



Trading as Trans Data Communications

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Health Sector Capability Overview

Sonar Health Sector Capability

1. Overview

The following provides an overview of the solutions that Sonar Technology currently has available to it which are relevant to a major hospital operation, such as Jurong Health Service.

While Sonar has other health related applications in its product portfolio these are aimed at small end clinical management, an area Jurong is already well catered for.

2. General Capability

In reading the following product overviews it should be noted that all Sonar solutions incorporate the following features:

- They can be directly interfaced to any other existing corporate system such as Oracle Financials or SAP. Alternatively data can be moved between systems in real time via file transfers.
- They have inbuilt high level user and data security.
- They have a separate Data Mart and reporting layer that utilizes Crystal Report with the ability for users to tailor their own reports.
- They are scalable from less than ten to in excess of concurrent 3,000 users and can manage many thousands of simultaneous transactions.
- The core technology is C# and .Net.
- They are client server based, either centrally located or distributed with the ability to provide web user interfaces for low security, simple processes.
- They utilize a Microsoft SQL Enterprise Server RDBMS which is double byte enabling any language clients.
- Sonar Technologies has development teams and integration partners in Australia, India, Singapore, Jakarta and the Middle East and a very experienced mobile team of business analysts and system design specialists.
- All solutions are built around a common 'core' and are modular and fully customizable to suit each customer's specific requirements.
- Sonar's approach with new customers is to seek to partner with them in undertaking a suitable POC in order to firm their full set of requirements prior to a full rollout of the solution. In this way customers achieve the best result and ROI from the final system.

3. Sonar Health - Specific Capability

3.1 Sonar Consumables Management

1.3.1. General

Sonar's consumable and asset management solutions are designed to provide either a total end to end or partial solution directly linked to an existing warehouse package.

Our strength is providing our customers with the ability to track and trace and report on any item, irrespective of type or size throughout its entire life cycle and make its current location or status available in real time to end users.

1.3.2. Delivery to the Warehouse

When linked to suppliers, items can be fixed with barcodes or RFID tags, either at the pallet, carton or individual level at the time of manufacture or on order. Delivery manifests are then passed to the warehouse along with delivery dates/times, making delivery acceptance checking much simpler and cheaper as the information is already available in the Sonar database.

On arrival at the warehouse pallet or carton checking can be either managed electronically at the unloading point if RFID is employed via wide range readers or via hand held barcode readers and access points. The delivery can therefore be quickly checked against the delivery manifest already held in the database and any discrepancies discovered and resolved.

The delivery manifests and their current status are also available to other hospital users, such as accounts, either via the Sonar system or through the real time update of other systems in use by the specific department.

1.3.3. In the Warehouse

If an existing warehouse management system is not already in place Sonar can provide a total best practice warehouse management system.

We can also provide a partial solution linked to the existing system to enable the real time visual location and tracking of pallets, individual cartons and even items throughout the warehouse environment. By utilizing RFID locators and readers throughout the warehouse linked to RFID pallet tags the location of every pallet within the warehouse is instantly available and visible on a 'Warehouse Map'.

When a pallet is moved from one location to another the new location, either a rack or on the warehouse floor, the new location is assigned in the database in real time. If the current warehouse application enables it the new location can also be passed to it.

If RFID tags are fitted to cartons and/or high value items these can be tracked in exactly the same way when a pallet is split.

The solution can also work with barcodes, however while much cheaper the process is a manual one and prone to user errors. It is often economically more feasible however to use barcodes for individual cartons and/or individual items.

Sonar can also provide mobile warehouse management workstations, including monitor and printer for use within the warehouse, including in narrow aisles. These enable staff to work without having to constantly return to a fixed terminal to print barcodes, record movements, picking and packing, delivery dockets and so on thus saving valuable time and minimizing user errors.

1.3.4. Delivery to End Users

Deliveries to the consumer (Ward, OT, etc) can be tracked from their time of ordering, packing, leaving the warehouse, in transit and delivery. When linked to a PDA, delivery progress and if required signature capture, can be made at any point and is visible in real time.

If an internal automated delivery system is utilized, such as conveyer, progress is tracked via strategically placed RFID readers and wireless access points.

This means that end users can track progress from their own workstation without having to constantly refer to warehouse staff. It also means the warehouse can better manage its delivery resources and improve processes and forecast future requirements based on accumulated history.

1.3.5. Usage

The Sonar system can manage inventory usage, either automatically or via manual recording, providing the hospital management with full visibility of total inventory and usage throughout the hospital.

Depending on the level and type of recording – carton, box or item and barcode or RFID the system can automatically reduce the inventory as items are used. Alternatively staff can manually record usage. Individual item usage can also be recorded against specific patients or processes.

For replaceable items, such as sheets and towels these can be tracked into and out of the ward and throughout the complete laundry process enabling a replacement policy to be implemented based on usage (See Sonar Laundry System).

Through the use of spot inventory audits an accurate map of current inventories and overall usage over time can be maintained.

Of particular importance is the ability to better manage perishable inventory items and the location of Batch #'s as the system will record all 'use by dates' and 'batch #'s' embedded in the relevant barcode or tag, or manually entered on delivery. This enables the hospital administration to implement a policy of timely relocation of perishable items. In the case of inventory provided by suppliers on consignment a similar process can be implemented by them if they are provided access to their inventory via a secure portal.

1.3.6. Stock Control and Re-ordering

By accurately knowing the total inventory and its location at any time efficient stock control and reordering processes can be put in place.

In many instances large disparately located organizations, such as a hospital complex hold excessive stock and place inefficient numbers of small orders because of a lack of immediate visibility of total inventory and thus ability to move items from one area to another.

Given the normal non visible view by end users of stock levels and arrival of new stock into the warehouse they also have a natural inclination to order excessive amounts and to stockpile inventory by overstating usage. Sonar's system is designed to ensure this cannot easily occur as the total inventory is visible at all times.

1.3.7. Stocktaking

Once the Sonar system is set up, stocktaking becomes a simple process. A complete inventory, including location, of every item is always available in the system. This enables spot checks to be undertaken as and when required by the hospital administrators and auditors. End of year stocktaking is also much simpler and faster to complete and provides a far more accurate result.

1.3.8. Forecasting

By maintaining an accurate record of the organization's total inventory, even if the warehouse is managing more than one hospital, forecasting becomes a simpler and more accurate process. This can provide additional purchasing power with suppliers as well as better overall budgetary management.

4.1 Sonar Asset Management

1.4.1. Locating

Sonar has a unique asset management solution called 'Visual Assets', which provides its customers with total visibility of all its fixed and mobile assets.

Assets can either be uniquely identified by RFID or barcode or identified as a group of assets (chairs for instance) and placed on a visual electronic location plan.

The plan is available at both base end workstation and PDA and any asset can be manually or electronically repositioned by a user, for instance when a bed is moved from one room to another. Once moved the new location becomes immediately visible to all users.

If assets are fitted with RFID tags and the hospital has a mesh wireless network in place or RFID readers are strategically placed in areas where asset tracking is important the exact position of each asset is immediately visible. This makes locating the closest piece of equipment required in an emergency much faster than manually searching or calling multiple areas seeking its last known location.

1.4.2. Usage

When linked to the Sonar Asset Maintenance system a complete usage history of every asset is maintained, from its time of purchase and entry into the database to its eventual disposal (or loss). This makes forecasting and budgeting a more accurate process and ensures assets are utilized to their maximum extent possible.

1.4.3. Stocktaking

Stocktaking is a relatively simple exercise as the location of all assets is known by the system, making spot audits possible and quickly identifying lost items. Where items are not RFID tagged staff has a requirement to scan the new location into the system or manually enter it.

In cases where equipment is likely to be stolen or removed from the hospital readers placed at entrances can set an alarm if an item is taken out. The process works in a similar way to a department store.

5.1 Sonar Orderly Management

Sonar has a complete Orderly Management system designed to provide the most efficient utilization and management of orderly staff throughout the entire hospital complex. For maximum efficiency the solution utilizes RFID smart cards and PDA devices.

1.5.1. Resource Management

Generally, the names and relevant contact details of the orderly staff are passed to Sonar from the hospitals existing HR database. The system can however maintain all the information if required.

1.5.2. Rosters

Maintaining efficient rosters is often a major problem and can be time consuming for administration staff. Sonar's system enables rosters to be developed based on a person's hours of work, start time, skill set, security level and other relevant criteria. Rosters can be amended as required via a simple drag and drop mechanism.

Employees can be contacted automatically by SMS (or email) to advise roster changes, emergency callouts and so on.

The roster can also be visible throughout the hospital so key staff can be involved in roster management and advising of special requirements.

Staff can view their rosters via a console in their staff or operations room and if a PDA is utilized on the device.

1.5.3. Time Sheets

Staff members electronically sign in and out via an RFID smart card and entry reader that also can serve as their identification tag for use throughout the hospital.

Strategically placed readers will also enable operational management staff to locate each orderly throughout the hospital environment.

If a PDA is utilized staff can easily record their rest breaks and other start stop times that are relevant to their employment and remuneration.

Time sheets can be viewed in the system, printed and exported to the relevant HR or Payroll system as required.

1.5.4. Job Requests and Job Dispatching

The system is visible throughout the hospital and end users are able to quickly request a job with a few simple commands.

New jobs immediately appear on the operational manager's console and can be allocated to an available person via drag and drop and sent in real time to the persons PDA. The dispatcher can also reorder jobs according to priority. The PDA alerts the Orderly of the new job and a message is sent to the end users console advising them of the planned time for the orderly to arrive. The orderly can accept the job or request it be given to another orderly if their current job is taking longer than expected and similarly the end user can send a message to the operational manager requesting the job priority be increased.

Job progress status is visible to operational staff and if required end users, including start, stages and completion. If required a signature can be obtained or location barcode swiped for proof of service.

A great strength of the system is the ability to manage the entire orderly complement without their having to return to base in order to get their next job. By knowing the location of each orderly within the hospital complex jobs can be allocated to the closest available person, avoiding unnecessary travel and maximizing staff utilization. More jobs can therefore be completed with less staff and other hospital staff requiring orderlies to assist them, get a better service while also saving time in making and following up requests.

1.5.5. Forecasting and Budgeting

By maintaining a record of all jobs and staff utilization administrators can better forecast and optimize staff and budget utilization.

Cost can also be attributed to the specific departments using the service.

6.1 Sonar Laundry Management

1.6.1. Stocktaking

Sonar Laundry Management system can either run stand alone or an integrated component of the Inventory Management system.

When linked to inventory management a complete inventory of all items that are laundered, such as gowns, uniforms, sheets, towels, walkway mats and so on is held in the system.

1.6.2. Tracking

When special RFID laundry tags are fitted each specific article can be tracked, including its laundering history.

In the case of uniforms that are allocated to specific staff it is possible to maintain a register of uniforms and their location in a 'uniform rack', making it possible to quickly locate a person's uniform.

With the inclusion of strategically placed readers in the laundry and use of mobile readers, items can be tracked both within the laundry, in transit and at the end user site.

By utilizing a Sonar RFID Cabinet items can be individually traced and a full history maintained, otherwise the history is maintained at the laundry level, including item counts from specific locations through the use of identification tags on laundry bags or bins.

1.6.3. Forecasting and Budgeting

By automatically counting the number of times an item has been through the laundry (or repaired if this facility is in place in the laundry) a full usage history can be maintained, making usage forecasting and budgeting a more accurate and easier process.

1.6.4. OH&S Management

Sonar is also able to track laundry from operating theatres and identify theatres that have been responsible for depositing surgical devices and materials, such as scalpels, needles, sponges and body parts in laundry which impose a real threat to laundry staff.

To achieve this, the bags or bins holding the laundry articles are tagged and recorded against specific OT's. When opened onto the laundry conveyer and items are discovered the bag or bin tag is recorded and an automatic report sent to the hospital administration. OT staff can then be counseled on the need for more care when disrobing and OH&S regulations are maintained to the satisfaction of unions concerned.

7.1 Sonar Operating Theatre Management

1.7.1. Instrument/Device Tracking

Sonar can track most surgical instruments, even small items such as clamps and scalpels via a special barcode technology it utilizes or RFID tag. Instruments to be utilized in an operation can be quickly recorded via a console or mobile reader and checked out again at the conclusion of the operation.

Surgical devices, such as stents and prostheses can be similarly tracked and recorded against patient records.

Sonar also provides special RFID cabinets that can either be open or lockable and accessed via a smart card for the holding of high value packaged items such as stents. As an item is removed from the cabinet it is immediately recorded as used, if replaced it is added back into the hospitals inventory.

1.7.2. Consumable Tracking

The system is able to track high value or security required consumables, such as drugs, using the Sonar RFID cabinet and/or simple barcode technology.

1.7.3. Use-By Date Alerting

One benefit of the OT System is its ability to alert administration staff when devices and consumables are nearing their use by date. This enables items to be moved to other OT's or areas where they can be used prior to the end of life date.

By linking the Sonar OT system to the Sonar Inventory Management system any item that is past its use by date will set an alert when scanned in the OT.

8.1 Sonar Patient Tracking

1.8.1. Locating/Tracking

Sonar's patient tracking solution incorporates the use of an active RW/RFID tag and strategically placed readers or wireless mesh network. Depending upon the accuracy required, the system can show the location of a patient to within one meter (a baby for instance) or within a room or ward.

The system can also work outdoors for use in tracking Alzheimer patients for instance and can alert users if the patient moves within a designated area such as a gateway.

Tags are reusable and can last up to 10 years, so while the initial investment can be significant the cost over time is low.

1.8.2. Electronic Record

By utilizing the same tag a patient's details and even key information on their treatment or illness can be recorded on the tag and accessed via a mobile or fixed reader, thus avoiding unnecessary paper records and making identification in an emergency faster. Tags can be updated as required from a mobile console linked to the main patient management system.

9.1 Sonar Patient Transport

1.9.1. Scheduling and Dispatch

The patient transport system works in a similar way to Sonar's Orderly Management system. When a patient is to be transported to another hospital or location and requires a transport vehicle the end user will place a job request on the system. Often this is linked to the hospital's patient administration system and the job request comes via this system.

However it originates the job will appear on the Patient Transport Operational Manager's console. The manager will then be able to allocate the job to an available vehicle and schedule it according to priority. When GPS security and tracking devices are fitted to the vehicles the operator will be able to see the location of every vehicle as well as the current status of their current job. This in turn ensures the most efficient utilization of all resources is achieved.

The end users (often there will be several) will be alerted so the patient can be discharged, prepared for travel and moved to the pickup point to meet the advised schedule.

The driver will receive the job on their PDA and respond accordingly.

If the time changes because of vehicle or patient delay the job can be amended accordingly and all relevant users can be alerted to the change.

The solution enables a much better utilization of both resources and staff and saves considerable communications time and frustration in arranging and managing patient transport. The system also ensures patients are not unnecessarily waiting for long periods at pick up points.

1.9.2. Resource Management

By making the system visible to relevant users throughout the hospital system all resources can be better managed, including drivers, vehicles, administration staff and even nurses and orderlies.

The system manages the transport resources (drivers and vehicles) in exactly the same way as the Orderly Management System. This includes management of rosters, time sheets and with the addition of the vehicle management system the vehicles themselves.

If the hospital's patient transport is managed by a third party operator it can be a requirement that it utilizes the Sonar Patient Transport system. By taking this approach the savings and efficiency improvements will still be achieved by the hospital as well as the third party provider.

1.9.3. POD

By utilizing a PDA the driver can also provide the real time status of each job and if required capture a signature from the person receiving the patient at destination. This in turn saves unnecessary paperwork and provides a more secure record of all patient transfers.

10.1 Sonar Ambulatory Management

1.10.1. Pre-admission recording

When linked to the ambulance service and on board PDA the patient's details, including medical details can be sent to the hospital emergency admissions center for pre-processing. This enables much faster processing and emergency treatment of patients and ambulance turnaround, the latter being one of the major problems most ambulance services complain of.

Sonar's system can also manage the entire ambulance and emergency service, including calls, dispatching, navigation, communications and resource management. Details can be provided if in scope.

11.1 Sonar Asset Maintenance

Sonar's Trans-Service solution enables the scheduling and management of regular maintenance or ad-hoc job against any number of assets by any number of people.

1.11.1. Scheduling and Dispatch

Assets requiring maintenance, including location, maintenance history, frequency and next maintenance date are held in the system or passed to it from the current assets register.

The system will automatically generate maintenance jobs in advance and can automatically schedule them to staff based on skill sets, availability and priority.

Ad-hoc jobs can be entered into the system and immediately become visible to the maintenance supervisor staff.

All jobs are visible on a dispatch screen and can be manually or automatically allocated to maintenance staff.

In most cases a PDA is utilized by each staff member or at the supervisory level. Jobs are sent to the PDA, along with details of the asset, maintenance history and current job tasks. If required, a schematic and/or technical manual of the asset can also be available on the PDT. If a PDA is not available job sheets can be printed and passed to staff members.

If Sonar's Visual Assets module is in place the exact location of each asset can be plotted on a map or area diagram and viewable on both the PDA and administrator workstation.

1.11.2. Resourcing

As with all Sonar solutions the system will manage the maintenance resources available, including rosters, start times, time off, unavailable periods, time sheets and vehicle allocation if required. Initial data can be passed to Sonar from the existing HR system and time sheet data and other necessary information recorded passed back to the HR or FM system.

1.11.3. Job Recording

When a PDA is utilized operational staff can see the progress of each job in real time and a full job history including start, finish time, work completed, materials used and so on is available on the system.

If assets are fitted with an RFID tag or barcode this can be automatically recorded to certify job completion and identify specific asset.

1.11.4. Forecasting and Budgeting

By capturing a full job history administration staff can easily calculate the real cost of its assets, identify problem assets and better forecast and budget for asset acquisition and replacement.
