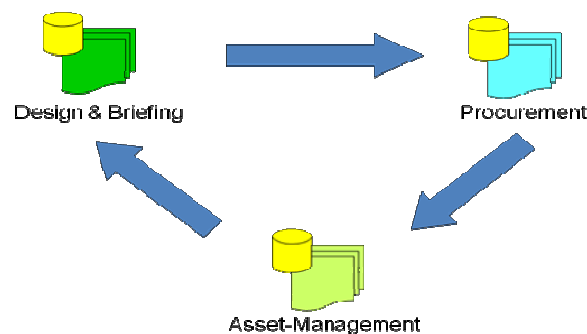


## Integra E-Quip: Meeting the Hospital Equipping Challenge

### Process Life-Cycle

Hospital equipping; the transition from design to commissioning, is a journey from a generic requirement to a specific solution, and possibly beyond. The designer specifies a general requirement, such as “Patient Monitoring”, and eventually a specific monitor is purchased, with a uniquely identifiable serial number. Once purchased the monitor must then be commissioned and maintained throughout its lifetime.



Each of these processes informs, and is in turn informed by, the others. The design specifies what is needed and thus informs the procurement process. Asset-management tools tell you what you already have, and so also inform procurement (since the difference between what you have and what you need is what you must purchase). Procurement in turn informs asset-management so that purchased items can be commissioned and maintained. The entire process is extremely dynamic, and small changes in one area often have far-reaching consequences in others.

Broadly speaking, any project will involve at least the following functions:

- **Design:** Specifying generic requirements.
- **Equipping:** Choosing specific solutions to meet those requirements.
- **Purchasing:** Ordering the equipment chosen by the equippers.
- **Asset-Management:** Commissioning new equipment, decommissioning transferred equipment, and the on-going maintenance of the assets.

These functions do not occur in isolation, and nor do they happen sequentially. They are often performed by separate teams, each using their own software tools. The challenge for the project team is to manage the entire process so that everything specified by the designers is in the right place, properly commissioned and ready for use, by the right date

## The Key Challenges for the Project Team

- **Process Management**
  - What should we do next?
  - What have we done so far?
  - How are we doing?
    - Are we on time?
    - Are we on budget?
- **Data Management**
  - How do we present the whole team with a consistent view of the data when none of their software tools can communicate with each other?
  - How can we make one user's changes immediately visible to everyone else?
  - How can we control multi-user access to the same data?
- **Communication**
  - How do Purchasing know when to raise a purchase order?
  - How does everybody else know that the order has been raised?
  - When things change how do we make everyone aware of those changes?
  - How do Estates, Medical Physics or EBME know what manpower resources they will need to commission or decommission equipment, and when those resources will be needed?

The “traditional” approach for project teams is to use a combination of spreadsheets, Windows documents and e-mail to attempt to control this process.

- Equipment lists are copied to one or more spreadsheets, with numerous columns added to keep track of progress, transferred assets, responsibility matrices etc.
- Tenders, specifications and quotations are kept as Microsoft Office documents (and possibly scans of paper documents) in Windows folders.
- Requisition forms, either paper or on-line, are used to request purchase orders.
- E-Mail is used to “glue” the whole thing together.

Microsoft Excel is a powerful tool, but it was never designed to be the cornerstone of the hospital equipping process. Consultants spend vast numbers of hours transcribing design outputs, room data sheets and even architects' drawings, into spreadsheets. These are then routinely e-mailed around the team, copied and modified, acting not only as a communication medium, but also as a data repository. So many revisions of the spreadsheets are created that the problem of reconciling the differences becomes almost impossible.

The Windows file system is also a very powerful tool, but it is not a searchable database. You may be able to tell from a Windows folder name that it contains the collection of documents which together form a tender (the cover letter, the terms of the tender, the contract terms, the technical specifications etc), but that is about all you can tell. Even if you open and read the documents you will have no way of knowing which equipment list items the tender relates to, how many associated quotations you have received, orders you have issued etc. Finding the information you need becomes practically impossible.

As a communication mechanism, E-Mail is hard to beat, but it is no more a searchable database than Excel or Windows folders. You can, for example, e-mail Purchasing and ask them to confirm that a purchase order has been raised after you have issued a requisition, and they can e-mail this confirmation,

but there is no link between these e-mails and the spreadsheets which are “managing” the process, and nor can your e-mails be easily searched by everyone in the team.

**E-Quip** is the first software tool designed specifically to rise to the procurement challenge, and to integrate the design, equipping, purchasing and asset-management processes.

## One Item, Several Names, Several Prices, Several Quantities

Throughout the transition from generic to specific, the same item may be given many different names, and the quantities and prices of items can also vary. Each phase tends to use its own nomenclature for equipment, making it difficult to reconcile this information. Activity DataBase or CodeBook component and room codes are unlikely to be meaningful to staff in the Clinical Engineering Department who are responsible for commissioning new assets.

Suppose that a designer specifies a requirement for:

Qty	Equipment Code	Description	Unit Cost
2	MON053	Monitor, multi-parameter with gas monitoring	£15,000

You might order the following:

Qty	Equipment Code	Description	Unit Cost
1	M8010A	Philips IntelliVue MP90 Monitor	£18,900
1	M8007A	Philips IntelliVue MP70 Monitor	£10,600
2	M3001A	Multi-measurement server	£3,500
2	M1026A	Anaesthetic gas module	£11,000
2	M1041A	Satellite 8-slot module rack	£35
2	M6004	14" touch-screen monitor	£1,200
<b>10</b>			

Note that a 1-line requirement has become a 6-line order, and that the equipment codes and descriptions are different to those specified by the designer. The number of order lines will also vary from supplier-to-supplier. Philips Medical Systems, for example, include the 4 commonest monitoring parameters (ECG, SPO<sub>2</sub>, respiration and blood pressure) in a single module, while Dräger might supply this as 4 separate modules.

The Clinical Engineering Department, EBME or Medical Physics are unlikely to record details of racking and monitor screens on their database, since they would normally only record details of items which they maintain. In addition, they will almost certainly use different model codes and descriptions to the designers and purchasers.

In the sample asset-management inventory records shown below, notice that in general, asset-management systems have no concept of “quantity”; a patient monitor is a single patient monitor, uniquely identified by a serial number. The initial requirement for “2 × Patient Monitor” becomes two (or more) individual inventory records.

Serial No	Model Code	Model Description	Purchase Price
DE54015906	MP90	Patient Monitor	£18,900
SBOCL01234	MP70	Patient Monitor	£10,600
SAOCL13529	MMS	Monitor module	£3,500
SAOCL22521	MMS	Monitor module	£3,500
SAOCL21124	GAS	Gas Box	£4,380
SAOCL56284	GAS	Gas Box	£4,380

We can see that throughout the process both the codes, names, quantities and prices of items are changing to reflect the different requirements of the teams.

## E-Quip - Rising to the Challenge

**E-Quip** is a project-management tool designed specifically to move equipping away from Excel and into a database, where information can be easily searched and updated, and shared throughout the project team in a controlled way.

**E-Quip** is designed to supplement your existing tools, not to replace them.

**E-Quip** contains everything you need to manage the transition from lists of generic equipment requirements through to the purchase (or transfer) and commissioning of tangible assets.

**E-Quip** acts as a central repository for all of the data that everybody in the project team needs access to.

**E-Quip** makes sense of your Windows documents. By linking documents to database objects such as tenders, quotations, orders, product brochures etc, you can search for documents in ways not possible with the Windows file system.

**E-Quip** manages nomenclature reconciliation so that the appropriate names are used at each stage of the process.

**E-Quip** puts the equipment list (we call it the Equipment BOQ, or Bill-of-Quantities) at the heart of the process. Everything in **E-Quip** links back to one or more BOQ entries.

The BOQ
The list of equipment requirements, optionally on a department-by-department, room-by-room basis. May be imported from a design system, or from spreadsheets. A project may have several BOQ's
Each BOQ entry starts as a generic requirement, and eventually becomes specific. The BOQ tracks this transition as tenders & requisitions/orders are issued, and as deliveries are made. Eventually each BOQ entry becomes one or more tangible assets
A BOQ entry can track changes in price, from the initial budget costs, general cost estimates & product list-prices, through to the actual purchase price
BOQ entries can be linked to transferred assets
Drives & simplifies the procurement process – orders/requisitions can be raised directly from within the BOQ
Monitors the procurement process – gives an easy view of what has been done so far, and what remains to be done
Acts as a communication medium for the project team. As soon as a change is made, all users can see it immediately
Once equipment has been purchased the BOQ can be exported to asset-management systems. (For Philips Optim CEM it can actually create inventory records and schedule commissioning & decommissioning work)
If the design changes the BOQ can be updated, and will automatically highlight all changes so that appropriate action can be taken
Equipment responsibility matrix changes can be easily updated

## E-Quip Product Features

### Easy-to-use, easy-to-learn

- Combines the intuitive look-and-feel of the Windows Explorer for navigation, with in-grid editing and filtering based on Microsoft Excel. Powerful capabilities such as Bulk Update, Auto-Order creation, Auto-Asset creation & drag-and-drop simplify complex tasks.

### Data Management:

- Gets your valuable data out of spreadsheets and Windows files, into a secure, searchable database, but still gives you the ease of access of Excel.
- Puts all of your support data where it can be searched and accessed in a controlled way
  - Supplier Lists
  - Product & Price Lists
  - Specifications

### Extensive Data Import:

- **BOQ:** Equipment lists can be imported from practically any design system, including Activity DataBase & CodeBook.
- **Transferred Assets:** Transferred equipment lists can be imported from almost any asset-management system.

- **Supplier & Products:** These can be imported from spreadsheets.

### Equipping Functions

- Manage the name, quantity and price changes as items progress from generic to specific.
- “Individualise” BOQ entries
  - Convert “12 x Suction Controller” into 12 entries each with a quantity of 1.
- “Split” BOQ entries
  - Convert “1 x X-Ray System” into multiple entries, each retaining the link to the original:
    - 1 x Generator
    - 1 x Collimator
    - 1 x Tube Holder
    - 1 x Table
    - 1 x Console

### Process-Management Functions

- Take control of the procurement process by linking BOQ entries to key project dates and product lead-times.
- Track progress by monitoring BOQ entry status.

### Purchasing Functions

- Issue tenders.
- Evaluate and record tender responses, or quotations.
- Raise orders or requisitions.
  - A single tender can give rise to multiple orders.
  - Manage order payment dates
- Manage deliveries, or Goods Received Notices.
  - A single order may be delivered in several batches, each to different locations.

### Asset-Management Functions















- Automatically create assets from the BOQ.
- Import transferred assets and link them to BOQ entries.
- Manage asset pools for bulk items that you do not wish to manage individually, such as waste bins, chairs, power outlets etc.
- Manage manpower resources to give adequate advance warning of commissioning and decommissioning work.
- Pass the results of procurement on to the asset-management phase
  - Export lists of new devices
  - Automatically update Philips Optim CEM asset-management system:
    - Create new inventory records.
    - Create commissioning jobs for new assets.
    - Create decommissioning jobs for transferred items.

### Document -Management Functions

- Make sense of your documents by linking them to BOQ entries and other records
- Turn your Windows file system into a searchable database

## E-Quip Data Model

The table below lists the most important screens within **E-Quip**.

E-Quip Object Model		
<b>Design-level</b>		
INPUT DATA	 Briefed Equipment	Coded equipment descriptions, normally imported from a design system, such as Activity DataBase
	 Rooms	
	 Departments	
	 Equipment List, or BOQ	Room-by-room, department-by-department or project-wide list of equipment requirements. Importing a BOQ will also import all of the associated departments, rooms and equipment
<b>Procurement Level</b>		
EQUIPPING DATA	 Tenders	An invitation to one or more suppliers to provide goods or services. Tenders will normally be associated one or more equipment specifications.
	 Quotations	A response from a supplier to a tender. These are manufacturer-specific, and will refer to particular models of equipment
	 Orders/Requisitions	An order for the goods referred to in a quotation
	 Deliveries	A GRN (Goods Received Note) for items received as a result of an order
	 Asset Pools	Used for bulk items where BOQ items are not linked to individual assets. E.g. beds, power outlets
CORE DATA	 Generic Equipment Specifications	Specification of the functional or other requirements of an item of equipment. Used in conjunction with tenders
	 Models	Manufacturer-specific equipment items. Contains pricing and lead-time information
	 Suppliers	Companies from whom equipment can be purchased
	 Equipment Categories	Generic descriptions of different types of equipment
<b>Asset-Management Level</b>		
OUTPUT DATA	 Assets	A tangible, individual item of procured equipment. These are the output of the procurement process, and can be used to update asset-management systems. information

## Benefits

The **E-Quip** application is powerful, easy-to-use and easy-to-learn. It is based on the Windows XP© Explorer and Microsoft Excel, both familiar to most computer users.

E-Quip provides an environment where:
No need to merge complex spreadsheets which have been amended by multiple users.
All information is available to everyone in the project team, and can be easily searched. A fine granularity of control allows you to specify what information groups of users can see and modify. The procurement process is <b>efficiently managed</b> .
<b>Everything</b> that is needed is actually ordered, at the appropriate time.
<b>Nothing</b> is ordered more than once!
<b>Everything</b> that is ordered is actually delivered.
<b>Everything</b> that is delivered is commissioned.
Those responsible for commissioning are made aware in good time of the resources that they will need, and when they will need them.
There is <b>no need to re-enter data</b> , which brings a risk of introducing errors. The data that you import from the design phase is used by the procurement phase, and then passed on to the asset-management phase.
Core data (supplier lists, model pricing, equipment specifications etc) is maintained centrally, with access control and full audit facilities.
With its easy-to-use powerful search and reporting capabilities <b>E-Quip</b> gives <b>at-a-glance monitoring</b> of the status of any part of the project.
Import and Export facilities allow you to <b>leverage your existing data</b> .
<b>Cost comparisons</b> between budget, projected and actual prices are simple.

## Licensing

**E-Quip** is supplied on an annual licence basis, in units of 1-5 users, 1-10 users, or an unlimited number of users. The licence is for concurrent users. i.e. **E-Quip** may be installed on any number of computers, but only the licensed number of users may access the software at any one time.

The licence fee includes:

1. 1 day initial on-site installation and user training
2. Telephone and e-mail support
3. Software patches and updates as available

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