

# The pain points of structural conceptual modeling

## Term of consent

**Study description:** In this study, we looked into the frustrations — named here as pain points — faced by modelers throughout structured conceptual modeling. We borrow the term "pain points" from Marketing which refers to moments of customer dissatisfaction at not having their expectations met through their experience with a particular product and/or service. A deeper understanding of the pain points of modeling can help to develop and enhance modeling methods, languages, and tools to improve modelers' experiences. It can also help to (i) assess the costs of modeling, (ii) identify alternative solutions to deal with modeling difficulties, and (iii) facilitate the learning process for novice modelers.

**Study participation:** The study takes about 15 minutes of your time. You will be asked to complete an online survey with questions concerning your academic and professional background, as well as your experience with structural conceptual modeling.

**Data collection:** The research team will collect and analyze the data but your responses will remain confidential, and no names will be included in any reports. The data collected during the study will be anonymous and treated following the General Data Protection Regulation (GDPR) privacy and security law. This research has been approved by the Ethical Committee of the Free University of Bozen-Bolzano (Italy).

If you have any questions or concerns regarding this study, contact the person named below.

Controller name: Isadora Valle Sousa

Contact details: ivallesousa@unibz.it

\* Please select your choice below.

Clicking on the "Agree" button indicates that

- You have read and understand the above information
- You voluntarily agree to participate in the online study
- You are 18 years of age or older
- You understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without penalty.

Agree

Disagree

Thank you for accepting to participate in our study!

## The pain points of structural conceptual modeling

Before starting this survey you need to know...

What are Structural Conceptual Models?

They are conceptual models that focus on structural (as opposed to dynamic) aspects of the domain aiming at identifying, analyzing, and describing key structural regularities (i.e., types, attributes, relations, and constraints) of a specific universe of discourse.



Examples of structural conceptual models are those developed with **UML Class Diagram**, **OntoUML**, **ORM**, and **ER**.



Examples of what we do not consider structural conceptual models are those developed with **ArchiMate**, **BMPN**, **i\***, and **e3value**.

## The pain points of structural conceptual modeling

\* Have you ever experienced the process of creating a structural conceptual model?

Yes

No

## The pain points of structural conceptual modeling

### Respondent Profile

PQ1.1 Which of the structural conceptual modeling languages below do you have experience with?

- UML
- OntoUML
- ER / EER
- ORM
- Other (please specify)

PQ1.2 \* Among the structural conceptual modeling languages you have experience with, choose **one** to be your reference while responding to the remaining survey question.

- UML
- OntoUML
- ER / EER
- ORM
- Other (please specify)

PQ2.1 Which of the structural conceptual modeling tools below do you have experience with?

- |  |  |
|--|--|
| <input type="checkbox"/> Visual Paradigm   | <input type="checkbox"/> ArgoUML               |
| <input type="checkbox"/> Enterprise Architect (Spars Systems)  | <input type="checkbox"/> MagicDraw             |
| <input type="checkbox"/> Astah   | <input type="checkbox"/> StarUML               |
| <input type="checkbox"/> Lucidchart  | <input type="checkbox"/> IBM Rational Rhapsody |
| <input type="checkbox"/> Draw.io   | <input type="checkbox"/> JetUML                |
| <input type="checkbox"/> Other (please specify)<br><div style="border: 1px solid black; height: 30px; width: 100%;"></div> |  |

PQ2.2 \* Among the structural conceptual modeling tools you have experience with, choose **one** to be your reference while responding to the remaining survey question.

- |   |   |
|---|---|
| <input type="radio"/> Visual Paradigm   | <input type="radio"/> ArgoUML               |
| <input type="radio"/> Enterprise Architect (Spars Systems)  | <input type="radio"/> MagicDraw             |
| <input type="radio"/> Astah   | <input type="radio"/> StarUML               |
| <input type="radio"/> Lucidchart  | <input type="radio"/> IBM Rational Rhapsody |
| <input type="radio"/> Draw.io   | <input type="radio"/> JetUML                |
| <input type="radio"/> Other (please specify)<br><div style="border: 1px solid black; height: 30px; width: 100%;"></div> |   |

PQ3 \* For how long have you been engaged in structural conceptual modeling?

- |   |
|---|
| <input type="radio"/> Less than 1 year.   |
| <input type="radio"/> Between 1 and 3 years.  |
| <input type="radio"/> More than 3 years (Please specify for how many years).<br><div style="border: 1px solid black; height: 30px; width: 100%;"></div> |

PQ4 \* Which of the activities below best describes how you have been involved with structural conceptual modeling over the years?

- I have been involved in reading and providing feedback on conceptual models created by other people.
- I have been involved in creating conceptual models myself.
- I have been involved in documenting conceptual models.
- I have been involved in implementing conceptual models.
- I have been involved in updating conceptual models created by someone else.
- Other (please specify)

PQ5 \* How would you self-evaluate your experience with structural conceptual modeling?

- Novice** (Limited experience, new to the field, needs significant guidance, creates basic models with low complexity.)
- Beginner** (Basic understanding, may require guidance, developing expertise, capable of simple models.)
- Intermediate** (Good grasp of concepts and tools, works independently on many tasks, creates moderately complex models.)
- Advanced** (High expertise, works independently, guides less experienced modelers, creates complex and accurate models.)
- Expert** (Highly proficient and sought after, handles complex tasks, in-depth understanding of methodologies and tools.)

PQ6 \* In which context do you usually get involved with structural conceptual modeling?

- Education
- Research
- Industry
- Government
- Other (please specify)

PQ7 \* How did you learn about structural conceptual modeling?

- |  |   |
|--|---|
| <input type="checkbox"/> Bachelor Course   | <input type="checkbox"/> Independent Course / Enterprise Training   |
| <input type="checkbox"/> Specialisation Course   | <input type="checkbox"/> Work Experience (On the job)               |
| <input type="checkbox"/> Master Course   | <input type="checkbox"/> Self-learning (E.g online resource, books) |
| <input type="checkbox"/> PhD Course  |   |
| <input type="checkbox"/> Other (please specify)<br><div style="border: 1px solid black; height: 30px; width: 100%;"></div> |   |

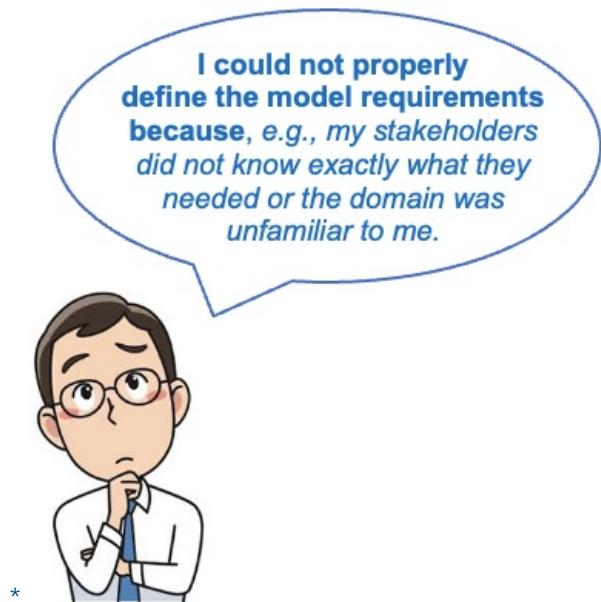
PQ8 \* What is your educational level?

- Bachelor's degree
- Trade school certification
- Master's degree or higher education
- Other (please specify)

- Prefer not to say

## The pain points of structural conceptual modeling

PP 01



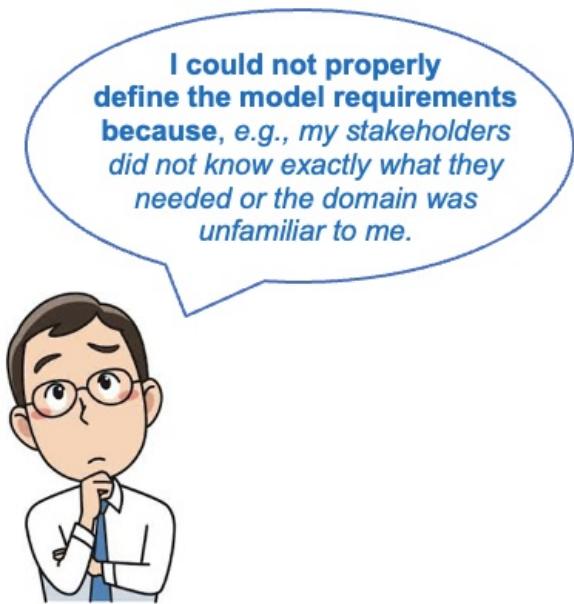
\* Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 01



I could not properly define the model requirements because, e.g., my stakeholders did not know exactly what they needed or the domain was unfamiliar to me.

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 02



**My stakeholders resisted adopting modeling, a modeling language, or a tool because, e.g., they did not think it was worth it or I could not show its value.**

\*

Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 02



**My stakeholders resisted adopting modeling, a modeling language, or a tool because, e.g., they did not think it was worth it or I could not show its value.**

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

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This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

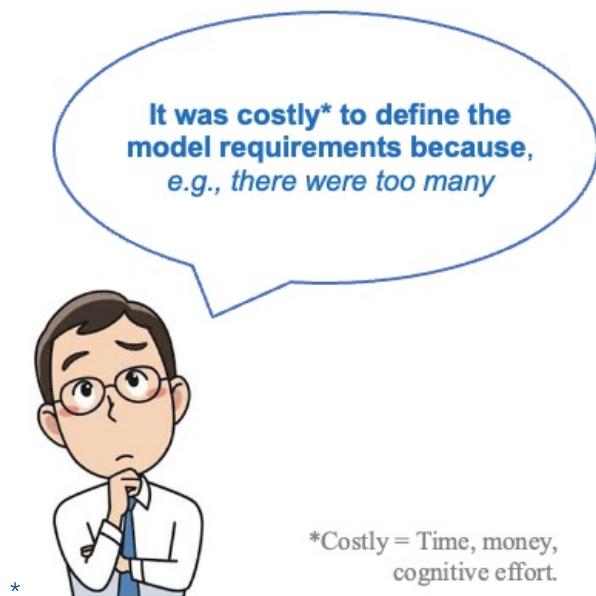
This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 03



\*Costly = Time, money,  
cognitive effort.

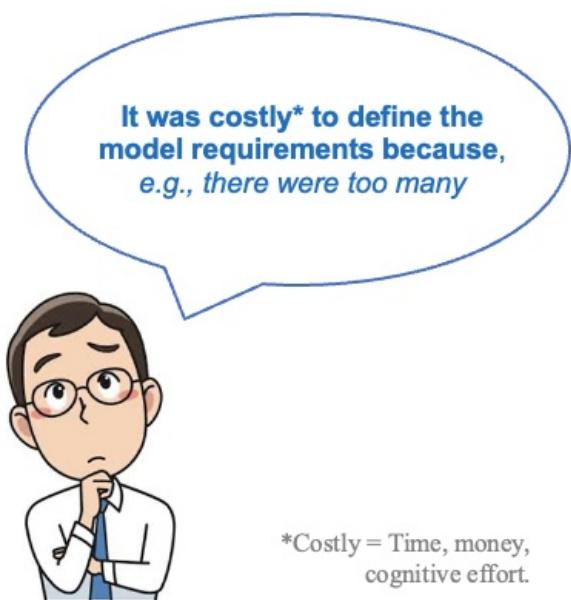
Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 03



**It was costly\* to define the model requirements because, e.g., there were too many**

\*Costly = Time, money, cognitive effort.

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

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This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 04



\*Costly = Time, money,  
cognitive effort.

Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 04



It was costly\* to negotiate a common definition among the experts about a concept of the project's domain of interest.

\*Costly = Time, money, cognitive effort.

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
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I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

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skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

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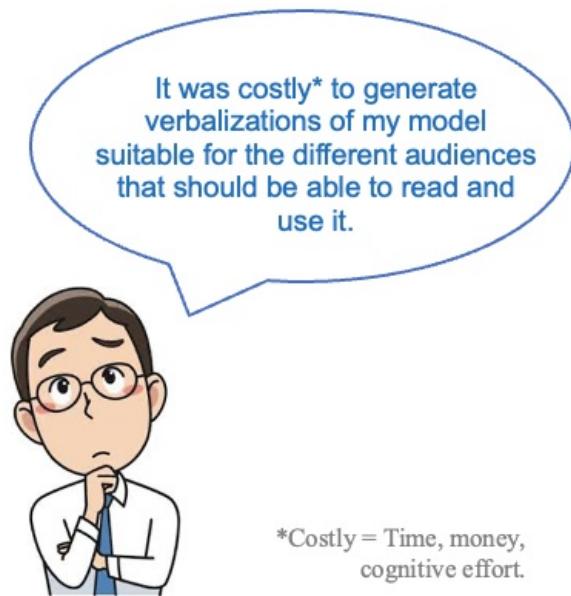
This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 05



\*Costly = Time, money,  
cognitive effort.

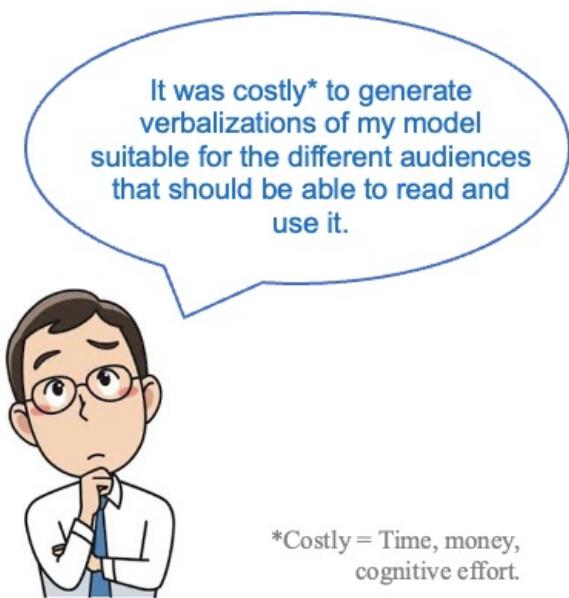
Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 05



\*Costly = Time, money,  
cognitive effort.

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
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This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 06



\*

Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 06



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
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I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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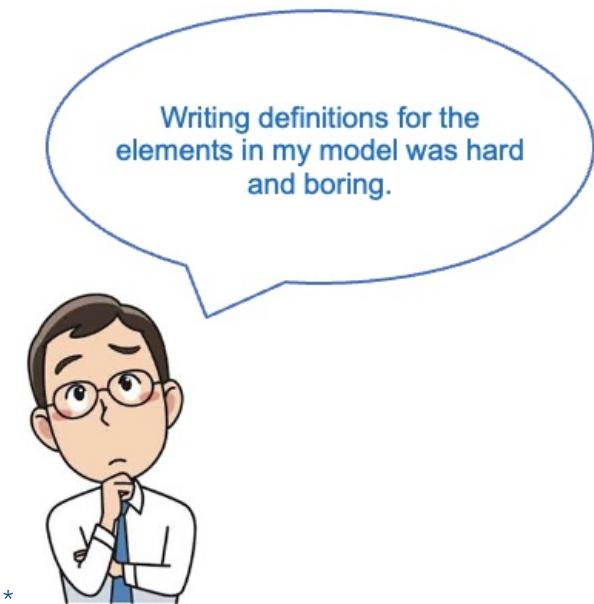
This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 07



\*

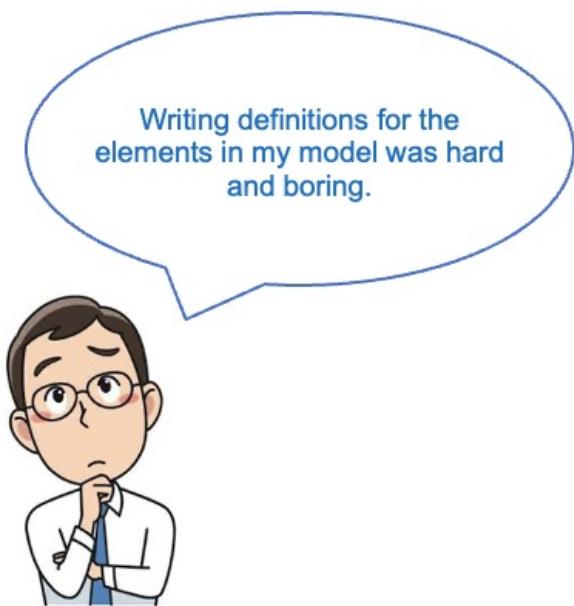
Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 07



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

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This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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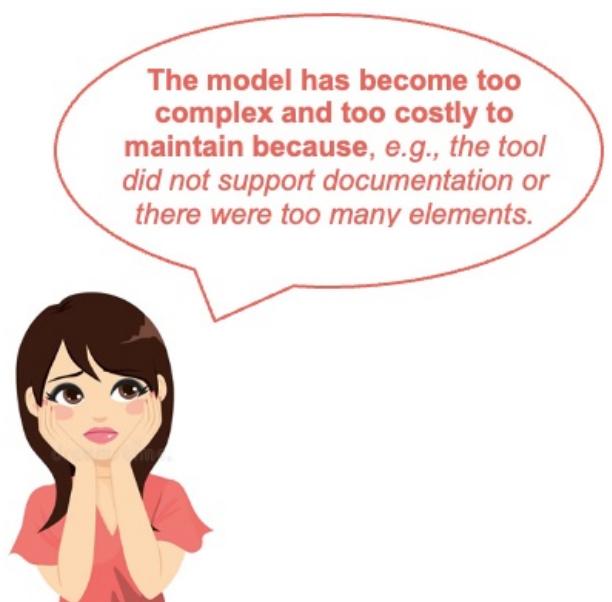
This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 08



\*

Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 08



**The model has become too complex and too costly to maintain because, e.g., the tool did not support documentation or there were too many elements.**

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Other action (please specify)

## The pain points of structural conceptual modeling

PP 09



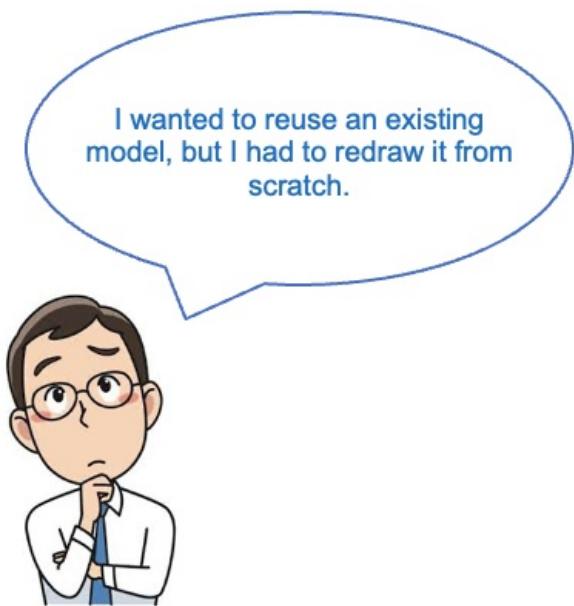
\* Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 09



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 10



\*

Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 10



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

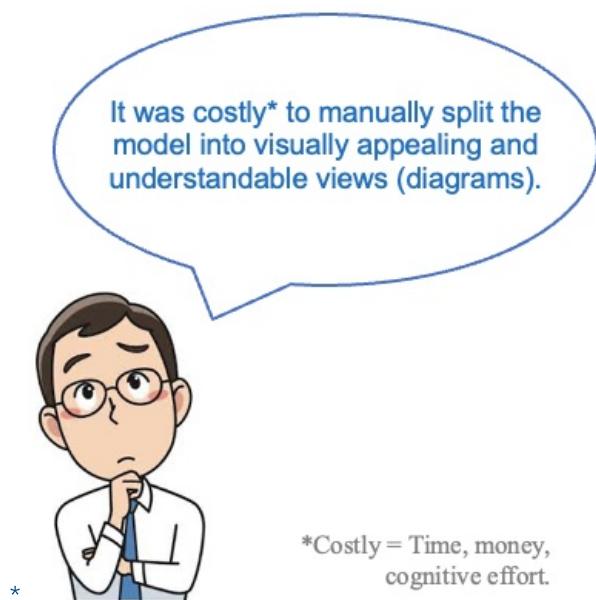
This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 11



\*Costly = Time, money,  
cognitive effort.

Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 11



\*Costly = Time, money,  
cognitive effort.

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 12



\*

Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 12



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 13



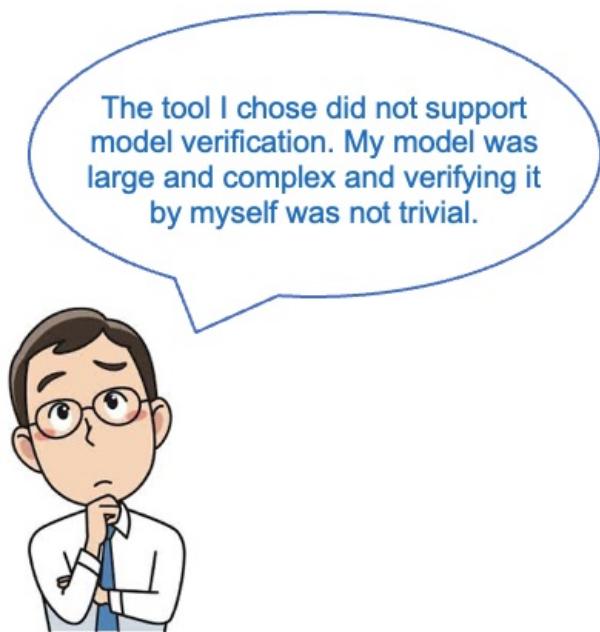
Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 13



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

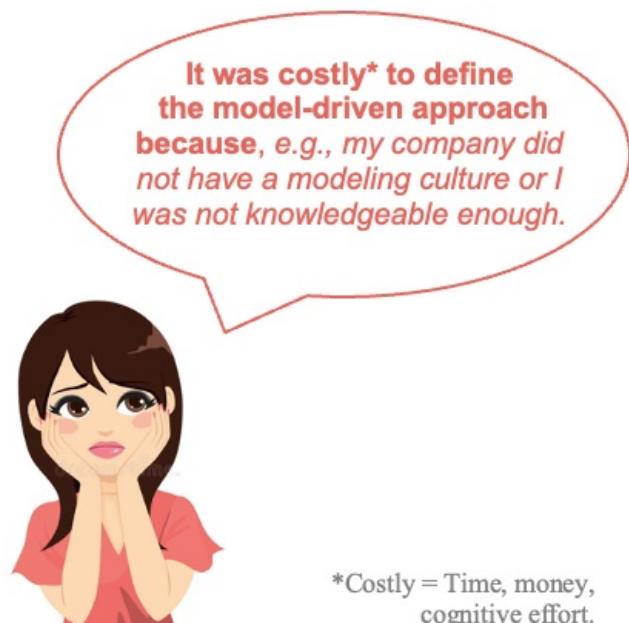
This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 14



**It was costly\* to define  
the model-driven approach  
because, e.g., my company did  
not have a modeling culture or I  
was not knowledgeable enough.**

\*Costly = Time, money,  
cognitive effort.

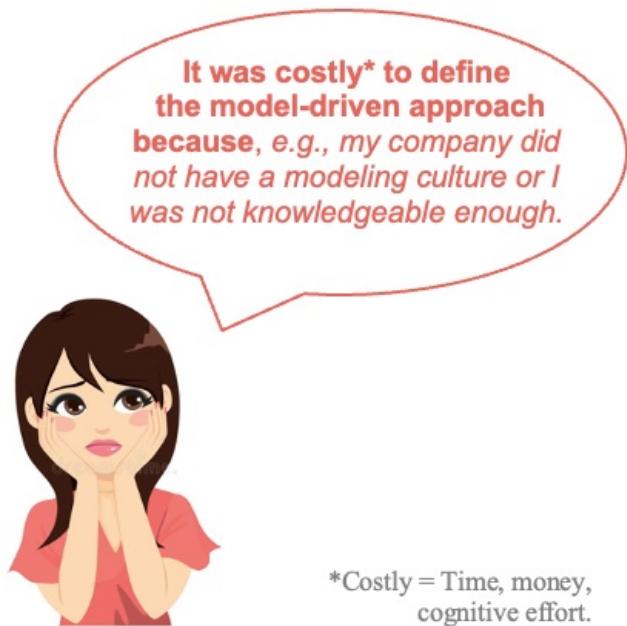
Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 14



**It was costly\* to define  
the model-driven approach  
because, e.g., my company did  
not have a modeling culture or I  
was not knowledgeable enough.**

\*Costly = Time, money,  
cognitive effort.

\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 15



\*

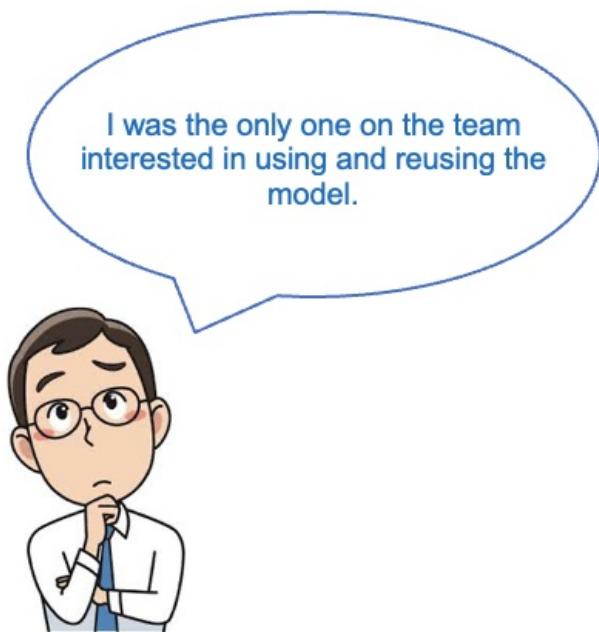
Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 15



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

PP 16



\* Do you recall feeling this frustration throughout the modeling process?

Yes

No

## The pain points of structural conceptual modeling

PP 16



\* How often do you recall experiencing this frustration?

- N/A     Rarely     Sometimes     Usually     Always

\* Please indicate whether you agree or disagree with the following statements about your **reasons** for feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt frustrated because I wasted time or made others waste their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because it generated more costs than expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I could not achieve my goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt frustrated because I had negative feelings about myself (e.g. incompetence, unappreciated).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other reason (please specify)	<input type="text"/>				

\* Please indicate whether you agree or disagree with the following statements about your **actions after** feeling this frustration.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Although I felt frustrated, I kept modeling without changing anything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to change the modeling language.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This frustration contributed to my decision to increase my and/or my team's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

skills in conceptual modeling.

This frustration contributed to my decision to change the modeling tool.

This frustration contributed to my decision to change the modeling method.

This frustration contributed to my decision to implement a workaround within the model-based approach.

This situation made me frustrated enough to give up on solving the problem using model(s).

Other action (please specify)

## The pain points of structural conceptual modeling

If you answered "This frustration contributed to my decision to implement a workaround within the model-based approach." or "This situation made me frustrated enough to give up on solving the problem using model(s)." for one of the frustrations presented, we would like to know more about your experience.

Therefore, we would be grateful if you could share with us your **contact details** using the form below. This is needed to guarantee the confidentiality of your responses as well as your personal data.

[https://docs.google.com/forms/d/e/1FAIpQLScm\\_z9SaapwA9XNhx1AWL0l9KoI3UsVHawnLsScHC9jagBgBQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScm_z9SaapwA9XNhx1AWL0l9KoI3UsVHawnLsScHC9jagBgBQ/viewform?usp=sf_link)