Ensuring Completeness of Business Process Analysis through Model Consistency

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Abstract

Business analysis is an important part of every project and an accurate business process analysis plays a significant role in it. Business process analysis materializes in the business process models and other relevant business models and their accuracy can be characterized by their consistency and completeness. These two can be considered as two separate perspectives but in this paper, we argue that completeness and consistency of business models are related and that business models in form of consistent mutually complementary viewpoints help the completeness of the models.

Keywords: MMABP, completeness, business process analysis.

1. Introduction

The business analysis and requirements gathering is an undividable part of every project or a change initiative and, as the PMI surveys suggest, also the crucial one. The PMI's surveys show that one of the main reasons, why projects fail, is the inaccurate requirements gathering [14, 15].

Ideally, a product of a business analysis should be a consistent and coherent requirements architecture for a specific solution consisting of different viewpoints [9], put together using an architecture framework that can be used as a tool to structure thinking, ensuring consistency and completeness viewpoints [9],[21]. An important part in this plays the business process analysis which captures the business process viewpoint in the business process models. Nevertheless, as the BABOK [9] notes, it is an important viewpoint, but for a consistent and coherent requirements architecture, there have to be present other viewpoints like entity models or other business models.

Merriam-Webster dictionary generally defines consistency [11] as "agreement or harmony of parts or features to one another or a whole" or specifically "ability to be asserted together without contradiction". In this paper, we focus on the consistency of a business system. As a *business system*, we understand any system created and constantly developed by people, the aim of which is achieving so-called *business goals*. In this conception, the business system consists of *business objects* and their essential relationships that altogether express general rules of the environment called *business rules*, whichdetermine mutually collaborating *business processes* focused on achieving particular *business goals*. A *consistent business system*, therefore, means a system of business processes, which do not contradict business objects and their relationships nor with each other. With *completeness*, we mean a kind of consistency; the presence of all essential parts and their relationships in the system. A more detailed definition of consistency and completeness and their relation is in section 4. Consistency Rules.

The models constitute the basic structure and architecture of the solution a project is trying to achieve and having consistent and complete models (viewpoints) is a necessity in order to be able to deliver at the end the accurate requirements architecture.

Consistency can be addressed by consistency rules that provide one with a tool at the analytical stage that allows one to ensure that the different viewpoints represented by business models are consistent.

Current frameworks and standards have, in general, two ways how they approach the business models' consistency. The consistency rules are either in form of analytical reminders in the prescribed analytical procedure, reminding that one should check the consistency of the models after finishing each model without actually providing a particular tool for it [9] or there are defined meta-models covering all the possible entities and their relations one can capture in the models [13, 20, 21].

Completeness of business models is the less elaborated field of business process analysis and it is more difficult to assess [6]. Current frameworks stay at the level of reminding that one should check the completeness of the models after finishing each model. These reminders are either in form of analytical reminders in the prescribed analytical procedure [9], gap analysis [21], or concerns listed at each viewpoint description [20].

This approach to completeness relies heavily on an analyst's focus, skills, and experience and so it is prone to inevitable errors, growing with the scale of the analysis.

In this paper, we discuss the completeness of the business model and argue that with the right set of mutually complementary viewpoints and well-defined consistency rules, the consistency of the business process model with other business models (viewpoints) can verify in a certain sense also its completeness. This would provide an analyst with a tool that allows one to validate the completeness formally not relying only on one's experience.

We use the Methodology of Business Process Modeling and Analysis (MMABP) for such cases. MMABP with its minimal business architecture [18], unlike the standard frameworks with a large number of viewpoints, provides us with a specific set of viewpoints with appropriate levels of detail. There are defined consistency rules among these viewpoints that ensure the model consistency and therefore its impact on completeness can be evaluated.

In this paper, we show that the viewpoints in MMABP are mutually complementary and that their combination helps to ensure the models' consistency including its completeness.

This paper consists of five sections.

After the next section with some related research, we roughly describe the Methodology for Business Process Modeling and Analysis (MMABP) focusing on its specific set of viewpoints.

In the fourth section, we provide the reader with an overview of MMABP consistency rules and explain how the MMABP viewpoints are mutually complementary, and then we discuss how consistent mutually complementary viewpoints can help the completeness of the models.

In the final section, we then make some basic conclusions.

2. Related Research

Completeness and especially consistency are elaborated in many standards, frameworks, and research papers.

BABOK [9] points out the importance of completeness and consistency of requirement architecture, which consists of different viewpoints including a process and data model. BABOK, respecting its focus, stays at the level of prescribed analytical procedure reminding that one should check the consistency and completeness of the model after finishing each viewpoint without providing a particular tool for it.TOGAF [21] and ArchiMate [20] use a metamodel as the tool for consistency. Their focus is mainly on the architectural level of detail. They stay abstract (even though the ArchiMate meta-model is much more detailed than TOGAF's) and the consistency rules are more focused on consistency among the layers. Rules for business process detail and its consistency are not subject to TOGAF or ArchiMate, this is left to BPMN [20, 21]. Completeness rules stay at the level of prescribed analytical procedure in form of gap analysis [21], concerns listed at each viewpoint description [20].BPMN [12] is a specification specific for modeling business processes. Consistency of the business process model is based on the meta-model, but consistency with other viewpoints (incl. TOGAF) and model's completeness is not elaborated in the specification in detail.UML [13] as the unified modeling language provides a large number of models, which represent different viewpoints. The consistency of these models is based on a meta-model interconnecting all the models together. Completeness is not elaborated in the specification.Dumas [6] suggests for completeness and consistency of business process models to check against the reference process models like the Process Classification Framework [2], Carson [5] suggests basing the completeness of business requirements on their approvement by all the stakeholders.

Consistency and completeness have been also a concern of the field of Artifact-centric business processes.The basic viewpoints of artifact-centric business processes are the business processes and object life cycles [1]. The consistency of these two models has been elaborated in for instance in [1, 8, 19].This concept of two basic viewpoints was further extended by BALSA [3] and BAUML [7] with the concept of business artifacts in form of a class diagram, but their primary focus is on conformance validation of executed processes with the models rather than consistency and completeness of the models they are being validated against.Completeness in the case of artifact-centric models is a specific point of view that differs from the analytical point of view. The field of artifact-centric process models looks at completeness from the process execution readiness point of view. There is reviewed the validity of the graph of the very detailed execution ready models [4] so that they are ready for flawless execution. Abstract analytical business process models are far from this level of detail necessary for the application of these methods.

3. Methodology of Business Process Modeling and Analysis

Methodology of Business Process Modeling and Analysis (MMABP) [17] is a general methodology for modeling business systems. MMABP defines the essential background, basic contents, and mutual relationships of basic business system model diagrams by the so-called *Philosophical Framework of the Business System Modelling*[17]. The framework is based on the idea that the model of a business system consists of the models of two basic kinds in two basic dimensions (see Table 1).

There are specified diagrams for each model. TOGAF Event diagram [21] for the Process Map, BPMN diagram [12] for the Process Flow Model, UML Class diagram [13] for the Conceptual Model, and UML State Machine Diagram [13] for the Object Life Cycle Model.

Table 1: Four basic models of the business system [17]

Dimension \ Kind of model	System view	Detailed (particular) view
Acting (processes)	*Process Map*	*Process Flow Model*
Being (objects)	*Conceptual Model*	*Object Life Cycle Model*

According to MMABP, *business* means "*achieving the goals in the given environment*". From this definition follows that there are two basic and mutually completing dimensions in which the business exists:

- *being* in terms of the given environment, and
- *acting* in terms of achieving the goals.

The dimension of being represents the facts and rules that have to be respected by any business activity, i.e. the structure, general logic, and causality of the relevant part of the Real World.

The dimension of acting represents the business goals and the ways of achieving them, i.e. the chains of business activities in their mutual relationships driven by the stated goals and respecting the given objective circumstances (attributes of the dimension of being).

The business system is then the system consisting of *business objects* that represent the environment and the facts and rules, which must be respected by all activities, and *business processes* that represent the activities and ways of achieving the goals. MMABP also pays special attention to the information system as an integral part of the business system even if it itself is a model of the business system. Nevertheless, in this paper, we do not focus on the information system. MMABP proposes a minimal number of types of diagrams that have to be elaborated in order to have a compact and consistent business architecture that is ready for digital transformation.

4. Consistency Rules

Regarding its multi-perspective character, MMABP pays special attention to the mutual consistency of different models of the modeled business system. This feature is actually a consequence of the above-mentioned multiple perspectives. On one hand, different models specify mutually different facts about the business system. On the other hand, the models address also some common facts, just from different perspectives. To avoid possible contradictions, these intentional redundancies have to be under methodical control, which is an essence of the consistency rules.

Consistency of models of the business system means *the absence of any contradiction between different expressions of the same fact in different models*. By the contradiction we mean not only a contradiction between two existing elements of different models but also the situation when the particular element, whose necessity follows from another model, is missing in the given model. Therefore, MMABP distinguishes between two basic kinds of consistency: *Correctness* and *Completeness*.

4.1. Business System Models Consistency Framework

For the exhaustive understanding of all generally possible variants of the consistency of models, we have developed the *Business System Models Consistency Framework*. It is based on the basic premise of the Philosophical Framework of the Business System Modelling [17] presented in the previous section and expressing the idea that the business system is the system consisting of business objects that represent the environment and the facts and rules, which must be respected by all activities, and business processes that represent the activities and ways of achieving the goals.

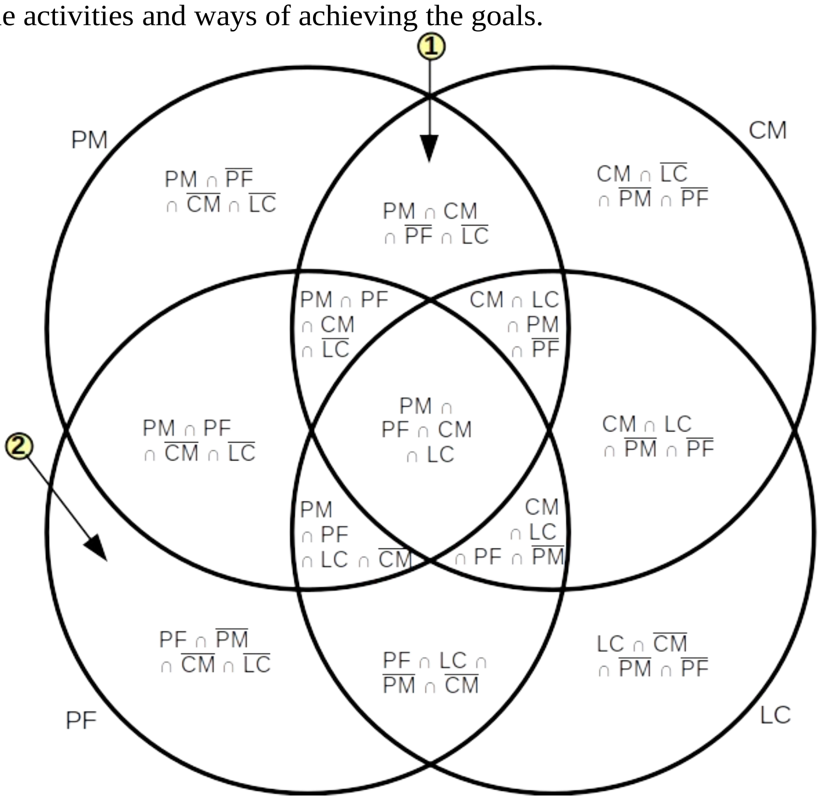

Fig. 1: Simplified picture of the business system sets using Venn diagram

As it follows from the definition of consistency above, the same fact may be manifested in different models in different ways. Therefore, we need to watch how the general fact may be manifested in which different ways in particular combinations of particular models. The framework maps all possible combinations of four basic particular kinds of models of the business system, which are given by two basic dimensions of the business system and two basic general kinds of its models how they are defined in the Philosophical Framework of the Business System Modelling [17]. For the systematic investigation of all possible combinations of models, we use the language of the set theory. Each particular model is represented in the framework by the set of all facts, which are expressed in it. Particular combinations of models are then represented by the intersections of the sets.

Figure 1 shows the purposefully simplified picture of the business system sets using the diagram recommended by John Venn and presented in his famous article [22]. The picture contains all 13 relevant conjunction sub-sets of the four sets set, where:

- PM represents the set of all facts expressed in the Process Map of the given business system.
- PF represents the set of all facts expressed in all Process Flow diagrams that specify the flow of some business processes from the Process Map of the given business system.
- CM represents the set of all facts expressed in the Conceptual Model of the given business system (Class Diagram).
- LC represents the set of all facts expressed in all State Chart diagrams that specify the life cycles of some objects from the conceptual model of the given business system.

Each intersection represents the logical conjunction of all facts expressed in all involved models. For instance, arrow 1 points to the set of all facts, which are expressed in Process Map and in Conceptual Model and are not expressed in any Process Flow diagram nor in any diagram describing object life cycle. Similarly, arrow 2 points to the set of all facts expressed only in Process Flow diagrams but not in any other model.

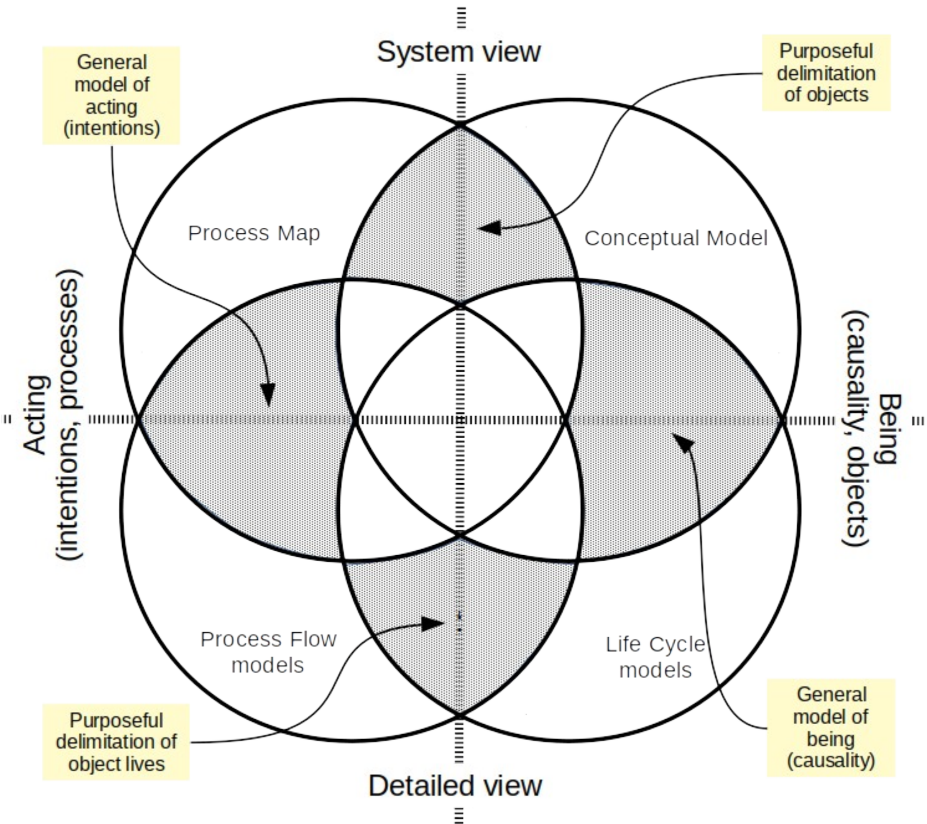

Fig. 2: Interpretation of the business system sets, part I.

Figures 2 and 3 show how to interpret the particular sets in the framework. They also show the context of models in terms of the Philosophical Framework of the Business System Modeling [17]. The upper two models represent the system view while the lower two models represent the detailed view. The left two models (Process Map and Process Flow models) describe the facts about "acting" while the right two models (Conceptual Model and Life Cycle Models) describe the facts about "being". In Figure 2, there are emphasized all four bilateral intersections. Each of them represents either only the process- or object-oriented set of models (i.e. left or right side of the framework), or only the system of detailed kinds of models (i.e. upper or lower side of the framework).

Process Map with Process Flow models represent the *general model of acting (model of business processes)*. Consistency rules in this field cover just the purposeful issues of the business without the regard of the general, process-independent rules of the business system.

Conceptual Model with Life Cycle models represent the *general model of being (general, process-independent rules of the business system)*. Consistency rules in this field cover just the general process-independent rules of the business system without the regard of the business processes, i.e. particular business goals and ways of achieving them.

The combination of both global models (Process Map and Conceptual Model) represents the *purposeful delimitation of objects*. Process Map delimits which objects of the business system and their relationships are important and therefore have to be taken into the account for the correct conception of business processes. Also, the consistency rules in this field are focused on the respect of the general modality of the business system in the system of business processes.

The combination of all detail models (Process Flow and Life Cycle models) represents the *purposeful delimitation of object lives*. Life cycles express the relevant general causality of the business system, which have to be taken into the account in the detailed conception of the business processes, which work with the given object. Also, the consistency rules in this field are focused on respecting the general business system causality in the algorithmic structures of particular business processes.

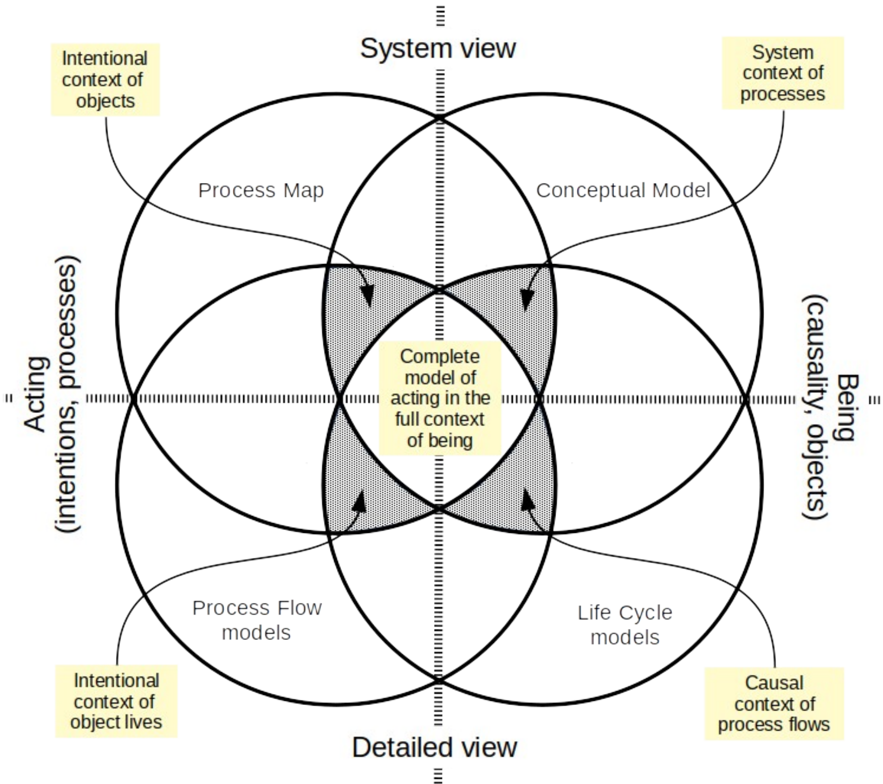

Fig. 3: Interpretation of the business system sets, part II.

In Figure 3, there are emphasized all four trilateral intersections. It also shows the overall (quadrilateral) intersection of all four model types.

The combination of the Process Map and all Process Flow models with the Conceptual Model represents the full *intentional context of business objects*. Consistency rules in this field are focused on the completeness and correctness of the Conceptual Model from the point of view of the business processes. This includes the existence of all relevant objects handled in business processes and their relevant classifications with all relevant associations between them.

The combination of the Conceptual Model and all Life Cycle models with the Process Map represents the full *system context of business processes*. Consistency rules in this field are focused on the completeness and correctness of the Process Map from the point of view of the business system modality and causality. This includes the existence of all relevant business processes in their relevant associations in the Process Map, which are necessary for handling all relevant objects in the full context of their lives and corresponding associations to other objects.

The combination of the Process Map and all Process Flow models with the object Life Cycle models represents the *full intentional context of object lives*. Consistency rules in this field are focused on the completeness and correctness of the life cycle models from the point of view of the business processes. This includes the existence of all relevant object states and proper transitions between them for each object handled in business processes. Relevancy of object states and transitions is given by the focus of business processes as it delimits the states and their relationships (possible transitions), which represent the business rules that have to be taken into the account in processes.

The combination of the Conceptual Model and all Life Cycle models with the Process Flow models represents the *full causal context of business process flows*. Consistency rules in this field are focused on the completeness and correctness of the process flow models from the point of view of the business system causality. This includes the existence of all relevant actions in business processes in relevant ordering (structures), which correspond to the business rules expressed in the life cycles of relevant objects in corresponding associations to other objects.

The overall intersection of all four model types represents the *complete model of acting in the full context of being*. Consistency rules in this field are based on the common meanings of particular phenomena occurring in different models. In the intersection of all four models, the consistency rules are about events (representatives of the modality/causality of the business system) and actions (representatives of the business intentions). Particular consistency rules there follow the equilibrium of the given business rules and intended business actions.

Table 2 summarizes all 13 compartments of the framework with their interpretation in terms of its meaning and the kind of consistency, whose need the given combination of models evokes.

Table 2: Interpretation of particular compartments of the framework

#	Compartment	Represents	Kind of consistency	Meaning
1	$PM \cap \overline{PF}\,\overline{PF} \cap \overline{CM}\,\overline{CM} \cap \overline{LC}\,\overline{LC}$	Process Map only.	Internal consistency of the process system.	Collaboration.
2	$PF \cap \overline{PM}\,\overline{PM} \cap \overline{CM}\,\overline{CM} \cap \overline{LC}\,\overline{LC}$	Process Flow only.	Internal consistency of the process flow.	Acting.
3	$CM \cap \overline{LC}\,\overline{LC} \cap \overline{PM}\,\overline{PM} \cap \overline{PF}\,\overline{PF}$	Conceptual Model only.	Internal consistency of the conceptual model.	Real World structure (modality).
4	$LC \cap \overline{CM}\,\overline{CM} \cap \overline{PM}\,\overline{PM} \cap \overline{PF}\,\overline{PF}$	Life Cycles only.	Internal consistency of the object life cycle.	Real World objects causality.
5	$PM \cap PF \cap \overline{CM}\,\overline{CM} \cap \overline{LC}\,\overline{LC}$	Process models only.	Consistency of process relations.	General model of acting (business goals and processes).
6	$CM \cap LC \cap \overline{PM}\,\overline{PM} \cap \overline{PF}\,\overline{PF}$	Object models only.	Consistency of object relations.	General model of being (Real World modality and causality).
7	$PM \cap CM \cap \overline{PF}\,\overline{PF} \cap \overline{LC}\,\overline{LC}$	Complete system view only.	Global consistency of the business system structure.	Purposeful delimitation of objects.
8	$PF \cap LC \cap \overline{PM}\,\overline{PM} \cap \overline{CM}\,\overline{CM}$	Complete details only.	Temporal consistency of the business system.	Purposeful delimitation of object lives.
9	$PM \cap PF \cap CM \cap \overline{LC}\,\overline{LC}$	Complete process model with conceptual model.	Consistency of processes with general business system structure.	Intentional context of objects.
10	$CM \cap LC \cap PM \cap \overline{PF}\,\overline{PF}$	Complete object model with Process Map.	General consistency of the process system structure.	System context of processes.
11	$PM \cap PF \cap LC \cap \overline{CM}\,\overline{CM}$	Complete process model with life cycles.	Consistency of processes with business system causality.	Intentional context of object lives.
12	$CM \cap LC \cap PF \cap \overline{PM}\,\overline{PM}$	Complete object model with Process flow models.	General consistency of process actions.	Causal context of process flows.
13	$PM \cap PF \cap CM \cap LC$	Issues of all four models together.	Overall consistency of events with business actions.	Full model of acting in the full context of being.

4.2. Examples of Consistency Rules

In our approach to the consistency of business system models, so-called "internal" consistency in a particular single model (see the first four rows in Table 2) actually represents the conformance with the fact that is generally superior to the model and therefore, it can be used as a gauge of the general correctness of the model. In the case of the business system models, such a gauge is the Real World. As all four basic models of the business system are actually specific descriptions of the modal logic of the Real World, their conformance with the Real World is based on the Kripkesemantics [10]. All the internal consistency rules for particular single models generally require the validity of the given fact "*in all possible worlds*", which actually expresses the request for a specific kind of completeness. Focusing on these consistency rules in more detail we can require for instance in the detailed model of processes (process flow model, row 3 in Table 2) that *the process flow model has to be valid for all possible instances of the process*, which evokes a number of additional consequential rules like for example:

- *The process flow model has to cover all possible relevant Real World events with proper individual reactions.*
- *If there is a parallelism in the process flow model, the model has to ensure that none possible relevant Real World event can cause an inability of the process to merge all parallel branches to a single branch.*

Similarly, in the life cycle model (row 4 in Table 2) we can require that:

- *The model has to cover the whole life of the object.* To ensure the completeness of the whole object life in the model, MMABP defines three mandatory types of object methods (stereotypes): *constructor, destructor*, and *transformer* that ensure exactly one beginning of the life cycle and at least one its end. Moreover, the transformer type of a method requires that *the use of such method results in the change of at least one attribute of the given object or/and its relationship to another object.*
- *The model has to be valid for all possible instances of the object class (and consequently, for all possible instances of its relationships to other classes)*, which evokes a number of additional consequential rules like:
  - *No possible object can transit between two specified states in a way, which is not specified in the life cycle model*. If there is such a possibility it usually means the specification of the life cycle is incomplete.
  - *Every possible object can be in exactly one state at a particular moment.* If there can be more states of the same object at the same moment it usually means the description of another related object class is missing in the set of models.

Even more rich set of consistency rules we can get by taking into account also other models that represent other points of view on the business system. For instance, in the field of the causal context of process flows (see row 12 in Table 2), we can require that the models of process flow fully respect the causality of the business system specified in both object-oriented models, which leads to the rules like:

- *Every event specified in the transition between the states of the life cycle has to be used in at least one process flow model in all corresponding contexts*. The corresponding context includes both involved object states and also the context of the life cycle(s) of other objects possibly related to the given object. Relationships to other objects are specified in the Class Diagram. State Charts of those related objects then specify in more detail which relationships to other objects are relevant for the given transition. All in this way involved objects have to be processed either in a single process or in a set of directly collaborating processes in terms of the meaning of the given transition event and following corresponding associations to other objects.
- *Every method specified in the transition between the states of the life cycle has to correspond to at least one process task (i.e. a process step or activity) in all corresponding contexts.* The corresponding context includes the type of the method (Constructor / Destructor / Transformer) and also the context of the life cycle(s) of other objects possibly related to the given object. Constructor represents the creation of the new object and Destructor represents the end of its life in the system (deletion). Transformer represents the change of attributes or/and possible relationships to other objects. The contents of every corresponding process task have to correspond to the corresponding meaning of the method. Moreover, every method may also lead to the change of relationship(s) to (an)other object(s) how they can be seen in the Class Diagram. In such case, the process task has to cover also that meaning.

Let us illustrate the consistency rules and their effect on completeness with the following example (schematically depicted in the Figure 4). The example illustrates the combination of the Conceptual Model and Life Cycle model with the Process Flow from Figure 3.

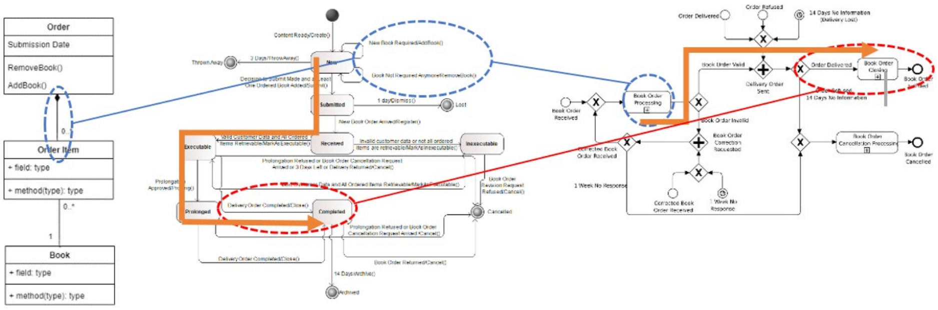

Fig. 4: Example illustrating schematic diagram: Class, Object Life Cycle, and Process diagrams

Consider a process that covers the processing of an order for the delivery of goods to an end customer - from the actual arrival of the order to its fulfillment. The model of such a process has its intersection with the life cycle of an order for goods. The process works with multiple objects, of course, but the basic object is the order for goods from the customer. Consistency rules specify that the life cycle must be captured from the creation of the object to its end, and the sequence of activities in the process model must not conflict with possible sequences of actions in the life cycles. On the contrary, they must be consistent with each other, and causality, what initiates the activities and what is the given output state, must also be consistent. This way the consistency also ensures completeness - process activities cannot skip life stages of the object they work with, on the contrary, the process must contain all relevant activities and capture all processing possibilities that the life cycle defines, so that the process is consistent with the life cycles of the objects it works with, in this case, the order for goods**.** Consistency rules with the class diagram provide another view that helps the completeness of the process model. The class diagram specifies, among other things, the possible relationships between objects, and the creation, termination, or change of these relationships must be reflected in both the object life cycle model and the process model. An order for goods is usually captured in a class diagram the way that it consists of order items. To be consistent with this, the lifecycle of the order for goods object needs to specify the actions that add, remove, or change order items and define under what conditions these actions are triggered. The consistency rules ensure that the process model reflects this and that it is not in conflict with the rules specified in the lifecycle. The completeness of the process is thus ensured by consistency with the life cycle which is consistent with the class diagram.

Figure 5 shows the part of the MMABP Business System Meta-model that defines the concepts and their relationships relevant to the problem of consistency. For the implementation of the consistency rules, the methodology defines the special relationships between selected concepts from both Business Process Meta-model (dark classes) and Business Substance Meta-model (bright classes) packages. For instance, the process concept *Event* is directly related to the ontological concept *ClassLifeCycleStep* in the role of the *BusinessReason* (i.e. as a reason for the transition between class life cycle states). Similarly, this model expresses a general m:n connection between the process concept *State* and the *ClassState* or a general connection between Class and the process concepts *ExternalAspect* and *Input/OutputSet*.

There are also several special concepts, original just in this meta-model (see the classes without identification of the source package on the right side of the model). These concepts allow mapping of the ontological concept *ClassLifeCycleStep* and the process concept *Activity* by means of the *StructureElement* class that mediates a basic connection between them through the generic concept *Structure* and its sub-types with the help of another generic concept *OppositeClassMultiplicity* and its sub-types (see the gray area). In this way, the model expresses the so-called structural coherency between the steps of the class life cycle and the corresponding structure of the process activities. Structural coherency is a basis for a special set of consistency rules: *structural consistency rules*.

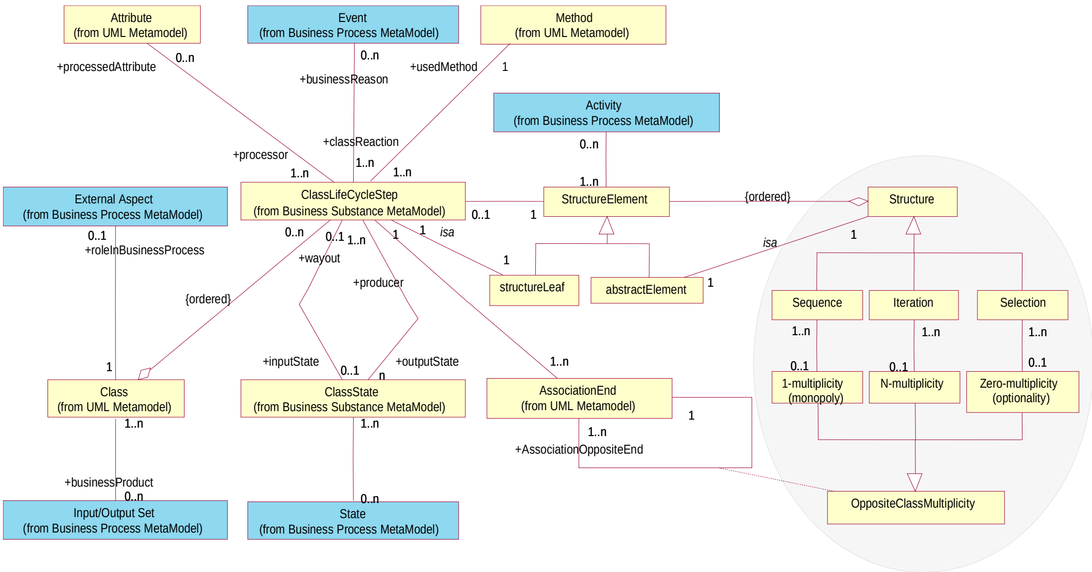

Fig. 5: Consistency package from the MMABP Business System Meta-model.

Comprehensive specification of the MMABP approach to consistency is out of the scope of this paper. A more detailed explanation of the MMABP Business System Meta-model can be found in [16].

5. Discussion and Conclusions

The MMABP constitutes the completeness and correctness of models' of business process analysis on three basic components – mutually complementary models (viewpoints) describing acting in a given environment, the meta-model, and the consistency rules. In the analysis above, we have described how the four mutually complementary models form 13 compartments (outlined by the models' intersections) with their interpretation in terms of its meaning and the kind of consistency, whose need the given combination of models evokes. Each compartment has specified consistency rules focused on the completeness and correctness of the models.
The analysis of the compartments describes the complementarity of the four models and how the correctness and completeness are ensured by the consistency rules specified by each compartment. Compared to current standards like TOGAF and ArchiMate, the MMABP not only provides compatible meta-model [18] and selection of the basic models a business architecture has to consist of, but also the consistency rules, enabled by the mutual complementary models, which ability to describe consistency and correctness of the models goes far beyond the abilities of the sole meta-model. The MMABP consistency rules, in a sense, support the completeness specified by Carson [5]. If the stakeholders approve the individual models, the completeness of the whole business analysis is ensured by the consistency rules.
Compared to the executable (workflow) artifact-centric business processes, the MMABP enables one to stay at the conceptual, less detailed level, than it is required for processes ready for execution by some workflow engine, and still to be able to ensure the correctness and completeness of the business process analysis.
Further research in this field is necessary. The current standards for business architecture give wide options to the analysts, but they do not provide many tools that would ensure the models' consistency and completeness. This paper shows that constituting the consistency and completeness of the business architecture only on general advice and just classifications-oriented meta-models is not enough.

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