

Case Study: Analysis of a Purchase-to-Pay Process

1 Task

The case study deals with a large multinational company operating from The Netherlands in the area of coatings and paints, whose Purchase-to-Pay (P2P) process is supported by an ERP system. Such a process involves purchasing items from a vendor (purchase order item). These are at some point delivered and received by the company (goods receipt). The vendor generates invoices for the items and these have to be cleared by the company.

To ensure that the P2P process runs correctly, goods receipt documents that are recorded should be matched against the recorded invoices and the purchase order item. Overall, the intended procedure is as follows: first, a purchase order item is created; once purchased goods are physically delivered, quantities of the purchase order item need to be matched against the actual delivery quantities on the goods receipt document. Invoices should be recorded only after the receipt of the goods has been recorded and the quantities and prices stated on the invoice need to match both the values of the purchase order item and the goods receipt document. This is known as a **3-Way Match, invoice after goods receipt** procedure (see Figure 1). For a single purchase order item, there can be many goods receipt documents and corresponding invoices, which are subsequently paid. Consider for example that an IT department of a university purchases ten laptops for ten different chairs; the vendor has five laptops on stock and delivers them right away, but has to reorder the other five which are shipped in another delivery. Hence, there is one purchase order item, two goods receipts, and (possibly) ten invoices (one per chair that has to pay their own laptop). Overall, for each purchase order item, the amounts of the item, the goods receipt messages and the invoices have to match for the process to be compliant (cf. [1]).

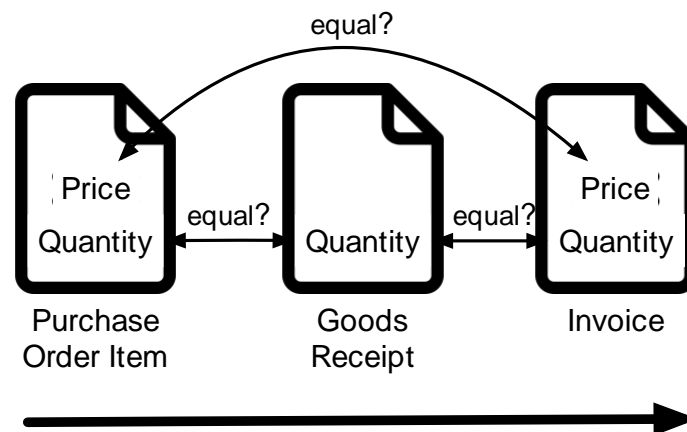


Figure 1: Illustration of 3-Way matching, invoice after goods receipt.

1.1 The Data

Please find the event log on ILIAS (contained in Course Materials/Case Study along with this description). This log is a filtered version of the original data used for the BPI Challenge 2019, such that it only contains cases that should follow the 3-way-matching, invoice after goods receipt procedure. See the reference [1] for a detailed explanation of the attributes present in the log.

1.2 Your goal

The overall goal of the project is to develop a good understanding of the recorded business process and demonstrate this by obtaining useful insights in a data-driven manner. To achieve this, you are free to analyze the event log with any available tools, methods, and techniques.

When conducting your analyses, focus in particular on the following aspects:

- **Process Discovery:** What does the process look like? For this, we ask you to establish (a) BPMN model(s) that is/are useful for the further analysis tasks you conduct. You shall use automated process discovery methods as a basis, yet you need to ensure that your actual model(s) is/are of good syntactic, semantic, and pragmatic quality. Choose which details to include and which to omit; you may also adjust the names of activities (see 7PMG) or add abstraction by merging parts. Make sure to report on the key design choices that you made while establishing your model(s).
- **Compliance:** Given that the process should follow the 3-way-matching procedure:
 - Do all cases indeed adhere to this procedure?
 - Which characteristics do non-compliant cases (if any) have; are there common issues?
 - What is the throughput of the invoicing process, i.e., the time between goods receipt, invoice receipt and payment (clear invoice)?
 - Can you observe any other (potentially) problematic behavior and/or issues with respect to the data quality?
- **Additional Insights:** Can you obtain additional interesting insights (for instance, regarding rework in the process or regarding the resource perspective of the process)?

1.3 Group assignments

You have been assigned to groups with 5-6 students. Allocations were sent by email. Get in touch with your teammates and start working on the project right away! If there are any issues with group members, contact Adrian Rebmann (rebmann@uni-mannheim.de) as early as possible.

1.4 Deliverables

The main deliverable is a slide set (approx. 20-25 slides) capturing your answers to the above questions. We need to understand how you got to your results, so you can also provide auxiliary materials supporting this. If you do so, please provide everything in a single zip file.

1.5 Assessment

You will be graded as a group based on the following criteria:

- Method (Which techniques/methods are used and are these used appropriately? Width and depth of analyses)
- Results (Are posed questions answered? Discussion of findings. Implications of the findings)
- Presentation (Clarity, structure, visuals appropriately used, ...)

1.6 Submission

When submitting your results, keep the following in mind:

- **Deadline:** Thursday, November 24 at 23:59
- Through the course platform (ILIAS)
- Only make one submission per team
- Include names and matriculation numbers of all team members in your report
- Use PDF as the format for your slides (and a .zip folder if you have auxiliary materials)
- Name your submission document "IS515_HWS22_group_[group ID]_case_study.pdf"

1.7 Questions regarding the content

Should you have any questions regarding the content feel free to post it on the case study forum. Do not write emails to the instructors regarding non-administrative matters, use the forum on ILIAS for this.

2 Reference

[1] <https://icpmconference.org/2019/icpm-2019/contests-challenges/bpi-challenge-2019/>