

Try Backlog Visualization to solve conflicts between predictability and incremental Product Development

Introduction & Experience Report,
LeSS Conference Berlin 2023
Frank Preiß BMW, Mark Bregenzer



Agenda

Introduction Backlog Visualization & Forecast Approach

Motivation, Foundation & Purpose

Useful Product Backlog Structure

Taking Queueing Theory Into Account

Helpful Product Backlog Visualizations

Experience Deep Dive at a BMW case

Q & A



A young child is shown in profile, wearing a dark flight suit with a striped shirt underneath and goggles on their forehead. They are looking out over a blurred landscape of hills and trees under a bright sky. A dark blue horizontal bar is positioned across the lower part of the image, containing white text.

Motivation, Foundation & Purpose

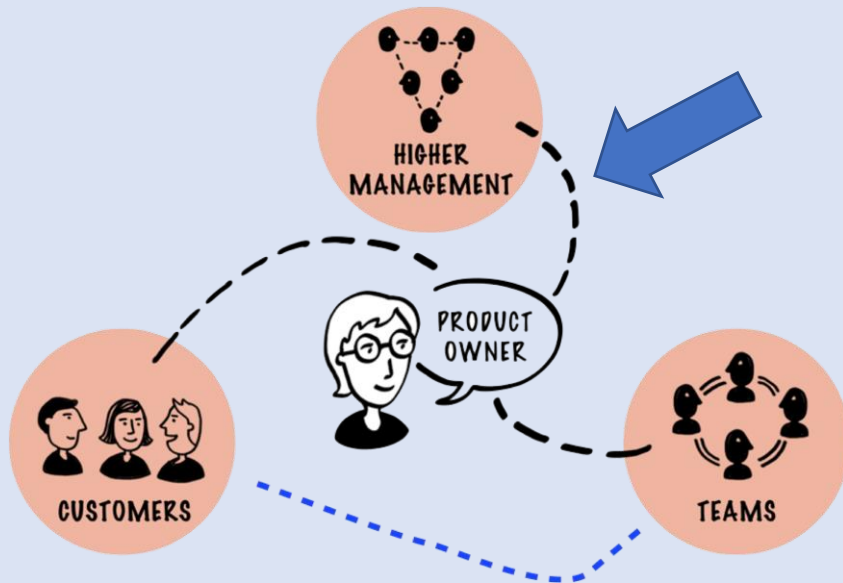
Key Challenge

A background image of the Golden Gate Bridge in San Francisco, with its iconic red-orange towers and suspension cables stretching across a blue sky and a hazy bay.

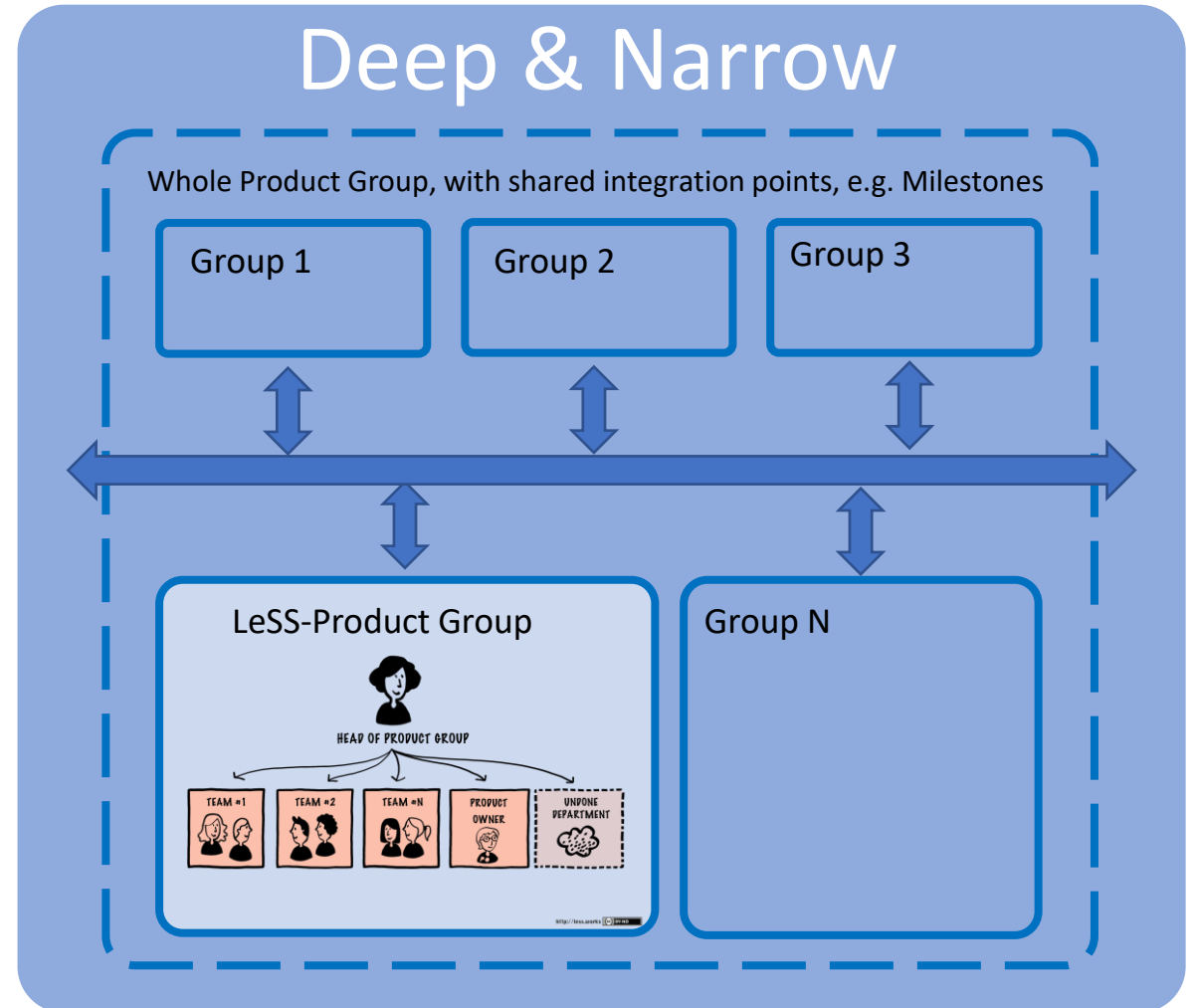
How to bridge the gap between predictability (Waterfall) and incremental product development (Agile)?

The Gap is the Product Owner Challenge

Fixed Price Mentality

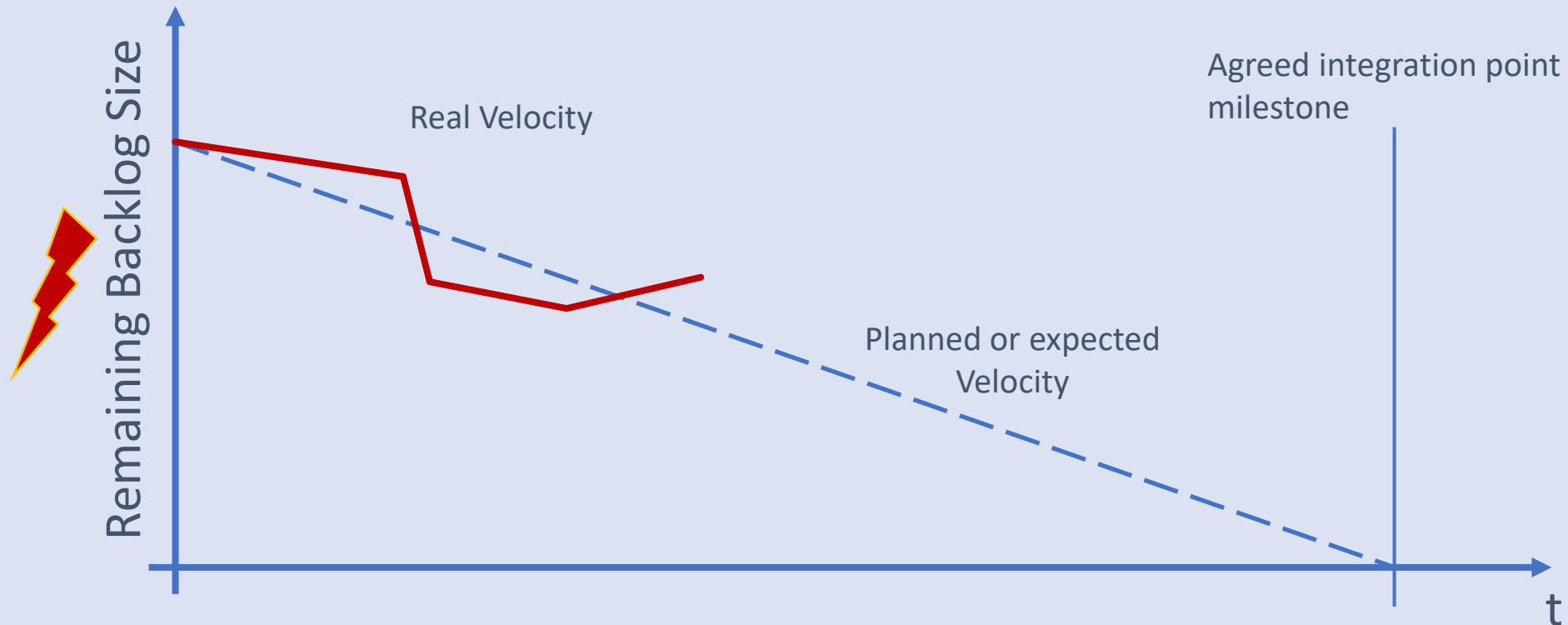


Deep & Narrow



Agile Metric for Deadlines

The Product Backlog Burndown Chart



The Crux

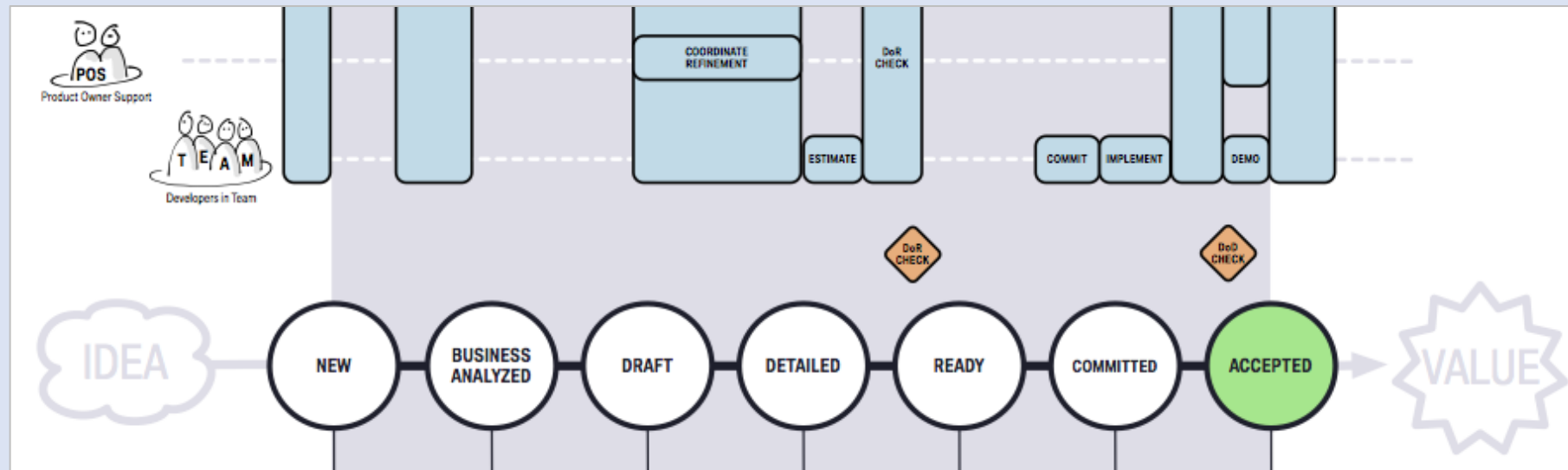
The background of the slide is a photograph of a person's hand placing a blue sticky note onto a wall. The wall is covered with various other sticky notes in different colors like red, yellow, and green. Some of the notes have handwritten text, including the letter 'L' and the number '15'. The overall scene suggests a collaborative workspace or a brainstorming session.

Estimating the remaining Product Backlog creates an upfront analysis phase before the implementation.

This is a sequential lifecycle and destroys any Agile approach.

Deadlines Depend on Velocity

An item's velocity, flow from idea to value creation, can be evaluated by a common status model.



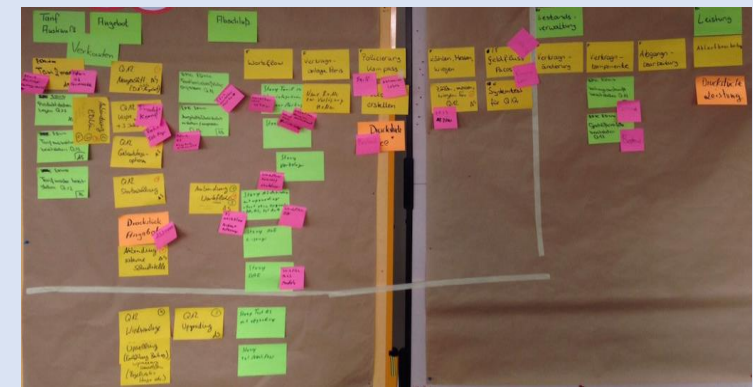
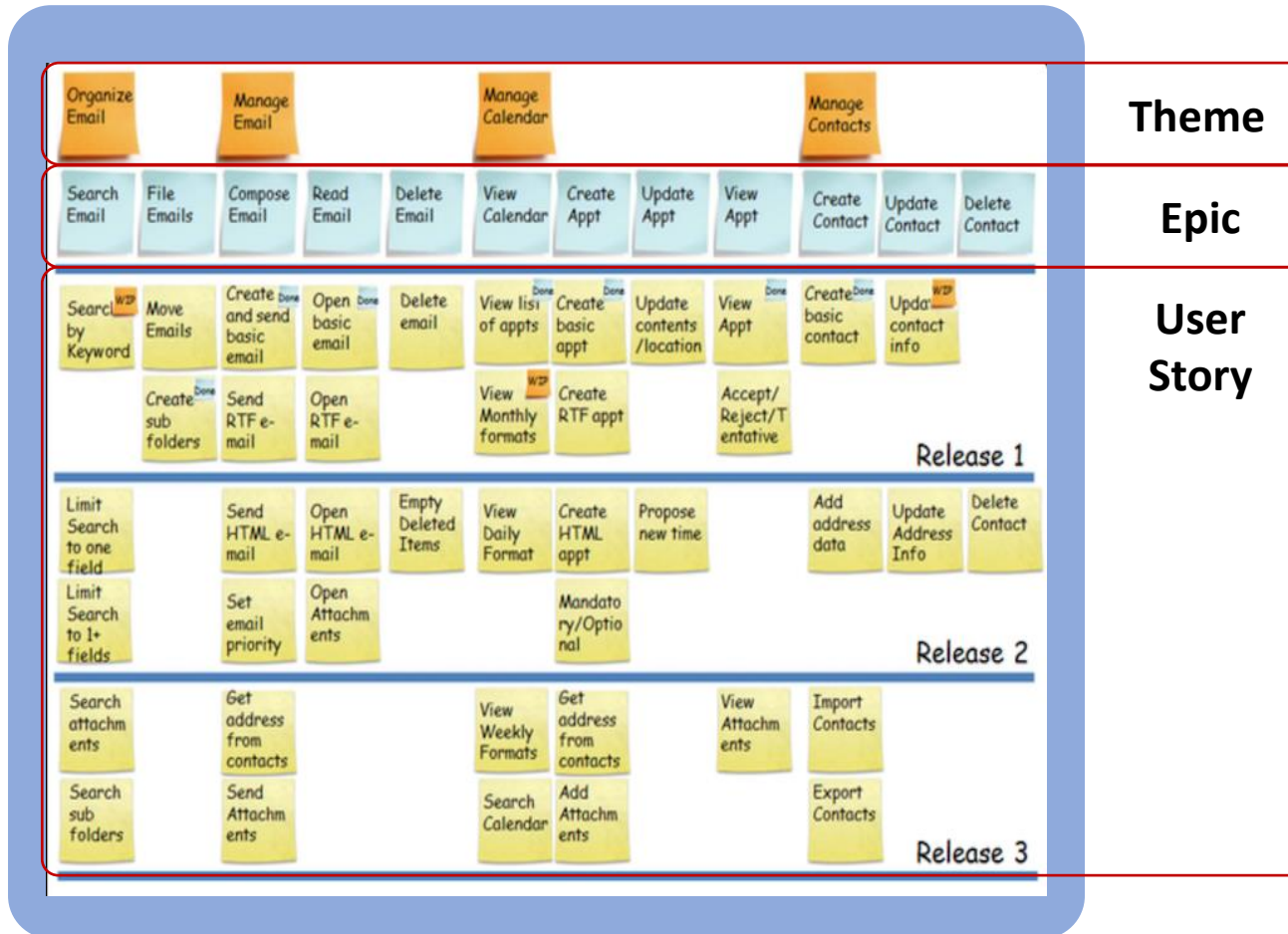
What is an Item?

An Item can be huge or tiny.
Therefore many organizations structure
their Product Backlog into layers.

The background of the slide is a light blue color with a subtle pattern of hexagons. Overlaid on this are several dark blue and black geometric and network-like diagrams. On the right side, there is a prominent circular structure with internal lines and dots, resembling a complex network or a molecular model. Other smaller, similar structures are scattered across the upper right and bottom right areas. The overall aesthetic is technical and modern.

Useful Product Backlog Structure

User Story, Epic Mapping

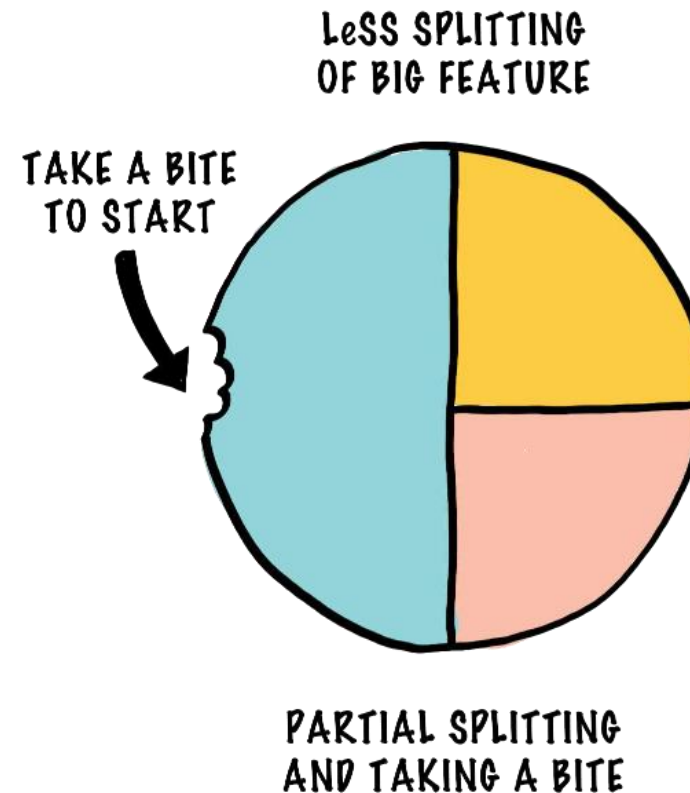


LeSS Recommendation Cell-based Splitting

Preferred flat Backlog hierarchy.

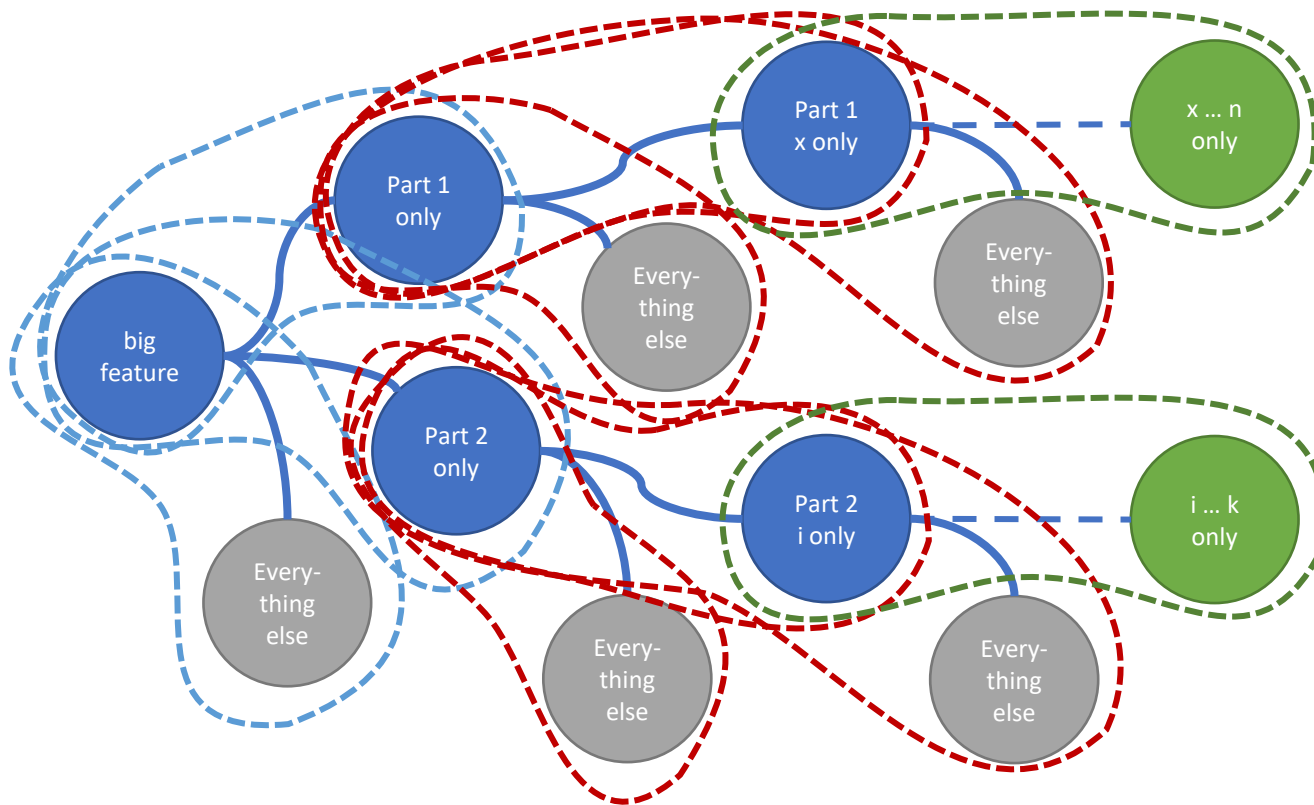
Still good, two layers of Backlog Items.

In exceptional cases (e.g. LeSS Huge), a maximum of three layers is acceptable.



From Cells to Product Backlog

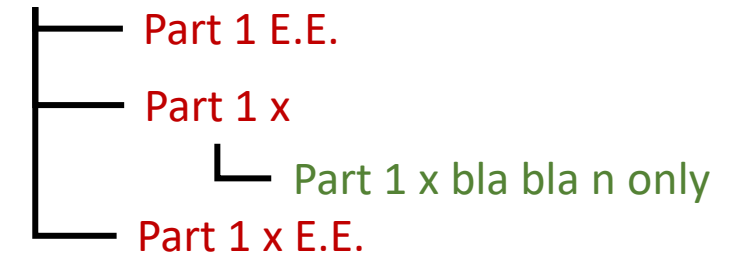
Refinement tree



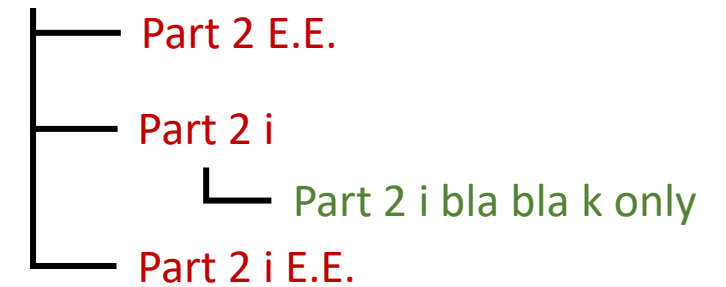
Product Backlog (example: three levels)

<Theme> <Epic> <Item>

bF Part 1



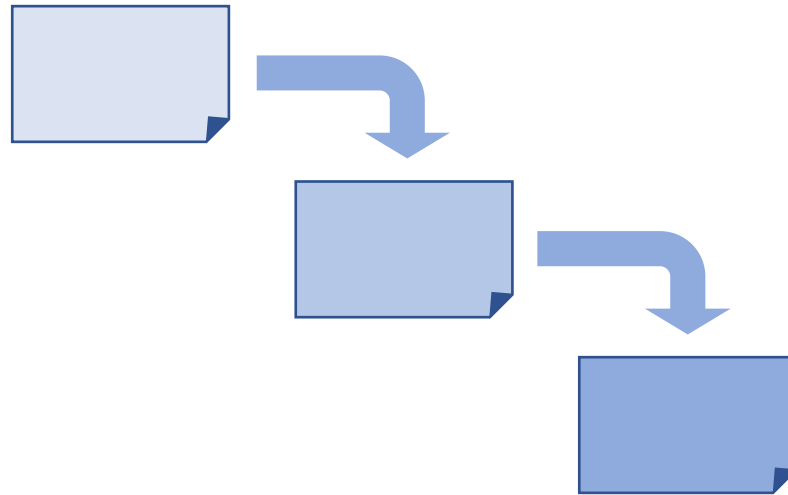
bF Part 2



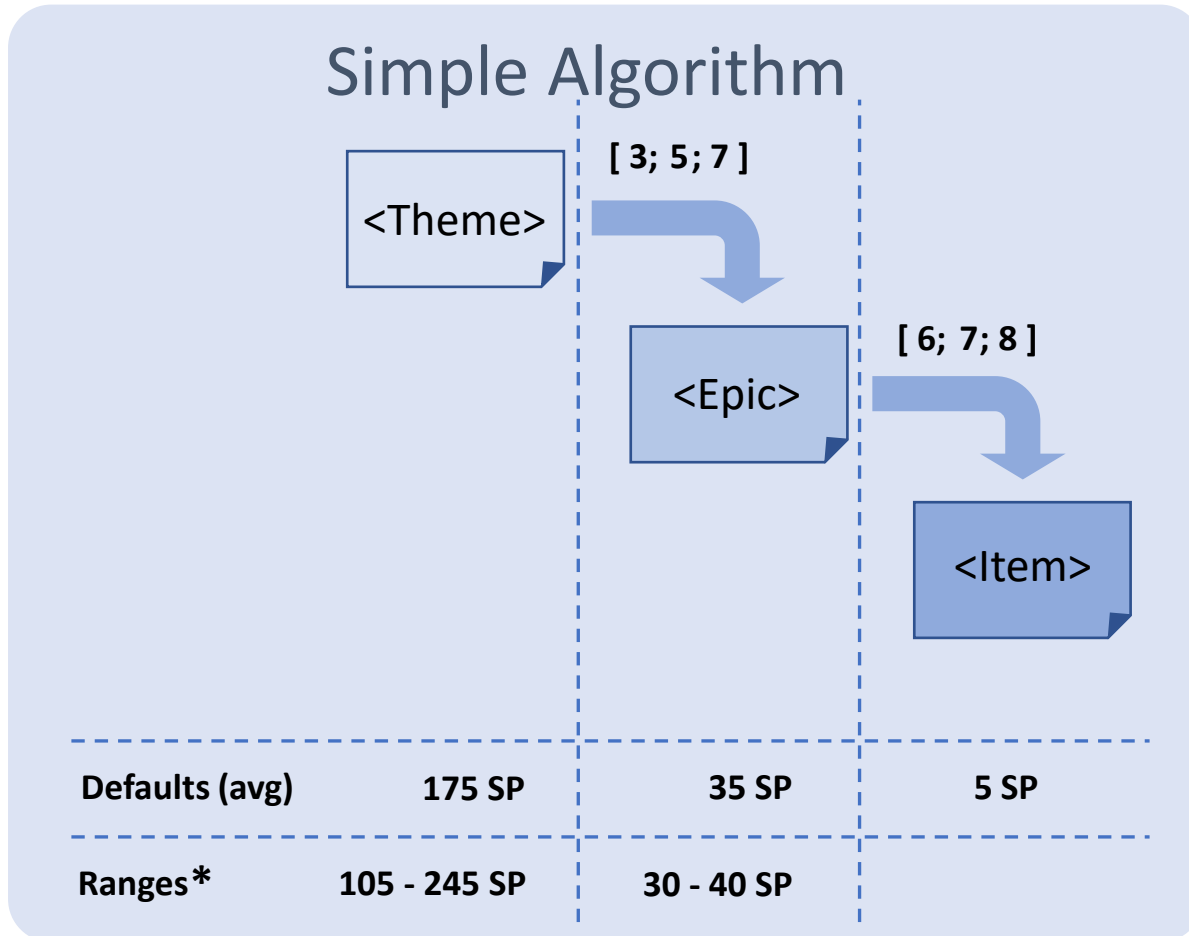
bF Part E.E.

Product Backlog Structure

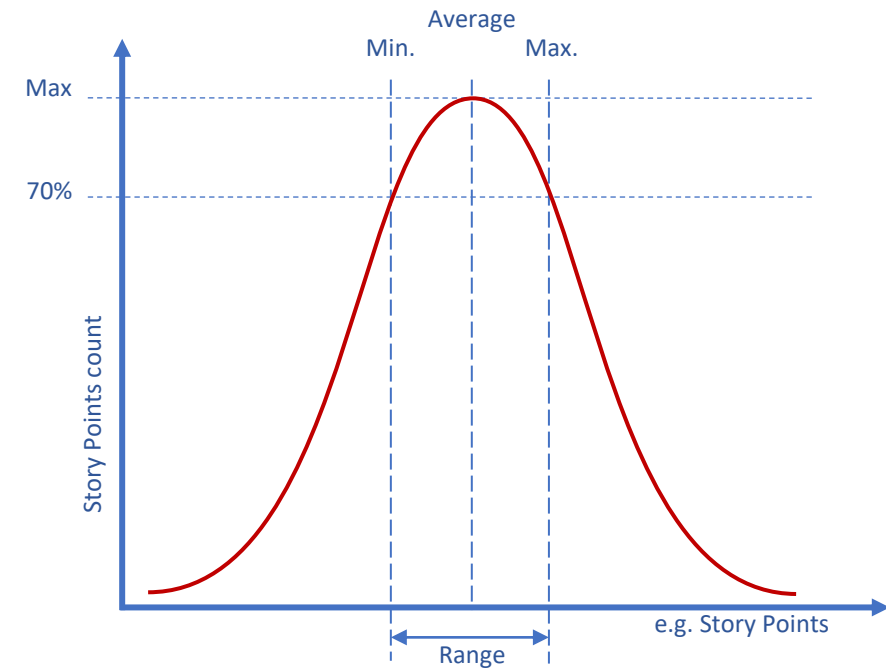
<Theme> <Epic> <Item>



The Statistical Approach



Standard Deviation



* This approach can produce a range of 5 to 500.000 Story Points with 70% accuracy. This is a correct forecast but useless!

A blurred photograph of four cyclists racing on a track, with a blue overlay at the bottom containing the title text.

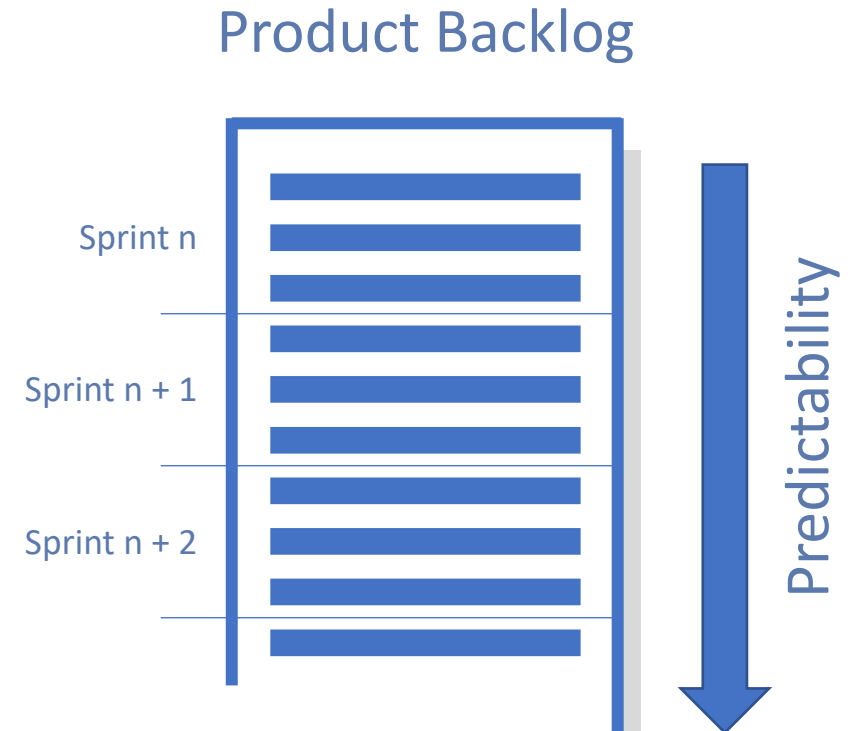
Taking Queueing Theory Into Account

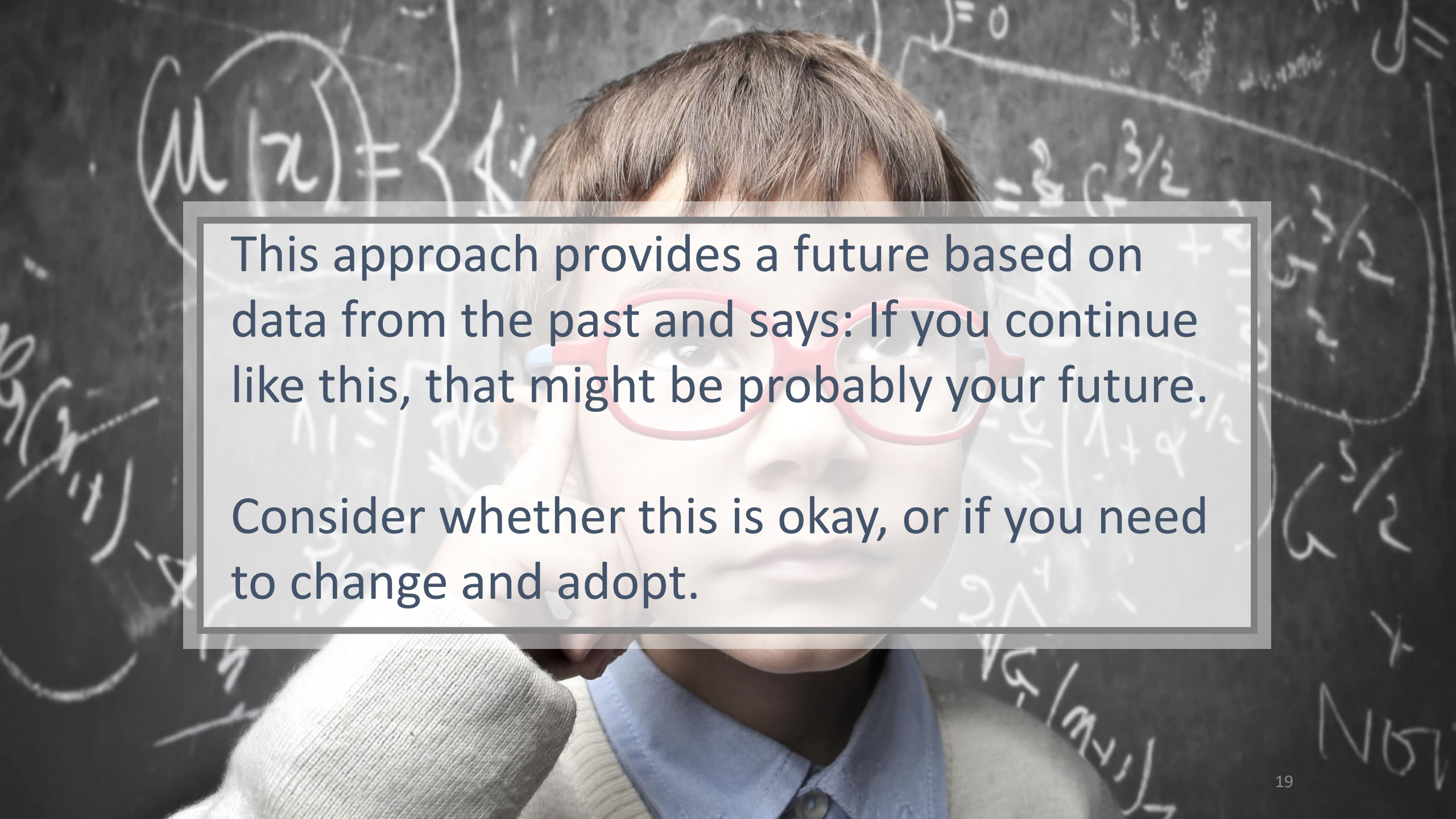
Queueing Theory (one small part of it)

Predictability on Queues/Lists

The most accurate predictability in queues or ordered lists can be achieved if every item in the queue/list has exactly the same size.

We don't need to be perfect and have exactly the same sized items, but approximately similar sized items will improve the forecasting.





This approach provides a future based on data from the past and says: If you continue like this, that might be probably your future.

Consider whether this is okay, or if you need to change and adopt.

The background is a light blue gradient with a faint, repeating pattern of hexagons. Overlaid on this are several dark blue and black line art elements. On the right side, there is a large, complex network diagram with many nodes and connecting lines. In the upper right, there are smaller, more intricate diagrams that look like molecular structures or small-scale network graphs. Some of these smaller diagrams include plus signs and circles.

Helpful Product Backlog Visualizations

Backlog Data

Determinate & Assign Default Values

Use existing, estimated Items to determinate the default values and ranges.

Apply them on each Level:
Items, Epics and Themes

Calculate the three remaining
backlog Sizes

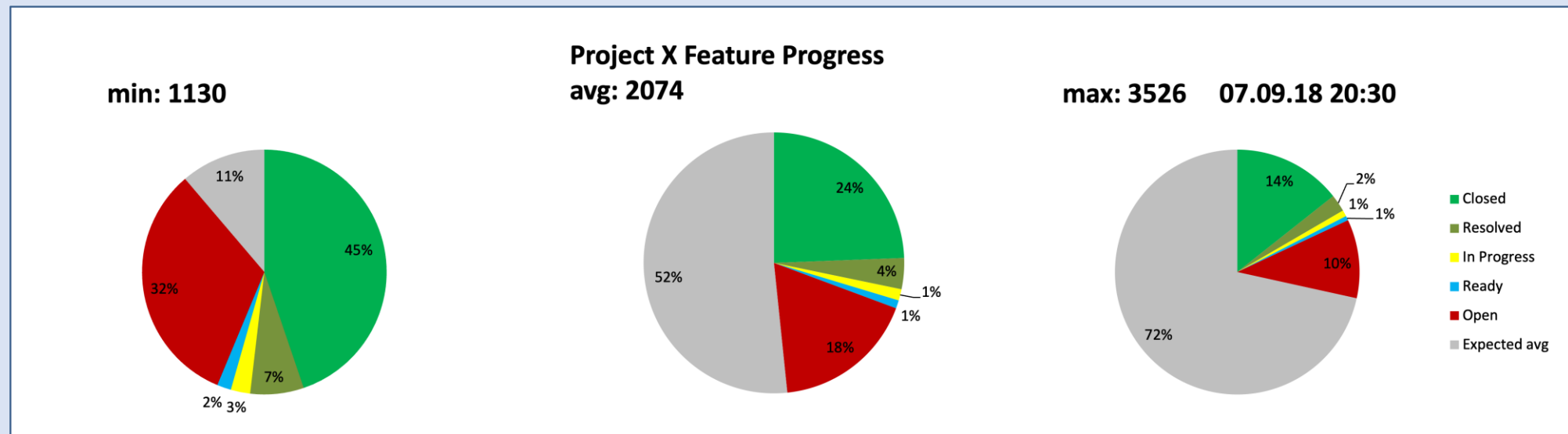
Default Values			
	MIN	AVG	MAX
Theme	7,5	37,5	52,5
Epic	5	15	25
Item	2,3	5	7,7

Backlog Data				Expected		
Key	Type	Status	Estimate	MIN	AVG	MAX
1	Theme			34,6	40	45,4
2	Epic			22,3	25	27,7
3	Item	Open		2,3	5	7,7
4	Item	Ready	5			
5	Item	In-Progress	2			
6	Item	Resolved	8			
7	Item	Closed	5			
8	Epic			2	2	2
9	Item	Closed	2			
10	Epic			10,3	13	15,7
11	Item	New		2,3	5	7,7
12	Item	In-Progress	8			
13	Theme			10	30	50
14	Epic			5	15	25
15	Epic			5	15	25
16	Theme			7,5	37,5	52,5
Remaining Backlog Sizes				52	108	148

Current and Expected Backlog

Determinate Three Possible Remaining Backlogs

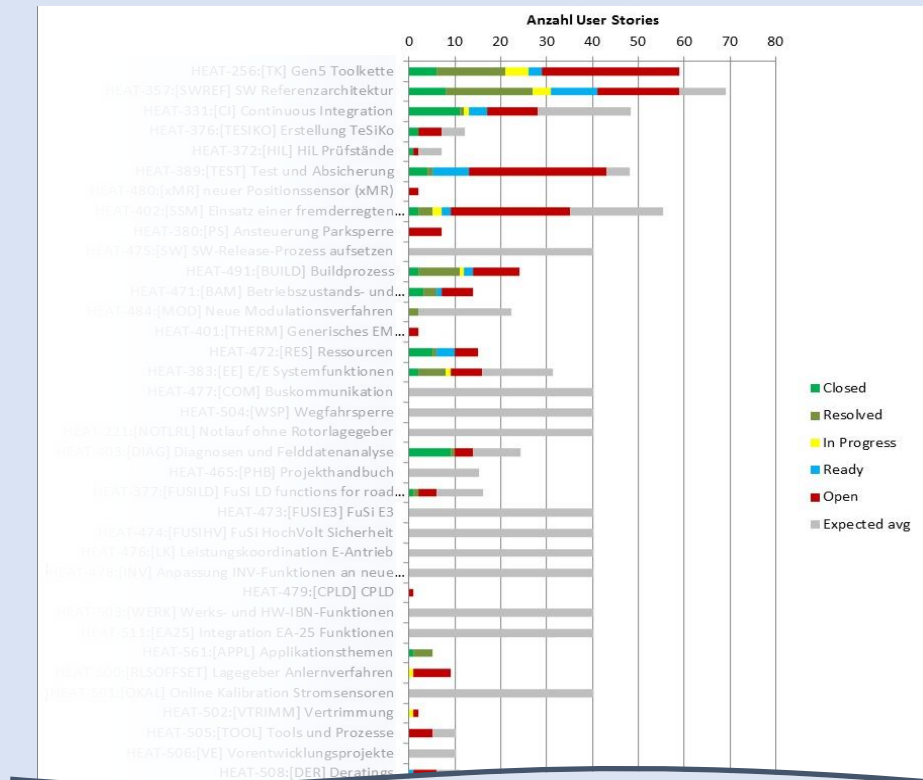
With the average and \pm standard deviation default values, whenever there are no estimates available*.



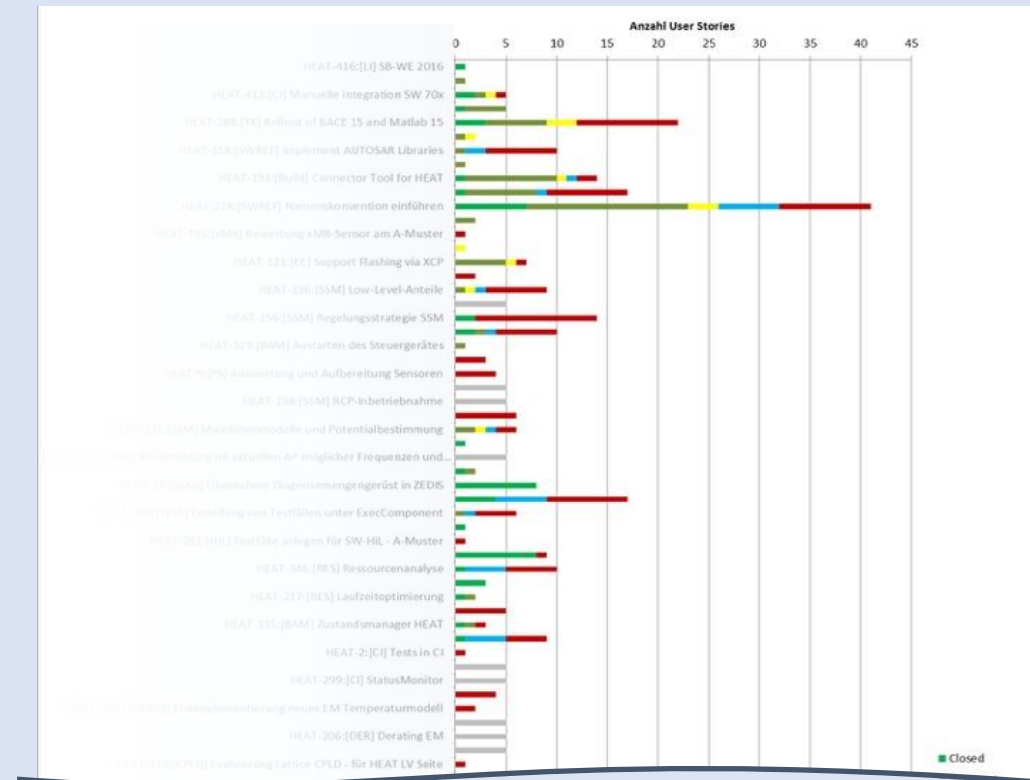
* Colored areas represent real existing items in the Product Backlog. Gray areas represent the summary of all expected (default values) efforts.

Progress Visualization

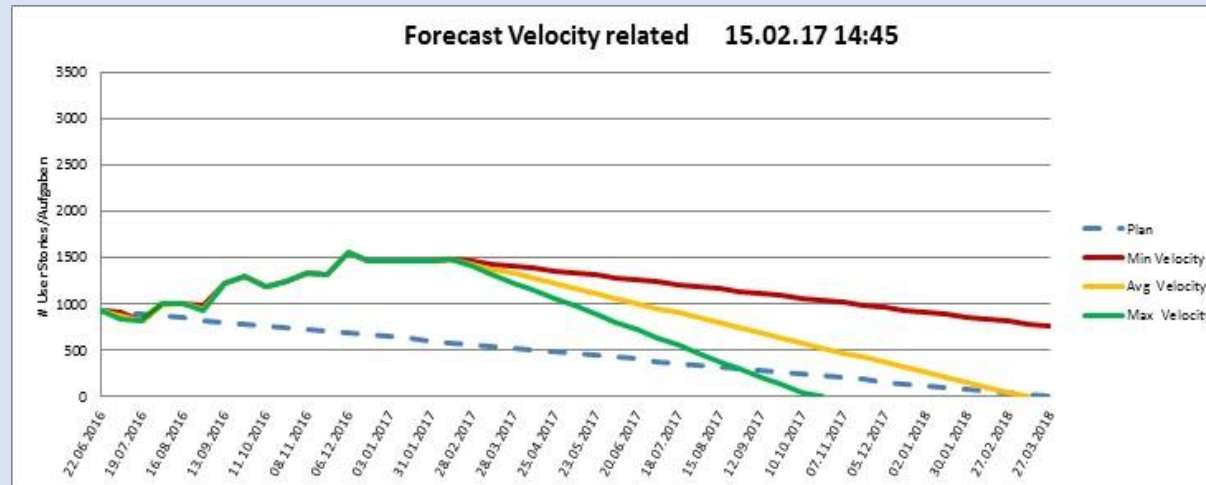
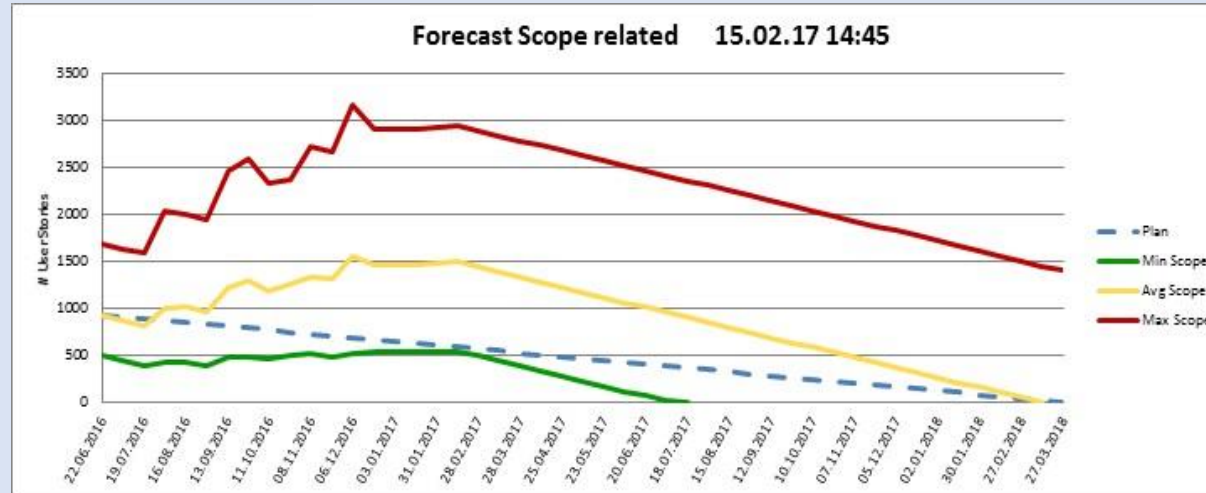
Theme Level



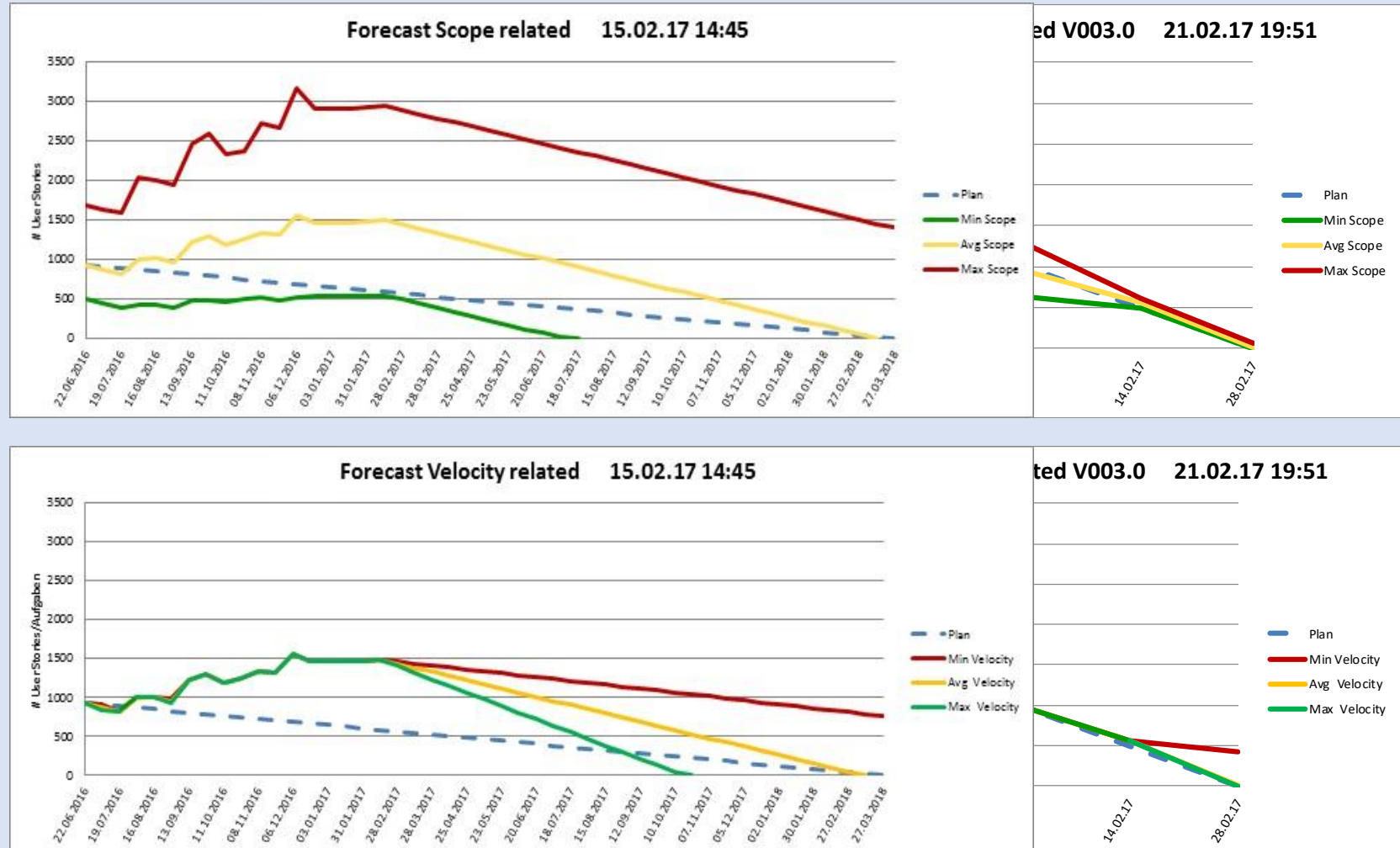
Epic Level



Two Dimensions of Forecasting

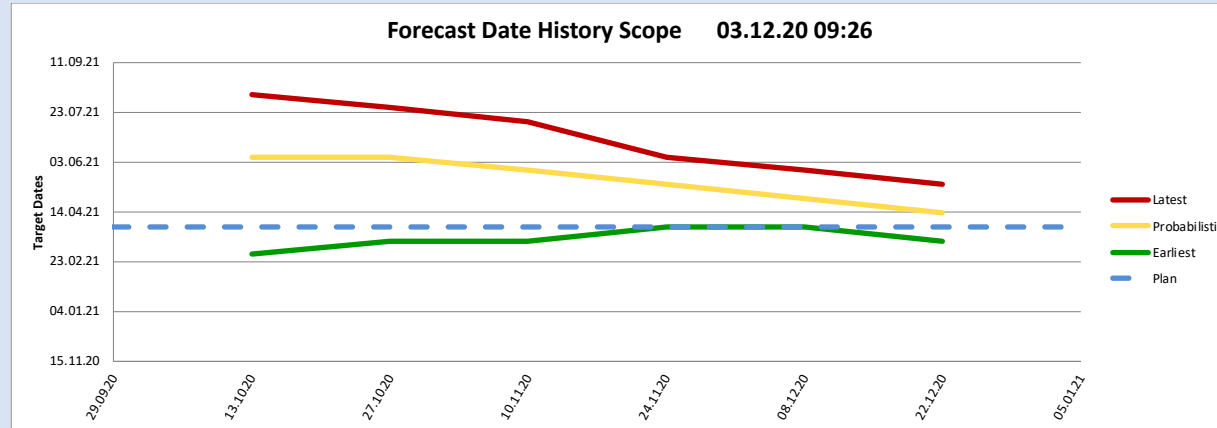


Multiple Timeframes of Forecasting



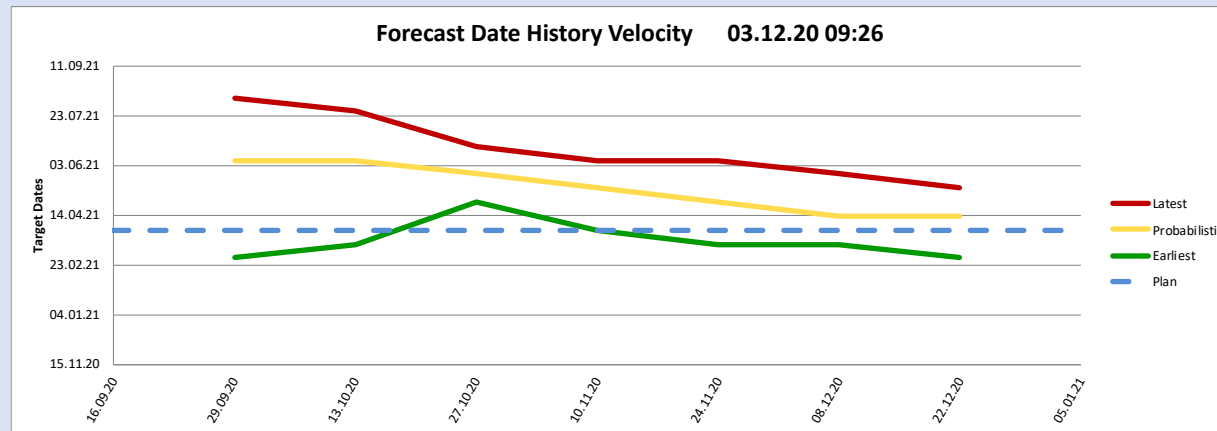
Numbers Are Always Wrong...

Observe the Trends

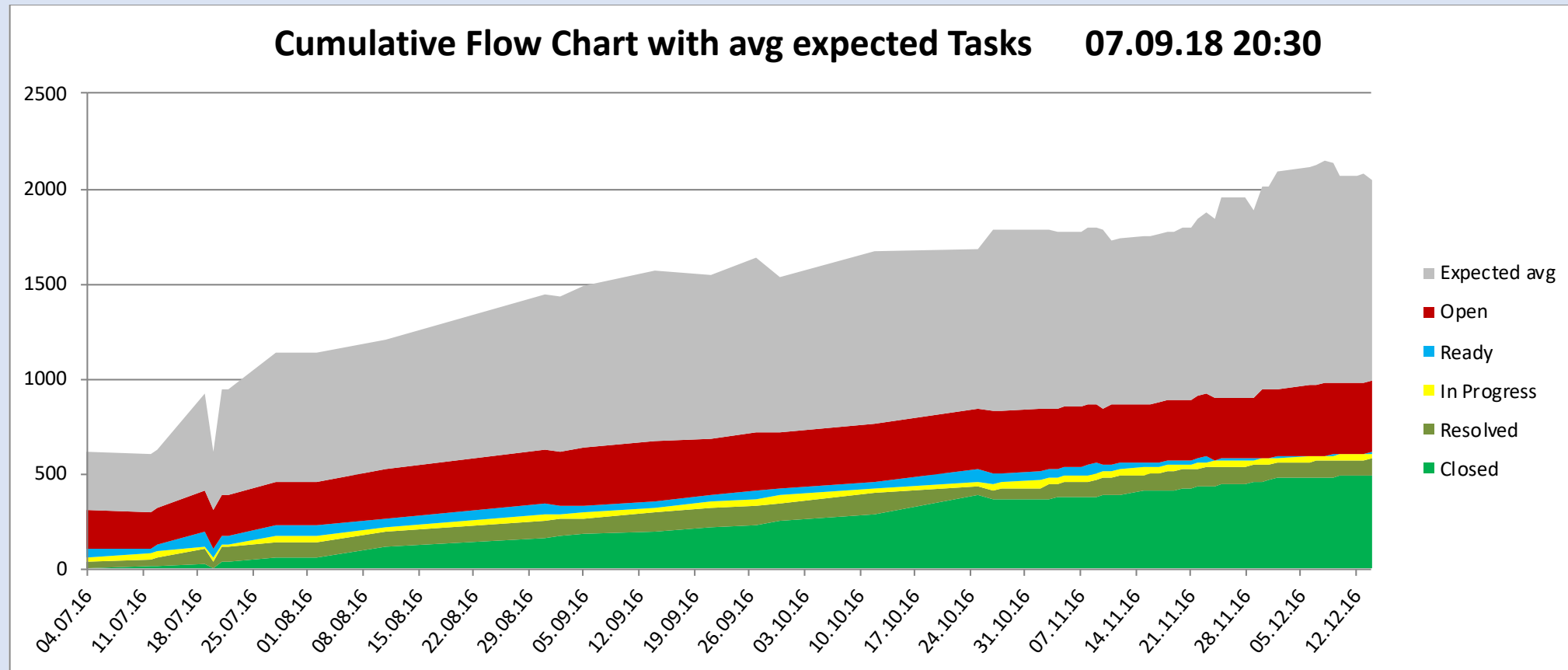


Predicted Target Date

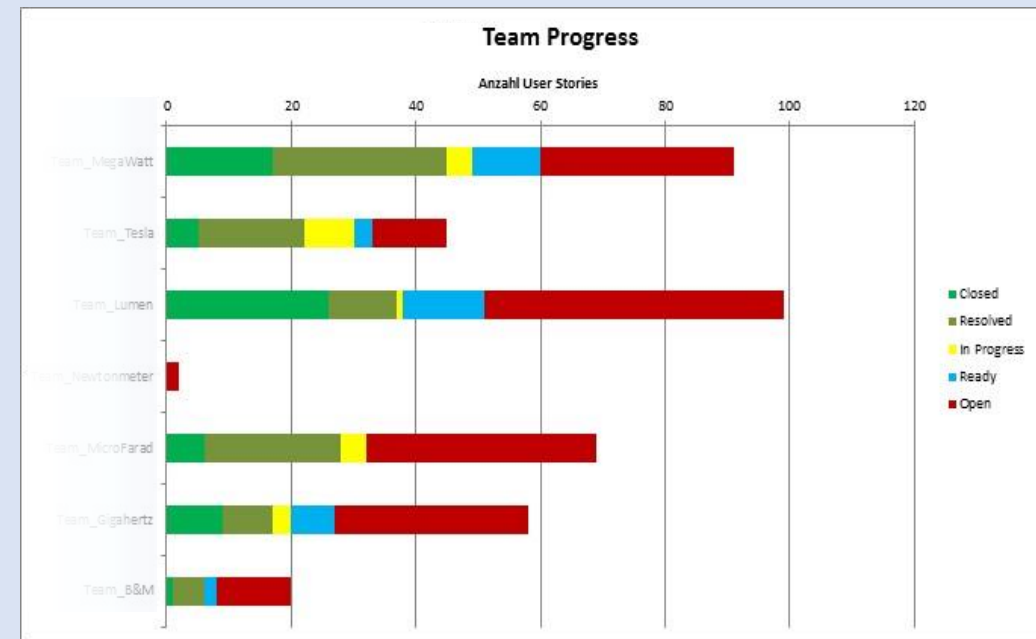
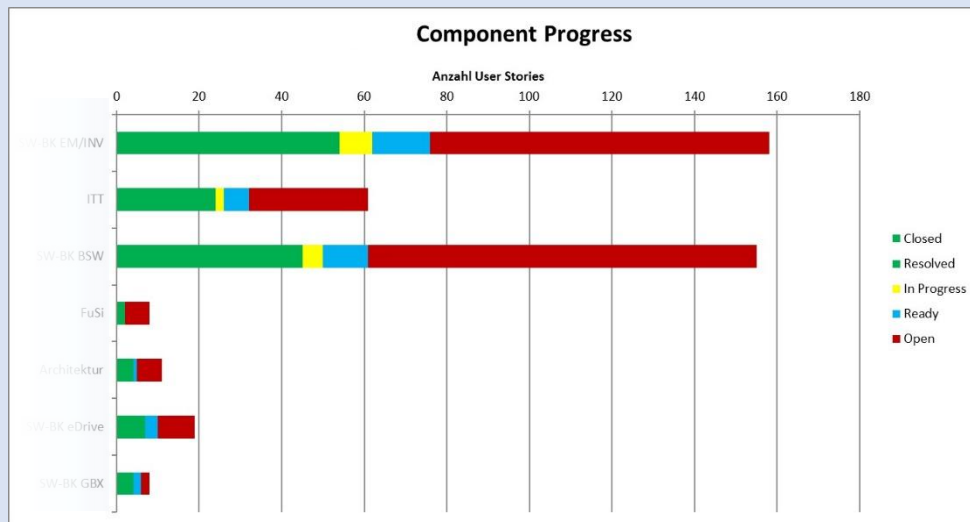
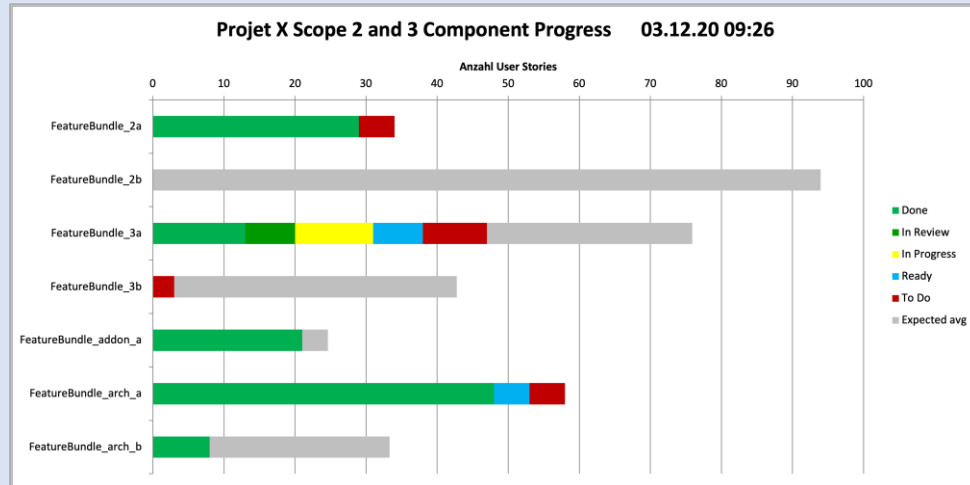
- Latest
- Probabilistic
- Earliest
- Plan



Endless Increasing Product Backlogs



Progress on Team, Bundle or Unit-Level



Experiences: Deep Dive at a BMW Case

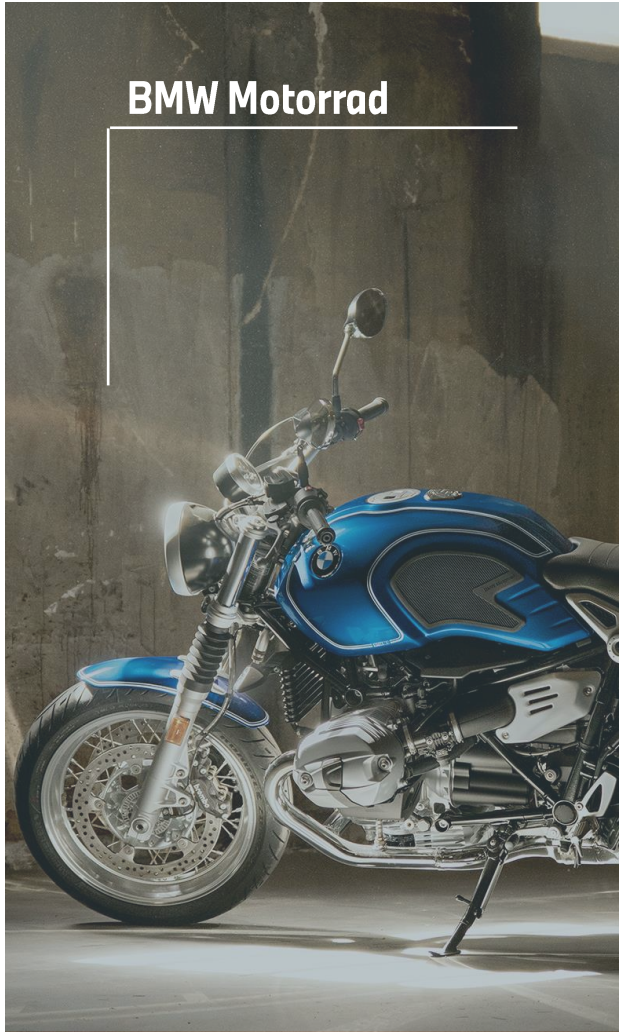


OUR BRANDS.

BMW



BMW Motorrad



MINI



Rolls-Royce Motor Cars



OUR STRATEGY.



“ BMW GROUP EXISTS TO MOVE:
BODY, HEART AND MIND. ”

Want to learn more about the BMW i Vision Dee?
Search for „CES 2023 BMW Keynote“ on YouTube.

BMW GROUP IT – FACTS AND FIGURES.




60 Nationalities in 29 Countries


More than 11.000 Applications

BizDevOps setup with 66 Domains and 319 Products

● BMW Group IT
● DevOps Hub
● Tech Office




12
PRODUCTS




~190
APPLICATIONS




60
BizDevOps TEAMS



~150
FTE @ BMW



~60
FTE @ HUB



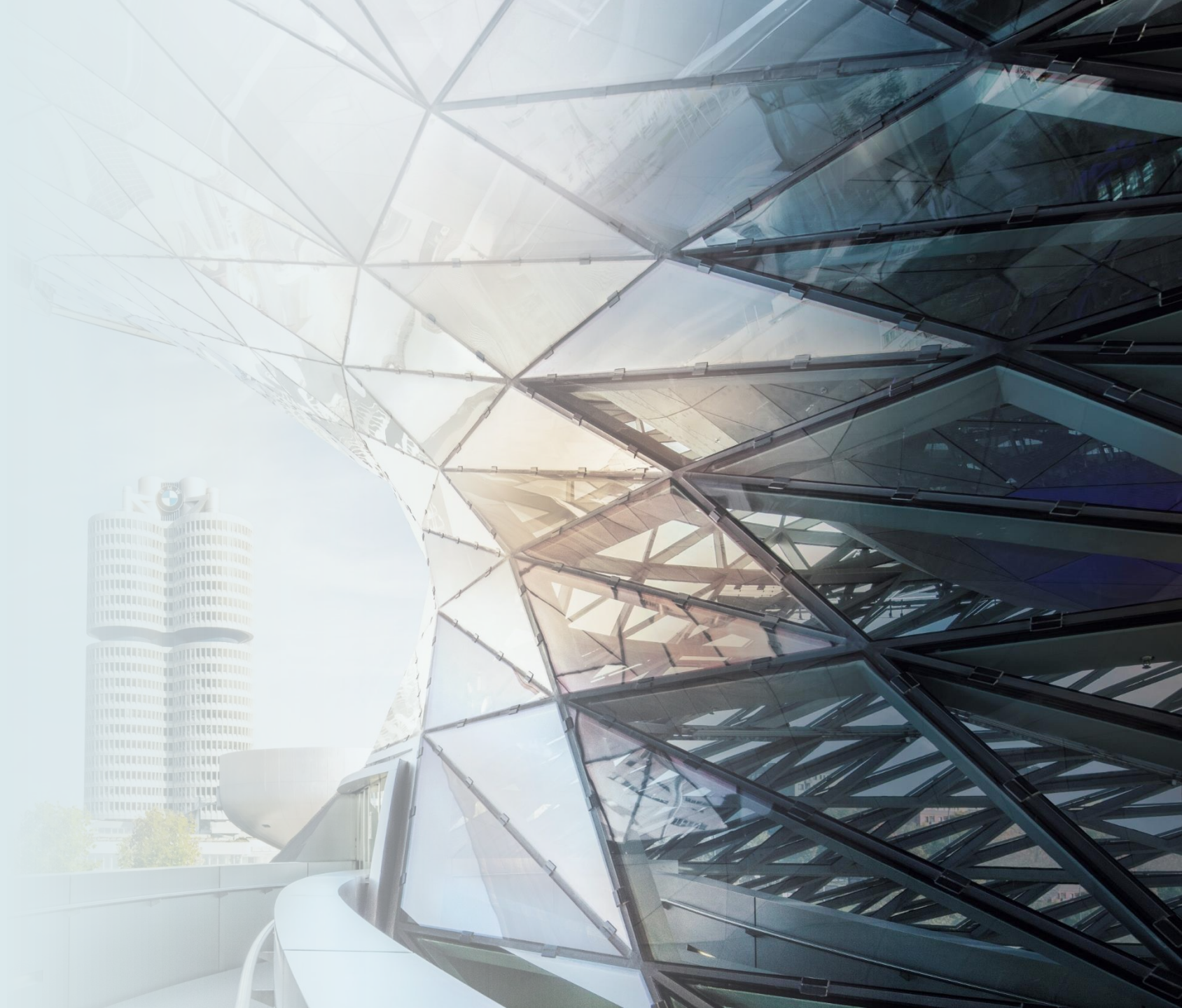
33
PROVIDER

DOMAIN SERVICE & REPAIRS PARTS LIFECYCLE MANAGEMENT

**OUR ROLE IN THE
CUSTOMER JOURNEY.**

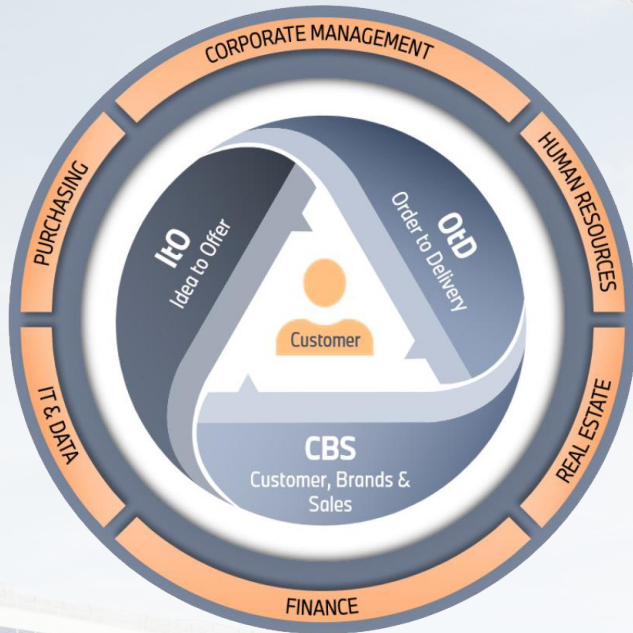


AGILE WORKING MODEL.



AWM – AGILE WORKING MODEL.

Business Processes



Organization

BMW Product Catalogue

PRIME

DOMAIN

PRODUCT

SUB-PRODUCT

BizDevOps TEAM

Agile Working Model



Processes, organization and working model are closely aligned.

BMW as a whole is moving away from project driven to product and value oriented.

AWM is a generic description of a scaled agile framework, supporting SAFe and LeSS.

AWM – AGILE WORKING MODEL.

Organization

LeSS Huge Adoption

Jira



We work in quarterly cycles and two week sprints.
Layer model of Product Catalogue is reflected in Jira structure.
Simplified Jira workflows are aligned across the whole company.

MILESTONES?
MILESTONES.



MLESTONES? MLESTONES.

As BMW is a well established economy with **proven processes**, we are very well used to **milestones** – and so we further use them for **synchronizing efforts** all over the company.



THE JOURNEY
BEGINS.



BACKLOG VISUALIZATION – AS THE JOURNEY BEGAN.

Challenges we were facing:

- **Only cross product topics** were visible with only limited information on timelines.
- It was **difficult** to tell, whether we could make certain **deadlines**.
- **Huge efforts** and a lot of alignments needed on overarching topics.
- There was no awareness that prioritized topics were **not being worked together**.



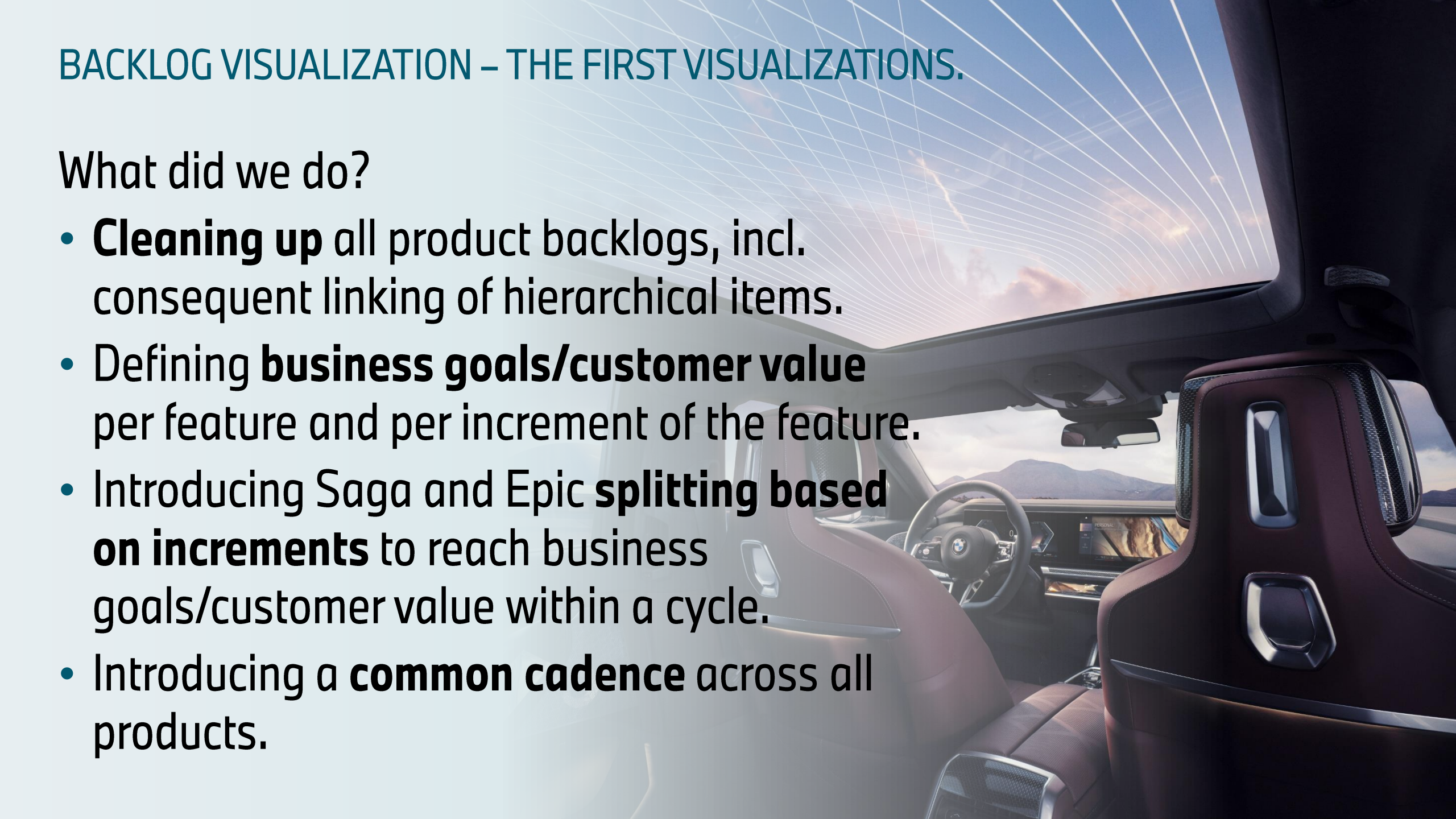
LET'S MAKE IT
VISIBLE.



BACKLOG VISUALIZATION – THE FIRST VISUALIZATIONS.

What did we do?

- **Cleaning up** all product backlogs, incl. consequent linking of hierarchical items.
- Defining **business goals/customer value** per feature and per increment of the feature.
- Introducing Saga and Epic **splitting based on increments** to reach business goals/customer value within a cycle.
- Introducing a **common cadence** across all products.



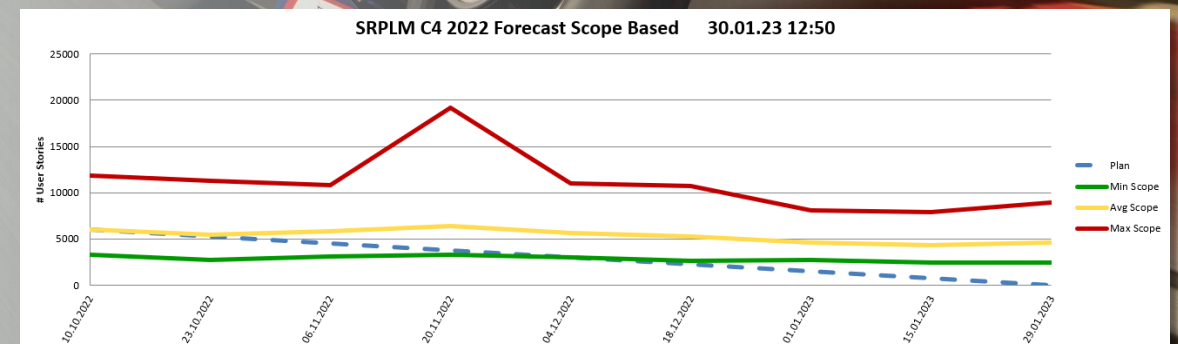
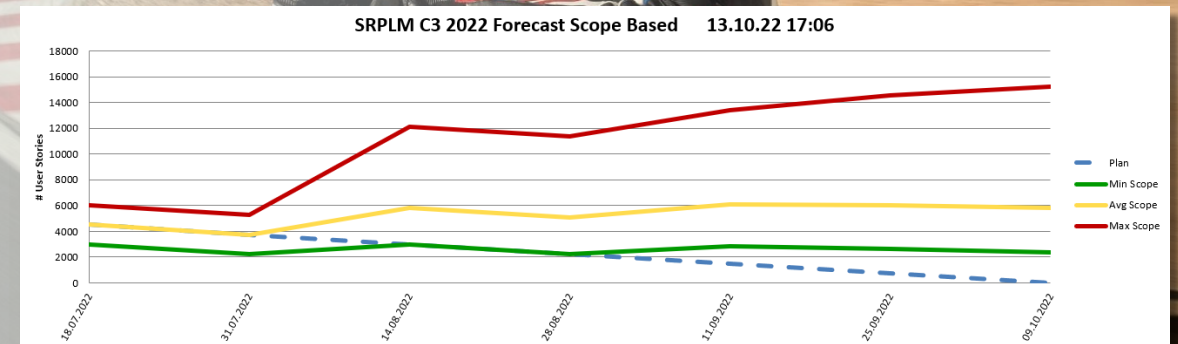
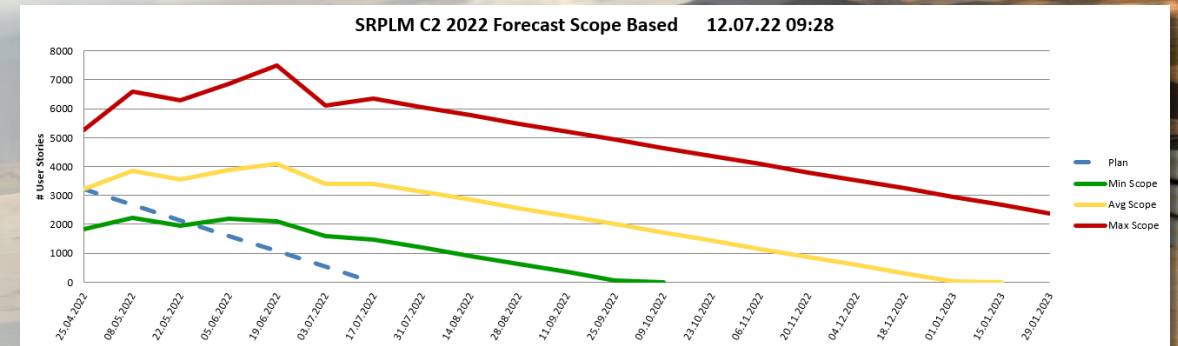
GAINING SPEED.



BACKLOG VISUALIZATION – VISUALIZATIONS IN 2022.

Still most of the cycle goals were not met, due to...

- Epics not really split to cycles.
- no real increments, still a lot of waterfall-ish “splitting”.
- too many topics in parallel.



BACKLOG VISUALIZATION – VISUALIZATIONS IN 2022.

But we reached other goals:

- Transparent and maintained backlog.
- Clear prioritization.
- Awareness on backlog size.
- 70/30 planning.
- Joint responsibility.

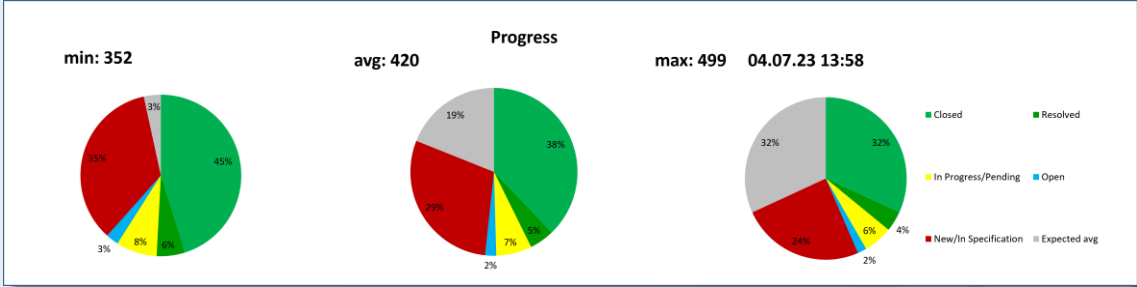
→ The mindset changed!



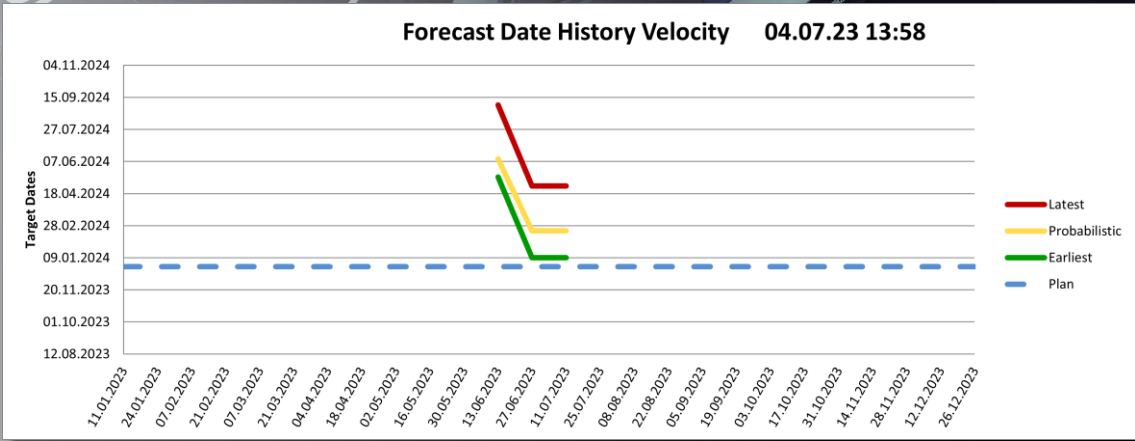
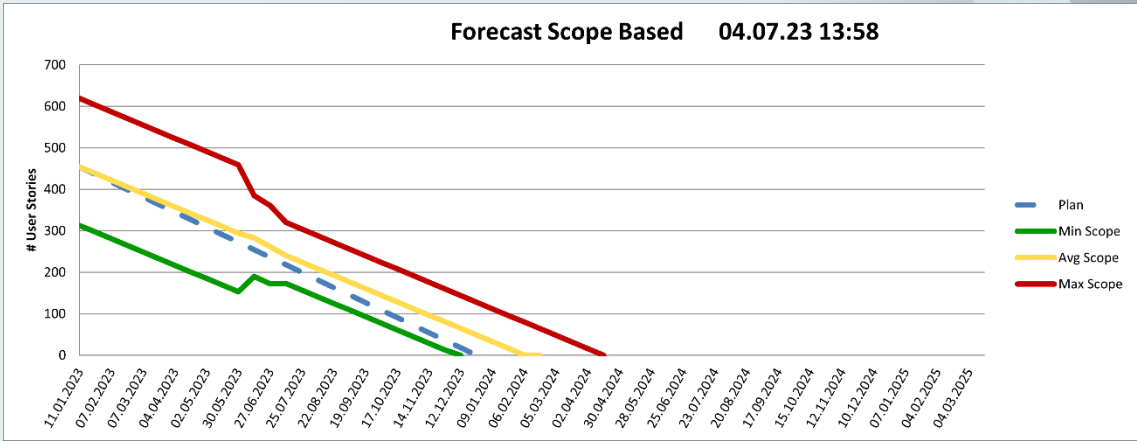
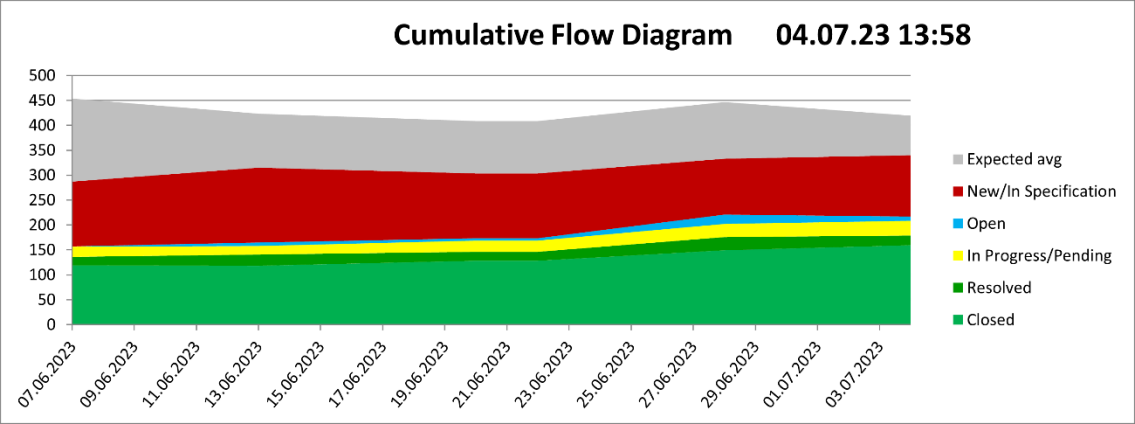
POLEPOSITION.



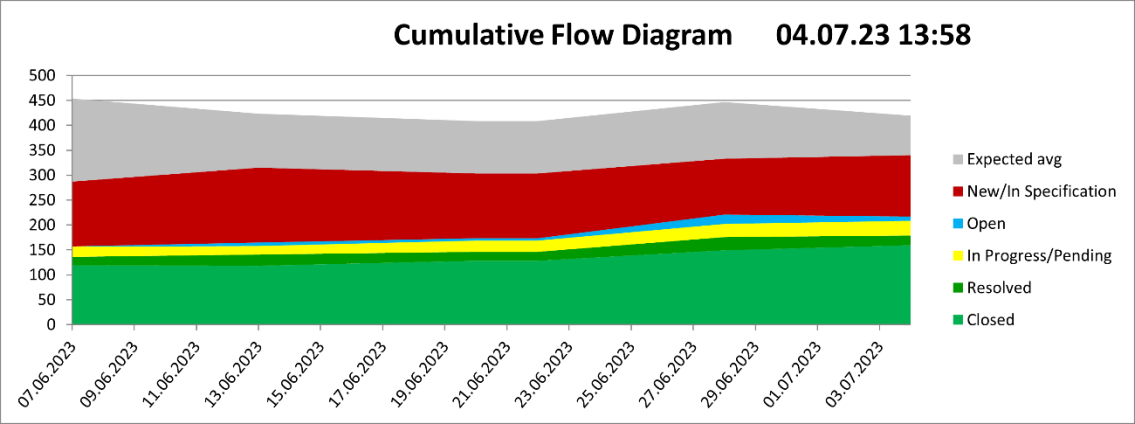
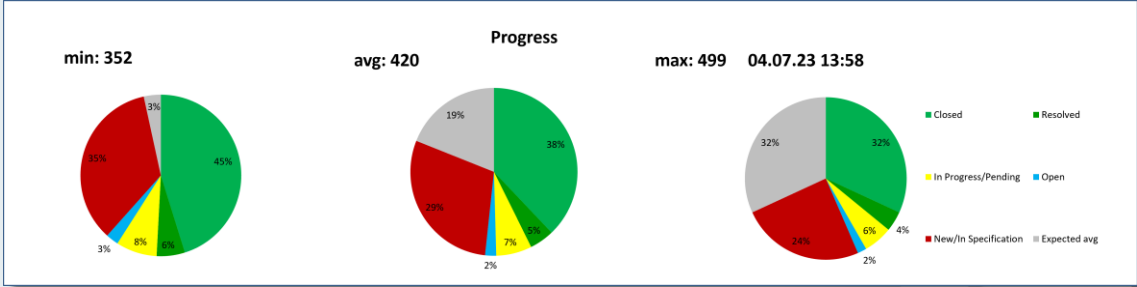
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



Complex feature with high revenue forecast.
Eight BizDevOps teams.

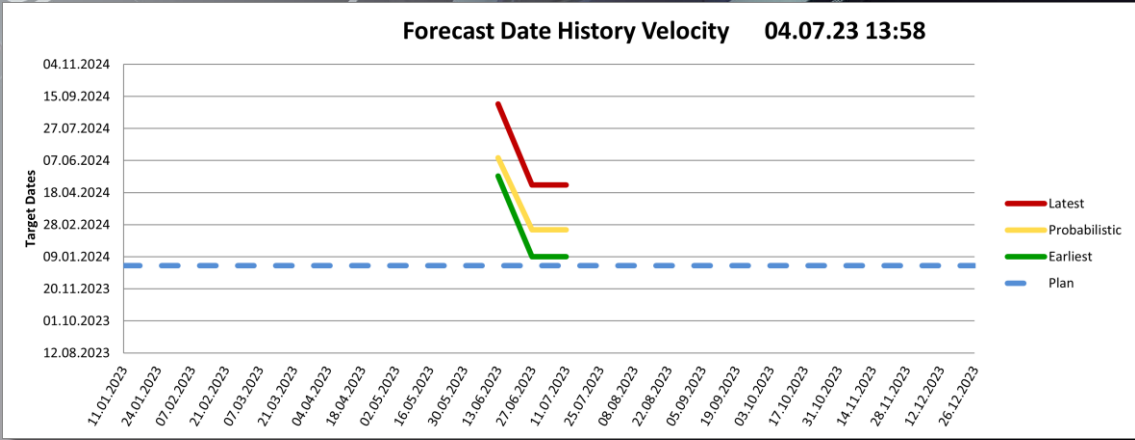
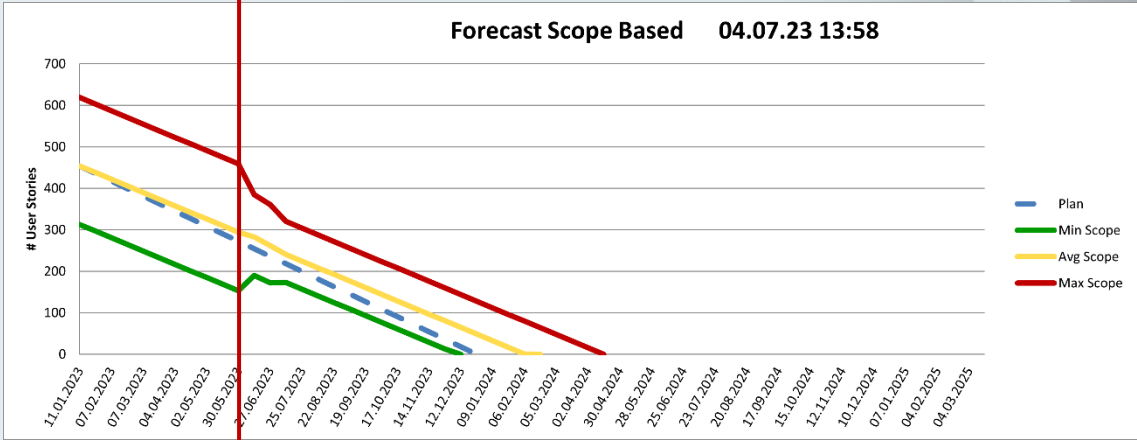


BACKLOG VISUALIZATION – WHERE WE ARE NOW.

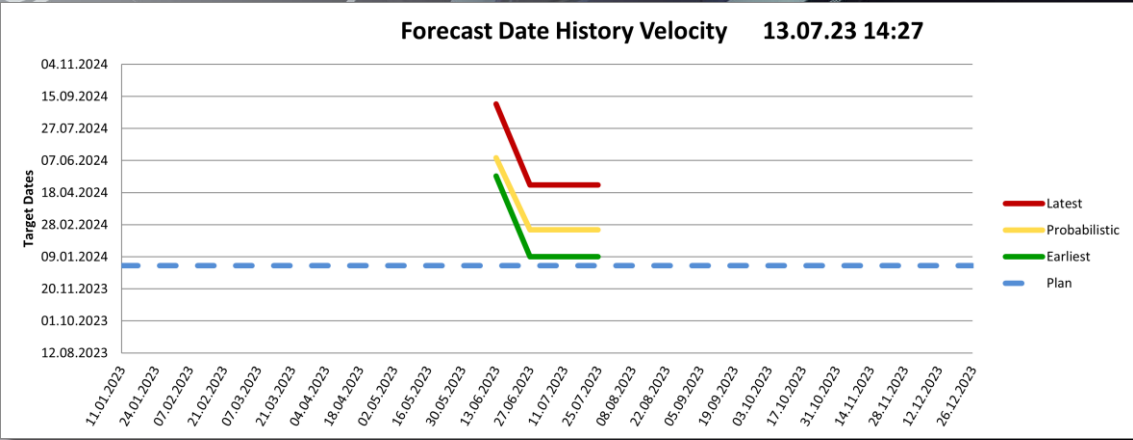
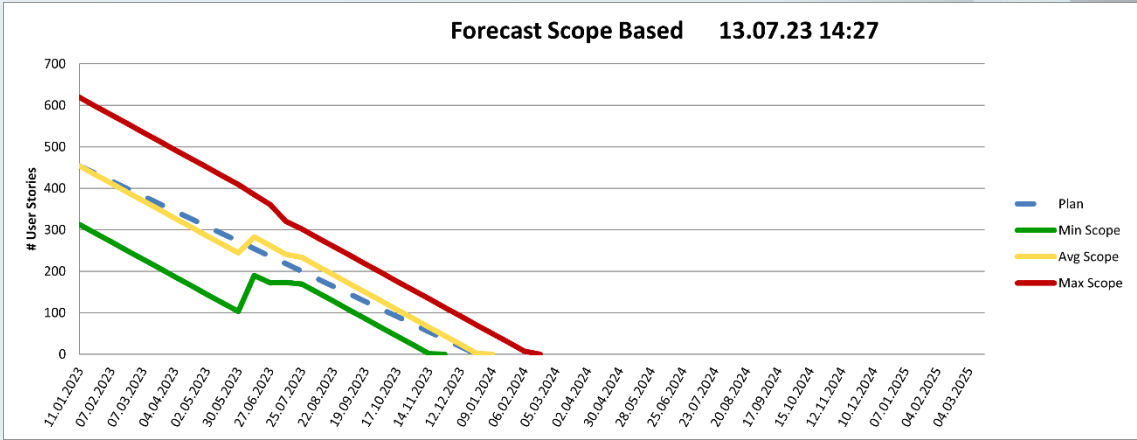
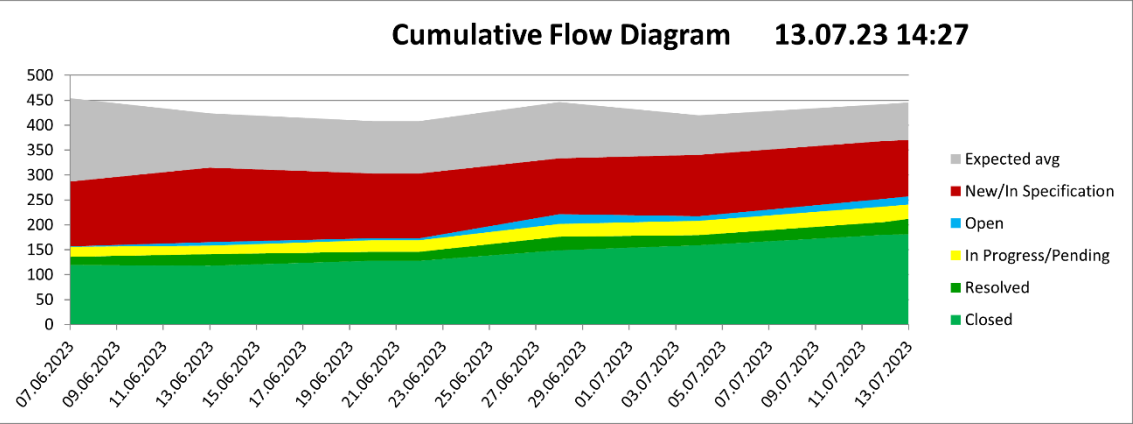
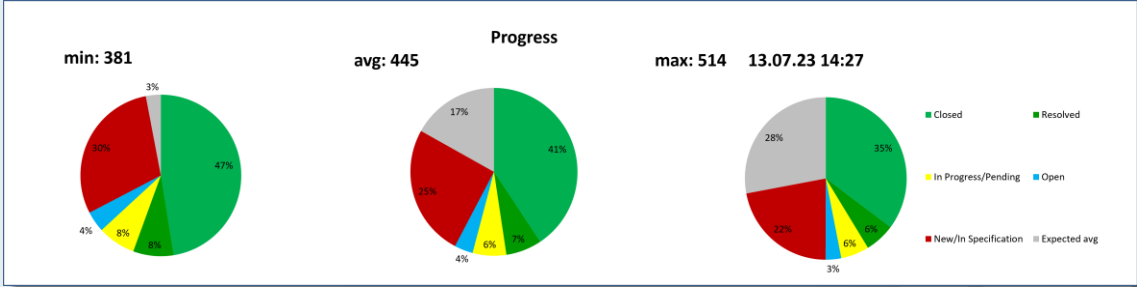


Deadline moved from 6/24 to 12/23.

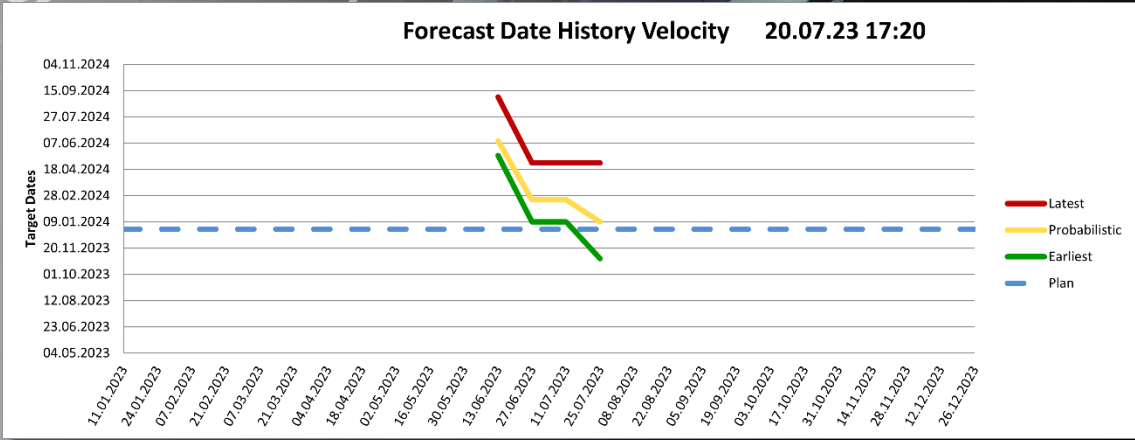
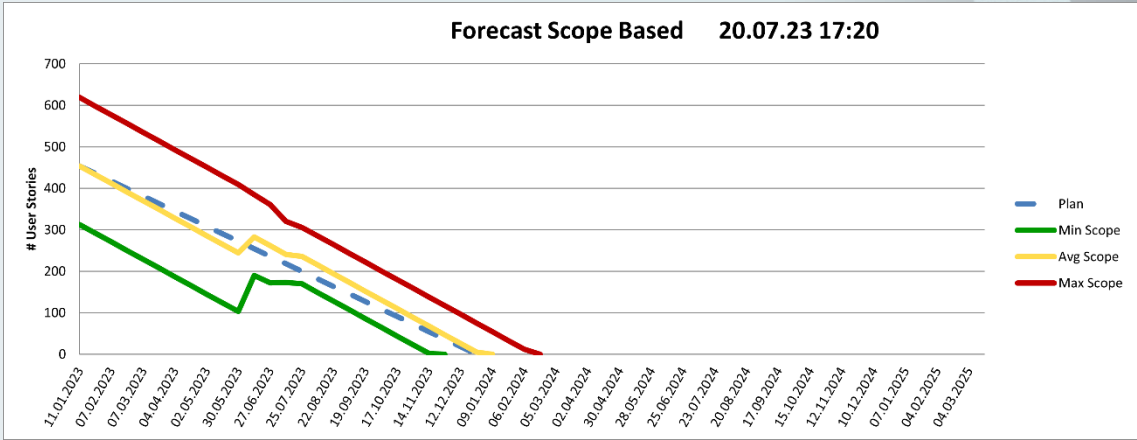
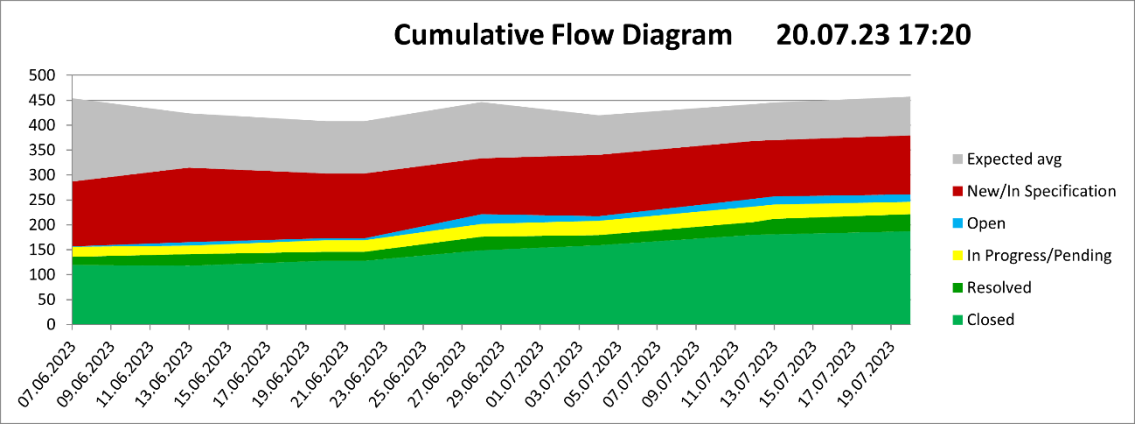
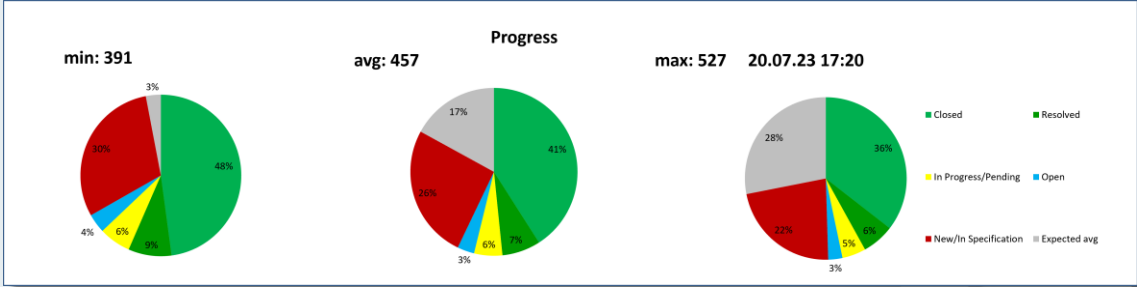
Scope reduced from whole portfolio to two types with most value.



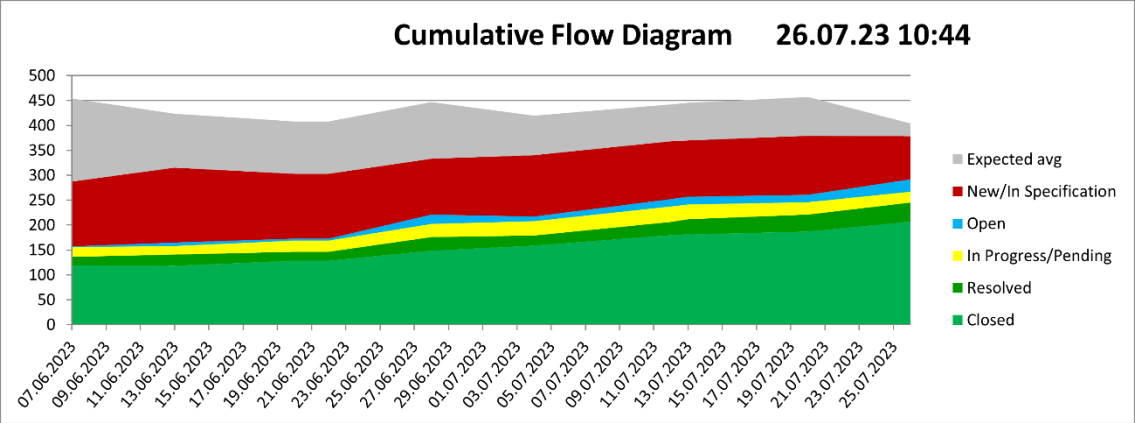
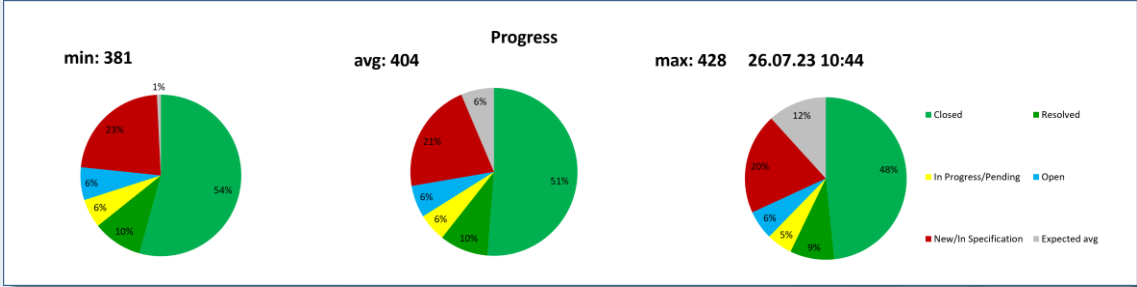
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



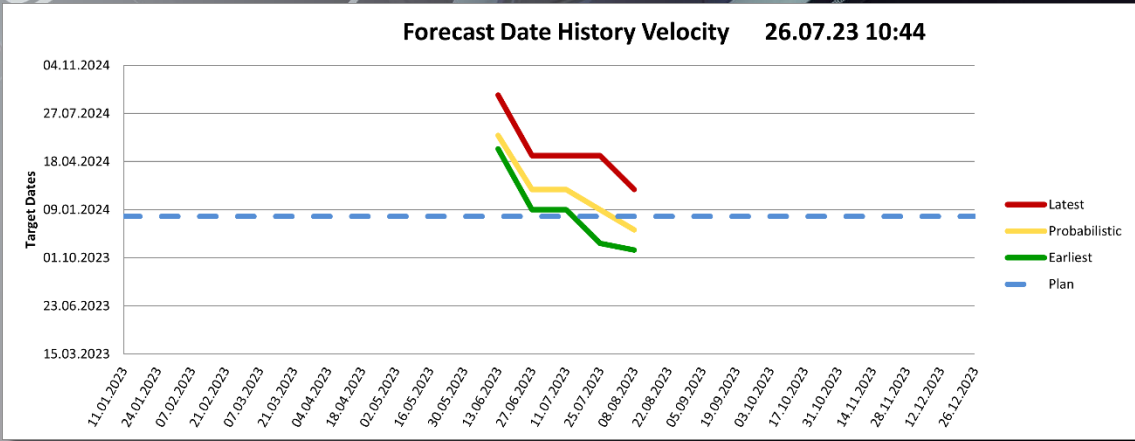
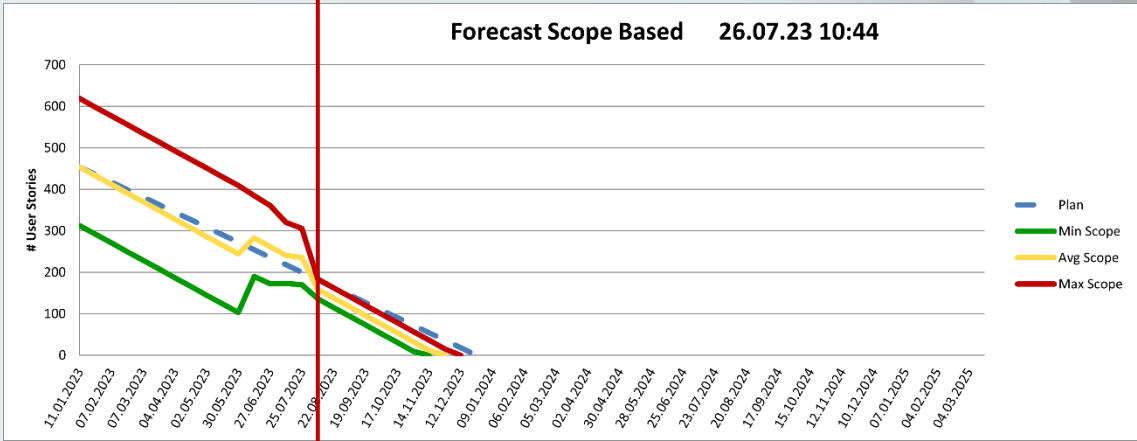
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



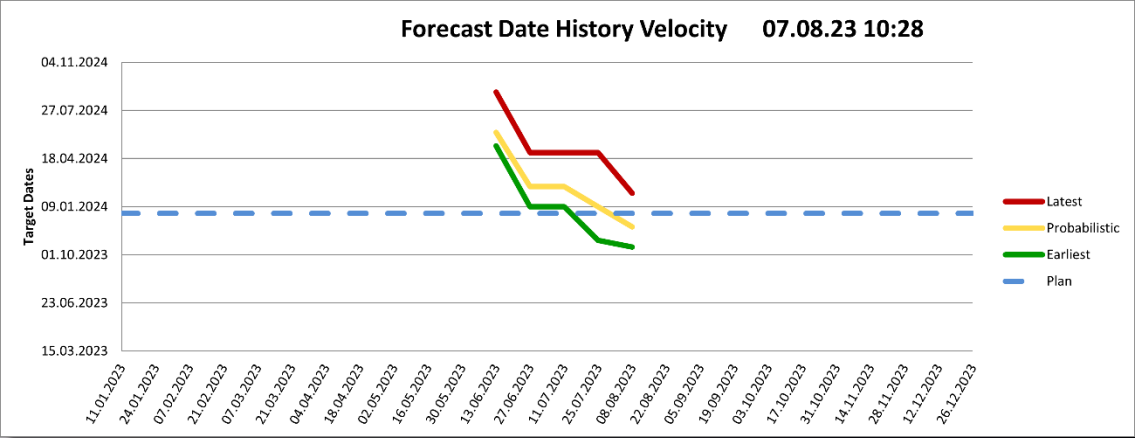
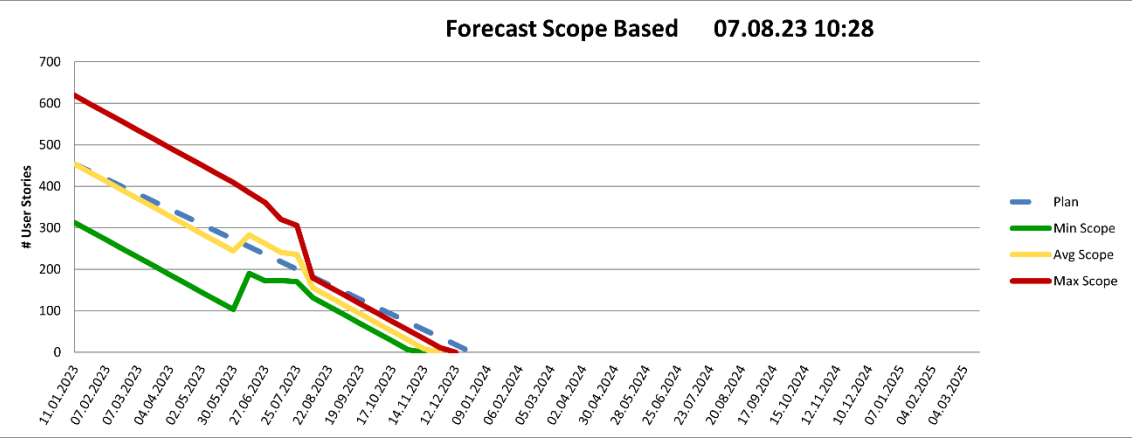
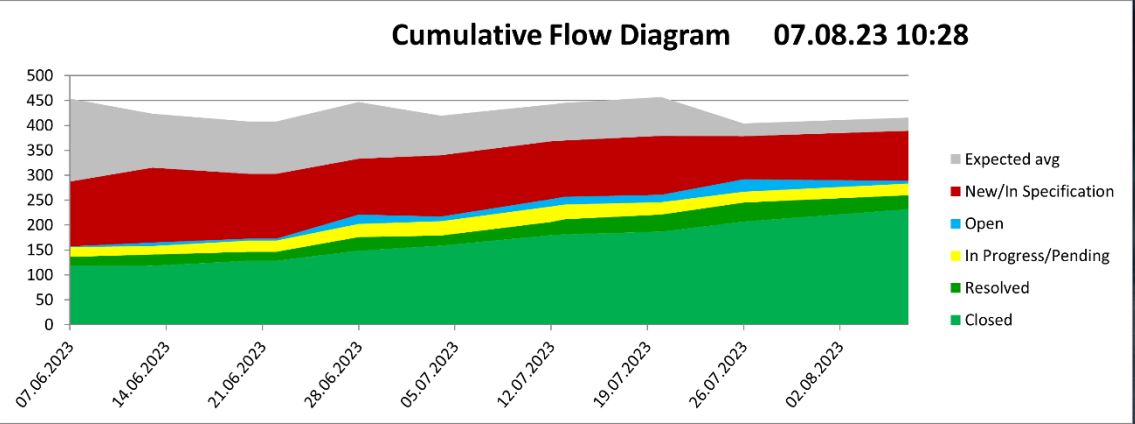
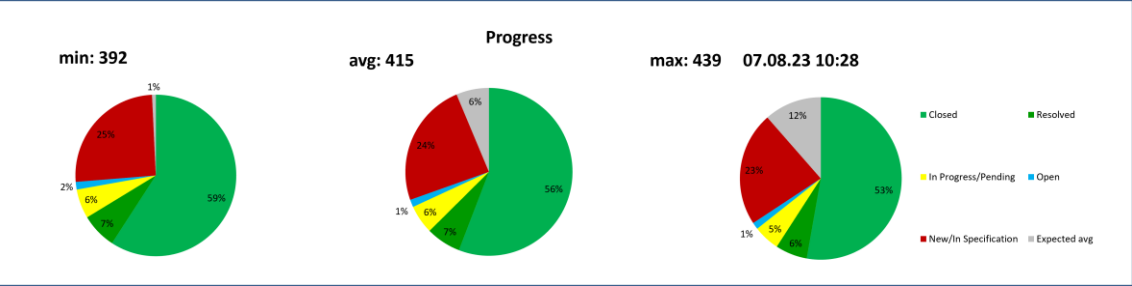
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



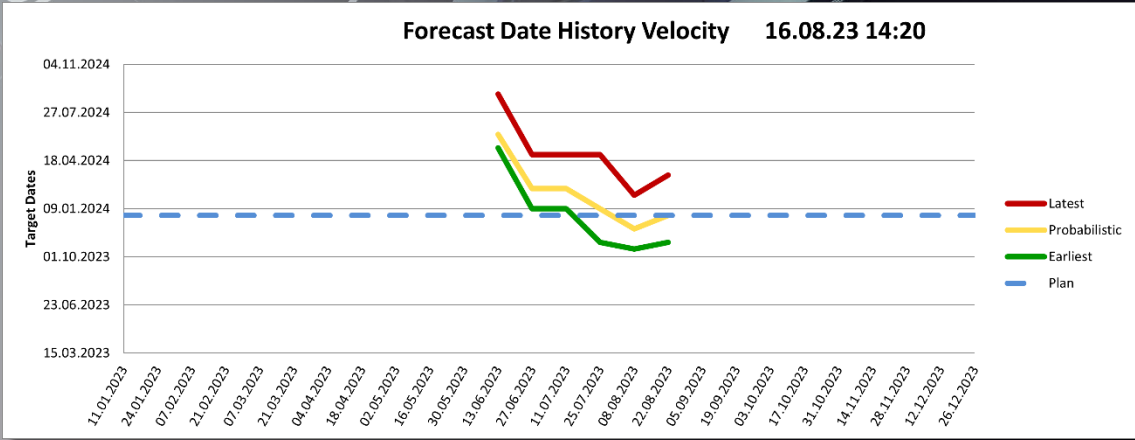
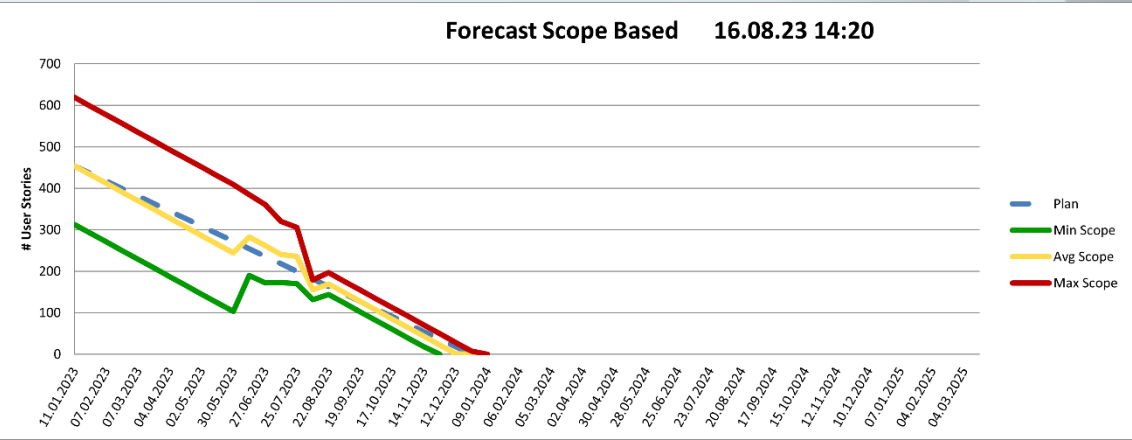
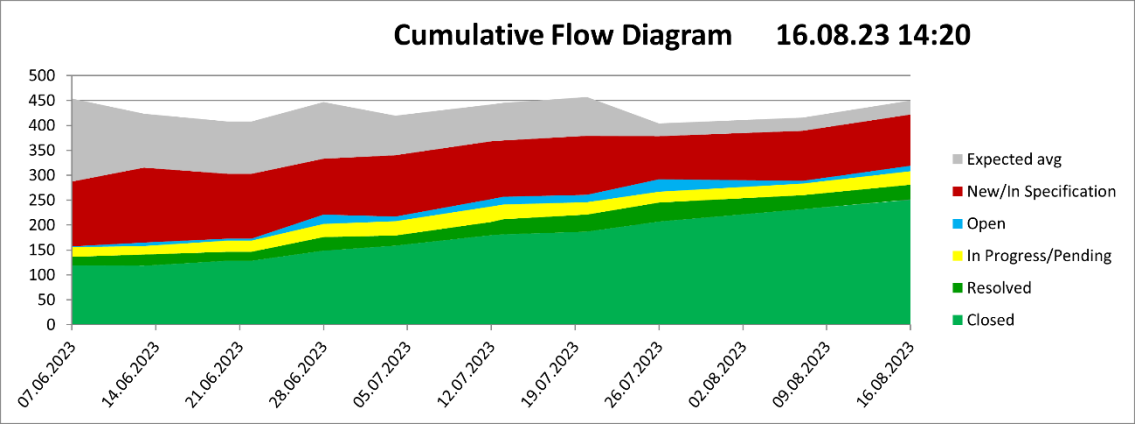
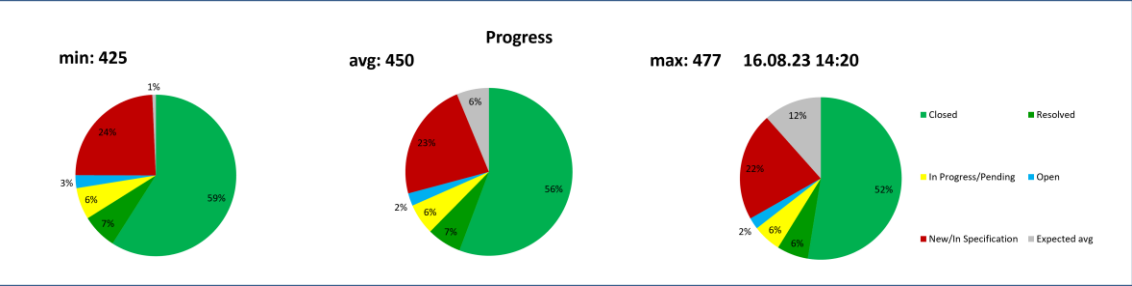
Major refinement on uncertain items (Epics split into Stories).



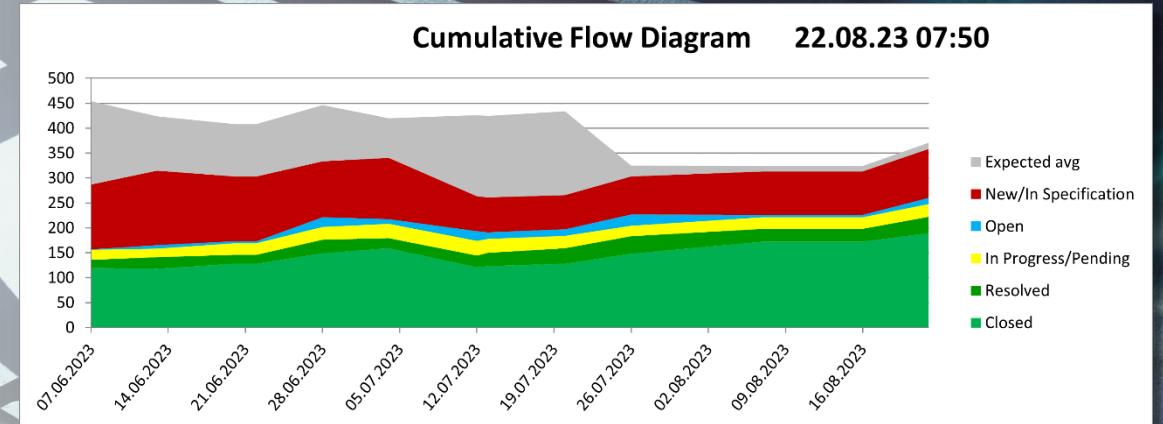
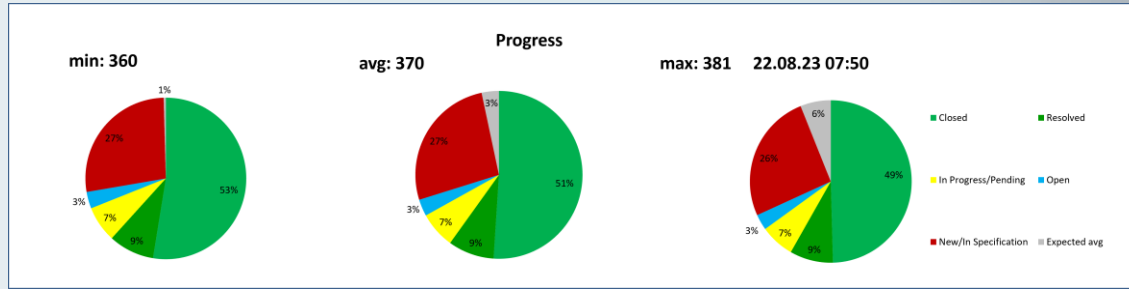
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



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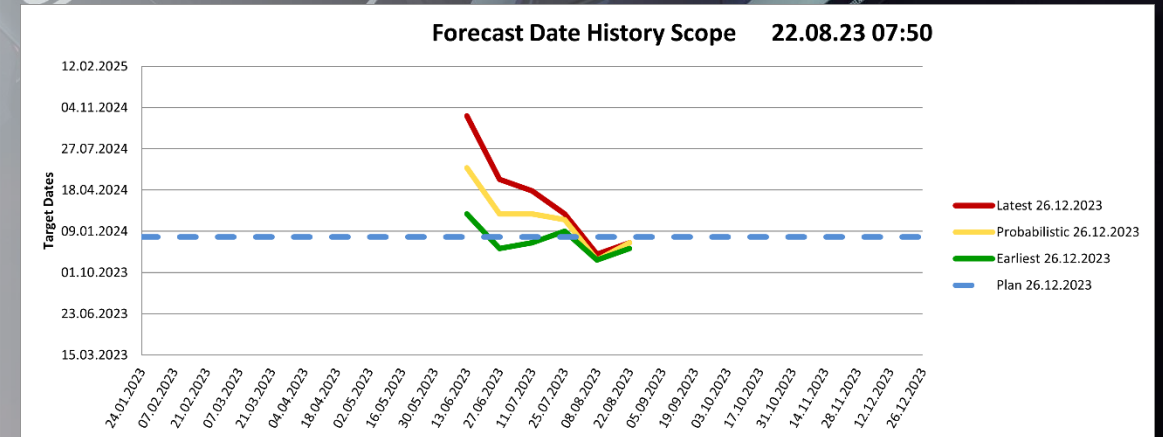
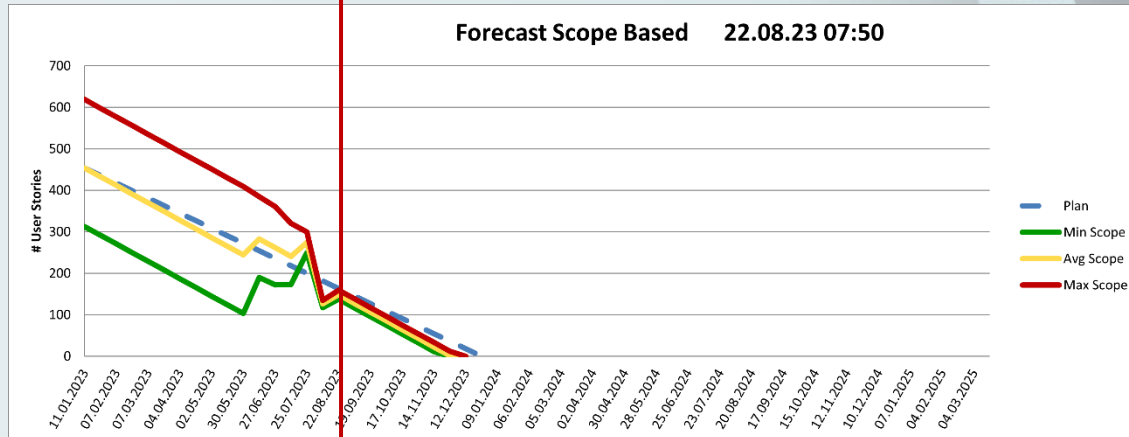


BACKLOG VISUALIZATION – WHERE WE ARE NOW.

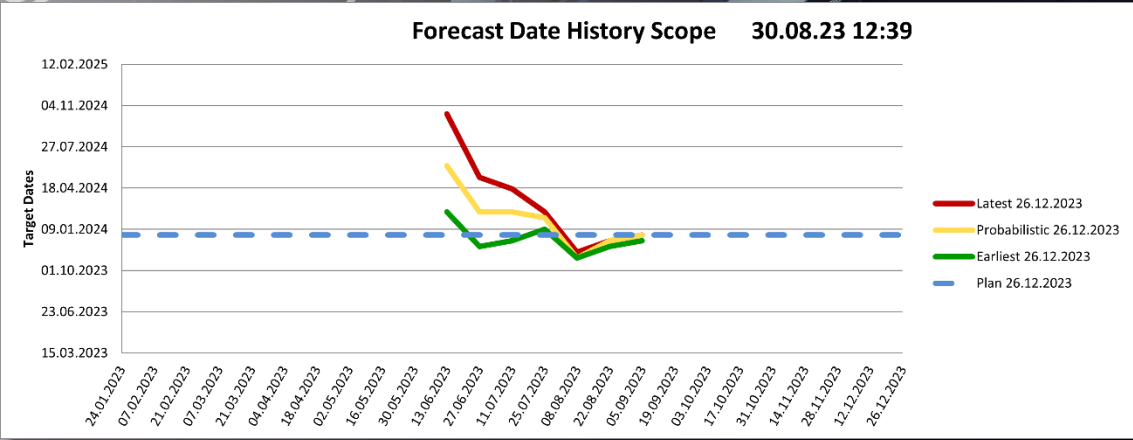
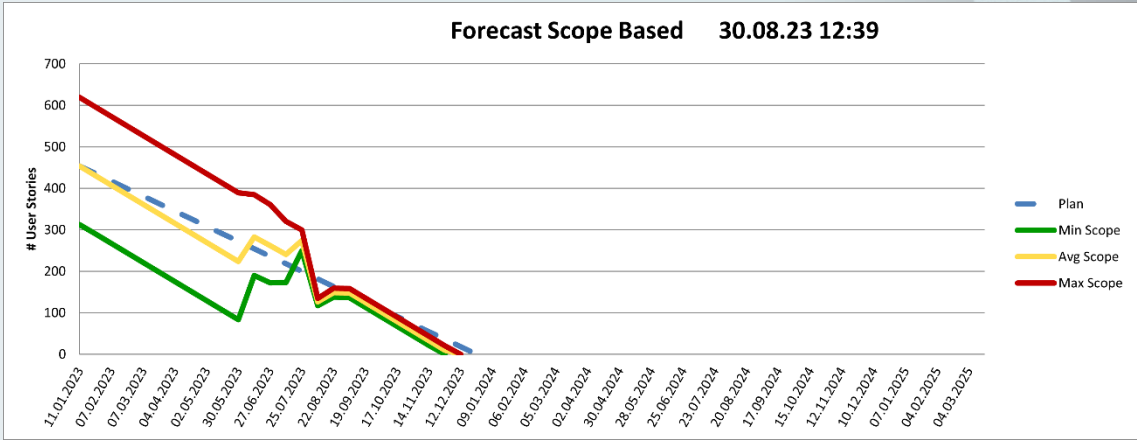
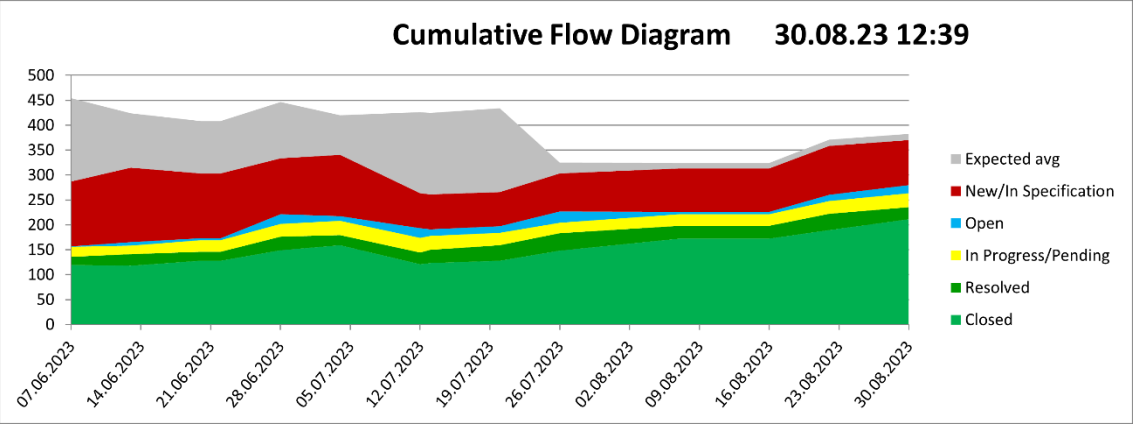
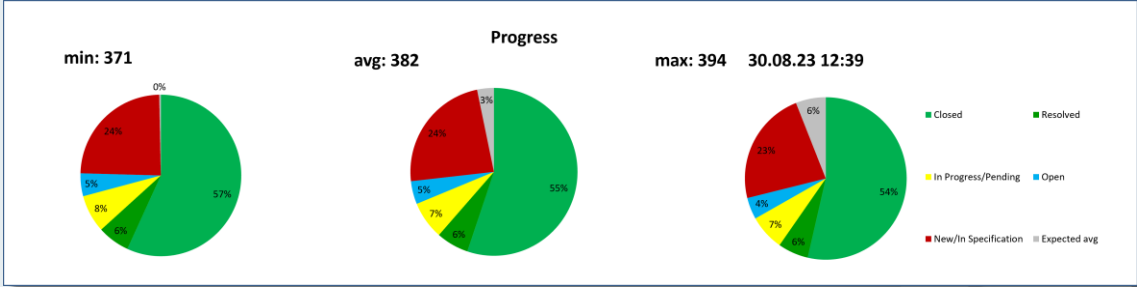


Further „nice to have“ items identified and removed.

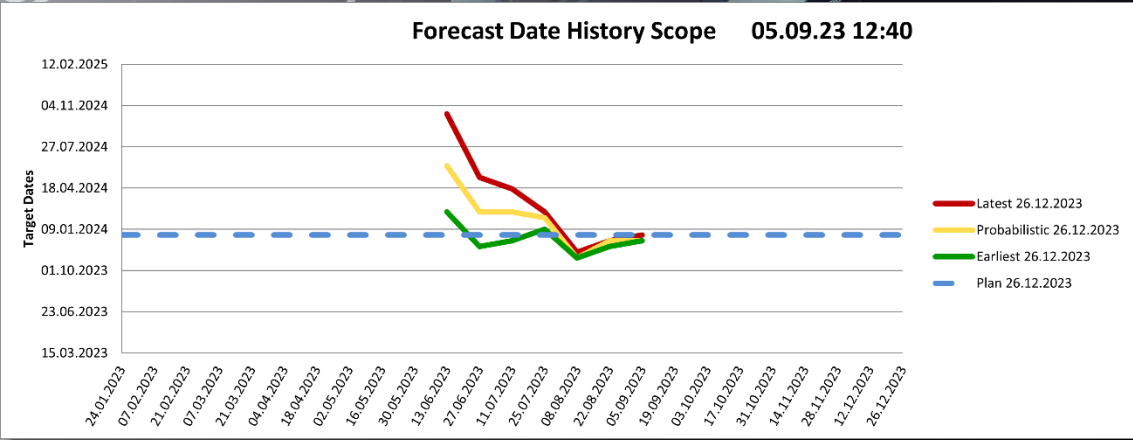
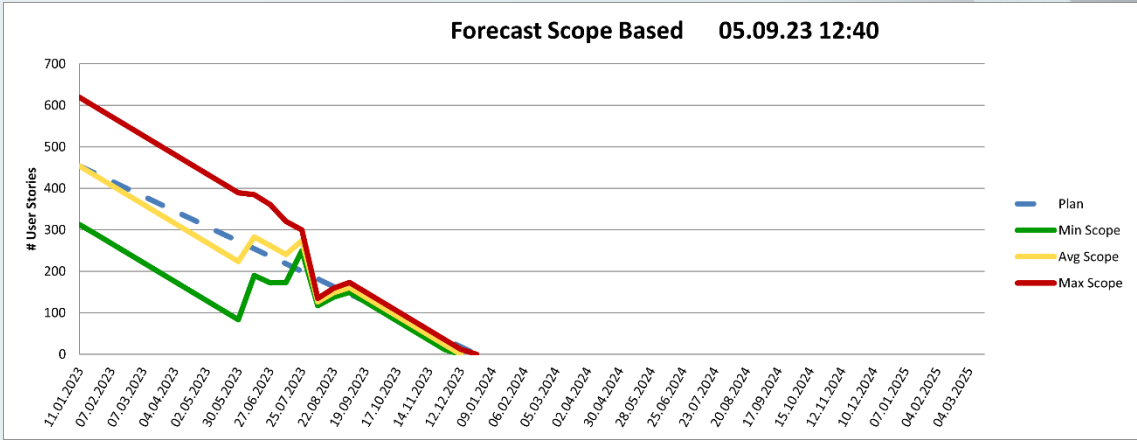
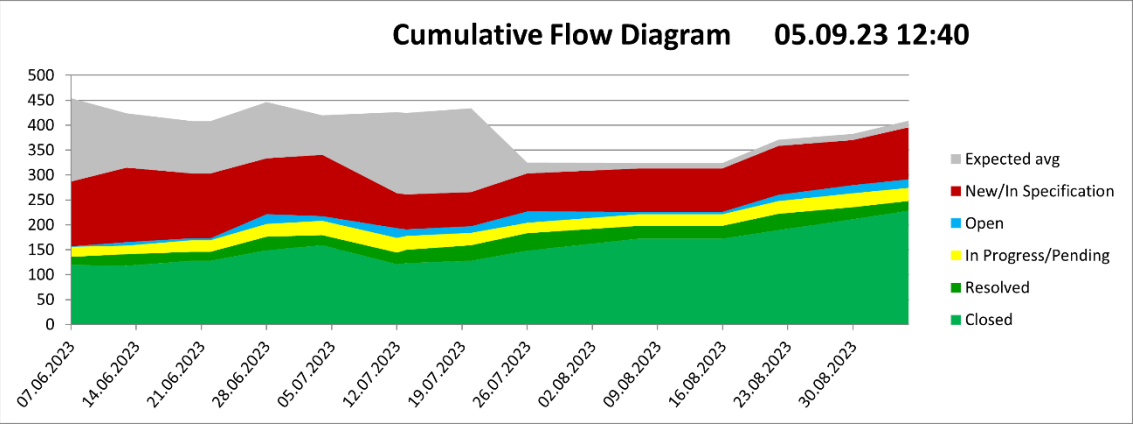
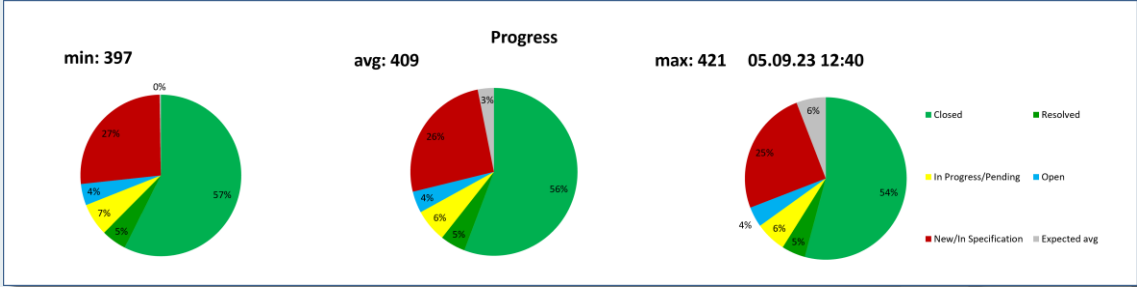
Increase of workload: summerbreak and additional work identified.



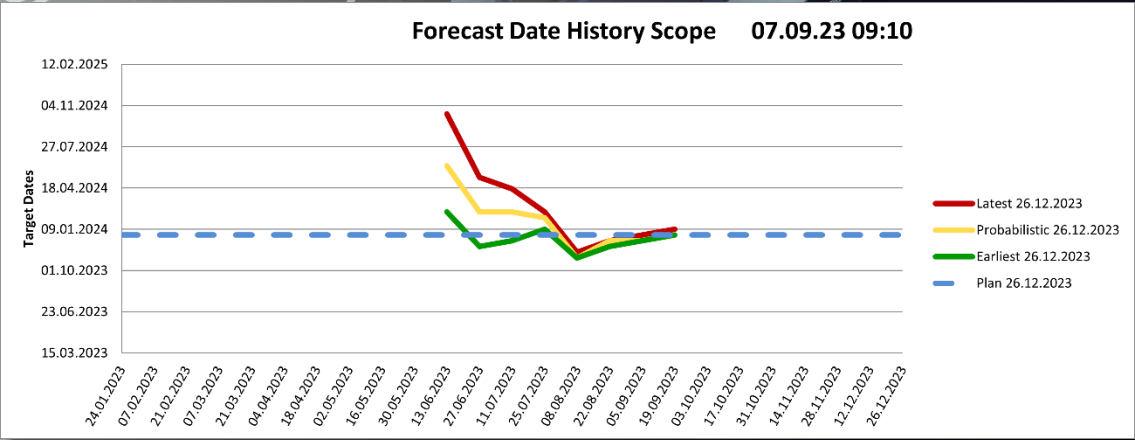
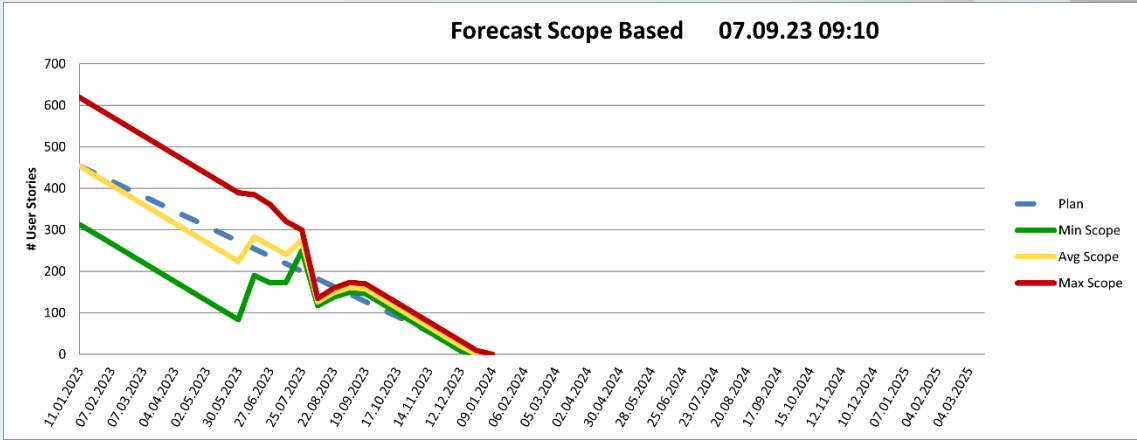
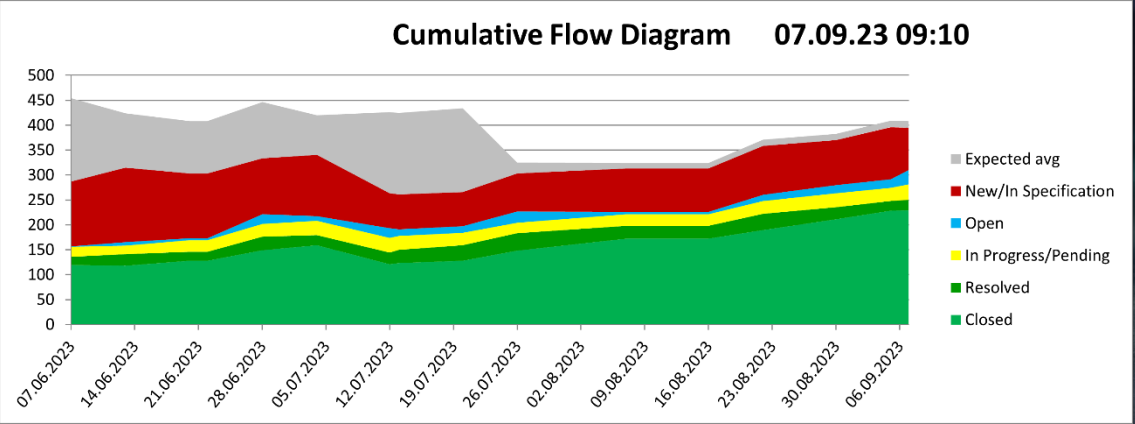
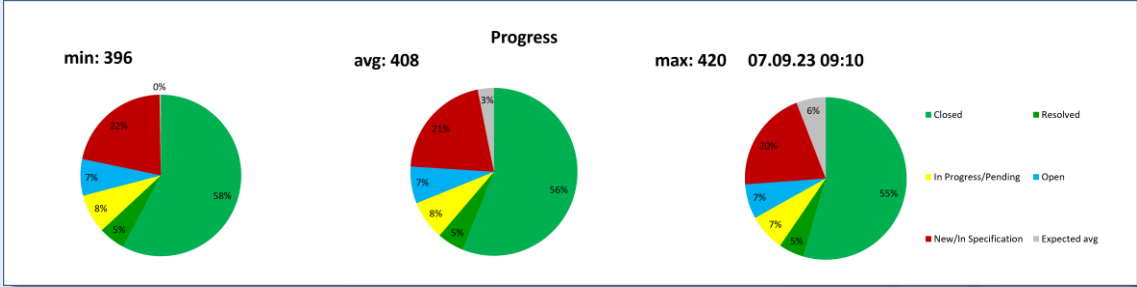
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



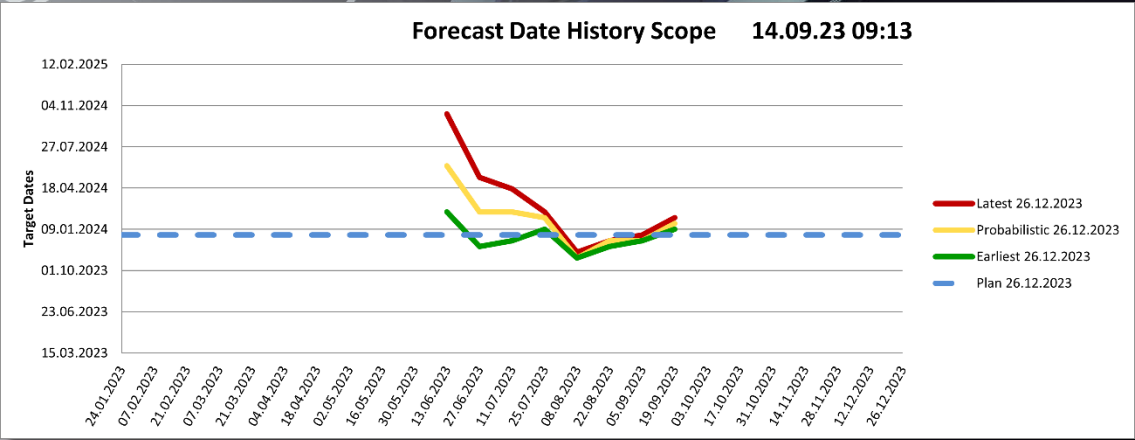
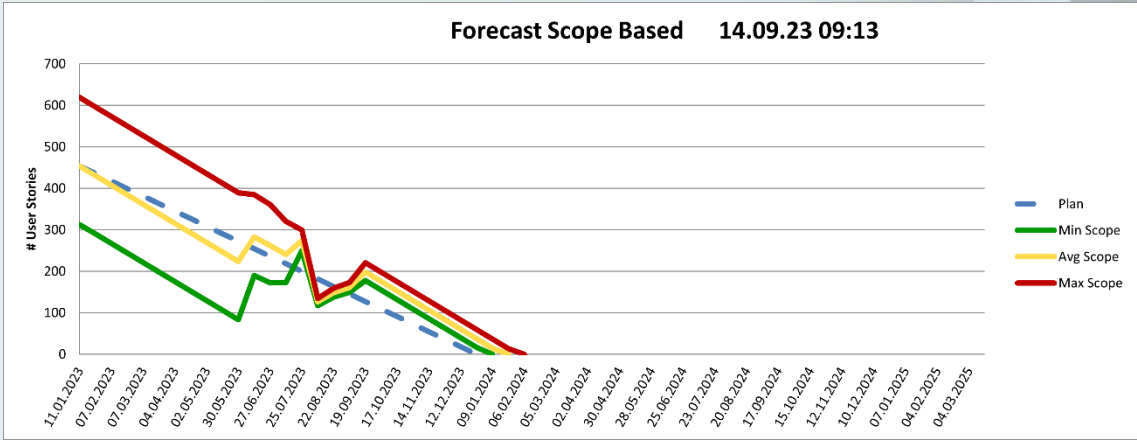
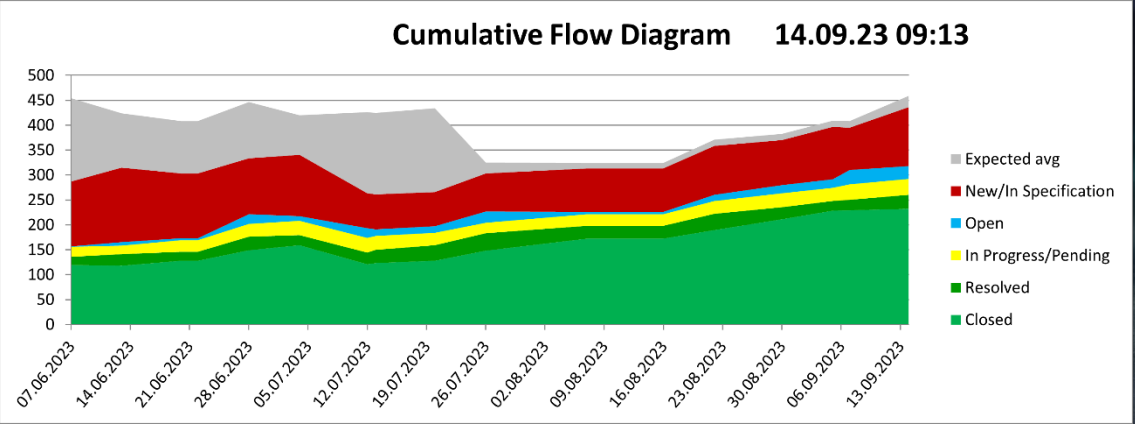
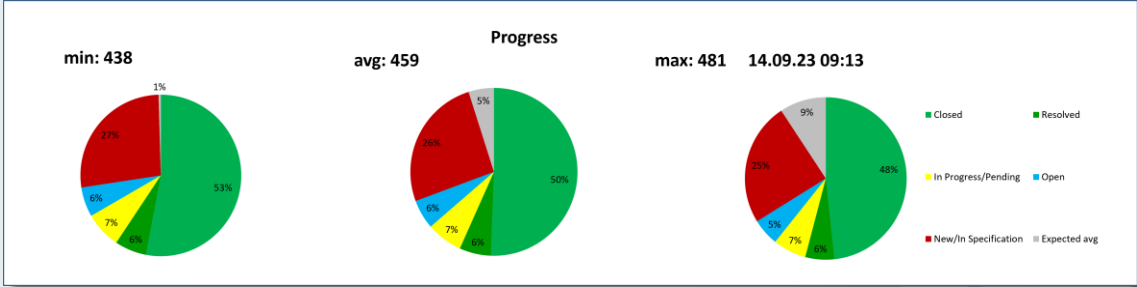
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



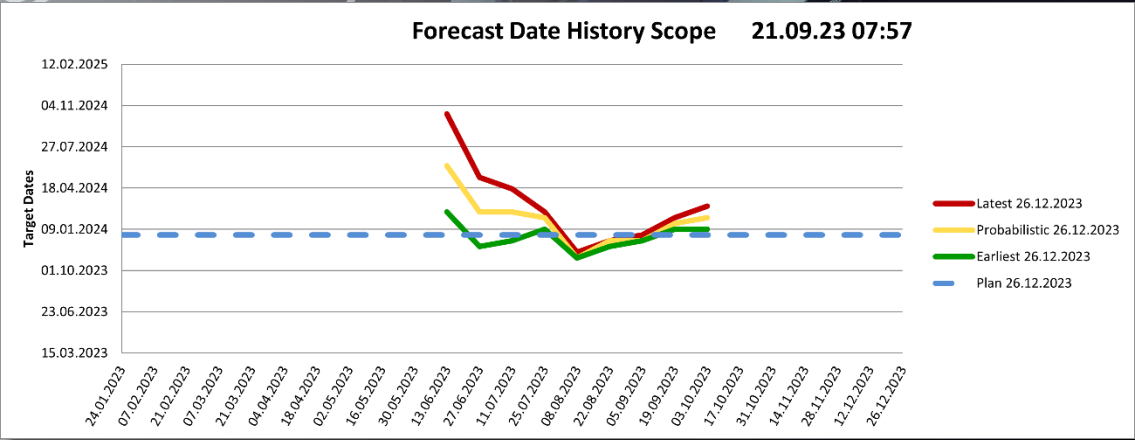
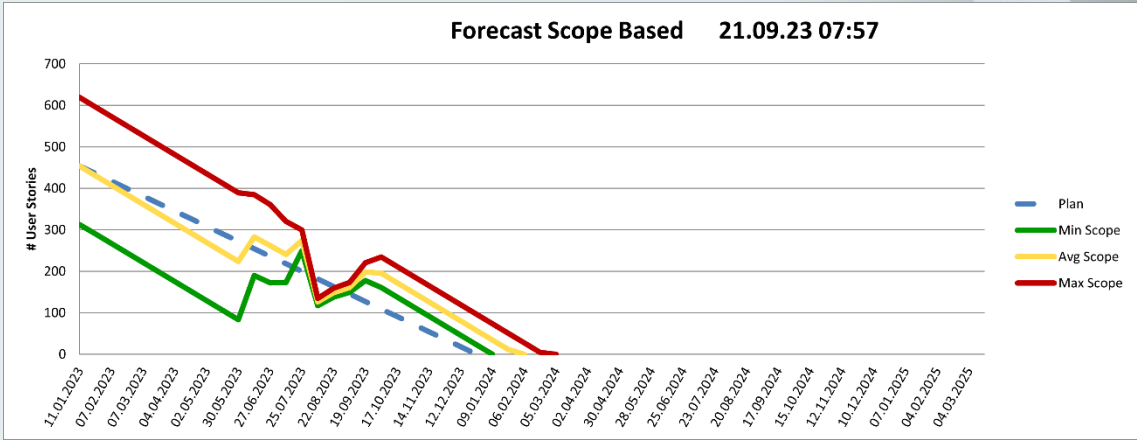
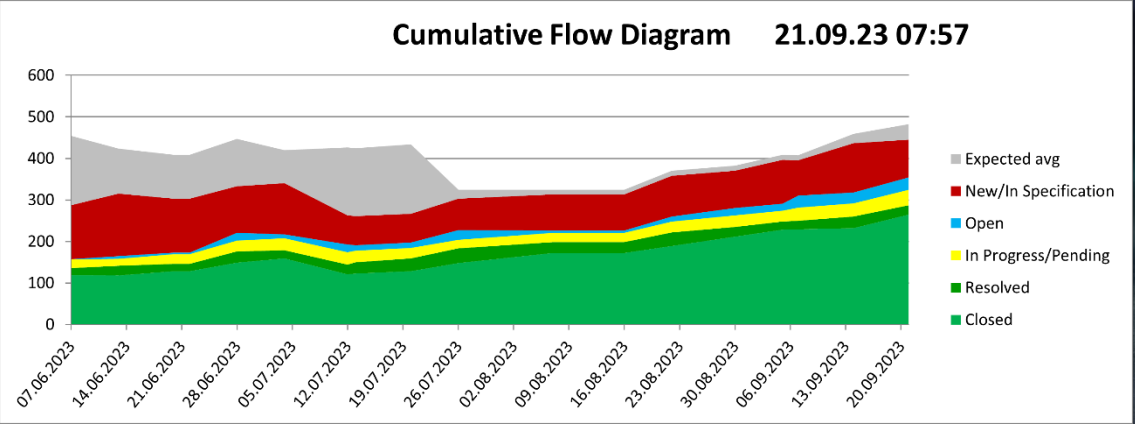
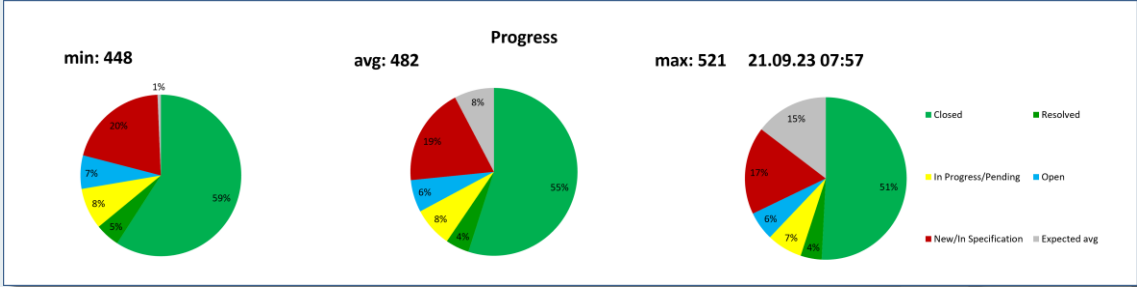
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



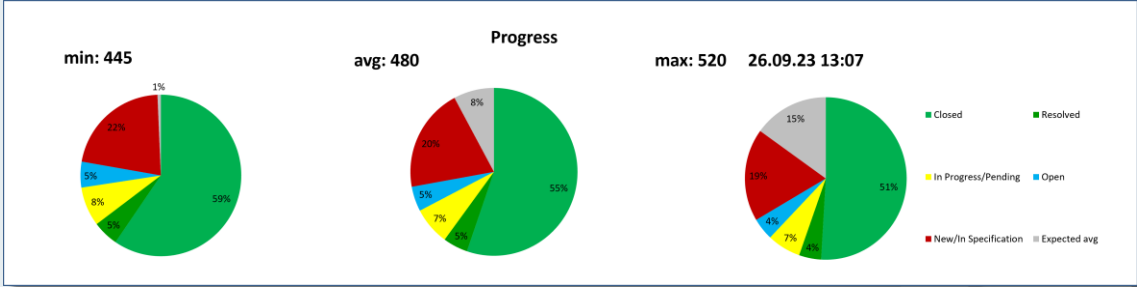
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



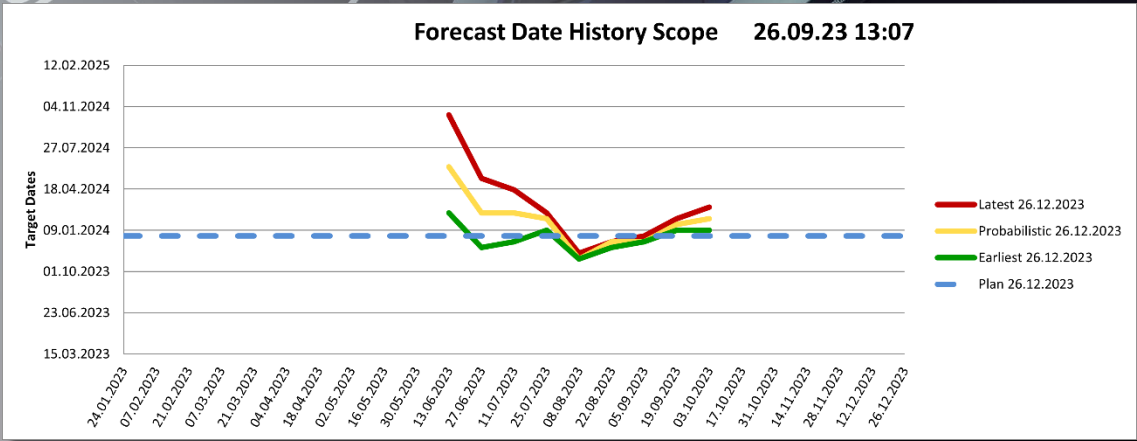
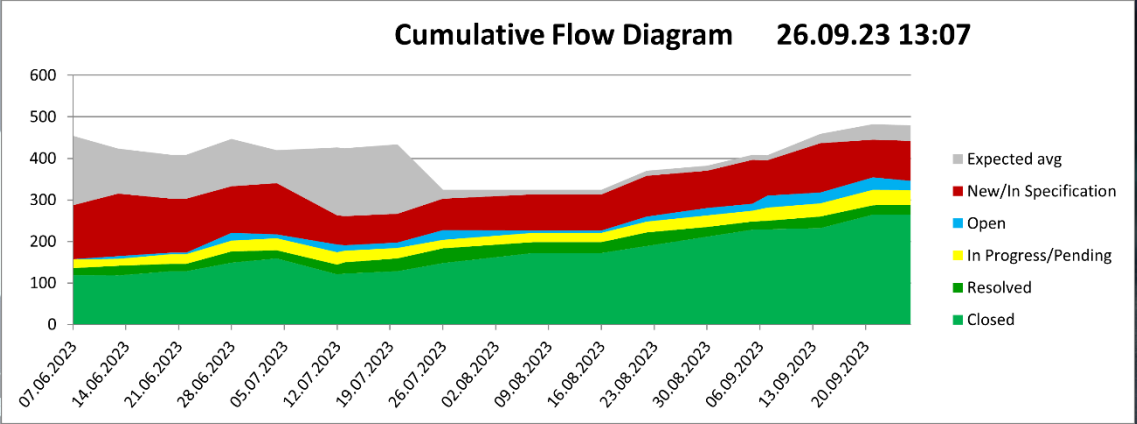
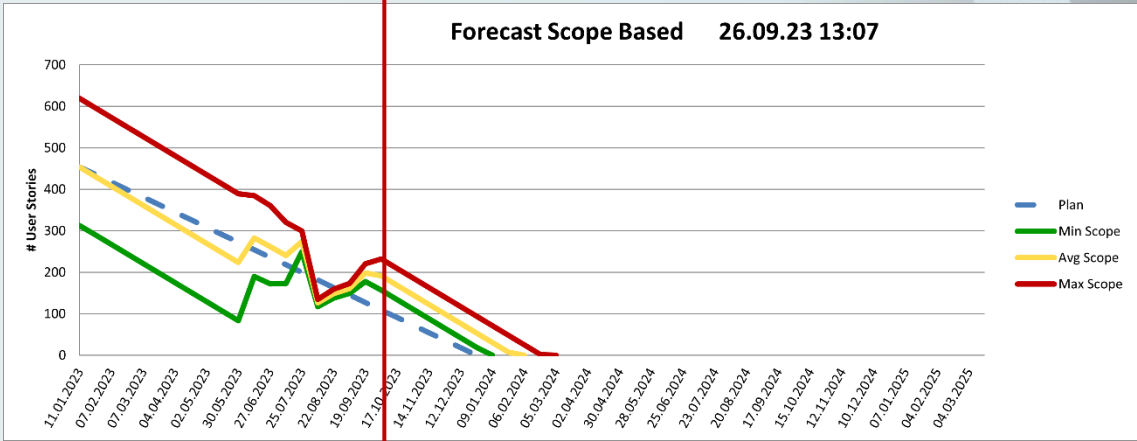
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



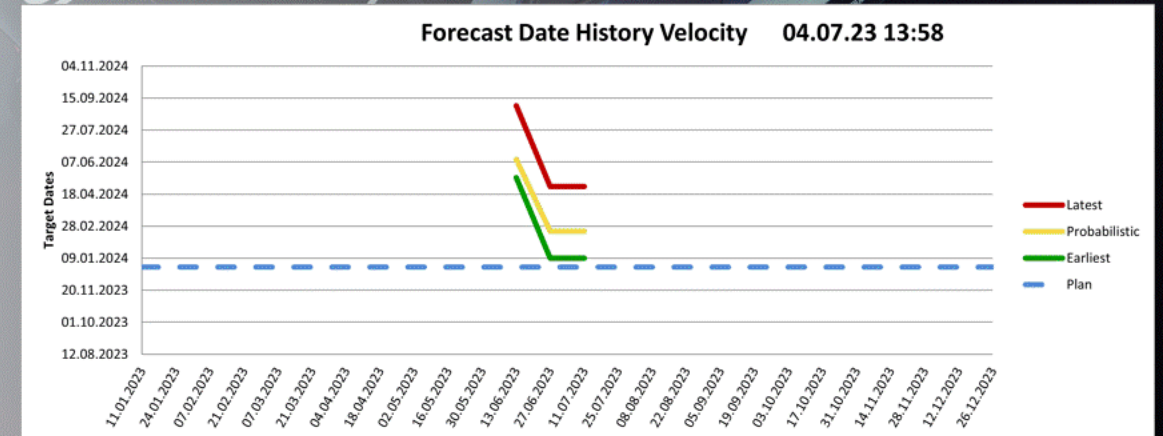
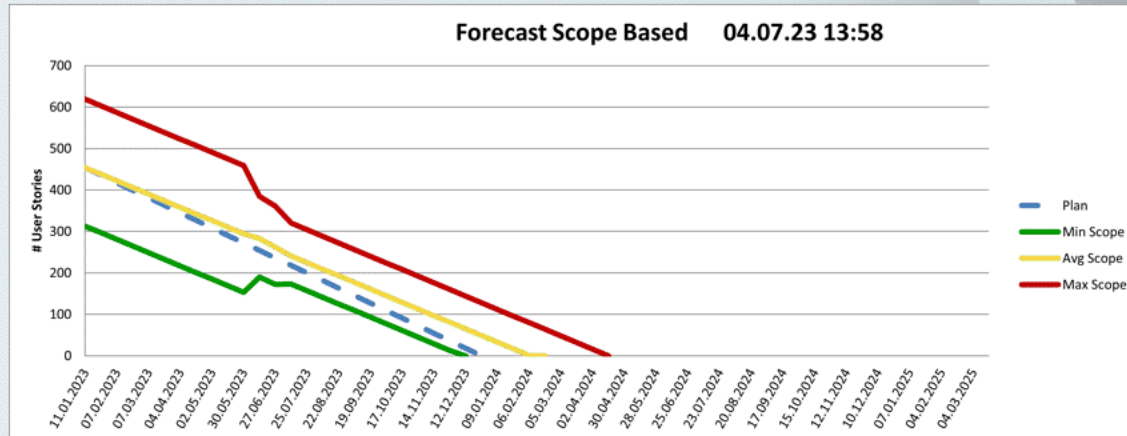
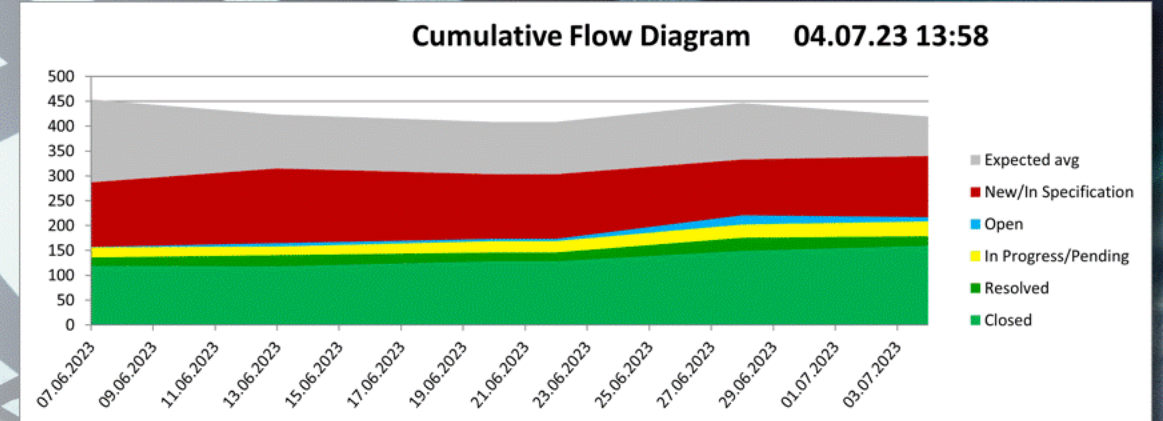
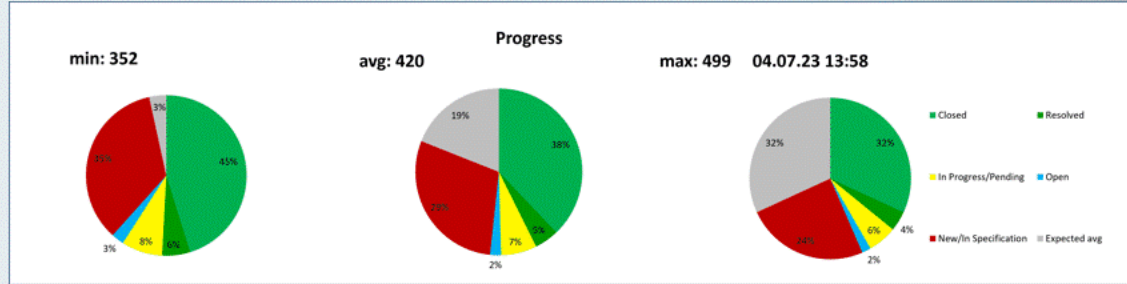
BACKLOG VISUALIZATION – WHERE WE ARE NOW.



Velocity back to normal.
One team heavily blocked.



BACKLOG VISUALIZATION – WHERE WE ARE NOW.



**VISUALIZE
YOUR
BACKLOG.
NOW.**



Q & A Session



THANK YOU VERY MUCH FOR YOUR ATTENTION.



What Does Similar Size Mean?

Similar size refers to items on the same level

<Theme>



Range of items on this level (if needed) doesn't matter that much

Try to keep representing customer value for this item level. Sometimes it's better to split for more accurate predictability.

<Epic>

Range of items on this level matters even more

It's easy to achieve. Try to keep representing customer value for this item level. But sometimes it's better to split for more accurate predictability*.

<Item>

Range of Items on this level matters a lot

Rule of thumb: 3 – 5 Product Backlog Items (User Stories) per team and sprint.

The value of standard deviation is a good indicator, if items have a similar size.

Why? This will lead to a 66% - 80% predictability accuracy if the team works together on each item according to the priority.

Another splitting technique that guarantees quite similar items is when using Fibonacci numbers and splitting Items equal to or bigger than 13.

* This is a concession for milestone planning and forecasting and is helpful when such a constraint exists.

Waterlines in Product Backlogs

A problem of a burndown chart

Burndowns show us if we are on track or not, but in discussions with stakeholders, we often need to make statements about what we will deliver and which items we might miss.

Furthermore, the visualization of waterlines in Product Backlogs can help to recognize the effects of re-prioritization immediately.

Waterlines for Multiple Sprints & Releases

	A	B	C	D	E	F	G	H	I	J	K	L	M
	Hierarchie_easy BI	Schlüssel	Zusammenfassung	Status	Story Points	System	Sprint	Priorität	Erstellt	Aktualisiert	Vorgangstyp	Lösungsversion(en)	Agile Teams
1	VM-	KFZIV-	eVB-Nr	Im Sprint	3	EDwin	EDwin	3 normal	#####	#####	Story	2016-	
2	VM-	AS-5229	Reports	Im Sprint	2	EDwin	EDwin	3 normal	#####	#####	Story	2016-	EDwin
3	VM-	AS-5230	GEPU-	Im Sprint	2	EDwin	EDwin	3 normal	#####	#####	Story	2016-	EDwin
4	VM-	KFZIV-	Datenba	Im Sprint	8	EDwin	EDwin	3 normal	#####	#####	Aufgabe	2016-	
5	Ende Sprint n + 0				Kapazität: 15 Story Points								
6	VM-	AS-5227	GEPU	Im Sprint	13	EDwin	EDwin	3 normal	#####	#####	Story	2016-	EDwin
7	VM-	AS-5243	Neue	Im Sprint	8	EDwin	EDwin	3 normal	#####	#####	Story	2016-	EDwin
8	Ende Sprint n + 1				Kapazität: 21 Story Points								
9	VM-	AS-5231	Existiere	Im Sprint	5	EDwin	EDwin	3 normal	#####	#####	Story	2016-	EDwin
10	KL-	KL-34562	Maskens	In	8	KOMPA	Sprint	3 normal	#####	#####	Aufgabe		SHU&Te
11	VM-	KFZIV-	Kfz -	In Test	8	Workflow	WF-	3 normal	#####	#####	Aufgabe		Workflow
12	Ende Sprint n + 2				Kapazität: 21 Story Points								
13	Ende Release n + 0				Kapazität: 57 Story Points								
14	VM-	KFZIV-	Kfz -	Ready	8	Workflow	WF-	3 normal	#####	#####	Aufgabe	2016-	Workflow
15	VM-	MC-278	Neues	In	3	Scannen	WF-	3 normal	#####	#####	Story		Workflow
16	KL-	KL-34667	Ungepla	In	0	Partnerv	ParIS-	3 normal	#####	#####	Aufgabe		Paris
17	VM-	KFZIV-	Internet:	In Test	8	eComme	Int Sprint	3 normal	#####	#####	Story	2016-	
18	VM-	KL-34542	Verifizier	In Test	5	eComme	Int Sprint	3 normal	#####	#####	Story		Internet
19	Ende Sprint n + 3				Kapazität: 24 Story Points								
20	VM-	KL-35106	Verifizier	In Test	3	eComme	Int Sprint	3 normal	#####	#####	Story		Internet
21	VM-	KL-32682	Internet	In Test	3	eComme	Sprint 8	3 normal	#####	#####	Story		
22	VM-	KL-34727	Policend	In	5	In-	InEx-	3 normal	#####	#####	Story		Pacos
23	VM-	KL-26154	Weitere	Ready	5	In-	InEx-	3 normal	#####	#####	Story		
24	KL-	KL-34142	GEPU	Ready	2	In-	InEx-	3 normal	#####	#####	Story		
25	VM-	MC-291	EDwin	Ready	5	EDwin	EDwin	3 normal	#####	#####	Story		EDwin
26	Ende Sprint n + 4				Kapazität: 23 Story Points								
27	VM-	MC-240	EDwin	Ready	5	EDwin	EDwin	3 normal	#####	#####	Story		EDwin
28	VM-	MC-266	Reportin	In	8	EDwin	E&P / 6/	3 normal	#####	#####	Story	2016-	
29	VM-	MC-69	Anonym	Neu	8	EDwin	EDwin	3 normal	#####	#####	Story	2016-	
30	Ende Sprint n + 5				Kapazität: 21 Story Points								
31	Ende Release n + 1				Kapazität: 68 Story Points								
32	VM-	MC-268	Ordner	Neu	8	EDwin	EDwin	3 normal	#####	#####	Story		
33													