White Paper: Optimisation of Healthcare Estates Through Technology

Service Works Global

Contents

1. Introduction

Healthcare estates account for a major proportion of the world's built environment. While many are leading edge digital facilities, others are faced with the challenges of providing advanced medical care amidst crumbling infrastructure. As one of the world's largest industries (at close to 10 percent of global GDP) healthcare organisations globally are facing rising operating costs due to aging and growing populations, increased focus on care quality and value, and evolving regulations[1]. Built areas of this scale present operational difficulties and the demand for service and value requires action to be taken without reducing essential functionality. However, advances in technology have meant that optimising estates management within the healthcare sector has become more achievable, both in terms of usability, cost and ease of implementation.

In this white paper, Service Works draws on its extensive experience in providing estates management software to the healthcare sector, to explore how technology can be used to help both new and long standing facilities operate more effectively, wherever they are in the world.

[1] https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-2016-health-care-outlook.pdf

There has been a growing drive over the past few years for the adoption of patient-centric care systems. A patient-centred care system has been defined as: "one where patients can move freely along a care pathway without regard to which physician, other health-care provider, institution or community resource they need at that moment in time. The system is one that considers the individual needs of patients and treats them with respect and dignity"[2].

This differs from a more traditional approach where a patient is required to adapt to the healthcare system they find themselves in and to navigate through its many intersections[3].

Patient-centred care has been identified as an important issue by organisations around the world, including the World Health Organization (WHO)[4], the Organization for Economic Co-operation and Development (OECD)[5], the National Health Service in Britain[6], the National Health and Hospitals Reform Commission in Australia[7], and the American Agency for Healthcare Research and Quality (AHRQ) in the United States[8].

One of the mainstays of delivering patient-centric care is the establishment of a partnership between practitioners and patients to ensure all decisions respect a patient's wants, needs and preferences. This requires a change of mindset among health professionals in taking a less authoritative approach and adopting a more informative, empathic partnership relationship.

As part of this process, medical institutions are increasingly keen to utilise the latest technologies to help ensure they access all the available data on a patient in order to help personalise their care. But the technologies being implemented can go a lot further in helping to streamline core clinical and non-clinical service delivery.

Computerised Maintenance Management System (CMMS) software has been adopted in hospitals across the world to manage maintenance and operations of healthcare estates, to ensure that, for example, work requests such as scheduled, reactive and planned maintenance repairs take place in a timely and economical manner.

Integrating CMMS software with other hospital systems can further improve efficiencies and deliver long-term cost savings. Whereas disparate systems can result in time-consuming reporting, with a lack of centralised data posing a significant risk of error; a best-in-breed, integrated software solution ensures that tasks are fully automated and actions across the organisation more easily prioritised.

The new Royal Adelaide Hospital (nRAH) has notably integrated 26 systems in order to drive efficiency, including patient administration, nurse call and an AGV (Automated Guided Vehicle) management system. Further details of this can be found in the case study overleaf, or request our white paper, Integrating CMMS with Other Organisational Systems, by emailing info@swg.com.

[2] Ontario Medical Association definition
[3] www.oma.org/Resources/Documents/Patient-CentredCare,2010.pdf
[4] http://www.who.int/servicedeliverysafety/areas/people-centred-care/en/
[5] https://www.oecd.org/sti/ieconomy/from-quantified-self-to-population-health.pdf
[6] British Department of Health. NHS 2010-2015: From good to great: Preventative, people-centred, productive
[7] Commonwealth of Australia, National Health and Hospitals Reform Commission. A healthier future for all Australians
[8] Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services. National healthcare quality report 2009

3. System Integration - Case Study

The new Royal Adelaide Hospital (nRAH) in South Australia[9] will be the largest, busiest and most technologically advanced hospital in Australia with 800 single in-patient rooms, including 100 same-day beds and 80,000 same-day and overnight patient admissions per year. Australian service provider, Spotless, will deliver a total of 14 facilities management services once the hospital is operational, including critical support services - delivered around the clock by more than 500 full-time equivalent Spotless staff.

QFM software from Service Works will be used to record and manage all FM service requests; providing real-time, detailed management reporting. The CMMS software will control a host of day-to-day activities including:

- Help desk management and service requests
- Reactive maintenance management
- Asset management
- Service management and service schedules

QFM will also be integrated into other systems at the hospital to provide a much more comprehensive service for patients. These include Automated Guided Vehicle (AGV) software, Building Management Systems (BMS), Nurse Call and Patient Management software, the benefits of which are explored overleaf.

Further to this, nRAH plans to further streamline the operational management of the facility by looking into dynamic displays to provide event information and way finding, and room AV systems to allow for swift room bookings.

[9] http://www.swg.com/wp-content/uploads/2016/03/Case-Study-nRAH.pdf

4. Benefits of Integration

There are a wide range of benefits for healthcare estates in adopting an integrated software solution, ranging from a much more streamlined approach to patient management to ensuring that medical equipment is maintained to specific standards.

Some of the main benefits of integrating CMMS with other healthcare applications are outlined below:

Integration with Patient Management Systems and Automated Guided Vehicle (AGV) Systems

Integration of CMMS software with operational / patient management systems can dramatically improve the quality of service to patients. For example, when a patient is discharged, a whole series of jobs can be automatically created to manage the process. This could incorporate requesting a porter for the required time to transport the patient from the room; requesting fresh linen delivery; scheduling the correct level of clean for the room based on the patient's treatment (i.e. a level two clean to a deeper level four clean); generating a request for a ward nurse to check the room; and creating a job for the housekeeper to prepare the room for the next patient.

This process can be further streamlined by integrating with an AGV system. A request for clean bedding can be made via the AGV, and once delivered the housekeeper is automatically notified to prepare the room. This seemingly straightforward process can vastly improve the efficiency of the housekeeper, in that they are not wasting time either waiting for or collecting linen, and of course the bed is ready for re-use much faster and a higher percentage of beds are made available.

Meal Management

A meal management system can also run in conjunction with an AGV, as well as the patient management system. Meals can be ordered by the patient through a bedside terminal then the meals are transported in trolleys, via the AVG system, to the required rooms / floors for distribution by PSSA (Patient Support Service Assistants). Integration with CMMS software ensures that the correct meals are delivered to the correct patient, at the correct time – reducing waste and improving the patient's hospital experience.

Inventory Management System (IMS)

The IMS can manage stock levels of medicines and linens within the hospital environment to achieve an optimum balance between the amount of storage space required and the frequency of deliveries. Hospitals can integrate this with their selected CMMS, in order to streamline the management of planned and reactive maintenance activities, which will require parts to be ordered and supplied by the IMS.

5. QR Codes to Improve Maintenance

6. Self-Service

QR codes can be used to create a secure and automated approach to managing maintenance requests within a facility. For example, if a member of the maintenance team needs to raise a reactive job, they can log it within seconds by scanning a QR code with their smartphone. These codes are printed labels placed on assets or used as location markers, and once scanned, this information can be used to pre-populate much of the job information to make the whole process quick and accurate.

QR codes have become more popular than barcodes in estates management. Whereas barcode information could be read by non-authorised parties, QR codes are completely secure. They also hold more information than a barcode, in a smaller amount of space. An engineer can also scan a code for further data about the asset in question, allowing them to access live data which therefore increases the efficiency and accuracy of job completion.

Taking this a stage further, there is the option for hospitals to afford this facility to members of the public so that visitors can log maintenance faults themselves.

Hospitals are increasingly using self-service functionality to help automate facilities management processes. For example, if a visitor notices a spillage in a waiting area they no longer need to find a member of staff but can instead access a designated public computer or kiosk in order to log the spillage. They don't have to log in or even be familiar with their location in order to describe where the problem is located – as the kiosk can be equipped with a simple interface, displaying a pre-populated list of services, which automatically adds the kiosk's location to the job request.

This feature is also an easy way for members of the public to report lost property, which is then managed within the system. Colour coding can be used to identify how long the lost property has been with the hospital, and can manage details of those who have reported lost possessions that have not yet been handed in, ready to be flagged when a match is found.

By providing simple screens in busy areas, issues like spillages, broken equipment and exhausted supplies are more likely to be reported and can be easily addressed by the hospital. A user can even complete a satisfaction survey, report a complaint or make a request. This type of functionality allows the hospital to be informed of visitors' issues quickly and openly, stripping out a lot of activity which was previously run by a service department, reducing costs and likelihood of user error and increasing the efficiency of FM services.

The creation of large-scale hospital estates enables healthcare providers to consolidate specialty care, clinical, research and teaching programmes into single sites[10]. For example, the McGill University Health Centre (MUHC) in Montreal, Canada, is a 'super' hospital founded through the merger of five Montreal hospitals and is one of the largest and most modern in North America[11]. This $2.26 (C$2.3) billion development was financed via a PPP contract producing a hospital that covers over 3 million square feet (28 hectares), with 40,000 in-patients annually and over 17,000 doctors, nurses and research staff. The hospital opened on schedule in April 2015 and received an ambulance on average every three minutes with patient transfers.

Providing mobile communications to a healthcare establishment with such a massive footprint is a major consideration when managing facilities and porterage can be vastly improved in this type of instance with the use of customisable checklists. This means that when a porter receives a job, a checklist shows what is needed to start the task; for example, it could require a certain type of wheelchair or perhaps two people for lifting. By providing this additional, easy to read information, the porter is more informed and it significantly reduces the instances whereby the porter turns up unprepared and time is wasted making a return visit.

Some healthcare establishments are currently trialling a specific mobile device for porters which comprises an Android-based smartphone with the addition of an integral two way radio, to further aid communication.

Medical Equipment Asset Management

As well as enhancing the level of service delivery, CMMS software can help Clinical Engineering or Medical Equipment Maintenance teams support a wide range of medical equipment, such as ventilators, X-ray machines and CT scanners. In addition to ensuring that medical equipment is maintained to specific standards during the required hours, CMMS software can help manage the entire life of the equipment - from initial purchase, maintenance and performance, through to asset depreciation and disposal.

This can enable the creation of comprehensive PPM (Planned Preventative Maintenance) routines and automatically schedule planned maintenance activity. The provision of comprehensive reporting capabilities also enables the accurate monitoring of medical equipment, helping ensure contractual KPIs are adhered to and regulatory standards are met.

Buildings Fabric Maintenance

Building Management Systems (BMS) used within healthcare facilities can also be linked to CMMS software. The BMS can diagnose a maintenance and service requirement and anticipate the condition of a piece of equipment or components based on utilisation and age; the software can also predict impending equipment failure by monitoring asset data. By providing an interface between the CMMS application and BMS system, jobs can be automatically raised and contractors or in-house operatives instantly notified when an alarm is raised via the BMS. Predicting a forthcoming fault reduces the number of failures and therefore increases service delivery. This allows considerable cost savings to be made by ensuring that preventative maintenance is only performed when necessary.

[10] www.hfmmagazine.com/articles/1850?dcrPath=/templatedata/ HF_common/NewsArticle/data/HFM/Magazine/2016/jan/cover-large-scale-medical-facility-design

[11] http://globalnews.ca/video/1963025/montrealers-have-new-super-hospital-muhc-move-to-glen-site-is-complete

9. Safety and Compliance

When it comes to safety compliance, healthcare facilities throughout the world are expected to demonstrate excellence in governance[12]. Adopting integrated software systems within a healthcare facility can help ensure that safety standards are maintained at the highest possible level. For example, the temperature of a cold store may be set not to rise above -12°C. This would usually be monitored by a BMS tool or as part of the freezer controls, which will normally trigger an email if there a problem. This then has to be picked up by a help desk which in turn generates a job.

By utilising integrated software, rather than the request alerting someone who has to manually raise a work order, the CMMS automatically generates a maintenance job, specifying the timescale for attendance by the designated in-house operative or outsourced contractor. The software creates a full audit trail, detailing the times the job was created, started and completed, to fully support legal and regulatory compliance.

This kind of technology is not only possible in a brand new state-of-the-art healthcare facility, but can be fitted to existing estates. The Royal Hospital for Neuro-disability[13] in London, UK, is by no means brand new – it was founded in 1854, expanded in 1868 and between 1901 and 1985 three of the five wings were added to the original building, which now spans nearly five hectares. After trialling and developing bespoke software technology solutions in selected hospital wards, a new software system was installed across the whole estate in just six months. Now the efficient logging of tasks and reduced failure rates achieved through the use of integrated software fully supports its enhanced health and safety performance.

[12] www.hsa.ie/eng/Your_Industry/Healthcare_Sector/Managing_ Safety_and_Health_in_Healthcare/
[13] www.swg.com/wp-content/uploads/2015/10/Case-Study-Royal-Hospital-for-Neuro-disability.pdf

Because most healthcare facilities require extremely high compliance standards in maintenance, service delivery and cleaning, FM contracts are expected to meet rigorous Service Level Agreements (SLA) and Key Performance Indicators (KPI). In one Canadian hospital where 20% of the new hospital's patient rooms were specialist infection control rooms, exacting standards had to be met. To help meet the demands, a totally paperless system was introduced with iPads running the software.

Housekeepers' uniforms were modified so that a mobile device could fit in their pockets and iPads attached to maintenance trolleys which enabled devices to become the operators' main communication method.

This both improved the overall performance of the contract and also enabled the facilities team to provide comprehensive data to help prove that performance levels were being maintained.

In addition, by consolidating all of the software into one system, covering all of the soft services (catering, cleaning, porterage), as well as all of the hard maintenance services including medical equipment, estates assets, space management and compliance, the healthcare facility could ensure total consistency in how they operate and how they report. Therefore, with one supplier relationship to manage, one help desk number to call, one contract to negotiate, and one purchasing process to negotiate, significant cost savings could be achieved.

10. Space Planning and Management

In February 2016 a review of England's National Health Service (NHS) hospitals (the Lord Carter Report)[14] found unwarranted variation in running costs, sickness absence, infection rates and prices paid for supplies and services. The review concluded that British hospitals must standardise procedures, be more transparent and work more closely with neighbouring NHS trusts. It was advised that by implementing the recommendations, it would help end variations in quality of care and finances that cost the NHS billions.

As well as reviewing hospitals across England, Lord Carter's review looked at healthcare systems in other countries, including in the US, Germany, Australia, Italy and France where hospitals have a greater focus on efficiency because they have established the clear link they have with patient care.

One of the key findings of the review was the widely divergent use of floor space within hospitals, where one trust uses 12% for non-clinical purposes, yet another uses as much as 69%. The utilisation of space was marked as a challenge for estates teams, with a target of just 2.5% unoccupied or under-used space by 2020.

The review also recommended improving the data added to the Estates Returns Information Collection (ERIC)[15] which collects information relating to the costs of providing, maintaining and servicing the NHS estate. In future, the review stated the need for in-depth information relating to service costs, utilised floor space, hard and soft maintenance costs and details of incidents reported.

To help fulfill this ambition, CMMS and estates management software can provide an easy, accurate method of reporting, notably in terms of space within a healthcare site, including the location of staff, assets and equipment. It allows the forecast of future space requirements and the creation of multiple 'what if' scenarios to help planning and decision making.

For example, taking a plan of a hospital building the software can determine where on each floor there are areas designated for clinical, administrative or visitor amenities and can also record which department each area belongs to and other key factors which are important for monitoring, such as its condition. By compiling all of this data, a report can be produced which shows the amount of space allocated to each department and function. This can then be measured against how many patients a particular department handles per month and whether space is being allocated correctly.

Using this kind of software, not only the UK's NHS hospitals and trusts, but hospitals across the globe could use more accurate information to uncover and rectify inefficiencies to increase productivity and reduce costs.

[14] www.gov.uk/government/publications/productivity-in-nhs-hospitals
[15] http://hefs.hscic.gov.uk/ERiC.asp
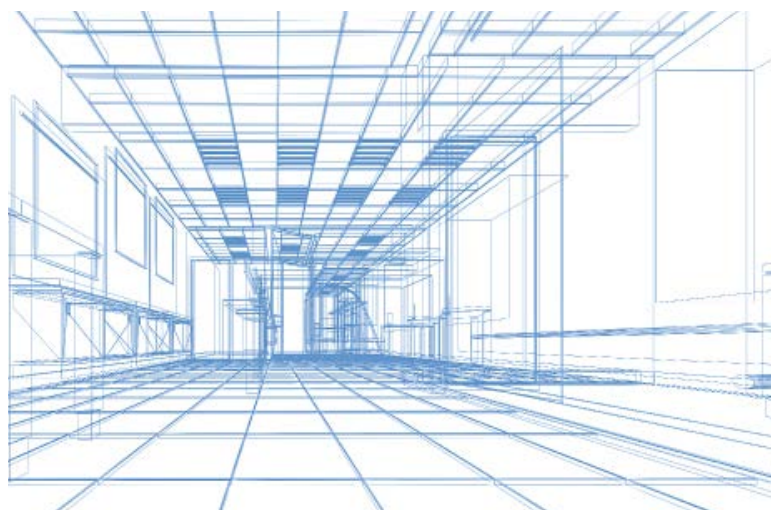
11. Future of Technology in Healthcare Estates

As the Carter Review confirmed, there are still wide disparities throughout many healthcare estates, with, for example, the average running costs for a hospital varying from $177 per square metre at one trust to as high as $1640 per square metre at another[16].

Yet while most healthcare providers would welcome the benefits of building brand new facilities, offering them the opportunity to have a clean slate to work from, it is possible for much of the digital technology being installed at brand new hospital complexes to be applied to existing estates.

Existing hospitals with limited resources often take a phased approach, initially implementing a CMMS tool to handle reactive maintenance, then adding functionality to manage planned maintenance, enhance soft services, cleaning or catering and perhaps adopting a self-service system at a later date.

As elements, such as self-service, patient-centric devices, patient access and mobile apps all begin to become intertwined, the role of leading-edge technology in enhancing the performance of healthcare facilities around the world will only get stronger.

The healthcare industry has always been changing, but what is different today is that the pace of change has sped up and health providers across the globe understand how the surge in consumerism, patient expectation, immense technological innovation and rapidly evolving legislation is reshaping the healthcare value chain.

Today's data is delivering new intelligence, perspectives and analysis on trends affecting all corners of the new patient-centric health economy. Now is the time to unlock the opportunity to take healthcare workplace productivity to the next level.

[16] www.gov.uk/government/publications/productivity-in-nhs-hospitals

12. Contact Us
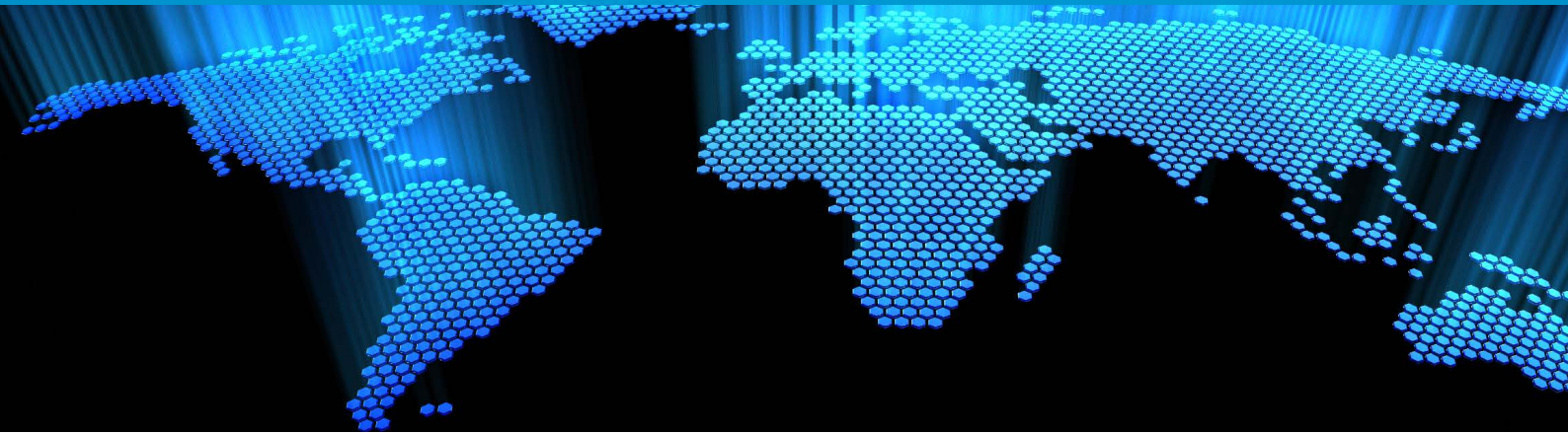
Australia & Asia Pacific:

Service Works Global Pty Ltd.
Suite 2.12
365 Little Collins Street
Melbourne VIC 3000

T: +61 03 8676 0380

Service Works Global is a global supplier of integrated estates, property and space management software. Its extensive experience within the healthcare estates environment has been proven to improve service standards and availability, track and manage assets and equipment, reduce operational costs and ensure compliance with statutory cleanliness and safety.

With offices also in: Sydney, **Australia;** Toronto, **Canada;** Kuwait City, **Kuwait;** London; **United Kingdom**

www.swg.com   info@swg.com