



# A Path to an Ontology of Organizations

Emanuele Bottazzi<sup>1</sup>, Roberta Ferrario<sup>1</sup>

<sup>1</sup>Laboratory for Applied Ontology  
Institute of Cognitive Sciences and Technologies  
Italian National Research Council

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# Introduction

## Aim of the paper

To lay down the bases for an ontology of organizations

## Formal Framework

We will rely on the DOLCE ontology

## Kinds of analysis

Two possible kinds of analysis can be conducted:

- ▶ Dynamic Aspects
- ▶ Static Aspects



# Dynamic aspects

## ▶ Historical analyses

- ▶ How are organizations born?
- ▶ What happens when an organization is born?
- ▶ What is necessary in order for an organization to be born?
- ▶ What kind of relation does it entertain with its founders?
- ▶ ...

## ▶ Analyses of the actions

- ▶ How are collective actions performed?
- ▶ Which relations do they entertain with actions of the individuals who participate in the collective one?
- ▶ Can organizations be considered agents of some kind?
- ▶ How can they act in the world?
- ▶ Are they responsible for their actions?
- ▶ What can or cannot they do?
- ▶ ...



# Static Aspects

- ▶ Which kind of relation between an organization and its members?
- ▶ What is necessary for a certain agent in order for him/her to be a member of an organization?
- ▶ Which relation between the roles of an organization and its normative layer?
- ▶ ...



# Related Works

## Studies in Philosophy (French, Tuomela)

- ▶ Focus on ethical issues (moral personhood and responsibility)
- ▶ Not much formalism (exception: Tuomela)
- ▶ Focus on the dynamic aspects

## Studies in Computer Science (TOVE project, Dignum, Dietz)

- ▶ Focus on enterprise modelling (workflow, activities, processes)
- ▶ Global scope (teleological aspects, interaction patterns)
- ▶ Relations as “black boxes”
- ▶ Bottom-up vs. top-down



# Background Concepts

## Endurants (me, my cat, an umbrella)

### ▶ Social Objects

- ▶ Agentive Social Objects (legal person, customer)
- ▶ Non Agentive Social Objects (a law, a currency)
  - ▶ Social Concepts (crown, triangle)
  - ▶ Social Roles (President, employee)
  - ▶ Descriptions (a theory, a Constitution)

## Perdurants (a conference, a tennis match, my sister's wedding)



# Building Blocks

## ▶ Main Entities

- ▶ Organizations
- ▶ Agents
- ▶ Roles and Concepts
- ▶ Norms and Descriptions

## ▶ Relations

- ▶ Definition (an org. or a role are *defined* by a descrip.)
- ▶ Classification (an agent is *classified* by a role)
- ▶ Affiliation (an agent is *affiliated* to an org.)
- ▶ Institutionalization (a role is *institutionalized* in an org.)
- ▶ Validity (a rule or descrip. is *valid* in an org.)



## An example

- ▶ The individual Carlo Azeglio Ciampi is **classified** by the role President of Italy
- ▶ This role and the Italian State are **defined** by the Italian Constitution (a description)
- ▶ The role President of Italy is **institutionalized** by the Italian State
- ▶ Ciampi, as individual, is **affiliated** to the Italian State
- ▶ The Italian Constitution is **valid** for the Italian State



# Organizations

- ▶ They are different from social groups
- ▶ They are agentive entities
- ▶ They act through delegated agents
- ▶ They preserve their identity through the turnover of their members

Organizations are social individuals, they don't classify particulars, they depute their actions to some roles, which classify agents who are the ones who ultimately act



# Roles

- ▶ A role can be played by different entities
- ▶ The same entity can play different roles
- ▶ An entity can change role and play the same role more than once
- ▶ Roles are intrinsically relational
- ▶ They cannot act themselves, but they classify entities who can act



# Descriptions and Norms

- ▶ In our account, all norms are descriptions, but not vice versa
- ▶ Descriptions constitute the context inside of which organizations are defined
- ▶ Norms are valid inside organizations
- ▶ We can distinguish between:
  - (1) Constitutive Norms (defining function)
  - (2) Deontic Norms (regulative function)
  - (3) Technical Norms (descriptive function)



# Validity

- ▶ Validity is a relation holding between a description (norm) and a social individual (organization)
- ▶ In order for a description to be valid for a social individual, a necessary condition is the occurrence of a social event in which both the social individual and the description participate

$$A5 \text{ } SEV(x) \rightarrow PD(x)$$

$$A6 \text{ } SEV(x) \rightarrow \exists y, z, t(AG(y) \wedge SOB(z) \wedge PC(y, x, t) \wedge PC(z, x, t))$$

$$A7 \text{ } VAL(x, y) \rightarrow \\ SI(y) \wedge DF(y, x) \wedge \exists z, t(SEV(z) \wedge PC(x, z, t) \wedge PC(y, z, t))$$



# Institutionalization

- ▶ Institutionalization is a relation holding between a role (or concept) and a social individual (organization)
- ▶ A concept is institutionalized for a social individual if it is used by a description that is valid for the social individual

$$D1 \text{ INST}(x, y) \triangleq CN(x) \wedge \exists z(\text{VAL}(z, y) \wedge \text{US}(x, z))$$



# Affiliation

- ▶ Affiliation is a temporalized relation holding between an agent and a social individual (organization)
- ▶ An agent is affiliated to a social individual iff (s)he plays a role that is institutionalized for the social individual

A8  $RL(x) \rightarrow CN(x)$

D2  $AFF(x, y, t) \triangleq AG(x) \wedge \exists z(RL(z) \wedge CF(x, z, t) \wedge INST(z, y))$



# Representation I

- ▶ The representation relation holds between agents
- ▶ Representation is linked with the delegation relation
- ▶ Organizations, as immaterial entities, cannot act without a physical agent who acts for them
- ▶ A relevant agent (i.e. the founder) gives the authority to one (or some) agent(s) to act on behalf of the organization
- ▶ The representation relation holds between agents that are classified by two roles: the representative and the represented
- ▶ Differently from delegation, the represented cannot do itself the action that is delegated to the representative



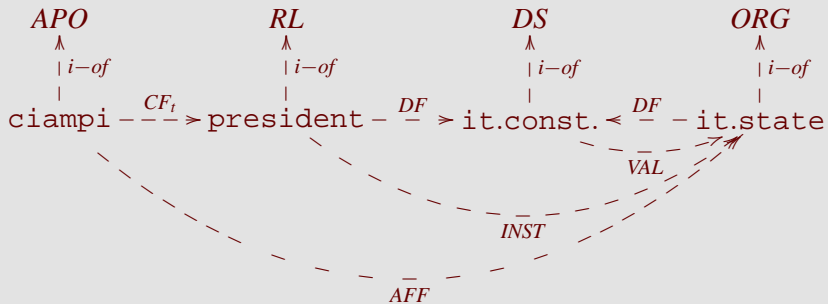
## Representation II

- ▶ An organization has at least a representative role and a represented role defined in its normative system
- ▶ The represented role classifies the organization and the representative role classifies another role (i.e. President) which, in turn, classifies an agentive physical object

With the representation relation, we could give a definition of organizations



## To sum up



# Future Issues

- (1) Linking representation with qua-individuals
- (2) Linking representation with affiliation (and with membership in a collection)
- (3) Specializing collection and collective into resources and staff (for organizations)
- (4) Interactions among organizations and embedding of organizations



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