Clinical Engineering & ICT outsourcing services for better procurement and management in healthcare

Ing. Diego Bravar

Chairman & CEO

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TBS Group profile

- TBS Group founded in 1980’s as the result of an Italian Research Council project
- Legal status: Incorporated Company
- About 2,300 personnel in the Group
- Active in 18 countries through over 20 subsidiaries, 46 regional operational centres and over 327 hospital workshops.
- Activities: outsourced management services of medical devices and ICT systems and supplies, integrated solutions of e-Health & e-Government (medical IT and IT solutions for Public Administration)
- Target market: healthcare structures - public and private; public administration
- Listed on AIM Stock Exchange Market since December 2009

A new business model in the clinical engineering & ICT outsourcing integrated services

TBS Group's vision:

operate in a way to curb technology costs by providing integrated management solutions to improve the quality of healthcare services supplied to citizens and to influence in a positive way their healthcare needs

TBS Group's mission:

develop outsourced integrated clinical engineering and e-Health services and products in order to ensure that the use of technology in hospitals, social healthcare institutions and homes is safe, effective and efficient. To this end, "technology" means biomedical equipment and other medical devices, medical IT systems and solutions, telecare and telemedicine systems and solutions

Group History and Strategy

	Key Milestones	Strategic Rationale
Beginning	Established in **1987** as a spin-off of a research project of the Italian research Council (CNR)	TBS Group founded after identifying low level of efficiency in the medical technologies management in Italian hospitals, compared to a US benchmark.
Leadership in Italy	TBS grows as **undisputed leader in Italy** as CE outsourcing market rapidly develops, due to financial constraints and favorable regulatory environment (DRG system, a pay for performance hospital reimbursement scheme)	Following the adoption of cost containment measures and incentives in Public Hospitals, TBS grows fast. CE **outsourcing services is quickly acknowledged**, as Italian hospitals historically had weak internal technical teams.
Move into *e-Health*	Move **into *e-Health*** through strategic acquisitions (Telecare and Clinical IT)	Vision of one market for medical technology through **convergence between medical equipment, medical IT and telehealthcare** systems and solutions.
European Leadership and Asia expansion	Acquisition of European Clinical Services activities of **GE in 2004** (Uk, Spain, France, Germany, Belgium, Portugal). Followeb by other acquisitions in Netherlands, Spain, Germany and Italy. Acquisition of **Insiel Mercato in Italy**, MNE Tech (now TBS India) in India, JV's in China and acquisition of Agile's branches and REM in Italy	Leverage Italian experience and know-how in other key European countries. Entry in Middle East and Asia: become the only global player in outsourcing medical technology services to exploit economies of scale. Create barriers to entry and competitive advantage by quick geographical expansion.

Significant competitive advantages

Know How

- Technological know-how, gained in over 20 years of activity in 17 countries.
- IT platform for the management of services and the sharing of know how (more than 900,000 biomedical equipment, 150,000 ICT systems and 40,000 telecare and telemedicine systems under management).
- Piattaforma Phi Technology sia per lo sviluppo di nuovi prodotti di informatica socio sanitaria, sia per lo sviluppo di nuovi servizi di System Integration per la gestione in outsourcing delle soluzioni integrate di informatica medica degli ospedali
- Highly-qualified employees (more than 2,300) and ability to attract new talent.
- Long standing collaboration with universities and research centres (teaching and R&D).

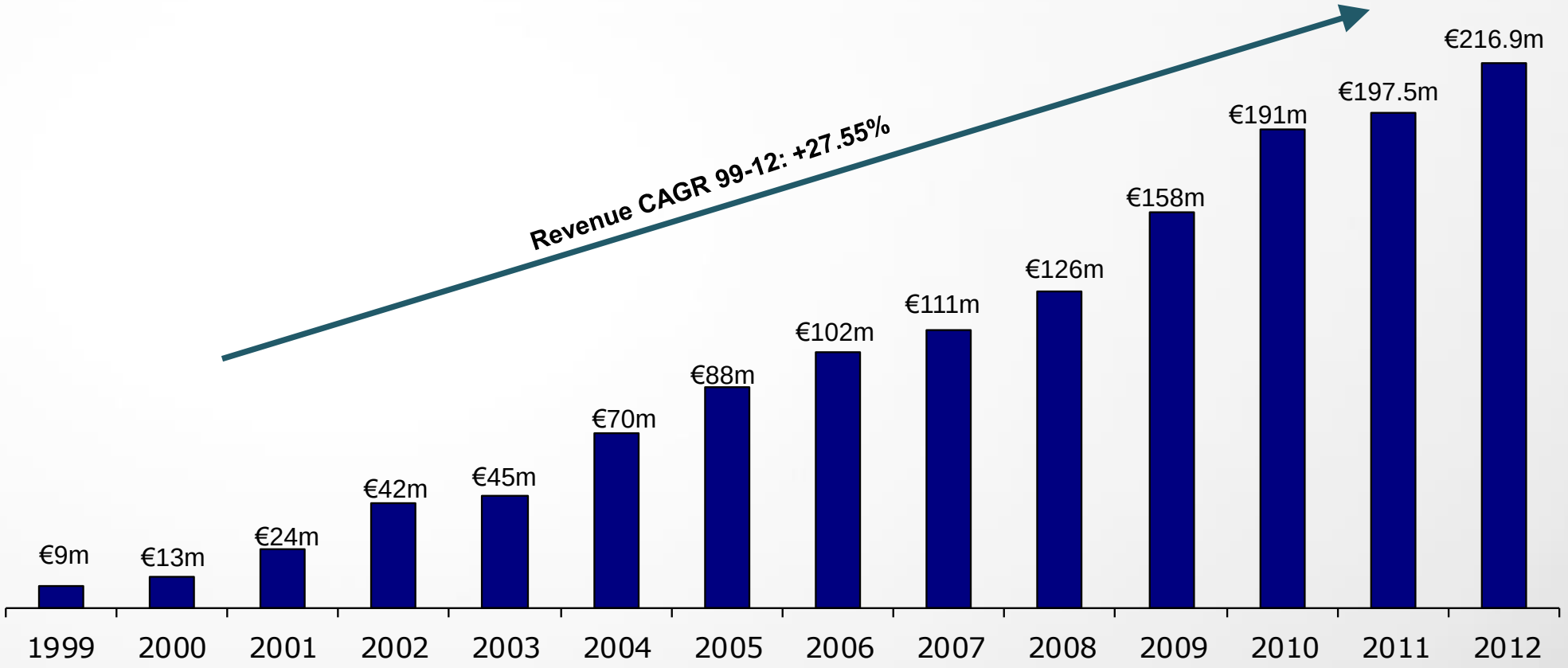
Competitive Positioning

- Very innovative business model.
- Large bids need strong references and track record.
- Integrated outsourced service portfolio, in medical technology and ICT systems.
- Presence in all main European countries plus India and China.
- Provider for more than 1,000 hospitals / healthcare providers and more than 200 other public and private institutions.

Organization

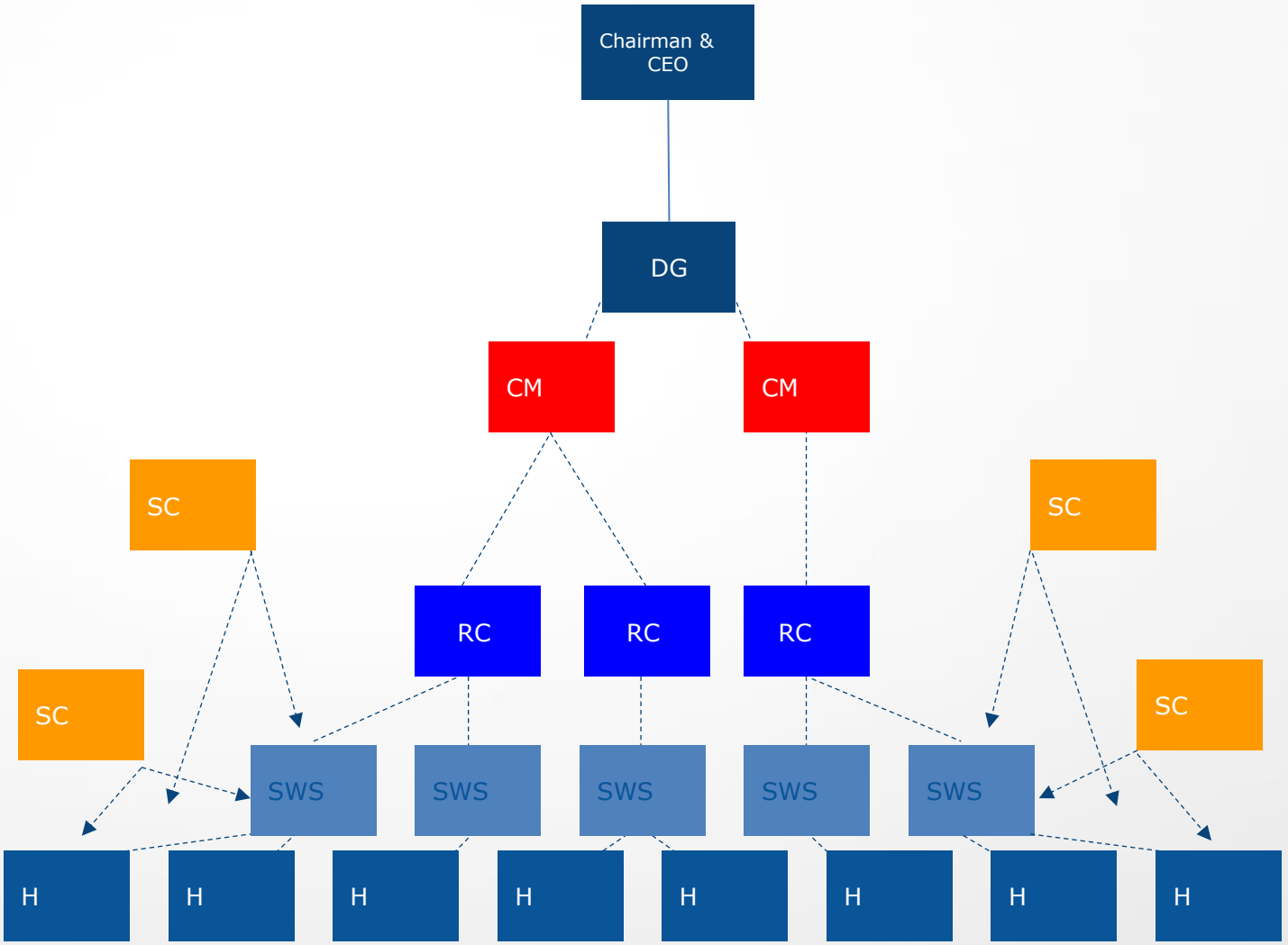
- International network of clinical and IT engineers, biomedical & IT technicians and telecare & telemedicine operators: over 320 in-hospital workshops and more than 20 specialist centres.

A History of Growth



Early Stage → Growth in Italy and e-Health Start-up → European Expansion → Global Expansion

TBS Group: growth strategy supported by clinical engineering companies and by companies or ICT specialized centers



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Group's General Managers (GM)

7 Clinical Engineering Company Managers (CM)

21 Company or Specialized Centers Managers (SC)

55 Regional Operational Centers managers (RC)

327 Hospital Workshops' Managers (SWS)

> 1,000 customers in healthcare centers and hospitals in Europe

TBS Group's companies overview: international network

PCS GmbH
www.pcs.at

TBS BE Telematic & Biomedical Services Bvba
www.tbsbe.com

TBS FR Telematic & Biomedical Services Sarl
www.tbsfr.com

Subitec GmbH
www.subitec.de

MSI MedServ International Deutschland GmbH
www.medservinternational.com

TBS Group S.p.A.
www.tbsgroup.com

EBM Srl
www.ebm.it

Insiel Mercato Spa
www.insielmercato.it

TeSAN S.p.A.
www.tesan.it

TBS IT Srl
www.tbsit.com

CRIMO Italia Srl
www.crimo.it

Caribel Srl
www.caribel.it

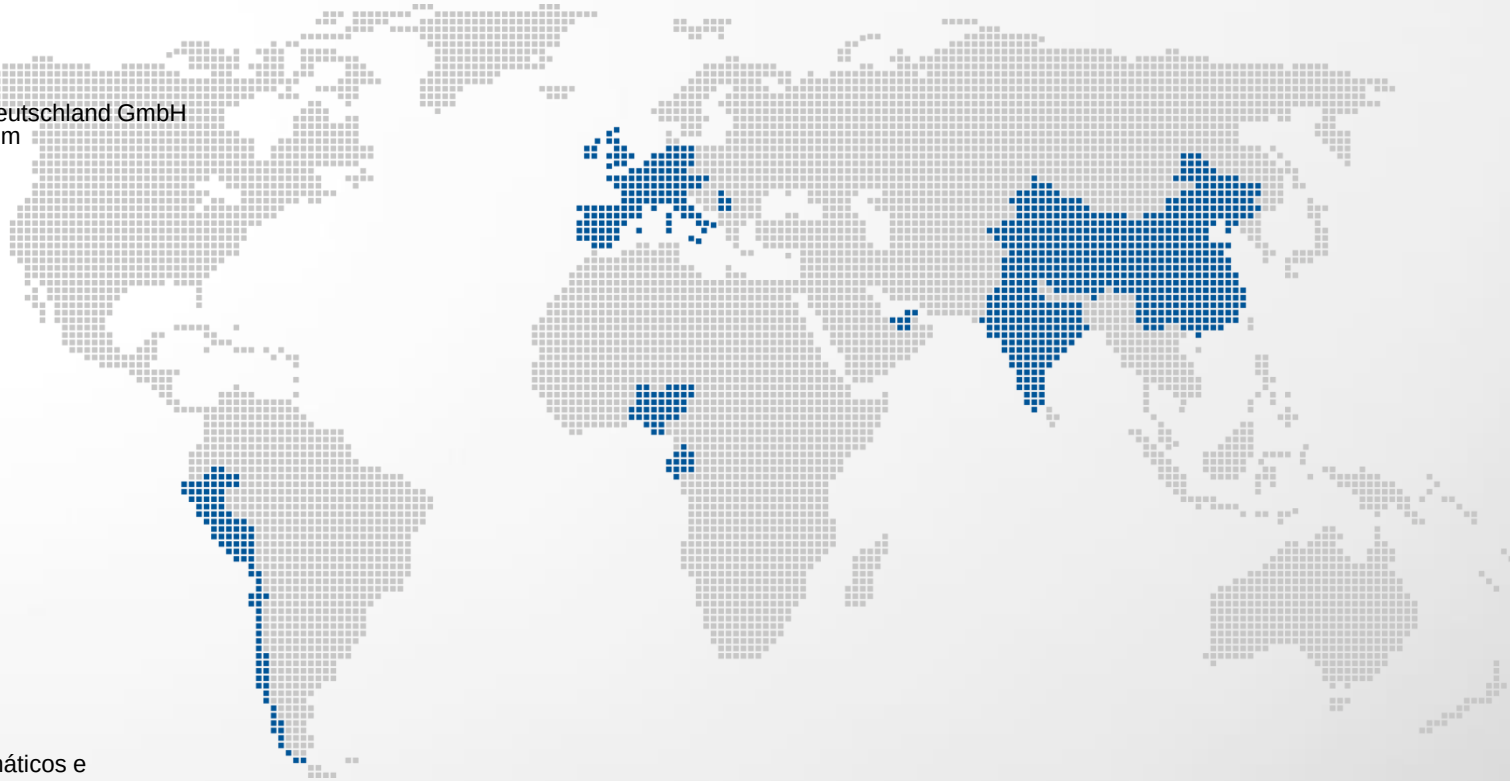
SLT srl
www.slt.eu.com

Surgical Technologies BV
www.surgical.nl

TBS PT (STB Serviços Telemáticos e Biomédicos Unipessoal LDA)
www.tbspt.com

TBS G.B. Telematic & Biomedical Services Ltd
www.tbsgb.com

TBS ES (Telematic & Biomedical Services SL)
www.tbses.com



TBS India Telematic&Biomedical Services Ltd.
(www.tbs-india.com)

Sinopharm TBS (China)

Integrated Approach to Medical and Information Technology for better management in healthcare

Medical, Information & Communication Technology Outsourcing services include the following technologies:

- **Medical Devices (including Medical Equipment)**
- **Medical Information Technology (including Hospital IT Systems & Solutions)**
- **Telehealthcare and telemedicine systems & solutions**

TBS Group has anticipated the strategic trend **of progressive convergence between these technologies**, developing an integrated approach to the services of medical and information technology.

The integrated approach allows:

- Higher **cost savings**
- **Superior management** of these services and solutions
- A **single partner** for all Clinical Engineering and Medical IT needs

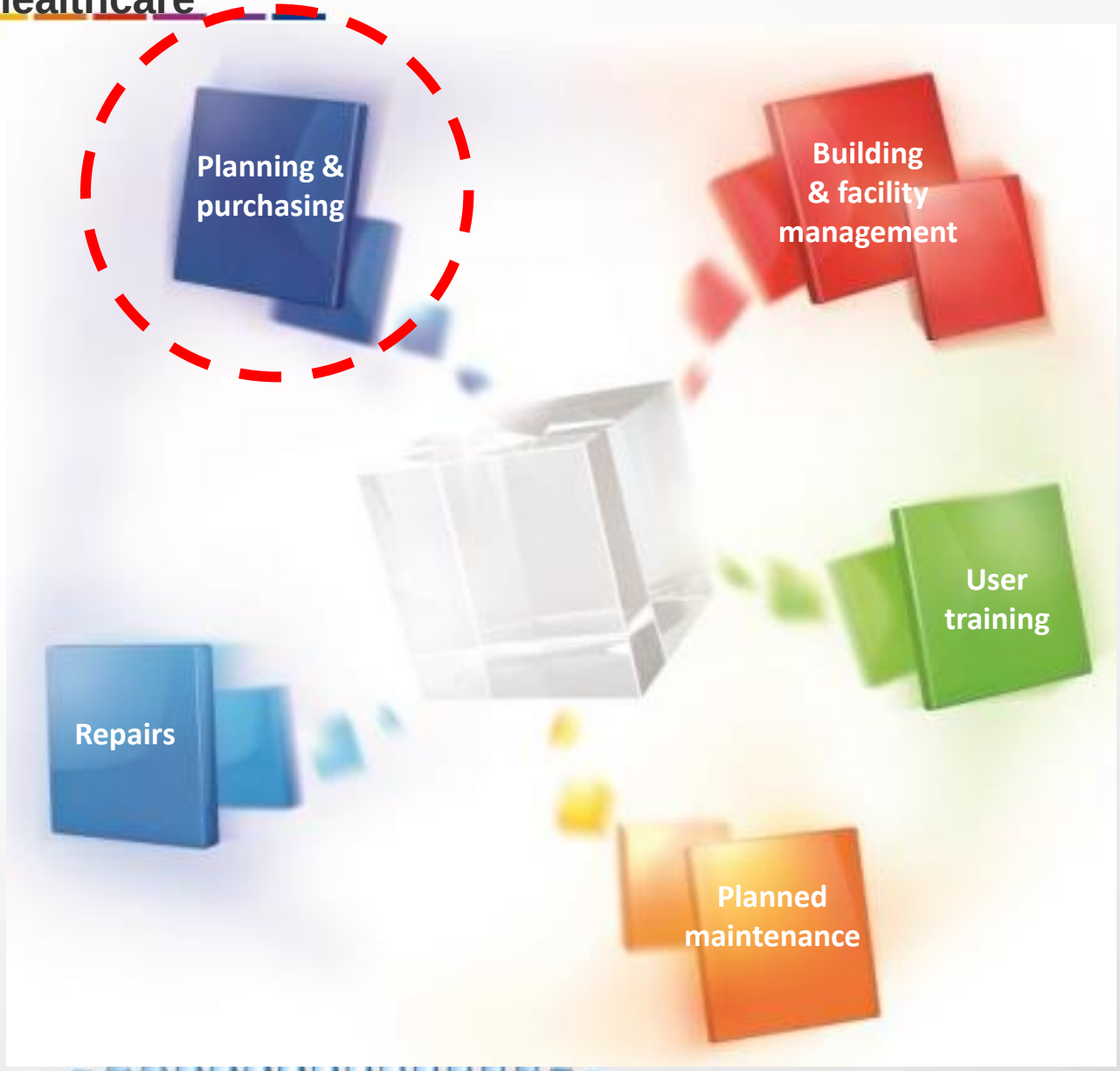
Convergence of **Medical Equipment** and **Medical IT** → Convergence of **Medical IT** and **Telehealthcare** → Innovation on **new services** →

Integrated approach to Clinical Engineering and ICT outsourcing services

Medical and Information Technology Integrated Approach for better management in healthcare

	Yesterday	Today	Tomorrow
Background	**Limited Medical Equipment** ▪ Little presence of Hospital Information Systems (“HIS”) ▪ Limited integration of Medical Equipment, digital data storage, HIS	**Medical Equipment systems & solutions** ▪ Equipment evolving towards special purpose computers ▪ Widespread integration of Diagnostic equipment with ICT systems (i.e. PACS) ▪ HIS penetration still limited	**Digital Hospital** ▪ Full integration of Equipment and IT platforms ▪ Closed loop systems (i.e. diagnostic data automatic drive of therapeutics) ▪ Patient data collected and viewed in hospital and outside
Hospital organization and management	Full separation of CE and ICT departments ▪ Separate organization, different skills and focus ▪ Separate budgets and buying processes	Start of cooperation and integration between CE and ICT departments: ▪ Most advanced organization understand the need to buy and support Equipments and IT solution with a view on integrating them	One department managing hospital and home care medical technology ▪ Mission of selecting and supporting the integrated Medical Equipment, Medical IT and telehealthcare systems and solutions
Impact on Medical Technology outsourcing services	Separate Markets / Different players ▪ No real synergies between CE and ICT outsourcing services ▪ Different categories of players providing solutions/services to the Hospital: CE outsourcers and ICT providers	Market Synergies between CE and ICT ▪ First signs of commercial synergies (eg joint tenders). ▪ Opportunity for up selling and providing integrated solutions (i.e. CE for devices, e-Health systems and solutions, ICT Outsourcing services for medical equipment management	One market for outsourcing CE and e-Health services ▪ Integrated CE outsourcing services for medical equipment & e-health systems and solutions ▪ Advantage from joint provision of consulting and support services on the full spectrum of medical technologies

TBS Group clinical engineering and ICT outsourced services for better management in healthcare



What problems do we solve with clinical engineering and ICT outsourced services?

- Hospitals buy **too much medical equipment & ICT systems and solutions** (*waste of money*)
- **Physician driven, silos purchase** (*focus on needs versus wants leads to money savings*)
- **Scarce standardization** – homogeneity (*waste of money, patient safety issues*)
- Management doesn't have **evidence based data** to deal with physicians requests (*imbalance in purchase criteria and internal negotiations*)
- Hospitals may **not have the necessary resources** to fulfill all procurement needs (*external support to raise production*)
- Etc.

What problems do we solve with clinical engineering and ICT outsourced services?

Financial Impact of Medical Technology

BY BINSENG WANG, RICHARD W. ELIASON, SONNY M. RICHARDS, LAWRENCE W. HERTZLER, AND ROBERT MOOREY

Incorporation, Utilization, and Management of Medical Devices in Acute Care Hospitals

The continuous rise of health-care costs has been troubling Americans for some time, especially the professionals involved in the various stages of medical device lifecycle, e.g., research, development, production, sales, regulation, procurement, maintenance, and disposal. According to the Centers for Medicare and Medicaid Services (CMS), health-care expenditures are expected to reach 18.7% of gross domestic product (GDP) by 2014, while it was only 8.8% in 1980 [1]. Although there is little doubt that technology is essential to providing quality care to patients, its strong impact on the continual rise of health-care costs has prompted many to question its value and effective management [2]–[6]. A segment of technology that has received much scrutiny is medical devices, which can be divided into three groups: implants (including prosthetic devices), equipment (ranging from defibrillators to surgical robots), and supplies (gloves, catheters, medical gases, etc.).

Among the medical devices, equipment has often been singled out probably because of its size, high capital investment, and costly life-long maintenance requirements. Thus, it is not difficult to find studies on specific equipment such as magnetic resonance imaging (MRI), computed tomography (CT) scanners, and radiation therapy equipment [4], [7], [8]. On the other hand, few have analyzed how hospitals manage their entire arsenals of medical equipment in the midst of the delicate balancing act of keeping up with the arms race, ensuring quality of care, and remaining financially viable.

This article reports an attempt to understand how acute care hospitals deploy medical equipment using data provided by 174 organizations. In particular, the cost of equipment acquisition and maintenance is compared to those of other medical devices and drugs. Although this sample is small (~3% of all American hospitals), it is fairly evenly and widely distributed in terms of size, location, ownership, and teaching characteristics. The reason for focusing on hospitals is because hospital care accounts for the largest share (~31%) of the national health-care expenditure [1]. Although the other segments of health-care industry (e.g., nursing homes, homecare, and personal care) also employ equipment, the hospitals are by far the largest consumers of medical equipment (but not necessarily of other types of devices).

Materials and Methods

The data analyzed were collected by Solucient LLC (later acquired by Thomson Healthcare) through the Action O-I service. In 2005, this service had approximately 850 subscribers, with reporting hospitals from all 50 states and the District of Columbia. The data extracted was for the fiscal year that ended by the second quarter of 2005 and included only acute care hospitals that provided four consecutive quarters of equipment

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Medical equipment & ICT is around **20%** of the total value of the physical assets (property, plant and equipment)

Ratio of the medical & ICT maintenance cost and the total medical equipment & ICT acquisition costs: around

4-6%

… few have analyzed how hospitals manage their entire arsenals of medical & ICT equipment in the midst of the delicate balancing act of keeping up with the arms race, ensuring quality of care, and remaining financially viable.

Supply, Lease and/or Operating Leaseback for better procurement in healthcare

Developed Countries

Main driver is the economic crisis

Cost cutting for Medical & IC Technology management

Private and public hospitals with cost constraints are reducing acute care beds

Manage technology as OPEX
Better control of cash flow
Improvement in productivity
Improvement in safety
Tax benefits (e.g. UK)

Medical & ICT Technologies as a service

PPP
Leasing/Rental/COMS
Pay Per Use/Revenue Sharing
Risk Sharing

Emerging Markets

Main driver is the need of value for money

Need of cash for investments in Medical & IC Technology

Not enough acute care beds in the private and public hospitals

Limited primary care and diagnostic services

Need fast healthcare services growth
Need partner to finance this growth (e.g. managing technology as OPEX)
Share risks / rewards

What problems could we solve with clinical engineering and ICT outsourced services?

Difficulties in Italy:

- Overall debt of P.A. in Italy: 62 mld €
- Of this the debt of Local Health Authorities versus suppliers: 33,5 mld €
- Average delay in payment of suppliers in Italy: 259 days (agains 30 for germany and 65 for France)

Opportunities:

- Replacement total value of medical equipment (9mld€) and ICT systems and solutions (4mld€) in Italian hospitals and other Public Administrations: around **13 B €**
- Estimated current value (for a possible lease back operation) around **4 B €** for paying debts or for doing medical and information technology investments
- Further possible savings in the Italian hospitals through further implementation of integrated clinical engineering & ICT outsourcing services: around **140 M €/year**
- Further possible savings in the Italian hospitals through efficiencies and scale economies with integrated purchase of medical & ICT technologies: around **110 M €/year**

Clinical engineering and ICT projects and related data-banks

As a result of a strong demand of tools for a greater rationalization of the sector of medical devices, the Italian Ministry of Health has conducted many important projects that involved the contribution of TBS Group

Project "**Biomedical and Health Technologies - Subproject AC.MA.GEST.**"

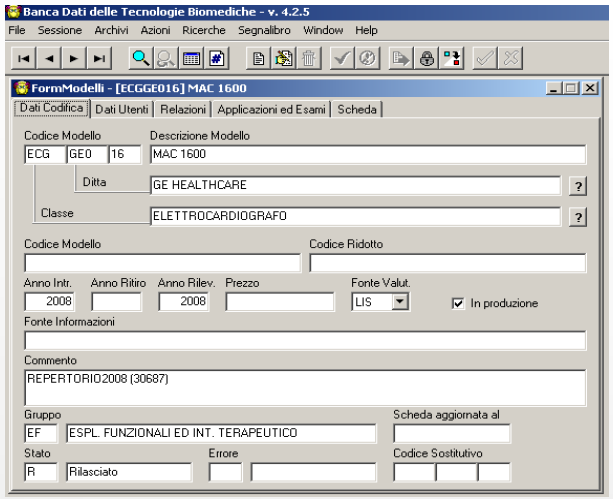
In 1983, the italian National Research Council began a project called “Biomedical and Health Technologies” in the area of the improvement of the National Health System services, the technology assessment and the management of equipment. The second of these sub-projects, called "AC.MA.GEST." (Acquisition, Maintenance and Management of Biomedical Equipment), was to provide methods of analysis and intervention in both administrative and technical areas being expecially related to the management of the electrical equipment in use in National Health System.

At the end of 1987, the following outcomes were available: inventories of biomedical equipment and suppliers, commented lists of technical instructions, procedures for acquisition, testing, installation and maintenance of equipment along with instruction manuals for users, guidelines for periodic checks of performance and safety of equipment, analysis of the direct costs of services in diagnostic radiology or clinical laboratories and analysis of clinical engineering services activation

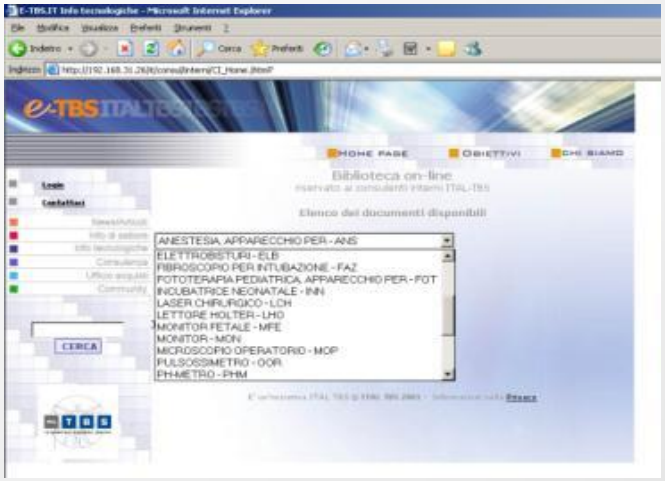
Clinical engineering and ICT projects and related data-banks

Under an agreement between Area Science Park of Trieste and the italian Regions Friuli-Venezia Giulia, Veneto, Lombardy, Emilia Romagna, Trentino Alto Adige, Lazio and Sicily, from 1990 to 1996 all Hospitals of these Regions were provided with a series of new services for the management of biomedical equipment:

- **BITB - Informative Bulletins on Biomedical Technologies**: updated and detailed publications issued to give technical and commercial information on biomedical equipment available on the domestic market.
- **YEARBOOK**: a yearly publication about biomedical equipment, manufacturers, suppliers and models.
- **CIVAB CODES** release service: daily coding service aimed to update the national database of biomedical technologies (along with technical data sheets about the devices and commercial information about the companies) and to help hospital staff to keep inventories updated



TBS Code Data Bank (former CIVAB)
> 2,000 classes
> 9,000 companies
> 180,000 models



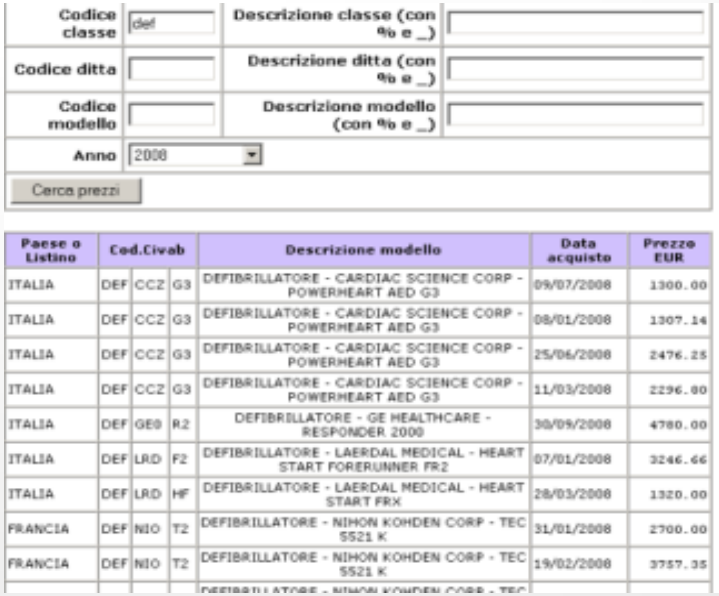
On-line library
> 120 classes
> 450 documents

Clinical engineering and ICT projects and related data-banks

TBS Group has successfully carried out two special projects by the Italian Ministry of Public Health during the periods 1997-1998 and 1999–2000 respectively entitled:

- "Experimental establishment of the national Observatory of Prices and Technologies"
- "Consolidation and effectiveness in the Italian National Health System of the **Observatory of Prices and Technologies (OPT)**"

These projects continued until 2010 with the maintenance and update of the CIVAB codes
Since 2011 TBS Group continued the development of these codes (now TBS Medical Device & ICT Codes) and data-banks



Codice classe	def	Descrizione classe (con % e _)	
Codice ditta		Descrizione ditta (con % e _)	
Codice modello		Descrizione modello (con % e _)	
Anno	2008		

Cerca prezzi

Paese o Listino	Cod.Civab			Descrizione modello	Data acquisto	Prezzo EUR
ITALIA	DEF	CCZ	G3	DEFIBRILLATORE - CARDIAC SCIENCE CORP - POWERHEART AED G3	09/07/2008	1300.00
ITALIA	DEF	CCZ	G3	DEFIBRILLATORE - CARDIAC SCIENCE CORP - POWERHEART AED G3	08/01/2008	1307.14
ITALIA	DEF	CCZ	G3	DEFIBRILLATORE - CARDIAC SCIENCE CORP - POWERHEART AED G3	25/06/2008	2476.25
ITALIA	DEF	CCZ	G3	DEFIBRILLATORE - CARDIAC SCIENCE CORP - POWERHEART AED G3	11/03/2008	2296.80
ITALIA	DEF	GE0	R2	DEFIBRILLATORE - GE HEALTHCARE - RESPONDER 2000	30/09/2008	4780.00
ITALIA	DEF	LRD	F2	DEFIBRILLATORE - LAERDAL MEDICAL - HEART START FORERUNNER FR2	07/01/2008	3246.66
ITALIA	DEF	LRD	HF	DEFIBRILLATORE - LAERDAL MEDICAL - HEART START FRX	28/03/2008	1320.00
FRANCIA	DEF	NIO	T2	DEFIBRILLATORE - NIHON KOHDEN CORP - TEC 5521 K	31/01/2008	2700.00
FRANCIA	DEF	NIO	T2	DEFIBRILLATORE - NIHON KOHDEN CORP - TEC 5521 K	19/02/2008	3757.35

TBS Group Prices observatory
> 20,000 records
Data from all Europe (and growing with India and China)

Clinical engineering and ICT projects and related data-banks

TBS Group, in the years 2006-present, is also involved as an important consulting and operative partner to the Italian Ministry of Health for the activities concerning the registration of medical devices into the Repertory of NSIS (New Italian Health Information System) by italian or international manufactures before being put on the italian market (according to the European Directive 93/42/EEC). The Repertory is a large computerized collection of data concerning all medical devices put on the italian market (European Directive 93/42/EEC).

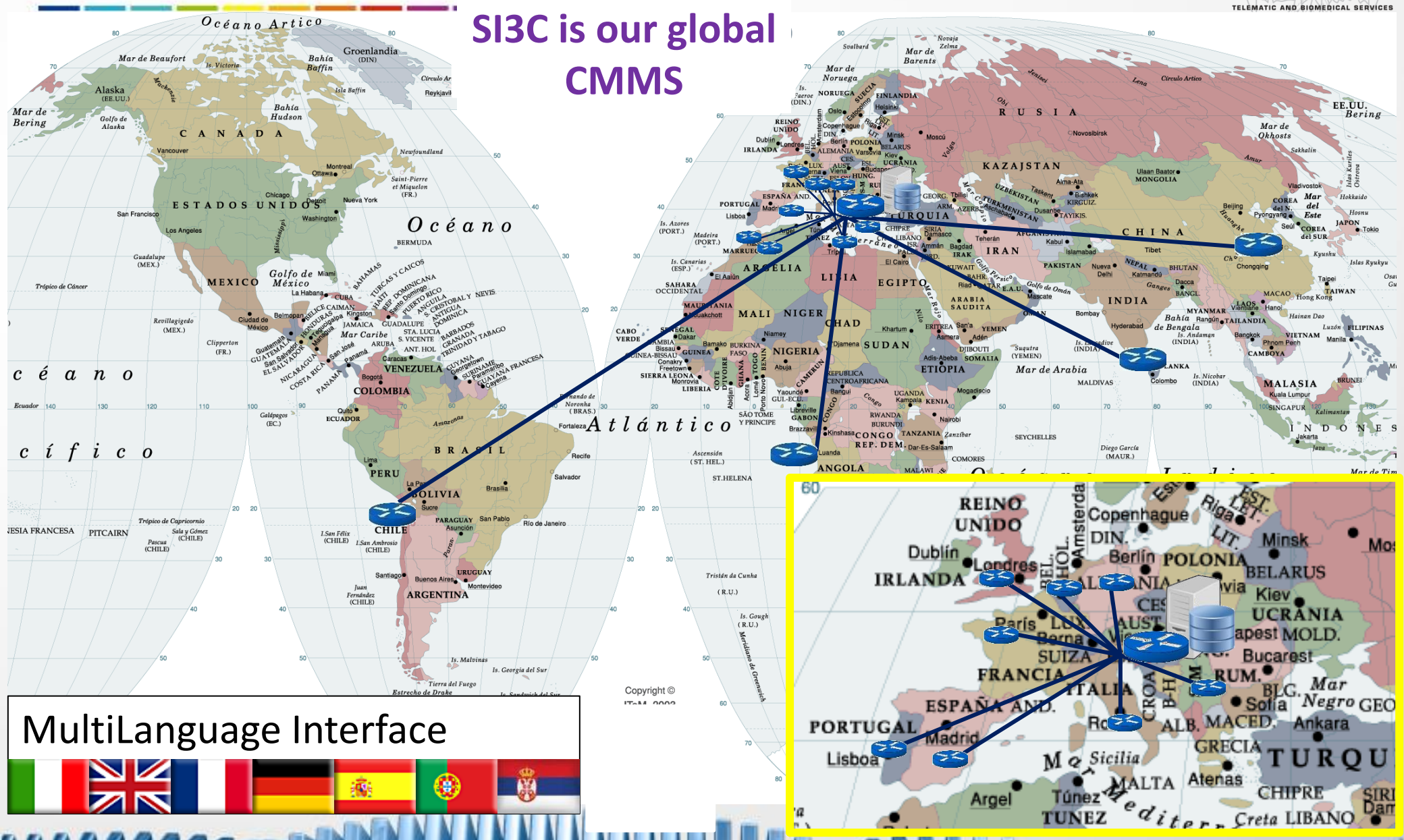
TBS Group has provided useful tools for the new classification to be consistently applied such as:

- the **periodic updating of the names and complete descripions** of the types (categories) of medical devices
- the **complete trans-coding tables between the new italian classification system CND (including TBS Code) and the european GMDN** (Global Medical Device Nomenclature),
- the **glossary and synonyms** tables
- the **English translation** of terms and descriptions

The TBS Group Global network for Medical Equipment management

TBS GROUP
TELEMATIC AND BIOMEDICAL SERVICES

SI3C is our global CMMS



MultiLanguage Interface

TBS Group recent track record in integrated medical equipment procurement & services, using the TBS Code and related data banks

3 contracts in China and 1 contract in Honduras signed in 2013

Pengzhou
Equipment classes: 10
Total devices: 29
Typology of equipment: endoscopy, ventilation/anesthesia, radiology, ultrasound
Value of the contract: 1,8 M€

Sichuan
Equipment classes: 39
Total devices: 84
Typology of equipment: electromedicine, endoscopy, ventilation/anesthesia, radiology, ultrasound, laboratory, sterilization
Value of the contract : 7,5 M€

Daixian
Equipment classes: 32
Total devices: 76
Typology of equipment: electromedicine, endoscopy, ventilation/anesthesia, radiology, ultrasound, laboratory, ambulance
Value of the contract: 1,8 M€

TBS Group recent track record in integrated medical equipment procurement & services, using the TBS Code and related data banks

3 contracts in China and 1 contract in Honduras signed in 2013

Honduras
Equipment classes: 44
Total devices: 454
Typology of equipment: electromedicine (defibrillators, electrosurgery, infusion pumps), neonatal incubators, monitors, ventilation/anesthesia
Value of the contract: 2,6 M€

Overall revenues > 13 M€

Added value services, not just procurement

Using medical devices	Inappropriate design
	Context
	Lack of appropriate management
	Lack of appropriate staff training
	Maintenance problems

Medical devices issues

A medical device needs to be appropriate for the context or setting in which it is intended. Context in this sense refers to linking the correct medical device with its corresponding health need to maximize its effectiveness. However, almost all devices present in developing countries have been designed for use in industrialized countries. Up to three quarters of these devices do not function in their new settings and remain unused. Factors contributing to this are: lack of needs assessment, appropriate design, robust infrastructure, spare parts when devices break down, consumables, and a lack of information for procurement and maintenance, as well as trained health-care staff. These issues are part of a broader problem in many countries: the lack of a medical device management system.

Added value services: not just using the TBS Code and data banks for procurement, but to deliver all related integrated services

Providing an integrated plan for procurement and related integrated services:

- **Medical equipment**
- **ICT systems and solutions**
- **Installation and testing**
- **User training**
- **Maintenance (spare parts, repairs, etc.)**
- **Consumables availability**

… always using and updating the TBS Code and data banks

Value Proposition with Clinical Engineering and ICT outsourcing services

End-users (public and private hospitals and social services institutions)

- Reduction of costs
- Unique technical reference with multiple best practices
- Increased uptime (and thus utilization) of medical technology
- Improved safety for patients and healthcare in public and private organizations
- Improved quality of the healthcare and home care services offered
- Continuity of treatment by extending medical services from hospitals to patient's homes

Suppliers of medical & ICT technology (OEM)

- Reduced support and warranty cost
- Improved service to the end user
- Organizational simplification

Using publicly available Medical Device & ICT codes and data banks