Factoring Rapid or Uncertain Technology Change into Procurement Financing Processes in Healthcare

Updated: September 27, 2018

INTRODUCTION

The rate of technology change in IT devices is quite high and has increased dramatically from 2013 to 2018, as has the uncertainty of technology directions. This reality has been a major factor in the adoption of shorter refresh cycles for IT assets, and consequently, in the rise of using residual-value-based finance for its economic advantages.

With medical devices taking on more and more characteristics of IT assets (e.g. faster refresh, network requirements, impact on IT data and storage architectures, and information security requirements), their rate of change and uncertainty of architectural direction are having a similar impact on planning and financing.

It is easy to know whether to buy or to lease an asset when the useful life (UL) is known for sure (i.e. the default for devices with ULs of less than 5 years should be residual-value-based leasing, for the measurable cash savings; those with ULs of more than 5 years would be candidates for a wider range of financing options). With medical technology today, the difficulty is knowing for sure the UL of an incoming device.

This paper will identify the main factors which should be considered in assessing this, using the American Hospital Association's (AHA) publications on estimated useful lives and drawing insights from leading textbooks on medical device management and healthcare finance..

REPLACEMENT CYCLE AND FUNDING METHOD

It is well known that there are cash-out-the-door advantages for using residual-value-based finance for generic assets with replacement life (whether that is considered the useful life or not) of less than 5 years. In fact, in the case of operating leases under the new FASB ASC 842 Leases, the maximum cost to the lessee must be less than 90% of the asset's fair market value (and even discounted beyond that). This means that for short-lived assets there are cash savings to be had in the 8-10% range—from residual value based lease finance.

Ideally, if a finance or sourcing executive could predict the future replacement cycle of an asset which is being sought by some department of the healthcare organization, then they could quickly determine whether to default to leasing (with a clear estimate of the cash savings) or to invoke more traditional lease-versus-buy evaluation methods. This would be the case whether this process was being conducted by internal personnel, an external shared services firm, or a collaborative GPO (global purchasing organization). For devices which were clearly in the faster-refresh category, this could save considerable cash, could reduce process costs, and speed up deployment.

Without some guidelines or indication that a potential asset falls into this faster-refresh category, the procurement process cannot take this short cut and must invest the full resources for a full lease-versus-buy evaluation.

THE CHALLENGE OF PREDICTING REPLACEMENT CYCLES

Help from the American Hospital Association

It is difficult in the extreme to predict medical device futures in the 5-7 year range, so the safest course of action is to base assessment approaches on the most recent past. This uses the traditional forecasting principle that the best predictor of the immediate future is the most recent past.

Since we are attempting to identify trends or patterns upon which to base trajectories and extrapolations, we need at least two fixed points. Fortunately, in the healthcare space such data is available in the publications of the American Hospital Association (AHA) in a series of documents titled "***Estimated Useful Lives of Depreciable Hospital Assets***". [Note 1]

Although replacement or refresh cycles are not always identical to useful lives (they are typically shorter), any relative change within one category would typically be reflective of the other.

Comparing the last two revisions of the documents dated 2013 and 2018, some patterns can be seen and used for developing initial guidelines. [Note: A list of most of the changed items, omitting most building/furniture items, is found in the Appendix to this document.]

Some of the patterns and implications for process design include:

- By far, the greatest number of additions to the list, indicating new technologies that became mainstream between 2018 and 2013, are in the Diagnostic and Treatment section (Table 8). This suggests that rapid change in hospital assets, as opposed to assets used in home health and/or mobile health, is most concentrated in that area.

- Of the new assets added:
    - 4 were assigned ULs of 3 years
    - 18 were assigned ULs of 5 years
    - 7 were assigned ULs of 6-7 ears.
    - None were assigned ULs over 7 years

- As can be seen from Figure 1, the average age of these devices dropped by 30% -- by more than 2 years. The overall age falls neatly into the range where residual-value-based lease finance offers the greatest savings, while providing obsolescence protection.

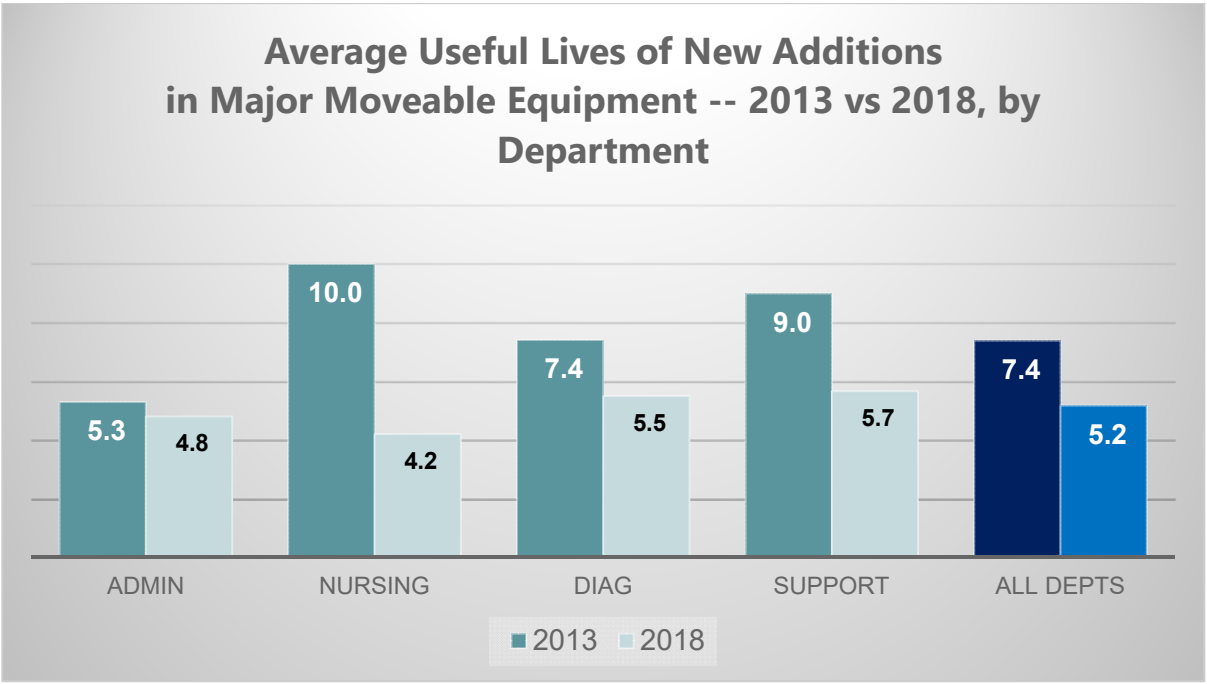

Figure 1. [Note 1]

.

The implications for procurement policy:

- **For a requested asset which is listed in the publication**: Residual-value-based leasing should be considered the default for everything in the 3-5 year category (the economics work best there)

- **For a requested asset which is too new to even have been listed in the publication**. This would indicate that the asset is likely a first-generation device, and the cost-decay curve (due to competition, assuming regulatory environment allows this) will be significantly faster than in the past. This would suggest, based upon similar patterns in ultrasound monitors, for example, that these devices (typically very expensive in the first generation) should be considered as good candidates for leasing. Lease terms should provide for easy extensions, but also for easy 'outs' depending on how fast the second-generation devices (i.e. less expensive, more flexible, with more features) materialize. In some cases, the institution might use a portfolio approach to acquisition: buying some percentage/fraction of the fleet and leasing the rest (for easy replacement if/when desired).

BEYOND THE PRESENT

Technology areas needing additional scrutiny

The AHA publications tip us off that change has occurred in several areas, but they cannot, however, warn us that significant change is impending in any given area. Various devices in many areas are being transformed by inter-connections with mobile devices. The smartphones and tablets of the world are being used as adjuncts and/or additional intelligence for these devices and this will affect the useful life of the base device.

Many of the advanced monitoring devices currently in hospitals will be superseded in the near future by a combination of a less advanced device connected to and controlled by smart mobile devices. This combination will prove to offer better economic value and better results for the practitioners, and financial flexibility via leasing should be built into any near-term acquisition of the stand-alone base-function devices.

These impending changes can only be recognized by close attention to indicators of market changes such as:

- new products and services announcements of vendors
- published results of pilot programs
- early statements released by regulatory bodies
- forecasts by analysts who work in the various disciplines.

MEDICAL EQUIPMENT MANAGEMENT

Rate of change and the importance of refresh

In a standard reference book on the subject "*Medical Equipment Management*", by Willson, Ison, and Tabakov, the authors make the link between rate-of-change and leasing very explicit [Note 2]:

> *"Ultrasound scanners are capital items…continued technological innovation on these machines creates a need for regular turnover where state-of-the-art equipment is required, for example, when scanning for fetal abnormalities. This makes leasing attractive, as a machine can be leased for less than its purchase price and handed back after, say, 5 years."* (page 15)

Rate of innovation alone can create the need for replacement, apart from traditional useful life considerations:

> *"A new ultrasound scanner might be a replacement or be intended for use in a new clinical service or function. Ultrasound is currently evolving quickly, with continuing development of new functions and improvements to image quality and portability. Equipment may be considered functionally inadequate well before it physically deteriorates far enough to require replacement on the grounds of reliability or inability to provide ongoing support."* (page 12)

The authors wisely point out that embedding refresh/ replacement into standard operating procedures can help greatly with the funding challenge:

> *"Competition to obtain funding for new and replacement medical equipment is often intense, and replacement equipment budgets are often underfunded because service need and complexity tend to grow in developing healthcare systems. Funding is less of a problem where depreciation and replacement of equipment forms part of a long-term business plan." (*page 14)

This position marries the flexibility of leasing for high innovation areas with easier funding for regular replacement policies.

EARLY OBSOLESCENCE

Refreshing Before End-of-life

Best practices in medical device management all recognize that technology is advancing much faster than in the past, bringing new opportunities to improve care and enhance organizational vitality. Binseng Wang--in the Synthesis Lectures-- points out that this rapid advance has two important implications for asset management and finance:

1. Devices are being replaced/refreshed long before their 'useful life' is actually reached:

   > *"Due to the rapid introduction of new and better medical technologies and procedures, medical equipment is increasingly being replaced well before it is unsafe or unreliable."* [Note 3, Wang (2012), page 29].

2. Purchasing is not the most cost-effective method of financing, given rapid advances and high TCO (total cost of ownership):

   > *"The traditional method of acquisition through purchasing could not be the most cost-effective method in the following situations, individually or in combination: When the life cycle of technology is very short, so the buyer may end up with obsolete equipment very soon… When the costs of operation and maintenance are much higher than the cost of initial investment…"* [Note 3, Wang (2009), page 35]

This final point brings us full circle back to IT asset management. As noted in the beginning of this paper, medical devices are becoming more and more 'like' IT devices. They are networked, they have learning curves, they have security issues, and they require upgrades and patches.

Fast refresh, as a best practice, is often used in distributed IT assets (e.g. PCs and laptops) as a way to reduce technical support costs as well as to reduce 'hidden costs' which take a toll on end-user productivity.

Wang notes this in Strategic Health Technology [Note 3, Wang (2009) page13), making the IT paradigm explicit:

> *"Hidden/End-User Costs: The most often ignored costs are those related to the users because these costs are in the form of staff time and, therefore, are difficult to quantify. This was first noticed and gained attention in IT with the rapid introduction of personal computers (PCs) into corporations. The Garter Group (http://www.gartner. com) has published numerous studies showing the importance of these costs, which they call 'end-user operations.' Due to the progressive incorporation of microprocessors and computers into medical equipment, clinical users are experiencing similar types of challenges and are spending significant portions of their time in learning and using the equipment, thereby reducing their overall productivity. Typical 'hidden'/end-user costs include: self-learning and peer training, customization of user interface and reports, data management (archiving, recovery, etc.), applications development (e.g., setting up specific sequences of MR imaging), and troubleshooting (attempts in finding problems [sic] before calling for support)."*

When the rate of change is so high, obsolescence risk is material. When the rate of change is so high, the total cost of usage/support (TCO) of older devices both drains user productivity and escalates support costs. The savvy financial manager will take note of this and begin to insist upon shorter retention cycles and flexible financing vehicles, in order to support innovation (via new devices), support cost efficiencies (via newer devices) and risk mitigation (via early return of devices).

Mitigating obsolescence risk is second only to optimizing cash flow, in reasons given for financing being preferred over cash:

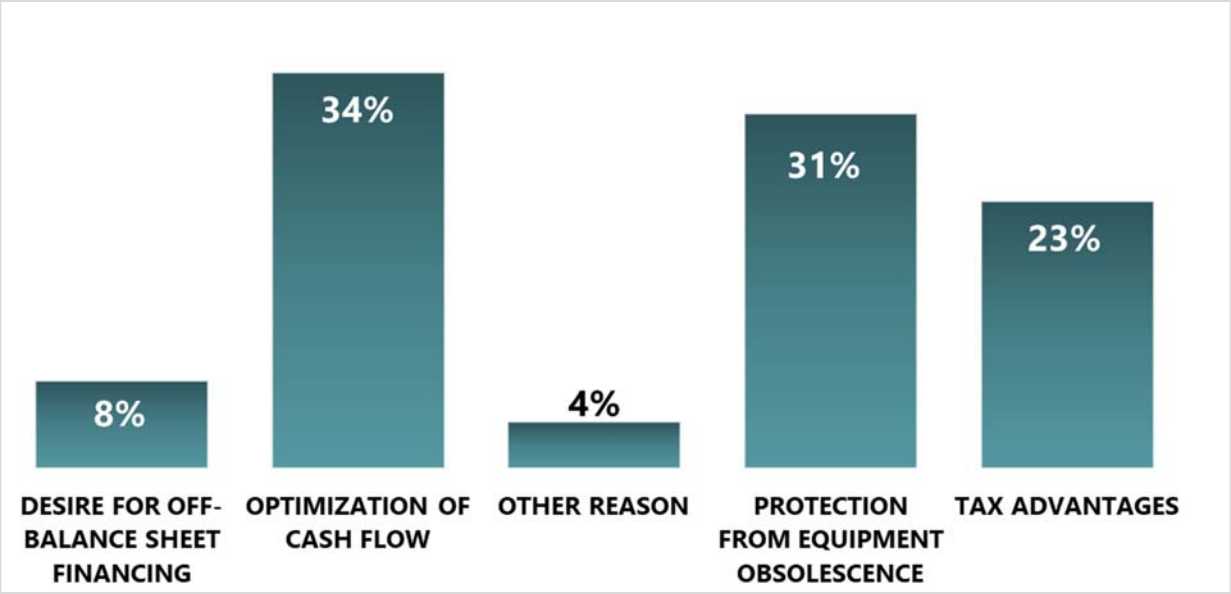

Figure 2: Reasons for Selecting Financing over Cash [Note 4]

FINANCIAL MANAGEMENT IN HEALTHCARE

Help from the textbooks

Financial management in healthcare organizations can be quite complex, especially with the changing revenue models and difficulty of cost control.

Many good resources are available to help financial executives in allocating capital and managing risk, and these resources typically point out the very benefits of lease finance discussed above and also emphasize the necessity to consider operational / TCO costs.

One such resource point out that failure to factor in TCO costs is one of the main breakdowns in analyzing capital proposals:

> *First-class analysis is the backbone of effective capital allocation, especially as it relates to threshold capital initiatives. Common breakdowns in the quantitative analysis of projects include the following: Incompletely quantifying the capital necessary to maintain the proposed investment after initial investment:* ***Examples include insufficiently recapitalizing*** *investments in long-lived facilities and* ***information technology upgrades****.* [Note 5, emphasis mine].

And other gives this snapshot of leasing advantages:

> *Lease decisions have several advantages over purchase decisions and can provide the lessee with more flexibility, more financing options for other equipment, more protection from unexpected events such as changes in technology, and more and better maintenance. In the case of for-profit healthcare organizations, capital leases can provide the same tax advantages as equipment purchases.* [Note 6]

That residual-value-based finance has been recognized as providing cash advantages, increased flexibility, and obsolescence risk protection can be seen in the rapid shift in preferences between Cash and Leasing from 2012 to 2016 in U.S. organizations:

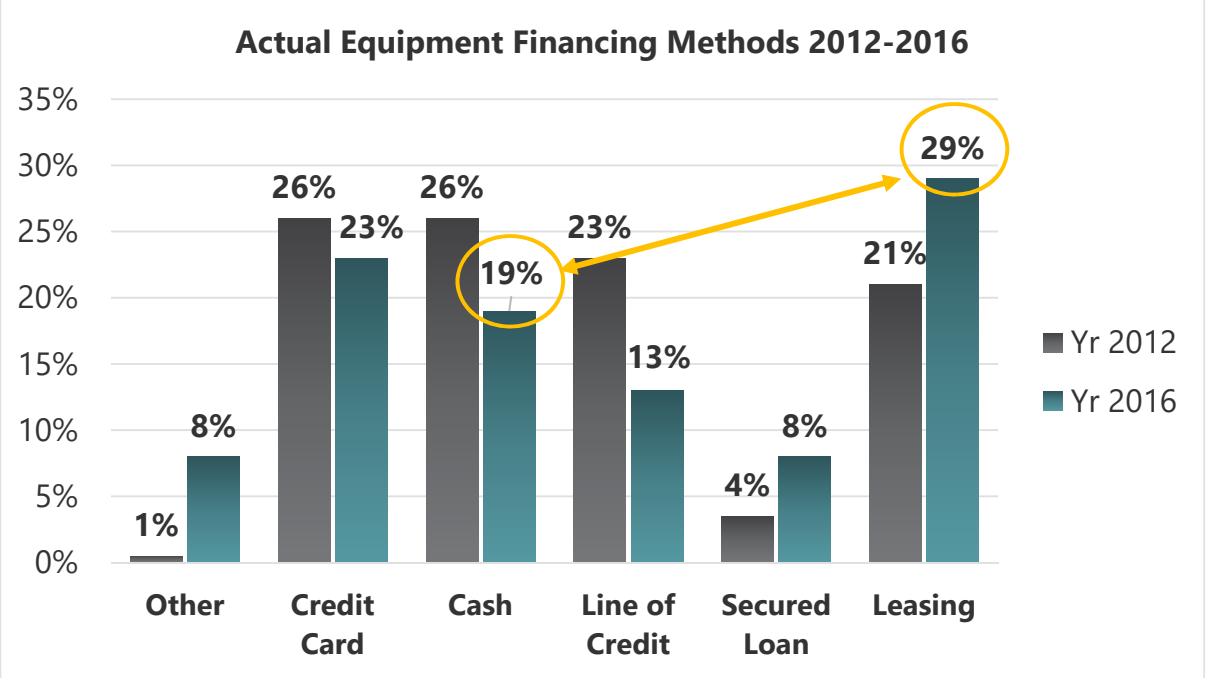

Figure 3. [Note 7]

CONCLUSION

Combining these Approaches

Using a simple taxonomy of healthcare devices, we can list the device classes which are best candidates for treating as either fast-refresh assets or as uncertain-trajectory assets:

Analysis of the AHA changes would suggest devices in these classes:

- Smart devices
- Robots
- Biometrics

Analysis of market changes and vendor directions would suggest devices in these classes:

- 3D-based technologies
- Drone assistive technologies
- Advancing computing systems: Artificial Intelligence, Quantum computing, Augmented reality

At present, there are no obvious patterns in the individual technologies, other than the move to embed more intelligence into every device and to reduce cost through leverage of commodity parts, so we are essentially forced to take a more practical, financial, and consensus approach to assigning useful life estimates. The two overarching principles, however, are essentially the same as are applied to generic IT assets:

- The faster the refresh, the shorter the replacement cycle, and the more the economics favor residual-value-based finance as the default since the organization does not actually pay for the whole thing.
- The greater the uncertainty of when replacement will be needed by the organization, the more risk-management values favor leasing structures to create the flexibility to change/return devices earlier/whenever needed, without adverse impact on the financials.

By embedding these principles into the early stages of a procurement process, financial executives will have a greater chance of realizing cost savings, process efficiencies, and deployment benefits, without any increase in risk or additional management overhead.

Huntington Technology Finance is dedicated to and has established a proven track record of helping healthcare providers stretch their equipment spend further, while maintaining a flexible technology footprint. This has afforded organizations the nimbleness needed to quickly adopt and exploit new medical technologies for better patient outcomes.

As an independent, stand-alone financial services firm, our equipment-neutral position offers great flexibility and our financial strength allows us to offer pricing adapted to client requirements. We look forward to working together with you and your healthcare technology partners in harvesting these benefits in pursuit of your organizational mandates.

LEARN MORE

Contact Huntington Technology Finance at 248.253.9000 or technology-finance@huntington.com

* * * *

Notes:

1. Estimated Useful Lives of Depreciable Hospital Assets, Health Forum Inc./American Hospital Association, 2018; Revised 2013 edition and Revised 2018 edition.]
2. Medical Equipment Management, by Keith Willson, Keith Ison, and Slavik Tabakov, CRC Press/Boca Raton FL: 2014, in the Series in Medical Physics and Biomedical Engineering, Webster, Ritenour, Tabakov, Ng, and Barlow (eds).
3. Medical Equipment Maintenance: Management and Oversight by Binseng Wang (Morgan & Claypool: 2012), and Strategic Health Technology Incorporation by Binseng Wang (Morgan & Claypool: 2009); Lectures #45 and #32, respectively, in the Synthesis Lectures on Biomedical Engineering series, John D. Enderle, series editor.
4. IHS Markit. *U.S. Equipment Finance Market Study: 2016-2017*. Equipment Leasing & Finance Foundation, n.d. Print. Page 30, Figure E.
5. Sussman, Jason H. . Strategic Allocation and Management of Capital in Healthcare: A Guide to Decision Making, Second Edition (ACHE Management Series) (pp. 112-113). Health Administration Press. August 22, 2017. Kindle Edition.
6. Nowicki, Michael. Introduction to the Financial Management of Healthcare Organizations, Fifth Edition (Kindle Locations 5450-5457). Health Administration Press. April 15, 2014. Kindle Edition.
7. IHS Markit. *U.S. Equipment Finance Market Study: 2016-2017*. Equipment Leasing & Finance Foundation, n.d. Print. Page 7, Figure 1B (source given inside Figure: 2012 and 2016 Foundation Borrower Surveys).

APPENDIX:

Useful Life Ages of New Additionss to the 2018 American Hospital Association (AHA) "Estimated Useful Lives of Depreciable Hospital Assets".

	2018 Book	YR 2018 AVGs
Table 6 - Major Movable Equipment, Administrative Departments		
3D Printer	**5**	
Artificial Intelligence	**5**	
Computer Quantum	**5**	
Middleware systems	**6**	
Smart glasses	**3**	
	AVERAGE:	**4.80**
Table 7 - Major Movable Equipment, Nursing Departments		
Electronic underwear preventing bed sores	**3**	
Light: Smart, and other smart textiles for patient monitoring	**3**	
Mattress: Smart, and other smart textiles for patient monitoring	**3**	
Remote patient monitoring system	**7**	
Robots, Assistive Nursing	**5**	
	AVERAGE:	**4.20**
Table 8 - Major Movable Equipment, Diagnostic and Treatment Departments		
3-D breast ultrasound system	**5**	
3-D ultrasonic holography	**5**	
Artificial pancreas device system	**5**	
Augmented/virtual reality system	**5**	
Computer-assisted tomography CT equipment: Spectral CT imaging	**7**	
Digital subtractive angiography (DSA) system	**7**	
Focused Ultrasound (FUS)	**5**	
ICG fluorescence endoscopic imaging system	**7**	
Nanotechnology diagnostic device	**5**	
PET Helmet	**5**	
Photoacoustic imaging	**5**	
Robots: Emotional	**5**	
Robots: Telepresence	**5**	
Table: Operating, integrated with robotic surgery system	**7**	
Vocal biomarkers analysis technology	**5**	
Warm donor organ perfusion systems	**5**	
	AVERAGE:	**5.50**
Table 9 - Major Movable Equipment, Support Departments		
Drones, Ambulance	5	
Drones, building maintenance monitoring	5	
Robots: Disinfection	7	
	AVERAGE:	**5.67**
AVERAGE OF MAJOR MOVABLE ADDITIONS:	**5.17**	