

BCIT Tutorial Document

1 Prefaces

1.1 Goal

The goal of this tutorial is (1) to demonstrate the feasibility of modeling the motivation scenario introduced in the paper, and (2) to demonstrate the feasibility of modeling the interrelations of alternative compliance processes and their integration into the business process (Figure 1 & Figure 2).

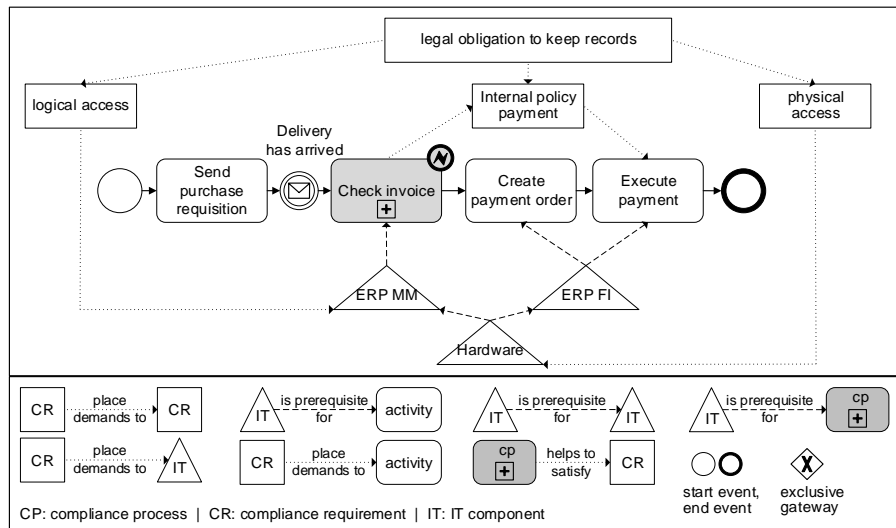


Fig. 1. Motivation scenario

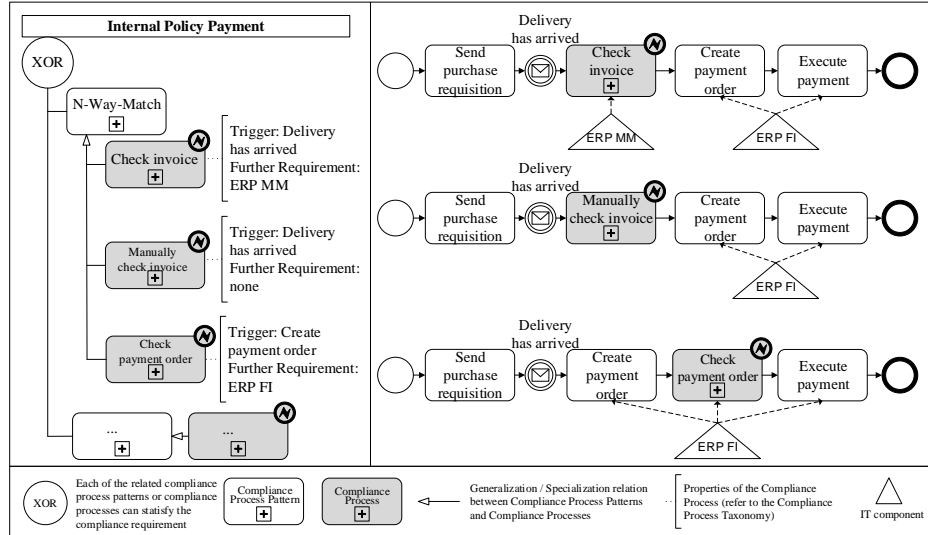


Fig. 2. Alternative compliance processes and recommended compliant purchase to pay processes

1.2 Structure of the Tutorial

In this tutorial, we follow the steps offered by BCIT as Figure 3 shows:

1. *Import Models*: Import compliance requirements modelled as JSON, import business processes modelled as BPMN and import IT infrastructure modelled as ArchiMate models.
2. *Link elements*: Link compliance requirements to other compliance requirements, link business process activities to supporting IT components, link business process activities to demanding compliance requirements and connect IT components to demanding compliance requirements.
3. *Define alternative compliance processes*: Define and connect alternative compliance processes to compliance requirements.
4. *Analyze*: Automatically analyze the interactions between business process compliance and business process change.
5. *Recommend compliant business processes*: BCIT recommends compliant business processes that are based on alternative compliance processes.

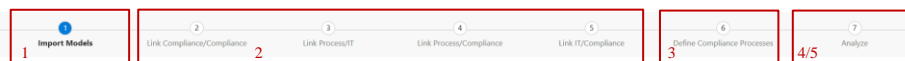


Fig. 3. Areas of BCIT

2 Import Models

Step 1 (Import Models) allows to import the models of compliance requirements, a business process model and an IT infrastructure model. Alternatively, previously build project models can also be imported (File → Open Project). *Please note that in this demonstration, a demo project is automatically loaded at the start of BCIT.*

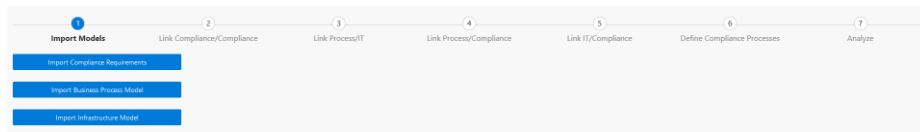


Fig. 4. Import Models

3 Link Elements

The imported models (compliance requirements, activities of the process and IT components) must be manually linked together. Further, at least one business activity in the business process must be defined as a compliance process.

Technically, the imported models are transformed into directed graphs. Each node represents an element within the imported model (e.g. a flow element of the business process, an IT component of the IT infrastructure model, ...). The graph (see Figure 5) can be viewed using the menu item File → View Graph.

Please close and reopen the graph view if the graph should not be displayed.

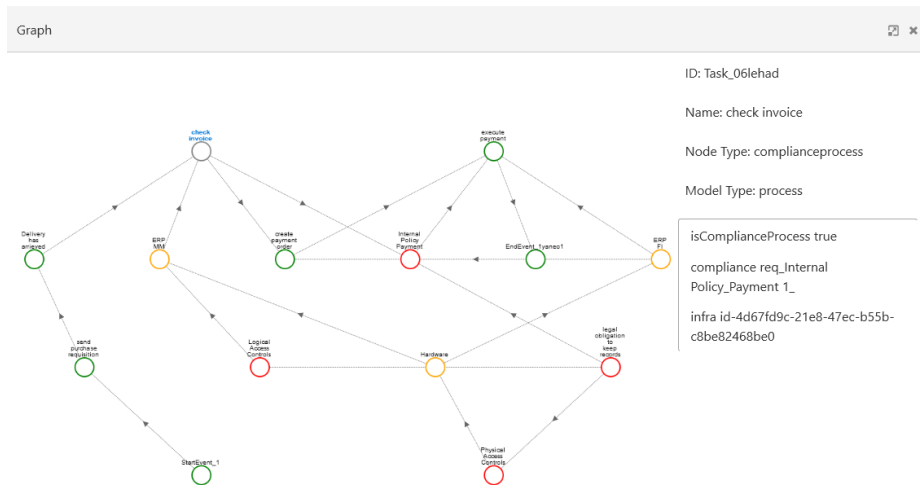


Fig. 5. Graph view

3.1 Link Compliance and Compliance

In Step 2 (Link Compliance/Compliance) compliance requirements are linked together (Figure 6). The list on the left side represents the compliance requirements that are specialized by the ones on the left side. The **connection can be established** by tapping the yellow connect button. In our example we connect the following compliance requirements:

- § 238 German Commercial Code → Logical access controls.
- § 238 German Commercial Code → Internal policy payment.
- § 238 German Commercial Code → Physical access controls.

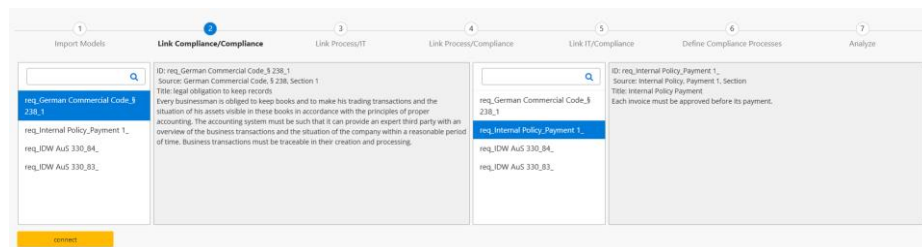


Fig. 6. Link compliance requirements

3.2 Link Business Process and IT Components

In Step 3 (Link Process/IT) business activities are linked to supporting IT components. The upper part of the window shows the imported business process model, whereas the lower part shows the IT infrastructure model (Figure 7).

The respective **business activity and IT component** can be **selected** by a click. The elements are connected by press the yellow connect button. After that BCIT visualizes the connection through the data store. Note, that BCIT only displays the IT component that is directly connected to the flow element within the process model. Additionally, the property list on the right side displays the id of the connected IT component. A **link can be removed** by selecting the respective property and tapping on the blue remove button.

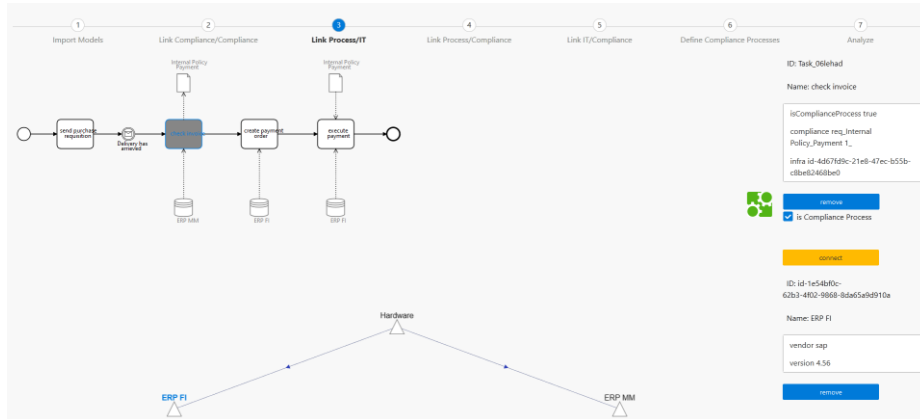


Fig. 7. Link business process activities and IT components

3.3 Link Process and Compliance Requirements and Define a Compliance Process

In Step 4 (Link Process/Compliance) business activities are linked to demanding compliance requirements (Figure 8). This is done in the same way as the previous step. In our example we link the compliance requirement ‘internal policy payment’ to the business activity ‘execute payment’. BCIT indicates the connection to a compliance requirement through a data object. Note that BCIT visualizes only the compliance requirement that is directly connected to the business activity. All previous compliance requirements are not visualized in the process model

Further, we **define** the business activity ‘check invoice’ as a **compliance process**. This is done through enabling the checkbox **is Compliance Process**. BCIT highlights a compliance process in grey. Besides that, we also connect the compliance requirement ‘internal policy’ to the compliance process.

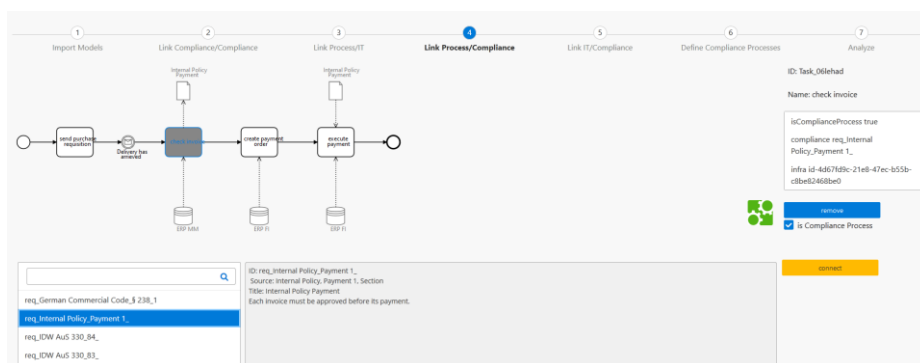


Fig. 8. Link business process activities and compliance requirements

3.4 Link IT and Compliance Requirements

In Step 5 (IT/Compliance) we link IT components to demanding compliance requirements (Figure 9). This is done in the same way as the previous connections. Similarly, the connection can be released again. In our example, we define the following connections:

- Logical access → ERP MM and
- Physical access → Hardware.

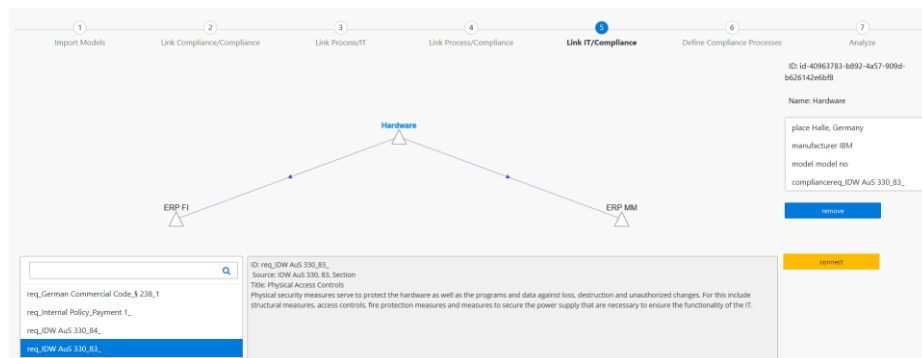


Fig. 9. Link IT components and compliance requirements

4 Define Alternative Compliance Processes

After connecting the elements together, we can either analyze the interactions between BPC and change (section 5) or we can define alternative compliance processes. In order to put forward proposals for a business process adaptation, we first define alternative compliance processes in Step 6 (Define Compliance Processes). Therefore, three steps have to be done:

1. Add and specify the compliance requirement.
2. Add compliance process patterns.
3. Add and specify compliance processes.

In our example we select and **add the compliance requirement** ‘internal policy’ from the list on the left side. Next, we **add the compliance process pattern** named ‘n-way-match’ (Figure 10).

Fig. 10. Add and specify the compliance requirement

After that, we **add compliance processes**. Each new element is added to the selected element. First, we select the defined compliance process ‘check invoice’ (Figure 11). The name and the further requirements for execution are automatically filled out. We manually define the trigger ‘Delivery has arrived’.

Fig. 11. Define the compliance process

Second, we **define an alternative compliance process** ‘check payment order’ which specializes the previous defined compliance process pattern ‘n-way-match’ (Figure 12). The trigger is the existence of the business activity ‘create payment order’. Further requirements for the execution of this compliance process is the IT component ‘Financial Management Module’.

Fig. 12. Define an alternative compliance process

Finally, Figure 13 shows the **modelled interrelations** between the compliance requirement ‘internal policy’, the compliance process pattern ‘n-way-match’ and the compliance processes ‘check invoice’, ‘manually check invoice’ and ‘check payment order’. Each node can be edited or removed at the panel on the right side.

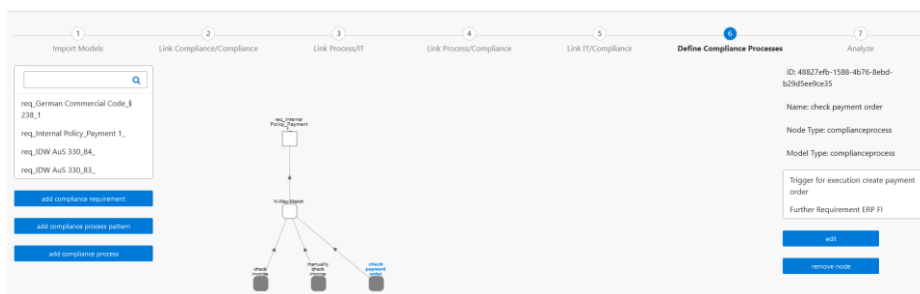


Fig. 13. Alternative compliance processes and compliance process pattern

5 Analyze the Interaction between Compliance and Change

In Step 7 (Analyze) the interactions between compliance and change are analyzed and the compliance of the business process can be checked. In case of a compliance violation, BCIT recommends compliant business processes through the integration of executable compliance processes modelled in the previous step.

In order to analyze the interactions between compliance and change BCIT offers three different views to select the changed element: first the user can select every compliance requirement that is connected to another element (e.g. business activity or IT component), second the user can select elements from the process view and third the user can select an element based on the IT infrastructure model. We can define every element as the changed element.

Basically, we differentiate between the change pattern ‘change element’ and ‘delete element’. The pattern ‘change element’ shows the direct and indirect demands by compliance requirements when replacing the selected element by another one. The pattern ‘delete element’ shows the impacts on compliance requirements when removing the selected element. In the following, we will refer to the change pattern ‘delete element’.

The **element that shall be changed** can be selected through tapping on it. The selected element is shown on the right side (Figure 14).

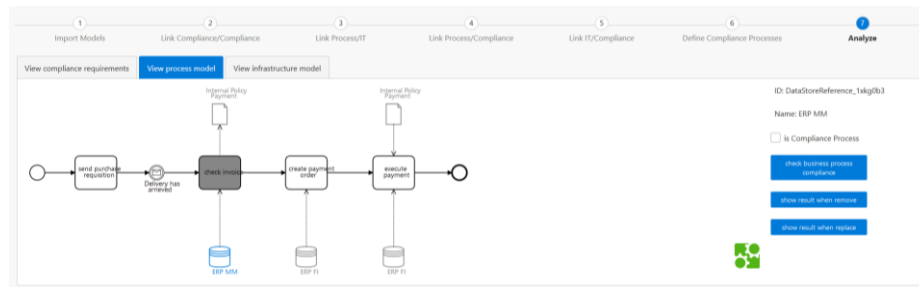


Fig. 14. Selecting the element that shall be changed from a process perspective

Figure 15 shows impacts on the compliance requirements when removing the IT component ‘Material Management Module’. The violated and obsolete elements shown in the graph and listed on the right side.

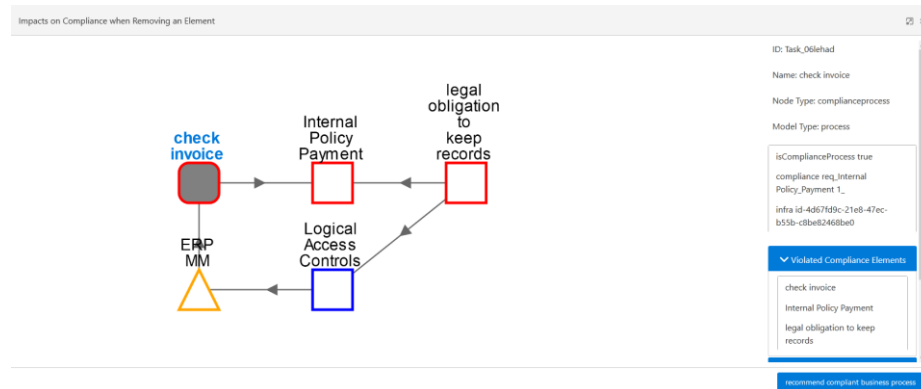


Fig. 15. Impacts on compliance when removing an element

Table 1 contains the meaning of the graph shapes and their border colors. In this example the compliance process ‘check invoice’ cannot be executed. Thus, the compliance requirements ‘internal policy payment’ and ‘legal obligation to keep record’ are violated.

Table 1. Meaning of the graph elements

Shape		Border color	
Rectangle	Compliance Requirement	Orange	Changed Element
Rounded rectangle	Business Activity	Blue	Obsolete Element
Triangle	IT component	Red	Violated Element

In order to get recommendations for compliant business processes the button recommend compliant business process has to be clicked.

6 Recommend compliant Business Processes

Figure 16 shows the original business process. The removed element is highlighted orange. The violated elements are highlighted red. The left side of Figure 16 shows a list of the original process and all recommended compliant business processes that are adapted by alternative compliance processes. Each process can be exported as a BPMN model and opened in any modeling tool, such as Camunda Modeler.

Figure 17 and Figure 18 show compliant business processes. They are compliant through the integration of the alternative compliance processes ‘manually check invoice’ and ‘check payment order’.

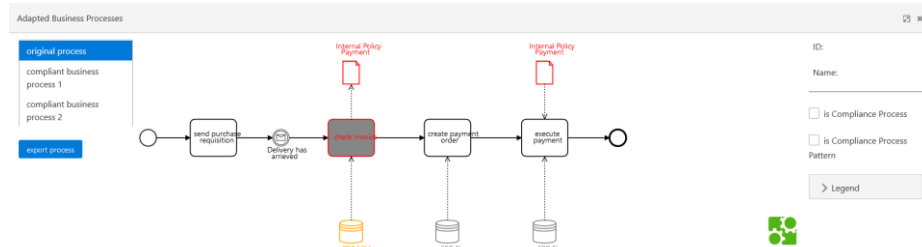


Fig. 16. Original but violated business process including the compliance process ‘check invoice’

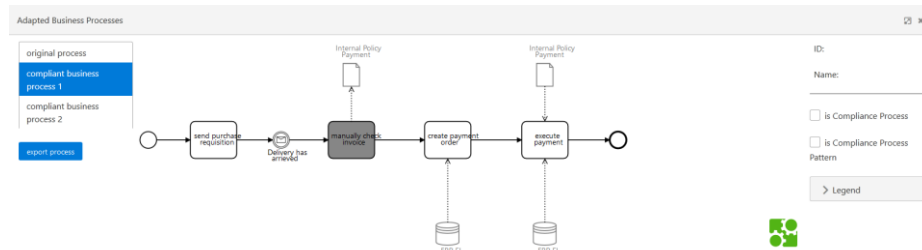


Fig. 17. Compliant business process including the alternative compliance process ‘manually check invoice’

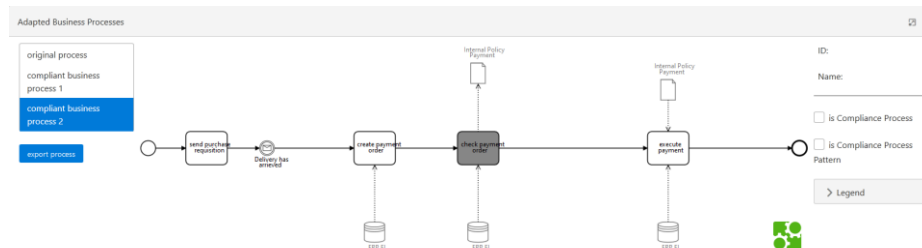


Fig. 18. Compliant business process including the alternative compliance process ‘check payment order’