1. **ORGANIZATIONAL MODEL:**

WATER company

maintenance office

call center

maintenance team

USERS

1. **FUNCTIONAL MODEL (CRASO, PROCESS TABLE, UML PROCESS):**

**N.B Vedere se bisogna farlo per AS IS o TO BE**

**CRASO:**

|  |  |  |
| --- | --- | --- |
| REQUEST | CUSTOMER | OUTPUT |
| maintenance | user | Maintenance report |

**PROCESS TABLE:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NAME | INPUT | OUTPUT | DESCRIPTION | OU INVOLVED |
| Intervention needed | User calls  alarm signal  programmed intervention | Work order generated | User calls maintenance office through the call center or an alarm signaled a malfunction or there is a programmed intervention scheduled and then the maintenance office generates a work order. | User, call center, maintenance office |
| Work order implememtation | Maintenance office generates work order | Maintenance report | The work order is generated by the maintenance office and allocated to a maintenance team that produces a report at the end of the task. | Maintenance office, maintenance team |

**UML PROCESS:**

Immagine che contiene diagramma, testo, linea, Piano

Descrizione generata automaticamente

**BPMN:**

Intervention needed:

Immagine che contiene diagramma, Disegno tecnico, Piano, schizzo

Descrizione generata automaticamente

Work order implememtation:

Immagine che contiene testo, diagramma, schermata, Rettangolo

Descrizione generata automaticamente

1. **IT/TECNOLOGICAL MODEL (DEPLOYMENT UML, BUSINESS RULE):**

**DEPLOYMENT UML:**

Immagine che contiene diagramma, testo, linea, Piano

Descrizione generata automaticamente

**BUSINESS RULE:**

Daily task have to be assigned respecting the priority (the ones with higher priority come first).

Cost of repair must be <= 50% of element cost

1. **DEFINE KPIs:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CSF  Name | KPI  Category | KPI  Name | KPI Description | Unit of measure |
|  | General | **N\_** reports | Number of reports generated by WATER |  |
| CSF1 | Service | **LT\_**work\_order | Lead time to implement a work order (from receiving work order to completing report) | t |
| CSF2 | Efficency | **C\_**task | Cost of computing work order and of the implementation of the task (repair/substitution) | euro |
| CSF1 | Quality | **Q** | N\_non\_conform\_interventions/N\_interventions  N\_bad\_reports/N\_reports | % |

1. **COMPARE** the previous and the current situation, using the KPIs defined above:

|  |  |  |
| --- | --- | --- |
| KPI | AS IS | TO BE |
| Types |  |  |
| **N\_** reports | Number of reports generated by WATER | No change |
| **LT\_**work\_order | Time to allocate work order to a team  Time to receive the printed documentation  Time to receive the printed description  Time to write the report on paper  Time to deliver the report to the maintenance office | Decreases times for allocation, documentation and description (received on digital device)  Decreases time to send report (entered on the device) |
| **C\_**task | Manual allocation of work order to a team  Physycally deliver the report to the office | Automated allocation of wo to a team  Automated delivering of the report |
| **Q** | Manual writing of report  Manual entrance of report on IT Application | Same  Automated entrance of report on IT Application (decreases errors) |

***PATTERN***

Prendere ogni **KPI** definite e descrivere a cosa fanno riferimento in **AS IS** e nella colonna successiva, per ogni cosa scritta, dobbiamo dire COME cambia nel **TO BE**

1. Considering the WATER company and the infrastructure it has to build or acquire for the TO BE, define the **SOFTWARE** **FUNCTIONS** needed:

|  |  |
| --- | --- |
| **PROCESS/ACTIVITY** | **SOFTWARE FUNCTION(S) NEEDED** |
| Receiving work order | Send work order (web server)  Receive work order (application on device) |
| Accessing documentation | write documentation (web server)  visualize documentation (application on device) |
| Collect and store reports | Send reports (application on device)  Receive reports (server) |

***PATTERN***

Leggiamo dal testo I processi/attività in cui sono convolti dei **SW** e spieghiamo a cosa servono quei SW sia per la parte di **DEVICE (application**) sia per la parte di **SERVER (server)**

1. Considering the comparison in point 5, summarize **pros and cons for the actors in the TO BE situation** (add actors if needed):

|  |  |  |
| --- | --- | --- |
|  | **PROS** | **CONS** |
| WATER | Increases the efficiency in assigning and completing wo 🡪 increases number of operations per day  Decreases errors in storing reports | Need to spend money for digital services and applications |
| Maintenance team | Decreases time to receive documentation  Simple receiving of wo  Simple delivering of report | Need to spend money for digital services and applications |

***PATTERN***

In riferimento al confronto fatto tra AS IS e TO BE per le KPIs, **PER OGNI ENTITA’** scritta nella lista di organizational chart (punto 1, comprende sia organizzazioni che persone), analizziamo **PRO e CONTRO del TO BE**.

* **CONTRO:** sempre costo per acquistare device/SW
* **PRO:** i pro scritti nella comparison delle KPIs spiegati

1. Define the **TCO** for the WATER to shift to the TO BE situation:

|  |  |  |
| --- | --- | --- |
| **PHASE** | **COSTS** | **CAPEX or OPEX** |
| Construction selection | Acquisition of devices  Acquisition of SIMs  Integration with existing IT Application  Development of SW functions | capex |
| Deployment | Installing apps on devices  Training employees | capex |
| Operation | Costs to send/receive data  Electricity | opex |
| Maintenance | Device maintenance  Server maintenance  Application bug fixes | opex |
| Dismissal | Dismiss devices  Data migration | opex |

***PATTERN***

**Capital expenditures (CAPEX)** are a company's major, long-term expenses (construction/selection,deployment) while **operating expenses (OPEX)** are a company's day-to-day expenses (operation,maintenance,dismissal).

**Operation:** azioni giornaliere e costi giornalieri banali

**Dismissal:** dismiss dei device + data migration

**Deployment:** inizializzazione

1. Considering a 5 years period, define costs and savings (**ROI analysis**) by adopting the TO BE situation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year/Cost or Saving** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| Cost | Construction, selection, deployment costs | Maintenance, operations cost | Maintenance, operations cost | Maintenance, operations cost | Maintenance, operations cost |
| Saving | No errors during reports delivery  More efficiency (wo per day) | No errors during reports delivery  More efficiency (wo per day) | No errors during reports delivery  More efficiency (wo per day) | No errors during reports delivery  More efficiency (wo per day) | No errors during reports delivery  More efficiency (wo per day) |

***PATTERN***

**Il primo anno** ci sono i **costi** di Construction, selection e deployment, i **successivi** ci sono i costi di maintenance e operation.

I **savings** sono sempre gli stessi.

1. What do you estimate? Will break even happen or not? Motivate your answer

Break even: i savings raggiungono i costi

Cost of device: 400

Savings: 10minutes per wo (more efficiency), assuming a pay of 20$/hr we need 20hr of savings -> 120 wo

If we consider 1 wo per day -> after 120 days we break even

Cost of IT Application: 50K

Assuming 300 wo per team and 25 teams, each team has to save 2K.

120 are needed to break even the device, so 180 wo are left 🡪 1800 minutes saved 🡪 30hr 🡪 600 $ saved in 1 year for each team. We have to reach 2K so they are needed slightly more than 3 years of savings (2K/600=3.3)

1. Assume that WATER decides to outsource maintenance of the network. So now company MAINT is in charge of all maintenance work. Propose a few SLAs to monitor the outsourced maintenance.

The SLAs are:

Cost (C\_task), Flexibility, Response time(LT\_work\_order), Availability

1. What are the main concepts of ‘Agency theory’?

This theory helps to resolves the issues between the principals (owners) and the agents (employees).

There are different agency costs:

Bonding

Monitoring

Residual loss

1. What has been the effect of the wider adoption of IT on agency costs?

It decreases agency costs in particular monitoring because the IT Application and the devices automated all the process of assigning work orders and writing/sending tasks.

1. Mention one cognitive bias and explain how it can affect decisions

An example is confirmation bias in which who talks gives only the convenient informations to motivate his decision, without the all context.

Another is anchoring in which the first part of information affects the final aoutcome.

Another example is Authority bias in which the same information is more trusted if it is said by an authority person than a non-authority one.

**OUTSOURCING**:

9 A large service company selects these options for their IS. The company buys for every employee a laptop connected to the internet. A data server is bought and installed on premise. A data server (hw) and the related sw is bought and installed on premise. An ERP / CRM product from an external provider is used as a service, but data is on the owned database. Frame this case in terms of the outsourcing dimensions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object | **Activity/Service** | **Unicity** | **Location** |  |
| Laptop, hw server | IT Infrastracture | Not unique | On premise/on site | Insourced (owned) |
| Sw server | Application | Not unique | Off site | Insourced (ownded) |
| ERP / CRM | Application | Not uniquw | Off site | Outsourced |

***PATTERN***

In **Object** mettiamo il *prodotto* in questione, in **Activity/service** mettiamo *IT* *Infrastracture* se si tratta di HW, *Application* se si tratta di SW, in **Unicity** mettiamo se è unico o no e in **Location** mettiamo *in* *site* (se si trova dentro l’organizzazione) o *off* *site* (fuori dall’organizzazione) infine diciamo se è Outsourced (proviene da un’azienda esterna) o Insourced (di proprietà dell’organizzazione).