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