Politecnico di Torino

Master's degree in Engineering and Management

Master's Degree Thesis

" THE ROLE OF THE ICT FUNCTION IN A TREASURY PROCESS REORGANISATION"

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ABSTRACT

In this thesis it is analyzed a merge of two companies both have a network of sales and production plants. All these activities concerned collection and expenditures of money. Cash liquidity is managed by a central treasury with three branches that work in completely different manners however now there are no more two companies but only one. Being a unique company implied several projects of convergence to reach a new model of treasury in which employees work in the same way.

The convergence process lead to problem of communication, delay of projects, mix of IT roles with business roles moreover convince people belonging to different companies and with different backgrounds to converge to a new treasury process is far more difficult than develop the new processes.

The thesis described how different kinds of projects have been managed by the ICT Treasury that has a critical role dealing with business requirements and the compliance to the Sox Law and company's policies.

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Introduction

In this thesis it will be analysed the role of a project manager that has been hired as an external consultant in a company.

The client I have been working for these years is a multinational product company with a turnover of about 190 billions euro and about 240000 employees.

This company includes two main business lines:

- Sales
- Production in plant

This society has been recently created through a merge of two groups, it is composed by different societies present in different regions such as America, Middle East and Far East and a headquarter in which the main corporate functions are centralized.

One of the corporate functions that is centralized is the group treasury, it is the area in which I have been working.

Even if the treasury is centralized the single companies can move freely on the markets to look for suppliers and to do sales, marketing activities, comply with legal norms related to the belonged region.

All these activities generate cash flows every day and they are handled in a centralized way by the group treasury for this reason it is necessary to have a team that manage the centralized activities and projects of the treasury to increase its efficiency and decrease the manual effort.

The first part of the thesis will focus on the management of the treasury explaining what a treasury is and why it matters then it will be analysed the management of projects that have the objective of automatize some activities done in the treasury and converge to a new model of treasury. In the last chapter it will give an overview about the compliance to the Sox Law in order to protect the shareholders of the company. The ICT treasury team, in which I work, is obliged to provide all the evidences requested by the auditors to satisfy the compliance with the law.

1. Management of a Treasury

1.1 What is a Treasury

Treasury involves the management of money and financial risks in a business. Its priority is to ensure the business has the money it needs to manage its day-to-day business obligations, while also helping develop its long-term financial strategy and policies.
The treasury is split up in two parts cash management and risk management.[1]

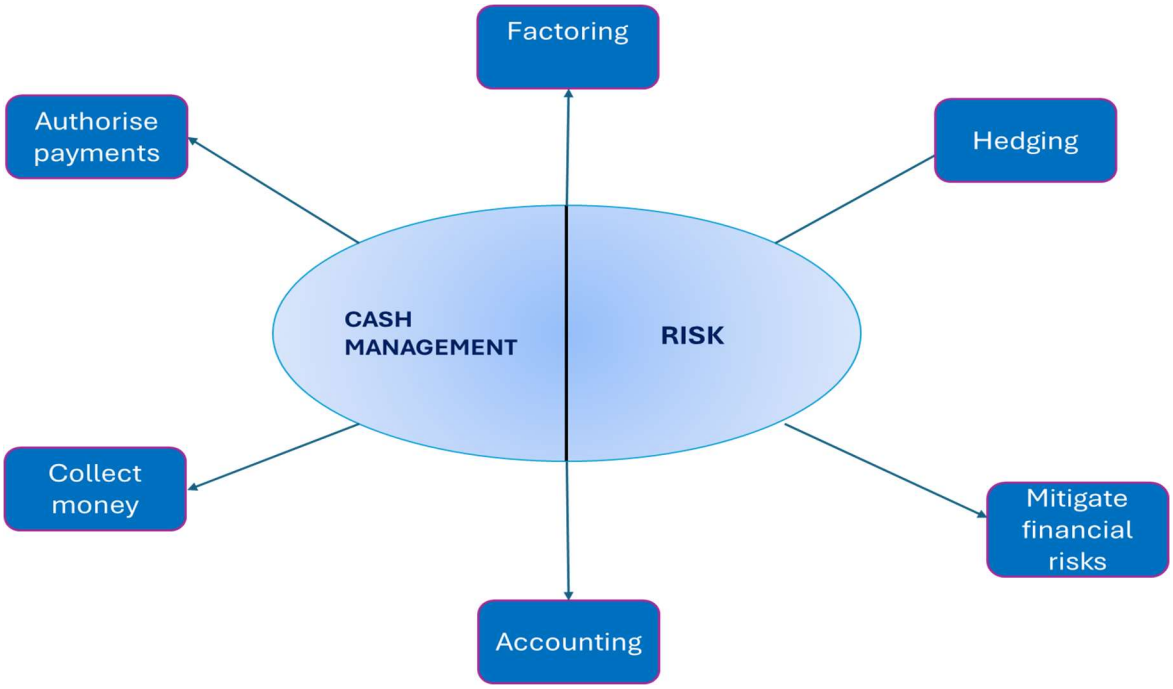

Figure 1:Treasury

The first part authorizes payments and inflows of cash this part is involved in the monitoring of the cash flows to ensure the society has enough liquidity to manage the daily operations.
The second part is involved in covering risk to protect and increase the value of the society.[2]

[1] Manca F., September 2023, *Controllo della liquidità nelle PMI,* Wolters Kluwer
[2] Cooper R., November 2003, *Corporate Treasury and Cash Management*, Palgrave Macmillan London

Linked to cash management and risk management there is the accounting part, it is used to manage balance, accounts payable, general ledger and so on and the factoring part in which the company sells its account receivable to gain immediate liquidity.[3]
Only one treasury hub is not enough for structured company for this reason there are also other branches. The company which will be discussed has two hubs in Europe and another one in a non-European country.

1.2 Who works in a treasury

There are two main groups: front office and back office, the first group composed of ten people deals with trading whereas the other, that requires ten resources, is responsible for the handling of money.

1.3 When a treasury works

The goal of the treasury is to guarantee the continuity of its work for this reason it works every day except for Saturday, Sunday and the international bank holiday such as New Year's eve and Christmas. The national bank holidays aren't respected since it is necessary to guarantee the continuity of the activities for this reason the multinational companies have more than one treasury hub.

1.4 Where is a treasury

The treasuries are localized wherever there are productive plants or a consolidated network of sales.

[3] https://economictimes.indiatimes.com/definition/factoring

1.5 Why is it necessary

From small companies to large companies each of them needs a treasury in fact its goal is to perform payments and of course every company does these operations. The differences that are observable are related to the organization of the treasury for example one hub or more, lots of bank account, only one bank account and so on depending on the level of the complexity of the operations they perform.

As it will be discussed in the next paragraph the company is growing with new subsidiaries in new countries. This trend reveals the importance of the treasury management whose objective is improve the company's financial resources to maximize liquidity, cut down risks and increase profitability.

To sum up a treasury system is critical whenever the organization's aim is guarantee operational efficiency, strategic growth, and long-term stability. [4]

[4] https://gtreasury.com/blog/why-is-treasury-management-important/

1.6 Payment factory

"A payment factory is an accounts payable function that has been centralized for an entire organization". [5]

Usually a payment factory has some characteristics:

- capability to handle high transaction volumes
- recognize payment files in several formats
- possibility to create digital documents from the ones received in a paper format
- possibility for suppliers to upload their invoices
- Approval of documents through a workflow

There are positive and negative aspects to use a payment factory.

Pros:

- thorough projection of cash outflows thanks to centralized cash forecasting
- simple and well-organized payables processing
- easy to move a resource from a legal entity to another one
- higher volume of transactions that lead to lower fees
- more control over outflows of cash
- netting of payments namely aggregates all the amount of a beneficiary in a unique payment
- possibility to route payments exploiting in-country accounts in order to bypass foreign transaction fees applied to suppliers located outside the country

Cons:

- expensive software and related systems furthermore high cost of maintenance.
- payment control is centralized this implies that the legal entities have no more control.

[5] https://www.theglobaltreasurer.com/2012/05/15/payment-factories-different-ways-of-achieving-payment-efficiency/

- in complex organization usually there is a bank of the group, so it is highly recommended to use it and this lead to the terminations of some bank relationships even if they have always been in place.
- Since it is a central organization, the workflow related to the approvals of payments is equal for all the subsidiaries however in some countries it is not possible to reach certain links. This can be a problem because it is necessary to implement a different solution that implies other cost and it can be not compliant with the regulation policies.[6]

This company decides to adopt this function due to the high volume of payments that is more than 2,5 millions in a year. In fact over the years the group has been enlarged thanks to the new legal entities born in new countries, a higher profit and new employees.

At the beginning of 2000s there were 30% of processes handled locally and 70% handled centrally however in the 2020s the percentages change the process handled locally increased till 55 % as a consequence this lead to a fragmentation of IT systems and business processes that have become locally focused rather than centralized.

The goal is to take back the local processes to 20% and 30% in this way it will be easier to implement standard solutions for the treasury area without let entities to organize on their own.

[6] https://www.accountingtools.com/articles/the-payment-factory

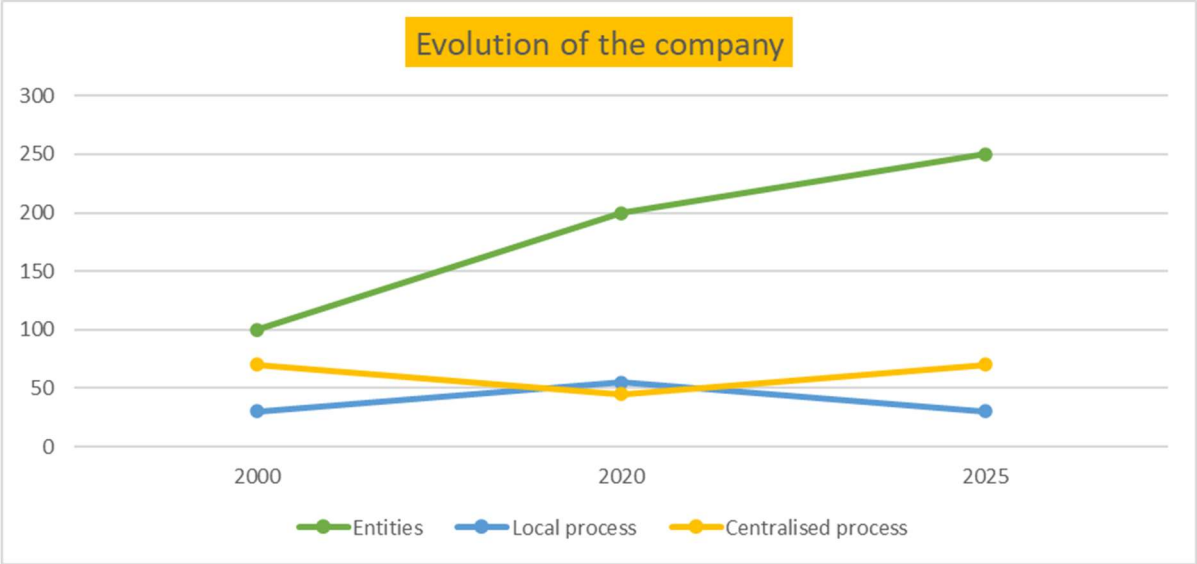

Figure 2: Evolution of the company over the years

Exploiting the payment factory the aim of the society is to reorganize and converge to a new centralized reorganization.

Implementing this centralized hub, it is possible to manage the workflow pf payments becoming from the subsidiaries in different ways.
These are two models of Treasury mainly adopted in this society:

- P.I.N.O.
- P.O.B.O. / C.O.B.O

The first acronym stands for "payment in the name of" namely every society has got its own bank account.
Instead P.O.B.O./ C.O.B.O. stands for "payment/collection on behalf of" this is a completely different structure since the societies don't have their bank accounts in this case it's the central treasury that pays on behalf of the societies.[7]
In complex realities the two models can coexist.

As already explained the goal of the treasury is to ensure that the business has enough money to manage its day-to-day business obligations. How can the treasury do this?

[7] https://www.business.hsbc.co.nz/en-gb/insights/managing-cash-flow/treasury-transformation

It uses the forecast there are two types of forecast:

- Projected foresees the payments but the flow has not been disposed (used in PINO)
- Actual the flow has already been disposed[8] (used in POBO)

These two kinds are complementary since one refines the other.

It is possible to do forecast with a temporal window of 30 or 60 days because there could be the maturity of the financial coverages.

Although there are the forecasts it's necessary to remember that they have a certain grade of inaccuracy.

It can happen that there are mistakes or variations to overcome this problem the bank of the group has a credit line that is able to bear the changes so as the treasury can manage all its operations.

1.6.1 How a Treasury performs a payment

There are three ways to perform payments:

1. Upload a file for example an excel file in the internet banking
2. Use a connection host to host from ERP to banks
3. Use a more complex architecture to perform them

Usually the first procedure is used in case the company is small. Large companies use the second or the third procedure.

The second one allows seamless communication and data exchange between different software systems. It's like having a direct line between the company's system and the banking partner.

Host-to-host (H2H) is an automated solution for high volume data transfer between banks and their corporate clients.

The last procedure foresees that the payments go through a chain of platforms before reaching the bank.

The third method will be analysed in detail since this is used in this company.

The networks of payments can be one to one or they can be over a local bank network such as ebics or cbi or they can use a global interconnected network such as SWIFT.

[8] https://brixx.com/comparing-actuals-vs-forecast-a-brixx-update-preview/

Some countries such as Germany and France use the "EBICS (Electronic Banking Internet Communication Standard) defined as the standard for electronic data exchanges between corporations, banks, and other financial institutions"[9].

[9] https://www.virtusa.com/digital-themes/ebics

1.6.2 Types of payments

There are different types of payments and collections that a society can perform:

- Domestic/ commercial payments when the society pays the suppliers.
- Crossborder payments when the society pays a supplier who is not in SEPA area or it uses a different currency rather than euro.
- Intercompany payments when the society pays another society which is within the company, they can be cash physical transfer or cashless (for centralised treasury)
- Tax payments such as payments to the “Agenzia delle entrate”
- Payroll the salaries of the employee
- Collection when the treasury receives money from customers

There are different secure and reliable payment methods that have been specifically developed to process payments within the European Union.

- DD(direct debit in local currency no euro) and SDD (sepa direct debit) this means that the society will collect money taking directly from the bank account of the suppliers
- CT (credit transfer in local currency no euro) SCT (sepa credit transfer) collection of money
- Checks
- Bank transfer
- Order to cash in case there is urgency to pay a supplier

1.6.3 Format file of payments

There are different format to execute payments it is possible to use all the possible format files such as csv, xls, xml however it is necessary to have a structure shared with both parties: the company and the bank. The critical aspect to keep in consideration when preparing a payment file format is that all these files must be positional namely each field must be of a maximum predefined length.

So far each country could have its own type such as France that use this kind CFONB320, in Germany DTAZV and so on.[10]

The aim is to use the same format in this case the xml ISO20022 in fact it is mandatory from 2025 to use this format in order to have a standard language that is readable worldwide.

[10] https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/3cb1182b4a184bdd93f8d62e3f1f0741/a2e13b556fbc47c7869a197380d66075.html

1.6.4 What is the flow of payments?

The architecture of payments, that are at the moment used in this company, requires four steps:

- ERP
- IPH
- ICE
- Banks

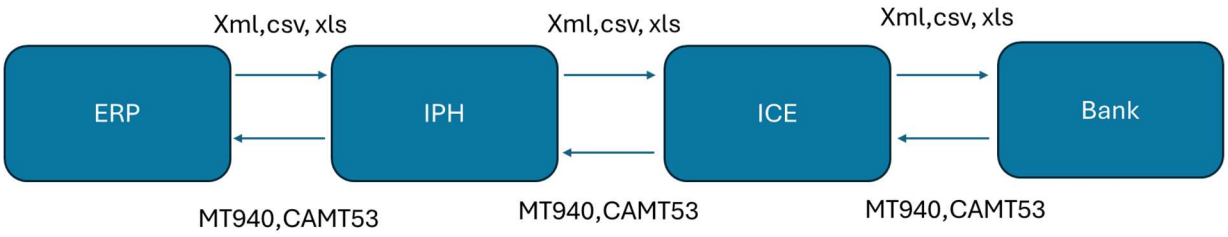

Figure 3: CPCH

The ERP creates the files such as a commercial payment, a payroll, a payment to a supplier and so on. Usually for these types of payments they created a pain 001, a payments initiation message by ISO 20022 that depicts a Credit Transfer message in XML format.

Below there is an example in which there are shown the different fields requested in this kind of format. In the second column there is the name of the field whereas in the third column it explained the content of the field.

SEPA payments	Description	Comments
<?xml version="1.0" encoding="utf-8"?>		
<Document xmlns="urn:iso:std:iso:20022:tech:xsd:pain.001.001.03" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">		
<CstmrCdtTrfInitn>	Customer Credit Transfer Initiation	
<GrpHdr>	Groupe header	
<MsgId>663871ITZ4230053BS0000</MsgId>	Message Identifier	Message Identifier: this string must be filled using CPCH rules: Company code (6 digits) Country code (2 digits) System sender code (2 digits) Year --> 2 digits Progressive remittance number ---> Counter - 4 num . To reset at the beginning of the year Service code --> 2 digits ('BS' for Sepa) Business Area----> 0000 (usually filled as 0000, but it is possible to use different value if you need to distinguish payments released by different sites, different departments, different purpose.. scope)
<CreDtTm>2023-03-13T00:00:00</CreDtTm>	Creation Date Time	
<NbOfTxs>002</NbOfTxs>	Number of transactions	Total number of transactions in the entire message.
<CtrlSum>40000.00</CtrlSum>	Control sum	The sum is the total of values in Instructed Amount

<InitgPty>	InitiatingParty	
<Nm>AKMA S.P.A.</Nm>	Name	Name of the company is sending the file
<Id>		
<OrgId>	Organizational Identification	
<BICOrBEI>AKMAITTT</BICOrBEI>	BIC	
</OrgId>		
</Id>		
</InitgPty>		
</GrpHdr>		
<PmtInf>	Payment Information	
<PmtInfId>663871ITZ4230053BS0000</PmtInfId>	Payment Information Identifier	same string of Message Id
<PmtMtd>TRF</PmtMtd>	Payment method	TRF' fixed value
<BtchBookg>false</BtchBookg>		
<NbOfTxs>002</NbOfTxs>	Number of transactions	
<CtrlSum>1000.00</CtrlSum>	Control sum	
<PmtTpInf>	Payment Type Information	
<InstrPrty>NORM</InstrPrty>	Instruction priority	always NORM (normal)

<SvcLvl>	Service Level	
<Cd>SEPA</Cd>	Service Level Code	fixed value SEPA
</SvcLvl>		
<CtgyPurp>	Category purpose	
<Cd>SUPP</Cd>	Category purpose code	Supplier
</CtgyPurp>		
</PmtTpInf>		
<ReqdExctnDt>2023-03-13</ReqdExctnDt>	Requested execution date	
<Dbtr>	Debtor	
<Nm>AKMA S.p.a.</Nm>	Debtor Name	
<PstlAdr>	Postal Address	
<Ctry>IT</Ctry>	Country code	
<AdrLine>Via di Guidi, 7</AdrLine>	Address line	
<AdrLine>10036 Settimo Torinese</AdrLine>	Address line	
</PstlAdr>		
</Dbtr>		

<DbtrAcct>	Debtor Account	
<Id>		
<IBAN>IT12A1234512345123456789012</IBAN>	IBAN code	
</Id>	Currency code	
<Ccy>EUR</Ccy>		
</DbtrAcct>		
<DbtrAgt>	Debtor Agent	
<FinInstnId>	Financial Institution Identification	
<BIC>BCITITMMXXX</BIC>	Bank Identification code	
</FinInstnId>	Bank - Country code	
</DbtrAgt>		
<ChrgBr>SLEV</ChrgBr>	Charge of bearer	It should be always 'SLEV' in case of SEPA
<CdtTrfTxInf>	Credit Transfer Transaction Information	
<PmtId>	Payment Identification	

<InstrId>111111ITZ4230053-0000000278BS0000</InstrId>	Instruction Identification	**Instruction Identifier** composed by: 1st part : Company code+Country code+ system sender code+year+remittance number 2nd part -->Progressive payment number(Counter, 10 num +Service code (fixed value 'BS ')+BusinessArea Hyphen '-' between first and second string The payment number is a counter dedicated to each single payment . Example: Remittance number 1: it contains payment number 1, payment number 2, payment number 3 The remittance number 2 will contain payment number 4, payment number 5, payment number 6 and so on..
<EndToEndId>111111ITZ4230053-0000000278BS0000</EndToEndId>	End to End identifier	Same value of Instruction Id
</PmtId>		
<Amt>	Amount	
<InstdAmt Ccy="EUR">30000.00</InstdAmt>	Instructed amount/ccy	
</Amt>		

<Cdtr>	Creditor	
<Nm>BUBU TRASPORTI S.R.L.</Nm>	Creditor name	
<PstlAdr>		
<Ctry>IT</Ctry>	Creditor country	
<AdrLine>VIA DELLE FORESTE, 33</AdrLine>	Addres line	
</PstlAdr>		
</Cdtr>		
<CdtrAcct>	Creditor bank account	
<Id>		
<IBAN>IT13A1234512345123456789012</IBAN>	IBAN	
</Id>		
</CdtrAcct>		
<RmtInf>	Remittance information	
<Ustrd>Ft. n. 23V0003 del 07/03/2013,Ft. n. 23V0004 del 07/03/2013</Ustrd>	Unstructured information	free text 140 char. Max., it is used when it's necessary to add further information

<RmtInf>	Remittance information	
<Ustrd>Ft. n. 23V0003 del 07/03/2024,Ft. n. 23V0004 del 07/03/2024</Ustrd>	Unstructured information	free text 140 char. Max.
</RmtInf>		
</CdtTrfTxInf>		
<CdtTrfTxInf>		
<PmtId>		
<InstrId>663871ITZ4240053BS0000-0000000111BS0000</InstrId>		
<EndToEndId>663871ITZ4240053BS0000-0000000111BS0000</EndToEndId>		
</PmtId>		
<Amt>		
<InstdAmt Ccy="EUR">40000.00</InstdAmt>		
</Amt>		
<Cdtr>		
<Nm>Mario Rossi</Nm>		
<PstlAdr>		
<Ctry>IT</Ctry>		
<AdrLine>37068 VIGASIO VR ITALIA</AdrLine>		
</PstlAdr>		
</Cdtr>		
<CdtrAcct>		
<Id>		
<IBAN>IT12A1234512345123456789012</IBAN>		

</Id>		
</CdtrAcct>		
<RmtInf>		
<Ustrd>Ft. n. 1 del 06/03/2023</Ustrd>		
</RmtInf>		
</CdtTrfTxInf>		
</PmtInf>		
</CstmrCdtTrfInitn>		
</Document>		End of file

Table 1: xml file pain 001

The file can contain only one transaction or multiple transactions, it must include transactions related to only:

- One debtor
- One bank account
- One execution date
- One currency

In this case there were two transactions as the field “Number of transactions” showed.

Then this file will reach the intercompany payment hub. In this platform the format is controlled, users will approve the payments or block it in case there are mistakes due to the date of execution. If the payment is correct it is unlocked and it reaches the next platform. In ICE there are two level of approval the first person unlocks the payment then the second signs. Due to security reasons the two people have to be different this is the segregation of duty. After the procedure the payment will reach the bank however the bank manipulates it only if the payment respects the cut off otherwise it will be executed the day after.

Once the file reaches the bank, it will send back a PSR (payment status report) there could be two levels of PSR the first one (called ACTC) is related to the envelope and it controls the technical format of the file whereas the second level states for each transaction contained in the file whether it’s accepted or rejected based on content check.

Here below there is an example of ACTC:

```
<?xml version="1.0" encoding="utf-8"?>
<Document xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="urn:iso:std:iso:20022:tech:xsd:pain.002.001.03">
<CstmrPmtStsRpt>
<GrpHdr>
<MsgId>BANK/20240820-PSR/3333</MsgId>
<CreDtTm>2024-08-20T10:50:07</CreDtTm>
<InitgPty>
<Id>
<OrgId>
<BICOrBEI>CITIUS33</BICOrBEI>
</OrgId>
</Id>
</InitgPty>
</GrpHdr>
<OrgnlGrpInfAndSts>
<OrgnlMsgId>222201FL67890187CS0000</OrgnlMsgId>
<OrgnlMsgNmId>pain.001.001.03</OrgnlMsgNmId>
<OrgnlCreDtTm>2022-03-20T12:21:44</OrgnlCreDtTm>
<OrgnlNbOfTxs>1</OrgnlNbOfTxs>
<OrgnlCtrlSum>10560.24</OrgnlCtrlSum>
<GrpSts>ACTC</GrpSts>
<StsRsnInf>
<AddtlInf>ACK - FILE ACCEPTED</AddtlInf>
</StsRsnInf>
</OrgnlGrpInfAndSts>
</CstmrPmtStsRpt>
</Document>
```

Table 2: ACTC

In this example it is possible to see the messageid that is the unique code to identify the transaction, in this example the envelope is technically correct and it has been accepted.

The time in which PSR are received are different since it depends on banks, type of payment, currency and country. Usually, the first level of PSR it is received immediately whereas the second level it will be received when the bank will instruct the payment. There is another file that the companies received it could be of two different formats MT940 or CAMT53. This file will be sent from the bank when there is the execution date of the payment. This file contains also a financial classification namely a number that the people, who work in the accounting area, use to classify the different kind of payments.

This kind of file is critical because the companies use it to report.

From the point of view of the bank it has reported the operation namely it is ultimate.

1.6.5 Architecture and connectivity

The platform can be of different types:

- Public web servers are hosted online so everybody can reach them in fact to access to them usually people implement a 2FA: login with userid and password and then an otp
- Private cloud you just need to buy the software and the licenses however it is not installed in your server farm.
- Saas (software as a service) the server is installed on your service farm however you can't customize it.

To connect these different platforms, it is possible to implement different solutions. The solutions that this company decided to adopt are the following ones:

- SFTP
- SPAZIO
- CONNECT DIRECT

"Secure File Transfer Protocol (SFTP) is a network protocol for securely accessing, transferring and managing large files and sensitive data".[11] This protocol is free evidently it has some limitations: it can happen that the address doesn't receive the file however if the sender check it seems that the file has been sent. To avoid this problem, it is necessary to develop other functionalities to ensure that the file arrive at the destination. Unfortunately developing functionalities costs money and this protocol is no longer free.

Connect:Direct is a computer software product that transfers files between mainframe computers and/or midrange computers. Using this kind of software, you are sure to receive the same file, if the file has been modified the file will be sent to another path and it will be sent an alert.

Spazio is another software that it is equal to Connect:Direct but the provider of this software is different.

All these three protocols imply a crypted channel.

[11] https://www.techtarget.com/searchcontentmanagement/definition/Secure-File-Transfer-Protocol-SSH-File-Transfer-Protocol

The last two software imply a maintenance cost whereas if you want to use simply SFTP without adding new functionalities it is free. People can question themselves about using only SFTP to save money however it is always necessary to assess whether it's critical to receive a file that is surely not modified by anyone. Taking as examples payment files it would be better to use Connect or Spazio to avoid files that can be corrupted.

Is a encrypted channel enough?

If doing an analysis, you notice encrypting the channel is not enough you can also encrypt the data presented in the channel. This company exploits OpenPGP, it is a standard to use to encrypt all types of data such as email, file, messages.

This kind of encryption is called asymmetrical since it expects two different couples of keys: two public and two private.

The sender will encrypt the file with his public key, the addressee will use his private key to decrypt the message.

Usually, files don't remain in the intranet, they reach destinations all over the internet for this reason it is necessary that they will be transported via a secure channel namely a VPN (Virtual Private Network). It is possible to take as examples the files that from ICE will go to the banks or other files having as destination other platforms.

The VPN enables the exchange between two entities that are in public network.

Exploting VPN you are sure of:

- Only the address can read the data
- The sender can be verified
- The address can verify if the data have not been manipulated
- An intruder can't read the date since they are encrypted[12]

To implement a VPN it is created a tunnel in which the files go through.

Is it necessary to have a complex architecture and a robust security?

When the architecture of platforms has been chosen different reasonings were put in place. The more the number of platforms the more the architecture is complex, and this means it

[12] https://www.cisco.com/c/en/us/products/security/vpn-endpoint-security-clients/what-is-vpn.html

is more secure. Nevertheless, it is not possible to create an architecture composed by a huge number of platforms because the total maintenance will have a huge cost in addition it is difficult to understand where the problem is and solve it as soon as possible whenever one shows up.

It is necessary to find an efficient architecture that will give the possibility to monitor the payments avoiding the use of too many resources.

As far as it concerned the security it is critical that data arrive to the destination without being manipulated for example the payslip nobody would want that they would be public since they are private information for this reason it is important to encrypt data whenever it is necessary.

1.7 What is SWIFT?

"SWIFT (Society for Worldwide Interbank Financial Telecommunication) is a network"[13] that has been created to move money between bank accounts. It has been founded in 1973 it ensures the security of financial transactions. This network is used by different customers such as banks, treasury companies, trading companies and so on…
To access to SWIFT it is necessary to sign the SWIFT Score Agreement between Swift and the banks involved and to pay a fee every year.

SWIFT transmissions can be performed in three different ways:

- The SWIFT Alliance Lite2 (SAL2) connector
- The SWIFT Service Bureau
- Direct connection

Taking as example this company, it has been decided to use a service provider since accessing directly to SWIFT implies having a huge amount of controls done in the society, using a SSB it moves the control from the company to the supplier.

The SWIFTNet network offers the following advantages:

- Standard communication over the internet (quick and very secure, enabling very large files to be sent)
- Adopted by all banks worldwide
- Compatible with the international formats ISO 20022
- Integrated personal digital signature
- Safe transit guaranteed using FIN and FILE ACT service

[13] https://stripe.com/en-it/resources/more/what-is-swift

Let’s deep dive in some of these advantages to explain what they are.

1.7.1 ISO20022

So far over the internet to perform financial operations can be used different kind of files such as MT101, MT103 and so on however in 2025 it is mandatory to adhere to the standard ISO 20022 that standardize both domestic and global communications.
This standard imply:

- less errors
- less cost due to maintenance activities
- higher quality
- improve fraud prevention
- more automatized processes[14]

1.7.2 DIGITAL SIGNATURE

The digital signature has the objective to demonstrate the legitimacy of the message. It guarantees to the receiver that the sender has sent the message and the integrity of the message.

1.7.3 FIN AND FILE ACT

FIN is a message-based protocol by SWIFT it ensures the seamless exchange of structured financial messages.
This system is designed to handle and transmit more than a hundred types of messages related to payments, securities, treasury transactions, trade services, and other financial business areas.

[14] https://www.cic.ch/it/prodotti-e-servizi/imprese/pagamenti/traffico-dei-pagamenti/armonizzazione-del-traffico-dei-pagamenti/di-cosa-si-tratta.html

“FIN messages follow a structured format defined by SWIFT, consisting of five blocks:

- basic header
- application header
- user header
- text
- trailer”[15]

Each block contains specific information, such as the message type, sender and receiver’s identifiers, priority, delivery monitoring, and banking instruction details.

Moreover, each FIN message has a specific type denoted by a three-digit code, referred to as the Message Type (MT). For instance, MT103 represents a single customer credit transfer, MT202 represents a general interbank transfer, and so on. These predefined message types simplify automated processing, reduce errors, reduce cost and improve operational efficiency.

To sum up SWIFT FIN is a robust, secure and widely accepted protocol that allow the exchange of financial messages.

SWIFT FileAct is a file-based protocol, it is designed to transfer large and unstructured files between financial institutions and corporates worldwide.

It allows transmission of both structured and unstructured files, giving it the flexibility to carry any type of data such as reports, images or other complex financial documents.

The difference with FIN relies in its ability to manage bulk data transfer, instead of individual financial transactions, FileAct deals with entire files that might contain multiple transactions, which are typically batched together for processing.

This bulk data handling capacity it is an ideal choice for businesses that require transmission of large files, such as those involved in securities or trade finance in fact this protocol is exploited in this company.

A critical strength of FileAct lies in its adaptiveness since tt supports a wide range of file formats, providing corporates with the flexibility to send data in the format that best meet their requirements.

[15] https://www.ir.com/guides/swift-message-format

Both SWIFT FIN and FileAct require corporates to be a part of the SWIFT community, incurring membership and ongoing service fees. Implementing the necessary infrastructure and systems to use can be complex, demanding technical knowledge and expertise in addition due to the lack of standardization of FileAct this complicates the automatic processing, and it requires manual effort[16].

[16] https://treasuryxl.com/blog/navigating-the-swift-current-a-deep-dive-into-banking-protocols/

2. Management of projects

2.1 ICT Treasury organization

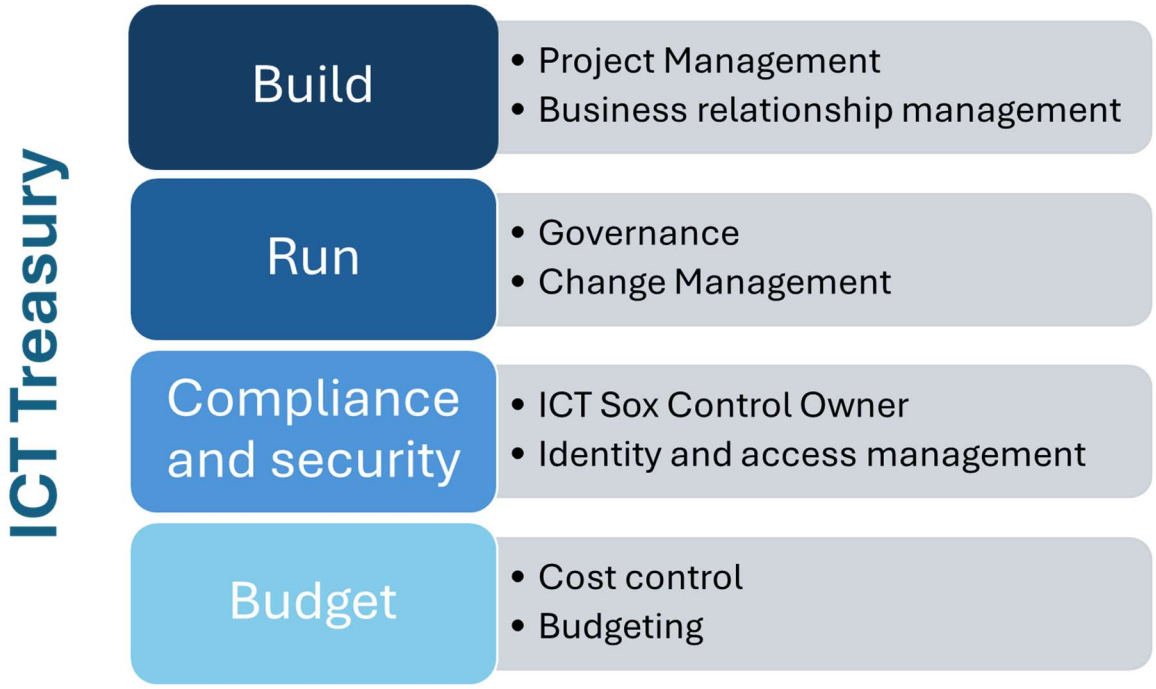

Figure 4: ICT roles

The role of the ICT treasury focuses on four main components listed above. These four categories can't be managed by one person.

This area is divided on the different roles of the treasury:

- Accounting
- Cash management
- Risk management
- Factoring

To each category it is associated a team of professionals made up of internal and external resources that handle the governance of the treasury applications, the management of new projects and they guarantee the compliance with the Sox law.

The part of Build and Run belong to different teams of external suppliers usually for the build the company contact a supplier that has a big background in treasury applications whereas the run namely the day-by-day activities are deployed by a team of external supplier that a has a lower cost compared to the original vendor.

Regarding the budget component all the expenses both CAPEX and OPEX must be kept under control.

In October it is prepared a budget for the projects of the next year, it is based on the needs of the ICT Treasury and on the guideline of the company.

Usually there are several meetings during the year to understand what percentage of the budget it has been worn out. This is useful to monitor the status of the projects evaluating if the actual cost of the work performed is in line with the budgeted cost of the work performed[17]. Moreover, during these meetings there can be also cut of budget or increase of it due to requests coming from top management that looked at the market if it is in dilation or not.

The choice of exploit external resources is based on the fact that this is not a core competence since every company even if it is not complex has to deal with cash management, in addition external resources have a reduced cost and they are not a fixed cost, and it can be included in CAPEX expenses.[18]

[17] De Marco A., March 2018 *Project Management for Facility Constructions A guide for Engineers and Architects*, Springer Cham

[18] Grant R. M., (2016), *Contemporary Strategy Analysis Text and Cases*, Wiley

2.2 Introduction to projects in ICT treasury Area

Having passed the course of project management when you approach the first project you think you are able to impress colleagues and bosses with all you have learned:

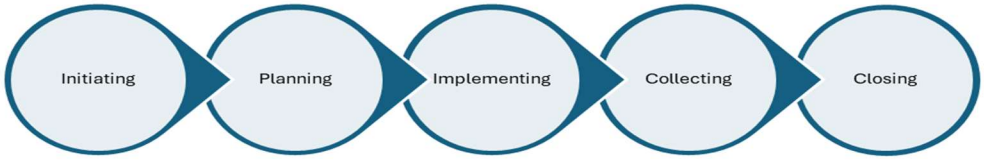

Figure 5: Project management process[19]

In the first phase you should prepare the project charter, in the second you create WBS, you estimate resources, costs, identify risks plan quality. In the third phase you implement the project, in the fourth you monitor the project at last you close the project.[20]

With the theory in your mind you participate in the first call of a new project and you notice that there are different stakeholders that work in a completely different manner and they don't want to change their way of working.

Usually everything starts from the need, it is the business that will reach the ICT team since it has a requirement. Listening to the business we collect the business requirements. After having listened to what business needs it begins the procedure related to the analysis of the perimeter starting from the as is till the construction of the to be going through the feasibility analysis. After the analysis usually there are different solutions to meet the business needs. In case of small project, it's the business that decides the solution whereas

[19] 2013 *A guide to the project management body of knowledge (PMBOK® guide),* Newton Square, Pennsylvania, Project Management institute

[20] De Marco, A. (March 2018) *Project Management for Facility Constructions A guide for Engineers and Architects,* Springer Cham

in case they are core projects of the treasury it's not the business that is allowed to make this decision but it's the group treasurer that will make the decision.

From a comparison with the theory it comes to light that the project charter is not prepared it is created a similar file that does not contains neither the resources allocated nor the risks that can emerge from the project. This makes us reflect about the difference between what is taught in university and what you discover when you approach the working world.

Sometimes it is complex to exploit your previous knowledge in an environment which is not open to change, and which works in a messy way not following a clear path.

The constraints incurred in all the projects are the time, the budget and the resources. These constraints are complex to overcome, it's difficult to allocate resources because most of the time there are different suppliers involved in projects.

In every project the watchword is saving however it is necessary to pay attention because this could lead to point of failures, more work for users, simple solutions that are not compliant with SOX etc...

At last, time is a constraint because usually every project should be developed as soon as possible.

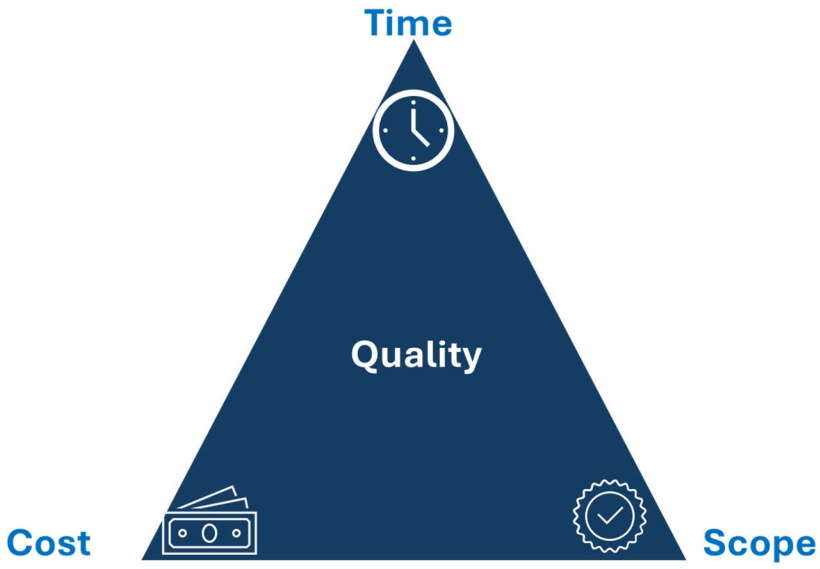

Figure 6: Triple constraint[21]

[21] https://www.projectmanager.com/blog/triple-constraint-project-management-time-scope-cost

2.3 Monitoring of projects during 2023-2024

Below there are the categories of project that are managed by the ICT Team:

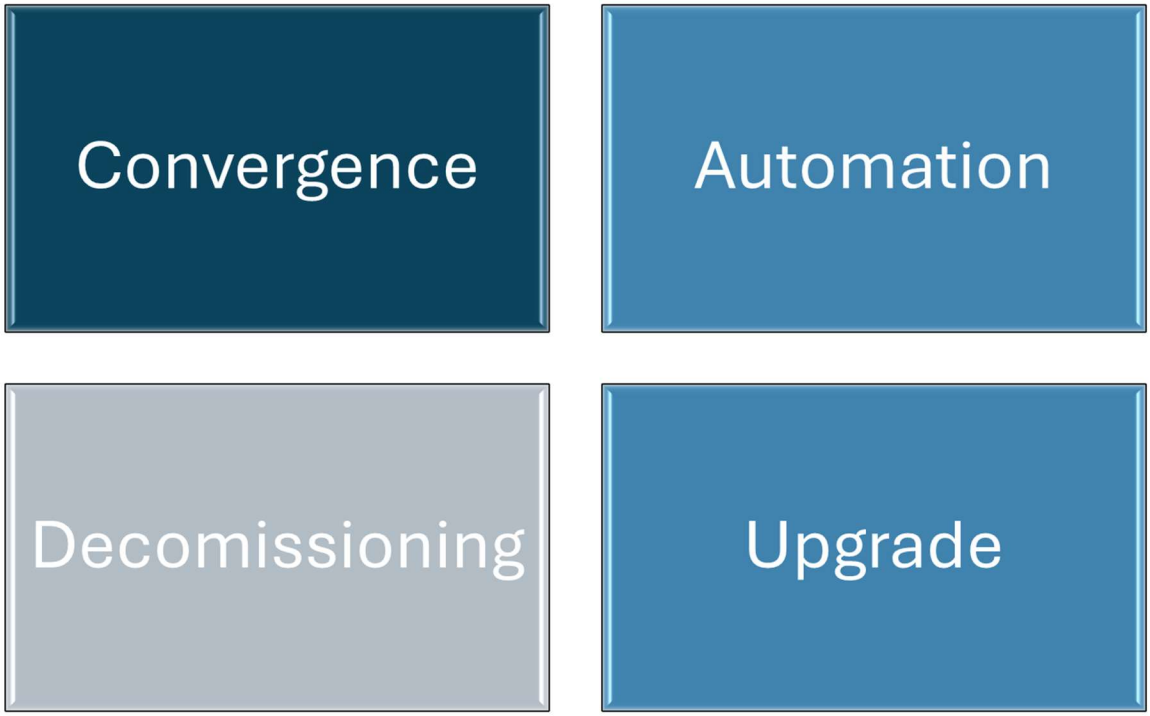

Figure 7: Categories of projects

The Convergence projects are the ones whose aim as discussed above is to take back to a central organization rather than a local organization.

Decommissioning projects usually are the consequence of convergence projects usually doing convergence there will be only one application to use so all the other will be dismissed. In other cases decommissioning projects are done only to save money and to simplify the process of the payment factory.

These two categories are the longest kind of projects in the Treasury area because they require long periods dedicated to the analysis in order to write new processes. In decommissioning projects it can happen that the application to dismiss is one used in the other company in this case it is necessary to do a process of reverse engineering to understand how the application works. In the convergence ones several months are spent to collect all the business requirements, to change the process, implement the solution, do

the tests. Both kind of project could last a year and a half due to the business requests that are used to work in the same way and they do not accept something different from what they did in the past.

Automation projects are all those projects whose goal is to automatise the payments reducing the workload, reducing the resources allocated thus the cost will decrease. This kind of project usually required a couple of months, but it depends on the business requirements in addition these projects are related to legal entities that work in a standalone way and for this reason sometimes the projects have been blocked due to budget issues.

The last category refers to applications that need an upgrade due to the lack of support, higher cost of maintenance, not compliance with the standard. The upgrade can require from about six months till one year.

2.3.1 Resources allocated in the projects

In most of the projects are involved the same kind of resources:

- the business that has a need
- the ICT project manager this is my role
- the external suppliers that will implement the solutions, in the supplier's team there are the developers, the analysts, and the quality assurance
- people belonging to infrastructure area
- people belonging to connectivity area, the role they play is related to the connection of the platform namely connect for example IPH with ICE adapting to the requests of the ICT requests and to the regulatory rules coming from the security teams.
- some implementation parts are done by employee of the infrastructure area or external consultant
- ERP teams they can be internal resources or external resources depending on the amount of work

As already discussed the choice of use internal or external resources is based on the fact that the external resources are less expensive in addition they are not always allocated but only for some months in some projects. The ICT Treasury area is not a core competence of the company for this reason the company decides to externalize it as much as possible.

2.3.2 Possible risks to take in account

The PMBOK® Guide defines risk as, "an uncertain event or condition, that if it occurs, has a positive or negative effect on a project's objective." [22] From this description it can seem that there is the possibility of incurring in positive effects however in all the projects I have monitored during these two years, unfortunately there were only events that lead to negative effects. The theory teaches us that it is possible to adopt different strategies to respond to risks:

Figure 8: Risk control strategies[23]

Avoid a risk: to do this there are different possibilities such as don't do a part of the project or change the aim of the project however it is not always possible. Mitigate a risk to avoid all the negative consequences that can happen, transfer a risk to move the risk to another party for example the choice of using a swift service bureau to move all the risks related to the Swift controls to the supplier. Accept the risk when no action is implemented to try to avoid a risk.

In this company the risk report it is not written even if it can be useful to identify the possible risks and assess their impact on the projects if something happened. To handle the possible risks a contingency is included in all the quotation of the different projects usually about a 10% of the entire cost of the project.

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[22] 2013, *A guide to the project management body of knowledge* (PMBOK® guide), Newton Square, Pennsylvania, Project Management institute

[23] De Marco, A. (March 2018) *Project Management for Facility Constructions A guide for Engineers and Architects,* Springer Cham

Convergence projects involve a huge amount of money due to the high cost sometimes the acceptance of the project by the group treasurer can last several months this can lead to several risks:

- the unavailability of the resources
- a higher cost of the external suppliers

During the meeting with the supplier, it will do an analysis of the project they have to implement and after that they send a quotation. This estimated price has a limited duration namely the offer is valid for example only for two months, however when the decisional process takes more time, the risks in which we can incur are an higher price and the unavailability of the resources because they will be already allocated to another customer. Another risk that that it is necessary to keep away from is the development of a solution that it is not compliance with the Sox Law. Whatever has to be implemented needs to be compliant otherwise it is possible to be fined as it happened with different subsidiaries who worked in a stand alone mode and whose payment flows didn't respect the Sox law.

2.5 On boarding of legal entities in the payment factory

Let's take the example of the onboarding of legal entities placed in Asia.
The AS-IS solution is the following one.
So far when the societies have to perform a payment, they upload manually a file and send it to the banks however in a large group it is not possible due to company policies. These legal entities have breached them thus they have been obliged to change the way to do payments.

Figure 9: AS IS manual payments

To solve this problem, they contacted us. My team and I spent several months analyzing the situation and we looked for the best solution that can fit to their needs and that respect their budget.
The analysis of feasibility sometimes is longer than we would have expected because it was hard to understand how people worked in the day by day, the language is also a critical point, not all the people speak in English so in some calls we needed an intermediary person this make everything more difficult and it requires more time.
During the process of analysis usually we asked the client to fill in a file called bank account structure in this file the client has to list all the societies, with their address, the bank associated with these societies, the Bic code, the kind of payments and the volume of payments.
It is likely that a company has more than one bank account and it performs the same kind of payment for example payment to suppliers in this case it is necessary to add in the BAS a default rule to use one bank as a default and the other as a backup.

All these data are useful to understand the perimeter and to set up the different platforms without any slowdown.

Before beginning the project, it is necessary to complete a file in which you write the scope of the project and the price amortized over the years in this case we put three years.

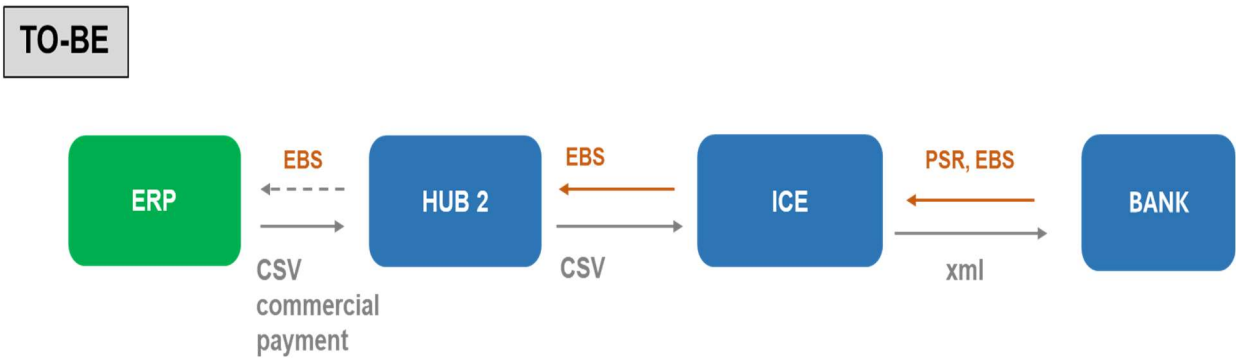


Figure 10: TO-BE payment solution

At the end of the analysis the best solution for these societies has been using an ERP, a hub and a gateway that communicate with the bank. The format of file was a csv, in ICE platform it will be converted in an xml since the bank doesn't accept a csv format.

This decision was made due to the limit of their budget and also because usually in the file there were special characters, and the usual platform IPH was not able to digest them.

These entities belong to our group for this reason we decided to use the platform gateway, ICE, that we already use to perform payments for a large part of the legal entities of the group. To access to this platform the users need the license, so we bought new licenses, they have a fixed cost and in addition there is also a maintenance fee.

2.4 CBILL PAGO PA

The AS-IS situation is the following one:

Figure 11: AS-IS CBILL payments[24]

When there is a payment of public administration a person takes his phone and then it pays the payments scanning the QR code. These kinds of payments are frequent in addition in certain days they could be up to 100 and they must be paid the same day, so the business decides to ask a solution to the ICT Treasury Team to find an automatized way to pay them. At first, we asked to our supplier that has already provided us a platform to perform payment addressed to the "Pubblica amministrazione" such as F24. Nevertheless, they were not able to provide us the solution. For this reason, it was necessary to look for another supplier that was able to help us.

Searching another supplier, it is not a simple operation usually everything starts from suppliers that are already in contact with the company this makes simple to prepare the offer. If in the list of suppliers there is not one that can meet our requirements it is necessary to look for another one.

Once a new supplier has been chosen it begins the process of register it in our ERP system generally it requires several months. This imply a potential slowdown of the project in addition it is critical to explain the perimeter of the project thus several meetings are required.

In this case LATE is a supplier already present in our ERP has been chosen since it was able to provide a good solution for the need required by the business.

[24] https://www.pagamentidigitali.it/payment-innovation/pagamenti-con-qr-code-cosa-sono-e-come-funzionano/

TO-BE solution

Late developed a platform called BELATE that can manage CBILL in pdf format and zip containing more than one files.

In the image below there is the process that they designed:

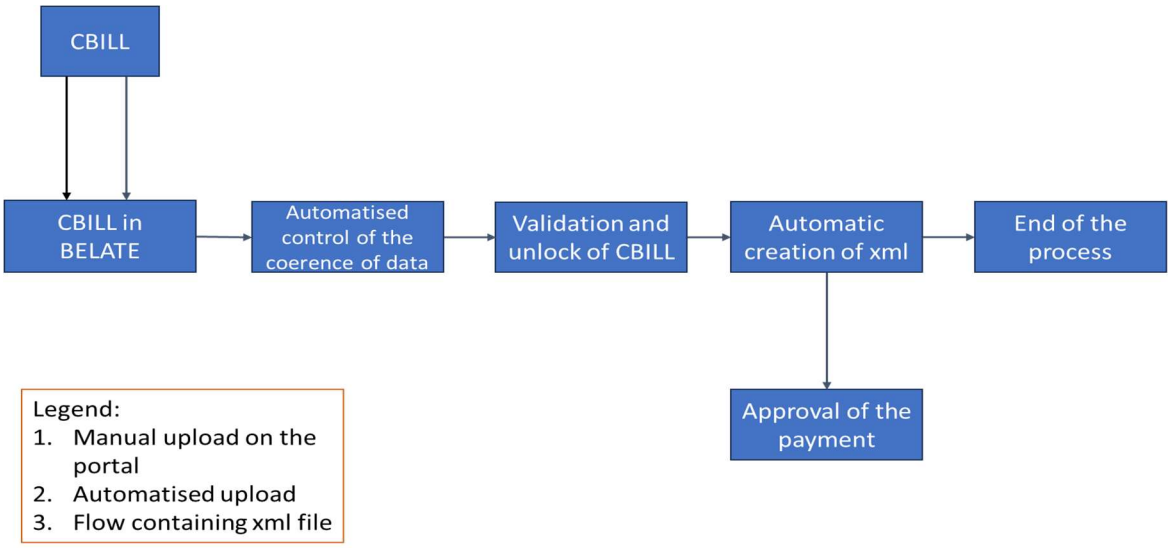


Figure 12: CBILL process

The business via SFTP or manually will upload the payment in the BELATE platform.

To exploit the first way, it has been created a shared folder in which the users via VPN upload there the file. There the system analyses the file, whenever it identifies missing fields or wrong ones it will send an automatic email to warn the users. In this case the user has to correct manually them after that it will check all the fields to validate the file.

The manual upload in the platform has been developed in case there were problems with the automatic upload in this case the procedure takes more time since the users have to complete manually several fields such as the amount, the beneficiary name, the debtor name and so on.

Given the fact that there could be up to 50 files per day of course the users will use the automatic upload however they have a backup solution that can be useful.

Once the platform got a file with all the correct fields two users are necessary: the first one has to validate the payment if it is compliant with the standard CBI (a format used for communications in the banking sector[25]) whereas the second unlock the payments. The

[25] https://www.1c-erp.it/supporto/guida-utente-gestionale/tesoreria/riba-formato-cbi/#:~:text=Lo%20standard%20CBI%20%C3%A8%20un,di%20farlo%20in%20maniera%20semplice.

first user can change the date to bring forward in case it is necessary to pay it in advance. The payment unlock role allows the user to refuse the payment if he notices a wrong file for example a payment can be refused if it belongs to a company that is not in his perimeter. When the workflow has been completed the system will generate an xml that will be encrypted with a private key and it will be sent via SFTP to QAR.

QAR is the platform developed by another supplier that is already in use to perform F24 payments.

In this application the payments via three hierarchical steps are sent directly to the bank.

Given the fact that QAR interacts with the bank it is necessary to guarantee Sox compliance with the segregation of duty in fact there are two levels of validation and then the file is signed.

To control the results of these kind of payments it is possible to access directly in the bank's portal due to security's reasons.

2.6 ICE upgrade

Platforms sold by supplier have an end of support date this means that in case of problems nobody will help, in addition after years updates are necessary and there are also changes of regulatory rules.

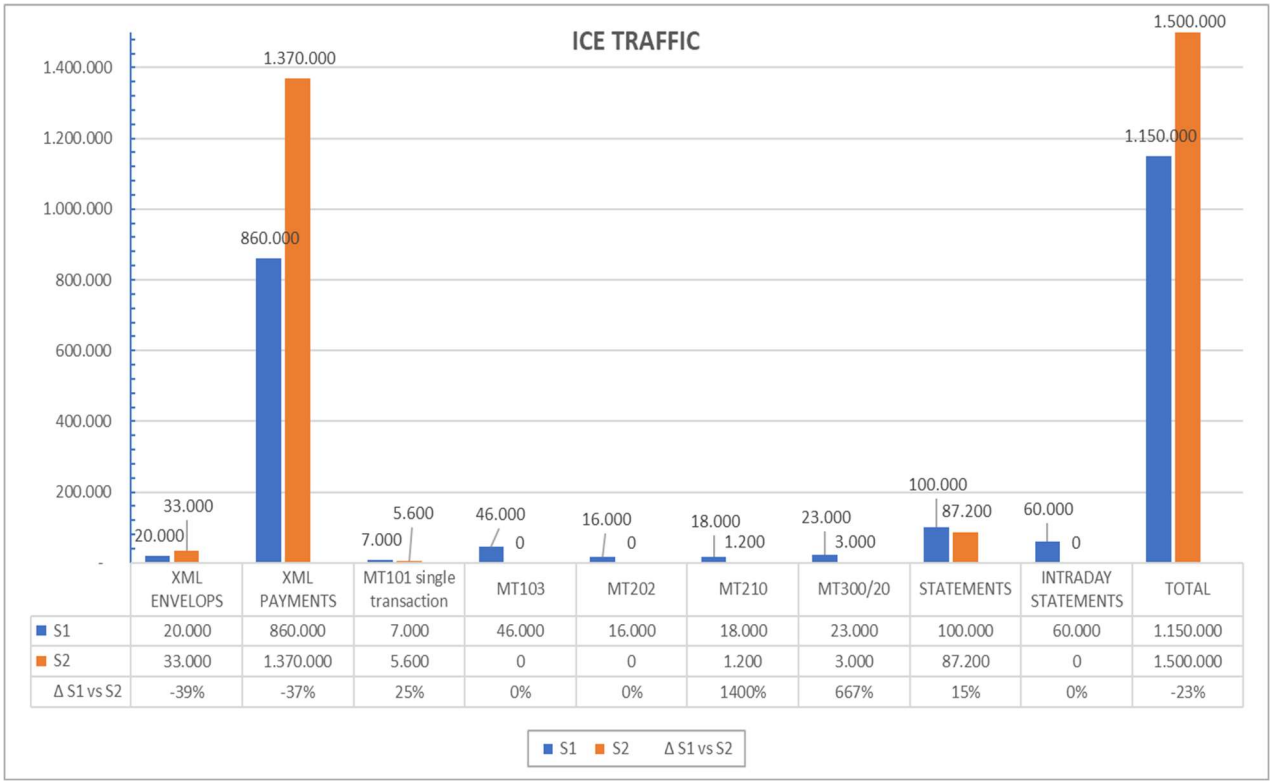
In this case the platform Ice whose role was explained in the previous chapter reached its end of support.

In the company there are two different ICE platforms since there was a merge of companies.

Taking advantage of this situation the first decision that was made was: let's converge to one unique ICE platform.

Having a unique platform implies that all the traffic of payment must convey to a new platform the two companies performed the payments in two completely different ways this means that it was necessary to analyze these two procedures to understand if one was better than the other or find a new way to perform payments.

First things first let's analyze the traffic in the two platforms:



	XML ENVELOPS	XML PAYMENTS	MT101 single transaction	MT103	MT202	MT210	MT300/20	STATEMENTS	INTRADAY STATEMENTS	TOTAL
S1	20.000	860.000	7.000	46.000	16.000	18.000	23.000	100.000	60.000	1.150.000
S2	33.000	1.370.000	5.600	0	0	1.200	3.000	87.200	0	1.500.000
Δ S1 vs S2	-39%	-37%	25%	0%	0%	1400%	667%	15%	0%	-23%

Figure 13: ICE traffic

Starting from the total the new platform must manage the traffic given by the sum of S1+S2.

As mentioned before users have access to this platform this means that in the future the users that will access are users of S1 + users of S2. The platform must bear a certain number of users at the same time without deceleration of performances or service unavailable. The number of the user depends on the solution chosen, given the fact that the use of intercompany payment hub reduces the number of users in ICE.

In the meantime, we are trying to find different solutions to implement in the whole company the business started a revision of the process this implies a new reorganization of the users equal to a certain number u3<u1+u2, u3 is the final number of users that will lead to a better performance of the platform and to economize on the costs of the licenses.

Below there is an example of the as-is situation for the two companies.

Company 1:

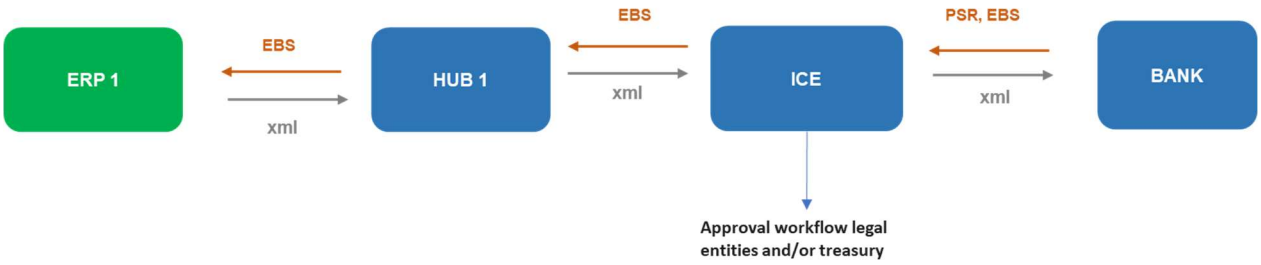


Figure 14: AS IS situation for company 1

The first company sends the files to a hub that will only collect them in the hub is not possible to do any operations, for this reasons ICE has more users than the ICE of company 2.

Company 2:

Figure 15: AS IS situation for company 2

This choice was applied long time ago due to the fact it provides a standard solution for all the entities within the company 2. In the intercompany payment hub, there are several users that unlock the payments, in this way the number of the licensed acquired for ICE is significantly reduced.

After the analysis the ICT team provided two different solutions, at this point the work of the ICT team has been completed since they cannot make the decision. The different scenarios will be presented to the group treasurer highlighting the advantages and disadvantages of the two solutions.

Whenever he will make the decision then the ICT team will implement the solution chosen.

In the two following images there are the two solutions:

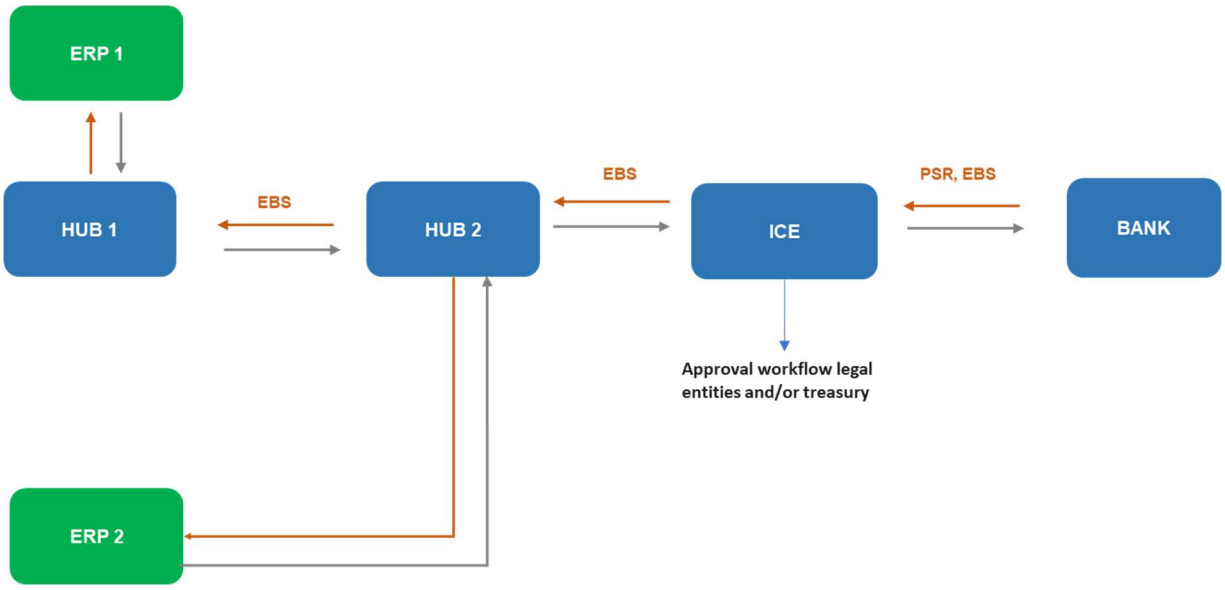


Figure 16: Scenario1

In the first scenario the ERP 1 includes all the ERP used in the first company, the ERP 2 includes all the ERP used in the second company. Like the AS-IS situation the ERP 1 will send the file to the usual HUB and then it will send to another hub that will also collect all the files coming from the ERP 2. The remaining part is the same already applied in the treasury.

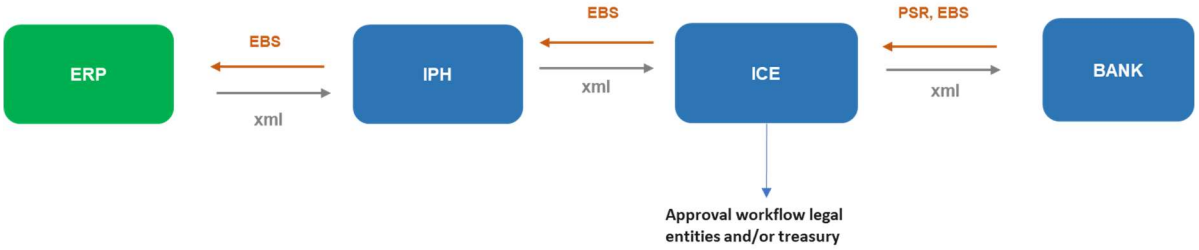


Figure 17: Scenario 2

In the second scenario the ERP includes both the ERP of the first and the second company, it creates the file and then it will be sent to the Intercompany payment hub. This solution as mentioned before is the one that is currently applied in the second company.

Each scenario has a quotation attached this will be another criteria that the group treasurer will evaluate before making the decision.

2.7 Atom's convergence

This platform was used in one of the two treasury hubs, due to the convergence of the companies it has been decided that also the other treasury must use this platform called Atom.

This decision has been made analyzing the situation present in the other hub: the application used as Treasury Management System was old, it needed an upgrade that of course has to be paid, it had high operative cost furthermore it has a lot of functions that the cash management have not been exploited during the years because there was unnecessary for the daily activities. Whereas the TMS used in the other hub had already had an upgrade, it could handle the volumes of both hubs, so this is how the decision was made.

Atom is a treasury management system; it is a specialized software solution that oversee and manage an organization's financial operations. These systems centralize information and processes related to liquidity, funding, and risk management.[26]

This project was divided in two waves the first one related to the European legal entities that operate in P.I.N.O. whereas the second regarded the Italian ones that work in P.O.B.O C.O.B.O.

The main goals of this software are: cash reconciliation and financial operations.

Before doing cash reconciliation the workers have inserted the forecasts of payments and collections foreseen explained in the previous chapter.

To do cash reconciliation the cash management area use the bank statement received from the bank.

The part related to the financial operation is more complex since it is the core of the treasury.

The objective of the treasury is to mitigate the exchange rate all the times that within the treasury there are currencies different from the base currency.

Derivatives are financial contracts whose value is linked to the value of an underlying asset such as raw materials, money in different currencies and so on.

[26] https://www.atlar.com/learn/what-is-a-treasury-management-system-tms

They are complex financial instruments that are used for various purposes, including speculation, hedging and getting access to additional assets or markets.

The derivatives can be done also for the raw materials in this case they are called commodities this happens when you have a surplus of copper, and you look for a financial product to cover the oscillation value of that raw material.

The derivatives could be:

- Spot it is a transaction which is done immediately.
- Forward it is a binding contract between two parties to exchange one currency into another currency at an agreed rate at a specific time in the future.
- Swap it is an agreement to simultaneously borrow one currency and lend another at an initial date, then exchanging the amounts at maturity[27].

To explain the lifecycle of derivatives it's possible to use an example. At a certain moment a company notices that it needs 100 k$ because it must do an urgent payment to a supplier. It sends via email a request to the treasury company which in turn uses the TRI platform to find the best exchange rate on the market to have the money. It is possible to compare the TRI platform to Trivago it gives you a list of the bank that are able to do the money you asked ranked by exchange rate, on this platform you complete the procedure like you book a hotel in Trivago. At this point front office decides a bank and both parties stipulates a formal agreement.

In the meantime, the deal has been created and there is the mirroring of the deal you have a deal with the bank but you have also a deal with the company that needed the 100 K$.

The deal agreed with the bank reaches Atom platform where it will be approved, and it will be created a MT300. MT300 will reach ICE that sends it to the bank.

The bank controls it and it generates another MT300. From ICE it will reach AMI, this platform matches the deal received by Atom and the deal sent back from the bank. If they perfectly match it will be generated an ACK otherwise a nack and it will be created a MT101 that will reach ATOM, then ICE.

And finally, the bank that it generates another MT101.

[27] https://startingfinance.com/guide/tassi-di-cambio-principiante/le-operazioni-spot-forward-e-i-derivati-nelforex/#:~:text=Le%20transazioni%20spot%20permettono%20di,scambiare%20le%20valute%20in%20futuro.

After all the exchanges of files the bank will send money to the central treasury that in turns will send to the entity applying a small spread.

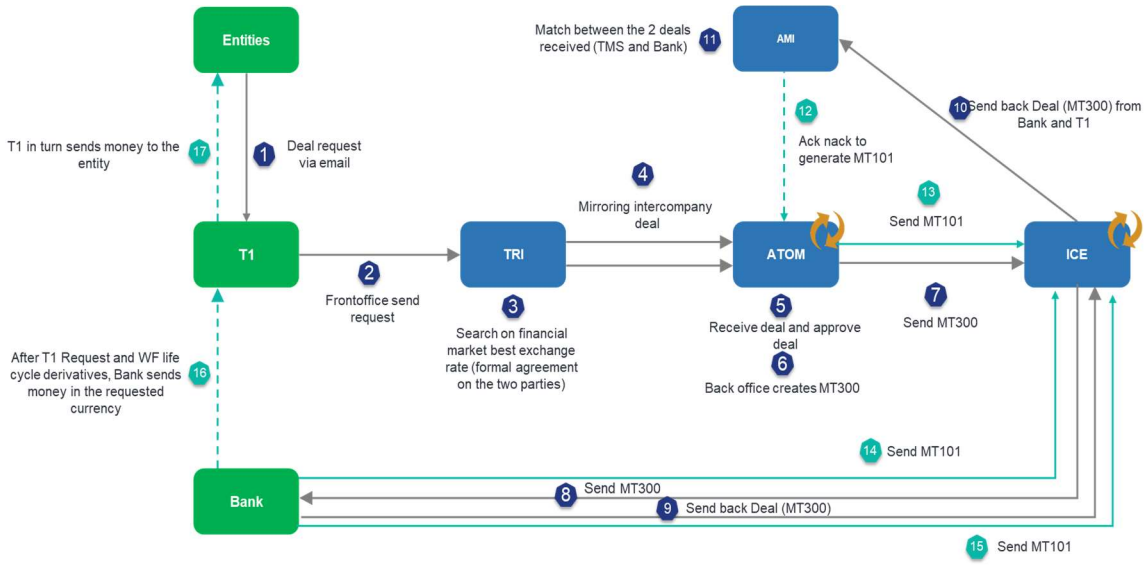


Figure 18: Lifecycle of a derivative

As already explained this company has more than one treasury hubs to better manage the organization and to handle in a better way the risk.

Another operation that has been done during the convergence to Atom it was to move all the financial operations to the other treasury placed in a non-European country. To do this it has been necessary to do an operation called novation. Novation implies replacing an obligation to perform with another obligation or adding an obligation to perform or replacing a party to an agreement with a new party[28]. In this case the old party was replaced by the other treasury.

[28] https://corporatefinanceinstitute.com/resources/valuation/novation/

2.8 Considerations about the projects managed in these years

Here below there is a summary related to the projects discussed above:

Projects	Scheduled duration	Actual duration	Delta time	Budget cost	Actual cost	Delta cost	Status
CBILL	4 m	4 m	0	50 K€	50 K€	0	closed
ON BOARDING LEGAL ENTITIES	5 m	7 m	0	160 K€	160 K€	0	closed
ICE UPGRADE	12 m	/		1.2 M€	0		open
ATOM'S CONVERGENCE	18 m	20 m	2 m	800 K€	680 K€	120 K€	closed

Table 3: Overview of projects

Looking at the first row of the table there is the CBILL project whose status is completed however after the go live the business noticed that the application BELATE work different than what they expected. They found out that there are some CBILL files that contain more than one files however the application is able to read only the file present in the first page and it rejects the other pages. Furthermore, when they want to change the date in all the CBILLs they have to change it one by one this requires a lot of time. These are only two examples of additional requirements that the business would like to have.

To meet the business needs ICT Treasury has prepared a file with all the new requirements and it was setup a call to discuss with the supplier however being the project finish these needs will be considered as an evolution of the actual project.

After the call the supplier will have to do an analysis and then it will come back to us with an estimation.

At this point the ICT Treasury will evaluate the estimation however the budget allocated for this project has already been consumed this means that it will be difficult to allocate more money for this project nevertheless they can talk with their boss to try to obtain additional funds.
In the meantime, they will create a priority list to associate to each requirement and they will choose only the critical needs to implement to avoid asking too much money.
Once a decision will be taken ICT Treasury Project Manager will talk with the supplier that will start the new implementations.
To sum up even if the project was in a closed status it didn't meet the need of the business so it is necessary to open it again and it will require at least other two months to complete it.

The second project had a delay of two months due to budget reduction this imply a longer analysis with the aim of funding an automatized solution with a lower cost in addition the defer was related to the communication with the business that has slow down the conclusion of the analysis.

ICE upgrade is an open task up to now the analysis has been concluded it has lasted more than what it has been expected this will have consequences on the duration of the project and probably also on the budget that was scheduled. So far the project is in a freeze status since we are waiting for the decision of the global treasurer.

The last project discussed was Atom Convergence this project had a delay of two months nevertheless the actual cost was lower than the budget cost this was possible thank to the exploitation of external teams of AMS team that have lower cost than the provider teams of the application.

3. Management of Sox Control

3.1 Sox control

During 2000s in USA there were different corporate and accounting scandals. Enron and WorldCom are only two examples that it is possible to quote: both changed the results of their companies to look better. To make people believe their sales were growing they exploited these actions:

- acquisition of new companies
- the use of reserves to increase the company's income.
- Mark-to-market accounting is a system through which the company accounts unrealized future gains into current income statements, therefore this let people believe that the profits are higher than the actual ones.[29]
- It has been coined a term "prepaid capacity," company accountants have been required to book certain costs as capital expenses, instead of as operating expenses. Capital expenses are for assets and can be expanded over a long period that can last years, whereas operating expenses must be recognized when they arise. This lead to results that showed a robust, profitable company[30]
- The lack of evidence to support certain financial transactions

After these scandals the government decided to enact a law that try to protect the shareholders. This law is called Sarbanes-Oxley this name derives from the people that proposed this law. The objective is to ensure transparency, integrity and accountability in financial reporting.[31]

The SOX controls are mandatory for companies that treat a huge amount of data:

- Societies that audit other societies

[29] https://www.britannica.com/event/Enron-scandal

[30]https://sc.edu/about/offices_and_divisions/audit_and_advisory_services/about/news/2021/worldcom_scandal.php

[31] https://www.upguard.com/blog/sox-compliance#:~:text=The%20stated%20goal%20of%20SOX,the%20accuracy%20of%20financial%20information.

- public companies registered with the U.S. Securities and Exchange Commission (SEC).
- foreign companies listed in US stock exchanges

Even if societies do not belong to the list above it is useful to follow sox principles since it helps bypassing frauds, improve governance and avoid violations[32].

The SOX law is not the only one there is also a similar one for Japanese publicly listed companies called JSOX.

This company is quoted on different markets one of which is the New York Stock Exchange, so it is obliged to adhere to the Sox regulation.

[32] https://www.ibm.com/topics/sox-compliance

3.1.1 How to perform Sox controls

All the Sox controls are collected in a platform in which a username and a password are used to enter in the first page it is possible to find all the control assigned to that person, in this platform you can upload all the files required by the auditor and once you have completed you can close that task. Whenever the auditor notice that there are some lacks or something that is not clear he will ask more evidences or he will setup a call.
Every year before executing the Sox Control it is necessary to review several documents in which there are all the instructions to follow to do a control. While inspecting it, it is possible to observe that a process has changed with respect to the previous year. In this case it is necessary to update the document thus the auditors will know how the process worked this year otherwise they can ask evidences that we are not able to provide because of the changes[33].
All SOX controls have a thing in common: a due date. If you don't respect it an issue can be opened and the company risks not being in the US market anymore.

In the following pages there are list of controls performed by the ICT Treasury area those are controls related to the application they used to manage the treasury other types of controls related to financial reporting are in charge of the cash management team.

[33] https://sarbanes-oxley-act.com/

3.1.2 User access revalidation

Once at year it is executed a control called user access revalidation. This control aims at certify that in each platform are presented only the users that are appointed to do a certain role.

To do this control it is necessary to download the list of the users of each platform and associate with a person who will approve this person usually the person is the manager. Below you find the table that it is needed to fill in:

RevID	delegatesIDs	userToRevalidate	userDetails	Permission	PermissionDescription
A1234	C5678	A1267	Consultant 1	AUTO	AUTO - LL
A1234	C5678	A1268	Giuliana Bianchi	TREASURER	TREASURER -LI
A1234	C5678	A1269	Alessandro Grande	READER	READER - LI
B9876	D3456	A1270	Paolo Rotellino	TREASURER	TREASURER -LL
B9876	D3456	A1271	Claudia Carli	READER	READER- LI
B9876	D3456	A1272	Enrico Pepe	TREASURER	TREASURER- LL

Table 4: File for UAR

In the first column it is necessary to report the name of the approver, in the second the name of a delegate in case the approver is not available, in the third the users to revalidate one approver can approve more than one users, in the fourth the name and surname of the users if there is written consultant this is not a real name but it indicated a user used by the provider of the application. This user is used in case there are bugs, changes requests to implement and so on. The last two columns regard the permission of the users.

It seems an easy task to complete however from the application it is not possible to download a file like that so you can download the list of users but the approver has to be appointed one by one since this a complex company you don't know by hearts who is the manager of the users so you have to look up for them. Once the file has been filled it has to be uploaded in a tool in which it begins the UAR process. This process lasts seven weeks, in the first four weeks the approver will access to the tool to approve the users, block them if there are users who must not be there, ask for a change in case the permission is wrong or the user needs another kind of permission.

If within the four weeks the approver does not approve the users there is a rule called silence denial and this imply that the users will be deleted. After these four weeks the other weeks are useful in case it is necessary to do some changes otherwise we can consider closed the UAR.

This process will be reviewed by the auditors even if this process is completed it is necessary to give the auditors the evidence of the UAR namely the user list before UAR and after UAR in addition they also need a guide in which it is explained the entire process of the UAR.

3.1.3 User termination

The user termination is another kind of control that must be done once a month.
From the intranet portal it is necessary to download a list of people who left the company then it is necessary to download the list of users of the application. In the end it is necessary to do a comparison if in the application it is present a person who has already left the company it is mandatory to deactivate this user always to ensure transparency. At this point for some applications, it is necessary to give the evidence to the auditors for others the auditors will select some random months, and you have to provide him the evidences requested.

3.1.4 User provisioning

There are two different types related to this control. The first one is a general one in which the auditors demand an extraction of all users from the first day of the year till the date requested specifically they need:

- name and surname
- user ID
- date of creation
- date of modification
- profiles of the users (role)
- status of the user (enabled or disabled)
- deactivation date if the user is disabled

All the data above collected in an excel file.

They also need the timestamped to demonstrate how they obtained the data above:

- the system from which the data is extracted
- filters applied to generate the list, and the query used
- total number of occurrences as shown in the system before extraction the first lines of the list as shown in the system before extraction
- the last lines of the list as shown in the system before extraction

In the second type the auditor will upload a file with some random users of which he needs the person who request a creation or modification of access, the person who has validated this operation and the person who physically implement this action in the system.
For the first request usually there is an email in which these implementations are required, for the second it depends on the system it can be via email or it can be used a form in which you fil all the fields and then it has to be signed based on three levels workflow. Regarding the last request there are different AMS teams allocated to do this job.

3.1.5 Performance acceptance test

Like the user provisioning this test is of two types one general and the other based on random changes picked up by the auditors. The goal is to certify that no matter what change has been requested everything must be traced with a date of deployment, an identification of the change and the system/DB impacted.

3.1.6 Report controls

Another category of SOX Controls is the one related to report in every application used there are a huge amount certainly the auditors won't ask all of them otherwise it would be impossible for them to check all the evidences. They will focus only on the reports that reports sensible information.

For those they will ask:

- the entire report usually in xls format
- all the steps required to extract the report (collect print screens in word file)
- printscreen of the first lines
- print screen of the last lines
- last modification date of the report
- personal information about the person who performed the edits

The auditors change every year it means the auditors of the previous year do a KT (knowledge transfer) to the new auditors; this change complicates the requests about the SOX control.

The controls to be executed are the same every year they only have to be updated based on the date however given the fact that the auditors change, it is likely that the auditors are not satisfied with the evidence provided and they ask for meetings to deep dive and obtain the reports they required. As a consequence, it takes time to lot of people to participate in these calls time that they don't dedicate to other projects. For this reason this is workload must be taken into consideration whenever you allocate people to do AMS in addition it is also necessary a person that is in charge to collect all this controls, check them and send to the auditors. This person will be the referent person for the auditors.

All the controls discussed above do not require specific knowledge, apart from the knowledge related to the applications in which extract the evidences, however they take a lot of time. For this reason it is necessary to allocate the resources in a way they will be able to do the daily activities furthermore have enough time to perform the control.

Usually during the summer is the period in which there is the peak of the controls and all the resources already allocated are not enough to confront all these controls in these cases additional resources are allocated to do these activities however they need a knowledge transfer and this imply time to transfer it. In order to try to optimise the time at disposal to close the control, some of them will be moved from the AMS team to the PMOs that have access to the application and they will guarantee the closure of some controls.

Conclusion

Working in a complex environment enables you to deal with several kind of people such as technicians, business, suppliers, architects and so on in this way you can develop different skills based on the listener you have in front of you.

Working in a treasury is very challenging since when you imagine how the payment workflow is you don't figure out that is so complex. Around a single payment there are so many applications involved that you have to work years to understand everything and probably is not enough.

Reorganise two companies that merged is quite challenging. They worked in two completely different ways and no one wanted to change since they worked in the same manner for decades. In addition, everyone keeps secrets, nobody wants to help the other to understand the way it worked this has complicated all the projects of convergence because you do these projects like you take a leap into the dark. Nevertheless, we managed several projects but some of them in delay in respect of the scheduling.

To sum up: keep secrets only damaged our company not competitors, it makes us weak and not able to respond to market changes.

Change must be part of our life without it you can't improve, increase, grow as a company and above all inspire people changing their way of reasoning.

I hope that what I have taken during my journey in ICT Treasury area could have developed their creativity and widen their view.

I can consider this experience bittersweet: it let grow my career giving me more and more responsibility however the lesson learned is that it is difficult to promote efficient solutions if they are costly, they will be discharged in favor of cheaper ones no matter how hard you work on them. Nevertheless, I suppose that in most companies the goal is solve problem at the minimum cost.

Looking back at the past I would have behave differently in some projects. For example in the CBILL project discussed in chapter two it would have been necessary to collect better the requirements I talked with some users but they didn't represent the whole population and this lead to an application that lacked some functionalities.

From this journey I have the possibility to work in a complex organization, to know how a treasury work, how to work in a team that will help each other to reach the objectives.

I have benn lucky to find a boss who even if he has many projects to follow, he always dedicate time to explain this complicate “world” called ICT Treasury.

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