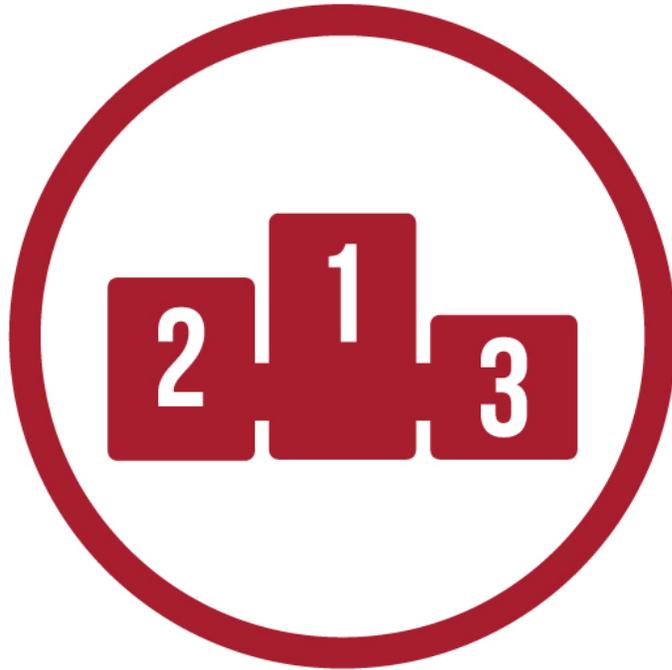


Process mining explained by an example

The logistics process at SmartCoat Inc.

What's on this week?



Benchmarking

What preceded ...



What preceded...



Marie, CEO of SmartCoat Inc., asked us to analyze and make recommendations for the logistics process via **process mining** and **data analytics** techniques ... Just by looking at the data in SmartCoat's ERP system!

In the third episode, Cédric verified whether the **checks** and **tests** Marie requires, have been performed correctly. Cédric gave feedback about some important process deviations.

Have you **missed** the **third episode**? Click on Marie ... and you will be redirected to the third episode!

Benchmarking



Cédric, your horsum guide



Cédric
Consultant

Hi, nice to see you again!

In the second episode, I showed you the content of the event log regarding the logistics process. I ensured that we can see **what** type of **activities** were performed, **when** the activities were performed, **by whom** and **where**.

I have also included the following information in the event log: the smartphone **brand**, the concerned **retailer** (customer) and the **function** of the resource (employee). We will use this information to do some **benchmarking** analysis.

Let me give a small recap on the next page!

Benchmarking



SmartCoat works with 3 **retailers** (customers): *Wallsmart*, *Callhouse* and *Phonemarket*. There are only 2 smartphone **brands**: *MePhone* and *Simsong*.

In addition to Marie, there are the **6 people** involved in the logistics process:



Alix
Coater



Edward
Test engineer



Elise
Test engineer



Tom
Warehouse
manager



Jerome
Warehouse
assistant

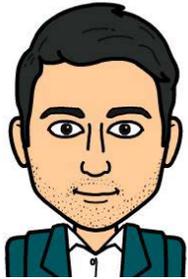


Arthur
Warehouse
assistant

To do the benchmarking analysis, I will work again with the process mining software Disco:

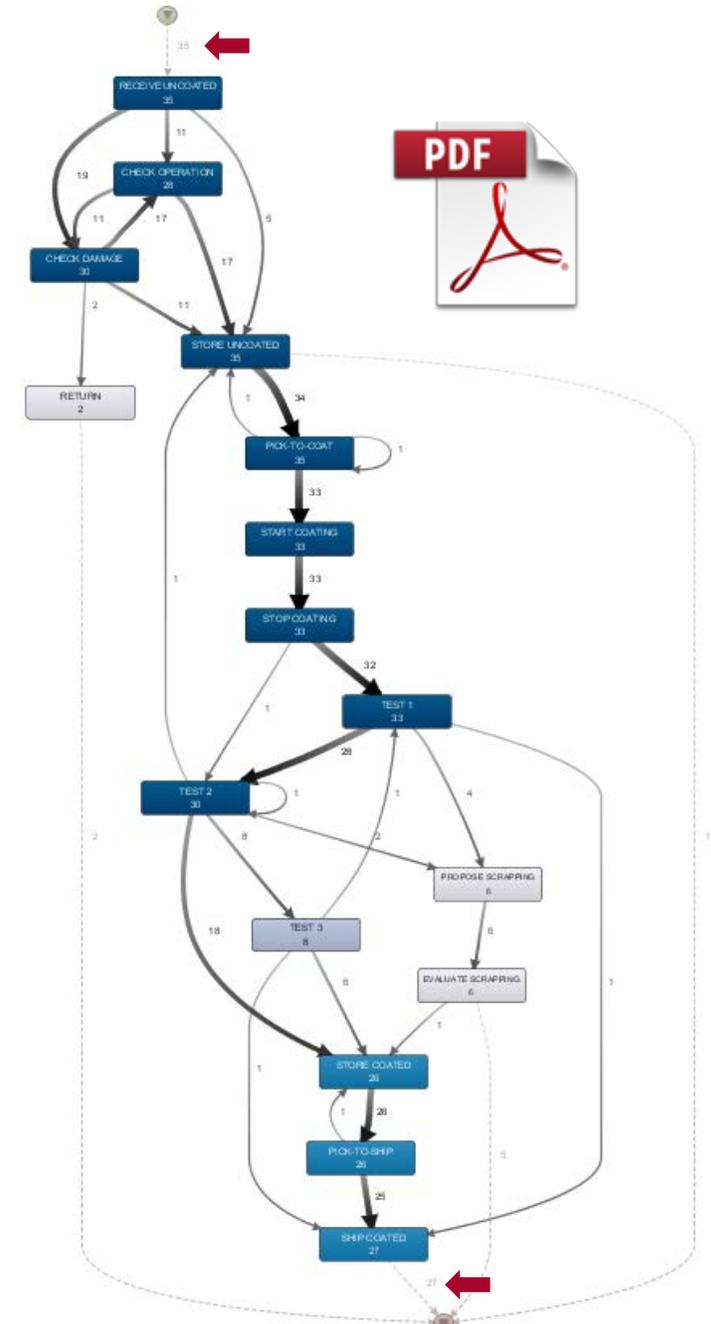


Benchmarking



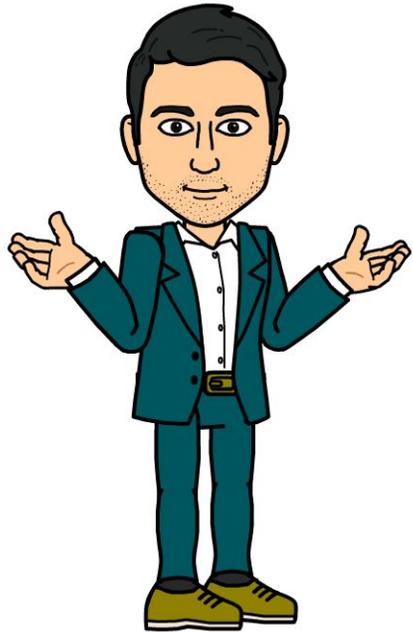
In the second episode, I also showed you the visual of the real process map. The process map is shown again on the right. Click on the PDF icon to zoom in on the visual.

As explained in the second episode, we immediately notice that the logistics process **starts** with **35 smartphones** and that **only 27 smartphones** are **finally shipped** to the retailer. The **key metrics** are shown below.



Event log analysis	Entire process map
Number of cases	35
Number of activities	16
Number of events	393
Number of “returns”	2
Number of “scrapping”	5
Number of “shipments”	27
Start	02.03.2016 08:10:00
End	31.03.2016 15:33:57
Median case duration	17 d
Mean case duration	16,5 d

Benchmarking

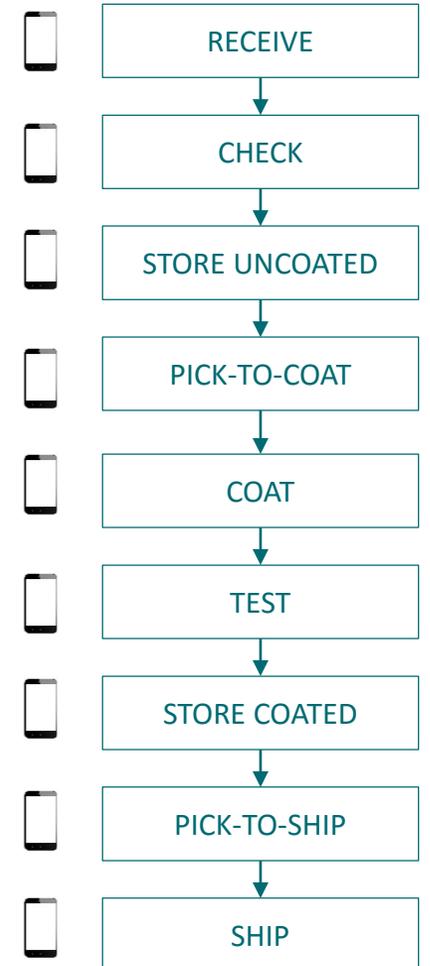


On the next slides, we will **divide** this process map down into **smaller pieces**. We will use the information such as brand, retailers and employees to do so. We will **benchmark** then the smaller pieces against each other.

Do you want to perform these analyses yourself?
No problem ... Please find the event log below:



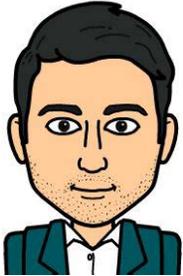
Event log
SmartCoat Inc.



Analysis



1. Retailer benchmarking

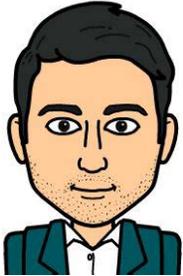


The process statistics per retailer are shown below. I immediately note that *Callhouse* is the largest customer (retailer) in terms of number of smartphones (cases). I also see that 10% of the received smartphones from *Callhouse* are returned. And finally, I note that the case duration for *Wallsmart* phones is a bit higher compared to *Callhouse* and *Phonemarket*.

Event log analysis	Entire process map	Wallsmart	Callhouse	Phonemarket
Number of cases	35*	9	20	6
Number of activities	16	15	15	14
Number of events	393	108	211	74
Number of "returns"	2 (5,7% of cases)	0 (0,0% of cases)	2 (10,0% of cases)	0 (0,0% of cases)
Number of "scrapping"	5 (14,3% of cases)	1 (11,1% of cases)	3 (15,0% of cases)	1 (16,7% of cases)
Number of "shipments"	27 (77,1% of cases)	8 (88,9% of cases)	14 (70,0% of cases)	5 (83,3% of cases)
Start	02.03.2016 08:10:00	02.03.2016 08:10:00	02.03.2016 11:32:00	02.03.2016 10:48:00
End	31.03.2016 15:33:57	31.03.2016 15:33:57	31.03.2016 14:59:49	29.03.2016 15:34:24
Median case duration	17 d	19,2 d	16,3 d	17,6 d
Mean case duration	16,5 d	18,5 d	15,3 d	17,4 d

* Note that the sum of the number of returns (#2), scrappings (#5) and shipments (#27) does not equal to the total number of cases (#35). Does this mean that a smartphone disappeared? The answer will be given in Episode 6: interactions.

2. Brand benchmarking



When I examine the process statistics per brand, I note that SmartCoat makes more *MePhones* waterproof than *Simsongs*. I also see that *MePhones* are relatively more often scrapped than *Simsongs* (17,4% versus 8,3%). Does this mean that the 'coating' process is more complex for *MePhones* and that as such more things can go wrong? Let's compare the 'coating' time for both brands on the following page.

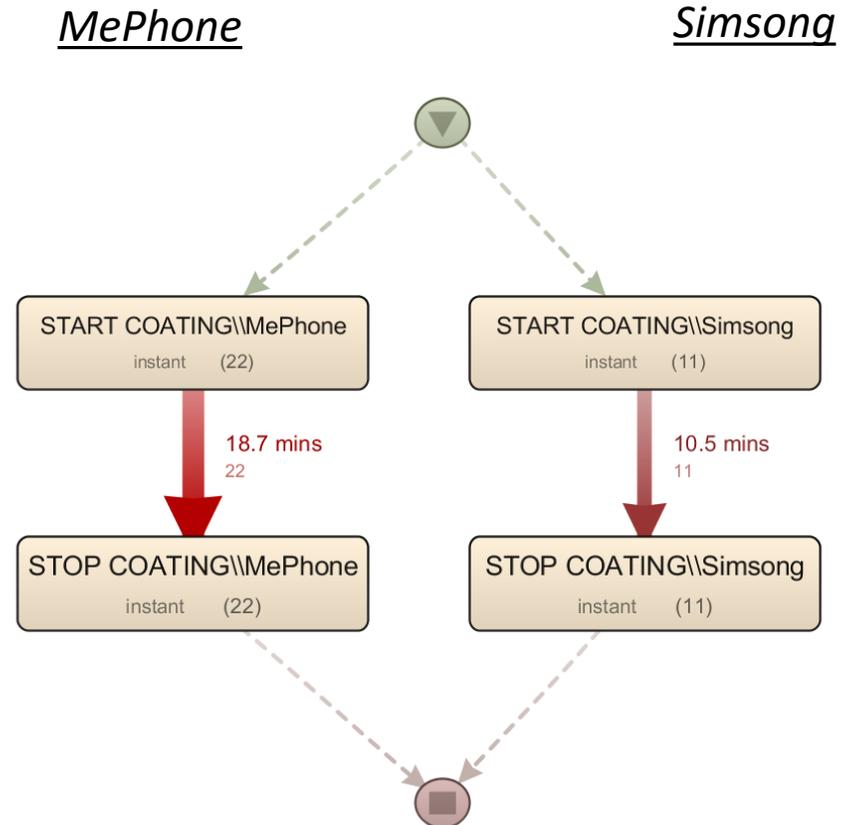
Event log analysis	Entire process map	MePhone	Simsong
Number of cases	35	23	12
Number of activities	16	16	15
Number of events	393	262	131
Number of "returns"	2 (5,7% of cases)	1 (4,3% of cases)	1 (8,3% of cases)
Number of "scrapping"	5 (14,3% of cases)	4 (17,4% of cases)	1 (8,3% of cases)
Number of "shipments"	27 (77,1% of cases)	18 (78,3% of cases)	9 (75,0% of cases)
Start	02.03.2016 08:10:00	02.03.2016 08:10:00	02.03.2016 10:48:00
End	31.03.2016 15:33:57	31.03.2016 15:33:57	29.03.2016 15:34:24
Median case duration	17 d	17,1 d	15,7 d
Mean case duration	16,5 d	17,1 d	15,3 d

2. Brand benchmarking



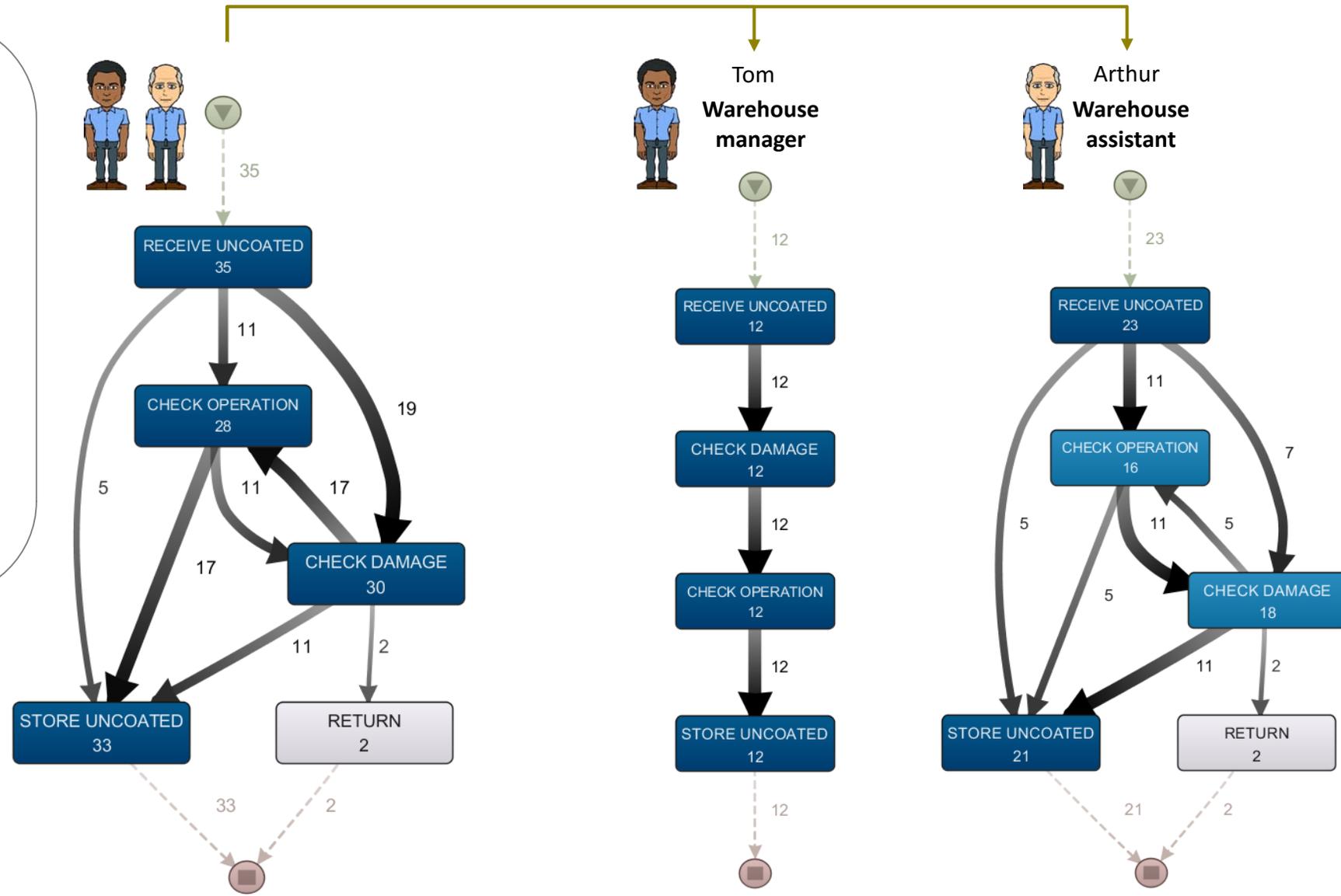
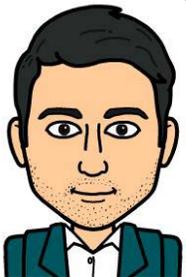
To analyze the 'coating' time, I only select the path between the steps 'Start coating' and 'Stop coating' in the process mining software for both *MePhone* and *Simsong*.

On the right, I see that the mean time to coat a *MePhone* almost takes twice the time to coat a *Simsong*. It might indicate that the coating process for *MePhones* is much more complex ... In Episode 7 'process costs', I will check whether this is properly included in the cost price calculation.



3. Employee benchmarking: inbound

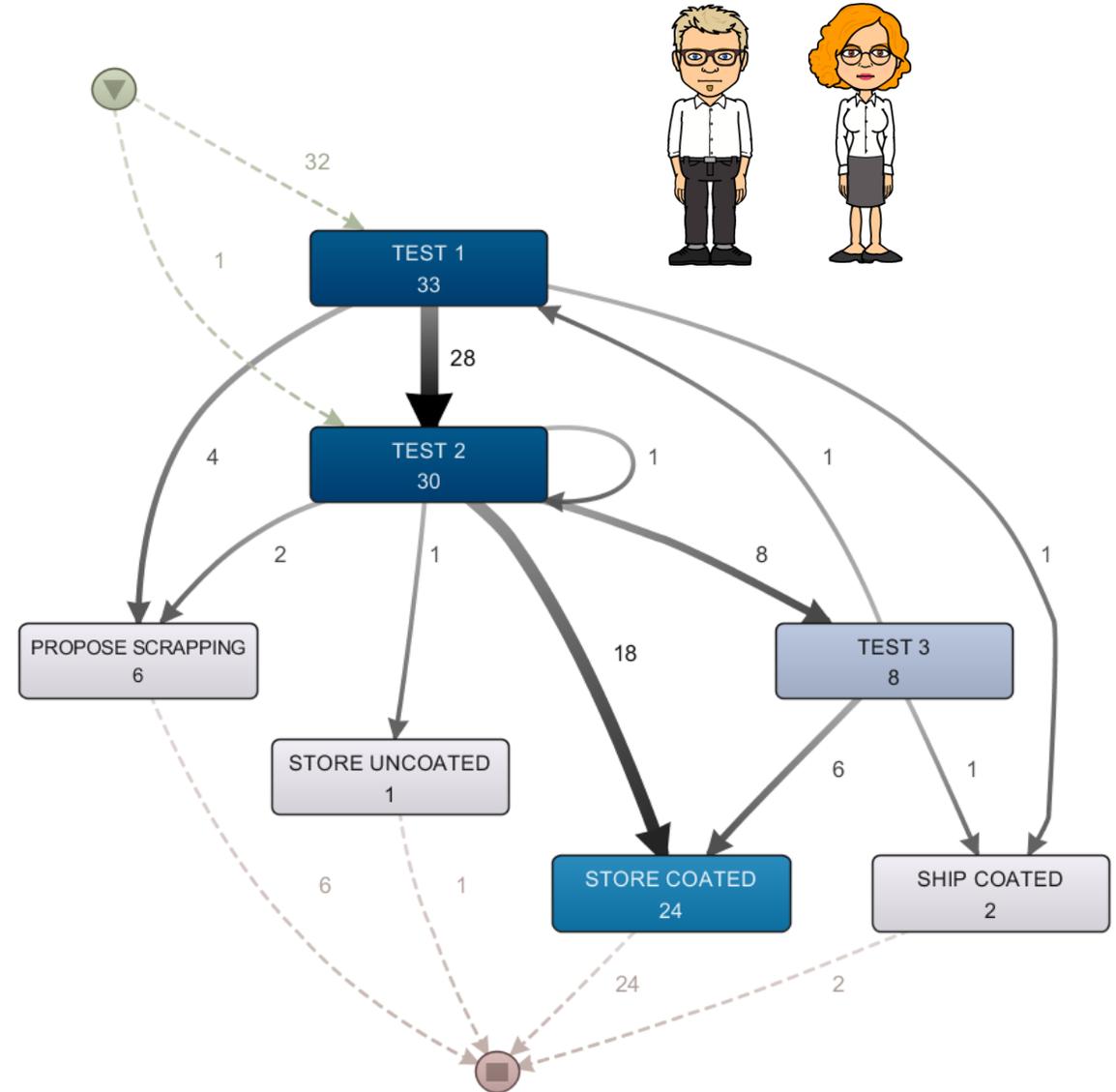
On the right, I note that *Tom* never forgets the inbound controls and that he performs them in a particular order: he first performs 'check damage' followed by 'check operation'. *Arthur* on the other hand sometimes forgets to perform the inbound controls. In addition, he performs the control in a random sequence. Let's ask Marie which order she prefers ...



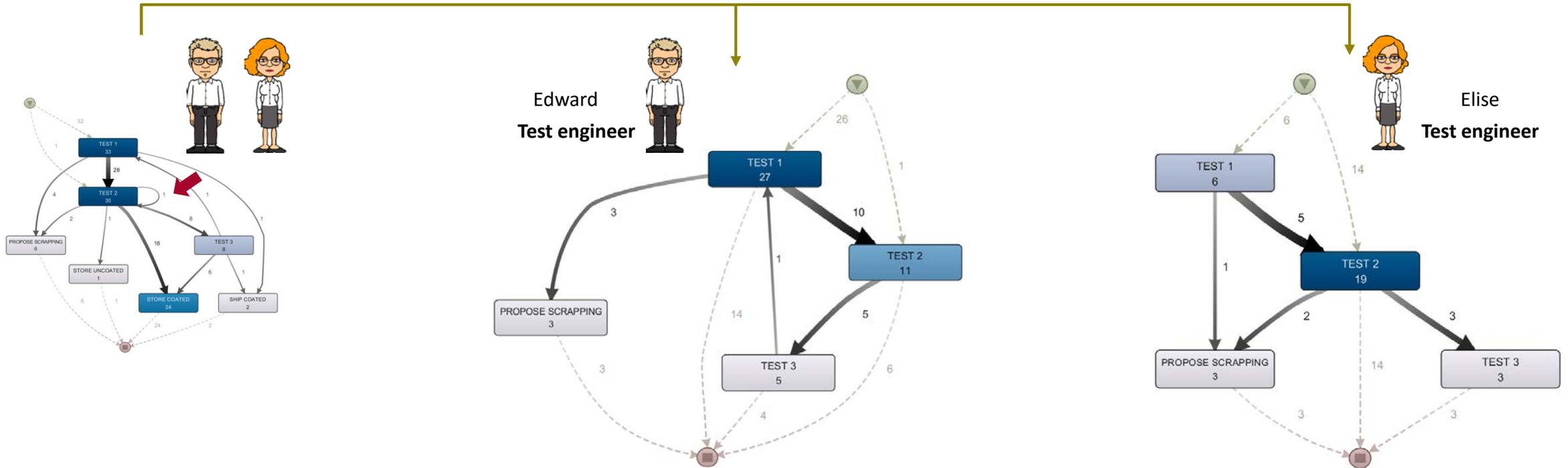
4. Employee benchmarking: testing and scrapping



The process map regarding the testing and scrapping is shown on the right. The tests ('test 1', 'test 2' and 'test 3') and the 'scrapping proposals' are done by *Edward* and *Elise*, the test engineers. On the next slide, we will divide the process map again into 2 pieces: the tests and proposals done by *Edward* and those done by *Elise*.

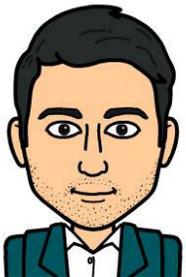


4. Employee benchmarking: testing and scrapping



In general, I note that *Edward* performs 'Test 1' more frequently, while *Elise* performs 'Test 2' more frequently. *Edward* proposes 3 scrappings over 43 tests (rate: 6,9%), while *Elise* proposes 3 scrappings over 28 tests (rate: 10,7%). Is this because *Elise* is only 'more severe' than *Edward*? I will ask Marie whether clear guidelines exist to propose scrapping.

In the third episode, I discovered that Phone 3666 is tested twice. This is shown by the loop for 'Test 2' on the process map **above left**. In the spit-up this loop is not visible, which means that phone 3666 has been tested once by *Edward* and once by *Elise*.



Feedback to Marie



Feedback



Hi Marie, I have performed some benchmark analyses this time: I benchmarked (1) the retailers, (2) the 2 smartphone brands, (3) the warehouse people responsible for the inbound activity and (4) the testing engineers.

I noted that most returns are related to retailer **Callhouse**. I realize that Callhouse is your largest customer... but compared to the other retailers, their **return rate** is **higher**. I suggest having a discussion with them in order to discuss how to reduce the return rate.

By benchmarking the brands, I noted that the **coating** for **MePhone** seems **more complex** than for Simsong. It takes more time to coat a MePhone and the scrapping rate is higher. Do you take this into account in your price setting?

Feedback



Last time, I told you that Arthur often forgets to do the **inbound checks**. I also noted now that, when he performs the checks, he is doing them in a random order ... while Tom always performs the damage check first, followed by the operation check. Does the **order** matter to you? If so, what's the reason why you prefer a certain sequence?

I also noted that **Elise** proposes relatively **more scrappings** than Edward ... Are there clear guidelines to propose scrappings? Or is Elise just more severe than Edward?

Do you also want to know **how** and **which**
bottlenecks Cédric will identify through **process**
mining ?



Watch the episode next week!

Planning

April 7th, 2016		Episode 1: introduction
April 14th, 2016		Episode 2: process discovery
April 21st, 2016		Episode 3: process deviations
April 28th, 2016		Episode 4: benchmarking
May 5th, 2016		Episode 5: bottlenecks
May 12th, 2016		Episode 6: interactions
May 19th, 2016		Episode 7: process costs
May 26th, 2016		Episode 8: prediction and real-time

Or check our website! www.horsum.be

Questions? **Contact us!**

Contact us!



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Processes, data, finance and business control

Result-driven, pragmatically and customized



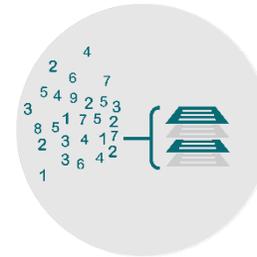
Process optimization



Financial projects



Internal audit



Data analytics



Process mining

