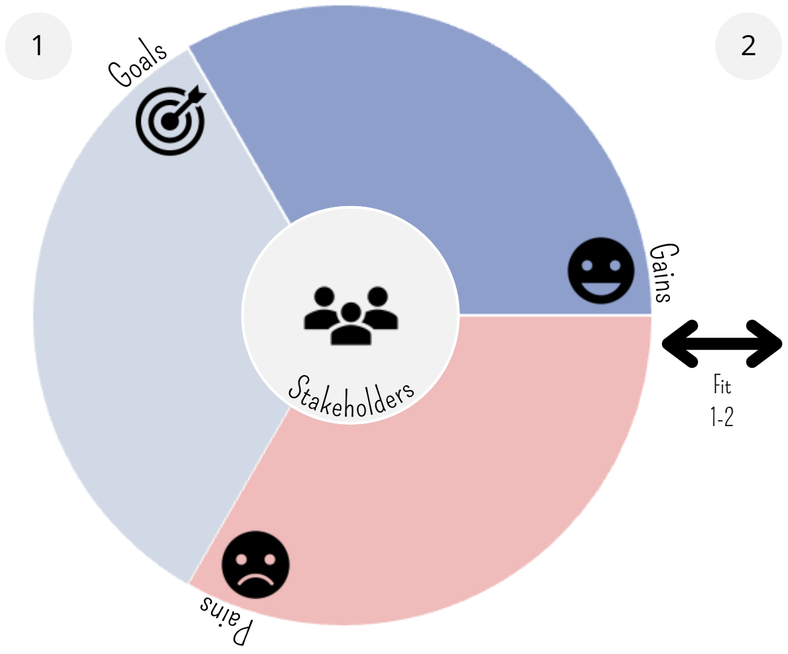
THE MODELING VALUE CANVAS

Guidebook

UNIVERSITY OF TWENTE. | Semantics Cybersecurity Services

Decision:



THE MODELING VALUE CANVAS

It provides a practical tool for capturing and communicating the value of modeling. It helps users decide when, what, and how to model, justify modeling choices, plan efforts and investments, and reflect on outcomes. It makes modeling-related decisions more transparent, strategic, and value-driven.

Download

Canva

PDF

The main goals of the Modeling Value Canvas

You can use it for ...

DECIDE

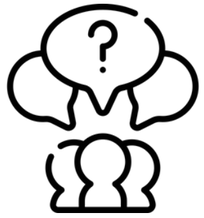
It assists in making informed decisions about whether, what, and how to model. It helps clarify questions such as: *Should we develop a model for this situation? Which type of model or modeling approach is most appropriate? Which modeling language or tool should be employed?*

JUSTIFY

It provides a structured basis for communicating and justifying modeling choices. It facilitates reasoning around questions such as: *Why is this model an appropriate solution? Why is a graphical representation valuable here? Why was this particular modeling language selected?*

PLAN

It supports the collaborative planning of modeling activities and investments. It provides a structured view to address questions such as: *Who should be involved in modeling? How much time and effort should be allocated? What scope and level of detail should the model cover?*

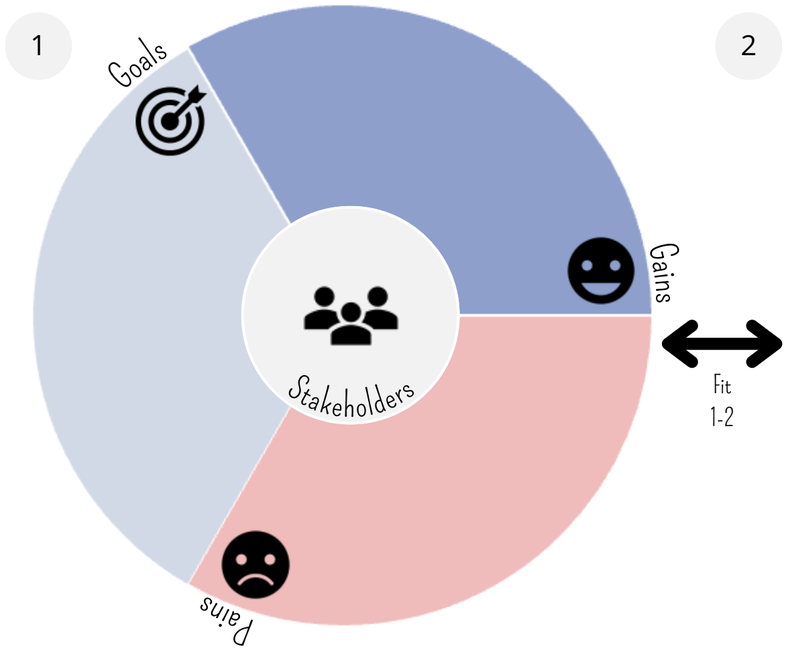


REFLECT

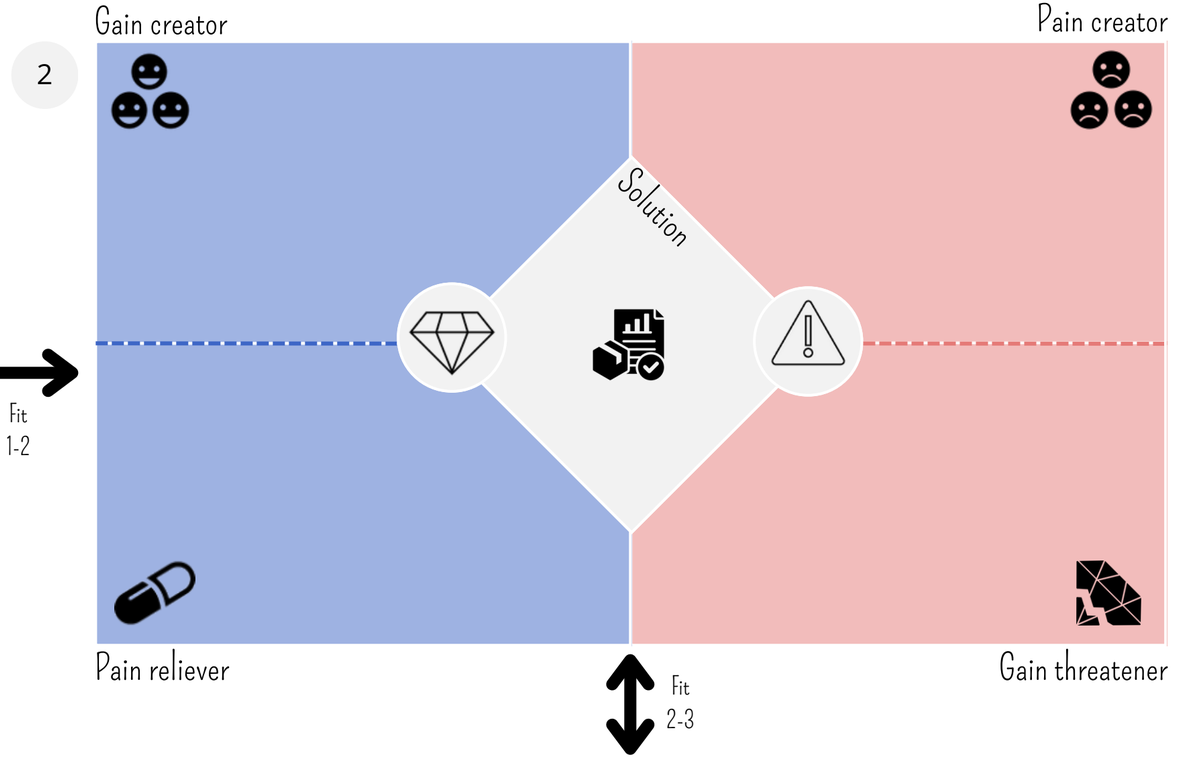
It encourages post-hoc analysis of modeling processes and outcomes. It supports reflection through questions such as: *What was the actual value of modeling in this case? What risks or limitations emerged because of modeling? Was modeling ultimately worthwhile in this situation?*

Decision:

Based on your goal in using the Modeling Value Canvas, you define the decision that the canvas is intended to support.



Fit
1-2



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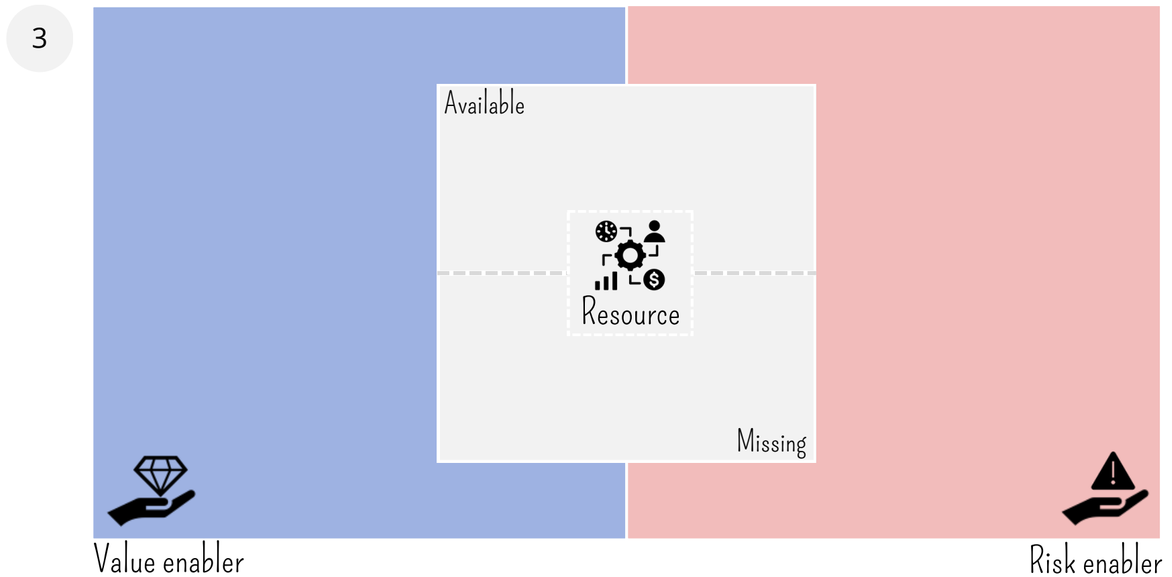
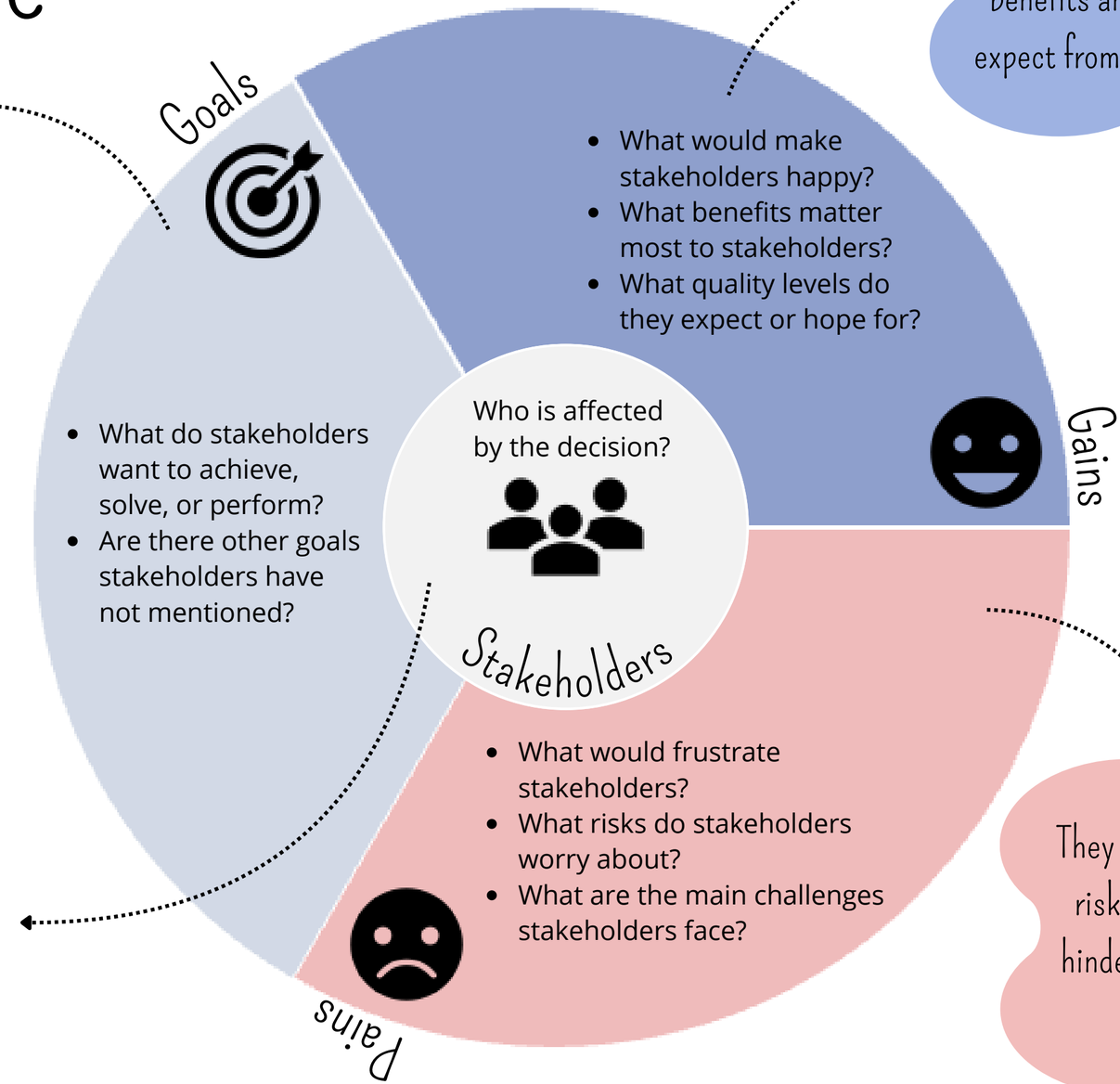


1st step

Stakeholder Profile

They refer to the objectives stakeholders seek to achieve, including both explicit aims and potential implicit needs.

They capture what would satisfy stakeholders, the specific benefits and quality levels they expect from achieving their goals.



It specifies the individuals or groups affected by the decision and included in the analysis.

They identify adverse outcomes, risks, and obstacles that may hinder goal attainment or cause dissatisfaction.

Note: The questions are intended to serve as a guide, and their utilisation is not mandatory.

1st step

Stakeholder Profile

Goals are typically broader in scope and not necessarily specific to modeling.

Depend on the purpose for which the Canvas is used.

Plan, justify, reflect

Decide

They are interpreted within the context of modeling, identifying which benefits modeling can help achieve and which obstacles it can help avoid or mitigate.

Known

Modeling solution

Unknown

They are broader and grounded in stakeholders' needs, guiding the selection of an appropriate modeling solution.

Goals

- Develop an application
- Integrate two systems
- Improve system maintenance processes

Gains

- Domain accuracy
- Increase integration correctness
- Automated propagation of changes

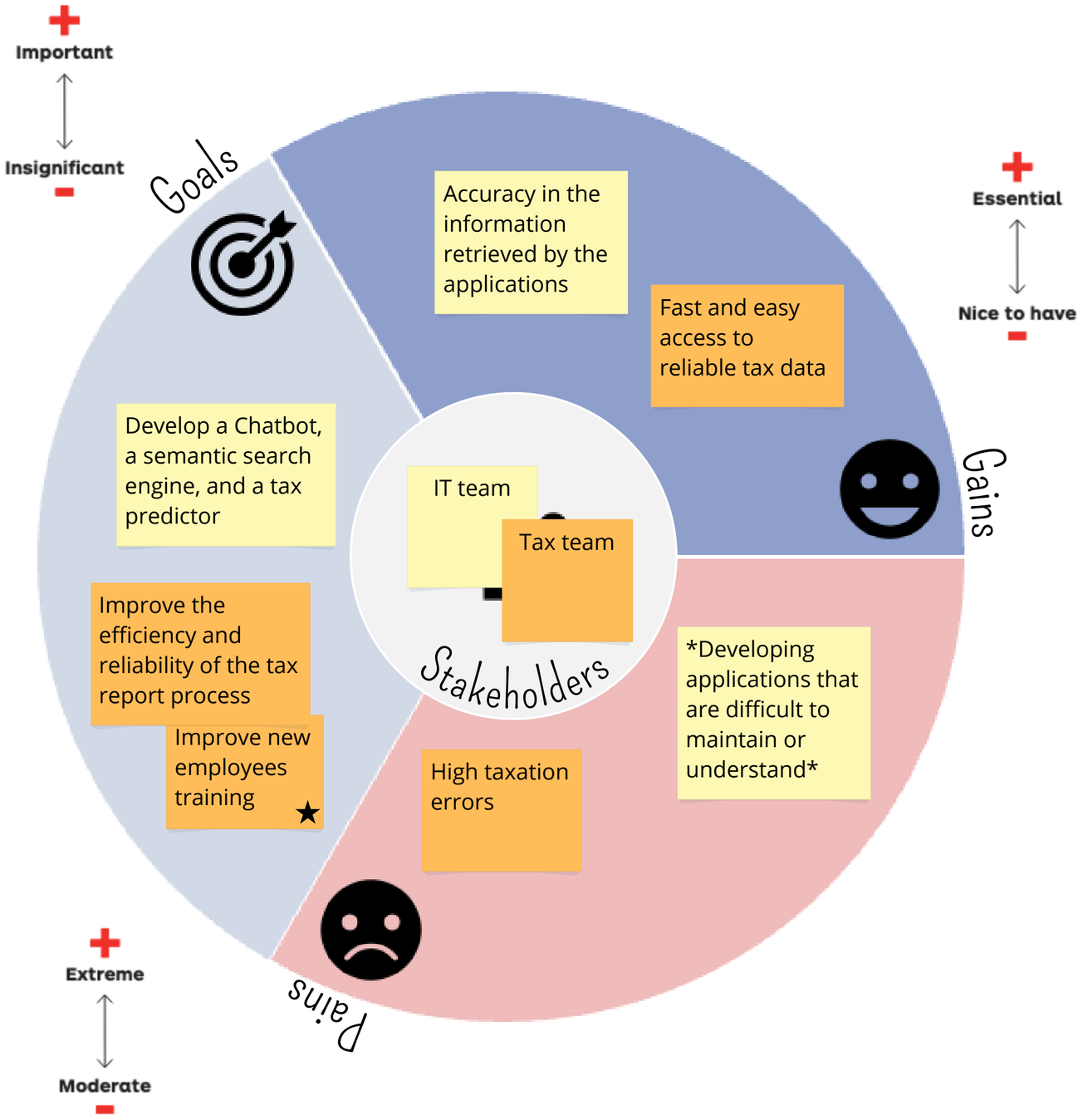
Pains

- Interoperability issues
- Data misunderstandings
- Excessive time consumption

Fill-in tips

Stakeholder Profile

- Begin by identifying each stakeholder, then define their goals, and record associated gains and pains, either sequentially or in parallel.
- Visually differentiate elements by stakeholder (e.g., using distinct colors for each stakeholder's goals, gains, and pains).
- Use an asterisk (*) to indicate pains stakeholders seek to avoid, distinguishing them from existing pains.
- Visually differentiate goals, gains, and pains inferred from analysis rather than explicitly stated. (★)
- When numerous elements are recorded, prioritize by ranking goals by importance, gains by essentiality, and pains by severity.



2nd step

Solution Value & Risk Map

Note: The questions and the post-it template are intended to serve as a guide, and their utilisation is not mandatory.

It specifies the object of analysis, which may be singular or multiple depending on the desired level of detail.

It captures how the solution generates value by achieving stakeholders' gains.

It describes how the solution introduces or exacerbates stakeholders' pains.

It explains how the solution generates value by mitigating stakeholders' pains.

It explains how the solution reduces or compromises existing or expected gains.

Gain creator

- How can the solution produce the gains stakeholders expect?
- What are the benefits offered by the solution?
- Can the solution produce gains that exceed stakeholders' expectations?

(*Solution(s)*) + **create(s)** + [*a gain*]

Pain creator

- How can the solution create new pains for stakeholders?
- In what ways could the solution intensify existing pains?
- Can the solution create pains beyond the context under analysis?

(*Solution(s)*) + **create(s)** + [*a pain*]

Solution

What should be done to achieve stakeholders' goals?

Pain reliever

(*Solution(s)*) + **reduce(s)** + [*a pain*]

- How can the solution alleviate stakeholders' pains?
- How can the solution improve stakeholders' experience?
- Can the solution mitigate pains beyond the context under analysis?

Gain threatener

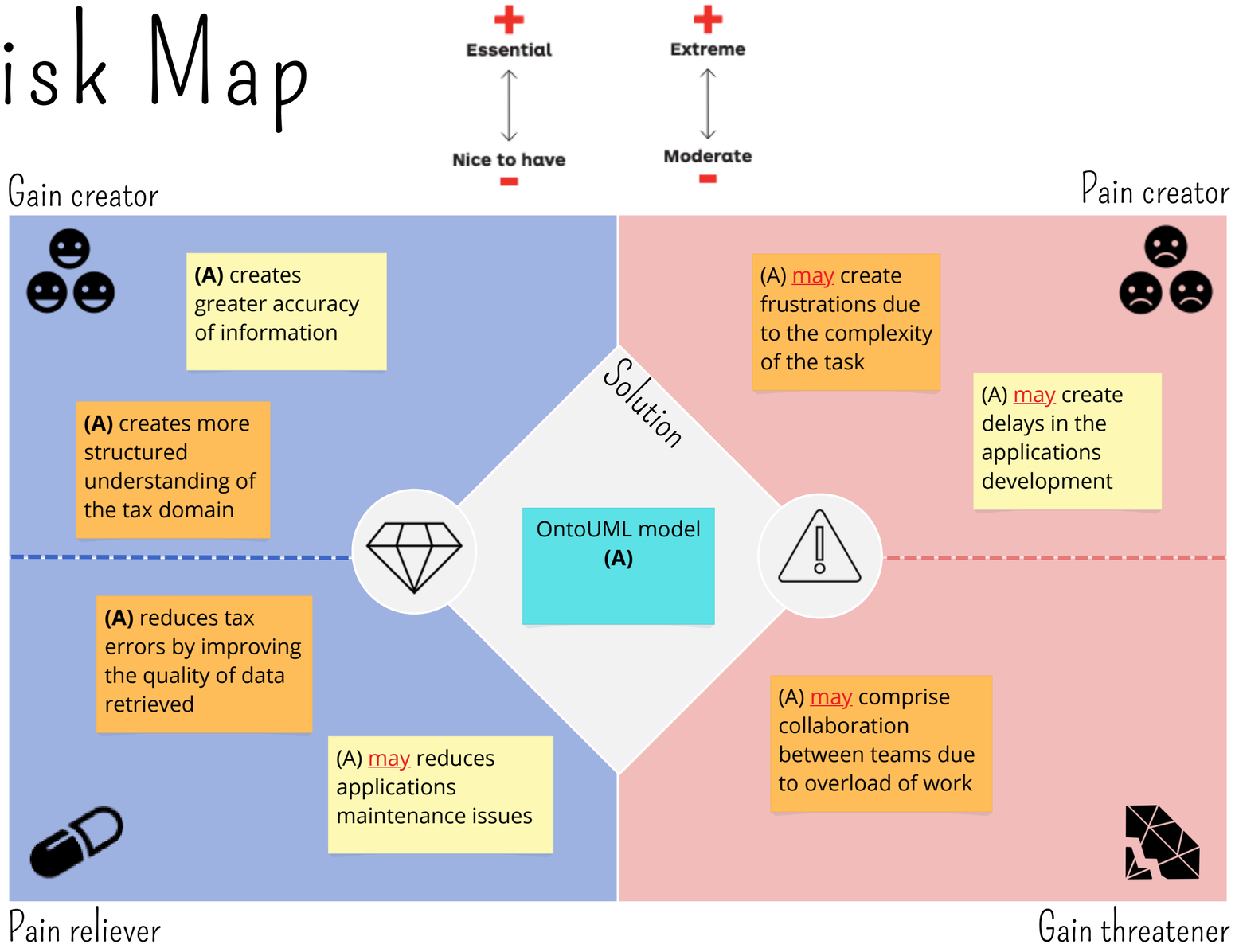
(*Solution(s)*) + **compromise(s)** + [*a gain*]

- How can the solution compromise the gains stakeholders have already achieved?
- In what ways could the solution compromise positive outcomes?
- Can the solution compromise gains beyond the context under analysis?

Fill-in tips

Solution Value & Risk Map

- Define the solution first, then complete the value- and risk-related blocks either sequentially or in parallel.
- If the solution is decomposed into parts, visually differentiate them (e.g., using distinct labels).
- Clearly associate each value or risk with the corresponding solution element.
- Visually differentiate elements by stakeholder (e.g., using distinct colors).
- Use the auxiliary `may" to indicate value or risk outcomes that involve uncertainty.
- When numerous elements are recorded, prioritize by ranking gains created and pains relieved by essentiality, and pains created and gains compromised by severity.



Fill-in tips

Value

When completing the Gain creator and Pain reliever blocks, the modeling solution(s) should be viewed as Value Object(s).

1

Identify the goals for which it can be used.

2

Determine the model properties required to achieve the goals.

3

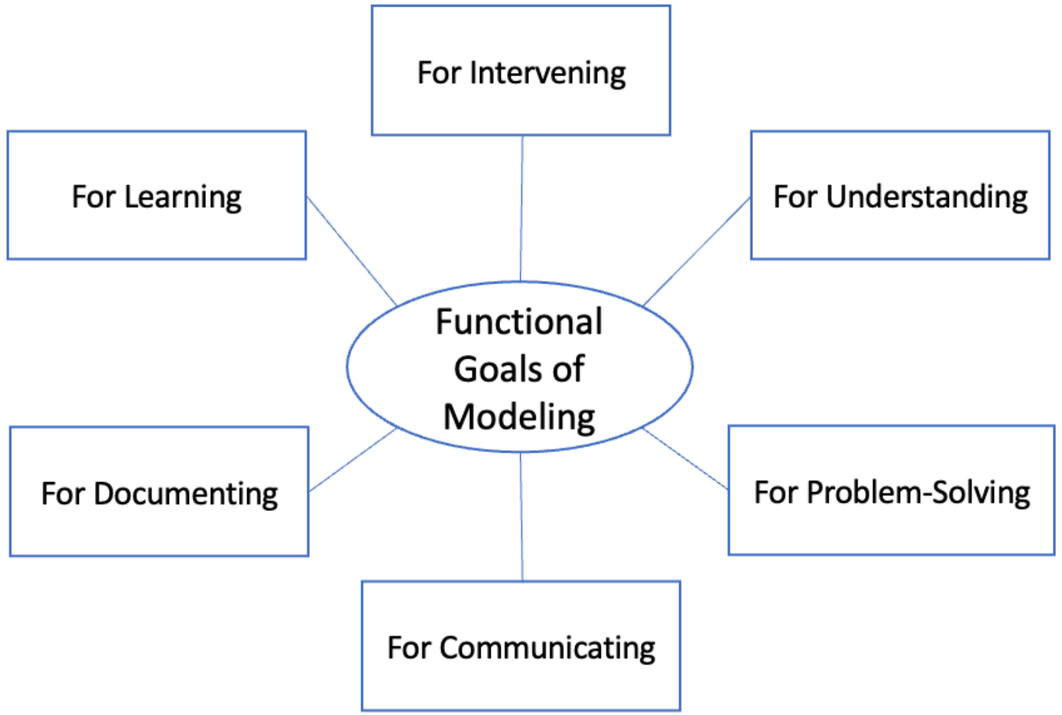
Analyze how these properties contribute to realizing stakeholders' gains and alleviating their pains.

Fill-in tips

Value

Academic reference

To comprehend the value of a model, it is imperative to identify the goals for which it can be used.



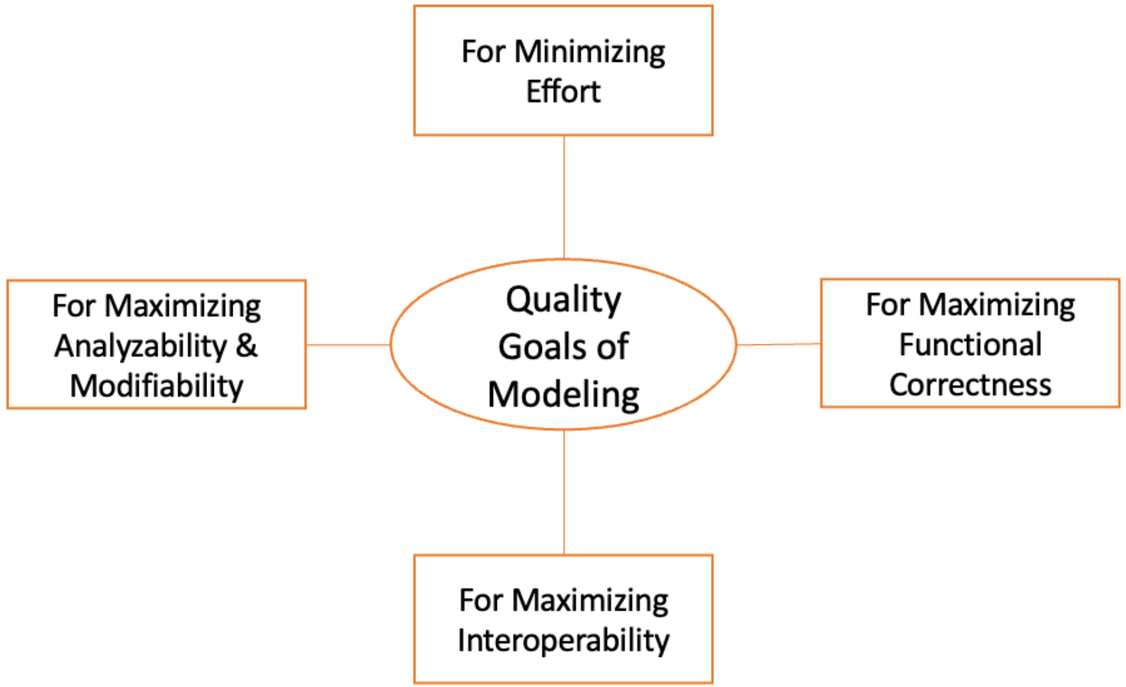
Goal	Definition
For Intervening	A goal of using a model as an instrument through which one changes something in the world.
For Understanding	A goal of creating a model to support domain understanding and meaning negotiation.
For Problem-Solving	A goal of using a model to guide problem-solving and decision-making.
For Communicating	A goal of using a model to support communication between people about a domain of interest.
For Documenting	A goal of using a model to support *asynchronous* communication between people about a domain of interest.
For Learning	A goal of creating or using a model to learn modeling, modeling methods, and modeling tools.

Fill-in tips

Value

Academic reference

To comprehend the value of a model, it is imperative to identify the goals for which it can be used.



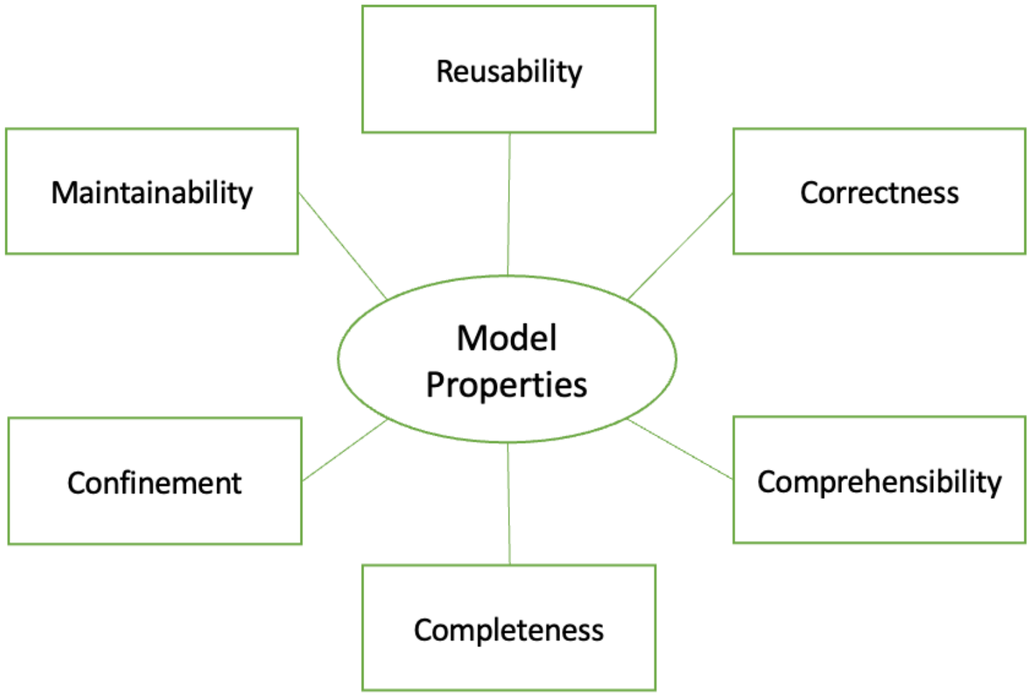
Goal	Definition
For Minimizing Effort	A goal of minimizing a user's effort in using a model to change the world or people's minds.
For Maximizing Functional Correctness	A goal of maximizing the degree to which a system functions correctly by using a model.
For Maximizing Interoperability	A goal of maximizing the degree to which systems, products, or components can exchange information and use the information that has been exchanged by using a model.
For Maximizing Analyzability & Modifiability	A goal of maximizing the degree to which it is possible to analyze and modify a system by using a model.

Fill-in tips

Value

Academic reference

To comprehend the value of a model, it is imperative to determine the model properties required to achieve the goals.



Goal	Definition
Reusability	The degree to which a model can be reused in a different context and{/}or for a different purpose than it originally intended.
Correctness	The degree to which a model can properly represent the domain, its elements, and their relations.
Comprehensibility	The degree to which a model can be understood by its intended users.
Completeness	The degree to which a model has the necessary information to fulfill its purpose.
Confinement	The degree to which a model only has the necessary information to fulfill its purpose.
Maintainability	The degree to which a model can be changed.

Fill-in tips

Value

To comprehend the value of a model, it is imperative to analyze how model properties contribute to realizing stakeholders' gains and alleviating their pains.

1

Identify the goals for which it can be used.

A model developed to support system interoperability

2

Determine the model properties required to achieve the goals.

Completeness is an essential property.

3

Analyze how these properties contribute to realizing stakeholders' gains and alleviating their pains.

It ensures that all relevant concepts and system elements are represented to enable successful interoperation.

Fill-in tips

Risk

Conversely, when addressing the Pain creator and Gain threatener blocks, the modeling solution(s) should be viewed as Threat Object(s).

1

Identifying which model properties are insufficiently addressed.

2

Determine how this insufficiency may become source of risk.

3

Identify under what conditions the model could endanger existing benefits or introduce new threats.

Fill-in tips

Risk

Academic reference

To comprehend the risk a model may create, it is imperative to identify when it becomes a threat.

Models become a threat when ...

They are abandoned

They become unsuitable for use

They are incorrect

They are difficult to understand

They are semantically unreliable

They become obsolete

They have poor layout

They are used for inappropriate goal

Fill-in tips

Risk

Academic reference

To comprehend the risk a model may create, it is imperative to identify the threat it may pose.

Out-of-date and inaccurate models may ...

- Causes delay in feature creation/bug correction
- Results in incorrect system integration
- Leads to software maintenance issues
- Leads to excessive time/effort in model maintenance
- Causes incorrect domain interpretation

Fill-in tips

Risk

1

Identifying which model properties are insufficiently addressed.

Poorly designed models reduce comprehensibility.

2

Determine how this insufficiency may become source of risk.

It leads to excessive maintenance effort.

3

Identify under what conditions the model could endanger existing benefits or introduce new threats.

This may compromise the project schedule.

3rd step

Resource Value & Risk Map

It lists the resources currently accessible for developing and applying the solution.

It explains how the resources' capabilities may support gains or mitigate pains.

(*Resource(s)*) + [*capability*] + **support(s)** + [*a gain*]

(*Resource(s)*) + [*capability*] + **mitigate(s)** + [*a pain*]

- What are the capabilities of the resources?
- How can these capabilities enhance the solution's value?
- How can these capabilities help mitigate the solution's risks?

Value enabler

Available

- What resources are available?
- Who is involved?
- Are there any time, budget, or other limitations?

Resource

- What additional resources are required?
- Which skills do the involved people need to strengthen or learn?
- How could missing resources affect stakeholders' gains and pains?

Missing

(*Resource(s)*) + [*vulnerability*] + **threat(s)** + [*a gain*]

(*Resource(s)*) + [*vulnerability*] + **reinforce(s)** + [*a pain*]

- What are the vulnerabilities of the resources?
- How can these vulnerabilities threaten the solution's value?
- How can these vulnerabilities reinforce the solution's risks?

Risk enabler

It explains how the resources' vulnerabilities may threaten gains or reinforce pains.

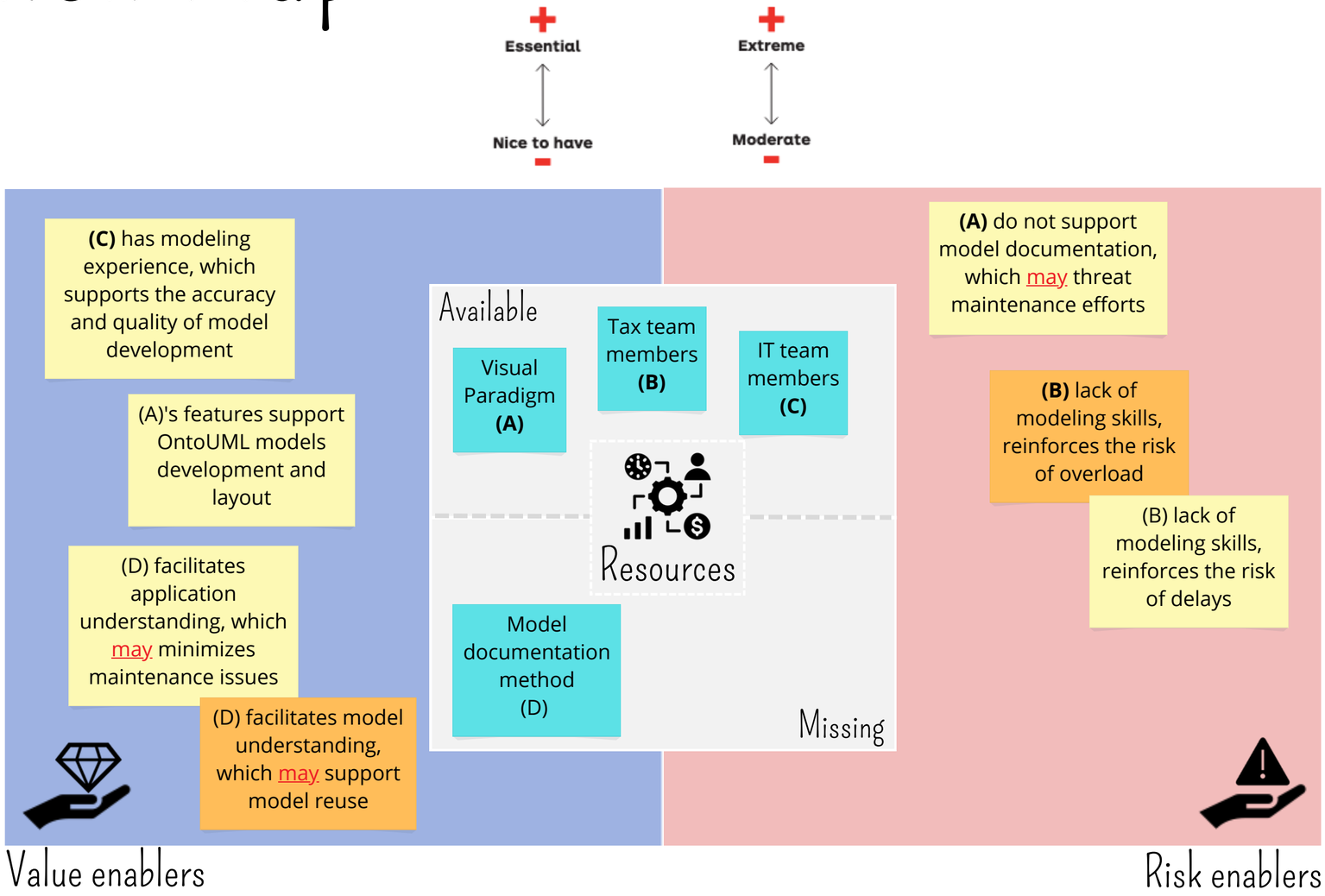
It lists the resources required but not yet available.

Note: The questions and the post-it template are intended to serve as a guide, and their utilisation is not mandatory.

Fill-in tips

Resource Value & Risk Map

- Identify available resources, then complete the value- and risk-related blocks either sequentially or in parallel.
- Specify missing resources by identifying gains and pains that could be influenced by resources the company does not currently possess.
- Visually differentiate the resource (e.g., using distinct labels).
- Clearly associate each identified enabler with the corresponding resource.
- Visually differentiate elements by stakeholder (e.g., using distinct colors).
- Use the auxiliary `may" to indicate enablers that involve uncertainty.
- When numerous elements are recorded, prioritize by ranking value enablers by essentiality and risk enablers by severity.



Fill-in tips

Value and Risk enablers

Resources function as Value Enablers or Risk Enablers, depending on whether their capabilities support desired model properties or their vulnerabilities compromise them.

1

Assess whether the resource constitutes a source of a pain point.

Fill-in tips

Value and Risk enablers

Academic reference

To define the enablers, it is necessary to assess whether the resource constitutes a source of a pain point.

The pain points of modeling

Pain point	Description
Improper Requirements	I could not properly define the model requirements. E.g., when stakeholders were unsure of their needs or the domain was unfamiliar to me.
Resistance to Modeling	My stakeholders resisted adopting modeling, a modeling language, or a tool. E.g., when they perceived modeling as unnecessary or I failed to demonstrate the value of the model I wanted to create.
Expensive Requirements	It was costly to define the model requirements. E.g., when many requirements had to be defined and agreed among many stakeholders.
Effortful Negotiation	It was costly to negotiate a common definition among experts about a concept of the project's domain of interest. E.g., when I lacked negotiation skills or even my domain experts could not agree among themselves.
Effortful Verbalization	It was costly to verbalize my model in a way that was suitable for the different audiences that should be able to use it. E.g., when the tool I used lacked such a feature or too many different verbalizations were required.
Inadequate Explanation	It was hard to explain my model to my stakeholders. E.g., because they do not know how to model or I am not good at explaining my model.
Unclear Conceptualization	Writing definitions for the elements in my model was hard and boring. E.g., when domain experts were not available or I was unsure how to structure a definition.
Complexity Issues	The model has become too complex and too costly to maintain. E.g., because the tool I chose did not support documentation or the model contained too many elements.

Fill-in tips

Value and Risk enablers

Academic reference

To define the enablers, it is necessary to assess whether the resource constitutes a source of a pain point.

The pain points of modeling

Pain point	Description
Laborious Reuse	I wanted to reuse an existing model, but I had to redraw it from scratch. E.g., when it was only available as an image or in a different language/tool.
Tool Restrictions	I could not choose the modeling tool I wanted. E.g., due to constraints related to cost, expertise, culture, or bureaucracy.
Effortful Diagramming	It was costly to manually split the model into visually appealing and understandable views (diagrams). E.g., when I was unfamiliar with aesthetic guidelines or the tool did not support diagram creation.
Overlooked Documentation	My colleagues did not consider it important to document the model and did not understand my efforts to do so. E.g., when they lacked modeling knowledge or I failed to show the model's value for maintenance or reuse.
Limited Verification	The tool I chose did not support model verification. My model was large and complex and verifying it by myself was not trivial. E.g., when I had to use a suboptimal tool due to organizational constraints or lacked experience.
Unclear Approach	It was costly to define the model-driven approach. E.g., when my company lacked a modeling culture or I struggled to identify the best method.
Disinterest in Use	I was the only one on the team interested in using and reusing the model. E.g., when I was the sole person who understood it or my colleagues did not know how to leverage its benefits.
Unclear Documentation	I was not sure how to document my model. E.g., when I was uncertain about what to include or how much effort to invest.

Fill-in tips

Risk enablers

Potential Causes of the Pain Points

Pain Point	Modeler	Stakeholder	Organization	Method	Tool	Language	Model	Domain	Project
Improper Requirement	X	X		X				X	X
Resistance to Modeling	X	X	X	X					
Expensive Requirement	X	X		X				X	X
Effortful Negotiation	X	X		X				X	
Effortful Verbalization	X				X	X			
Inadequate Explanation	X	X		X			X		
Unclear Conceptualization	X	X		X				X	
Complexity Issues					X			X	
Laborious Reuse					X	X	X		
Tool Restrictions		X	X						
Effortful Diagramming	X				X			X	
Overlooked Documentation	X	X	X						
Limited Verification	X	X	X		X				
Unclear Approach	X		X	X					X
Disinterest in Use	X	X	X						
Unclear Documentation	X		X	X					X

Academic reference

To define the enablers, it is necessary to assess whether the resource constitutes a source of a pain point.

Modeler-related Frustrations: Stem from the modeler's limited skills, knowledge, or confidence, causing difficulties in using tools, creating diagrams, or collaborating effectively.

Stakeholder-related Frustrations: Arise when stakeholders lack the ability to understand models or clearly express goals, needs, and domain knowledge.

Organization-related Frustrations: Result from a weak modeling culture, missing standards, unclear processes, or low acceptance of model-based practices.

Fill-in tips

Risk enablers

Potential Causes of the Pain Points

Pain Point	Modeler	Stakeholder	Organization	Method	Tool	Language	Model	Domain	Project
Improper Requirement	X	X		X				X	X
Resistance to Modeling	X	X	X	X					
Expensive Requirement	X	X		X				X	X
Effortful Negotiation	X	X		X				X	
Effortful Verbalization	X				X	X			
Inadequate Explanation	X	X		X			X		
Unclear Conceptualization	X	X		X				X	
Complexity Issues					X			X	
Laborious Reuse					X	X	X		
Tool Restrictions		X	X						
Effortful Diagramming	X				X			X	
Overlooked Documentation	X	X	X						
Limited Verification	X	X	X		X				
Unclear Approach	X		X	X					X
Disinterest in Use	X	X	X						
Unclear Documentation	X		X	X					X

Academic reference

To define the enablers, it is necessary to assess whether the resource constitutes a source of a pain point.

Method-related Frustrations: Occur when methods are absent, inappropriate, misused, or poorly supported by guidance, resources, or communities.

Tool- and Language-related Frustrations: Come from choosing unsuitable or misusing modeling tools or languages, or lacking support and guidance for their use.

Model-related Frustrations: Emerge when models are hard to understand, access, or reuse due to poor structure, documentation, or availability.

Fill-in tips

Risk enablers

Potential Causes of the Pain Points

Pain Point	Modeler	Stakeholder	Organization	Method	Tool	Language	Model	Domain	Project
Improper Requirement	X	X		X				X	X
Resistance to Modeling	X	X	X	X					
Expensive Requirement	X	X		X				X	X
Effortful Negotiation	X	X		X				X	
Effortful Verbalization	X				X	X			
Inadequate Explanation	X	X		X			X		
Unclear Conceptualization	X	X		X				X	
Complexity Issues					X			X	
Laborious Reuse					X	X	X		
Tool Restrictions		X	X						
Effortful Diagramming	X				X			X	
Overlooked Documentation	X	X	X						
Limited Verification	X	X	X		X				
Unclear Approach	X		X	X					X
Disinterest in Use	X	X	X						
Unclear Documentation	X		X	X					X

Academic reference

To define the enablers, it is necessary to assess whether the resource constitutes a source of a pain point.

Domain-related Frustrations: Originate from the domain's complexity or difficulty in accessing and understanding domain-specific information.

Project-related Frustrations: Stem from unclear project scopes or ambiguous stakeholder goals that hinder effective modeling.

Fill-in tips

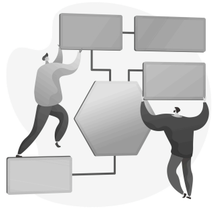
Value and Risk enablers

Resources function as Value Enablers or Risk Enablers, depending on whether their capabilities support desired model properties or their vulnerabilities compromise them.

1

Assess whether the resource constitutes a source of a pain point.

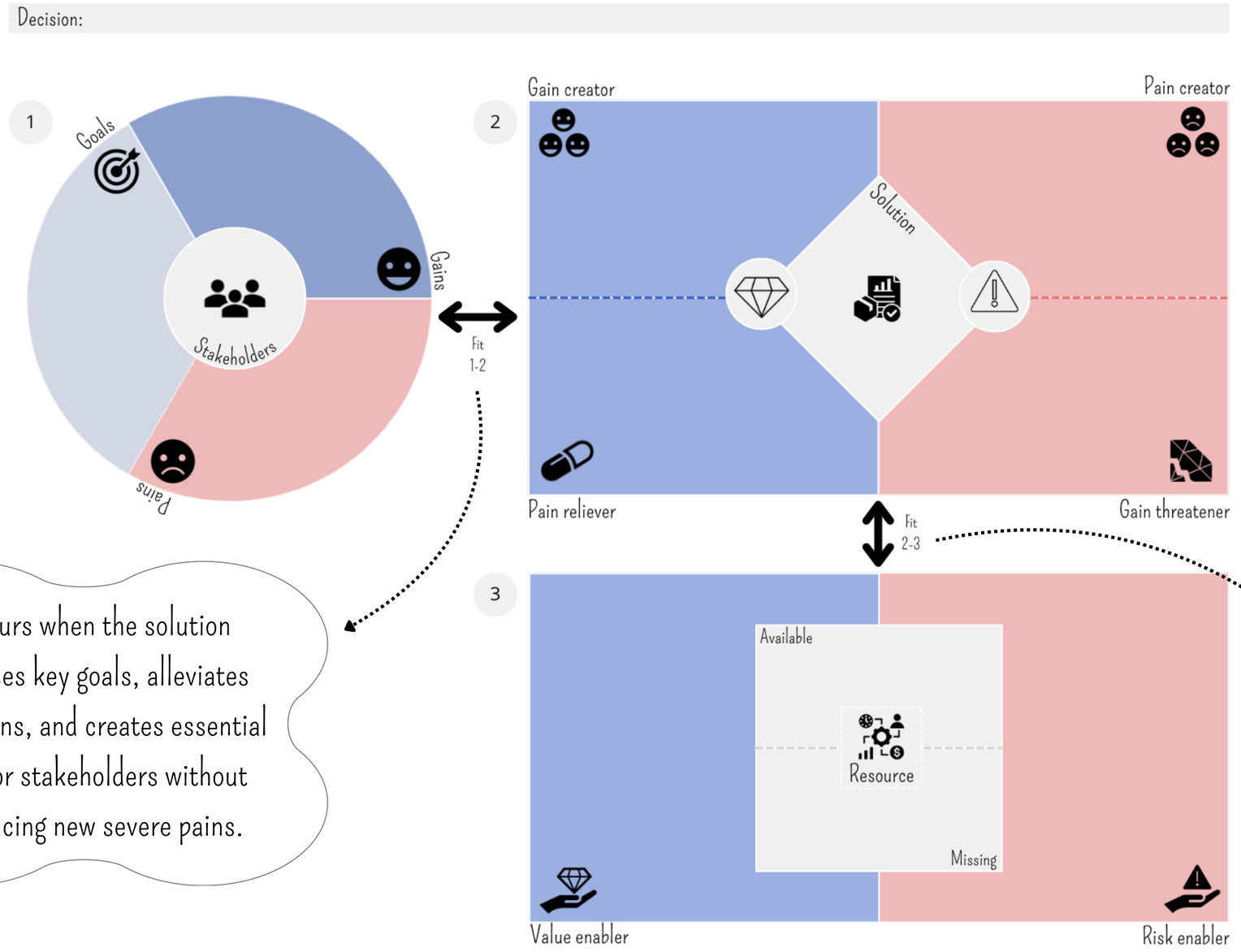
Experienced modelers often have diagramming skills that increase the comprehensibility of the model.



Novice modelers often lack diagramming skills, which can lead to the *effortful diagramming* pain point, reducing comprehensibility and increasing modeling time.

Final step

Fits



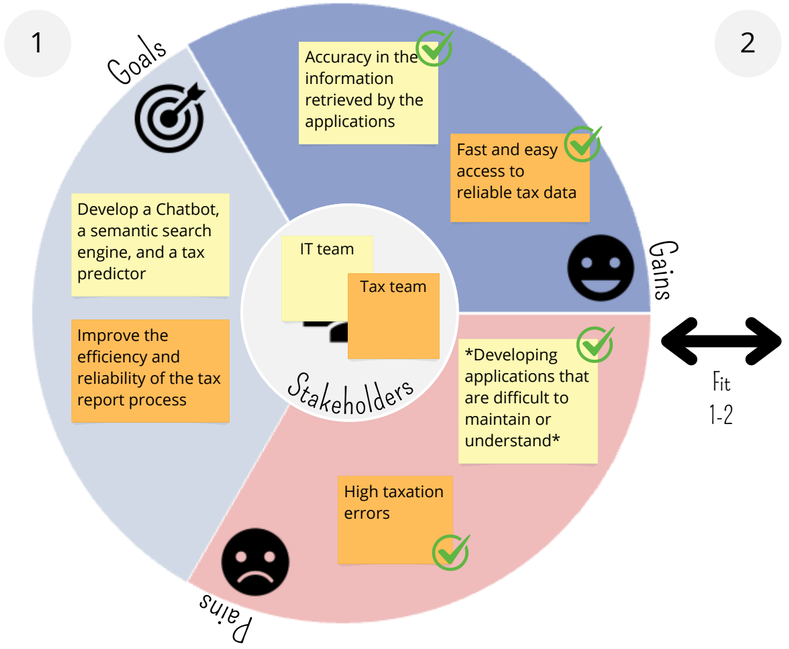
It occurs when the solution addresses key goals, alleviates major pains, and creates essential gains for stakeholders without introducing new severe pains.

It occurs when critical resources are used to strengthen the solution's capabilities to deliver desired value and reduce vulnerabilities that could undermine it.

Tips to achieve

Fits

Decision: Should we create a model to support the applications development?



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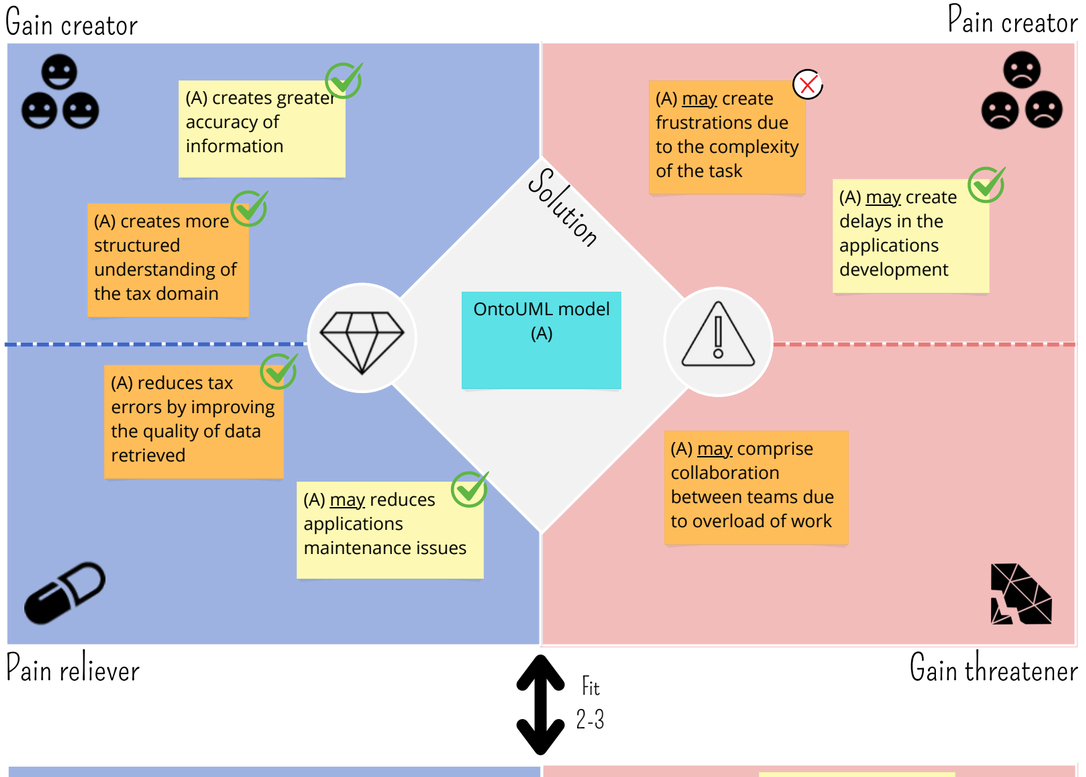
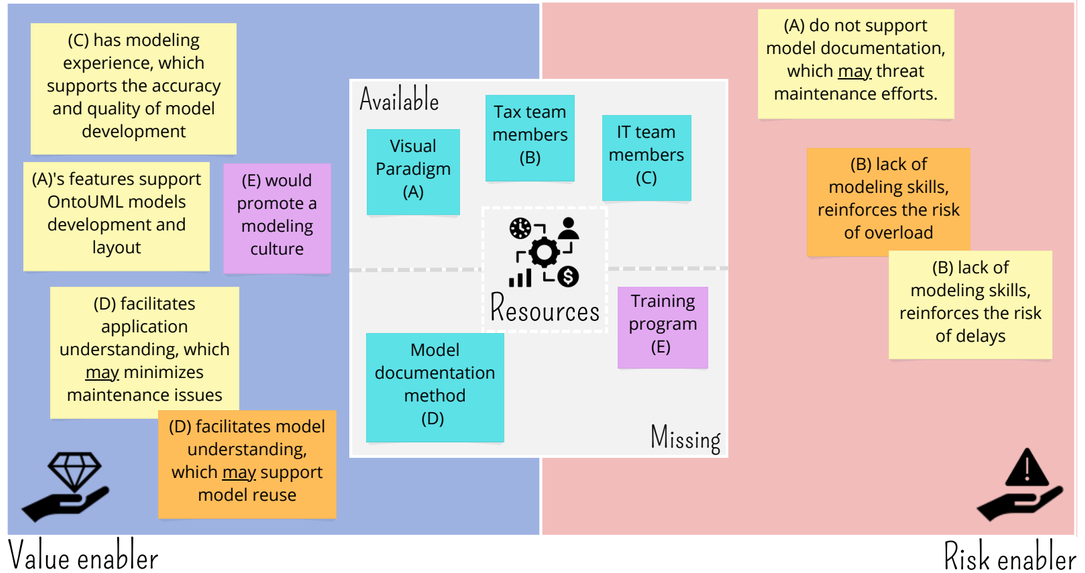


Fit 2-3

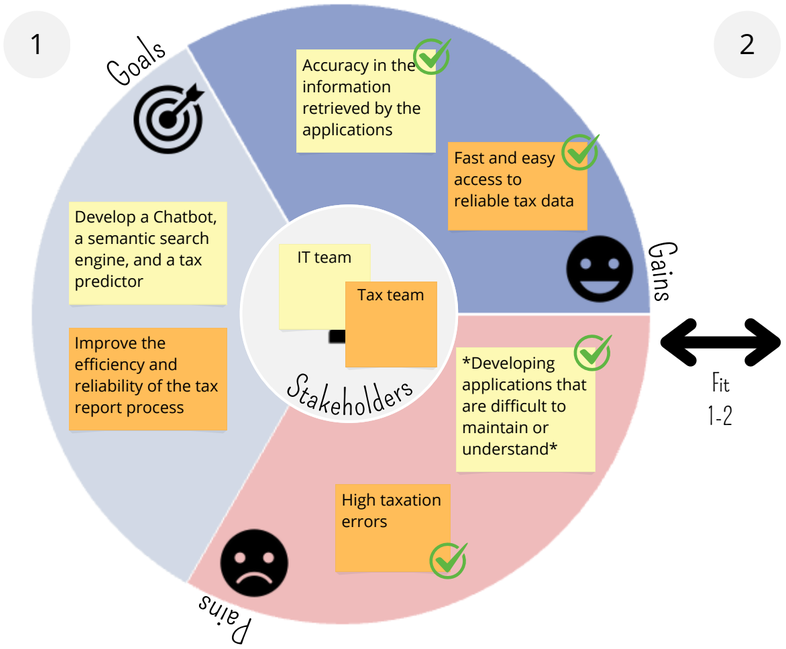


Identify the stakeholder goals, gains, and pains that the solution addresses, as well as those it does not.

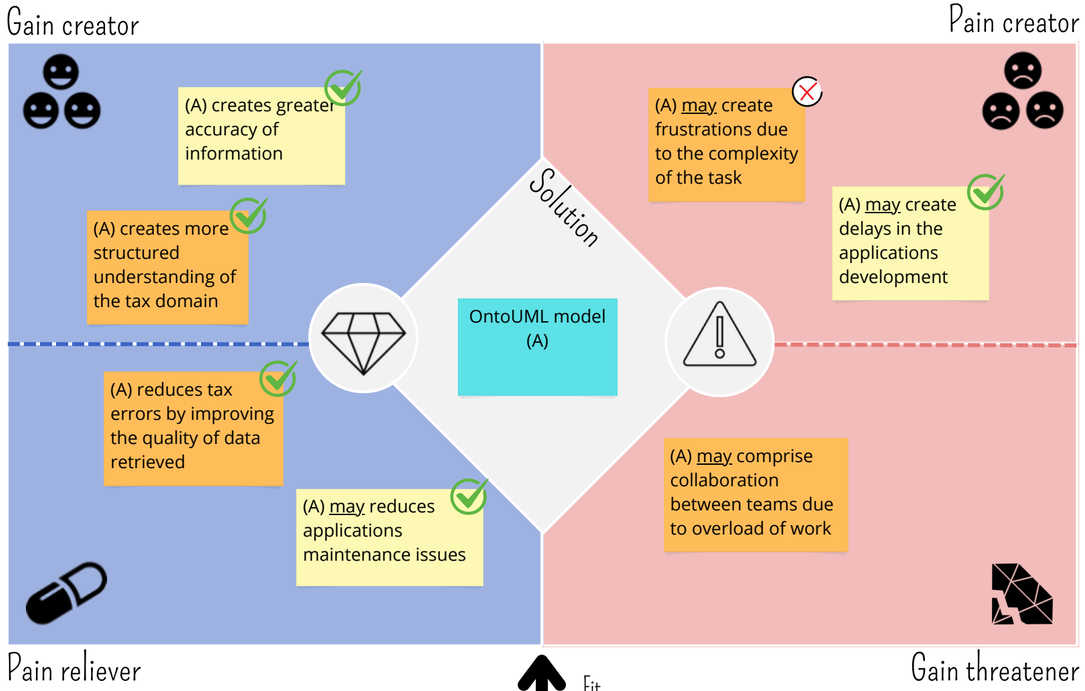
Identify the solution's values and risks that are not supported or mitigated by any resource.

Identify resource vulnerabilities that remain unaddressed and the capabilities that remain unexplored.

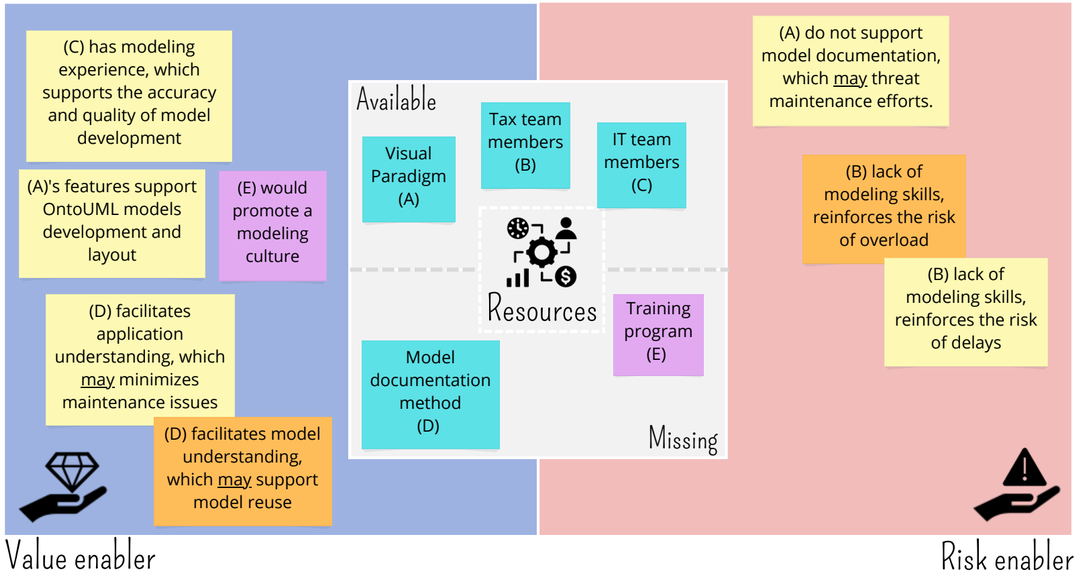
Decision: Should we create a model to support the applications development?



Fit 1-2



Fit 2-3



Fits

Both fits are difficult to achieve and sustain, but the process of pursuing them is what drives **effective decision-making**.