# Automation and profitability

You email your internet provider because the router has stopped working. Two minutes later an answer arrives: it has understood the problem, it has opened a ticket with the right technician, and it suggests restarting the router while you wait. Did a person read your email? Probably not.

Somebody decided to pay for that system. Not because it is modern, but because it saves hours of work, and those hours cost money. In September 2026, Telefónica announced that Meliá's technical support, which includes 37 hotels in the Balearic Islands, handles around 240,000 requests a year and already automates more than 70% of them. Today you learn to ask the question every company asks before it buys AI: **does it pay?** And you will answer it with numbers, in a spreadsheet.

**What you will learn**

- Tell apart three steps of automation: manual, by **rules** and with **AI**
- Tell **automating** a task from **optimising** it, and name the number that shows the improvement
- Find and cite a real AI use in a Balearic company, separating what the source says from your **hypothesis**
- Explain the chain from **data** to money, and why **big data** matters
- Build a **profitability** estimate in a spreadsheet: savings, net benefit, **payback period** and **ROI**
- Avoid the trap of the day: an AI project that saves 800 euros and costs 1,000 is not innovation, it is a loss

## Three steps of automation

> **Automation** is doing a task with less human work. **Optimisation** is doing it **better**: the best price, the best route, the best moment.

| Step | How it works | Example: a company's technical support |
|---|---|---|
| **Manual** | A person does every step | A technician reads every support email and forwards it to the right person |
| **By rules** (scripts, **RPA**) | A program repeats fixed steps defined by people. Works when the input is always the same | If the subject contains "invoice", the email goes to accounts |
| **With AI** | A model handles variable, unstructured input (free text, images, voice), predicts and proposes decisions | A model understands what the email is about, classifies it, estimates its urgency and drafts a reply |

> **RPA** (*robotic process automation*) is software that copies the clicks and keystrokes a person would make, following fixed rules.

AI does not replace rules; it covers the cases rules cannot reach. In the city-builder game, a timer on each traffic light is a rule; the advisor that watches the traffic overlay and changes the timings is AI.

### Where companies use it

| Use | What AI does | The number that shows the improvement |
|---|---|---|
| Classification and extraction | Reads invoices, emails or forms and pulls out the data | Time per document; typing errors |
| Customer service | Answers frequent questions and passes the rest to a person | Response time; questions solved without a person |
| **Demand forecasting** | Estimates sales, occupancy, consumption or workload | Forecast error; leftover stock or staff |
| Dynamic pricing | Adjusts the price to the predicted demand | Revenue per unit sold |
| **Predictive maintenance** | Spots signs of a breakdown in sensor data (the OT side) before it happens | Hours of unplanned downtime |
| Routes and planning | Calculates more efficient routes or shifts | Kilometres, fuel, hours |

## From data to money

Without data there is no AI, and with bad data the AI decides badly: garbage in, garbage out. When the data are huge, varied and arrive fast, we call it **big data**: too much for a spreadsheet, so it needs the cloud from Unit 3 and specific tools. You will study it in Unit 5.

AI can make a company more profitable in three ways: **more revenue** (sell more, or better), **lower costs** (time, errors, energy) and **lower risk** (fraud, breakdowns, fines). But it also costs: collecting and cleaning the data, the cloud service, setting it up and connecting it to existing systems, maintaining the model, and the people who supervise it.

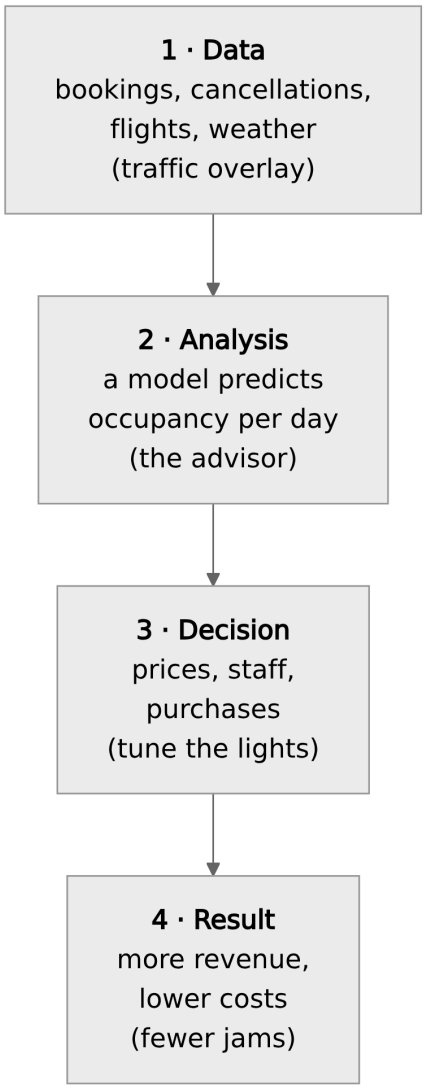
> **Return on investment (ROI)** = (what you gain – what it cost) / what it cost. The **payback period** is how many months it takes to recover the initial investment.

> **Careful: “it saves time, so it pays”**
> Saved hours are only real savings if those people spend them on other valuable work. And every mistake the model makes costs a person’s time to fix. A profitability estimate that ignores supervision and errors is too optimistic.

## In class: a real Balearic case

In pairs. The question: *which company or organisation operating in the Balearic Islands uses AI, or automatic forecasting, in a real process, what exactly does it do, and how do we know?* Pick one starting point, or find a case from your own company’s sector.

| Sector | Starting point | What to find |
|---|---|---|
| **Tourism** | Telefónica’s press release about Meliá (10 September 2026), on telefonica.com | How many Balearic hotels are in the deal, how many support requests a year, what share is automated, and what AI does |
| **Energy** | Red Eléctrica: “Real-time electricity demand in the Balearic Islands”, on ree.es | The three curves (actual, forecast and scheduled). How does REE say it calcu- |




| Sector | Starting point | What to find |
|---|---|---|
| | | lates the forecast? Is that AI, statistics, or can we not tell? |
| **Ports and transport** | The innovation news of Ports de Balears (portsdebalears.com), or EMT Palma / TIB | One concrete digitalisation or AI project, with a date. If there is no AI, say so |

For your case write: company and sector; the process; what the AI or the model does; the number the source gives; the full citation (title, website, date, link); and one line that separates **what the source says** from **what is your hypothesis**.

> **Does the source say "AI"?**
> Red Eléctrica explains that its forecast is built from consumption in similar past periods, corrected for working days, weather and economic activity. It does not say it is AI. Saying "REE uses AI" would be your guess, not a fact. That distinction is exactly what the project asks of you.

## In class: does it pay?

In pairs, in Google Sheets (or LibreOffice Calc). The figures are **invented for the exercise**.

A small software company in Mallorca receives **400 support tickets a month**. Each ticket takes a technician **15 minutes** on average, and an hour of a technician costs the company **€20**. They want an AI cloud service that classifies tickets and drafts a reply; they estimate the time would drop to **9 minutes** per ticket. The service costs **€300 a month**, and setting it up (integration and preparing the data) costs **€2,000** once.

**Step 1 —** Build the sheet with **formulas**, not with results typed by hand. Use only operators (`*`, `/`, `-`), because function names change with the language of the spreadsheet.

| Row | A (concept) | B (value or formula) | You should see |
|---|---|---|---|
| 2 | Tickets per month | 400 | |
| 3 | Minutes per ticket now | 15 | |
| 4 | Minutes per ticket with AI | 9 | |
| 5 | Cost of one technician hour (€) | 20 | |
| 6 | AI service (€ per month) | 300 | |
| 7 | Set-up (€, once) | 2000 | |
| 9 | Hours saved per month | `=B2*(B3-B4)/60` | 40 |
| 10 | Savings per month (€) | `=B9*B5` | 800 |
| 11 | Net benefit per month (€) | `=B10-B6` | 500 |
| 12 | Payback period (months) | `=B7/B11` | 4 |
| 13 | Net benefit, first year (€) | `=B11*12-B7` | 4,000 |
| 14 | ROI, first year | `=B13/(B6*12+B7)` | 0.71 (71%) |

**Step 2 — Sensitivity.** Suppose one reply in ten has to be rewritten, and the real time with AI is **11 minutes**. Change only `B4`. What happens to the payback period?

**Step 3 — Your process.** Duplicate the tab and model a process of your project company: the one from your Teachable Machine idea, or the Balearic case you found. Every number that does not come from a source goes in a cell with the word **hypothesis** in column C.

**Hand in on Classroom** (in pairs, "S17 · A real case and a sheet that pays", by 23:59 the same day): the table of your real case with its citation, and the link to your spreadsheet (shared with the teacher, view only) with both tabs. **No generative AI** in this activity.

## For your project

This lesson feeds Deliverable 4 · AI plan:

| Today's work | Becomes | Criterion |
|---|---|---|
| The process in your second tab | Section A: processes to automate or optimise | a |
| The data that process needs, and your spreadsheet | Section B: data and profitability estimate | b |
| Your real Balearic case, cited | Section C: the AI landscape of the sector | d |

## Key takeaways

- Three steps: **manual**, by **rules** (scripts, **RPA**) and with **AI**, which handles variable, unstructured input.
- **Automating** means less human work; **optimising** means better decisions. Each improvement needs a number that measures it.
- The chain: **data → analysis → decision → result**. Without good data there is no useful AI; **big data** needs the cloud.
- **ROI** = (gain − cost) / cost; the **payback period** says when the investment is recovered. Supervision and errors are costs too.
- A source that says “forecast” is not a source that says “AI”. What you cannot cite is a **hypothesis**.

## Quick check

**1** What does AI add compared with automation by fixed rules?

**A** It is always cheaper
**B** It can handle variable and unstructured input, such as free text or images
**C** It needs no data
**D** It removes the need for any supervision

**2** A hotel uses a model’s demand forecast to adjust its room prices every day. Is it automating or optimising, and what number shows the improvement?

**A** Automating; the number of emails answered
**B** Optimising; the revenue per room
**C** Automating; the number of rooms in the hotel
**D** Neither; prices cannot be improved with data

**3** An AI tool costs €300 a month and saves €800 a month of work. Setting it up cost €2,000. When is the investment recovered?

**A** In 2.5 months
**B** In 4 months
**C** In 7 months
**D** Never

**4** In the support example, the real time with AI turns out to be 11 minutes instead of 9. What happens?

**A** Nothing: the saving is the same
**B** The monthly saving drops and the payback period roughly doubles
**C** The project becomes more profitable
**D** The ROI cannot be calculated any more

**5** Red Eléctrica’s website says the Balearic demand forecast is built from similar past periods, corrected for weather and working days. Your teammate writes “REE uses AI to forecast demand”. What is the right correction?

**A** It is fine: every forecast is AI
**B** Write what the source says, and if you think it may be AI, label it as a hypothesis
**C** Remove the case: forecasts are not part of RA4
**D** Replace the source with a chatbot’s answer

**6** Which two costs are often forgotten in an AI profitability estimate?

- **A** The time people spend checking and correcting the model's output
- **B** The colour of the dashboard
- **C** Preparing and cleaning the data the model needs
- **D** The number of letters in the company name

**7** A water company wants to know whether to buy a predictive maintenance system for its pumps. Which data would be essential?

- **A** The customers' favourite songs
- **B** The history of sensor readings from the pumps and the dates of past breakdowns
- **C** Only the price of the system
- **D** The company's social media followers

You can now say where AI helps a company and whether it pays. Last question of the unit: which sectors use it most, what is it built with, and what does it change for you? Next: Sectors, languages and software.

## Solutions

**1. B** · Rules work when the input is always the same. A model can deal with **free text, images or voice** and propose decisions, which is where rules stop working.

**2. B** · Choosing a **better** price is **optimisation**, and the indicator is the revenue per room. Automating would be doing the same task with less human work.

**3. B** · The net benefit is 800 − 300 = **€500** a month, and 2,000 / 500 = **4 months** of **payback period**.

**4. B** · With 11 minutes, 26.7 hours are saved (about €533), the net benefit falls to about €233 a month and the payback period grows to about **8.6 months**. Profitability is very **sensitive** to the real time of review.

**5. B** · The source describes a **forecast**, not AI. In the project, what a source says is a fact with a citation; what you deduce is a **hypothesis** and must be labelled.

**6. A, C** · **Supervision** and **data** are real costs. Leaving them out makes any AI project look more profitable than it is.

**7. B** · **Predictive maintenance** learns from the sensors (the OT side) and from past breakdowns, which are the labelled examples. Without that history, the model has nothing to learn from.