

Automobile Rental Ontology

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Background

ICS > 03 > 03.100 > 03.100.70

ISO 9001:2015

Quality management systems — Requirements

**THIS STANDARD WAS LAST REVIEWED AND CONFIRMED IN 2021.
THEREFORE THIS VERSION REMAINS CURRENT.**

ABSTRACT

[PREVIEW](#)

ISO 9001:2015 specifies requirements for a quality management system when an organization:

- a) needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and
- b) aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

All the requirements of ISO 9001:2015 are generic and are intended to be applicable to any organization, regardless of its type or size, or the products and services it provides.

GENERAL INFORMATION

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Technical Committee : [ISO/TC 176/SC 2](#) Quality systems

ICS : [03.100.70](#) Management systems | [03.120.10](#) Quality management and quality assurance

Motivations for ARO

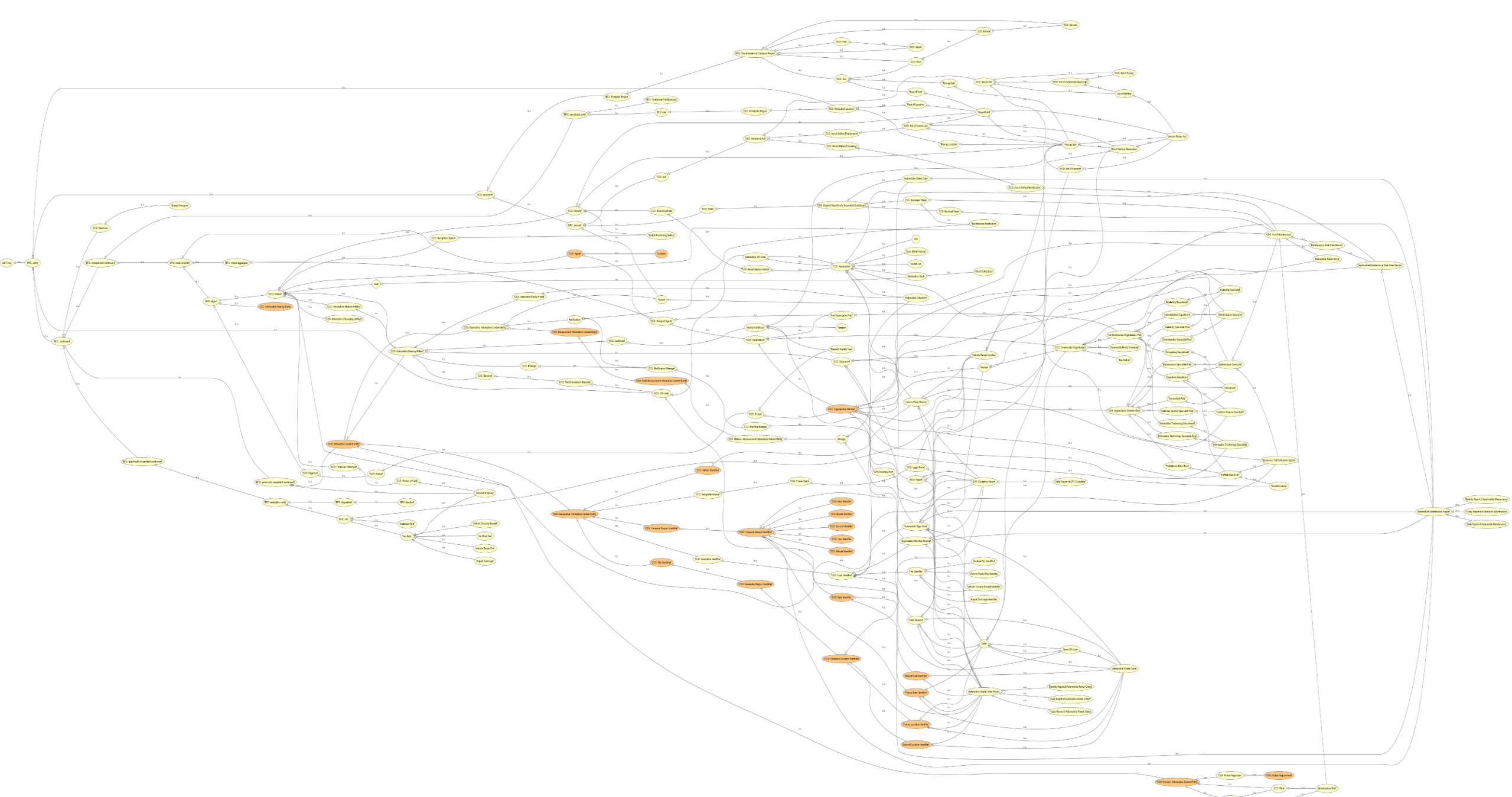
- 1. Characterize the organizational structure of an automobile rental company
- 2. Describe the automobile rental process
- 3. Tag important data items involved in car rental reports

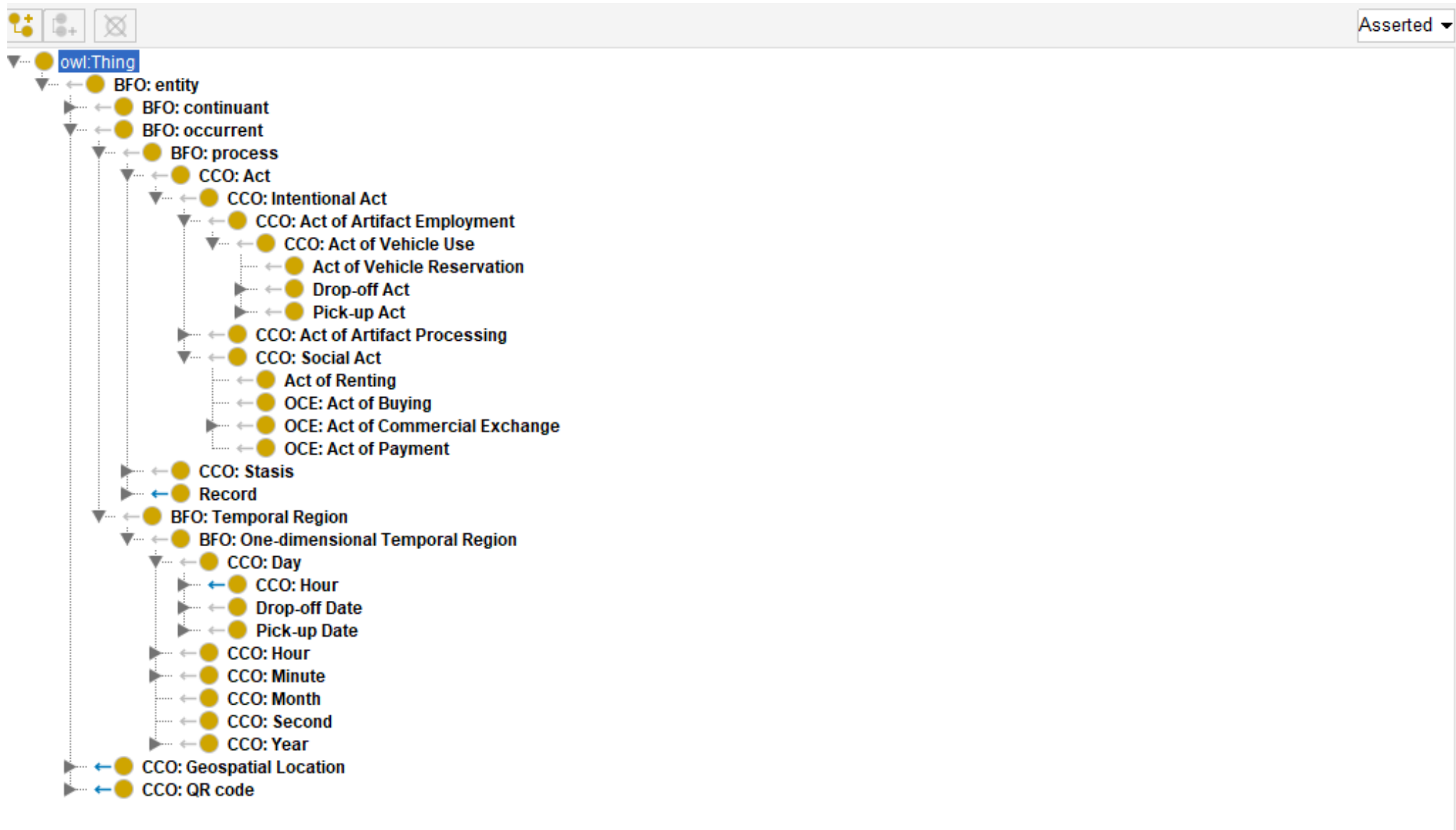
Design Principles of ARO

- 1. BFO (Basic Formal Ontology)-compliant
- 2. CCO (Common Core Ontologies)-compliant
- 3. OCE (Ontology of Commercial Exchange)-compliant, when dealing with Act of Renting
- ***4.** Fee as a role of GDC money

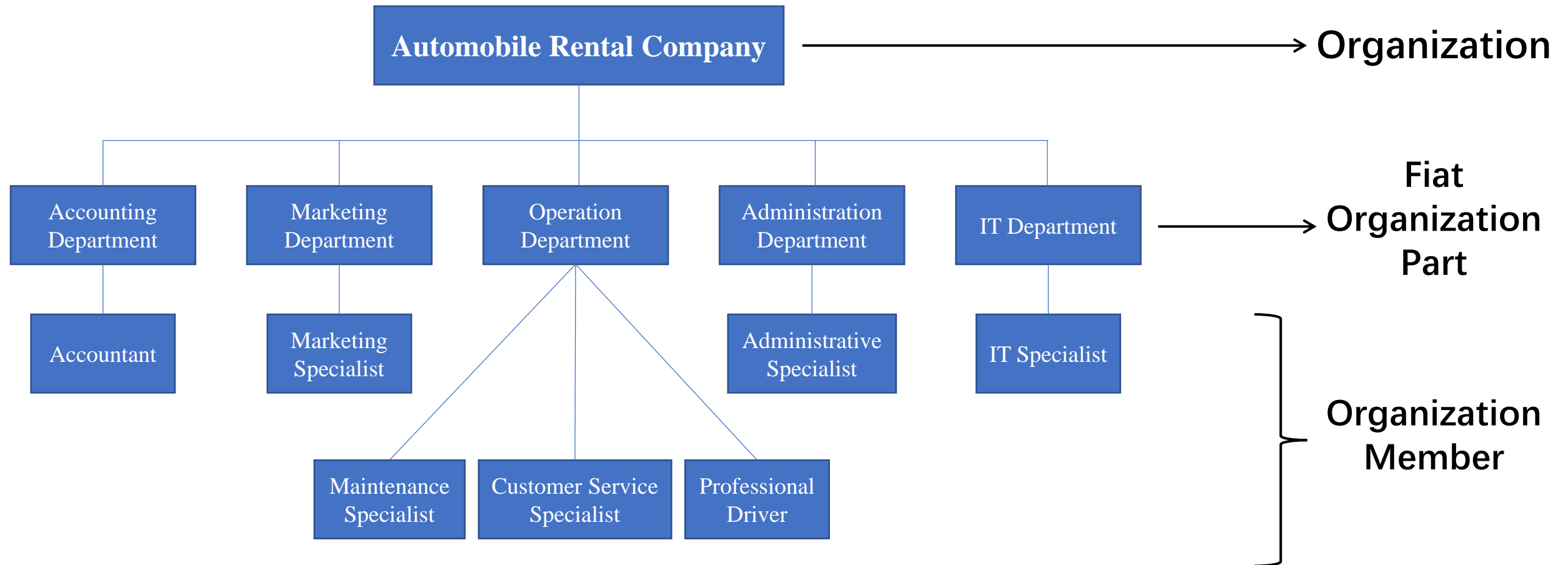
Current State of ARO

- **95** domain-specific terms
- General Theoretical Terms (4): fiat organization part, fiat commercial-organization part, amount of money, fee
- Terms for Domain-specific independent continuants: 49
- Terms for Domain-specific SDCs: 14
- Terms for Domain-specific GDCs: 21
- Terms for Domain-specific Occurrents: 7





Organizational Structure



Example: Fiat Organization Part

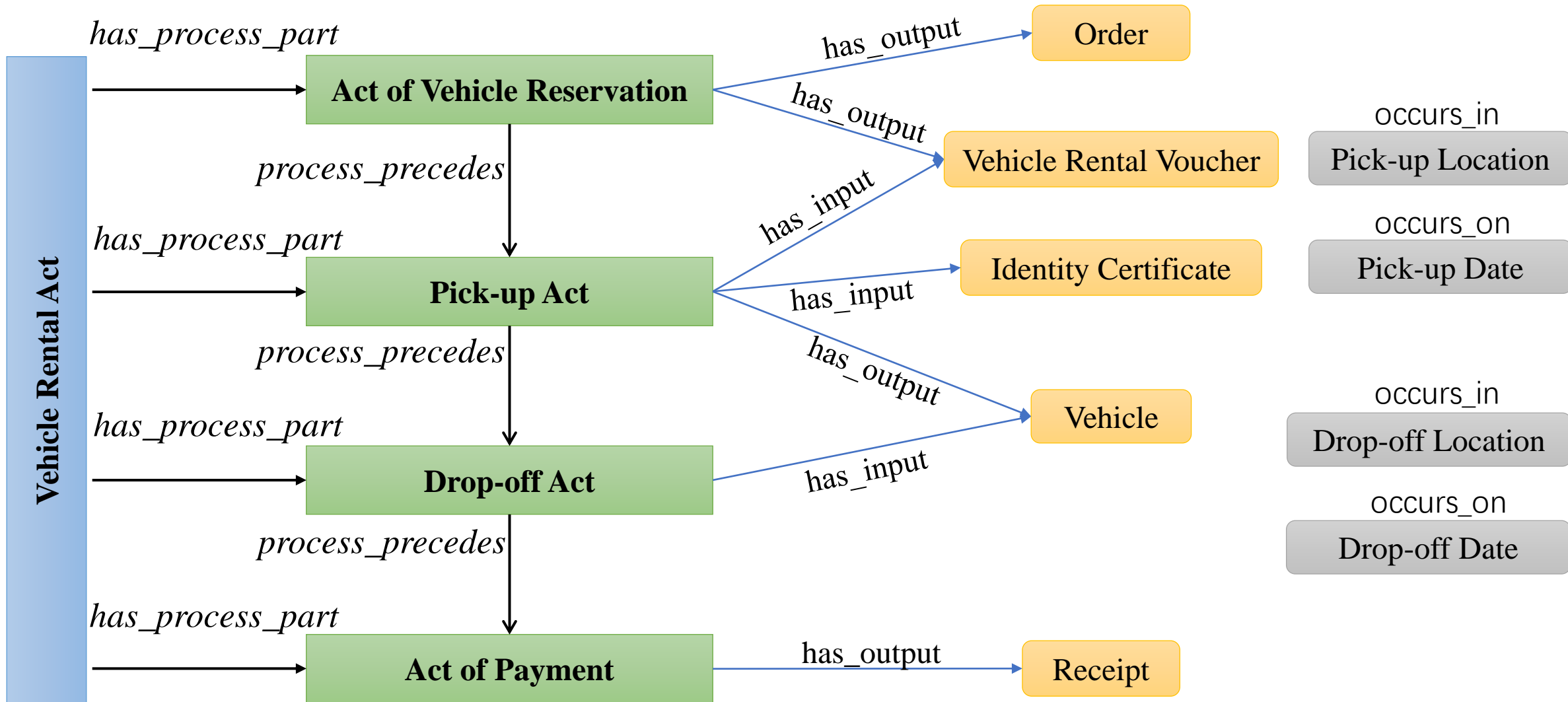
- 1. Fiat Organization Part

b is a fiat organization part = $_{def}$ b is a group of agents which is such that for all times t , if b exists at t then there is some organization c such that b proper continuant_part of c at t and b is demarcated from the remainder of c by a continuant fiat boundary.

- 2. Fiat Commercial-Organization Part

b is a fiat commercial organization part = $_{def}$ b is a fiat organization part which is for all times t , if b exists at t then there is some commercial organization c such that b proper continuant_part of c at t .

Automobile Rental Process



Vehicle Rental Act

- **Act of Vehicle Reservation** $=_{def}$ An **Act of Vehicle Use** which has output some Order and some Vehicle Rental Voucher that specify an Vehicle to be kept for some Customer to realize some Act of Renting.
- **Pick-up Act** $=_{def}$ An **Act of Vehicle Use** in which some Agent picks up some Vehicle.
- **Drop-off Act** $=_{def}$ An **Act of Vehicle Use** in which some Agent drops off some Vehicle.
- **Vehicle Rental Act** $=_{def}$ An **Act of Renting** in which one Agent, x, acquires temporary possession or use of a vehicle that is owned or controlled by an Automobile Rental Company, y.

Comparison: Buying vs. Renting

- **OCE: Act of Buying** =_{def} A **Social Act** that is a part of an **Act of Commercial Exchange**, in which one Agent, x, *receives a good from* the other Agent, y, or where y realizes some process directly or indirectly, for x, and in which x is obligated to realize some **Act of Payment**, which y receives.
- **ARO: Act of Renting** =_{def} A **Social Act** that is a part of an **Act of Commercial Exchange**, in which one Agent, x, *acquires temporary possession or use of a good or property that is owned or controlled by* another Agent, y, and in which x is obligated to realize some **Act of Payment**, which y receives.

Rental Fee

- **Amount of Money** =_{def} A **GDC** that generically depends on some Portion of Cash and is involved in a credit relation between at least two Agents or Organizations.
- **Fee Role (Fee)** =_{def} A **Role** that is borne by an **Amount of Money** which an Agent or Organization uses to realize some **Act of Payment** which is required by another Agent or Organization.
- **Vehicle Rental Fee** =_{def} A **Fee Role** that is borne by an Amount of Money which an Automobile Rental Company receives from a Customer in virtue of that Customer's acquiring temporary possession or use of a Vehicle that is owned or controlled by that Automobile Rental Company.

Rental Fee (II)

- **Airport Surcharge** $=_{def}$ A Fee Role that is borne by an Amount of Money which an Automobile Rental Company receives from a Customer that realizes a Pick-up Act at an airport.
- **No-Show Fee** $=_{def}$ A Fee Role that is borne by an Amount of Money which an Automobile Rental Company receives from a Customer because that Customer doesn't cancel an Act of Vehicle Reservation prior to a Pick-up Date, and doesn't realize a Pick-up Act on a specified One-Dimensional Temporal Region of that Pick-up Date.
- **Vehicle Security Deposit** $=_{def}$ A Fee Role that is borne by an Amount of Money which an Automobile Rental Company receives from a Customer in order to verify that Customer's intent to realize an Act of Renting.

Common Data Items in Car Rental Reports

All Reservations

Below you see all the reservations made through the Car Rental system. To edit or delete reservations use the icons at the right end of each row. You can use the search form to find a reservation. You can also use the quick filter buttons to show only Today / Tomorrow pick-ups or returns.

+ Add reservation

Search

All

Pick-up: Today Tomorrow

Return: Today Tomorrow

<input type="checkbox"/>	Pick-up / Return	Type	Car	Client	Total	Status	
<input type="checkbox"/>	22-07-2016, 09:00 at Hogarth Road, London 30-07-2016, 09:00 at Hogarth Road, London	Small: Mini	ABC12 345, Ford Ka	Alvin Lindsey (134) 633 7325	€ 640.00	Pending	<div><div></div><div></div></div>
<input type="checkbox"/>	18-08-2016, 09:00 at Hogarth Road, London 27-08-2016, 12:00 at Hogarth Road, London	Large: Premium	AB1 888C, BMW 7	Frances Dickson +145-39-7628799	€ 1302.00	Cancelled	<div><div></div><div></div></div>
<input type="checkbox"/>	13-09-2016, 09:00 at Hogarth Road, London 16-09-2016, 09:00 at Hogarth Road, London	Small: Mini	ABC12 345, Ford Ka	Hayley Leblanc +863-17-4326884	€ 240.00	Completed	<div><div></div><div></div></div>

- Automobile status code, automobile type code, license plate number, order number, organization member number
- Drop-off location identifier, pick-up location identifier
- Drop-off date identifier, pick-up date identifier
- Fee identifier: ...
- Proper name

How does ARO tag a rental order report?

Class hierarchy: Automobile Rental Order Report

owl:Thing

BFO: entity

BFO: continuant

BFO: generically dependent continuant

BFO: independent continuant

BFO: immaterial entity

BFO: material entity

BFO: object

CCO: Artifact

CCO: Act of Maintenance

CCO: Financial Instrument

CCO: Information Bearing Artifact

CCO: Barcode

CCO: Certificate

CCO: Document

CCO: Report

Automobile Maintenance Report

Automobile Rental Order Report

Daily Report of Automobile Rental Orders

Monthly Report of Automobile Rental Orders

Yearly Report of Automobile Rental Orders

GPS Exception Report

Order

Receipt

Vehicle Rental Voucher

CCO: Instrument Display Panel

CCO: Message

CCO: Information Medium Artifact

CCO: Information Processing Artifact

CCO: Navigation System

CCO: Vehicle

Electronic Toll Collection System

Seat

CCO: Information Bearing Entity

CCO: Organism

BFO: object aggregate

CCO: Agent

BFO: specifically dependent continuant

CCO: Resource

BFO: occurrent

CCO: Geospatial Location

CCO: QR code

Annotations: Automobile Rental Order Report

Annotations +

rdfs:label [language: en]

Automobile Rental Order Report

dc:creator [type: xsd:string]

karlx

dc:date [type: xsd:dateTime]

2022-05-03T03:44:29Z

definition [language: en]

A Report that is designed to bear some set of specific Information Content Entities that conveys an account of automobile rental orders during a particular period.

Description: Automobile Rental Order Report

Equivalent To +

SubClass Of +

'CCO: Report'

'is carrier of' some 'Automobile Type Code'

'is carrier of' some 'CCO: Temporal Interval Identifier'

'is carrier of' some 'Drop-off Date Identifier'

'is carrier of' some 'Drop-off Location Identifier'

'is carrier of' some 'Fee Identifier'

'is carrier of' some 'License Plate Number'

'is carrier of' some 'Order Number'

'is carrier of' some 'Organization Member Number'

'is carrier of' some 'Pick-up Date Identifier'

'is carrier of' some 'Pick-up Location Identifier'

General class axioms +

SubClass Of (Anonymous Ancestor)

'is carrier of' some 'CCO: Information Content Entity'

'part of' some 'CCO: Information Medium Artifact'

Thank You!