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Enhancing Intercompany Trading through Digitalization: Case company Johnson Controls International.

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Abstract

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Intercompany is the term used in Finance and Accounting field. It refers to business trades and activities of two subsidiaries within one corporation. Intercompany exists in various forms, from trading materials to services and human resources. All intercompany transactions need to be recorded in the accounting books of both involved entities. Before conducting the consolidated financial report for the whole group, intercompany transactions are required to be eliminated. This practice is to ensure the consolidated financial statements only represent the group financial result from business activities with external parties.

In reality, intercompany transactions recorded in the books of two subsidiaries often mismatch. These discrepancies required manual checking and resolving, which consumed a considerable amount of time and effort. The aim of the thesis is to identify, to simplify, and to enhance the accuracy of intercompany transactions through digitalization.

The research had two phases. The initial phase was to identify the existing problems in the current process of the case company, through general opinions of the process executors. This was conducted through face to face interviews with accountants in the case company. The second phase was data analysis of intercompany journals that had been recorded during the period of 6 months in the case company. The purpose of this phase was to visualize the overall performance of the intercompany procedure through explicit figures and data.

The results of the research were converted to proper criteria for assessing the software. In addition, the PSO (Purchase Software Operation) vendor scorecard from New York University was used as the framework for selection criteria. Additionally, a set of illustrated scores were given to popular accounting vendors for demonstrating how the framework can be applied.

Followed by this was a proposal suggested how the case company should adjust its internal governance in terms of frequency of reconciliation, internal control, and audit trail in the intercompany procedure to adapt the new selected software. This was the demonstration of how the case company could use the data analysis and the framework to evaluate the vendors and integrated the software.

Keywords
Intercompany transaction, Intercompany Reconciliation, Consolidated financial statements, Intercompany elimination

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1 Introduction

In this chapter, the writer introduces the main information about the thesis with to help readers understand the aim of the thesis and its overall structure. With the sub-chapter research questions, readers will be able to envision the main purpose and targeted research result. This came in a deeper, more comprehensive layer through the main questions that will be conducted during the research.

There are many topics in accounting that related to Intercompany. Hence, the existence of the demarcation serves as a boundary of which area will be covered in the thesis as well as which will not be. Next, the international aspect highlights international values and contributions of the research. Followed by the international value is the benefits sub-chapter that lists out all the benefits towards the readers, the authors, the case company, and especially the field.

Before diving into the main part, there is sub-chapter named as key-concept to explain all the professional terms will be included and mentioned in the thesis. This help readers who are in business field but not specialized in finance and accounting be able to comprehend the work. Finally, the sub-chapter about the case company will close the introduction part.

1.1 Background

The topic of this thesis is Enhancing Intercompany Trading through Digitalization: Case company Johnson Controls International. In the business world nowadays, there are a vast number of theoretical perceptions that cannot easily correlate with empirical situations. Intercompany recording is a great implication for this statement. It is evaluated as an intricate and sophisticated task by many accountants. Even though the whole intercompany accounting procedure can simply be summarized as: making sure subsidiaries have recorded the same information for the transactions that occurred between them.

Real-life accountants usually spend hours and a tremendous amount of effort to make the numbers match. It can be difficult for an outsider of the accounting filed to understand what makes intercompany accounting complex. In order for readers to comprehend the problems, consider a scenario from Parcells' article for example:

> A subsidiary in Germany enters into a transaction with a subsidiary in the United States. The entity in Germany records the transaction in euros, while the entity in America records the transaction in dollars. This results in an out-of-balance intercompany transaction with potential tax complications. If the entities use different enterprise

> resource planning (ERP) systems, validating the journal entries is complicated by the systems' different characteristics. If the accounting staff books the entries in different months-for example, if they book one journal entry on March 30 and the other on April 2-an automatic imbalance will occur. This is further complicated by the different currency exchange rates each day. (Parcells, 2015.)

Interestingly, this is an example from a CPA in the United States but it completely matches the situation of the case company Johnson Controls International. On top of these issues, intercompany trading is executed without proper initial documents from time to time, especially in urgent case. Despite the group governance guideline emphasizes the risk of this common practice, it still happens. This practice makes it harder to solve the discrepancy after being identified as there were no backup documents.

The complexity of intercompany transactions substantially comes from the consequence of the large scale of companies. This is applicable not only for intercompany area but also for the other accounting practices, finance functions, and business activities in general. When an organization extends its dimension, its resources, opportunities, size, and scale grow along with its challenges and sophistication in business activities. This is the reason why the thesis targets large-scale firms.

The writer has been exposed by this phenomenon during the internship at a worldwide company that executes a tremendous amount of intercompany transactions daily. That made the writer decide to dedicate the graduation thesis for this appealing subject.

1.2 Research Question

As mentioned in the introduction, the problem is partly created by business expansion. However, this cause is immutable. Business obviously could not resist itself from growth.

Hence, the aim of this thesis is not eliminating the cause of the problem but shed the light in a better way to cope with it. In order to achieve this, the research will investigate the difficulties in intercompany accounting that accountants dealing with every day. There are two lateral goals of the thesis. The first goal is detecting obstacles on daily tasks. The subsequent target of the research is proposing how to interpret the problems, and to use it to reach a proper solution.

There is a reason why one of the goals is obstacles detection. Despite having a mess under its internal transactions, not many companies take action on it. Problematic activities are here and there in the process. The aim of the thesis is to precisely recognize, neatly organize, and evaluate these obstacles in priority.

The result of this thesis will act as an idea about the improvement project for internal transactions for companies. Hence, the thesis helps to diminish the burden of initiating solutions for this accumulated problem. Those most prominent problems in the case company have a high probability to exist in any company with such scale. This leads to the fact that a remarkable part of the result could be used in other same-size companies to improve their intercompany processes. On the other hand, it also can be utilized by companies planning on enlarging their scale as a prediction and vision. In fact, they are the only ones who can use this thesis as a prevention to build a good-shaped intercompany trading from the start.

The subsequent part of the result is an evaluation list of available software and digital tools that support recording intercompany transactions in accounting. This is a suggestion for the case company on which model it can use to select the accounting software for enhancing its intercompany practice. The model criteria should be customized and tailored for each business to function at its best.

In order to achieve all the goals mentioned, the research will be executed adhering to those questions below. These questions are derived from the aim of the thesis, which has been discussed so far.

Research Question: What could be done better in recording intercompany transaction in multinational case company Johnson Controls International?

Investigate question 1. What is the current practice of intercompany accounting in case company Johnson Controls International?

Interview question 1.1: What is the procedure of recording intercompany transaction in case company Johnson Controls International?

Interview question 1.2. How do the employees describe the efficiency and effectiveness of the current intercompany accounting process in case company Johnson Controls International?

Interview question 1.3. What are the challenges accountants in case company Johnson Controls International face on daily task relating to inventory trading between subsidiaries?

Interview question 1.4. Do employees in company Johnson Controls has any recommendation to improve the process?

Investigate question 2: How current problems in Johnson controls can be solved by digitalization and harmonization?

Investigate question 2.1: What are the current needs to eliminate the incorrect transactions recording in intercompany?

Investigate question 2.2: What are the features accounting software currently offer?

Table 1. Overlay matrix

Investigative question	Theoretical Framework*	Research Methods	Results (chapter)
Investigate question 1. What is the current practice of intercompany accounting in case company Johnson Controls International?			
IQ 1.1 What is the procedure of recording intercompany transaction in case company Johnson Controls International?		Qualitative research – Face to face interview with accountants in case company Johnson Controls International	5.1.1
IQ 1.2 How do the employees describe the efficiency and effectiveness of the current intercompany accounting process in case company Johnson Controls International?		Qualitative research – Face to face interview with accountants in case company Johnson Controls International	5.1.1
IQ 1.3 What are the challenges accountant in case company Johnson Controls International face on daily task relating to inventory trading between subsidiaries?		Qualitative research – Face to face interview with accountants in case company Johnson Controls International	5.1.2
IQ 1.3 What are the challenges accountant in case company Johnson Controls International face on daily task relating to inventory trading between subsidiaries?		Data analysis – Overall report about number of outstanding invoices in Johnson Controls	5.1.2
IQ 1.4. Do employees in company Johnson Controls has any recommendation to improve the process?		Qualitative research – Face to face interview with accountants in case company Johnson Controls International	5.1.3
Investigate question 2: How current problems in Johnson controls can be solved by digitalization and harmonization?			
IQ 2.1: What are the current needs to eliminate the incorrect transactions recording in intercompany?		Qualitative research – Market analyzation and evaluation	5.2.2
IQ 2.2: What are the features accounting software currently offer?		Qualitative research – Market analyzation and evaluation	5.2.2 5.3

Table 1 below presents the theoretical framework, research methods and results chapters for each investigative question.

1.3 Demarcation

Intercompany is a vast and intricate topic. It is vivid that in order to maintain a stable trading relationship between subsidiaries, a firm needs a clear guidance and good manner for each area. However, it is overwhelming to cover all areas. In order to adhere to the time allocation determined and the credit value of the thesis, some areas will be eliminated from the thesis discussion.

By stating that, the main area that this thesis is the intercompany trading in accounting perspective; from recording transactions to reconciliation and elimination. During the thesis, the writer will investigate the process of intercompany trading, for products trade as well as service trade, from creating purchase order till settling payments. Purchase order does not belong to accounting aspect. However, it is undetachable from intercompany procedure, especially for inventory trading as it acts as backup document and the origin of transactions.

On top of that, any other relevant topics in finance decision perspective, such as intercompany loans, cost-allocation, human resources cross-charge, fee sharing agreement, transfer pricing, acquisitions and merges will not be covered in this topic. Despite being directly related to intercompany relation between subsidiaries, the mentioned areas are more relevant to financial planning and decision. Hence, it is out of scope for the aim of the research determined.

With a solid demarcation in one specific area, the solution provided will be more concrete and precise. This helps to conduct a consolidated and qualified thesis, especially for every recommendation will be addressed. Besides, with the areas that left out from this thesis, there are still a lot of rooms for further researches.

1.4 International Aspect

To be emphasized, intercompany trade is challenging yet it is a vigorous challenge that its presence is a merit for the company. Companies must have reached a certain threshold of business scope to possess subsidiaries, and to have intercompany transactions. In another world, this phenomenon often exists in large-scale companies that have numerous subsidiaries, for instance, a multinational corporation, case company Johnson Controls International. In short, this is the problem that usually occurs on the international level of trading. Hence, this directly contributed to the international aspect of this topic.

1.5 Benefits

In this part, to acknowledge the benefits of having a proper control over internal transactions, let take a look at the risk of not having one.

Sustainability has been the ultimate goal for a corporation for the last decades. Lacking control over intercompany transactions is the least sustainable thing for a company’s finance. Deloitte, a prestigious firm in the field, has phrased intercompany accounting as ‘the mess under the bed’, a product of continued denial and neglect (Deloitte, 2017). For companies that do trading in multiple nations across continents, without a careful manner in intercompany trades, the risk of being exposed by fraud in financial statement, compliance issues are critical. During internal trade, this likelihood might not be exploded but when merges and acquisition happen, the clock is on. A tremendous amount of problems from the inaccurate records of internal trading will release its pressure at one time.

Despite the high rate of risk, the problem has been neglected for years since it does not affect the net income of the group. Take into consideration the scenario presented in the introduction, when one of the two entities would be acquired by another corporation and become a complete outsider. At this time, the problem has accumulated for years. A mere chance to solve it completely with a minor loss is nearly zero.

This is just one of numerous scenarios that frequently happen and lead to a fault in internal trades. One mistake is subsequent by another. Tackling existing problems in intercompany accounting is equivalent to eliminating a massive corporate risk. This benefits the company's sustainability and its stakeholders. It is clearly the time to take serious action on this, not only for the case company but for all the other companies that have ‘a big mess under their bed’.

On a personal level, the thesis candidate has been instructed that the prominent criteria to choose the thesis topic is the personal interest in the subject. It must be the subject appealing enough that the writer can dedicate hours on researching and writing it on their free will without any reluctance. In this case, it is Intercompany. It serves the writer's career interest as aiming to work for large-scale companies. It is draining but intriguing to investigate and to analyze a monumental dataset to find out the problem. Additionally, finding out and having a solution for such a problem is another level of enchantment. That is why this topic was chosen.

1.6 Key Concepts

Key concept	Definition
Intercompany accounting	Intercompany accounting involves recording financial transactions between different legal entities within the same parent company (Katie, 2020).
Reconciliation	Account reconciliation is the process of comparing internal financial records against monthly statements from external sources—such as a bank, credit card company, or other financial institution—to make sure they match up (Shelley, 2019). In term of intercompany reconciliation, this means comparing the accounting books of two involved entities.
Elimination	An intercompany elimination is a cancellation of intercompany balances and transactions when preparing consolidated statements, whereby assets and liabilities transferred within the company group must be returned to their initial book value and intercompany gains or losses must be eliminated from the consolidated statements using either a consolidated worksheet or an elimination ledger. (Pencunica LLC, 2020).
Consolidated financial statement	Consolidated financial statements are the financial statements of a group presented as those of a single enterprise. Capital provided by the shareholders of the parent company flows into other group companies. Consolidated financial statements bring out the real profitability and financial position of the group to the fore. (Ambrish, 2016a.)

Table 2. Key concepts and definition.

1.7 Case Company – Johnson Controls Internationals

Johnson Controls, Inc. was founded by Warren Johnson in 1885 with its core mission to harness and preserve precious energy resources. During its respectful 135 years of operation, the company has expanded tremendously while successfully maintain its essence of origin: reserving precious energy for a better world. At 2020, Johnson Controls Inc's headquarter locates in Cork, Ireland. Currently, the company is the leader in several industries and do business in 150 countries across the globe. Additional to its vital mission, the company is now engaged in advanced building and technology solutions with the ultimate goal to shape smart cities. (Johnson Controls Annual Report, 2019a, 3.) At the end of the fiscal year 2019, the company has 104 000 worldwide employees with the net of sales approximately reaches 24 billion USD (Johnson Controls Annual Report, 2019b, 26).

The total net of sales is contributed by a variety of product channels including integrated control systems, security systems, fire detection systems, equipment, and services. Trusted Buildings brands, such as YORK®, Hitachi Air Conditioning, Metasys®, Ansul, Ruskin®, Titus®, Frick®, PENN®, Sabroe®, Simplex®, and Grinnell®. This gives the Company the most diverse portfolio in the building technology industry. The company also sets up an empire of sales and service offices in 70 nations to support its business. (Johnson Controls Annual Report, 2019c, 4.)

Johnson Controls do a lot of mergers and acquisitions and holds a considerable number of subsidiaries in each product segment. Here is the list of brands under the company's ownership categorized by industry.

Industry	Brands owns by Johnson Controls,Inc.
Building Automation & Controls	1. BCPro 2. Facility Explorer 3. Metasys 4. Penn
HVAC Equipment	5. Envirco 6. Hitachi 7. Ruskin 8. Titus 9. York
Industrial Refrigeration	10. Frick 11. Sabroe 12. York Process Systems
Fire - Special Hazard	13. Ansul 14. Chemguard 15. Hygood

ANSUL HYGOOD SABO FOAM CHEMGUARD MACRON SKUM	16. MACRON 17. Sabo Foam 18. Skum 19. Williams Fire & Hazard Control
Fire Detection AquaMist sprinkCAD Grinnell tyco	20. Fireclass 21. Simplex 22. Vigilant 23. Zettler
Retail ShopperTrak Sensormatic TrueVUE	24. Sensormatic 25. ShopperTrak 26. TrueVue

Table 3. The building products portfolio (Johnson Controls, 2019).

With this amount of ownership combining with a joint venture, wholly-owned, and partially-owned, the relationship and the number of trading activities between Johnson Controls subsidiaries are absolutely beyond an individual's comprehension. In order to support its intricate financial activities, Johnson Controls has built 4 regional business centers, in which currently 90% of the group's finance functions flow through. The group is also fully aware of the risk of intercompany at a corporate level. This is stated several times in the annual report. In 2019, there was also a legal case arises between Johnson Controls and its subsidiaries, which is quoted here:

> "...The complaint seeks, among other things, disgorgement of profits and damages. On September 30, 2016, approximately one month after the closing of the merger, plaintiffs filed a preliminary injunction motion seeking, among other items, to compel Johnson Controls, Inc. to make certain intercompany payments that plaintiffs contend will impact the United States federal income tax consequences of the merger to the putative class of certain Johnson Controls, Inc. shareholders and to enjoin Johnson Controls, Inc. from reporting to the Internal Revenue Service the capital gains taxes payable by this putative class as a result of the closing of the merger. The court held a hearing on the preliminary injunction motion on January 4, 2017, and on January 25, 2017, the judge denied the plaintiffs' motion. The plaintiffs filed an amended complaint on February 15, 2017, and the Company filed a motion to dismiss on April 3, 2017. On October 17, 2019, the court heard oral argument on the motion to dismiss and took the matter under advisement. Although the Company believes it has substantial defenses to plaintiffs' claims, it is not able to predict the outcome of this action. (Johnson Controls Annual Report, 2019d, 21.)"

The legal case mentioned also emphasized an instant demand of Johnson Controls for enhancement over intercompany transactions to prevent similar cases arise, or at least mitigate the risk if any does occur. Numerous mergers and acquisitions happen in large entities and such a case will resist the company to get a lucrative deal. A more cautious manner in internal control is equivalent to more potential investments. The aim of this case company's introduction is to help the readers envision the extensive global network and complication in accounting transactions of Johnson Controls with its subsidiaries.

2 Theory framework - Intercompany accounting

In this chapter, the main knowledge base relating to the intercompany area will be introduced to readers. The theory framework included the definition of intercompany and its types. Additionally, how the generally accepted international accounting policy defines intergroup transactions is presented. As well as which way it should be treated at the corporate level and subsidiary level will be mentioned in this part of the thesis.

2.1 What is intercompany?

Intercompany in accounting term refers to any legal entity or subsidiaries within one corporate. The other term for this is intra-group. The term also refers to financial activities either goods trading or service performance occurring between two entities in one group. For instance, sales from subsidiary A to subsidiary B is an intercompany sale. There are 3 types of intercompany trades:

1. Downstream: Trades from parent to its subsidiary.
2. Upstream: Trades from the subsidiary to the parent.
3. Horizontal/ lateral: Trades between two subsidiaries in one parent group. (Paul; Debra, 2011 & Mohamed, 2018.)

2.2 What is consolidated financial statement?

In practice, consolidated financial statement and intercompany transactions normally come hands in hands.

As regulatory, companies are required to provide a financial statement to an external partner. The two most common ones are Income statement and Balance sheet statement. However, investors and stakeholders usually want to review the financial position and financial performance of the whole group. With this being stated, in order to get the financial overview of a group with twenty subsidiaries, the investors need to read twenty different sets of financial statements. This is inefficient. It is also difficult to provide to stakeholder a comprehensive picture of the group. Hence, the consolidated financial statements, which mean the set of financial statements combining parent company and all group subsidiaries' financial statements are introduced. The consolidated financial statements represent the financial results of the group collectively (Ambrish, 2016b).

2.3 Consolidated financial statement by generally accepted accounting standard - IFRS

IFRS (International Financial Reporting Standard) is a non-profit organization that were established to develop a set of accounting standard which is generally accepted globally (IFRS, 2020).

In October 2012, an Investment Entities amendment to IFRS10, IFRS12, and IAS27 was issued by IFRS, which defined all the subsidiaries shall be consolidated. The amendment also emphasized that the parent company needed to measure the investments in each subsidiary by the fair value of the entity's profit and loss. On top of that, the IFRS 9 Financial Instrument demanded subsidiaries' profits and losses to be included in the group comprehensive financial statement instead of an individual entity's consolidated financial statements. (IFRS Foundation, 2012).

Additionally, IFRS 10 Consolidated financial statement also instructed a proper procedure for consolidating corporate's financial statement. It includes 3 main components: combining, offsetting, and intragroup. The first step is collecting and combining all the financial records of individual entities in the group. Subsequently, in the offsetting part, all the investment from the parent company to its subsidiaries will be eliminated in the report on both sides. The scenario can simply be described as the amount of money invested from parent to any subsidiary is rewritten in the group's assets. Simultaneously, that portion is written off from the subsidiary's book. This part dedicates merely for dividend, interest, and stock ownership. Hence, in the last step, the same scenarios will be done for the residual parts in the financial statement assets, liabilities, equity, revenue, expense, and cash-flow. (Silvia, 2014.) The essence of the policy is simply to assert the group consolidated financial statements only includes the revenue and cost of goods sold with third-parties trading.

Silvia has illustrated the complete process in one comprehensive flowchart.

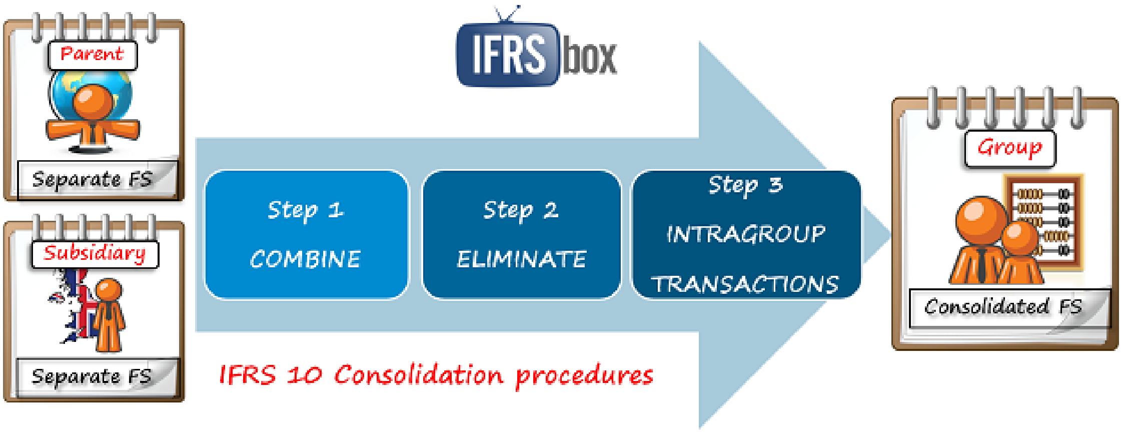

Illustration 2. IFRS 10 Consolidation procedures. (Silvia, 2014a.)

2.4 Intercompany elimination

As mentioned in the accounting standard, in order to conduct the consolidated financial statement, the procedure called intercompany elimination needs to be performed. What does intercompany elimination mean?

Intercompany elimination is the procedure required to be done by the parent company in order to conduct the consolidated financial statement. This means eliminating all the trades between subsidiaries from the consolidated financial statement of the group. The ending result of the elimination must have no impacts on the net asset of the corporation. In the other words, consolidated financial statements can be interpreted as the financial reports of the group as if all intercompany transactions had never happened (Paul; Debra 2011b). However, the elimination as well as consolidation is directly impact by the percentage of ownership. The wholly owned subsidiaries financial result is fully combined, and its intercompany transactions is fully eliminated. While the combination and elimination for 70% owned entity is only at 70%.

The process of consolidation includes line by line consolidation. In which each line item in the financial reports are reviewed respectively and intercompany transactions will be eliminated from the consolidated reports. Commonly the items eliminated from the individual entities book are investment from parent company, minority interest, internal loan, intragroup transaction, balance and unrealized profits (Ambrish, 2016c). In the scope of the thesis, intra-group transaction, balance and unrealized profits are mainly discussed.

In order to go further and understand the significance of intercompany elimination, the nature of intercompany transactions and how it is recorded need to be introduced.

2.4.1 Intercompany transaction

An intercompany transaction is a journal entry entered into an accounting book to record the financial impacts of one intercompany activity on the involved subsidiary.

Three general types of intercompany transactions may occur companies within the group:
a. Intercompany sales of merchandise,
b. Transactions in fixed assets, and
c. Intercompany debt/equity transactions.

There most common type intercompany occur is intercompany inventory transaction.

As the nature of the business world, one business transaction always demands to be reflected in two sides of the trade. This is also applicable for intercompany accounting. One intercompany activity must be reflected in the accounting books of all involved entities. In other words, one intercompany activity requires at least two intercompany transactions to be entered, one in each subsidiary. The two intercompany transactions are usually the exact opposite of the other. If one party records gain, the other must record loss.

In the following is the simplifying assumption to illustrate the intercompany transactions recording. This is the scenarios in one downstream intercompany transaction, when parent company P sales goods to its wholly owned subsidiary company S at 250 000 dollars. The cost of goods sold for company P was 200 000 dollars. During the same year, company S sales the goods to an external party at price 270 000 dollars. Here are how the transactions are recorded and eliminated correctly in both entities.

			Combined		Elimination		Consolidated balances	
	Parent company	Subsidiary	Debit	Credit	Debit	Credit	Debit	Credit
Sales	250.000,00	270.000,00		520.000,00	250.000,00			270.000,00
Cost of good sales	200.000,00	250.000,00	450.000,00			250.000,00	200.000,00	
Gross Profit	50.000,00	20.000,00					Balance	70.000,00

Illustration 5: Intercompany Sales Elimination

As shown in the illustration 5, there were two entries occurred in two entities for purchasing the exact same goods, from the external party and from the internal party. However, as the group point of view, the total revenue generated from the goods was only 270 000 dollars and it costed 200 000 dollars. This only comes from two transactions with external party.

The combined section vividly shows how incorrect the consolidated financial statement would be without eliminating. The figure in the combined section can be interpreted as the group had made 520 000 dollars out of the goods that costed 450 000 dollars. This is significantly overstated from the actual financial impact. Because both figures are overstated by the same amount, the net profit remains but the profit margin ratio is totally incorrect.

2.4.2 Unrealized profit in Ending inventory

In the hypothetic assumption above, the parent company made 50 000 dollars from internal sale when it sold to the subsidiary at 125% its cost. It was assumed that all the inventory purchased from the parent company has been sold to external party by the subsidiary, hence the whole intercompany profit made by both companies were included in the profit at the group level. However, in case at the end of the accounting period and the subsidiary had not sold all the internal purchase to external party, the internal profit made by company

P could not be fully combined in the consolidated statement and required adjustment at the group level.

This scenario is labelled as unrealized profit in theory concept. Unrealized profit is a profit shown in trial balance of one entity but could not be shown yet in the consolidated statement in the related accounting period. In the other words, before the goods is sold to external parties, intercompany transaction is only a transfer of an asset, and no revenue recognition can be recorded at the consolidated level. (O. Ray Whittington, 2013.) This idea is consistent with the concept that consolidated statement only reports financial result from transactions with external parties.

In conclusion, intercompany elimination is intricate, crucial, and requires a high level of meticulousness and accuracy. In order to make the elimination figure accurate and the process less burdensome, it must be done accurately since the step of entering intercompany transactions.

3 Preliminary observation of intercompany procedure in case company – Intercompany reconciliation

In addition to the theory framework, there are some internal policies and additional controlling phases regarding intercompany transactions procedure in the case company. The practice will be briefly introduced in this chapter. The information has been gathered through internal training materials and personal observation of the thesis candidate during the internship at the case company.

The intercompany reconciliation has not been mentioned much in the academic source. In theory framework, the reconciliation belongs to the intercompany elimination process and is not explicitly separated. However, in the case company, this is the biggest task of accountants in Intercompany department.

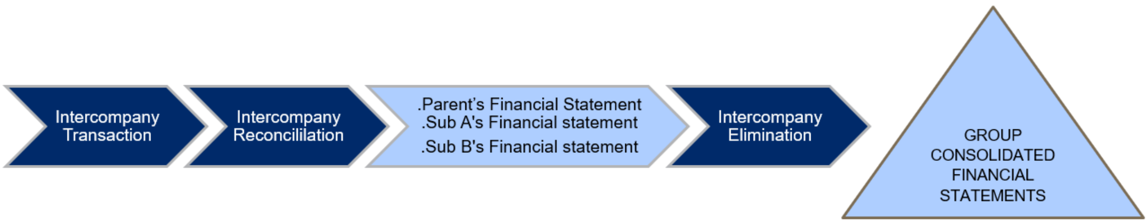

Illustration 8: Intercompany Procedure in Johnson Controls

Intercompany reconciliation is the process of checking and validating the recorded figures of intercompany transactions between subsidiaries. Theoretically, this phase is redundant and does not generate any benefit. In practice, this task consumes an enormous portion of accountants' time every closing period. However, this makes the figure much more accurate collectively as a corporate as well as individually as each entity.

Intercompany reconciliation is usually done by pair entities and with different intervals. It depends on the group policy. It could be monthly, quarterly, or annually. Exceptionally, with the monumental amount of intercompany transactions, Johnson Controls has an Intercompany department whose employees devote their whole working time to reconcile Intercompany transactions.

The reconciliation process between two subsidiaries for one period can be initiated when all the intercompany transactions for the period has been entered in both entities. To ensure this, and also to eliminate or at least mitigate the discrepancy due to timing differences, corporates usually implement cut-off time. This is the fixed time determines when all entities stop entering intercompany transactions for the related period.

After the cut-off time, the pair reconciliation is initiated by one party sending out the account statement to its intercompany partner. If the entity has more than one intercompany partner, it will execute this process for each partner. The account statement can be different depends on the partnership between two entities. It can be a payable statement, which indicates the amount the send out party is planning to pay to the other with detailed items. This is a one-side partnership, in which only one party provides products or performs services. There is a two-side partnership as well, and as represented by the name, the services or products coming from both sides. In this case, the account statement sent out includes payable and receivable statements.

Next, the receiver party will compare the partner statement with what has been recorded in their book. Idealistically, the number should be the same on both sides and the reconciliation will end for one partnership at this point. However, most of the time there is a discrepancy. The total discrepancy is quite vivid and easy to detect. The significant part of the reconciliation process is identifying the cause of discrepancies. Basically, it means figuring out what makes up the total discrepancy, from which transaction it comes, whether it is generated from one or several transactions, and why. The causes of discrepancy can be various. It can be a timing difference, which means the invoice was booked in different periods on two sides. It can also be the case where the good is sent and the invoice booked on one side but has not arrived and booked on the other side. Or the invoice was booked in the wrong partner account. This is time-consuming and the level goes up correlating with the number of transactions of the partnership. On top of that, the detail of one transaction usually dissimilar in different entities. For example, the item code of one product can be varied in each subsidiary's system.

After identifying the causes of a discrepancy, two involving parties need to communicate to agree on how to resolve the discrepancy. The communication needs to be comprehensive. The two parties are required to know what needs to be done in which side to prevent further discrepancy while trying to solve the existing one. Even at this solution state, it is still a problematic issue in real life. With the pressure on time during the closing period, reporting schedule, and deadlines, additional mistakes can be created.

The final goal of this thesis is to improve the reconciliation process, make it less laborious, time-consuming, and eventually saving time, cost, resources for the commissioning company.

4 Research Methods

The research methods chapter will introduce the method of data collection to answer the research question of this thesis. The research method will be described along with the reason for choosing these specific methods over the other.

There were two data collection phases to answer two significant questions. The interview session aimed to define the current practice and problematic issues in intercompany accounting in Johnson Controls. In the second phase, the market analysis served the purpose of searching out and assessing available tools and options, which could enhance and eventually made the intercompany accounting practice better.

The research method for both phases was qualitative research. In phase 1, two face to face interviews were conducted. They were open discussions between the writer and accountants at the case company Johnson Controls International. Five accountants were invited and interviewed in 2 sessions.

Phase 1 included 2 interviews for the initial data collection. The supreme goal of this phase was to fully envision the sophisticated procedure and data flows of the case company. The writer would then investigate and analyze the information that had been discussed in phase 1. This part was essential and held the potent power to drive the thesis result in a new path. The phenomenon that had been perceived base on the writer's empiricism was compared with information provided from interviewees, who had years of experience in intercompany accounting. Hence, this phase was a confirmation and validation for the origin of this thesis. The data was scrutinized to find out if there was any point that had been overlooked. This led to the second part of phase 1.

After the interviews, both the commissioning party and thesis candidate realized that the overall assessment was quite generic. The current status of the procedure needed to be visualized more concretely. To validate the current situation of the intercompany transaction process in Johnson Controls, a numeric data analysis was conducted. The commissioning party requested the thesis candidate to generate an overview report of aging items of a representative entity for the 6 months. The data was provided in an Excel spreadsheet. They were 6 reconciliation reports of the entity in the last 6 months. The report contained a list of missing receivable invoices with detailed information about the invoices, partner code, invoice number, purchase order, aging bucket, and comment on the status. The thesis candidate also utilized Excel to perform the analysis and generated the reports as requested.

V lookup function with invoice number as lookup value was used because it was the unique value for each item to compare open items in two targeted months. When the status of the invoice was known in both months, a pivot table was created for a summary report. The tables were presented in this thesis were original pivot tables.

Base on the data analysis from the phase 1 interview, the understanding of current inter-company problems in Johnson Controls was validated. Hence, before entering phase 2, the writer needed to translate validated current problems in Johnson Controls to technical needs and requirements. At this point, the intercompany problems had been validated and the perception about solution had been transferred to concrete needs. The framework for evaluating available accounting tools and software, ERP systems would be introduced in phase 2. A set of hypothetic number would be given to demonstrate how the framework could be applied for the evaluation.

The complete research process is illustrated in illustration 9.

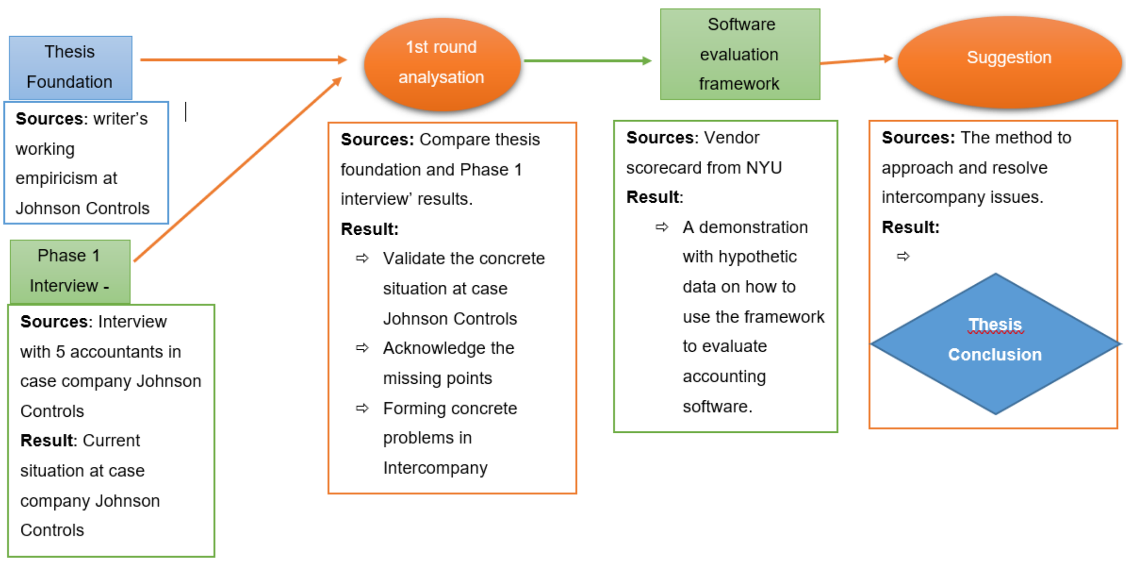

Illustration 9: Thesis research methods

In order to detect the problems under many layers of the process, a qualitative research with the form of face to face interview was the optimal choice. This kind of method served several benefits. First, a face to face interview provided the closest interaction between the two participant parties. It is a communicative environment, formal but affable. Second, a direct interview also played out a survey on this topic since it opened a broader scope of discussion. Hence, the findings would not be limited by the writer's assumption. Even with the typical exclusive question in the survey, the process of converting thoughts into words already decreased a remarkable chance of getting valuable data. Because of its immediate responsiveness, an interview had a higher possibility to capture spontaneous thoughts.

These thoughts were not necessary in either the participants' minds or the interviewer's but came up during the discussion. This kind of thoughts was priceless.

5 Result

In this chapter, the result of data collection will be represented. The chapter is divided into 2 main parts, which reflect two phases of data collection, from the interview sessions and the software market analyzation. The interview questions aimed to define the current practice and existing problems in intercompany accounting in Johnson Controls. In the second phase, the market analysis served the purpose of searching out and assessing the available tools and options. Which could enhance and eventually made the intercompany accounting practice better.

5.1 Result from qualitative interviews - What is the current practice of intercompany accounting in case company Johnson Controls International?

5.1.1 Current procedure and general assessment

This subchapter represents the result conducted from the interviews with the Intercompany department's accountants in the case company Johnson Controls International. Even though the two interviews were done separately, the general opinions and perspectives on Johnson Controls intercompany current practice from 4 accountants were consistent and similar.

The main responsibility of interviewees is reconciling intercompany transactions on a daily basis. This intercompany reconciliation has been introduced in the theoretical framework chapter 2.4.1. In common practice, intercompany reconciliation is a part of corporate accountants' task. Due to the monumental amount of intercompany transactions occurring across the corporate, Johnson Controls has established an Intercompany department for handling this specific task. The department structure is organized in such a way that each accountant will be responsible for the Intercompany relationship of one entity. This means the accountant takes care of all intercompany partnerships of the assigned entity, regardless of receivable or payable sides. The amount of partnerships varies from one entity to another and usually correlates with the scale of the responsible entity. The lager the responsible entity is, the more partnerships to be reconciled. Additionally, the number of transactions that occur between each partnership also fluctuates for different trading partners. Despite having said that, each entity has its common partner with whom it frequently trades. These partnerships typically have the highest transactions occurring each month, and from which out of balances mostly come.

The intercompany reconciliation process in Johnson Controls is initiated by the receivable side sending out their receivables statement. After that, an intercompany accountant will try to match each of the outstanding invoices in the partner's receivable statement with aged invoices that are still open in their payable account. Those invoices that are matched under this condition represent that the invoice status is currently open in both statements, and it is correct. Hence, no action is required, and these invoices will be paid out eventually. The intercompany accountant will continuously match the list of payments with the residual opening invoices. This means that the invoice has been recorded as paid and closed in the responsible entity, but their partners have not received it yet. It can simply mean that the money has not arrived in the partner's bank account or the cash application has not been done for received payments. In this case, on a month-end point of view, the receiving party will make an accrual for the money in transit and reversed in the following month. The most common cause for this comes from payment activities on the bank side and it is out of intercompany scope. Nevertheless, it is worth mentioning that a substantial amount of discrepancies is created by failure in payments. Handling fail payments properly will consequently reduce the amount of intercompany out of balances. All in all, the meaning of the intersection between the partner's receivable statement, the responsible party's payable invoices, and a list of payments can be summarized as below chart.

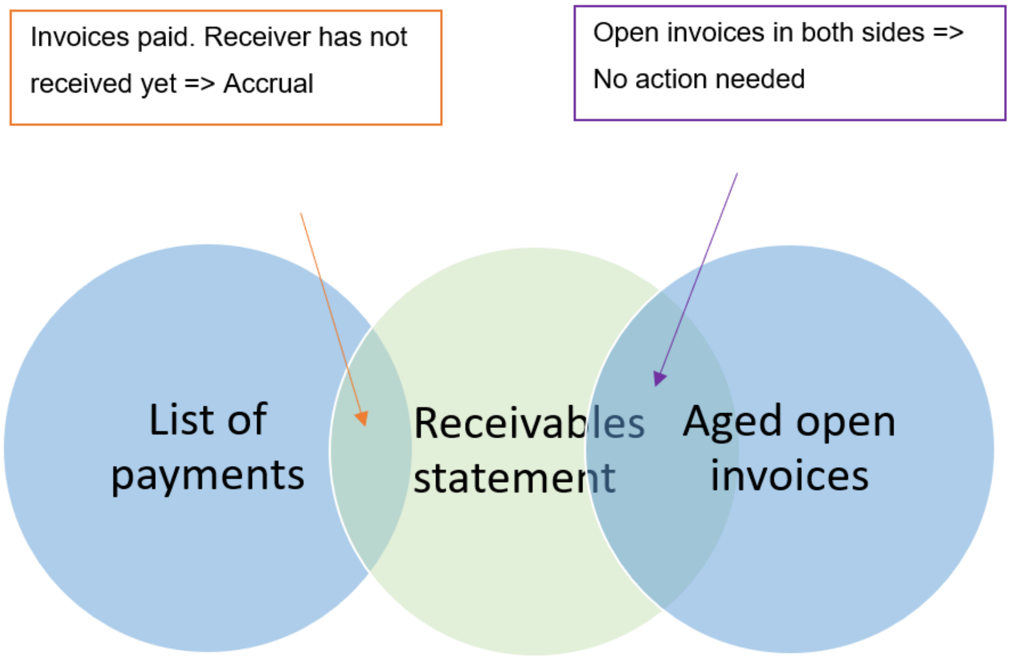

Illustration 10: Intersection between intercompany reports and its meaning

The intercompany matching described above needs to be done for each partnership. Basically, one accountant who is responsible for an entity that has 30 partnerships receives 30 receivable statements and executes the process described 30 times. An intercompany accountant will try to reconcile and resolve as many discrepancies as possible during the month. At the point of month-end closing, unidentified discrepancies will be accrued in good in transit account to temporarily match the balance for the period. The accrual will be reversed in the following month and the discrepancy investigation is continued. Intercompany reconciliation in Johnson Controls is a cyclical process.

With the current process of intercompany transactions reconciliation, 4 interviewees have agreed that the procedure was improved significantly since the back-office project. Which will be presented later in the next chapter. However, they stated that it still required constant development and enhancement to reach its ultimate function.

5.1.2 Problematic concerns

After matching the receivables statement from the partner entity with a list of payments and aged open invoices, the best scenario would be no residual invoices left from the receivables statement. Apparently, it is hardly the case. It could be that part of the partnerships do not have any outstanding invoices. However, it is unprecedented that one entity has its statements completely match with all partners, even after the first round of adjustment.

There are numerous reasons for the residual unmatchable invoices. Surprisingly, the purchase order seems to be the keyword in this area. Not only that a considerable amount of reasons for outstanding invoices is related to purchase order. A purchase order also acted as a trigger document for an intercompany transaction. Common reasons are purchase order is not created probably. The purchase order amount does not match with an invoice amount, the purchase order had been closed when the invoice received. The purchase order does not link with the material received note. The purchase order does not link with an issued invoice, and in some case, there is no purchase order. Without a proper purchase order, business controllers do not approve the invoices and left it on hold in the invoice dashboard.

Besides purchase order, invoice information and invoice format are problematic issues that often occur. If the legal name of partner entities changes without being update in all platforms, the information is not consistent. Hence, invoices cannot be automatically matched with open purchase orders. From the other angle, when a vendor issues a credit note and book in a customer account, the invoice format for credit note usually has an extra letter to an original invoice. Which cannot be recognized by the system as well. Hence, the credit note is not picked up by the automatic netting payment run. An intercompany accountant should recognize this from their statements and take correct action.

One of the things that make intercompany reconciliation in Johnson Controls perpetuate is the aging invoices. Despite having invested many efforts in improving control over intercompany accounting recently, Johnson Controls with more than a hundred years of operating has immense historic data. Hence, a large proportion of outstanding invoices is created from past transactions. It requires tremendous time and effort to solve these old accumulated invoices. There are many factors that contribute to the burdensome of solving old out of balance. With historic data, most of the information and knowledge regarding the open invoice has flown out of the company. The purchase was not recorded precisely in payable entities and the person in charge probably did not work at the company anymore. The current person in charge who locates in the targeted entity is either not enthusiastically collaborate or unaware of the past situation. Additionally, in order to resolve the out of balance, an expense must be recorded by one of the entities. In the case which the payable side did not record the payable invoice in before. If it was willing to accept the invoice from the receivable side now, the payable entity needed to pay this invoice eventually. On the other hand, if the payable side rejected the invoice, either the receivable party would write-off its revenue or would leave the invoice to stay open. This means the mismatch will be unsolved. In another word, accepting an old invoice affects the profitability of the entity and eventually the overall performance of the subsidiaries. Hence, it is explainable why subsidiaries are reluctant and neglecting in collaboration with intercompany accountants. This leads to a circumstance that intercompany accountants usually fail in requesting payment for an invoice that is due in years ago. Even though significant effort has been poured into investigation and the specific mismatched item was successfully identified.

5.1.3 Johnson Controls’ attempt to polish its intercompany accounting

Having realized the importance of proper manner and controls over intercompany accounting, the Intercompany department in Johnson Controls International has reorganized its structure. The purpose of this is to resolve ongoing issues in intercompany accounting. A new branch has been established inside the Johnson Controls Intercompany department named back-office. The back-office team's main responsibility is investigating old aging items and addressing them to the responsible person in the entity. The privilege that back-office team possesses is the autonomy, which is granted by corporate, to demand payment after successfully identifying mismatch items. Subsidiaries are also requested to support and collaborate with the back-office team to try to resolve the aging open invoices. However, the process of checking and identifying old mismatch items remain manual and draining as the back-office team needs to go and investigate each item line by line. Nonetheless, it is good that Johnson Control now has a project assigned to handle the historic mismatch data in intercompany accounting.

Another implication proves that Johnson Controls is fully aware and acknowledges the importance of intercompany accounting is its recent implementation for the interchain system utilized in intercompany non-trade cross charge. This means the transaction is visible for both entities before it is booked in the accounting system. The two sides will see and agree on the transaction before booking. By this, no mismatch will arise after the invoices are booked. Subsequently to the implementation, intercompany accountants confirm that the discrepancy for non-trade transaction intercompany has been diminished significantly.

Besides technical enhancement, it is worth mention that Johnson Controls has acknowledged the crucial of intercompany governance. The group has published in its internal training platform a well-conducted training material regarding the whole intercompany process. In the material, the procedure and solution for common scenarios creating discrepancies have been described meticulously. The cut-off time for month-end closing and quality for the initial document are stated explicitly and required strict adherence.

With all the attempts for proper control over intercompany accounting, what is the current status of Johnson Controls intercompany accounting?

5.2 Result from data analysis

All the common problematic scenarios that have been identified and concrete solutions through project establishment along with implementation has been done. Despite that, intercompany accountants still observe a high discrepancy rate in common partnerships of their assigned entity.

The question has been stated whether this discrepancy coming from new items occurring in recent months, or from the old items that are being investigated by back-office. Hence, the commissioning party requested the thesis candidate to conduct an overview report of aging items of the representative entity for the 6 months period. The presumption over the result is that if the discrepancy coming from historic data, it proves that the current control over intercompany transactions process in Johnson Controls is good enough. The difference will gradually be solved while the back-office project progressing further. On the other hand, if discrepancy also comes from current items and accumulates over months, another solution and attempt are required in intercompany accounting control.

5.2.1 Overall current status of intercompany accounting in Johnson Controls

There are several validations which the commissioning party and the thesis candidate aim to achieve through this analysis. In general, the analysis result will present the overall efficiency of intercompany accounting collectively as well as segmentally. Which means for the back-office project and intercompany reconciliation activities.

To conduct this report, the commissioning party provided to the thesis candidate with intercompany open items. The information included the aging category of the representative entity with all its partnerships in 6 months. There are 5 aging categories using in the report 0-60, 61-90, 91-180, 181-360, and over 360. An item categorized in 0-60 days aging in the month means the invoice has been recorded in the past 60 days. 61-90 days represents that the items have been recorded at least 61 days ago and at max 90 days ago. The logic applies to other categories.

First, the thesis candidate generated a report of number of outstanding invoices in each month from June to November 2019 grouped by age categories. In table 3, each month data is presented in 3 rows.

-The row with the name of the month is the number of outstanding invoices, which is listed in account receivable statements that were sent from all partners of the entity. These are number of invoices intercompany accountants need to investigate and to identify the status on their payable side.

-The manual matching line represents the number of invoices, which have been booked on the payable side. The invoice in these categories requires no action or only reclassification if the invoices were booked on the payable side with the wrong partner code.

-Missing on AP line contains number of invoices that are completely missing on the payable side and require further investigation.

Aging group	0-60	61-90	91-180	181-360	over 360	Grand Total	
June	**7356**	**962**	**1018**	**2154**	**5547**	**17037**	
June manual matching	5663	274	176	1080	562	7755	46%
June missing on AP	1693	688	842	1074	4985	9282	54%
July	**7102**	**624**	**1724**	**1261**	**6207**	**16918**	
July manual matching	5343	213	289	158	1559	7562	45%
July missing on AP	1759	411	1435	1103	4648	9356	55%
August	**6471**	**896**	**1963**	**1670**	**6410**	**17410**	
August manual matching	5039	299	471	171	1202	7182	41%
August missing on AP	1432	597	1492	1499	5208	10228	59%
September	**5655**	**668**	**1689**	**1656**	**5949**	**15617**	
Sep manual matching	4443	180	249	140	827	5839	37%
Sep missing on AP	1212	488	1440	1516	5122	9778	63%
October	**6085**	**406**	**1426**	**1965**	**6038**	**15920**	

Oct manual matching	4802	90	361	172	833	6258	39%
Oct missing on AP	1283	316	1065	1793	5205	9662	61%
November	**5530**	**536**	**1234**	**2029**	**6125**	**15454**	
Nov manual matching	4630	248	306	212	871	6267	41%
Nov missing on AP	900	288	928	1817	5254	9187	59%

Table 3: Outstanding invoices of original entity in Johnson Controls from June to November 2019

The table demonstrates coherently the tremendous amount of work intercompany accountants need to deal with. An amount of around 15000 to 17000 invoices needed to be reconciled. Out of which, an average of more than 59% is requested further investigations and only 41% does not need action or minimal adjustments. The number of missing on AP invoices, especially in the current category, reflects the accuracy of intercompany transactions entering in both receivables and payables side. In June, there are 1693 invoices that were entered in the receivables side without any information or records on the payables side. Which accounts for 23% of total new invoices being entered in the period. During the 6-month period, the number of missing on AP invoices decreases steadily, together with the number of outstanding invoices from receivable statements. However, the accuracy rate has indeed increased gradually from 77% in June to 84% in November. This is a considerable improvement yet 16% of inaccurate invoices can be further enhanced.

	CURRENT 0-60		61-360		over 360		Grand Total	
June	**7356**		**4134**		**5547**		**17037**	
June manual matching	5663	**77%**	1530	**37%**	562	**10%**	7755	**46%**
June missing on AP	1693	**23%**	2604	**63%**	4985	**90%**	9282	**54%**
July	**7102**		**3609**		**6207**		**16918**	
July manual matching	5343	**75%**	660	**18%**	1559	**25%**	7562	**45%**
July missing on AP	1759	**25%**	2949	**82%**	4648	**75%**	9356	**55%**
August	**6471**		**4529**		**6410**		**17410**	
August manual matching	5039	**78%**	941	**21%**	1202	**19%**	7182	**41%**
August missing on AP	1432	**22%**	3588	**79%**	5208	**81%**	10228	**59%**
September	**5655**		**4013**		**5949**		**15617**	
Sep manual matching	4443	**79%**	569	**14%**	827	**14%**	5839	**37%**
Sep missing on AP	1212	**21%**	3444	**86%**	5122	**86%**	9778	**63%**
October	**6085**		**3797**		**6038**		**15920**	
Oct manual matching	4802	**79%**	623	**16%**	833	**14%**	6258	**39%**
Oct missing on AP	1283	**21%**	3174	**84%**	5205	**86%**	9662	**61%**
November	**5530**		**3799**		**6125**		**15454**	
Nov manual matching	4630	**84%**	766	**20%**	871	**14%**	6267	**41%**
Nov missing on AP	900	**16%**	3033	**80%**	5254	**86%**	9187	**59%**

Table 4: Accuracy rate of invoices in Johnson Controls from June to November 2019

In order to get a more comprehensive status on efficiency, the analysis continuously examines aging categories for current item 0-60 and over 360 separately. The categories from 61-360 days are explored collectively.

With all these conditions, an item under category 0-60 days in June is expected to be disappeared from the list of open invoices in August and November. The current item 0-60 group performance reflects the ability to solve new inaccurate items in payables side.

Entity code	August 2019 Unsolved	November 2019 Unsolved	Total invoice missing on AP in June 2019
1	246	2	367
3	51	50	102
4	15	8	22
5	9	9	11
6	1	1	1
7	2	2	5
8	149	127	259
9	68	65	72
10	133	133	423
11	5	4	5
12	6	4	35
13			1
14	23	10	33
15			4
16	1	1	1
17	38	38	52
18	12	12	31
19	1		1
20	14	3	36
21	138	53	200
22	27	18	29
Grand Total	**939**	**540**	**1693**

Table 5: Number of current missing on AP items in June 2019 compared with August 2019 and November 2019 list of open invoices by entity.

As table 5 illustrates, a substantial number of invoices from June accumulated over August and until November. In specific, 939 new invoices out of 1693 invoices, which were missing in the payable side in June remain open in August. Less than half of them are solved from August to November. Eventually, 540 new items in June has accumulated to old aged invoices in November.

This concludes that the ability to resolve outstanding items is inefficient even to the newly occurring item. Which has the privilege of support and collaboration from the person in charge of the invoices and order. In practice the older an item, the more reluctance of co-operation from other departments. In order to validate this preliminary, items in June belongs to 61-360 days aging has been grouped and analyzed. The purpose is to determine how many items in this group remain unsolved in November.

For items in group 61-360 days, an average of solved efficiency is only around 25% for the period from June to August. The performance from August to November is also a concern. An addition of only 364 invoices are solved during the 3 months period from August to November.

June		August		November		Additional close from Aug to Nov
Status	**Invoice**	**Status**	**Invoice**	**Status**	**Invoice**	
61-90	964	91-180	597	181-360	506	
		181-360	38			
		Close	329 (34%)	Close	458	129
91-180	1044	CUR-RENT 0-60	1			
		91-180	150	181-360	656	
		181-360	642	over 360	1	
		over 360	1			
		Close	250 (24%)	Close	387	137
181-360	2207	91-180	1	91-180	1	
		181-360	507	181-360	113	
		over 360	1139	over 360	1415	
		Close	560(25%)	Close	658	98
Total close since Jun			**1139 (27%)**		**1503 (36%)**	**364 (9%)**
Grand Total in Jun			**4215**	**Total unsolved in Nov**		**2712 (64%)**

Table 6: Status of June invoices group 60-360 days in August and November 2019

Eventually, 64 percent of 4215 invoices that belonged to group 61-360 days in June, which is equivalent to 2712 invoices, remained unsolved in November. According to the data analysis, the efficiency of solving open invoices is inadequate in Johnson Controls. The performance rate worsens as the aging days increases.

Lastly to be able to recognize the back-offices project contribution, an analysis for over 360 days items in June was conducted. The target is to examine how many of these items have been successfully solved by the back office during the 6-month period.

Status	August	November	Addition from Aug to Nov
over 360	4886	4585	
close	698	990	292
current 0-60(1)		5	
61-90		2	
91-180		2	
Grand Total	5584	5584	
Percentage of close	13%	18%	5%

Table 7: Status of June over 360 days items in August and November.

(1): There are some invoices were dated over 360 days in June has newer status in August and November. This is due to the reclassification of the invoice with wrong partner code.

Out of items 5584 open items with aging days over 360 in June, 4886 invoices remained unsolved in August and 4585 of them until November. Overall, the percentage of closed case in August and November are 13% and 18% respectively. In other words, an addition of only 5 percent has been solved from August to November. This performance represents the efficiency of the back-office project. Based on the data analysis result, despite considerable effort and attempt to enhance the quality of intercompany accounting, Johnson Controls' intercompany accounting still demands a lot of improvement.

5.2.2 Information and data converted to technical requirement

Based on the previous subchapter, the overall status of intercompany accounting was perceived and reviewed precisely. With multiple enhancement in the procedure and governance, resolution for historic data and non-trade intercompany transactions have been implemented. However, the control of current practice needs to be changed in order to prevent current items accumulate over months and become historic data that will be transferred to the back office. Otherwise, new invoices keeps being hold and be added to old aging category. This will perpetuate the back-office project because the initial historic data had already been overwhelmed and requires a lot of time to resolve.

The data analysis has shown the complex in solving missing invoices in AP data and low efficiency of the back-office project. One key takeaway is resolving the occurred discrepancy is intricate and time-consuming. Hence, the aim of the next phase is to propose a way to eliminate the appearance of mismatches from the origin.

Many invoices required a duplicate or triple-checking repetitively through months. It is time-consuming and such a waste of resources. To be more precise, there is an invoice that showed in the receivable statement in June and has been identified with status as posted on the payable side. This invoice keeps appearing on the receivable statement from July to November. This practice raises a certain need to automate matching between receivable and payable invoices to mitigate the work. The invoice should be offset from the point of booking for the best circumstance or at least when the reason for the discrepancy is identified.

5.2.3 Commercializing Blockchain

Following the precedented success of implementing interchain for a non-trade invoice, the thesis also utilized digitalization and software to enhance the quality of intercompany accounting. The same idea of interchain is also considered to apply in traded intercompany transactions. Interchain is the term referred to blockchain technology for intercompany recording. Antony Welfare, who is an eminent leader in the world of blockchain, has written a book called Commercializing Blockchain (Google books, 2019). Antony Welfare has mentioned in his book on how blockchain technology could be implemented in intercompany area. The original problems that initiated blockchain technology share a lot in common with current intercompany circumstance in large corporations. Those similar problems that both areas encountered were different data source with lack of validity, various people with different versions of numbers involved, and the reconciliation for data input was laborious due to the scale.

Despite being an idea and concept originated in technology, block chain serves its end-user the solid validation. It is also valuable in creditability in the data source as well as the power of full internal control with its immutability. Hence, utilizing the blockchain concept in intercompany area in accounting, which called as interchain, has gradually adopt by some of the market leader in Enterprise Resource Planning industry.

Not only that, blockchain technology possesses a promising potential to be implemented in business rapidly in the future, with all its features for guaranteeing the creditability. Trustworthy is what enterprises constantly search for but seems to be in short in business world. This characteristic will make the commercialization of blockchain develop rapidly in the next few years. The ERP that is capable of adapting the technology will be ahead of the game. Those ERP currently operates on cloud-based has an advantage in the flexibility for modification and on blockchain adaptation as well. (Antony, 2019.)

Hence, the most critical feature of the qualified software is an interchain feature for trade intercompany transaction. This means an invoice or purchase order cannot be booked on both sides of the trade without a mutual agreement from two sides. Besides the interchain feature, the accessibility of the software is considered critical as the vast operation area of intercompany activities in Johnson Controls. The integration level is also a determined and crucial point. Because it has been stated several times in the thesis that part of the problems come from the fragment in data integration. A high level of integration not only serves real-time data but also minimize the inconsistency and increase transparency level with a proper audit trail. Integration criteria will be assessed based on whether the evaluated software can be merged with existing applications and tools currently used by Johnson Control. In case the merger cannot be done, it must have an option to import and export data between systems. Implementation, installation are also key criteria in assessing the software. For this, a cloud-based software solution is preferable. These are the valuable features, other available functions of software that not mentioned above are considered as a nice-to-have feature. Finally, the price range is also a determined point. The overall implementation cost cannot be evaluated since it depends on various factors: the scale of implementation, the regional provider, the local consultant fee. Furthermore, the cost to implement a whole ERP system largely differs from only for an intercompany section. Hence, the precise overall implementation cost cannot be included in the assessment, yet the price range is comparable and is one of the keys to select the software.

5.3 Result from software evaluation

Together with the criteria mentioned above, the framework of the software evaluation based on the PSO (Purchase Software Operations) Vendor Scorecard introduced by New York University was taken into use for evaluating the software.

The vendor scorecard acts as the proposal model for selecting and evaluating software vendors. The weight percentage and the scores given for each criteria below are merely illustrated. The aim of this chapter is to demonstrate how the commissioning party can utilize data analysis to select the software supplier.

The data presented below are collected from internet sources and self-reference of the thesis writer after trial uses of supplier's demo product. The evaluation was done without any contribution from the commissioning party. It is recommended that Johnson Controls should review and adjust the weight percentage and the given score. That will give the better evaluation based on Johnson Control's perspective because the evaluation below is just a framework rather than a final proposal.

Below is the overall software evaluation by area with respective weighted score in PSO vendor scorecard:

Software Evaluation Criteria	Description	Weight (%)
Functional and Technical Assessment Factors		
Functionality	Robustness of vanilla solution in comparison to best of creed solutions; Degree of customization needs that can be met; Availability of workarounds that can be used to meet business needs	30%
Usability	Ease of use, intuitiveness, number of clicks, user interface appeal, portal	15%
Technical Alignment	Architectural openness and extensibility, performance, scalability, reliability, availability, security and compliance	20%
Vendor Background	Company history, strategic direction, stability, support, risk impact	5%

Total Cost of Ownership	Hardware costs, software license, implementation costs, and on-going support costs	30%

Table 8: PSO vendor score card overall software evaluation by area with respective weighted score. (NYU, 2020.)

In this evaluation, the lists of accounting software suggested by users and experts will be filtered through the assessment criteria established in the previous chapter. The 2 most potentials and highly evaluated software will be analyzed in detail.

1) Evaluation Component: Functionality (30%)

4 = Full functionality is available, needs basic configuration
3 = Most functionality is available, may require basic customization
2 = Basic functionality is available, but requires some customization, supplemental technology, and/or other workaround
1 = Basic functionality is available, but requires highly complex customizations and / or manual workarounds
0 = Functionality is not available at this time

Business Process	Description	Netsuite Oneworld	SAP S/4 Hana	Dynamic365 Finance	Xero	Oracle JD Edwards
Intercompany Accounting	Support intercompany with intercompany partner code	4	4	4	2	3
Interchain feature	Journal entry entered one time and link with partner's book	3	3	4	0	3
Integration	Ability to integrated with other internal existing tools	3	4	3	3	3
Total	**12**	**10**	**11**	**11**	**5**	**9**

2) Evaluation Component: Usability (15%)

4 = Excellent
3 = Good
2 = Neutral
1 = Poor
0 = Functionality is not available at this time

Usability Criteria	Description	Netsuite Oneworld	SAP S/4 Hana	Dynamic365 Finance	Xero	Oracle JD Edwards
Ease of Use	The system allows user to easily move between pages and scroll through bodies of information	4	4	4	4	4
Number of mouseclicks	The number of mouse-clicks, keyboard strokes or	4	2	4	4	4

	other required actions are reasonable and efficient					
Words	The systems' choice of words/phrases helps user quickly find what they are looking for	3	2	4	3	3
User interface	Visual appeal. Organized and logical layout. Page are not overly busy. System font, colour.	4	3	4	2	2
Intuitiveness	The system is intuitive. User can quickly learn it well enough to accomplish basic tasks, find the information / data. Tools such as online help and search are available to help user	3	4	4	2	3
Personalize	The system is flexible and allows user to modify features according to their preferences. User can design the layout of home page allowing user to quickly access the information that user frequently use	3	4	4	3	3
Total	**24**	**21**	**19**	**24**	**18**	**18**

3) Evaluation Component: Technical Alignment (25%)

4 = No gaps identified
3 = Minor gaps identified
2 = Some gaps identified and may pose a risk to the business
1 = Gaps identified are of major concern to the business
0 = No information available

Technology Characteristics	**Description**	**Netsuite One-world**	**SAP S/4 Hana**	**Dynamic365 Finance**	Xero	**Oracle JD Edwards**
Architecture	Application, Development, Open, Scalable, Extensible, Performance, Reliability and Availbility, Disaster Recovery	3	3	4	3	3
Workflow Ease of Setup	How easily can Johnson Controls customize the system? What is the level of complexity to set up workflow? How easily can workflow integrate between modules and systems? How easily can the workflow be customized? What is	3	4	3	3	3

	the level of complexity of customization?					
Ease of Customization /Configuration	How easily can adjust customize the system?	3	2	4	3	3
Security	Application, Data Center, Auditing and Compliance.	3	4	3	3	4
Security (TSS)	Authentication, Access Control, Encryption, Integrity, Design/Development, Maintenance,	3	3	3	3	3
Total	**20**	**15**	**16**	**17**	**15**	**16**

4) Evaluation Component: Vendor Viability (5%)

4 = Exceeds industry norms
3 = Meets industry norms
2 = Partially meets industry norms
1 = Does not meet industry norms
0 = No information available

Vendor Background Criteria	Description	Netsuite One-world	SAP S/4 Hana	Dynamic365 Finance	Xero	Oracle JD Edwards
Company background	Rankings and awards, Reputation, History	4	4	4	3	4
Client base	What is the size and demographic of the vendor's current client base	4	4	4	3	3
Stability of product line	What is the probability that the product line will sustain for the long term (at least 20 years)	4	4	4	3	4
Global Support	What is the vendor's ability to capture demographic data?	3	4	4	3	4
Implementation Partners	Availability / access to expert resources	3	4	4	3	4
Customer Support	Quality of service, SLAs, Responsiveness of support team	4	3	3	4	4
Total	**24**	**22**	**23**	**23**	**19**	**23**

5) Evaluation Component: Total Cost of Ownership (25%)

4 = Good offer for Johnson Controls
3 = Reasonable for Johnson Controls
2 = Average for Johnson Controls
1 = High cost for Johnson Controls
0 = Expensive for Johnson Controls

Pricing	Description	Netsuite One-world	SAP S/4 Hana	Dynamic365 Finance	Xero	Oracle JD Edwards
Hardware costs	Hardware costs	3	2	3	3	3
Software license	Software license fee, access and user cost	2	2	3	3	3
Implementation costs	Implementation costs	2	4	2	3	2
On-going support costs	Consultant, maintenance	3	1	4	4	2
Total	**16**	**10**	**9**	**12**	**13**	**10**

Table 9: PSO vendor score card software evaluation by area rated based on Johnson Controls perspective

Based on the illustrated score and respective weight, Dynamic365 Business Central and SAP S/4 HANA has the highest overall score with 87%, 78% in our hypothetic demonstration. The detail on how the overall score computed is listed the Appendix 1. When taken the framework in use in real situation, the vendor with highest score will go through a detail analysis as below.

5.3.1 Dynamic365 Business Central / Finance – Inbox outbox area

Dynamic365 Business Central has the highest rate in the software evaluation based on the hypothetic number.

This is the software provided by Microsoft. The interchain feature allows the user to post the purchase order simultaneously in two entity account. Especially, the interchain feature can be used since the phase of creating a purchase order. This means not only general ledger but sub-ledgers in both entities are also reconciled from the initial step of the intercompany accounting procedure.

The essence of the interchain feature for Intercompany sales or purchase order works through an inbox outbox area. The document flow will be initiated when one entity created a sales or purchase order.

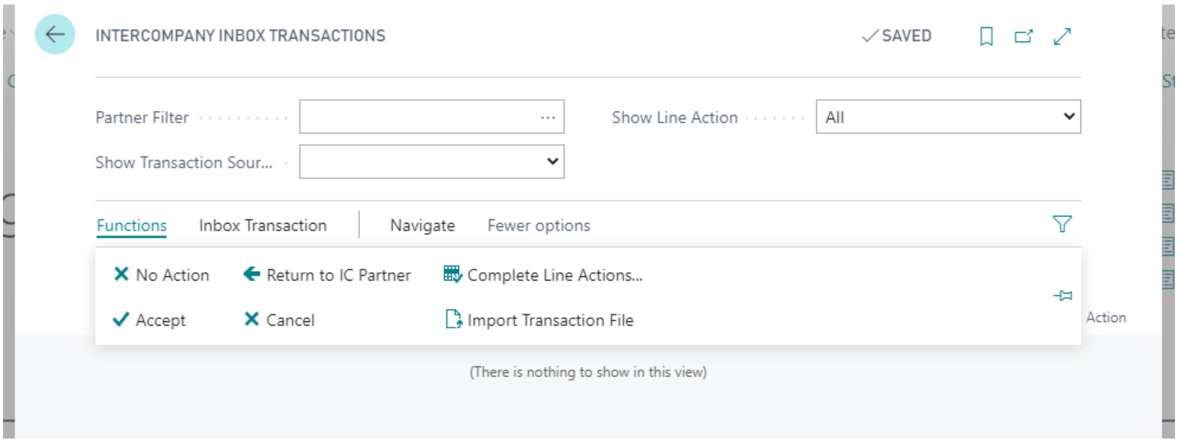

Illustration 11: Intercompany inbox transactions area in Dynamic 365 Business Central

For instance, the original entity creates an invoice with IC partner code on Dynamic365, with IC stands for Intercompany. After finish creating the invoice, original entity's user can open a function area and select Send IC invoice. This action will create a proposal journal that should be posted in the ledger of another counter partner, called destination entity. The proposal journal can be created in 3 types, journal, sale documents, and purchase documents corresponding to the document types that have been created in original entity. Original entity's user can go to the outbox area and send out the purchase order that has been just created to destination entity.

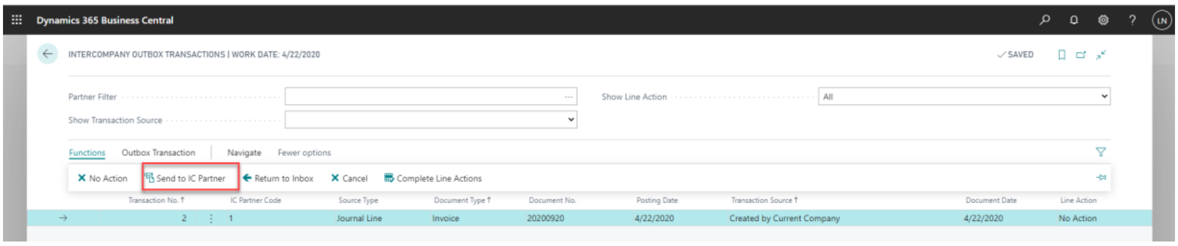

Illustration 12. Send to IC partner function in Dynamic 365 Business Central in original entity

The invoice is now visible in the inbox of destination entity with the status as Created by partner. The receiving partner can approve, reject, or cancel the request. The subsequent scenarios differentiate depends on the action that the partner decides to take on the proposed invoice.

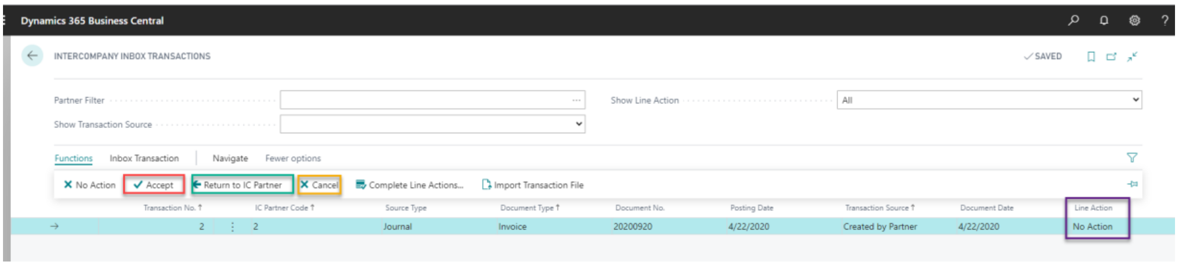

Illustration 13. Actions in Intercompany inbox transactions area in Dynamic 365 Business Central of destination entity

-If destination entity chose Accept, a proposal journal will be created in destination entity, user can review and make changes if needed then post without re-entering the data.

-If destination entity chose Return to partner, a proposal journal will be returned to original entity, the user can add a comment for the rejection if needed.

Below is the proposal journal in Intercompany General Journal area with respective inter-company partner account and account payables as offset account. All the information had been filled by sending entity.

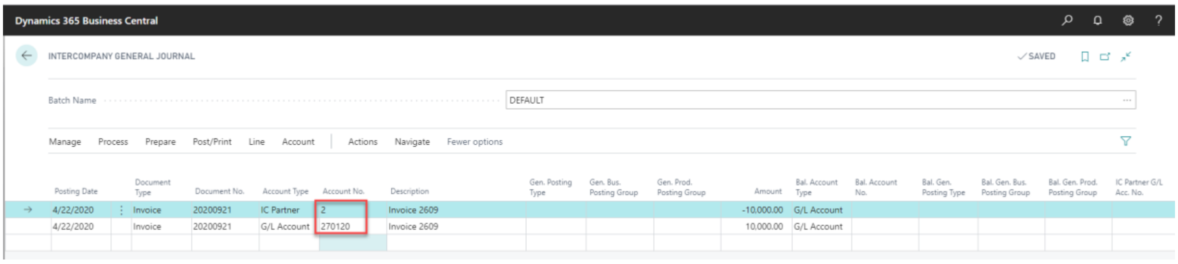

Illustration 16. The proposal journal in Intercompany General Journal area in Dynamic 365 Business Central of destination entity

In case the proposal journal was returned to the original entity, a user in original entity can see the journal visible in their inbox. Original entity can choose the return by partner action and make the necessary adjustment in the ledger. After the correction is made, the journal can be sent out again.

Not only having interchain function with initial trading activities for intercompany posting, but Dynamic 365 also supports this function for a cross-charge fee. This means expenses from trading with an external vendor can be posted across entity by using an IC partner. Additionally, when creating intercompany documents, the entities can assign a general ledger account in the partner’s book. There is also an option to set up a default offset account in Partner’s general ledger side. The setup allows users to enter an account in which they will post the amount to, for example, account receivable and the system automatically gives the set-up offset account in their partner’s general ledger side, which is an account payable in this case. There is also an option to map the dimension area (cost center).

For mass operation, after being accepted, all the invoices in IC Inbox transaction will be grouped as a batch and a journal is automatically prepared in the general ledger journal side. The journal can be reviewed before posted and will be posted under the batch name INTERCO.

In order to make the intercompany transaction works, there is an intercompany chart of an accounts function, which allows user to import the chart of the account of the Intercompany partner. If two partners use a different set of accounts and have different account numbers, it could be mapped. This is set up for later use in Intercompany transactions posting. Dynamic 365 also has various areas for Intercompany consolidation. (Microsoft, 2020.)

5.3.2 SAP S/4 Hana – Cross company posting

SAP S/4 Hana is an ERP system provided by the largest company in the ERP solution industry, SAP. SAP provides a wide range of functions of intercompany accounting. Cross company posting is how SAP refers to intercompany transactions and documents. The document type is IDOC as an abbreviation for the intercompany document. SAP uses company code as the base for its IDOC to be posted across multiple companies. SAP S/4 Hana enables users to post cost allocation for non-trade cost, the rechargeable cost with an external vendor. Intercompany billing periodic and sale order and purchase order are also available. Basically, intercompany transactions on SAP S/4 HANA can be done in General Ledger, account payable, and account receivables ledger.

The basic ideas for IDOC transactions are when an IDOC is created with intercompany code assign, once the original document is posted in creating entity, an automatic transfer will be posted on the relevant intercompany partner accounting books. Eventually, 2 journals will be created, one in each entity only through one entry. However, IDOC does not include any tax posting take into considerations the entities involved in the transactions can belong to different tax groups. Thus, an additional task is required at the end of the period, which is called the intercompany billing. This transaction will collect all journal entries that are posted under IDOC document type then calculate the tax and create an intercompany invoice booked in account receivables and payables in two entities respectively

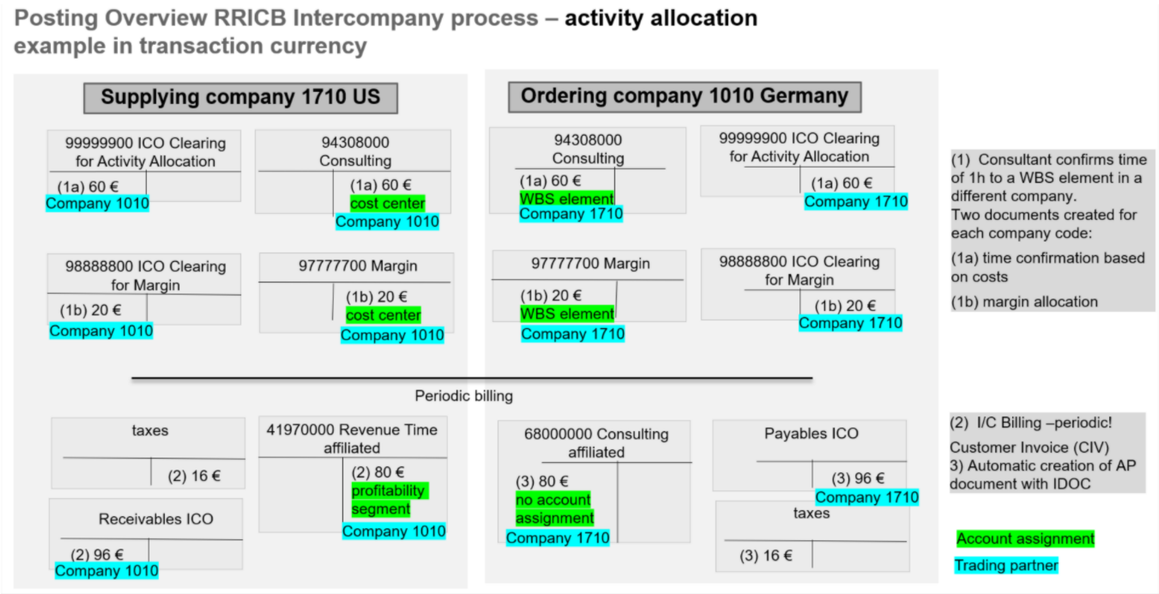

Figure 5: Posting of Intercompany periodic billing (Stefan, 2020).

With the same logic for periodic billing, an intercompany sale order can be created and posted in both companies in the same way through company code. Since the posting in the passive entity is done entirely automated in SAP, the default setup requires to be done carefully. Otherwise, an error will occur or the posting in the passive entity will be incorrect.

Another important basement of intercompany posting in SAP S/4 HANA is setting for clearing accounts. As the cost issued by the external party first then be recharged to other intercompany entities, the original invoice cannot be posted as a cross-company journal. All the automatic transfer and posting for the cost allocation of IDOC is going through the clearing account before hitting the actual profit and loss accounts. SAP consultant recommends each Profit and loss general ledger group of accounts to have its own ICO clearing account. Overall, at the point of cost allocation account, there is no actual impact on the financial statement of both the sender and the receiver entity. Thus, the periodic billing is created to make posting to balance sheet account and record revenue as well as tax. (Stefan, 2020.).

Both Dynamic365 Business Central and SAP S/4 HANA has its unique feature that enables to support intercompany accounting procedure that potentially solves the problem. However, the thesis candidate highly appreciates the agile and flexible communication that Dynamic365 Business Central provides. Additionally, the possibility to view the posted journal in other entities that involve the responsible entity of the intercompany accountant allows them to detect errors and make a correction in real-time. In this term, Dynamic365 Business

Central does the job better while giving the autonomy of posting entries in the entity receiving the journals to the responsible accountant. The full automation that SAP provides indeed reduces duplicate work but will make the correction and adjustment more complicated. This also makes the control process and errors detecting in the passive entity harder and if any correction is requested, it needs to be done in both entities. Hence, in the illustration, Dynamic 365 would be the selected software.

6 Discussion

6.1 Discussion on software implementation

Below is the proposal on how to implement the software selected. In this section, what factors are recommended to be taken into consideration for the implementation is discussed. Additionally, some ideas on how company can adjust its governance and internal procedure to integrate the selected software is also presented. Following the previous assumption result, Dynamic 365 is used as a hypothetically software selected for the discussion.

The key issue to eliminate intercompany out of balance is the agility in the communication flow. The out of balance needs to be detected as soon as possible in order to be corrected. The postponement in detecting incorrect items will reduce the responsiveness of the counter entity. Searching information in the last or 2 periods ago is inevitably harder than documents occurring yesterday or the past few weeks. The proposal here is intercompany reconciliation should be changed into a daily task instead of a monthly or quarterly task.

The valuable feature that Dynamic 365 offers is that the entity is being notified immediately when a transaction entered that involved their entity. This agility enables entities to detect errors affecting their books and react almost immediately.

Maple is a cloud-based dashboard to store all purchase invoices of Johnson Controls International. Commonly, the accounting booking of purchase invoices is based on approved invoices in Maple. This means invoices in Maple act as back up document for accounting journal. The invoice can be traced from one booking in the accounting book to Maple e-invoice through its invoice barcode.

After implementing new software, the accounting posting of intercompany purchase invoices are directly linked to sales order. Which is created in the receivable partner in the same system. Dynamic 365 also allows the audit trails to be visible across entities. The e-invoice can be inputted on the Maple system for storing data.

Obviously, in order to let the software function at its best, the company is encouraged to fully utilize and integrate data from current in-used systems to the chosen software. However, moving the conglomerate data from multiple ERP systems into one requires tremendous time and effort. Fortunately, there is a current project ongoing in Johnson Controls to enhance the integration of the corporate. Dynamic 365 should at least become one of the options for selection.

On the other hand, if there is limitations Johnson Controls cannot implement of Dynamic 365 for all its subsidiaries, Dynamic 365 could be used as an intermediate mutual flatform. In this case, Dynamic 365 acts as a simulated or virtual accounting book instead of an official accounting book. In which all intercompany reconciliation will be handled. Additionally, all the corrections, adjustments, and communication are done on this platform. Purchase orders or invoices can be inputted to Dynamic 365 first and reconciled with the counterparty. Any adjustment or correction will be done on the platform until the mutual agreement has been made between parties. At the end of each day, all the transactions accepted by both parties will be exported and transferred to the official accounting software of each entity. The key notice here is the only transaction accepted in both entities are entered in the official accounting book makes all the intercompany transactions in an official book are always reconciled.

The other point is this task needs to be done daily, incorrect or unreconciled items also required to be detected and categorized every day. The corporate policy for intercompany reconciliation and procedure is still valid and should be adhered to while using the intermediate platform. In addition to that, multiple points should be added to the policy such as the time allowance to resolve to send back items, making corrections, and adjustment. By taking the platform into use, the timing difference between inputting invoice in receivables and payable side could be reduced significantly from a week to a day. Nevertheless, the timing difference in payment date and goods delivery remains inevitable. Hence, the proper action and accruals still need to be made according to group policy during the month-end. Despite saying that, the effort to conduct the final number for accrual postings is also remarkably deducted. Technically, the status of the item has been labelled and classified every day through daily reconciliation. Therefore, the identification task is eliminated from the month-end closing task. At the month-end closing, intercompany accountants only need to sum up pending items by category and export the data from the intermediate platform to an official accounting book. After that, intercompany accountants need to decide appropriate postings journal or accruals for each category.

The process used to be comparing receivable statement with payable aging invoices, list of payment, identifying unmatched invoices, agreeing and confirming number for accrual via various emails, and continuously reconciling past data during the month. It will be changed into reconcile instant data on daily basis and sum up pending data by category and post accrual. The work has tremendously reduced by digitalization.

In general, it is possible to fully utilize or partially utilize the proposal software for Intercompany transaction. It is recommended to fully adopting a new accounting system. The implementation of new software is undeniably an intricate and complicated project. It should be planned and decided cautiously. However, this should not resist the change. Especially while the current system is not able to fulfil and support the needs of corporation enhancement and resists corporate sustainable growth. It is important to mention that the implementation of a new accounting system is sophisticated but so does the current intercompany accounting procedure. The red flag has been shown and action requires to be made, directly to the problem. Additionally, because the implementation is complex, the selection of a new accounting system needs to be evaluated carefully to make sure the change is worth and will apparently bring the expected benefits. This cannot be done merely in terms of intercompany accounting but needs to be exposed to other areas of accounting.

It should be made explicitly that Dynamic 365 is not the final recommendation for the commissioning party. It has been used merely for demonstration.

6.2 Proposal on historic data project improvement

Regarding the back-office project, data collection reflects that the back-office project efficiency is insufficient. Hence, there are two things needed to be done in this aspect. The new intercompany transactions need to be separated from existing aging items to prevent new items further accumulated to old aging invoices after periods. The approach of the back-office project should be reshaped. Line by line follow up items is not an efficient way as evidence has been shown. Items with small value invoice amount can be grouped by the partnership and other relevant criteria such as an occurred period or types of invoices.

Additionally, each entity has recorded its accrual during the period closes for reserves outstanding transactions. Even though the accrual journal is reversed after each period, the expenses have been budgeted, reserved, and recorded monthly. This reserve amount can be utilized to compensate for the historic data write-off. Especially, for the batches of invoices with small value have been pending through years. Because the expenses have been recorded during each period, this only has a mild impact on the profitability of each entity. The threshold for written-off allowance can be determined and decided by high-level managers. In order to push the project speed, the corporate can encourage entities to resolve aged invoices with a larger invoice amount. In order to manage this properly, the written-off decision should be made in all subsidiaries in the same period.

6.3 Conclusion

In conclusion, it is undeniably and inevitable that a remarkable proportion of errors in intercompany accounting is initiated from human errors. This phenomenon has been aware of but irresistible. Hence, the best solution is utilizing technology and digitalization to minimize human errors. The one-time entry and commercialized blockchain available in accounting software has enabled this solution. Intercompany reconciliation has always been intricate because the first step of the procedure contains various problematic issues. When the intercompany transactions input phase has been controlled in good shape and done properly, the subsequent parts of intercompany accounting will be less effortful.

The existing problems in intercompany accounting could be identical from the commissioning party to other companies. However, each company with its nature of the business, available resources has different needs, and financial strength to afford different solutions. Hence, the priority of key criteria for software selection can be varied and different. Each software has been listed in the evaluation has its own unique feature to provide solutions that are compatible with different businesses. Thus, software with a low overall score in the vendor scorecard of the thesis evaluation does not it is an inadequate software for all businesses. The evaluation is made mainly as an illustration for the framework. Other businesses that are planning to take the thesis proposal into use should be aware of this. The valuable features can be identical, but the priority assessment needed to be adjusted and tailor based on the nature of each company. Additionally, in order to make the digitalization function at its best, coherent internal governance and policy over intercompany accounting need to be conducted and strictly adhered to. All in all, digitalization can only work while the system is able to be customized to fulfil business requirements. On the other hand, the business also needs to adjust to fully adapt into the new system.

The change requires time and effort to eliminate habitual ways of working. However, none of the object should resist change. In my personal perspective, the common perception is that the larger the corporate the more reluctant it is towards change. This is paradoxical. The bigger an enterprise grows, the more complex challenge it faces. Hence, the faster capability of improvement and enhancement are required to adapt the situation.

7 Learning reflection

The process of writing this thesis has been a learning journey, in which each phase was a new lesson. This work was an integrated demonstration of all the skills the thesis writer gained during the Bachelor' degree.

The internship opportunity in the commissioning party was a huge contribution for the learning journey as well as inspiration for the topic of the thesis. Thanks to the internship, the thesis writer experienced the gap between academic knowledge and practical world. However, during the thesis writing procedure, the writer experienced the difficulties in converting practical knowledge into a proper academic paper.

The working experience gave a clearer view on the topic in real life but at the same time a narrower scope. The only working experience was interpreted as the single possibility for many cases. Additionally, personal opinions should be eliminated, and a strong statement should have an academic source backed up. This relates directly to the creditability of the research and should be constantly reviewed.

Besides, analytical skill of the writer was enhanced and utilized during the data analysis phase. The thesis candidate needed to be active and realized which area require a numerical analysis. The other critical soft skill on how to compromise and convince the commissioning party was developed during the thesis work.

Finally, the personal interest on the topic acts as a determined factor on the result of the thesis. The writing process was intensive, and passion contributed significantly to the persistent towards the thesis finalization.

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Attachment:

Appendix 1: PSO vendor score card overall software evaluation total score rated based on Johnson Controls perspective

Software Evaluation Criteria	Weight (%)	Max Score	Netsuite One-world	SAP S/4 Hana	Dynamic365 Finance	Xero	Oracle JD Edwards
Functionality	30%	12	10	11	11	5	9
Percentage of area (Vendor score/ Max score)			83	92	92	42	75
Score on total (Percentage of area * Weight)			**25**	**28**	**28**	**13**	**23**
Usability	15%	24	21	19	24	18	18
Percentage of area (Vendor score/ Max score)			88	79	100	75	75
Score on total (Percentage of area * Weight)			**13**	**12**	**15**	**11**	**11**
Technical Alignment	25%	20	15	16	17	15	16
Percentage of area (Vendor score/ Max score)			75	80	85	75	80
Score on total (Percentage of area * Weight)			**19**	**20**	**21**	**19**	**20**
Vendor Background	5%	24	22	23	23	19	23
Percentage of area (Vendor score/ Max score)			92	96	96	79	96
Score on total (Percentage of area * Weight)			**5**	**5**	**5**	**4**	**5**
Total Cost of Ownership	25%	16	10	9	12	13	10
Percentage of area (Vendor score/ Max score)			63	56	75	81	63
Score on total (Percentage of area * Weight)			**16**	**14**	**19**	**20**	**16**
	100%		77%	78%	87%	67%	74%

Interview questions

List of interview questions with accountants working in Intercompany department in Johnson Controls International.

1. Can you please briefly introduce yourself?
2. What is your current position?
3. In which department are you working in?
4. How long you have been working in Johnson Controls?
5. What is the current practice of intercompany accounting in Johnson Controls International?
6. How do you currently record intercompany transaction in Johnson Controls International?
7. How do you evaluate the efficiency of intercompany accounting in Johnson Controls?
8. What types of document required for a complete intercompany transaction?
9. What document qualified for triggering company transaction?
10. What document qualified for triggering the record of company transaction?
11. What is the area of intercompany that you find most difficult?
12. What are the common problems for mismatched balance?
13. How do you resolve the discrepancy?
14. Do you face any difficulty when you try to solve the discrepancy?
15. What are the most common reasons for rejected invoices?
16. What are the most common reasons for missing purchase order?
17. Have the company or the department tried to improve intercompany accounting?
18. How is the impact of the project?
19. Do you have any suggestion to improve intercompany accounting further?