

# Why Organizations?

- ▶ Computational representation inspired by human organizations
  - ▶ Map to business partners providing or using services
- ▶ Promote coherence in interactions
  - ▶ Offer a conceptually natural, high-level basis for understanding and designing service interactions

# Organizations

- ▶ Organizations nest, though usually not as trees
  - ▶ All organizations are agents
  - ▶ Some agents are organizations
- ▶ Organizations help overcome limitations of individuals in
  - ▶ Reasoning
  - ▶ Capabilities
  - ▶ Perception
  - ▶ Lifetime, persistence

# Three Kinds of Organizations

- ▶ Concrete (instantiated): agents playing roles
  - ▶ Configured, run-time concept
- ▶ Abstract (templates): roles and relationships among roles
  - ▶ Design-time concept
- ▶ Institutions: part abstract and part concrete
  - ▶ Run-time concept, but the membership can change
- ▶ Example: eBay
  - ▶ Buyers and sellers can change
  - ▶ But eBay itself is a fixed participant

# Legal Abstractions

- ▶ Contracts
- ▶ Directed obligations
- ▶ Hohfeldian concepts
- ▶ Compliance

# Contracts as Service Agreements

- ▶ Contracts structure interactions (i.e., service engagements) among autonomous parties
  - ▶ People and corporations
  - ▶ Governmental agencies
- ▶ Compare with contracts in programming
  - ▶ Each needs a computational representation
- ▶ *Key questions*: how to create, modify, perform, or monitor contracts

# Legal Concepts

Inherently multiagent: about interactions among autonomous parties

- ▶ Directed obligations
- ▶ One party being obliged to another party
- ▶ Multiagent flavor
- ▶ Contrast with traditional deontic logic
  - ▶ Zero-agent: it is obligatory that ...
  - ▶ One-agent: you are obliged to do ...

# Rights

- ▶ The rights or claims a party has on another party
  - ▶ Not the right (ethical) thing to do
- ▶ The claims of one party are the duties of another: claim is a correlate of duty

# Hohfeldian Concepts: 1

- ▶ The term right is used ambiguously
- ▶ Sixteen concepts distinguish the main situations:
  - ▶ Four main concepts
  - ▶ Their correlates
  - ▶ Their negations
  - ▶ Their negations' correlates



## Hohfeldian Concepts: 2

- ▶ Claim-duty: as above
- ▶ Privilege-exposure: freedom from the claims of another agent
- ▶ Power-liability: when an agent can change the claim-duty relationship of another agent
- ▶ Immunity-disability: freedom from the power of another agent

# Commitments for Contracts

- ▶ A contract is a set of related commitments
  - ▶ Provides a notional context to the commitments
  - ▶ Applies between specified parties, in a context (e.g., UCC, real-estate, Internet commerce)
- ▶ In contrast to commitments, other approaches:
  - ▶ Single-agent focused, e.g., deontic logic
  - ▶ Don't handle organizational aspects of contracts
  - ▶ Don't accommodate manipulation of contracts

# SoCom: Sphere of Commitment

A computational abstraction based on organizations

- ▶ An institution with additional features
  - ▶ Involves roles (abstract) or agents (concrete)
- ▶ A witness for the commitment
  - ▶ Trusted party to decide satisfaction or violation
- ▶ A locus for testing compliance and enforcing corrections (e.g., compensation)

# SoComs and Structure

A SoCom inherits policies from surrounding (contextual) SoCom

- ▶ E.g., UCC applies to commercial interactions
- ▶ Inherited policies can conflict because of
  - ▶ Nonunique nesting
  - ▶ When agents play multiple roles

# Virtual Enterprises (VE)

A VE offers commitments beyond those of its members to support business atomicity

- ▶ Sellers come together with a new proxy agent called VE
- ▶ Example of VE agent commitments:
  - ▶ Entertain order updates
  - ▶ Notify on change of order
  - ▶ Price guarantee
  - ▶ Delivery date guarantee

# A Selling VE (Composition Example)

- ▶ Diagram TBD

# Teams

- ▶ Tightly knit organizations
- ▶ Goals shared by all team members
- ▶ Commitments to help team members
- ▶ Commitments to adopt additional roles and offer capabilities on behalf of a disabled member

# Teamwork

When a team carries out some complex activity

- ▶ Negotiating what to do
- ▶ Monitoring actions jointly
- ▶ Supporting each other
- ▶ Repairing plans



# Organizations Summary

- ▶ Organizations are a natural metaphor for understanding and designing systems of services
- ▶ Organizations provide a basis for realizing coherent interactions
  - ▶ Legal and contractual concepts such as commitments
  - ▶ Teamwork
  - ▶ Understanding and formalizing negotiation