Toward an ontological representation for corporate financial documents and their components: an investigation on balance sheets and their accounts

2nd International Workshop on Ontology of Social, Legal and Economic Entities

Mauricio Almeida and Cristiano Moreira
Federal University of *Minas Gerais*
Sept. 17, 2021

AGENDA

Introduction and motivation

Theoretical topics approached

Final remarks

Prof. Mauricio Almeida, mba@eci.ufmg.br - *Information Science, PhD*

Introduction

Some documents can create obligations

A balance sheet allows corporations to meet obligations regarding taxes

The accounts in a balance sheet represent corporate assets

Prof. Mauricio Almeida, mba@eci.ufmg.br - *Information Science, PhD*

Introduction

Figure 1: template for a balance sheet

Motivation

R&D project in a power supply energy company
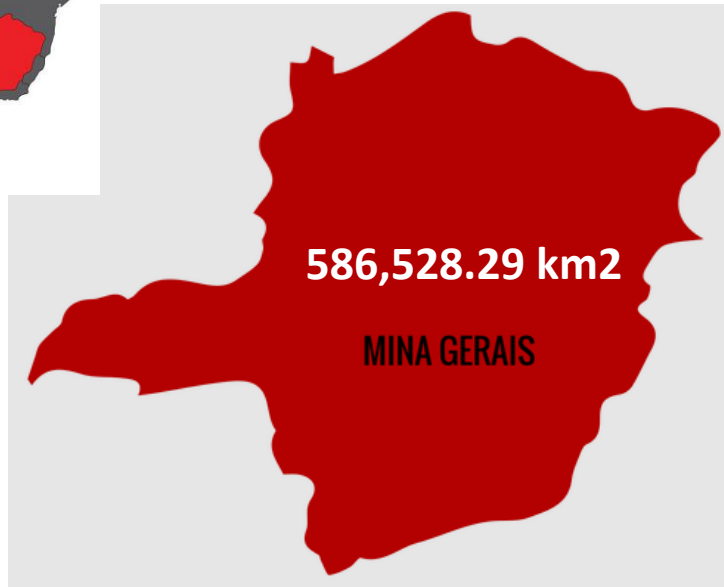
Integration of accounting databases

Ontology for the company assets represented in the balance sheet

Motivation:
Case in a power supply energy company

The company: CEMIG (the power supply company of state of Minas Gerais)

Brazil

586,528.29 km2

MINA GERAIS

640,679 km2
France

© WorldAtlas.com

Prof. Mauricio Almeida, mba@eci.ufmg.br - *Information Science, PhD*

6

Motivation:
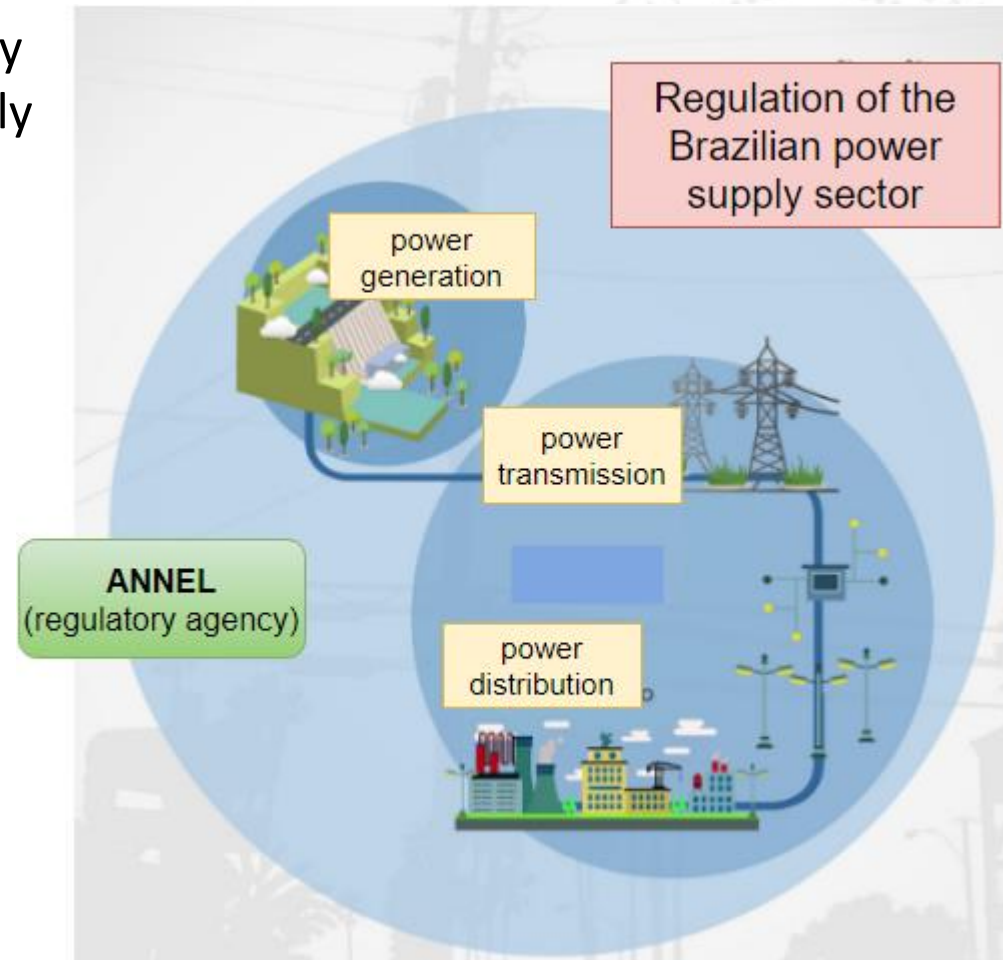# Integration of accounting databases

In Brazil, there is a federal regulatory agency to supervise the power supply companies (called **ANEEL**).
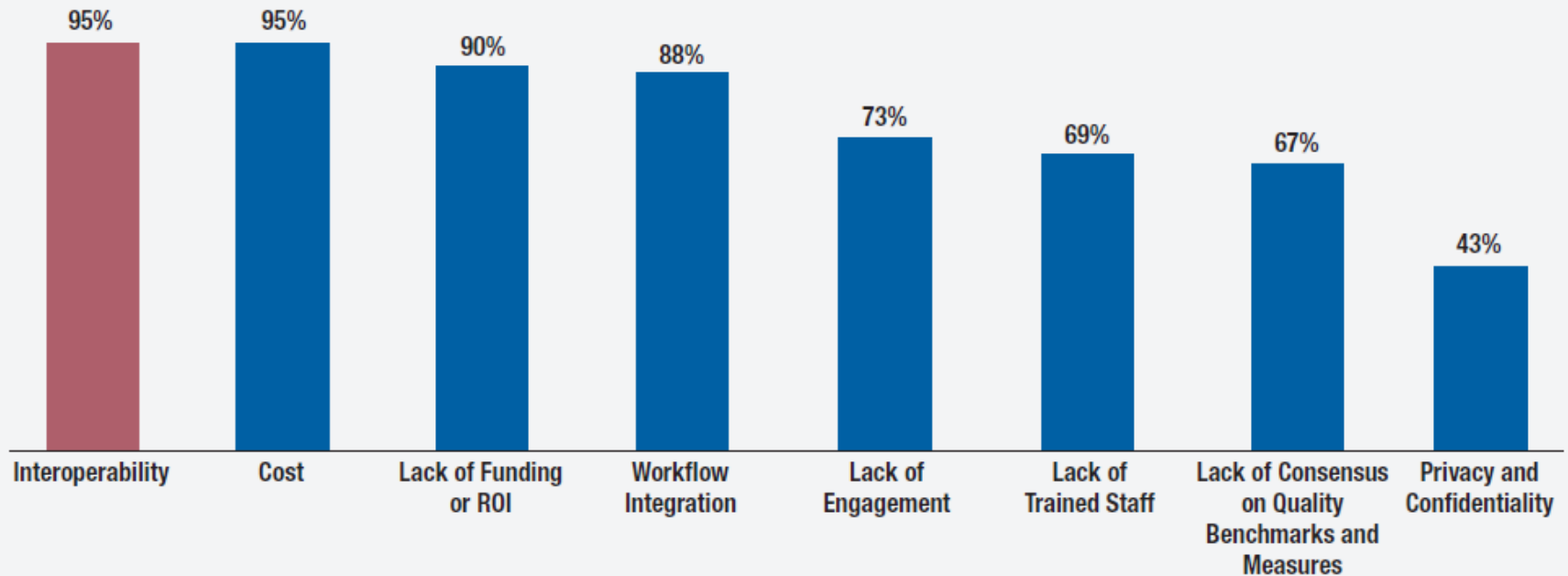

Database for accounting according to ANEEL

Database for management accounting

Prof. Mauricio Almeida, mba@eci.ufmg.br - *Information Science, PhD*

7

Integration

Interoperability is almost universally seen as a major obstacle to effectively using and meeting the potential of health IT.

Chart 4: Percent of ACOs Reporting Largest Barriers to Using Health IT Effectively, 2014

- Interoperability: 95%
- Cost: 95%
- Lack of Funding or ROI: 90%
- Workflow Integration: 88%
- Lack of Engagement: 73%
- Lack of Trained Staff: 69%
- Lack of Consensus on Quality Benchmarks and Measures: 67%
- Privacy and Confidentiality: 43%

Source: Premier, Inc. and eHealth Initiative survey of accountable care organizations fielded July – August 2014. 62 organizations responded to the survey.

American Hospital Association (2015)

Motivation:

Ontology for the company assets in balance sheets

Scheme for integraton in the project

Print of a Protégé screen
(in Portuguese)

Motivation: occurrents
Ontology for the company assets in balance sheets

The top-level scheme (in Portuguese)

Topics

The meaning of money

Documents and parts of documents

The place of balance sheets in ontologies

Prof. Mauricio Almeida, mba@eci.ufmg.br - *Information Science, PhD*

Topics:
The meaning of money

We define **money** (in this essay) as something that someone receives in return for providing an item (necessary condition).

It acquires a value associated with either material or immaterial objects and a **measurement system**.

Kinds of values: use value, payment value and exchange value.
An **exchange value** can receive a numerical value in a meaningful way.

Applying the **exchange value** to the current monetary system, one can delineate a debit and credit relation between a debtor and a creditor.

Topics:
Documents and parts of documents

The record that governs all economic assets in a corporation is the
balance sheet

This document has two main blocks representing the **rights** and
obligations of a corporation.

These main blocks are divided into small blocks called **accounts**.
Each account represents corporation's assets.

We use **BFO** to model the ontology and **Granular Partitions Theory** (GPT)
to investigate accounts as parts of balance sheets

13

Topics:
Documents and parts of documents

Topics:
Scheme of the ontology
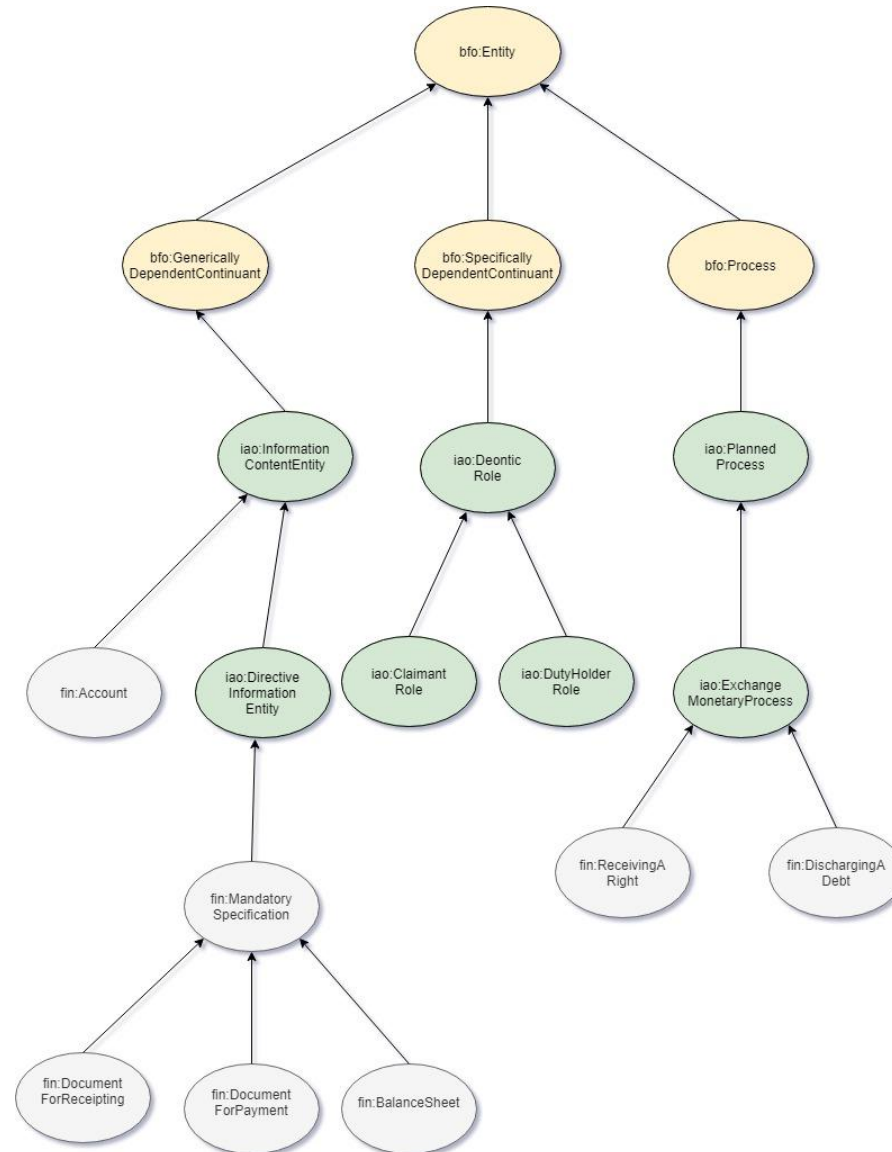
Topics:
Axiomatization

Class – **fin:BalanceSheet**

Superclass	**fin:MandatorySpecification**
Definition	A balance sheet is a mandatory specification that has accounts and records the exchange processes that occurred in a corporation.
Equivalent class	**fin:MandatorySpecification** and *fin:hasComponent* **fin:Accounts** and *fin:records* some **fin:ExchangeMonetaryProcess** and *obi:isSpecifiedInputOf* *iao:DeonticDocumentAct*
Example of use	The balance sheet of Ford Motor Company specifies that the corporation must pay some value to shareholders.
Observations	The deontic document act of which the balance sheet is the input can be an exchange process regarding a tax, a tribute, or a fee.

Final remarks

The subject of this paper is not a novelty.

This is a preliminary essay, we believe that more research is justified in the scope of financial documents.

There are several open questions, for future work, for example:

- To clarify the relations applied in the ontology
- Deontic distinctions proposed (by Searle) can not be captured in OWL
- To add an instantiation of the ontology to explain modeling decisions
- Improvements in the literature review

Thanks!!

Prof. Mauricio Almeida, PhD
http://mba.eci.ufmg.br