assigned to them.

- General Biomeds are assigned to vast majority of non specialty devices such as beds, clinic devices, IV pumps, non PM'able devices, etc.

* Patient monitoring is labeled as a specialty because in healthcare today, its more than just the bedside monitors, it's the system as a whole to include networking, cabling, servers (virtual and physical), switches, Telemetry, Access Points, etc. It could take an entire day to track down why patient data is not flowing from the patient to the EMR.

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Work Load Balance and Staffing

- Taking into consideration the different modalities, the techs experience, techs knowledge base, and need of the hospital will help determine staffing models for your shop.

- Staffing models will vary from shop to shop.

- Work load balances look different these days because its more about type of work than just the number of devices spread out amongst each tech.

- DISCLAIMER: just because the tech is a higher level tech, does not mean they cannot be used where needed if they have the time. Flex them where you need them within reason. TEAMWORK!!! Team work and comradery should be a goal for your whole team.

- This also will help you plan out your job descriptions to fit the needs of your team and shop.

Job Descriptions and Requirements

Give basic differences between a BMET 1 through BMET 3, supervisors, managers, Imaging 1-3, Lab 1-3. Other descriptions.
Mobile medical tech, road tech, field services.
Inhouse versus third party versus OEM

BMET I- Example

Skills and Experience

•Complex computer skills including the ability to interpret error codes, defragment hard-drives, replace power supplies, and interpret computer codes required

•Ability to integrate information from a variety of sources

•Excellent interpersonal and customer service skills

•Strong written and verbal communication skills

Education and Qualifications

•Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience.

•3 months experience working with biomedical equipment in a clinical engineering environment preferred

•Valid driver's license required; variable travel requirements depending on primary site that may require use of personal vehicle

BMET II- Example

Skills and Experience

•Complex computer skills including the ability to administrate a system, interpret error codes, defragment hard-drives, replace power supplies, and interpret computer codes required

•Ability to integrate information from a variety of sources

•Excellent interpersonal and customer service skills

•Strong written, verbal, and presentational communication skills

Education and Qualifications

•Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience

•Technical Certification (CBET) strongly preferred

•Minimum 3 years' experience working with biomedical equipment in a clinical engineering environment

•Valid driver's license required; variable travel requirements depending on primary site that may require use of personal vehicle

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BMET III- Example

- **Skills and Experience**
- Complex computer skills required, including the ability to administrate a system, interpret error codes, defragment hard-drives, replace power supplies, interpret computer codes, and apply networking concepts
- Ability to integrate information from a variety of sources
- Excellent interpersonal and customer service skills
- Strong written, verbal, and presentational communication skills
- **Education and Qualifications**
- Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience
- Bachelor's degree in engineering technology preferred
- Technical Certification (CBET) preferred
- Minimum 5 years' experience working with biomedical equipment in a clinical engineering environment
- Valid driver's license required; variable travel requirements depending on primary site that may require use of personal vehicle

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Sr. BMET- Example

- **Skills and Experience**
- Complex computer skills required, including the ability to administrate a system, interpret error codes, defragment hard-drives, replace power supplies, interpret computer codes and apply networking concepts.
- Advanced knowledge of Microsoft Office applications required.
- Ability to integrate information from a variety of sources.
- Ability to lead, mentor, and influence clinical engineering staff.
- Excellent interpersonal and customer service skills.
- Strong written, verbal and presentation communication skills. Possess strong leadership, organizational, and time management skills in effort to make effective decisions.
- **Education and Qualifications**
- Associates degree in a technical/electronics field or equivalent military experience or two year of equivalent experience.
- Technical Certification such as A+, CBET, CRES or CLES preferred.
- Minimum 5 years' experience working with biomedical equipment in a clinical engineering environment.
- Must have CE experience and knowledge and an ability to influence others.

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Supervisor- Example

- **Skills and Experience**
- Minimum 5 years' experience working with biomedical equipment in a clinical engineering environment, with at least 3 years' experience leading/managing in a clinical engineering environment preferred-Advanced knowledge of Microsoft Office applications required
- Ability to manage day-to-day and long-term site operations
- Possess strong leadership, organizational, and time management skills in effort to make effective decisions
- Ability to lead, motivate, and develop others
- Ability to perform basic financial analysis and calculate budgets, revenue and costs
- Occasionally required to bend, crouch, climb or maneuver body to perform equipment and EOC inspections
- Knowledge of state and federal inspection agencies (TJC, CAP, DNV, and other accrediting bodies)
- Strong written, verbal and presentation communication skills
- Ability to integrate information from a variety of sources
- Excellent interpersonal and customer service skills
- Must have the ability to lead others, execute company policies, procedures and strategies; build relationships across one customer base; provide mentoring to Technicians.

Manager-Example

- **Skills and Experience**
- Ability to think and manage strategically
- Ability to manage day-to-day and long-term site operations
- Ability to lead, motivate, and develop others
- Ability to perform financial analysis and calculate budgets, revenue, and costs
- Knowledge of Microsoft Office applications required
- Strong written, verbal, and presentational communication skills
- Rarely required to bend, crouch, climb, balance, or otherwise maneuver body to perform equipment and/or environment of care inspections
- Occasionally required to grab, grasp, or otherwise handle tools to teach and mentor technicians
- Build relationships across a diverse, and multiple customer base
- **Education and Qualifications**
- Bachelor's degree in electronics, engineering or technological field required.
- Technical certification such as A+, CBET, CRES, CLES, or CCE preferred
- Minimum 7 years' experience managing in a clinical engineering environment or direct management experience with proven business acumen and ability to develop others

Imaging Service Engineer I-Example

- **Skills and Experience**

- Complex computer skills including the ability to interpret error codes, defragment hard-drives, replace power supplies, and interpret computer codes required

- Knowledge of Microsoft Office (Excel) and networking applications required

- Ability to integrate information from a variety of sources

- Excellent interpersonal and customer service skills

- Strong written and verbal communication skills

- **Education and Qualifications**

- Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience.

- 6 months experience in the repair, maintenance, troubleshooting, and installation of medical imaging equipment preferred

- Frequently required to reach, pull, and/or employ fine motor skills during the installation, servicing, and maintenance of medical equipment

- Frequently required to bend, crouch, kneel, climb, balance, or otherwise maneuver body while servicing and/or inspecting medical equipment

- Frequently required to operate tools/machinery that use hand and/or foot controls (e.g. drills, saws, electronic test equipment) when servicing medical equipment

- Frequently required to lift, carry, or otherwise move up to 50 lbs while working with medical equipment

- Valid drivers license required; variable travel requirements depending on primary site that may require use of personal vehicle

Imaging Service Engineer II- Example

- **Skills and Experience**

- Associates degree in a technical/electronics field or equivalent military training required

- Minimum 3 years' experience in the repair, maintenance, troubleshooting, and installation of medical imaging equipment

- Frequently required to reach, pull, and/or employ fine motor skills during the installation, servicing, and maintenance of medical equipment

- Frequently required to bend, crouch, kneel, climb, balance, or otherwise maneuver body while servicing and/or inspecting medical equipment

- Frequently required to operate tools/machinery that use hand and/or foot controls (e.g. drills, saws, electronic test equipment, etc.) when servicing medical equipment

- Frequently required to lift, carry, or otherwise move up to 50 lbs while working with medical equipment

- Valid driver's license required; variable travel requirements depending on primary site that may require use of personal vehicle

- **Education and Qualifications**

- Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience.

- Complex computer skills including the ability to interpret error codes, defragment hard-drives, replace power supplies, and interpret computer codes required

- Knowledge of Microsoft Office (Excel) and networking applications required

- Ability to integrate information from a variety of sources

- Excellent interpersonal and customer service skills

- Strong written, verbal, and presentational communication skills

Imaging Service Engineer III- Example

- **Skills and Experience**
- Associates degree in a technical/electronics field or equivalent military training required
- Bachelor's degree in engineering technology preferred
- Minimum 5 years' experience in the repair, maintenance, troubleshooting, and installation of medical imaging equipment
- Frequently required to reach, pull, and/or employ fine motor skills during the installation, servicing, and maintenance of medical equipment
- Frequently required to bend, crouch, kneel, climb, balance, or otherwise maneuver body while servicing and/or inspecting medical equipment
- Frequently required to operate tools/machinery that use hand and/or foot controls (e.g. drills, saws, electronic test equipment, etc.) when servicing medical equipment
- Frequently required to lift, carry, or otherwise move up to 50 lbs while working with medical equipment
- **Education and Qualifications**
- Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience.
- Complex computer skills including the ability to interpret error codes, defragment hard-drives, replace power supplies, and interpret computer codes required.
- Knowledge of Microsoft Office (Excel) and networking applications required.
- Ability to integrate information from a variety of sources.
- Excellent interpersonal and customer service skills.

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Lab Service Technician I- Example

- **Skills and Experience**

- Problem solving skills to diagnose problems and develop solutions

- Strong written and verbal communication skills

- Valid drivers license required; variable travel requirements depending on primary site that may require use of personal vehicle

- **Education and Qualifications**

- Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience.

- Minimum 6 months working with biomedical or laboratory equipment in a hospital or clinical engineering environment.

- Frequently required to reach, pull, and/or employ fine motor skills during the installation, servicing, and maintenance of laboratory equipment.

- Occasionally required to bend, crouch, kneel, climb, balance, or otherwise maneuver body while servicing and/or inspecting stationary laboratory equipment.

- Frequently required to operate tools/machinery that use hand and/or foot controls (drills, saws, electronic test equipment, etc.) when servicing laboratory equipment.

- Frequently required to lift, carry, or otherwise move up to 20 lbs while working with medical equipment.

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Lab Service Technician II- Example

- **Skills and Experience**

- Minimum 2 years' experience working in a clinical laboratory or servicing clinical laboratory equipment

- Experience in working on most low-end clinical laboratory equipment required; some experience working on high-end equipment preferred

- Problem solving skills to diagnose problems and develop solutions

- Strong written and verbal communication skills

- Valid drivers license required; variable travel requirements depending on primary site that may require use of personal vehicle

Education and Qualifications

- Associates degree in a technical/electronics field or equivalent military experience or two year of equivalent experience.

- Bachelor's degree in engineering technology or a related field preferred

Lab Service Technician III- Example

- **Skills and Experience**

- Minimum 5 years experience working in a clinical laboratory or servicing clinical laboratory equipment

- Experience in working on most low-end clinical laboratory equipment required; some experience working on high-end equipment preferred

- Problem solving skills to diagnose problems and develop solutions

- Excellent interpersonal and customer service skills

- Strong written and verbal communication skills

- Valid drivers license required; variable travel requirements depending on primary site that may require use of personal vehicle

- **Education and Qualifications**

- Associates degree in a technical/electronics field or equivalent military experience or two years of equivalent experience.

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TIPS to getting new positions approved!

- Training Options/ Gaps in coverage- Provide justification for the new position and include the current coverage barriers as well as future coverage with training.

- ROI- Return of Investment analysis report.

- Increase in inventory due to hospital buying new clinics or hospitals-based on the size of the inventory coming in, does it justify a new FTE? What is the appropriate inventory for an FTE to cover? What type of department or site is being onboarded.

New Technology Challenges

Talk about new technologies that are challenging to maintain or even manage, such as:

- Device Integration-will the new or current equipment require integration into a hospital network system Ie: RFID tracking, EMR data flow
- Cyber Security- Does the new or current equipment have cyber security requirements or needs. Ie: Windows 7 no longer supported, hospitals require windows 10 or higher for cyber security prevention. Patches available? Firewall?
- Specialty equipment: Robots, Imaging Guiding Systems, specialty equipment that requires specific training to service. Some high-end pieces do not even offer training because its so specific and special.

Flow chart

Also we discussed a flow chart starting with asking the question: Is OEM training offered for these devices? And from there it goes down to inhouse service vs inhouse contract management, which in turn would require more resources based on the size and complexity of the organization.
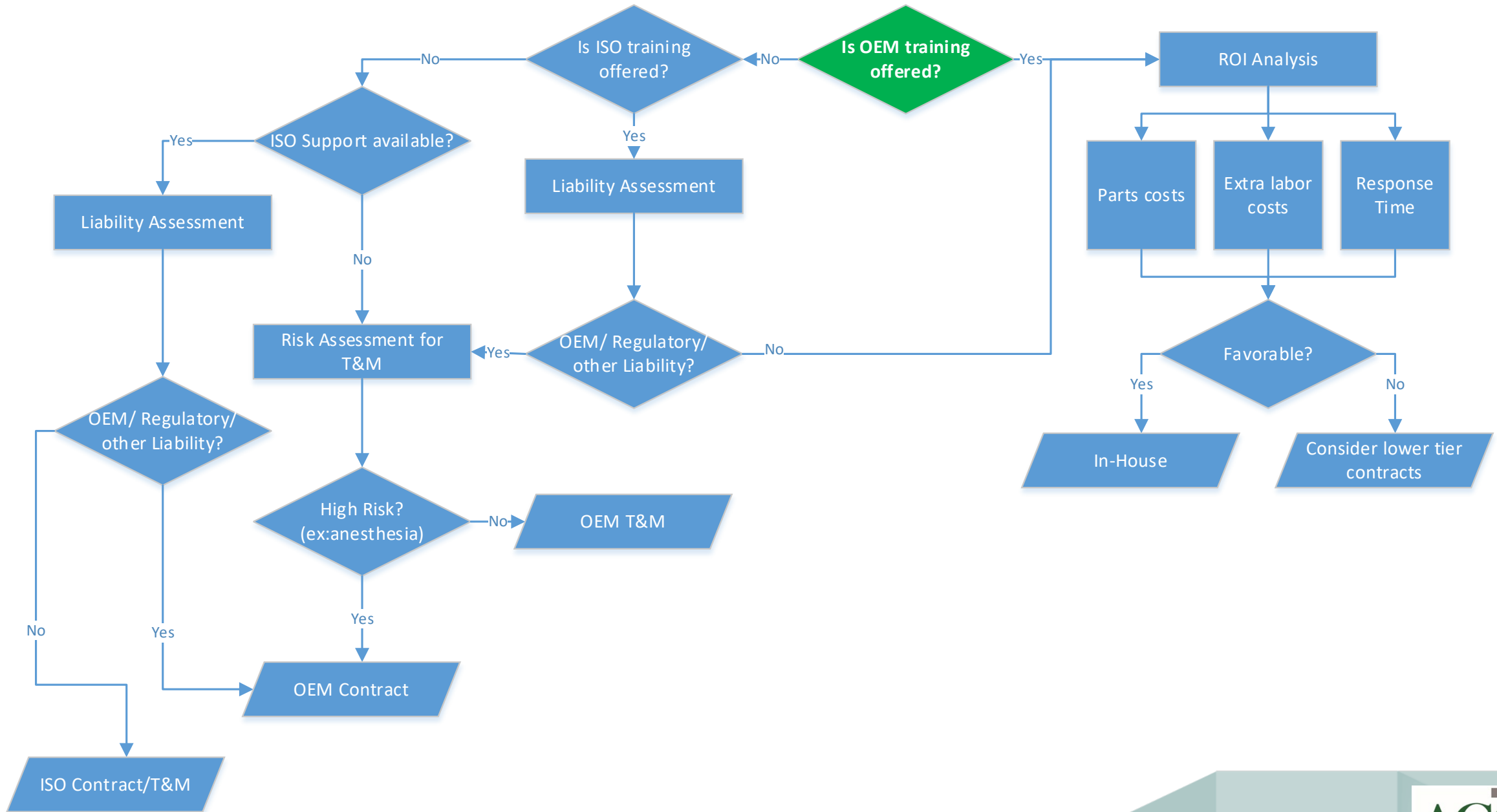
Questions & Discussions

Enter your questions to the Q&A window

Thank You

Please complete the online evaluation form at https://www.surveymonkey.com/r/2023_session7 or scan the QR code

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