

COMPATIBILITY CHECKING OF COMPOUND BUSINESS RULES EXPRESSED IN NATURAL LANGUAGE – CASE STUDIES

This appendix presents content of case-studies, described in the paper Compatibility Checking of Compound Business Rules Expressed in Natural Language Against Domain Specification, written by Bogumiła Hnatkowska, Adrianna Kozierekiewicz and Marcin Pietranik. The paper was accepted for publication to the COMPSAC 2022 conference.

Each case-study consist of a class diagram (Fig. 1, Fig. 2), being a specification of considered domain, and a set of rules written in natural language. Business rules used in test-cases together with information about their type (VS – valid simple, VC – valid compound, IS – invalid simple, IC – invalid compound), and tool response ('+' – correct, '-' – incorrect) are presented Table I and Table II respectively.

I. FIRST CASE STUDY

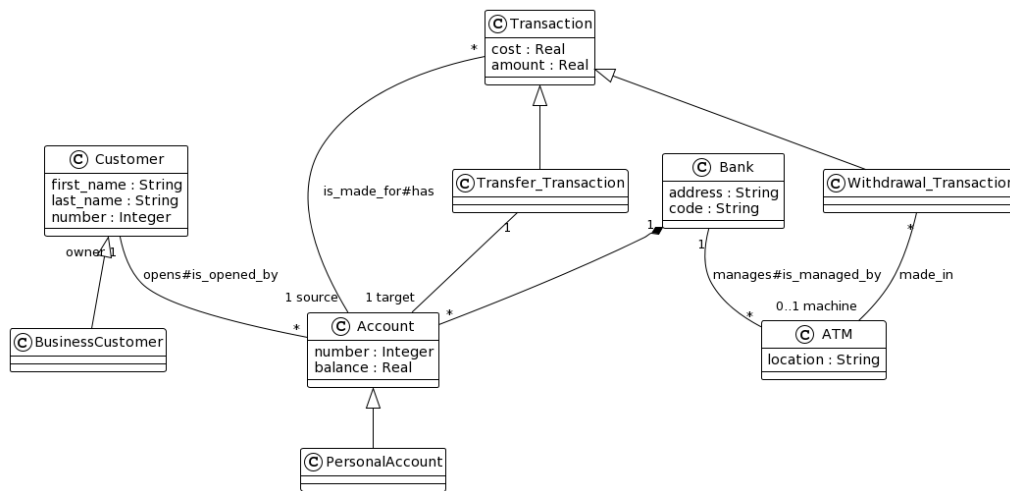


Fig. 1. E-Bank domain specification

TABLE I. BUSINESS RULES IN CASE STUDY 1

ID	Business Rule	Type	Tool Response
1	Client must open at most one account.	VS	+
2	Each bank must compose at least one account.	VS	+
3	It is possible, that a buyer opens at most one account.	VS	+
4	An account must be composed in at most one bank.	VS	+
5	Location of an Atm must be different than the address of a bank.	VS	+
6	Location of an Atm must be different than the bank's address.	VS	+
7	Each customer's number must be unique.	VS	+
8	Each personal account must be opened by at most one client.	VS	+
9	A business customer must open at least one personal account.	VS	+
10	A buyer must open at most one account.	VS	+
11	Personal account must be opened by one business customer.	VS	+
12	A personal account must be opened by one business customer.	VS	+
13	An atm must be managed by at most one bank.	VS	+
14	A bank must manage at least one atm.	VS	+
15	An account must be enclosed in at most one bank.	VS	+
16	Each person must open one bank account.	IS	+
17	First name of customer must be different from customer family name.	IS	+
18	Customer must open at most one customer account.	IS	+
19	It is necessary that each account belongs to one client.	IS	+
20	Account must be given by exactly one owner.	IS	+
21	It is necessary that each account is opened by exactly two guests.	IS	+
22	Each bank's first name must be unique.	IS	+
23	Bank aggregates many parts.	IS	+
24	Bank contains many ATM.	IS	+
25	ATM must aggregate at least one bank.	IS	+
26	The cost of withdrawal transaction must be zero if the withdrawal transaction was made for an account that was opened by a business customer	VC	+
27	The cost of withdrawal transaction must be zero if the withdrawal transaction was made for an account for which the owner is a business customer	VC	+
28	The cost of transfer transaction must be zero if the source is the same as the target	VC	+
29	The cost of transfer transaction must be zero if the source and target accounts are the same	VC	-

19	It is obligatory that each driver of a rental is qualified.	VS	+
20	Each car movement specifies exactly one car group.	VS	+
21	Each car transfer includes exactly one car movement.	VS	+
22	Each driver of the rental has a valid driver license.	VS	+
23	Each branch's name must be unique.	VS	+
24	At the <i>start date time</i> of each rental it is obligatory that the fuel level of the rented car of the rental is full.	IC	-
25	It is obligatory that the fuel level of the rented car of the rental is full at the <i>start date time</i> of each rental.	IC	+
26	A <i>car movement</i> has a scheduled pick up date time if and only if the scheduled pick up date time is the scheduled start date time of the rental period that is included in the rental.	IC	+
27	The transferred car of a car transfer is the rental car that <i>is connected</i> to the one way car movement that is included in the car transfer.	IC	+
28	A rental has a <i>required car group</i> if and only if the <i>required car group</i> is the car group that is specified in the car movement that is included in the rental.	IC	-
29	A <i>car move</i> has a transfer drop off date time if and only if the transfer drop off date time is the actual end date time of the fixed period that is included in <i>the car move</i> .	IC	+
30	A rental has a return date time if and only if the return date time is the scheduled end date time of the rental period that is included in the rental.	IC	+
31	If the period of the pick up branch of a rental is not the period of registration of the rented car of the rental then it is obligatory that the country of the return branch of the rental is the country of registration of the rented car.	IC	+
32	It is obligatory that each driver of a rental is old.	IS	+
33	Each <i>part's</i> name must be unique.	IS	+
32	Each car movement <i>defines</i> exactly one car group.	IS	+
33	It is permitted that <i>a driver of the car movement</i> is not a barred driver.	IS	+