Using a tool inspired by Balanced Scorecard to assess Green IT: An implementation within a regional hospital in France

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1 Introduction

ICT regarding sustainability

ICT as part of the solution

- Substitution effects

"An e-book reader can replace printed books "

- Optimization effects

"Less energy is used for heating in a smart home "

- Dematerialized Economy

"ICT has the potential to support sustainable patterns of production and consumption "

(Hilty, 2008; Hilty & Aebischer, 2014 pp. 21-22)
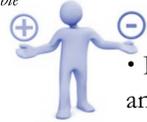
ICT as part of the problem

• Directs effects

"Accounts for approximatively 2% of global CO_2 emissions, a figure equivalent to aviation " (Gartner, 2007)

"13,5% of the French electric consumption " (Breuil et al., 2008 p. 2)

"In 2005 from 20 to 50 million tons of WEEE[1] were produced in the world " (Berthoud et al., 2012 p. 161)

• But also induction, obsolescence and rebound effects

IT FOR GREEN ⬅ ➡ **GREEN FOR IT**

"Using ICT as a transformational technology " (ICT for sustainability) (Hilty & Aebischer, 2014 p. 17)

"Reducing the environmental impacts of ICT hardware and software " (Green IT/ICT) (Hilty & Aebischer, 2014 p. 17)

◈ More and more organizations tend to develop Green IT policies.

◈ But how to assess the sustainability of ICT and the impact of these policies? *(Daly & Butler, 2009)*
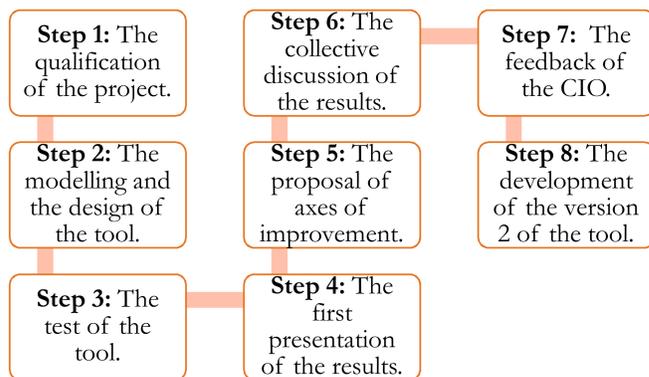
2 Objectives

This research answers to these three main objectives:

1 • To devise a tool to assess the sustainability of ICT.

2 • To experiment the tool in various organizational contexts.

3 • To discuss about the relevance of this tool.

3 Methods

◈ An **engineering research** (action research) in order to face the complexity of the problem and to design a tool useful for the collective action. It took place in 8 steps:

Step 1: The qualification of the project.

Step 2: The modelling and the design of the tool.

Step 3: The test of the tool.

Step 4: The first presentation of the results.

Step 5: The proposal of axes of improvement.

Step 6: The collective discussion of the results.

Step 7: The feedback of the CIO.

Step 8: The development of the version 2 of the tool.

◈ The **choice of the organization** (a regional hospital in France) was made by the consulting firm, partner in the elaboration of this tool, during answers to calls for tender or operations of commercial conquest.
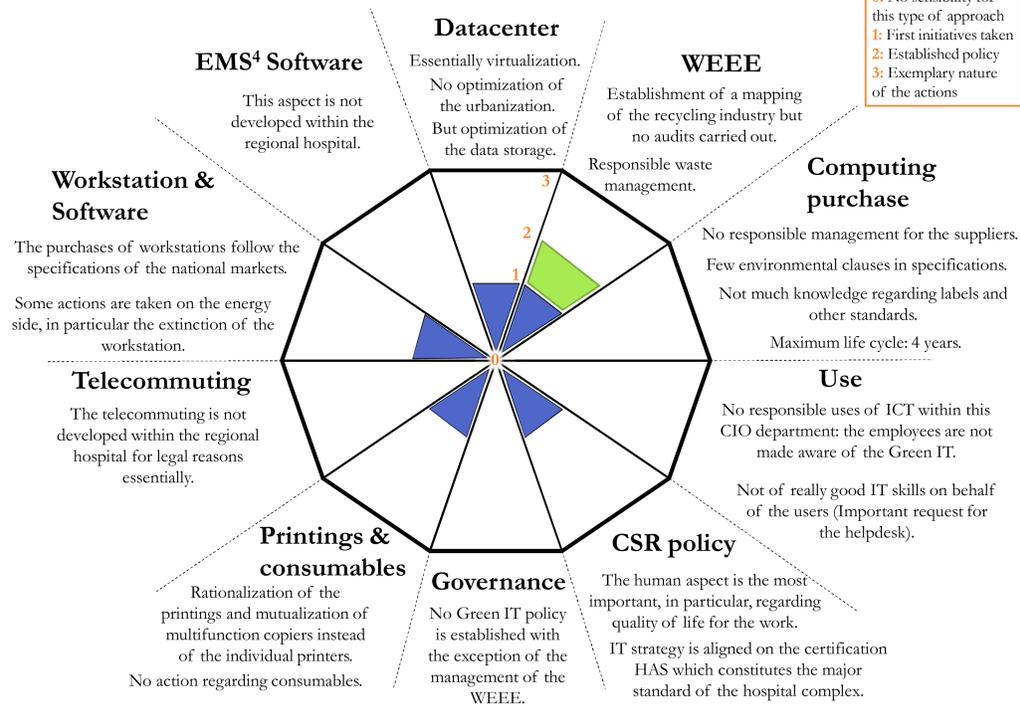
◈ **Characteristics of the case study made within a regional hospital in France:**

Sustainable Development policy	• Certification HAS[2] in progress with a part dedicated to SD. • Commitment HQE®[3].
Organization of the CIO department	• 30 collaborators for 4871 employees. • 5 services (Hardware, Software, Customer, Projects & Coordination of medical secretaries).
Main stakes of the CIO department	• To draw up and implement the master plan. • To be certified as ISO 20000 compliant.
Green IT policy	• Not formalized.
Green IT initiatives	• Virtualization and mutualization of the servers. • Rationalization of printings and mutualization of printers.
Green IT projects	• Project of telemedicine.

4 Results

◈ An assessment tool inspired by the **Balanced Scorecard (BSC)**. *(Kaplan & Norton, 1992)*

◈ **4 perspectives**: economic, environmental, human and system of management.

◈ Each is associated to **objectives**, **questions**, **indicators** and **ratios** allowing to estimate the **maturity on a scale from 0 to 3**. *(Bohas & Bouzidi, 2012; Bohas, 2013; Bohas, Bouzidi & Chappoz, 2014)*

◈ The tool includes **10 technical domains** which contain each of them several **sub-domains**.

◈ The data collected by the consulting firm within the hospital center allowed to measure the **maturity of ICT as regards sustainability** by technical sub-domain, by technical domain and by perspective.

◈ Here are the main results of the evaluation for the 10 technical domains:

Maturity scale
0: No sensibility for this type of approach
1: First initiatives taken
2: Established policy
3: Exemplary nature of the actions

Datacenter — Essentially virtualization. No optimization of the urbanization. But optimization of the data storage.

WEEE — Establishment of a mapping of the recycling industry but no audits carried out. Responsible waste management.

Computing purchase — No responsible management for the suppliers. Few environmental clauses in specifications. Not much knowledge regarding labels and other standards. Maximum life cycle: 4 years.

Use — No responsible uses of ICT within this CIO department: the employees are not made aware of the Green IT. Not of really good IT skills on behalf of the users (Important request for the helpdesk).

CSR policy — The human aspect is the most important, in particular, regarding quality of life for the work. IT strategy is aligned on the certification HAS which constitutes the major standard of the hospital complex.

Governance — No Green IT policy is established with the exception of the management of the WEEE.

Printings & consumables — Rationalization of the printings and mutualization of multifunction copiers instead of the individual printers. No action regarding consumables.

Telecommuting — The telecommuting is not developed within the regional hospital for legal reasons essentially.

Workstation & Software — The purchases of workstations follow the specifications of the national markets. Some actions are taken on the energy side, in particular the extinction of the workstation.

EMS[4] Software — This aspect is not developed within the regional hospital.

5 Conclusion

◈ To assess the sustainability of ICT we designed **a tool inspired by BSC**. *(Erek, 2011)*

◈ The experimentation of the tool within a regional hospital, associated to a previous one within a regional council, contribute towards validating the hypothesis of **relevance of the framework of the BSC** as a way of instrumentation of the Green IT to which it brings a **legitimacy** due to its strategic dimension and as it meets managers' approval.

◈ The results of the case study show that the **sustainability of ICT is little taken into account** except the statutory obligations (**conformity and not proactivity**).

◈ The major interest of this tool is not to provide an exact measure of the sustainability of ICT but to **make employees aware** of it and to lead them to reflect on this subject in order to **change their practices in a conscious way**.

◈ Perspectives:
- To pursue the improvement and the test of the tool. The tests having been limited to cases stemming from the public management, it would be interesting to validate its relevance for the private sector.
- To deepen the analysis of the performative capacity of this tool and to study in particular the *"fabric of organizing visions"*. *(de Vaujany et al., 2013)*

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1. WEEE: Waste Electrical and Electronic Equipment.
2. HAS: The Haute Autorité de Santé - or French National Authority for Health - is an independent public body which was set up by the French government in August 2004.
3. HQE: High Quality Environmental standard is a standard for green buildings in France.
4. EMS: Environmental Management System.

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