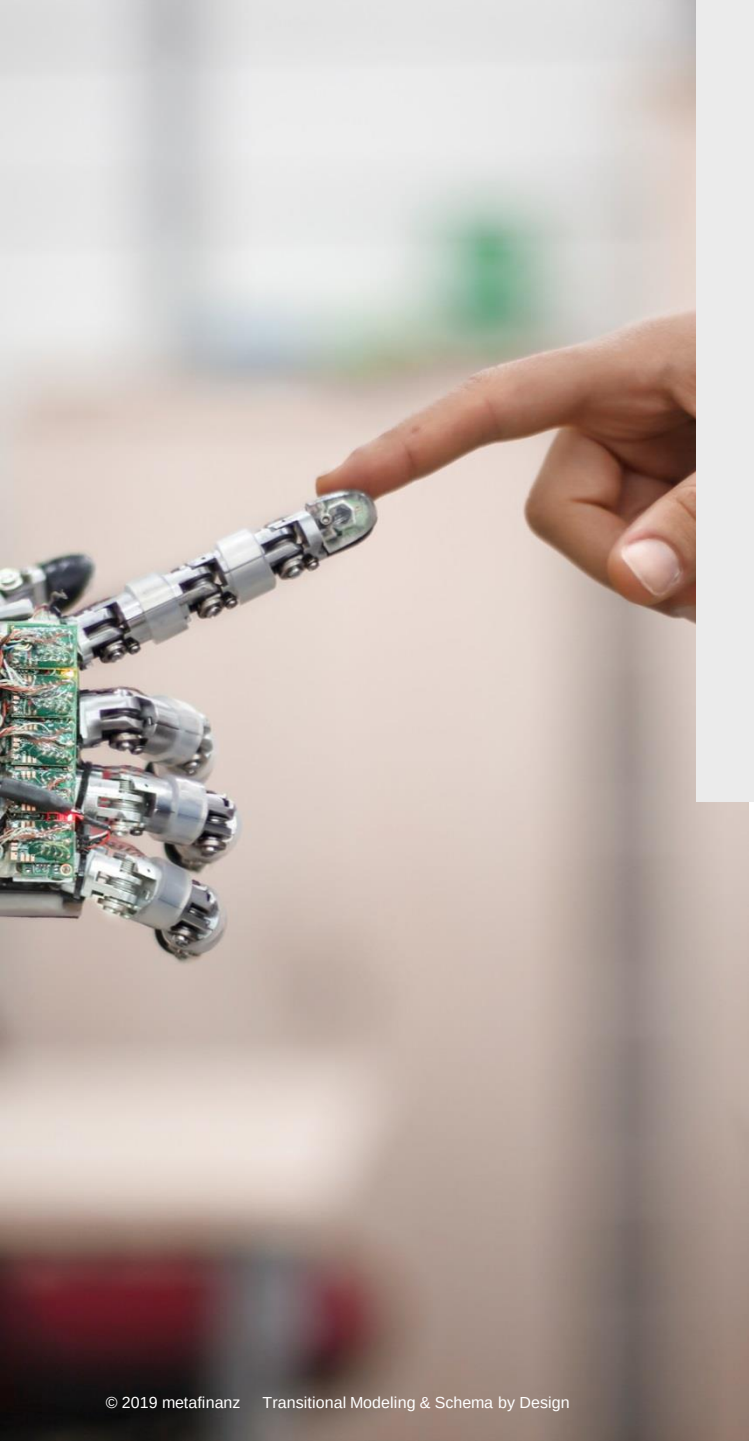

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— 9. Tagung der DDVUG (Frühjahrstagung 2019)

Transitional Modeling & Schema by Design

22. März 2019

Christian Kaul
metafinanz Informationssysteme GmbH

Agenda

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01

Transitional Modeling

02

Schema by Design

03

Resources

— Example

Alice and Bob

Our example:

Alice makes a phone call to Bob.

We will use the following unique identifiers:

- A for Alice
- B for Bob
- C for the phone call

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— Transitional Modeling & Schema by Design

Part 1: Transitional Modeling

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Transitional Modeling

- **Transitional modeling** is a powerful new modeling technique that can be used to model conflicting, unreliable and varying information.
- It achieves all this with a very simple notation.
- Popular data modeling techniques like data vault, anchor modeling and 3NF can be considered special cases of transitional modeling.

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Appearances

An **appearance** is a pair that consists of a unique identifier for something and a role that this identifier can play.

- (A, is calling party)
- (A, has a phone number)
- (B, is called party)
- (B, has a phone number)
- (C, is a phone call)
- (C, has duration)

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Dereferencing Sets

A **dereferencing set** is a set of one or more appearances that belong together.

Sets with only one appearance usually stand for properties of a thing.

Sets with multiple appearances usually stand for relationships between things.

- {(A, has a phone number)}
- {(B, has a phone number)}
- {(C, has duration)}
- {(A, is calling party), (B, is called party), (C, is a phone call)}

Posits

A **posit** is a triple that consists of a dereferencing set, some value and a time point, the **appearance time** of this dereferencing set with this value.

- p_1 := *[{(A, has a phone number)}, +491712345678, 2008-11-02]*
- p_2 := *[{(B, has a phone number)}, +491723456789, 2011-07-13]*
- p_3 := *[{(C, has duration)}, 302 s, 2018-12-05 14:47:31]*
- p_4 := *[{(A, is calling party), (B, is called party), (C, is a phone call)}, started, 2018-12-05 14:42:29]*

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Assertions

An **assertion** is a predicate that consists of a unique identifier (the **positor** who makes the statement), a posit, a **reliability value** between −1 and 1 and a time point (the **assertion time** when the statement is made).

- !(CRM, *[{(A, has a phone number)}, +49 1712345678, 2008-11-02],* 1, 2008-11-02)
- !(CRM, *[{(B, has a phone number)}, +49 1723456789, 2011-07-13],* 1, 2011-07-03)
- !(CDR, *[{(C, has duration)}, 302 s, 2018-12-05 14:47:31],* 0.99, 2018-12-05 14:47:32)
- !(CDR, *[{(A, is calling party), (B, is called party), (C, is a phone call)}, started, 2018-12-05 14:42:29],* 0.99, 2018-12-05 14:42:30)

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— Transitional Modeling & Schema by Design

Part 2: Schema by Design

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Schema by Design

- Transitional modeling allows for **schema by design**.
- At write time, only the theoretical minimum of structure is imposed. Modelers (who may even disagree on classifications) have to provide enough metainformation that one can understand what the model represents.
- At read time, consumers can view the information using the model that is the best fit for their needs.

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Classes

A **class** is a thing that can be used to classify other things.

At read time, the classes will become the entities of the model the consumer uses.

- [{(***CST***, is class)}, Customer, the dawn of time]
- [{(***PTY***, is class)}, Party, the dawn of time]
- [{(***CLL***, is class)}, Call, the dawn of time]
- [{(***COM***, is class)}, Communication, the dawn of time]

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Classifiers

A **classifier** is a posit that assigns a thing to a certain class.

At read time, the classifiers will be used to populate the entities the consumer uses.

- p_{m1} := *[{(A, thing), (**CST**, class)}, active, 2008-11-02]*
- p_{m2} := *[{(B, thing), (**CST**, class)}, active, 2011-07-03]*
- p_{m3} := *[{(C, thing), (**CLL**, class)}, active, 2018-12-05]*
- p_{m4} := *[{(A, thing), (**PTY**, class)}, active, 1972-05-18]*
- p_{m5} := *[{(B, thing), (**PTY**, class)}, active, 1987-03-14]*
- p_{m6} := *[{(C, thing), (**COM**, class)}, active, 2018-12-05]*

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Assertions of Classifiers

An **assertion of a classifier** is an assertion whose posit is a classifier.

These assertions represent the modeling decisions of the different modelers (modeler Hans asserts that p_{m1} is true, i.e. that Alice is a Customer, while modeler Dave asserts that p_{m4} is true, i.e. that Alice is a Party).

- !(Hans, p_{m1}, 1, 2018-12-07)
- !(Hans, p_{m2}, 1, 2018-12-07)
- !(Hans, p_{m3}, 1, 2018-12-07)
- !(Dave, p_{m4}, 1, 2018-12-07)
- !(Dave, p_{m5}, 1, 2018-12-07)
- !(Dave, p_{m6}, 1, 2018-12-07)

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Models

A **model** is a body of information in which each thing has been classified using assertions of classifiers.

Here, we have one model where the classifiers come from Hans and another model where the classifiers come from Dave.

- $\mathbf{M_{Hans}}$
- $\mathbf{M_{Dave}}$

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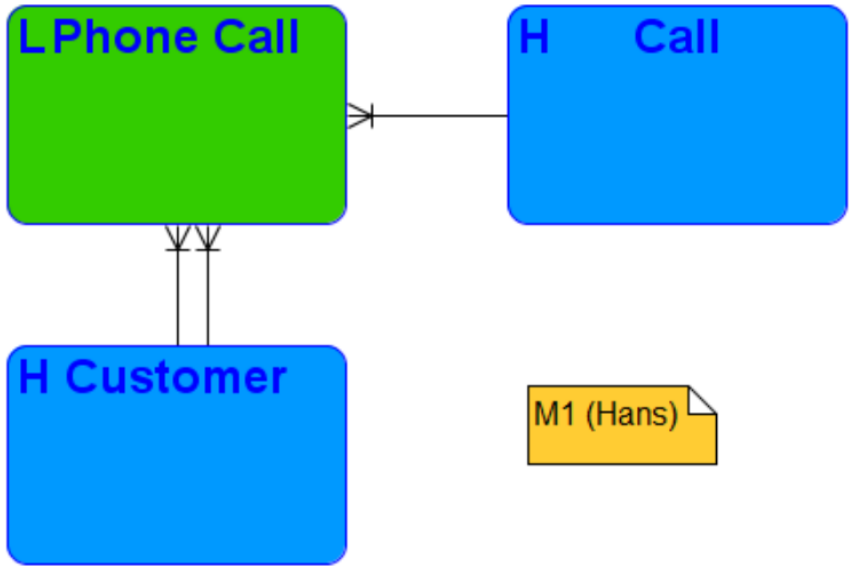
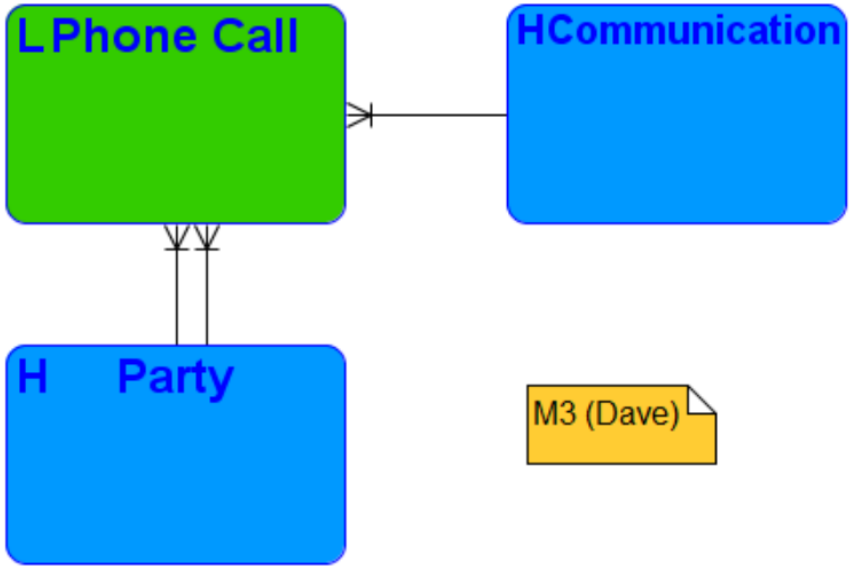
Same information, different models





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Part 3: Resources

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Resources

- The original paper: http://www.anchormodeling.com/wp-content/uploads/2018/12/Transitional_Modeling_DOI.pdf
- More articles by Lars: http://www.anchormodeling.com/
- An article by Barry Devlin: https://tdwi.org/articles/2019/02/01/diq-all-models-in-times-of-uncertainty.aspx
- My articles: https://www.linkedin.com/in/christian-kaul/detail/recent-activity/posts/

Any questions?

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