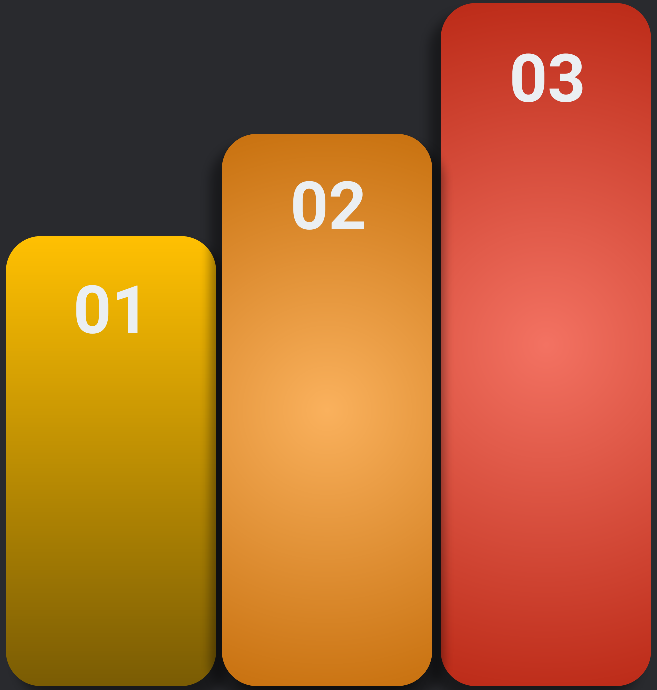
Kanban at Petrobras: how 30 teams delivered better results through the lens of ESP and KMM



Amanda Varella

@amandavarella

/in/amandavarella

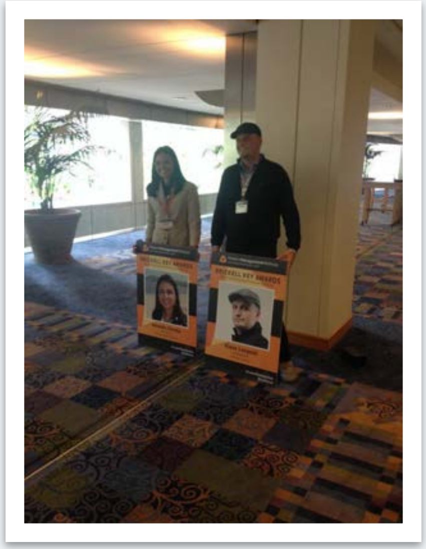
EnterpriseAgility
Europe 2019

About me

Improving business agility since 2008

ACCREDITED KANBAN TRAINER

Dev Manager at envato



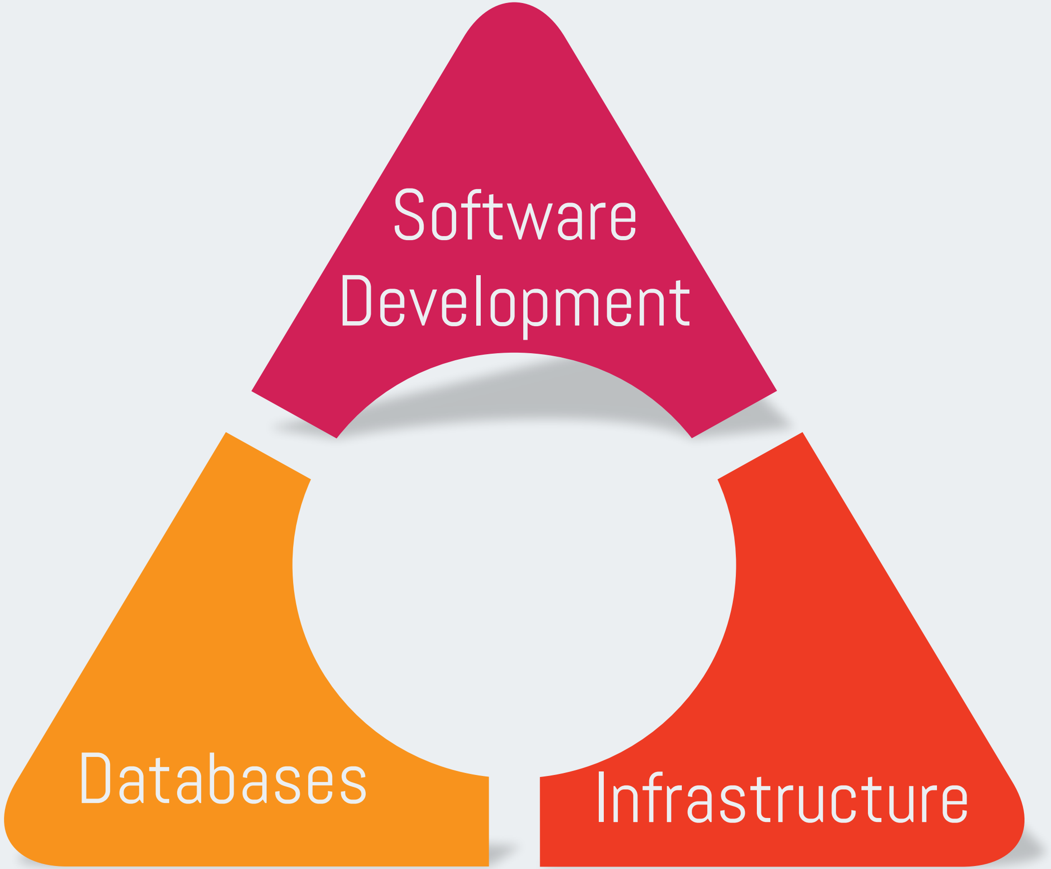
2014
Brickell Key Award
Petrobras Case

Petrobras is the biggest oil and gas company in South America

The company is formed by business areas of Exploitation and Production of oil and gas, and also other supportive areas. Its huge IT sector is segmented by business support

Our IT area supported the main business of the company, developing systems to control the production and exploitation of oil and gas.

Structure



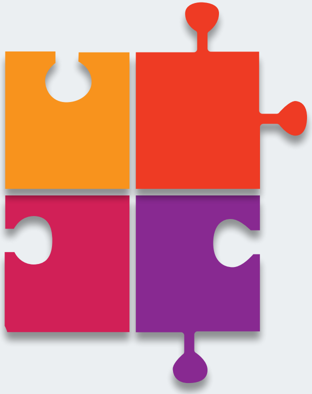
293

people

SNEP

Software Development Area

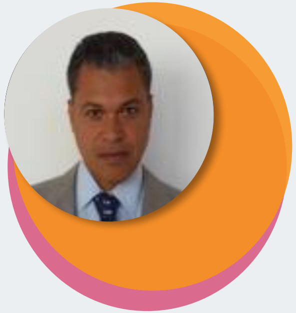
4 departments



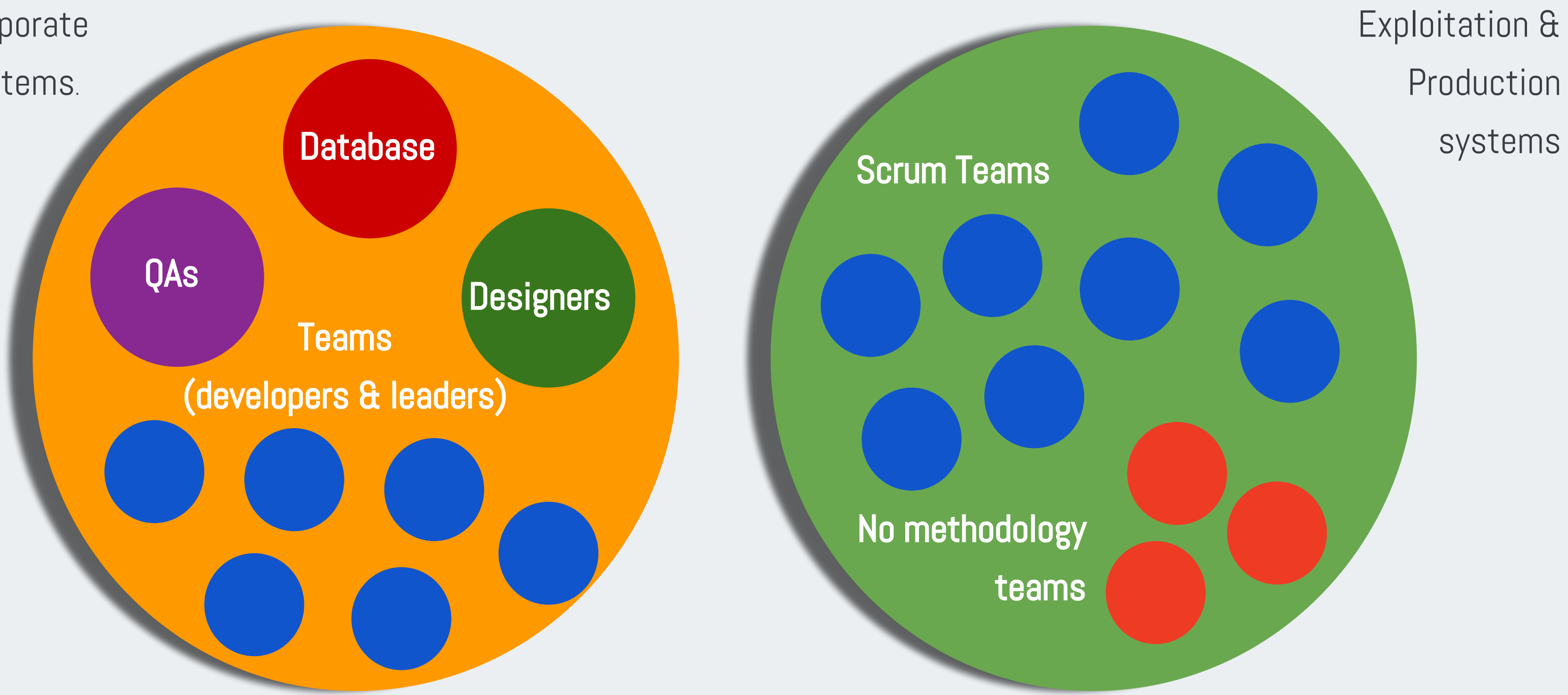
~30 teams

... and a forward

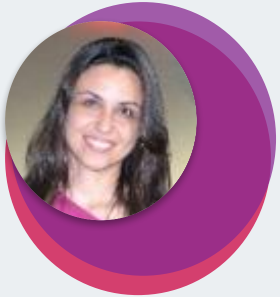
thinker manager



Software Development Area

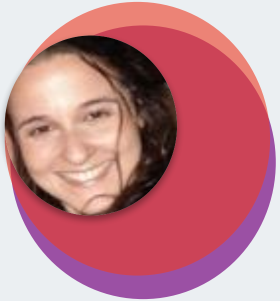


Awesome Teamwork
Continuous Improvement Team



Amanda Varella

Kanban, Agile
Culture



Cristine Dantas

DevOps

Daniel Borges

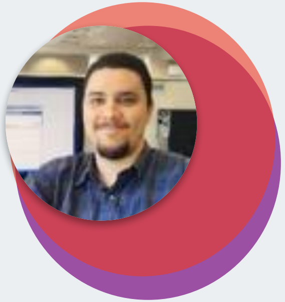
DevOps

Camila Bastos

DevOps

Fabiana Sampaio

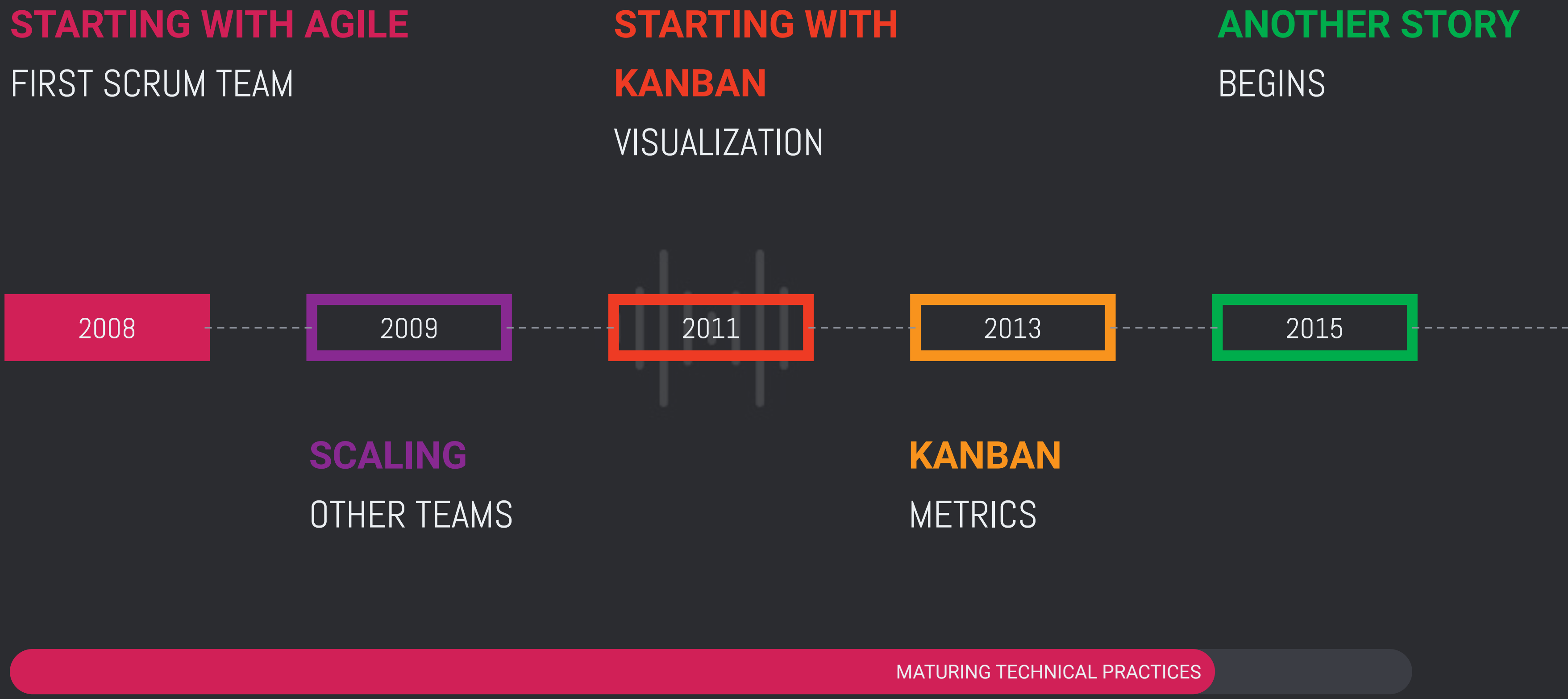
Databases



Bruno Guerchon

Software Development

Purpose: help teams to get into a state of continuous delivery and improvement



STARTING WITH AGILE

FIRST SCRUM TEAM

2008

2009

SCALING

OTHER TEAMS

STARTING WITH KANBAN

VISUALIZATION

2011

2013

KANBAN

METRICS

ANOTHER STORY

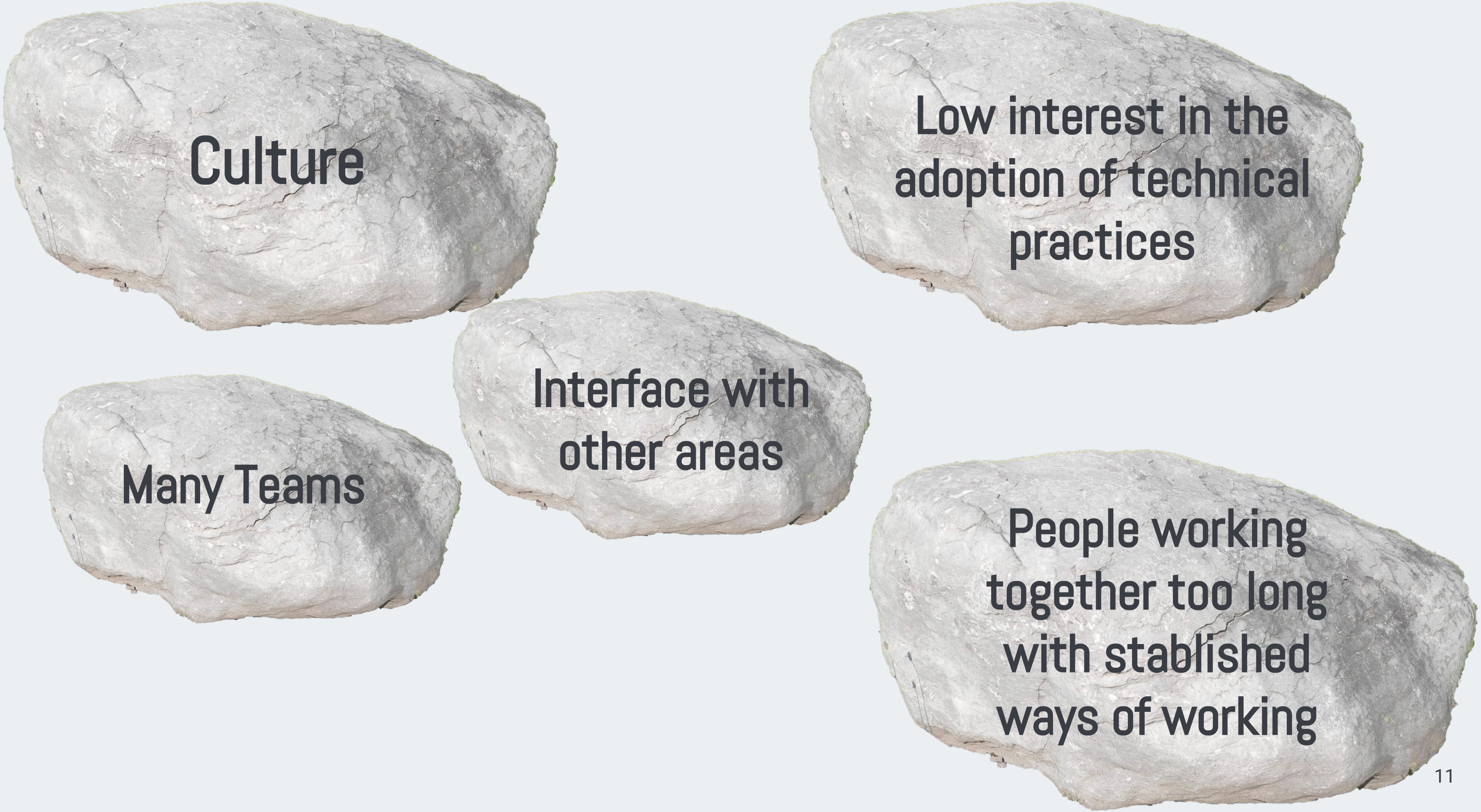
BEGINS

2015

MATURING TECHNICAL PRACTICES

EVOLUTIONARY CHANGE

The experience was not a rose-strewn path



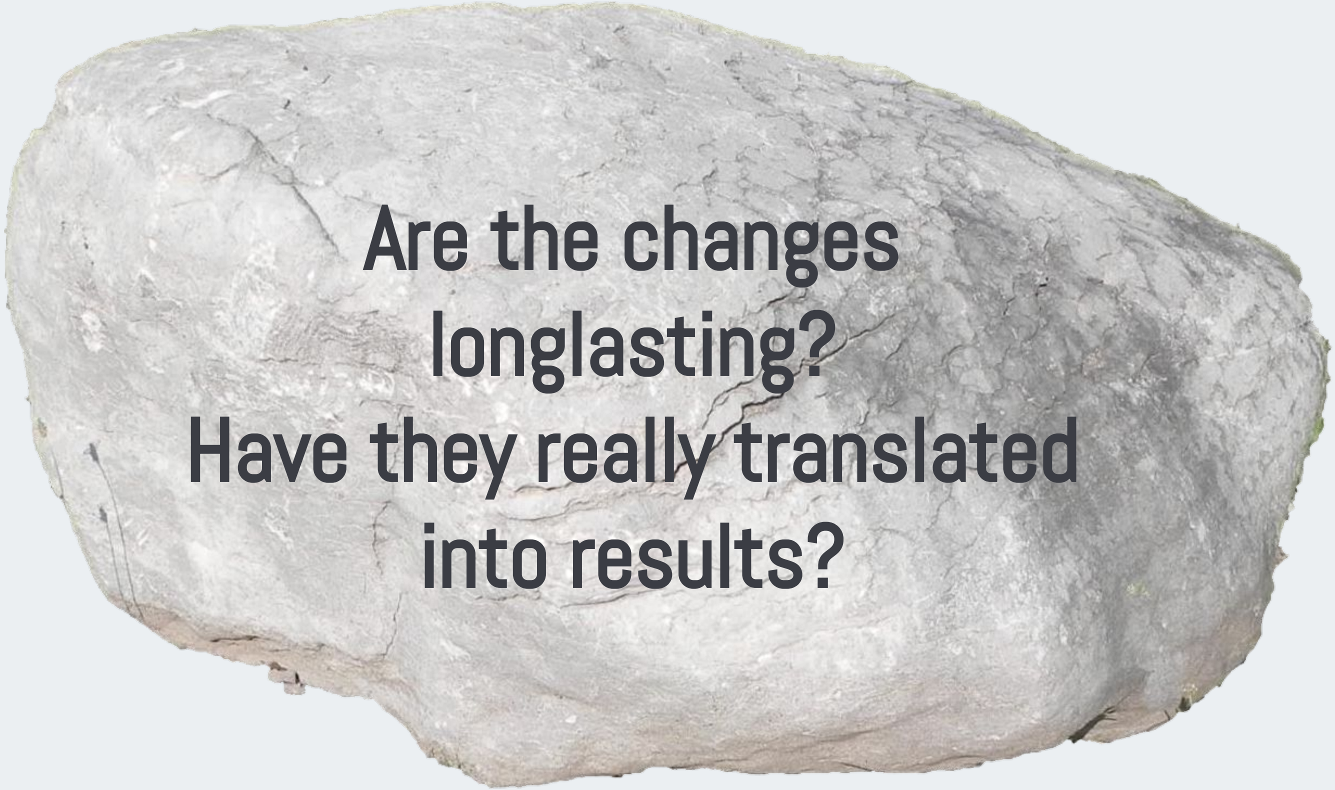
Culture

Low interest in the adoption of technical practices

Interface with other areas

Many Teams

People working together too long with stablished ways of working



Are the changes longlasting?

Have they really translated into results?

- 🟢 Some teams had great results and kept improving
- 🔵 Others got better, but took some steps back
- 🟡 Others stayed the same
- 🔴 Fortunately no team got worse than before

The Challenge

How to promote longlasting changes?

Acompanhamento de Projetos - CPROD - Coordenação de Produção
JAN
FEV
MAR
ABR
MAI
JUN
JUL
AGO
SET
OUT
NOV
DEZ

Happiness at ML-2

ML-2

Recognisable Patterns

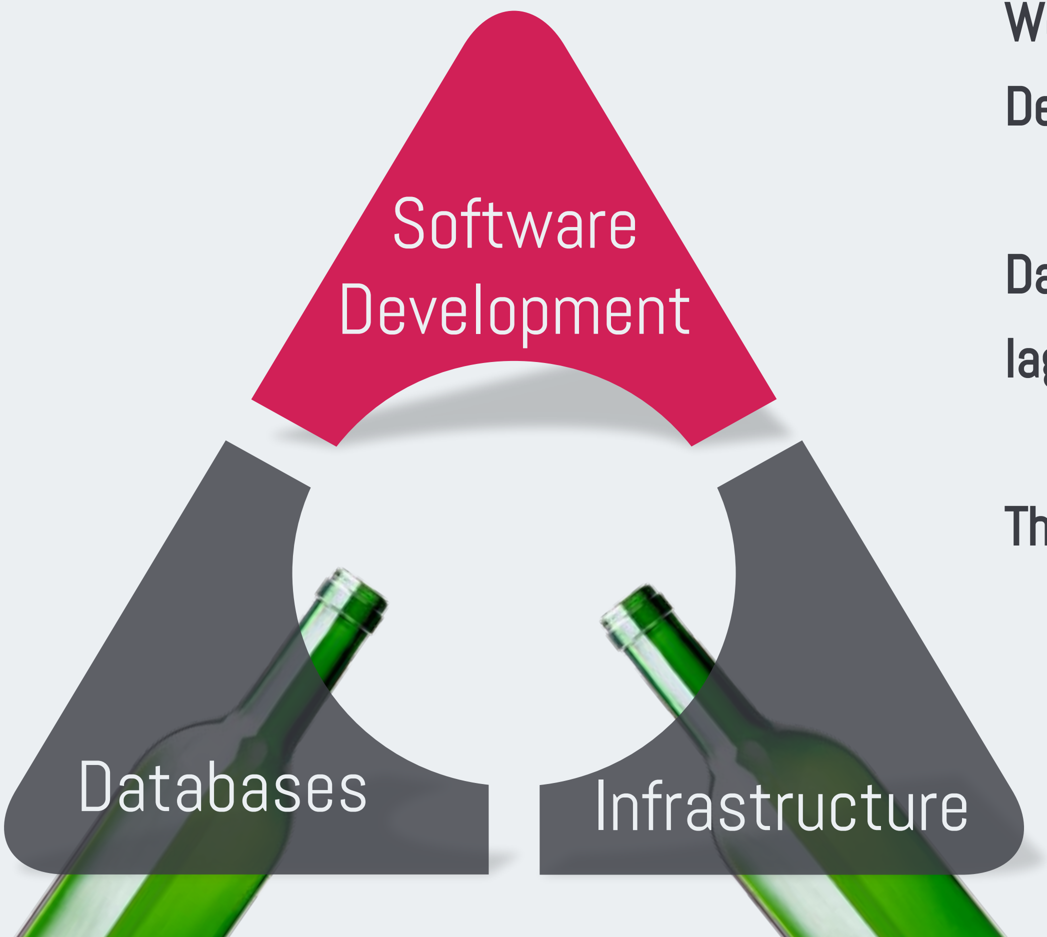
We are Scrum Teams

We are happy workers

We have consistent processes

Our customer is relatively happy

We have a rudimentary portfolio Kanban



We were optimising the Software Development Area

Databases and Infrastructure were lagging behind

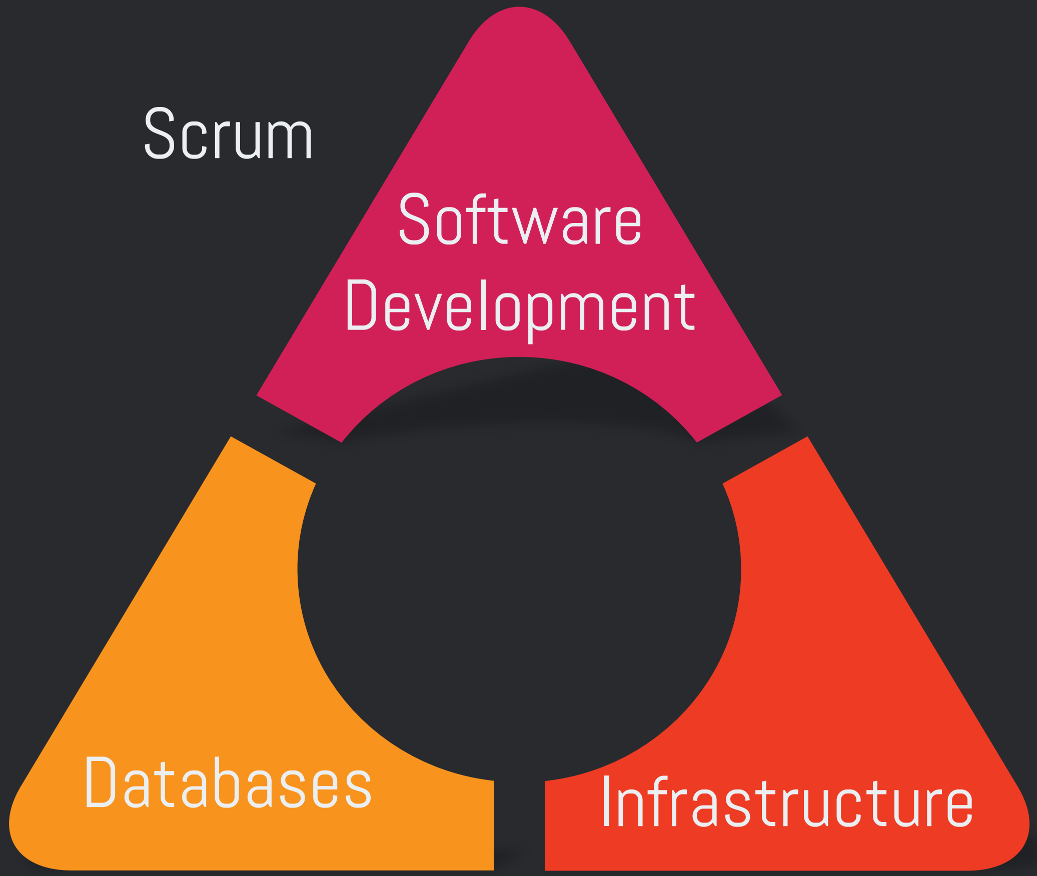
The bottlenecks were moving

David Anderson gave his second Training in Brazil in 2010

There, I met Alisson Vale, the pioneer of Kanban in Brazil. He became our consultant

Our Initial Idea

Trying to convince the managers from Infrastructure and Database areas to start with Kanban



Scrum

kanban systems

kanban systems

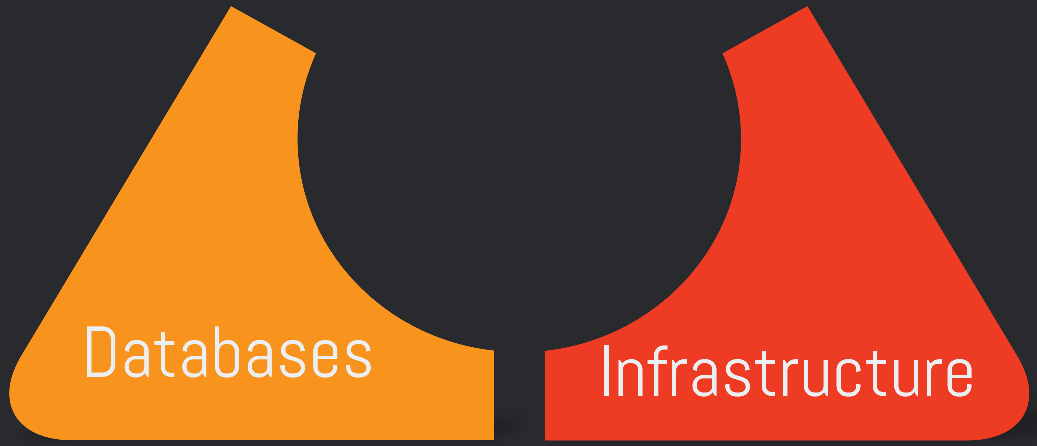
Didn't work!

The managers initially liked the idea,

but didn't put the effort to make it work

It was someone from outside, proposing something

FAIL



Databases

Infrastructure

kanban systems

kanban systems

And then we had Alisson.
How could we use his services now that the original plan had failed?

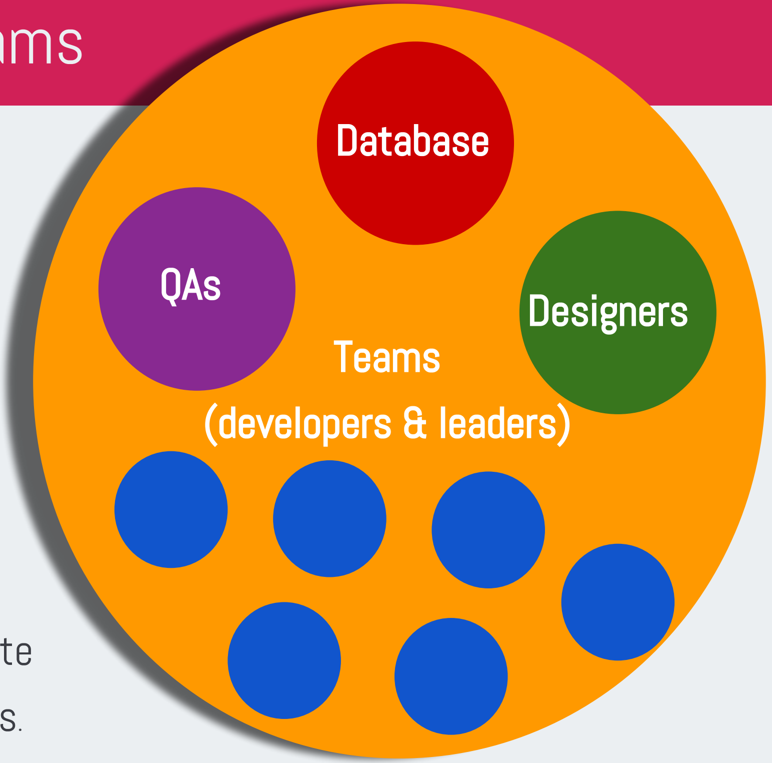
Well, let's work inside the software development area.

After all we still have many things to be improved

Businesses are ecosystems of interdependent services

First Experiment

Kanbanizing the services consumed by the software development teams



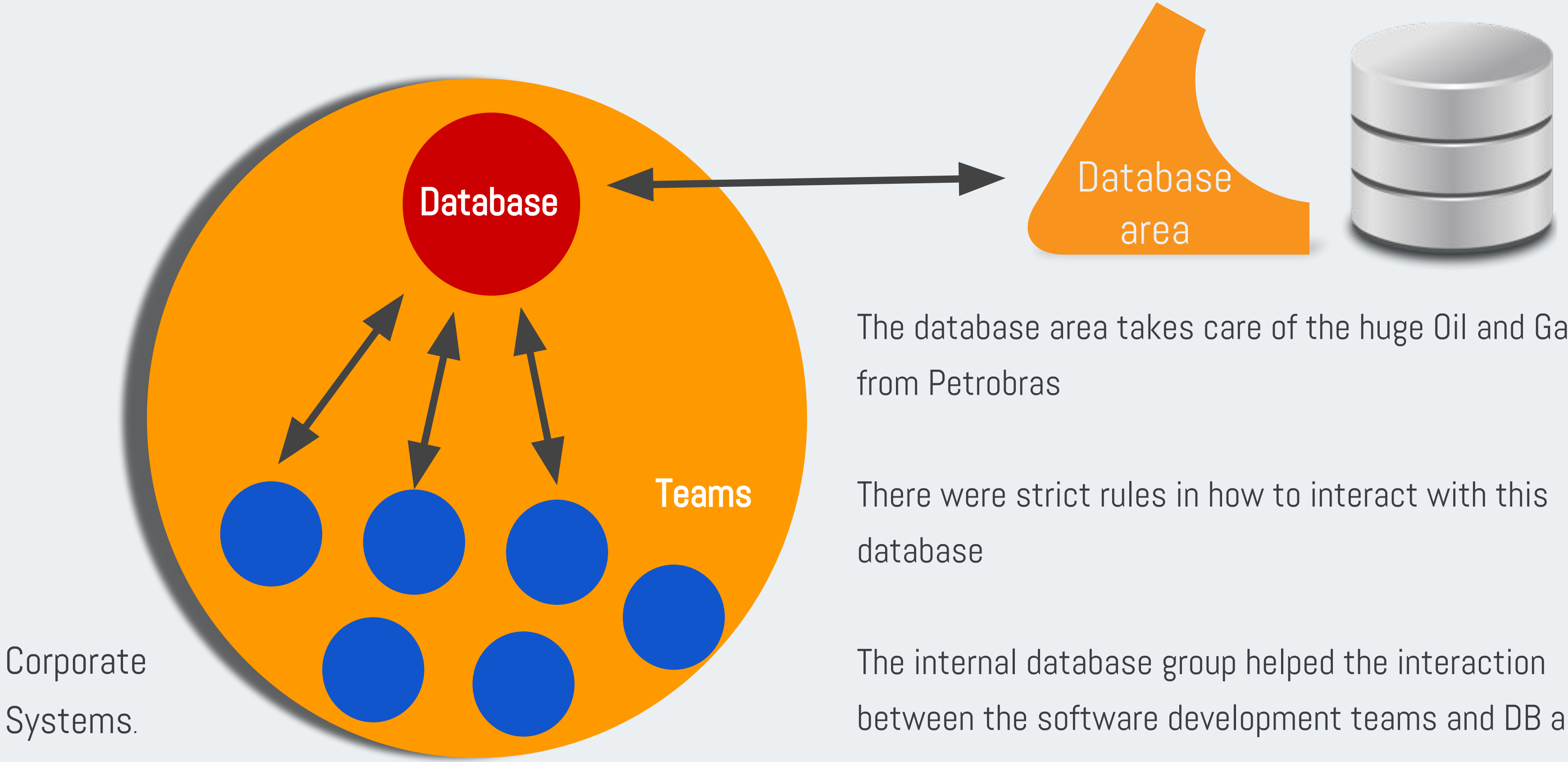
Corporate Systems.

The structure had worked that way for many years.

We thought that making these professionals work in cross-functional teams would be very disruptive and could hurt their identities, hence, provoking more resistance.

Also, there were economical reasons that could justify the functional groups.

Internal Database Group as a Service



The database area takes care of the huge Oil and Gas data from Petrobras

There were strict rules in how to interact with this database

The internal database group helped the interaction between the software development teams and DB area.

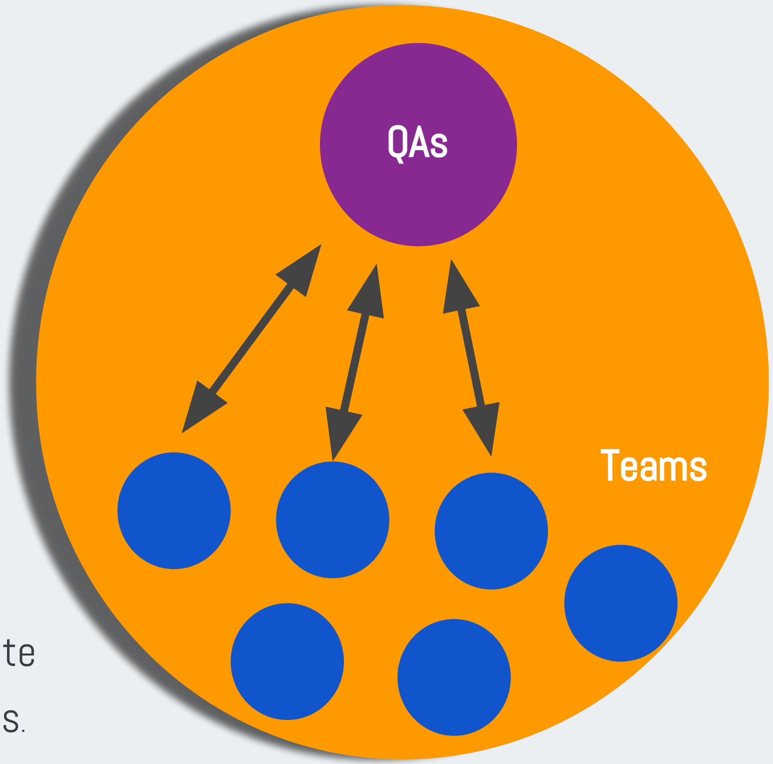
Internal Database Group as a Service

Experiment worked.

The team was formed by 4 people, and the level of service provided to the teams was enough.

No complaints!

QAs as a Service



Corporate

Systems.

QA was a traditional testing group.

They received code to test after developed,

needing much more documentation

than was needed.

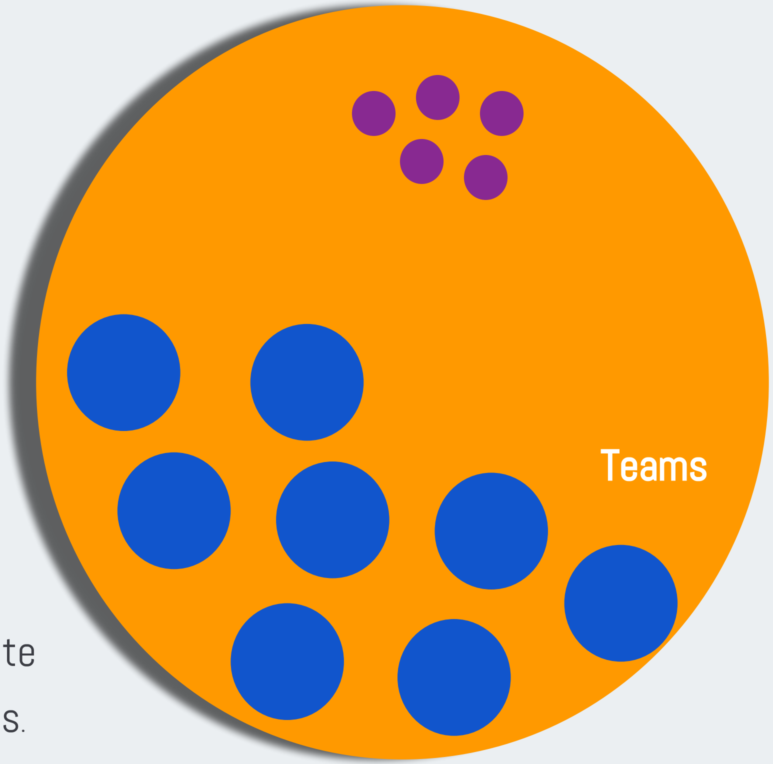
Service levels were not being met

With the constant complaints of the developers,

it was clear that the model wasn't working

Now, It would be easier to change.

QAs inside teams



Corporate

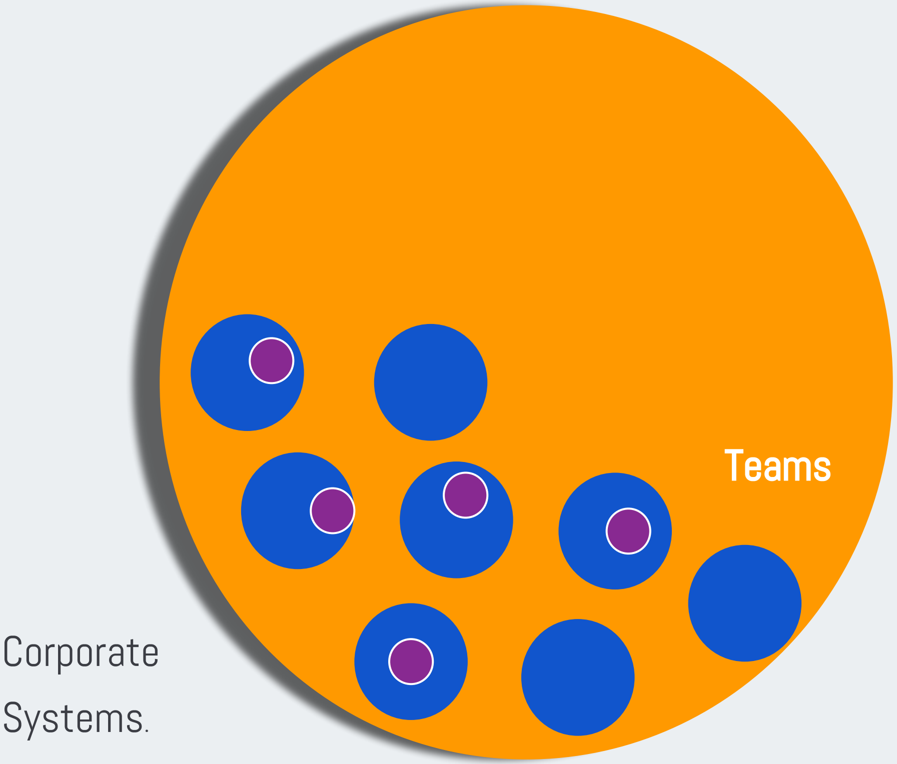
Systems.

The QA were assigned to the teams
Some of them were assigned to 1 or
2 teams

Some teams stayed without
a QA role

The assignment was based
on the criticality of each
System developed

QAs inside teams



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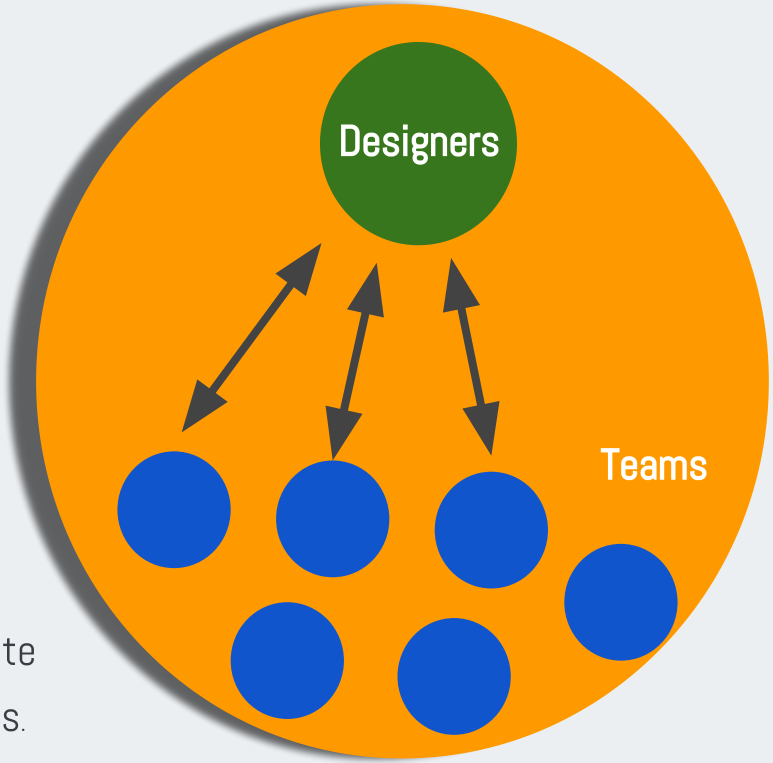
Designers as a Service



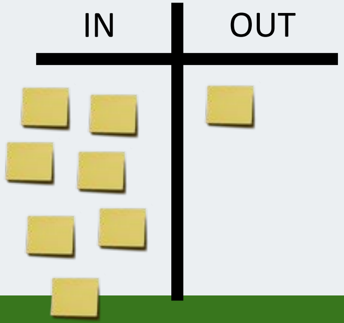
Corporate Systems.

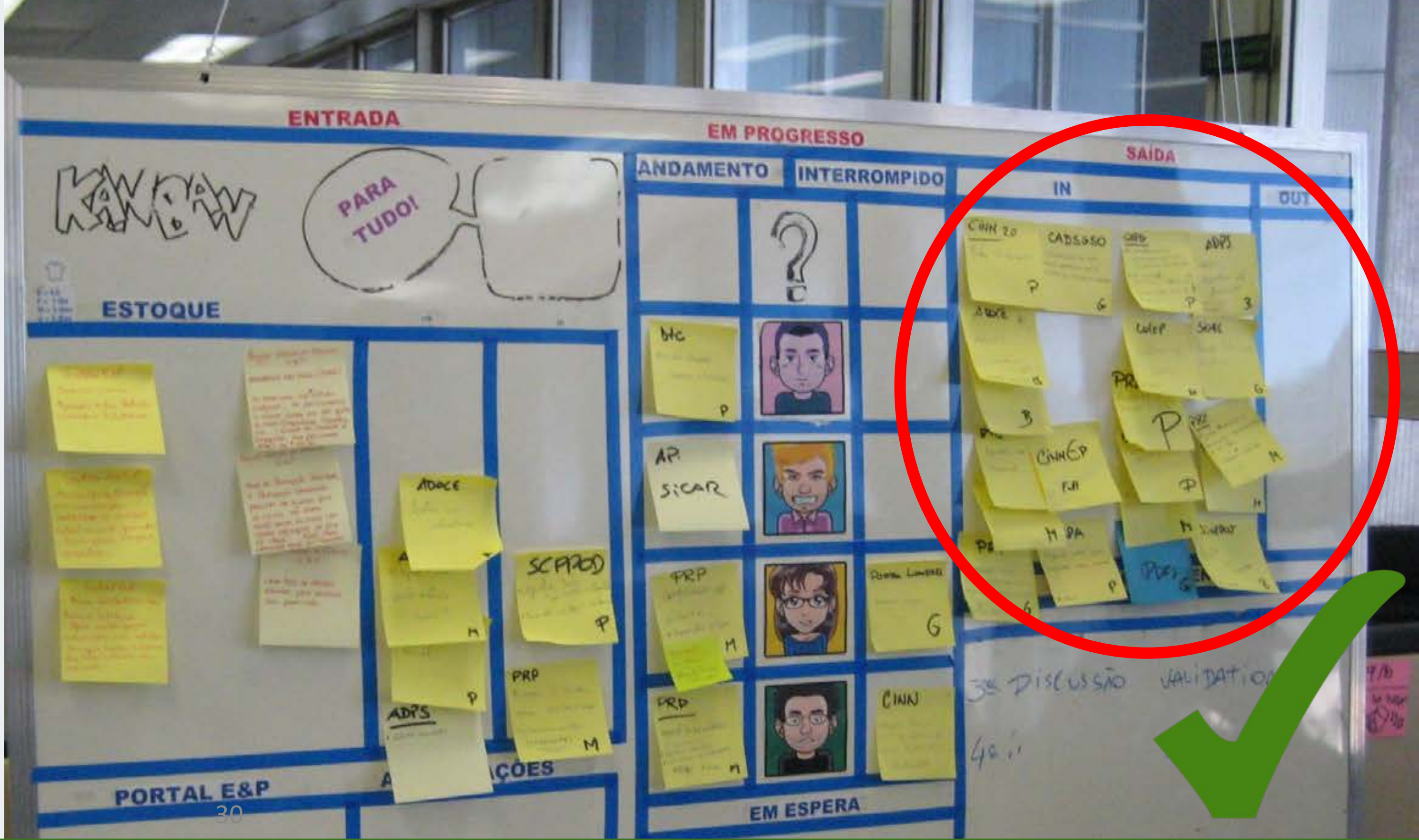
Due to the nature of the systems, most of them didn't need full time designers

They classified the job using T-Shirt sizes and assigned SLA targets.

Most of the times they had a DDP of **90%** or more.

Plus, the development leaders evaluation saying that everything was okay





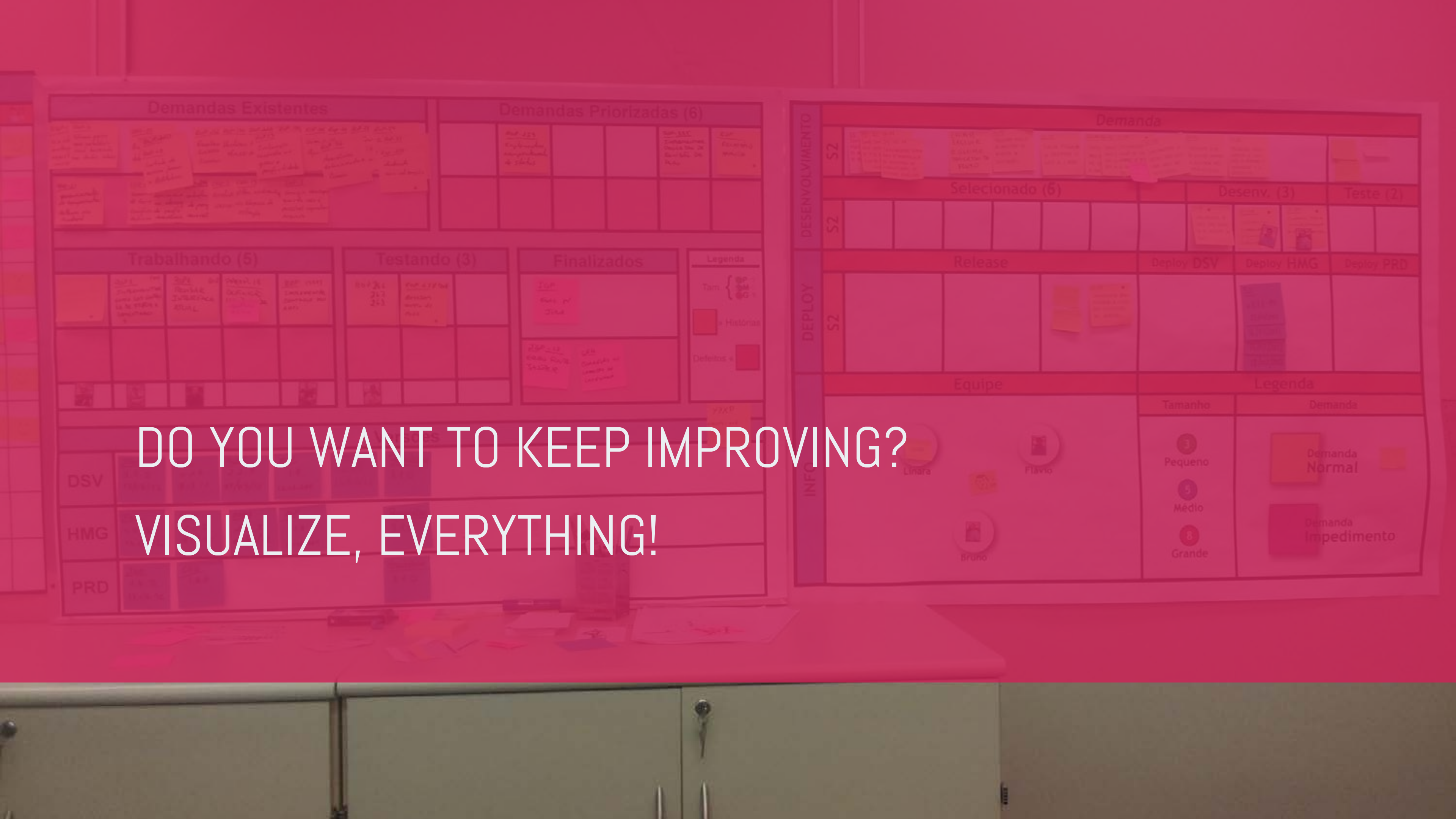
Designers as a Service

There is life beyond Multidisciplinary Teams

Not every service needs to be provided by a multidisciplinary team

Shared services can provide great results and economical benefits if well managed

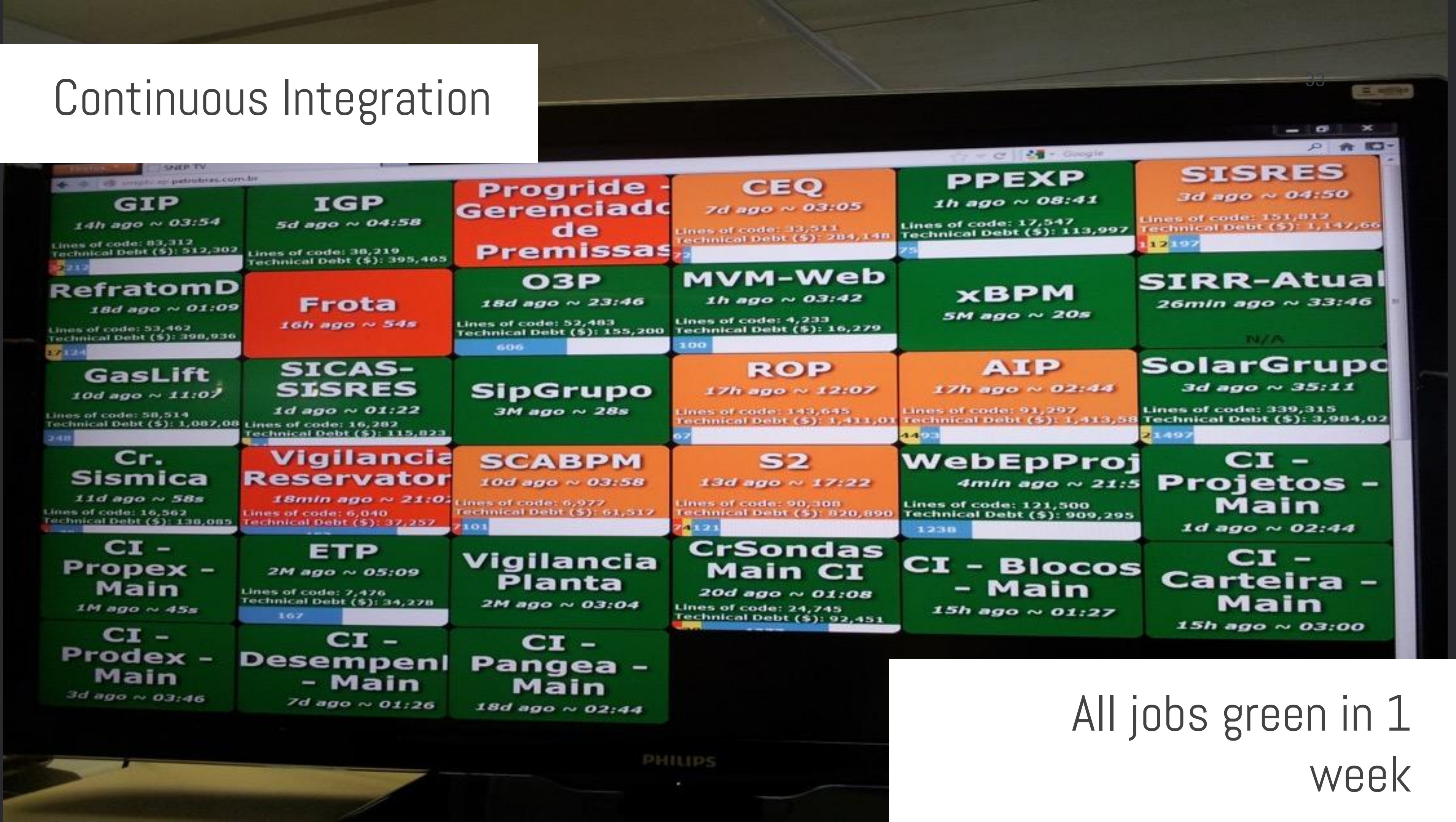
It all depends on the context



DO YOU WANT TO KEEP IMPROVING?

VISUALIZE, EVERYTHING!

Continuous Integration



GIP
14h ago ~ 03:54
Lines of code: 83,312
Technical Debt ($): 512,302
2 212

IGP
5d ago ~ 04:58
Lines of code: 38,219
Technical Debt ($): 395,465

Progride - Gerenciadc de Premissas

CEQ
7d ago ~ 03:05
Lines of code: 33,511
Technical Debt ($): 284,148
72

PPEXP
1h ago ~ 08:41
Lines of code: 17,547
Technical Debt ($): 113,997
75

SISRES
3d ago ~ 04:50
Lines of code: 151,812
Technical Debt ($): 1,147,66
1 12 197

RefratomD
18d ago ~ 01:09
Lines of code: 53,462
Technical Debt ($): 398,936
17 124

Frota
16h ago ~ 54s

O3P
18d ago ~ 23:46
Lines of code: 52,483
Technical Debt ($): 155,200
606

MVM-Web
1h ago ~ 03:42
Lines of code: 4,233
Technical Debt ($): 16,279
100

xBPM
5M ago ~ 20s

SIRR-Atual
26min ago ~ 33:46
N/A

GasLift
10d ago ~ 11:07
Lines of code: 58,514
Technical Debt ($): 1,087,08
248

SICAS-SISRES
1d ago ~ 01:22
Lines of code: 16,282
Technical Debt ($): 115,823

SipGrupo
3M ago ~ 28s

ROP
17h ago ~ 12:07
Lines of code: 143,645
Technical Debt ($): 1,411,01
67

AIP
17h ago ~ 02:44
Lines of code: 91,297
Technical Debt ($): 1,413,58
44 93

SolarGrupo
3d ago ~ 35:11
Lines of code: 339,315
Technical Debt ($): 3,984,02
2 1497

Cr. Sismica
11d ago ~ 58s
Lines of code: 16,562
Technical Debt ($): 138,085

Vigilancia Reservator
18min ago ~ 21:0
Lines of code: 6,040
Technical Debt ($): 37,257

SCABPM
10d ago ~ 03:58
Lines of code: 6,977
Technical Debt ($): 61,517
7 101

S2
13d ago ~ 17:22
Lines of code: 90,308
Technical Debt ($): 820,890
7 4 121

WebEpProj
4min ago ~ 21:5
Lines of code: 121,500
Technical Debt ($): 909,295
1238

CI - Projetos - Main
1d ago ~ 02:44

CI - Propex - Main
1M ago ~ 45s

ETP
2M ago ~ 05:09
Lines of code: 7,476
Technical Debt ($): 34,278
167

Vigilancia Planta
2M ago ~ 03:04

CrSondas Main CI
20d ago ~ 01:08
Lines of code: 24,745
Technical Debt ($): 92,451

CI - Blocos - Main
15h ago ~ 01:27

CI - Carteira - Main
15h ago ~ 03:00

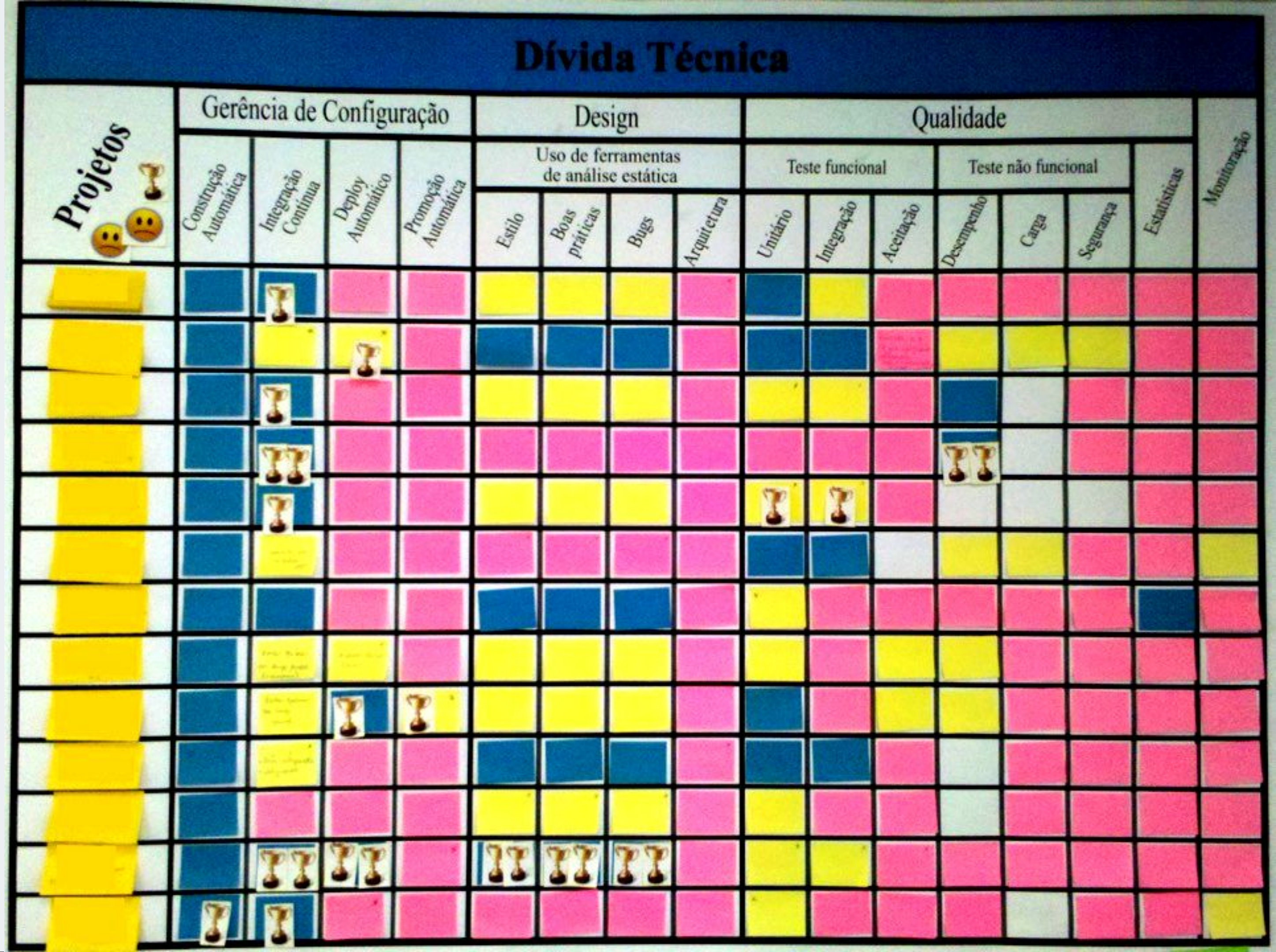
CI - Prodex - Main
3d ago ~ 03:46

CI - Desempenl - Main
7d ago ~ 01:26

CI - Pangea - Main
18d ago ~ 02:44

All jobs green in 1 week

30% Reduction of Technical Debt in 1 year



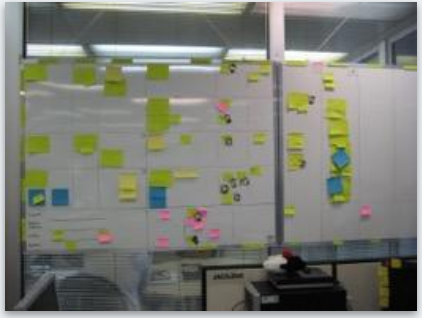
4 departments

Acompanhamento de Projetos - CPROD - Coordenação de Produção
JAN
FEV
MAI
JUN
JUL
AGO
SET
OUT
NOV
DEZ
SCRR
SNRES
SAG
PCA
CEP

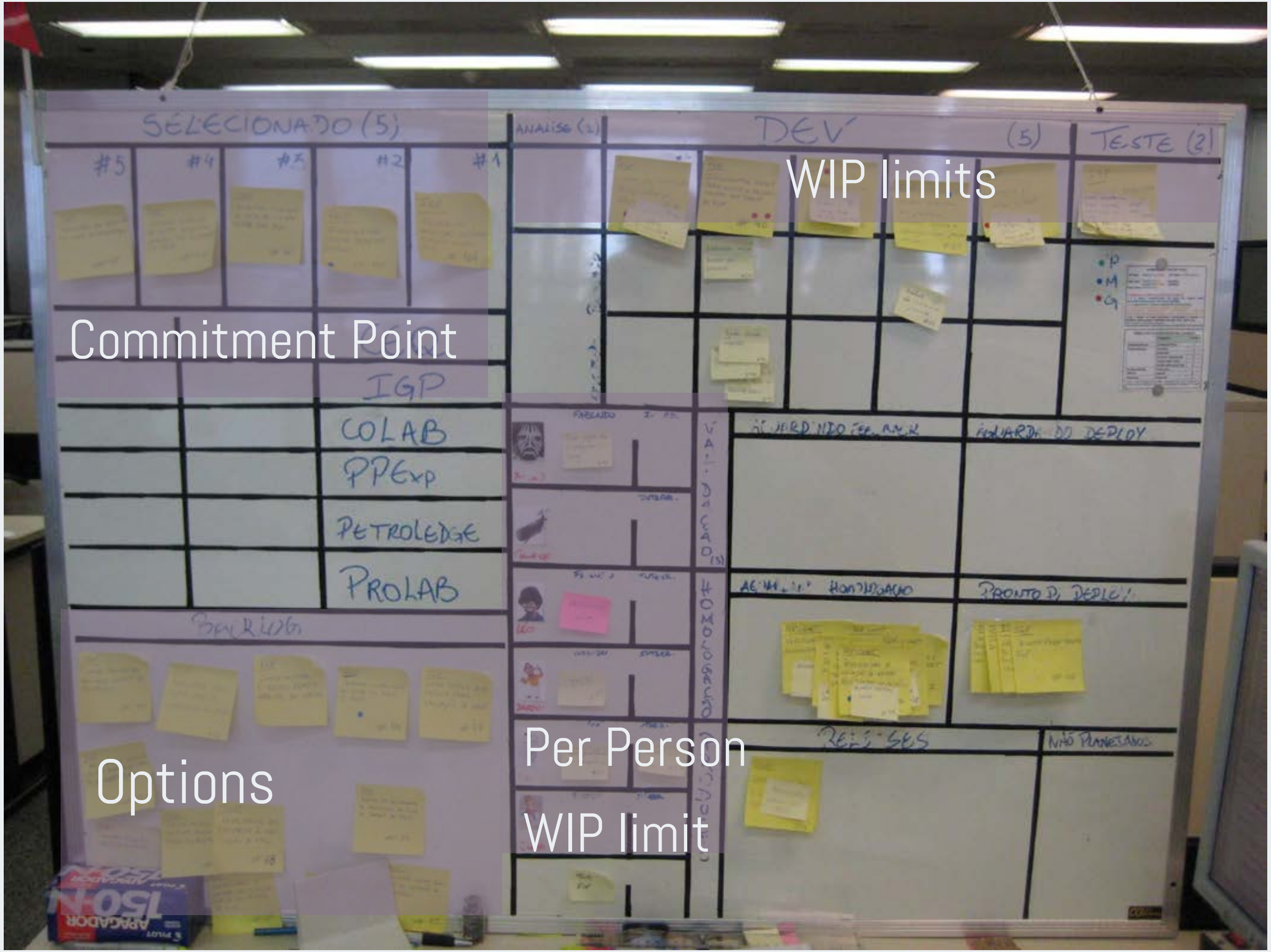
Project Portfolios

Strategic Planning

Process Modelling



Team Kanban

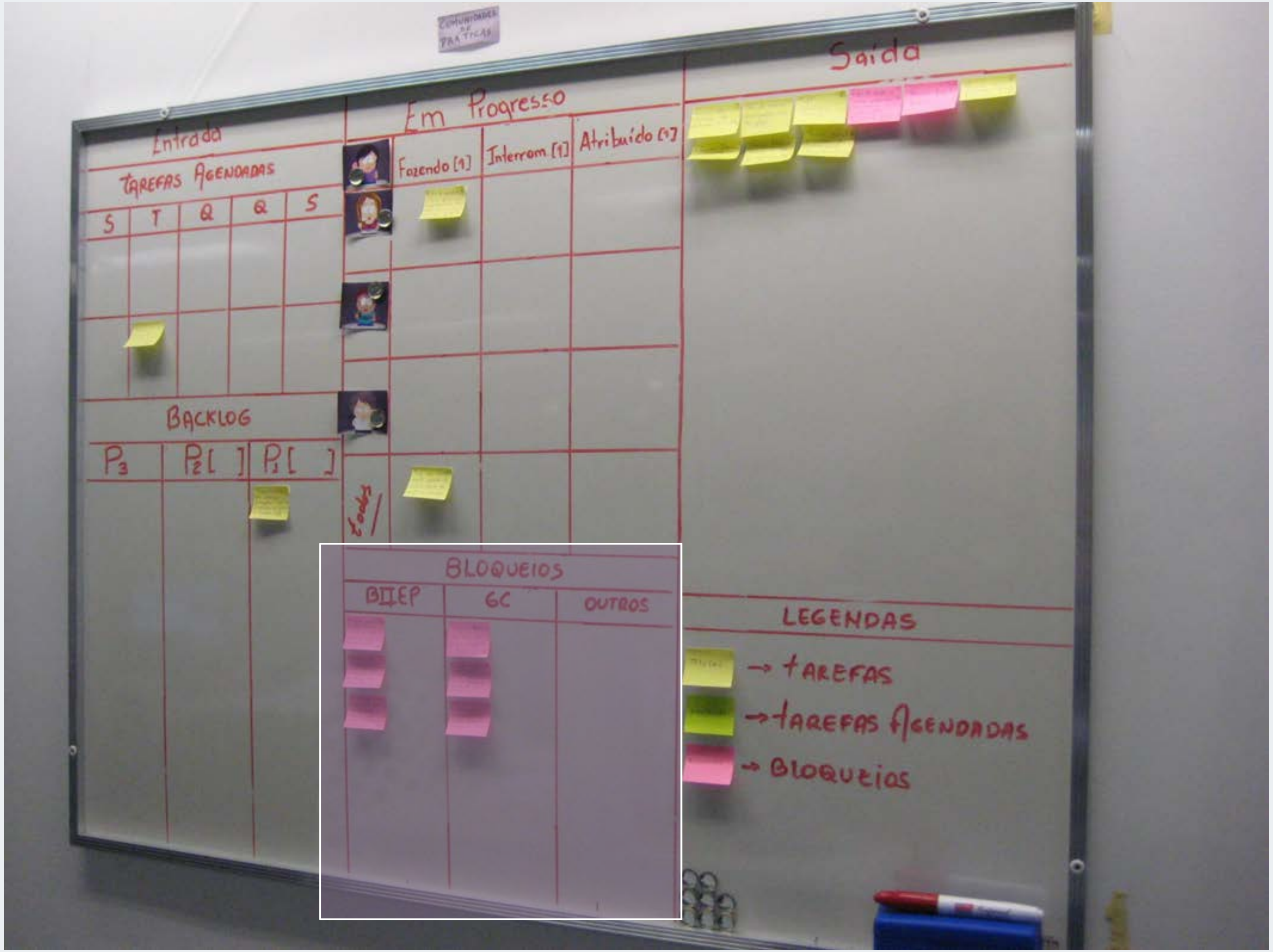


WIP limits

Commitment Point

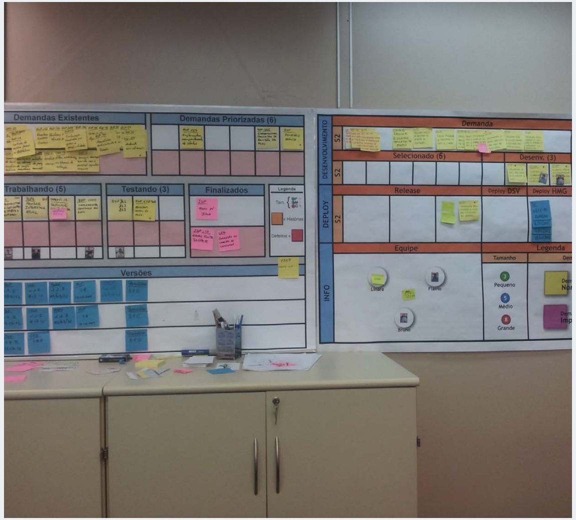
Options

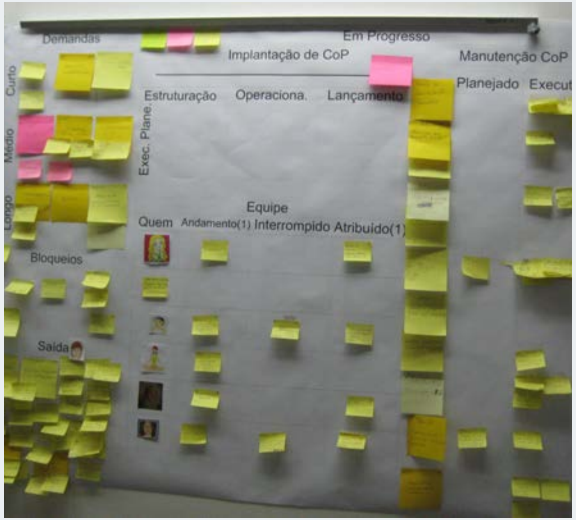
Per Person WIP limit



Parking lot to visualise dependent work on other services

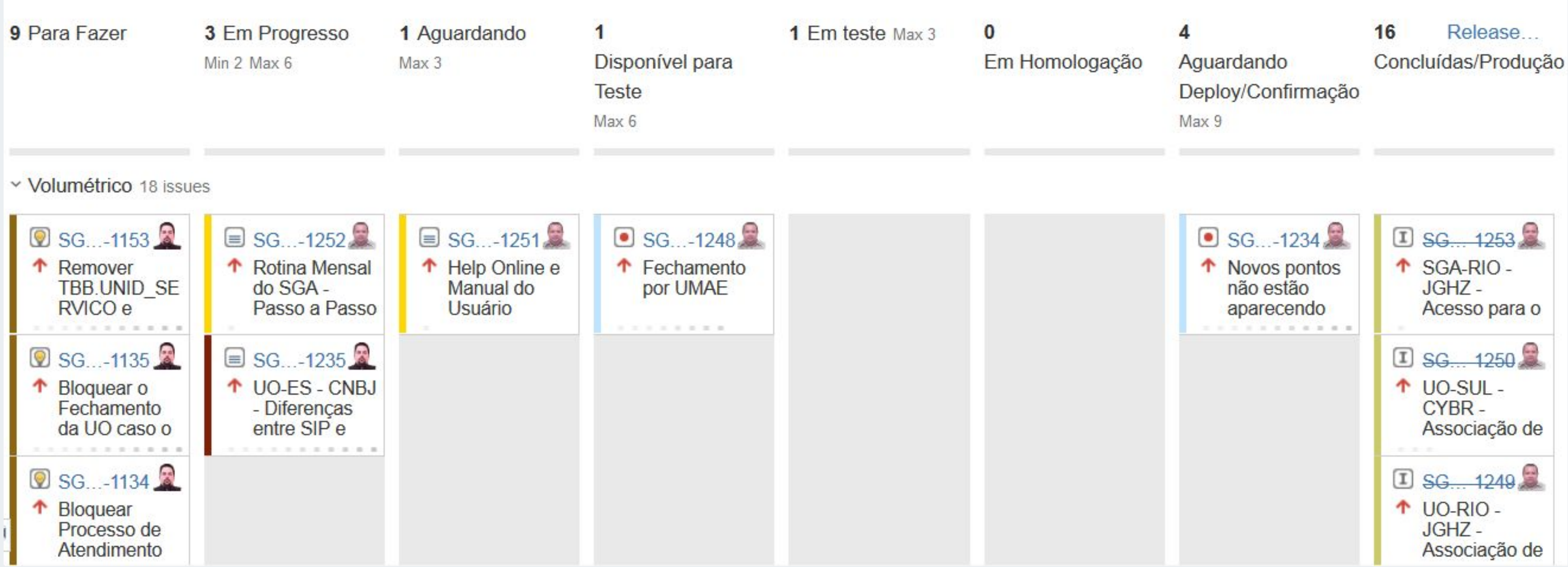
We started with many physical boards





We moved buildings, space has changed

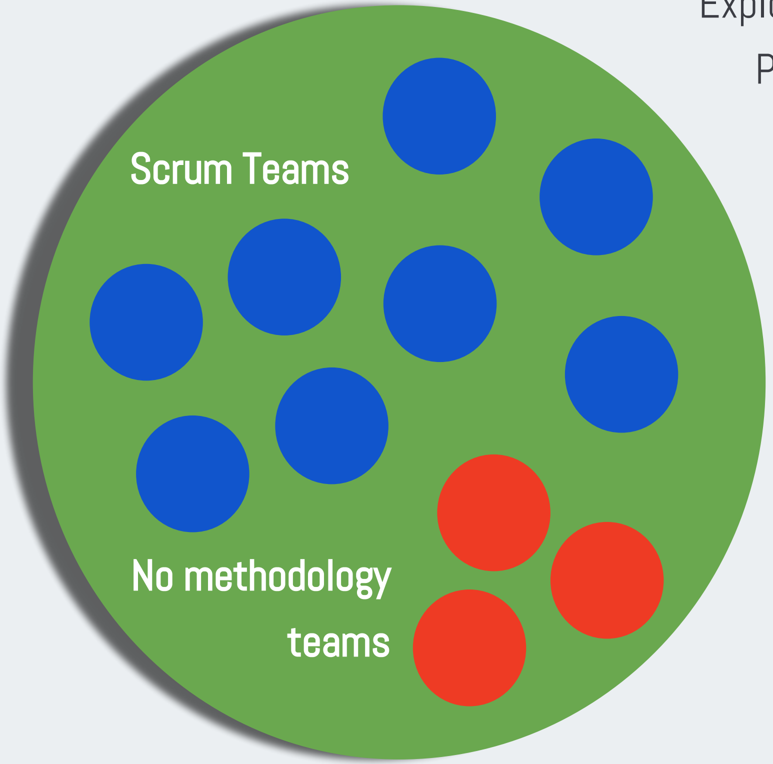
Some teams started using Jira



9 Para Fazer	3 Em Progresso Min 2 Max 6	1 Aguardando Max 3	1 Disponível para Teste Max 6	1 Em teste Max 3	0 Em Homologação	4 Aguardando Deploy/Confirmação Max 9	16 Release... Concluídas/Produção
Volumétrico 18 issues							
SG...-1153 Remover TBB.UNID_SERVICO e	SG...-1252 Rotina Mensal do SGA - Passo a Passo	SG...-1251 Help Online e Manual do Usuário	SG...-1248 Fechamento por UMAE			SG...-1234 Novos pontos não estão aparecendo	~~SG...-1253~~ SGA-RIO - JGHZ - Acesso para o
SG...-1135 Bloquear o Fechamento da UO caso o	SG...-1235 UO-ES - CNBJ - Diferenças entre SIP e						~~SG...-1250~~ UO-SUL - CYBR - Associação de
SG...-1134 Bloquear Processo de Atendimento							~~SG...-1249~~ UO-RIO - JGHZ - Associação de

We lost some things,
we've gained some others...

Do you remember those #nomethodology teams?



Exploitation & Production systems

Supporting core business functions:
production of oil, gas and water

Each team had an average of 10 years of existence

Development regulated by SOX. Requires formal approvals and acceptance

Legacy technology: Centura

Senior Developers: (experience and age!)

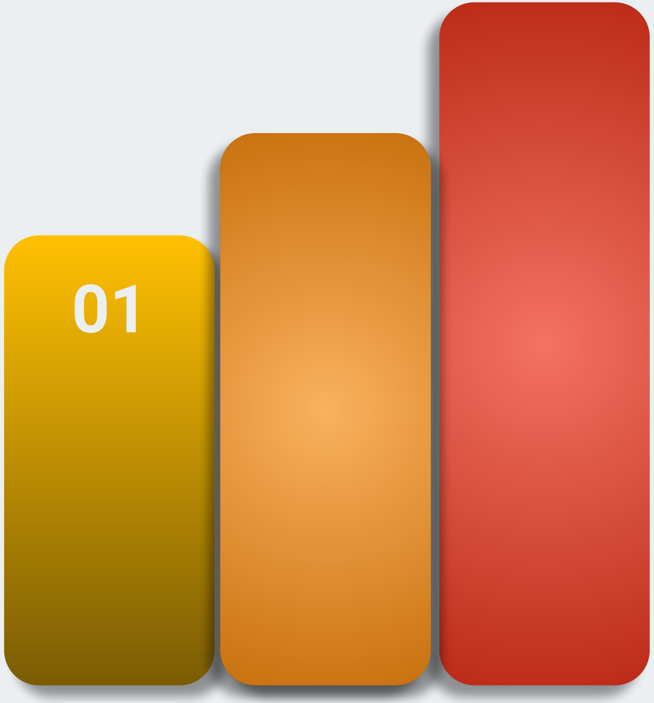
Critical Systems. If they stop, Petrobras loses millions

No methodology teams

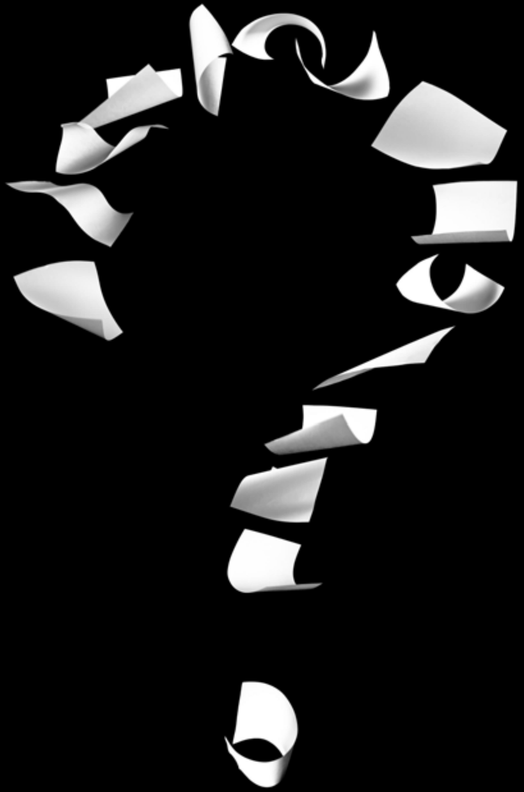
Conclusion:
no agile kids around here!

In the last years, those teams have delivered results with:

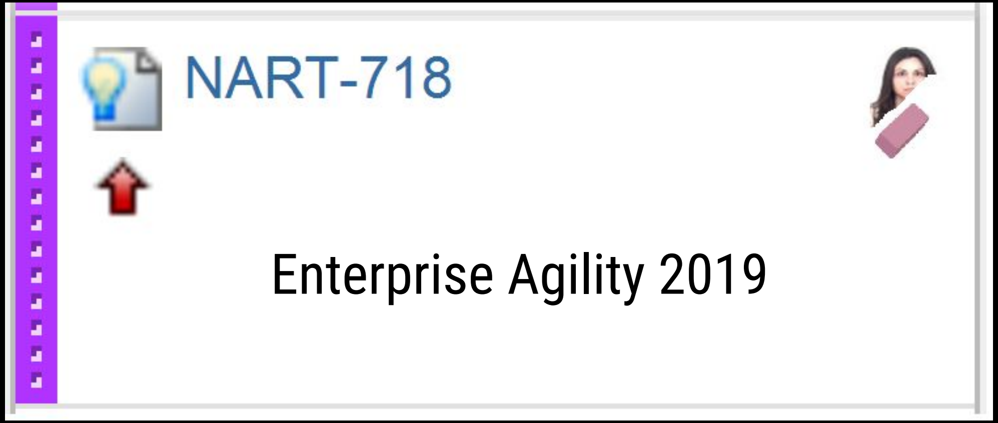
Inconsistent processes
Heroic efforts



And from a specific problem,
an opportunity arises
It all started with their Delivery Manager
asking:



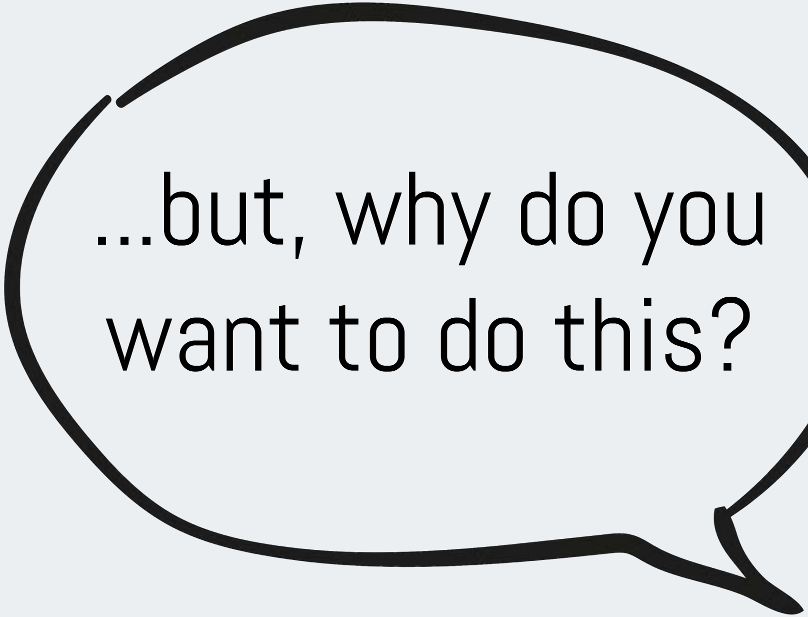
Amanda, can you hide who is doing what in Jira?



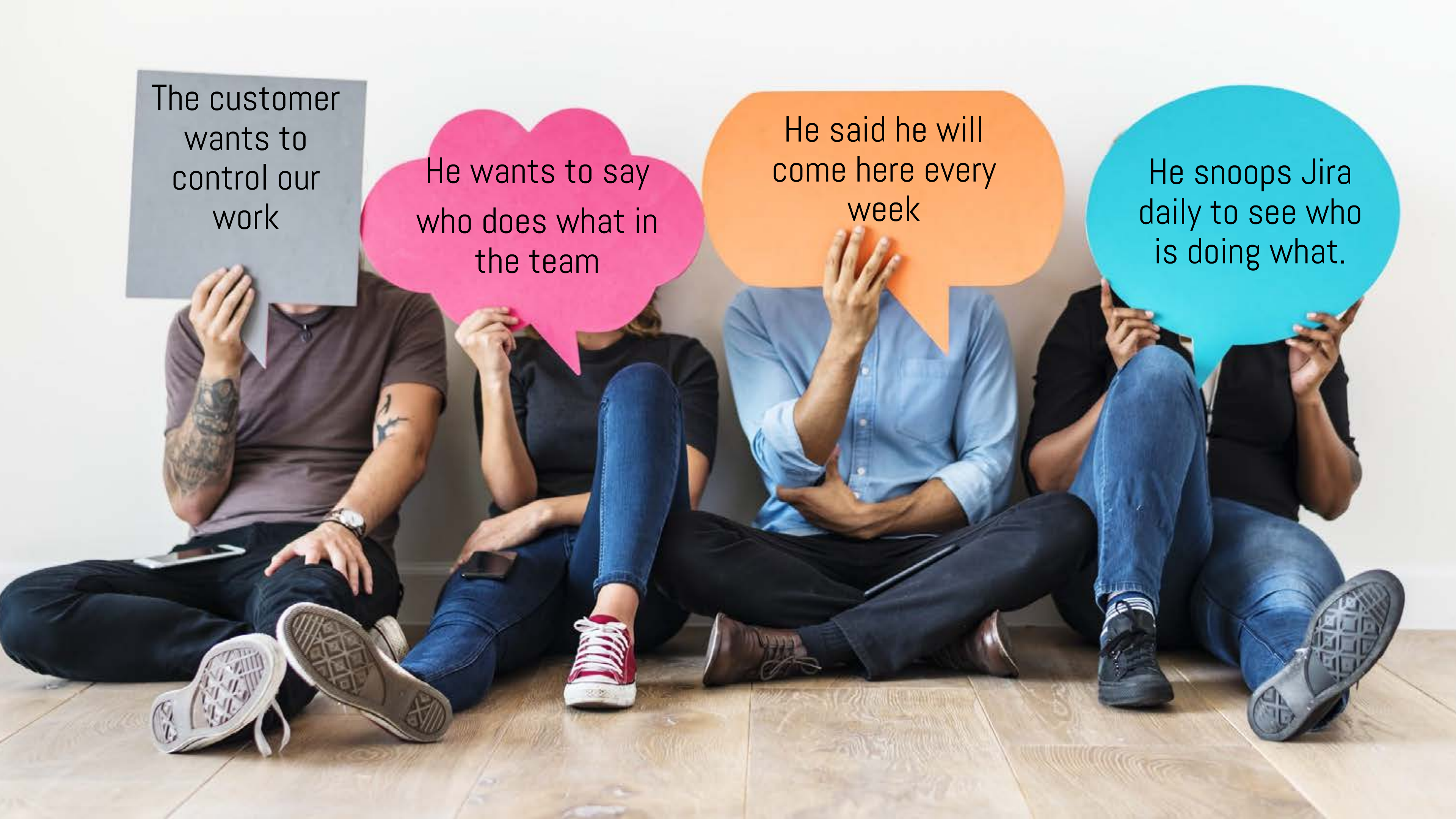
NART-718

Enterprise Agility 2019

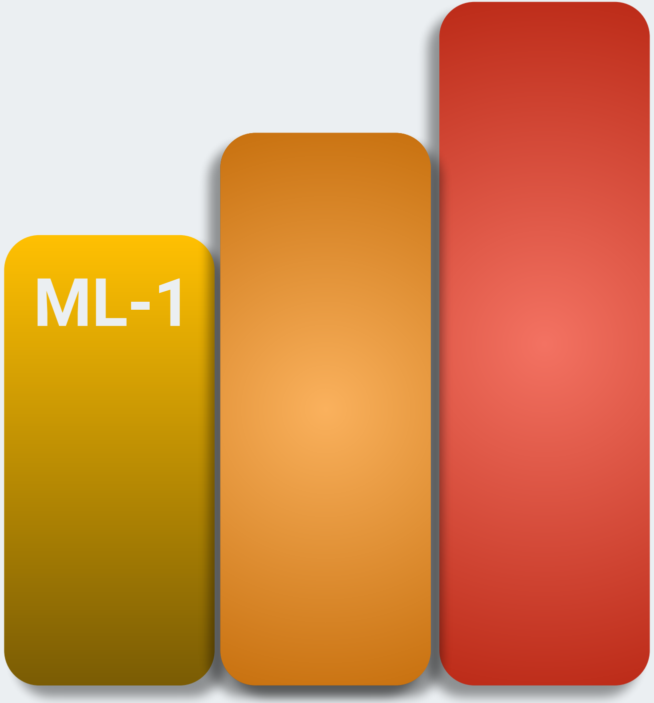
Look, there is no way of doing it...



...but, why do you want to do this?


The customer wants to control our work
He wants to say who does what in the team
He said he will come here every week
He snoops Jira daily to see who is doing what.

Observable Behaviour



Customers with sufficient transparency will show a preference or demand the involvement of specific individuals on their work requests as a means to mitigate risks of inconsistency, poor performance and disappointment

What was happening?

No methodology

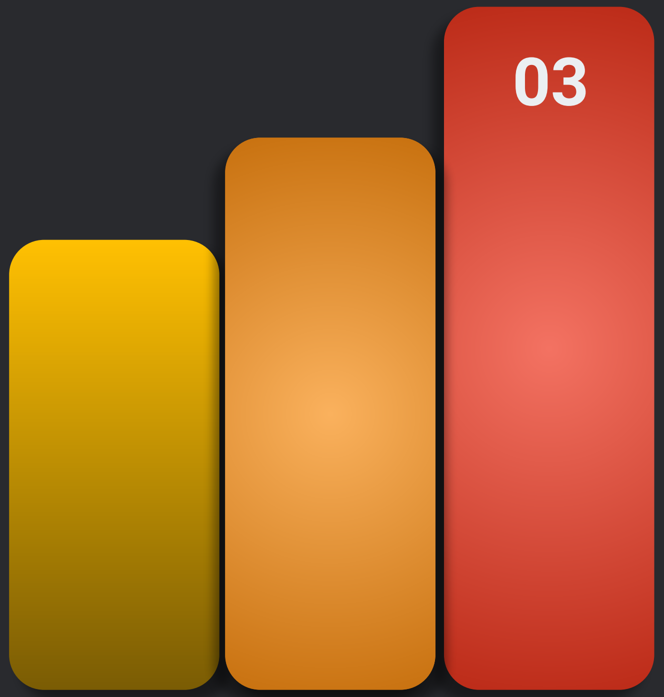
teams

After years of relationship with their customer, he has retired, and a new customer has come

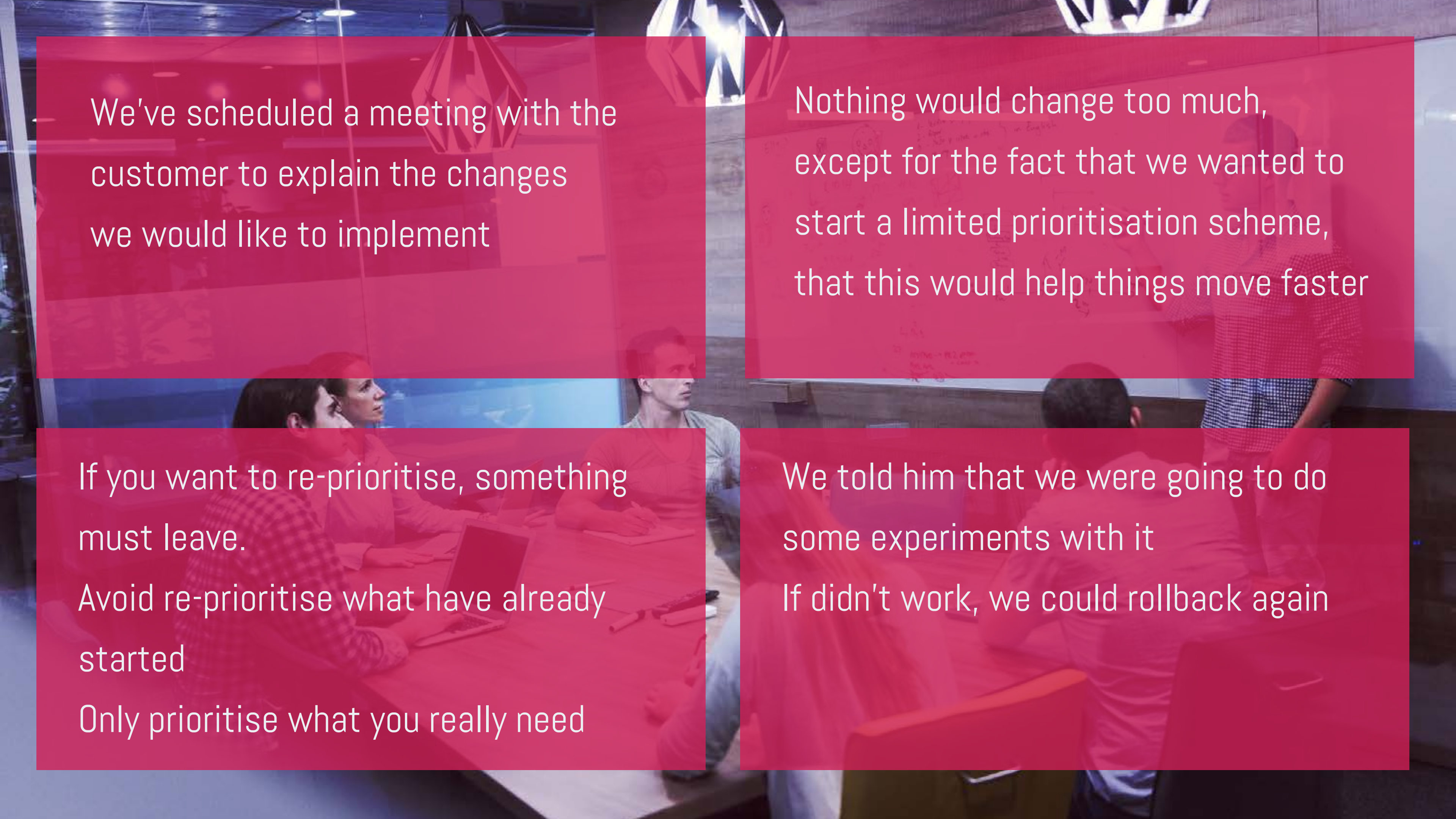
3 teams, same customer, similar problems

Hiding who
was doing
what in Jira
definitely was
not to going to
solve the problem

We would need reliable processes and outcomes to establish this new relationship, and the customer could trust in the teams



On the path to ML-3



We've scheduled a meeting with the customer to explain the changes we would like to implement

Nothing would change too much, except for the fact that we wanted to start a limited prioritisation scheme, that this would help things move faster

If you want to re-prioritise, something must leave.

Avoid re-prioritise what have already started

Only prioritise what you really need

We told him that we were going to do some experiments with it

If didn't work, we could rollback again

David Anderson's Formula for Evolutionary Change

- Stressor
- Reflection Mechanism
- Leadership

We had everything

Navigating through the Kanban Practices

VISUALIZE

LIMIT WIP

MANAGE FLOW

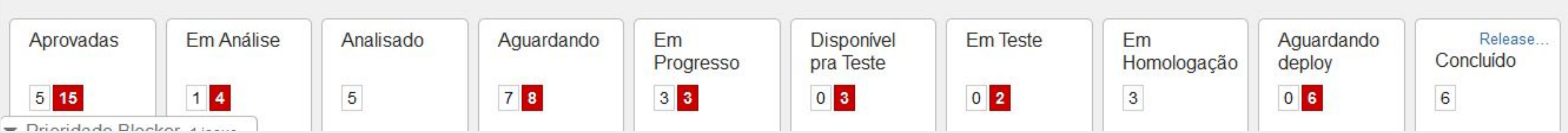
MAKE POLICIES EXPLICIT

IMPLEMENT FEEDBACK LOOPS

IMPROVE COLLABORATIVELY
EVOLVE EXPERIMENTALLY

VISUALIZE

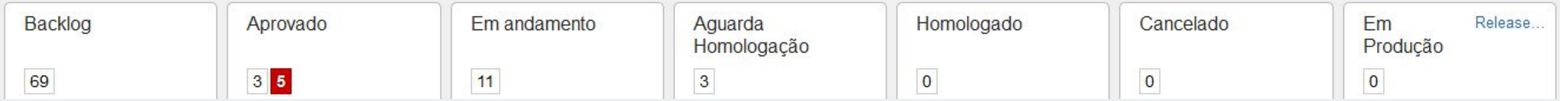
Software Development Flow



Aprovadas	Em Análise	Analisado	Aguardando	Em Progresso	Disponível pra Teste	Em Teste	Em Homologação	Aguardando deploy	Release... Concluído
5 15	1 4	5	7 8	3 3	0 3	0 2	3	0 6	6

Prioridade Blocker 1 issue

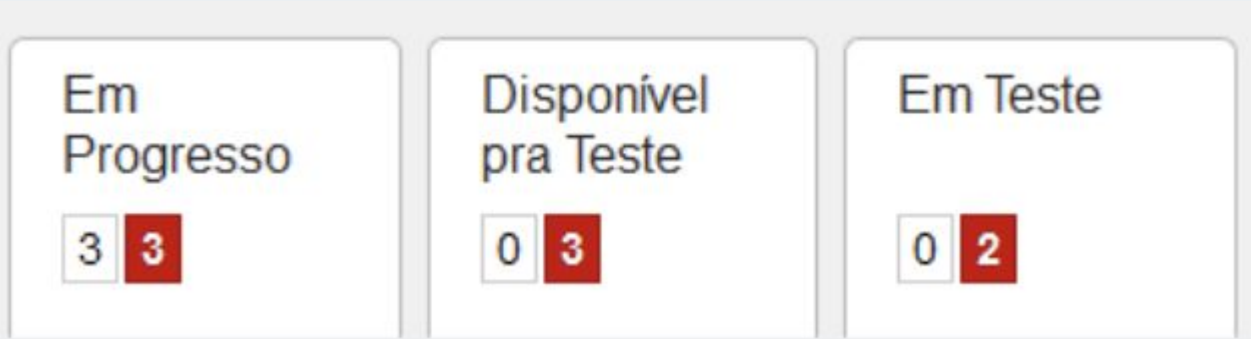
Customer Flow - for prioritisation and condensed view of In Progress items



Backlog	Aprovado	Em andamento	Aguarda Homologação	Homologado	Cancelado	Em Produção Release...
69	3 5	11	3	0	0	0

Being a SOX regulated system, all User Stories needed to be approved by the customer (moved in the board by him) and in the end, accepted also by him.
Also, there were several Jira rules in terms of other work: developer, testers...

Before setting WIP limits, teams with 3 people had 20 items in progress



Em Progresso 3 3

Disponível pra Teste 0 3

Em Teste 0 2

MANAGE FLOW

Cumulative Flow

Run Charts

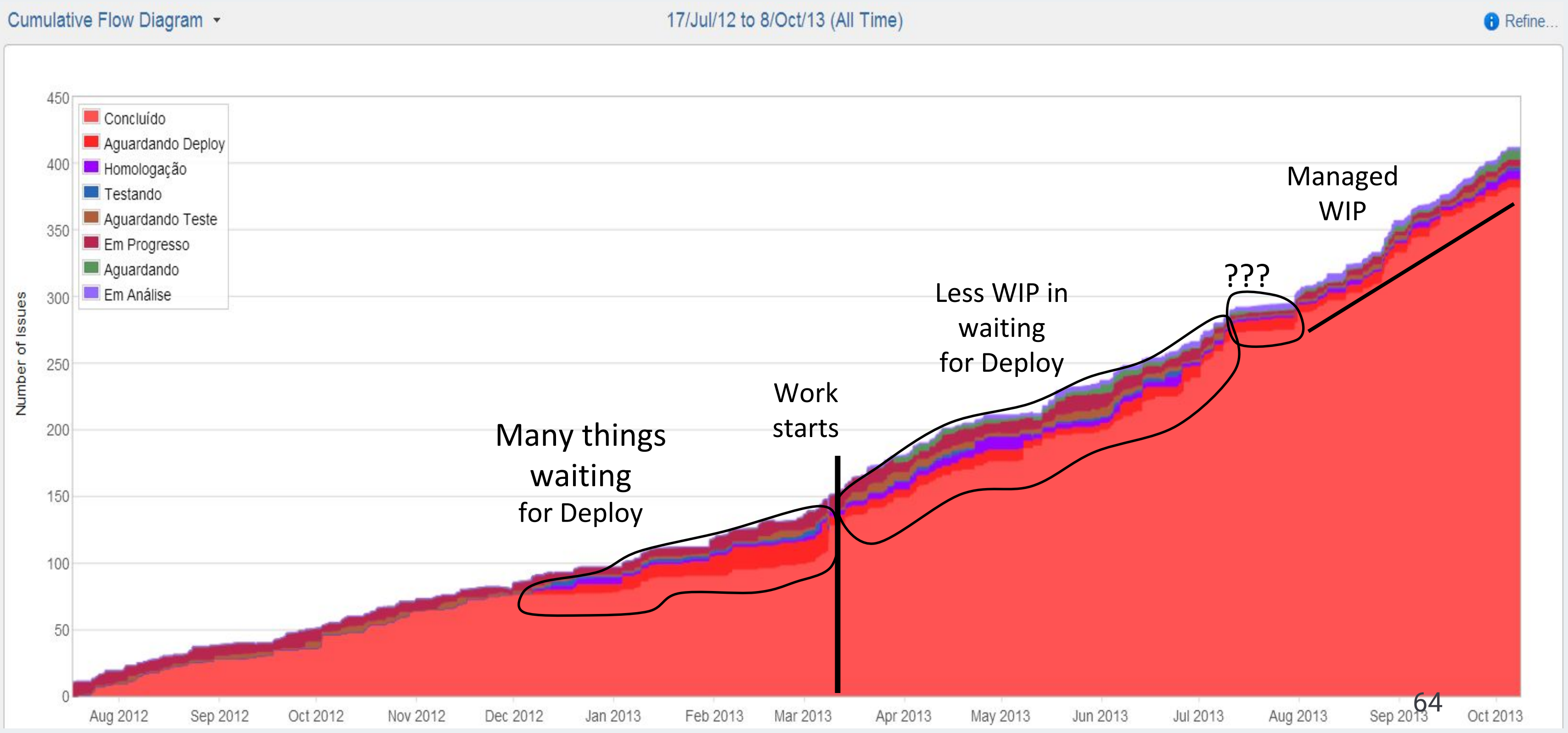
Throughput

Lead Time

Failure demand

… and other measures

MANAGE FLOW



Cumulative Flow Diagram ▾

17/Jul/12 to 8/Oct/13 (All Time)

Refine...

Many things waiting for Deploy

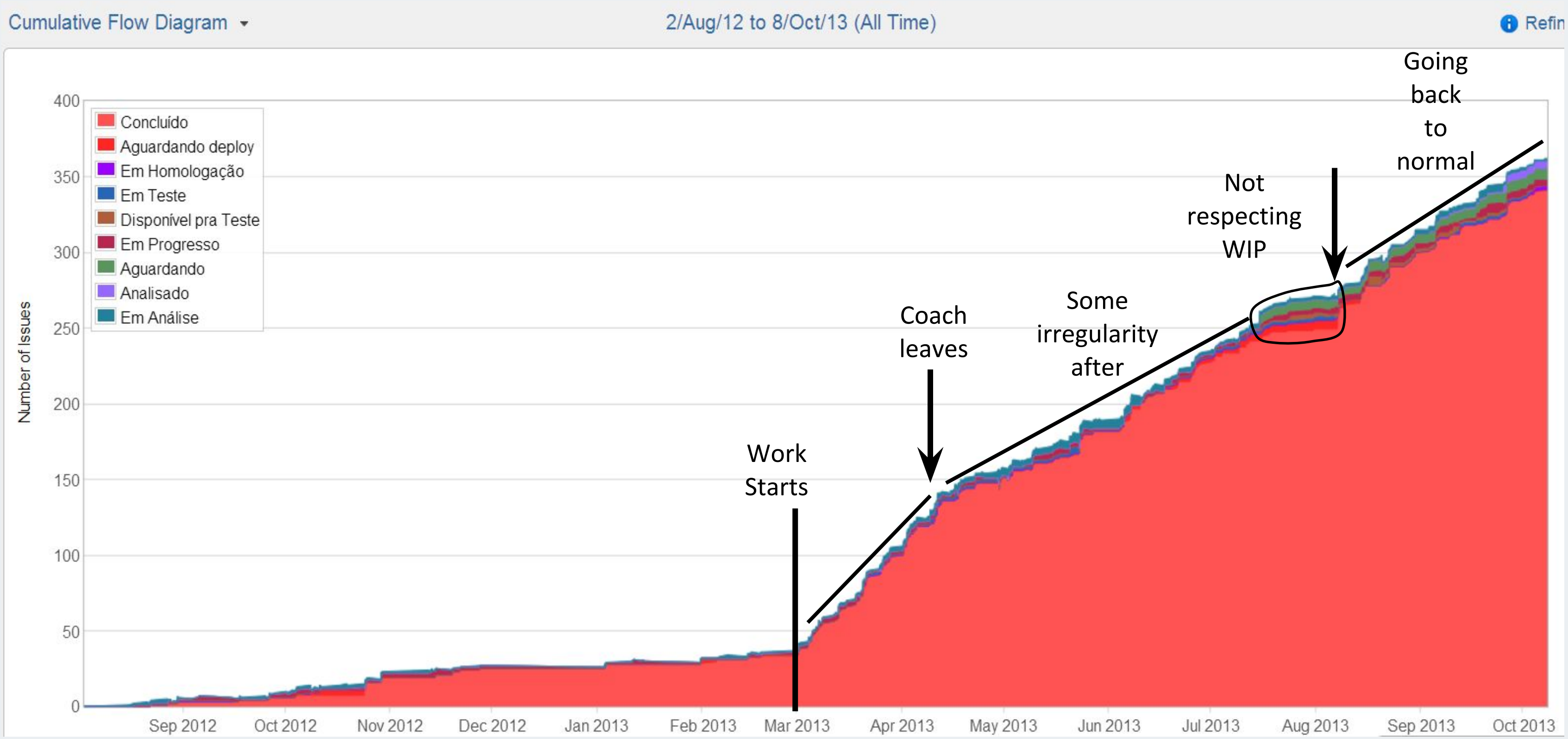
Work starts

Less WIP in waiting for Deploy

???

Managed WIP

MANAGE FLOW



Work Starts

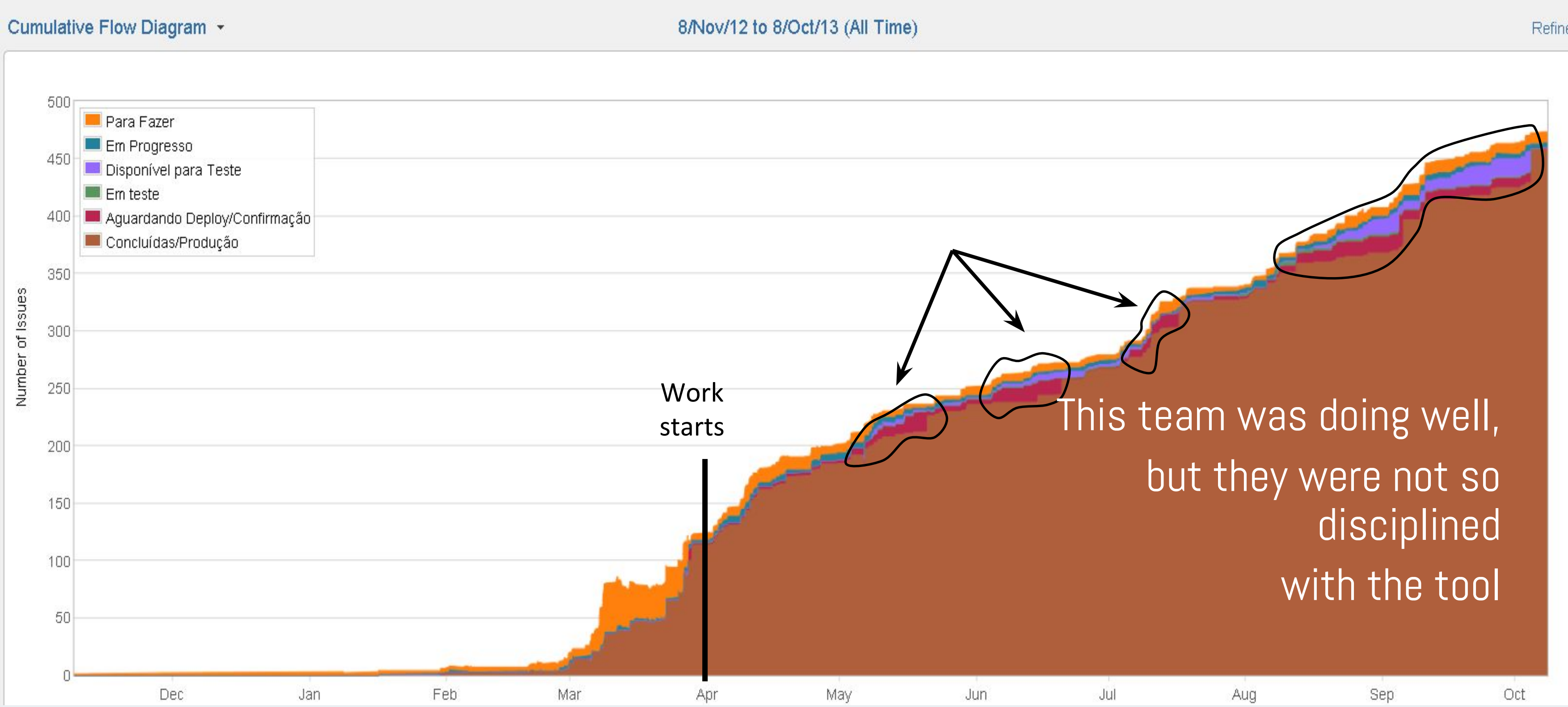
Coach leaves

Some irregularity after

Not respecting WIP

Going back to normal

MANAGE FLOW



Cumulative Flow Diagram ▾

8/Nov/12 to 8/Oct/13 (All Time)

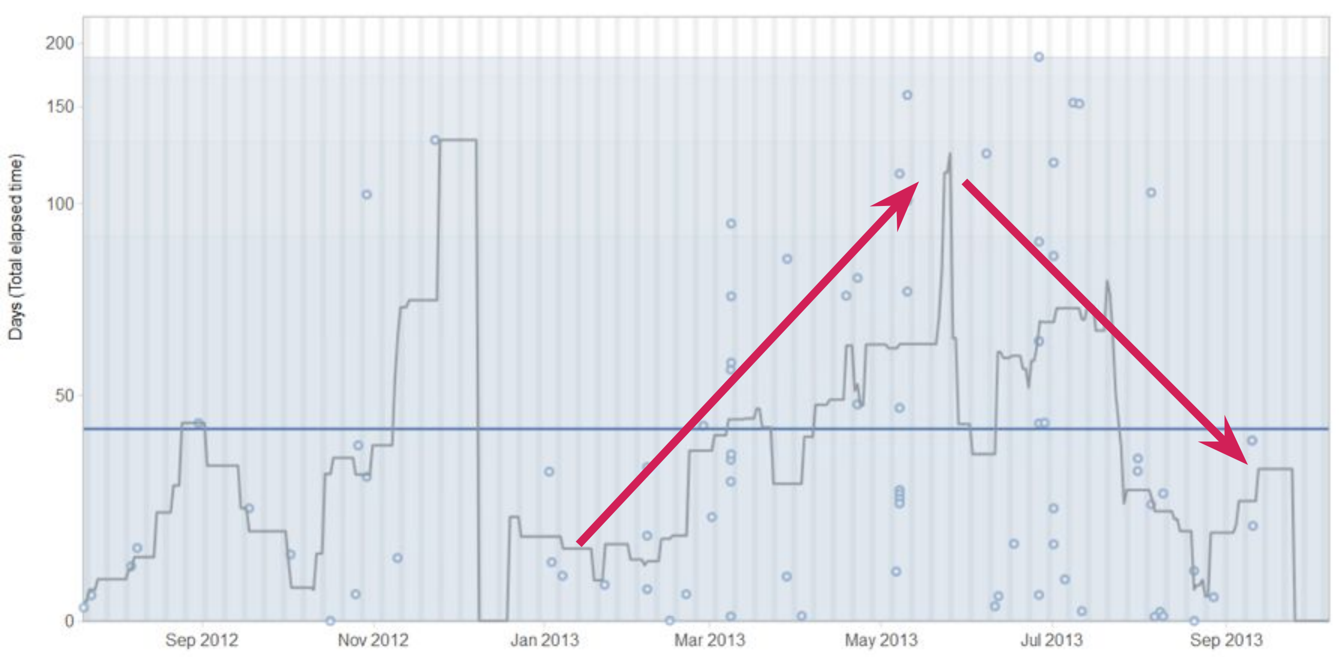
Refine

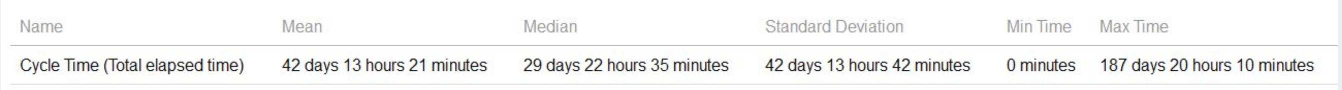
Work starts

This team was doing well, but they were not so disciplined with the tool

MANAGE FLOW

Team 1

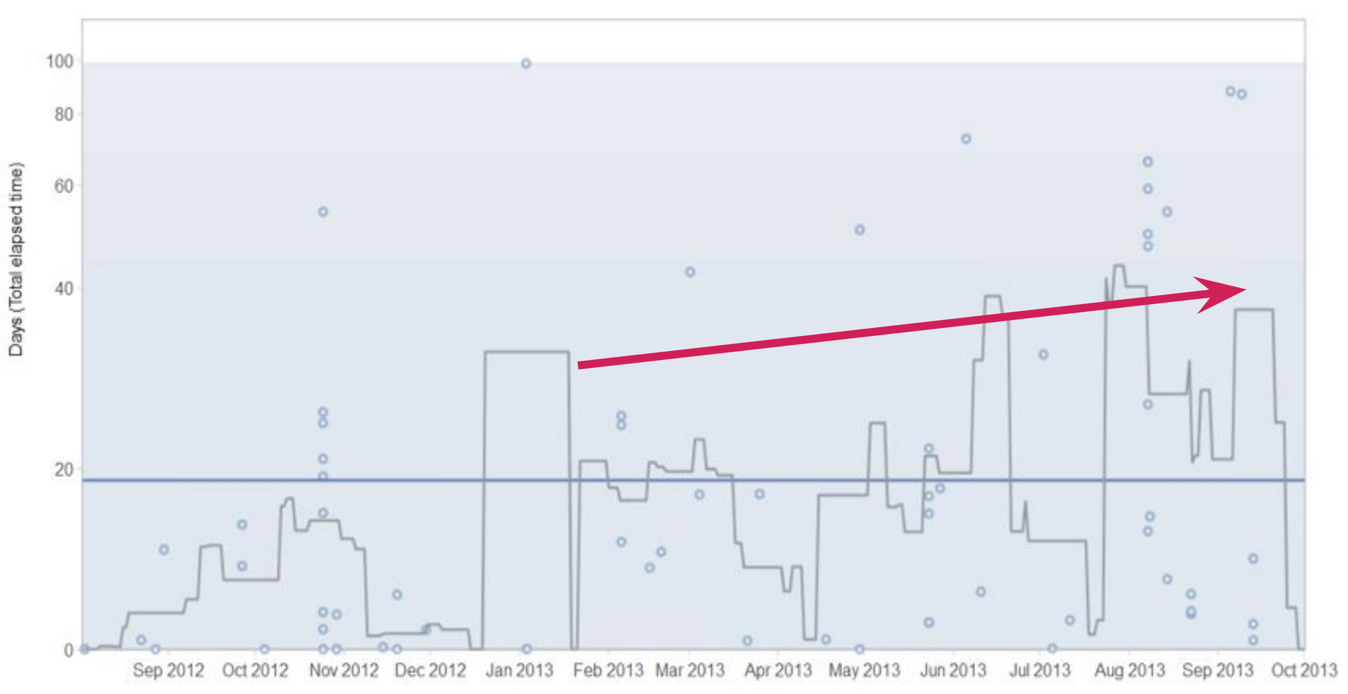




Name	Mean	Median	Standard Deviation	Min Time	Max Time
Cycle Time (Total elapsed time)	42 days 13 hours 21 minutes	29 days 22 hours 35 minutes	42 days 13 hours 42 minutes	0 minutes	187 days 20 hours 10 minutes

MANAGE FLOW

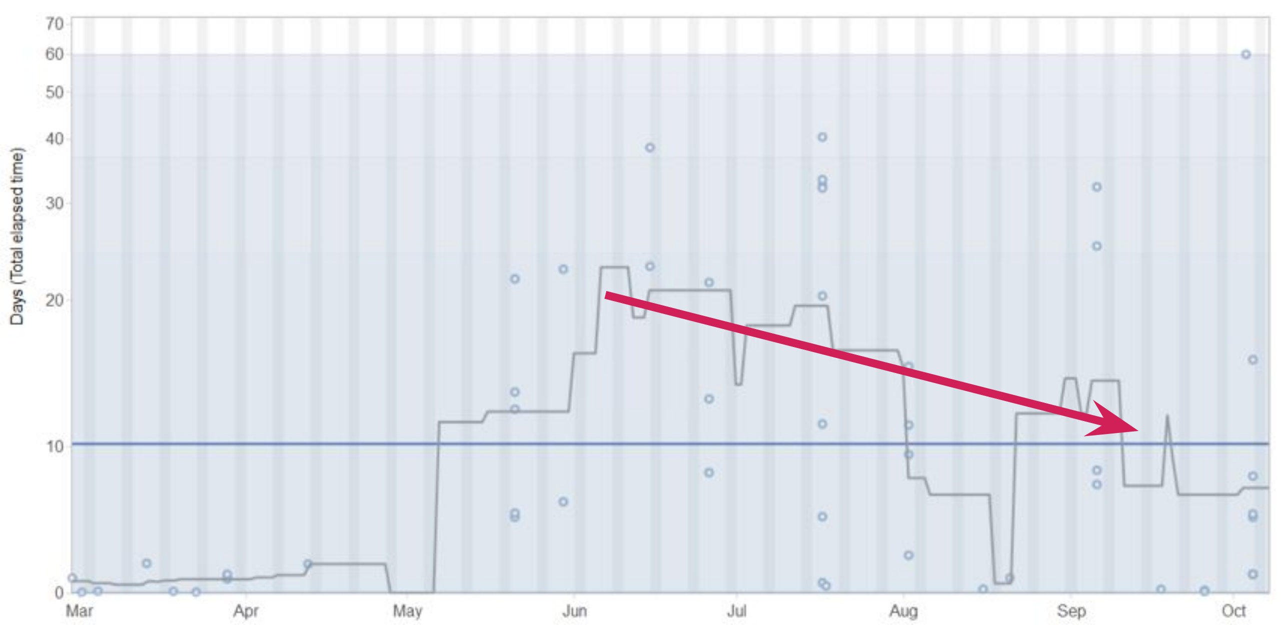
Team 2



Name	Mean	Median	Standard Deviation	Min Time	Max Time
Cycle Time (Total elapsed time)	18 days 17 hours 4 minutes	9 days 5 hours 17 minutes	24 days 3 hours 46 minutes	0 minutes	98 days 19 hours 33 minutes

MANAGE FLOW

Team 3



Name	Mean	Median	Standard Deviation	Min Time	Max Time
Cycle Time (Total elapsed time)	10 days 3 hours 53 minutes	5 days 4 hours 14 minutes	13 days 48 minutes	51 minutes	60 days 3 hours 50 minutes

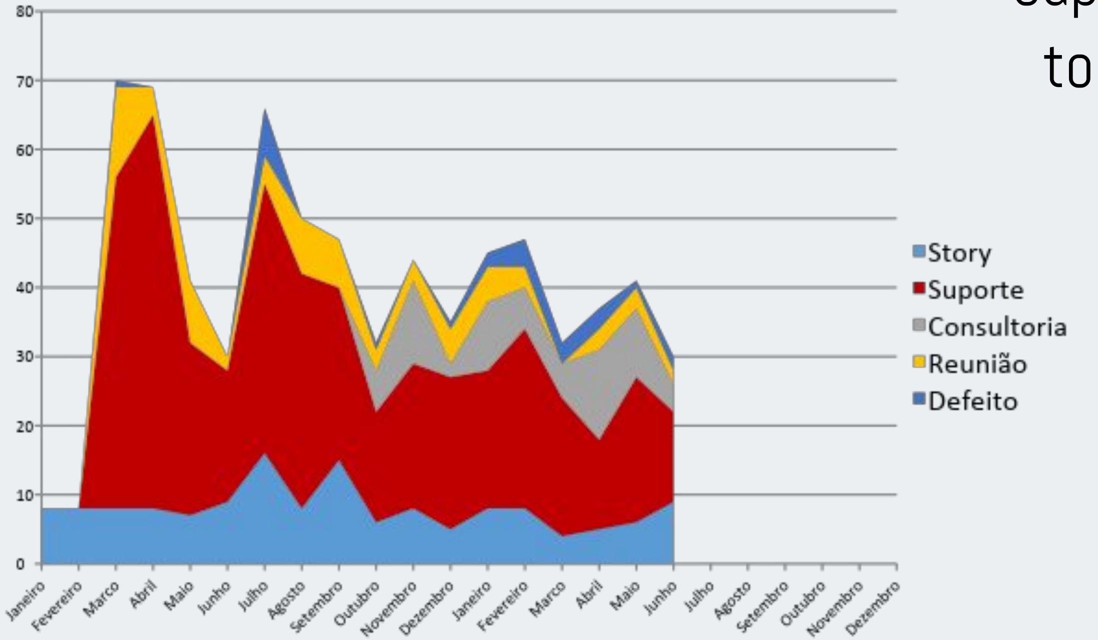
Problem: Customer is not satisfied with our throughput, he also says things take too long to finish

Let's understand why

MANAGE FLOW

Hypothesis

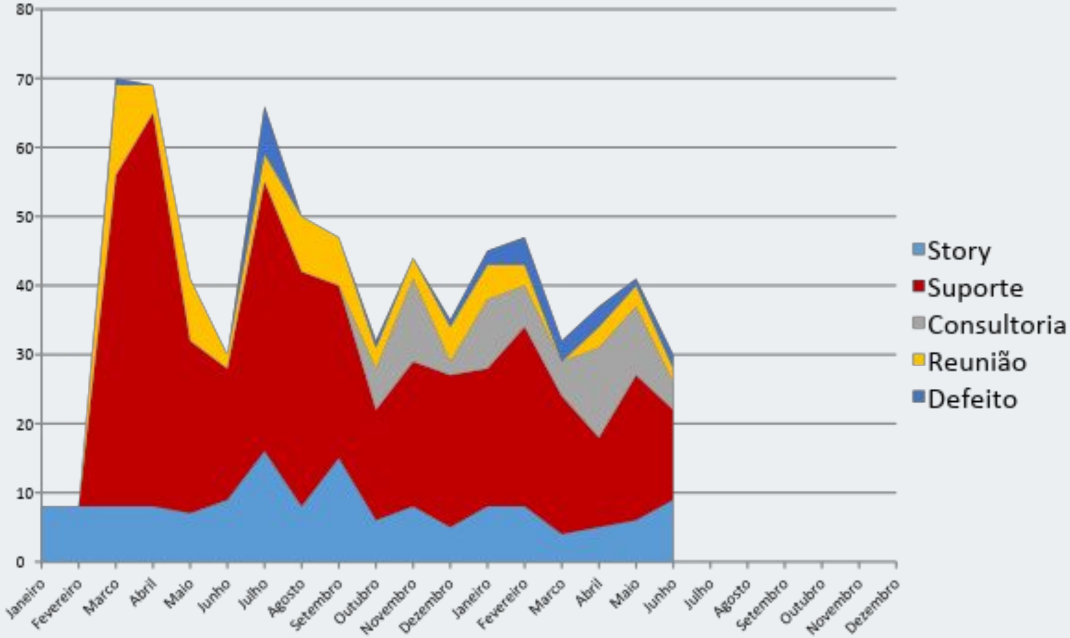
Cumulative Type Chart



We receive too many support calls and we go to many unnecessary meetings

MANAGE FLOW

Hypothesis validated!!!



Maximise value adding activities

🟦 Story

Minimise non-value adding activities

🟥 Support

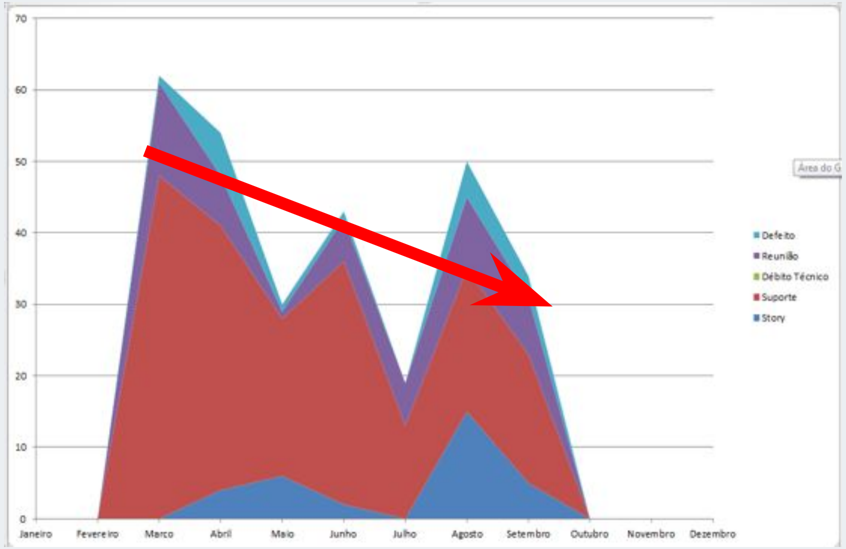
⬜ Advisory

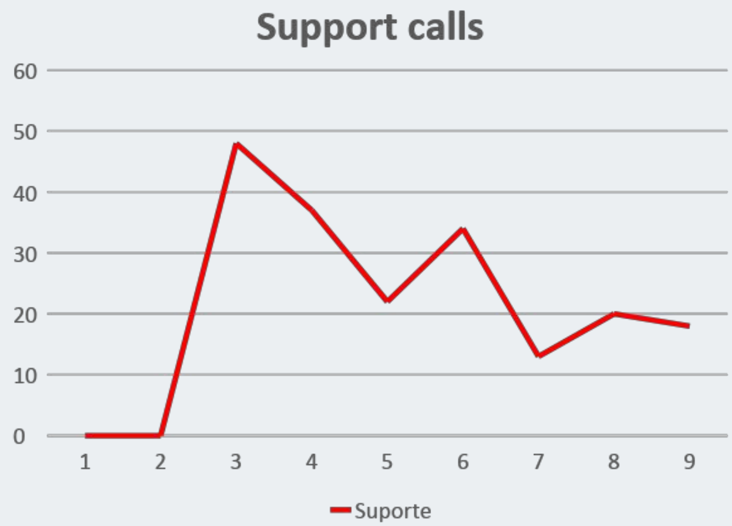
🟨 Meetings

🟦 Defects

We give too many calls and go to many unnecessary meeting

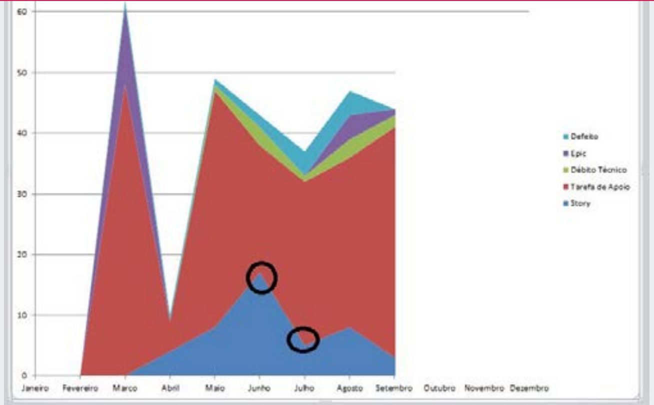
Support Calls



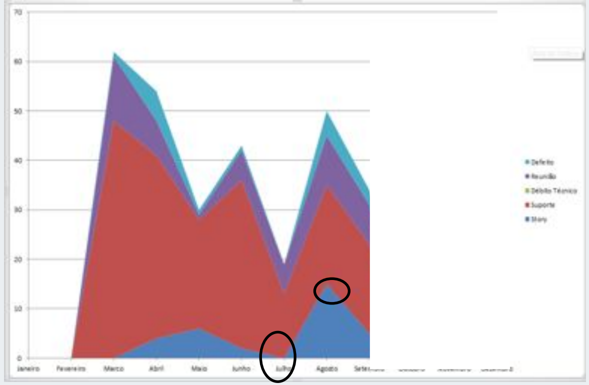


MANAGE FLOW

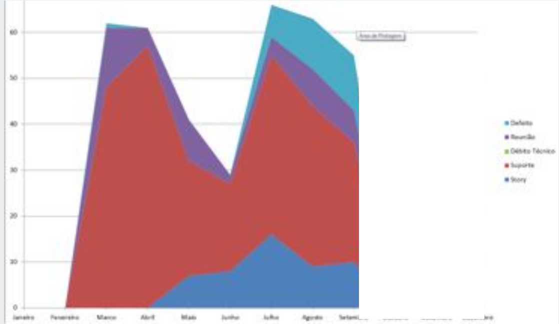
Throughput



AVG = 7,5 stories/month



AVG = 5,3 stories/month

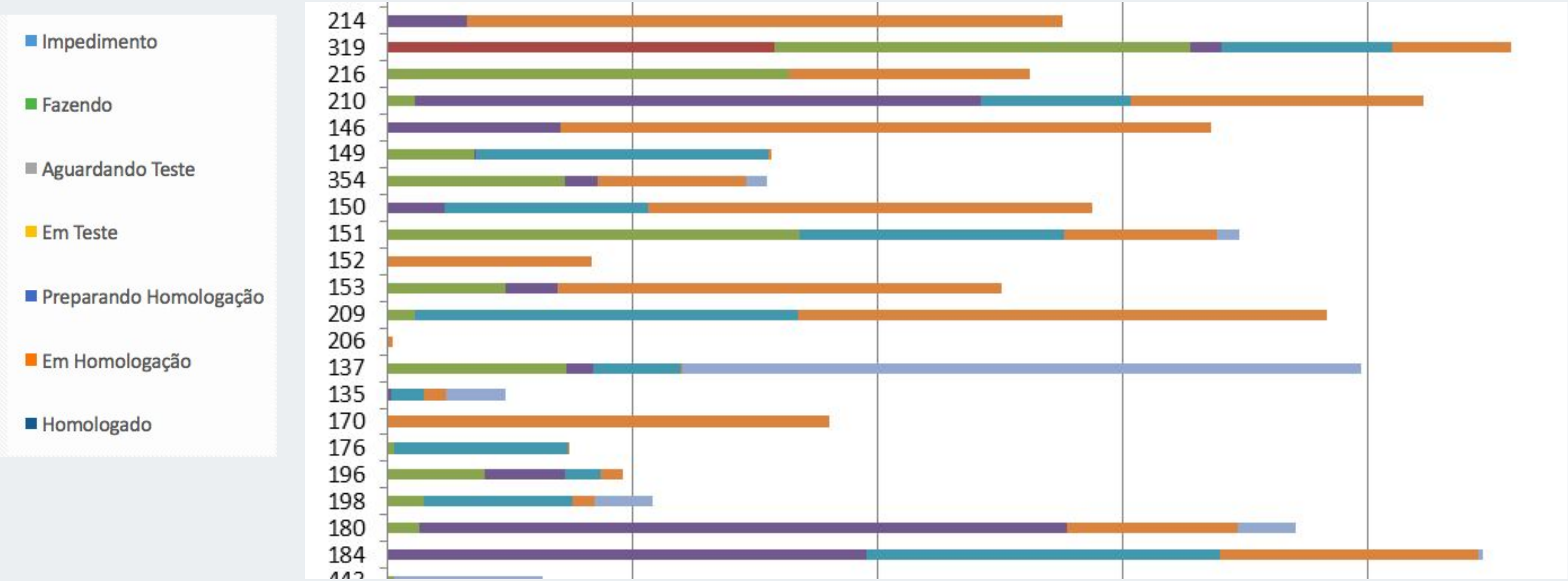


AVG = 10 stories/month

MANAGE FLOW

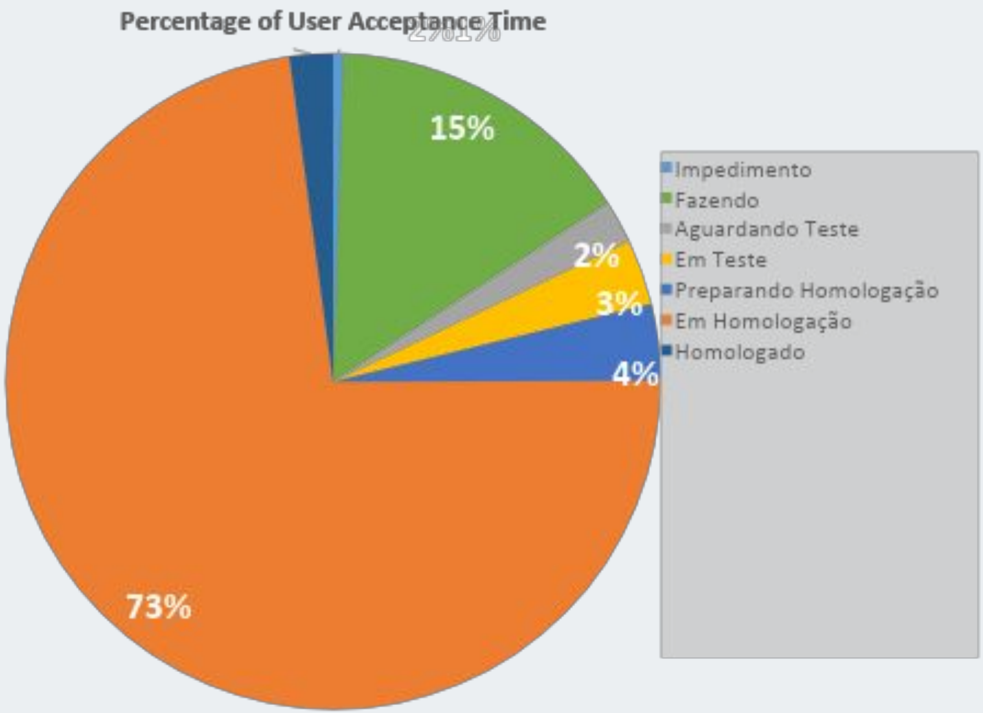
Problem: Customer complains that we take too long to deliver features

Hypothesis: the customer takes a long time to validate features. Let's investigate....



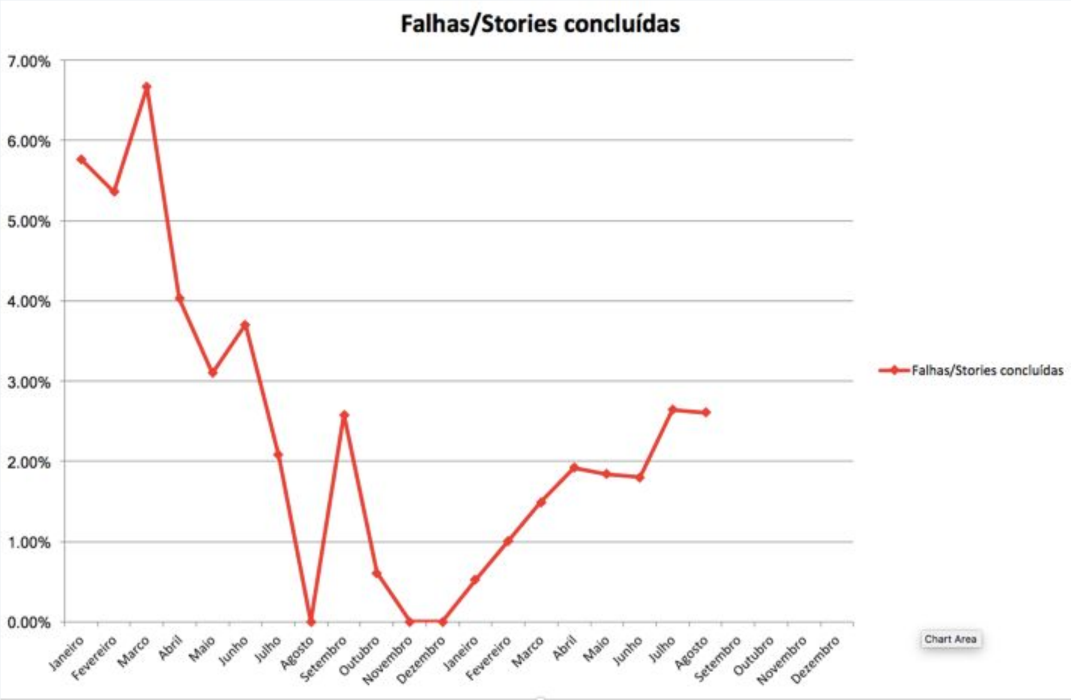
MANAGE FLOW

Fact: Customer takes too much time to accept features



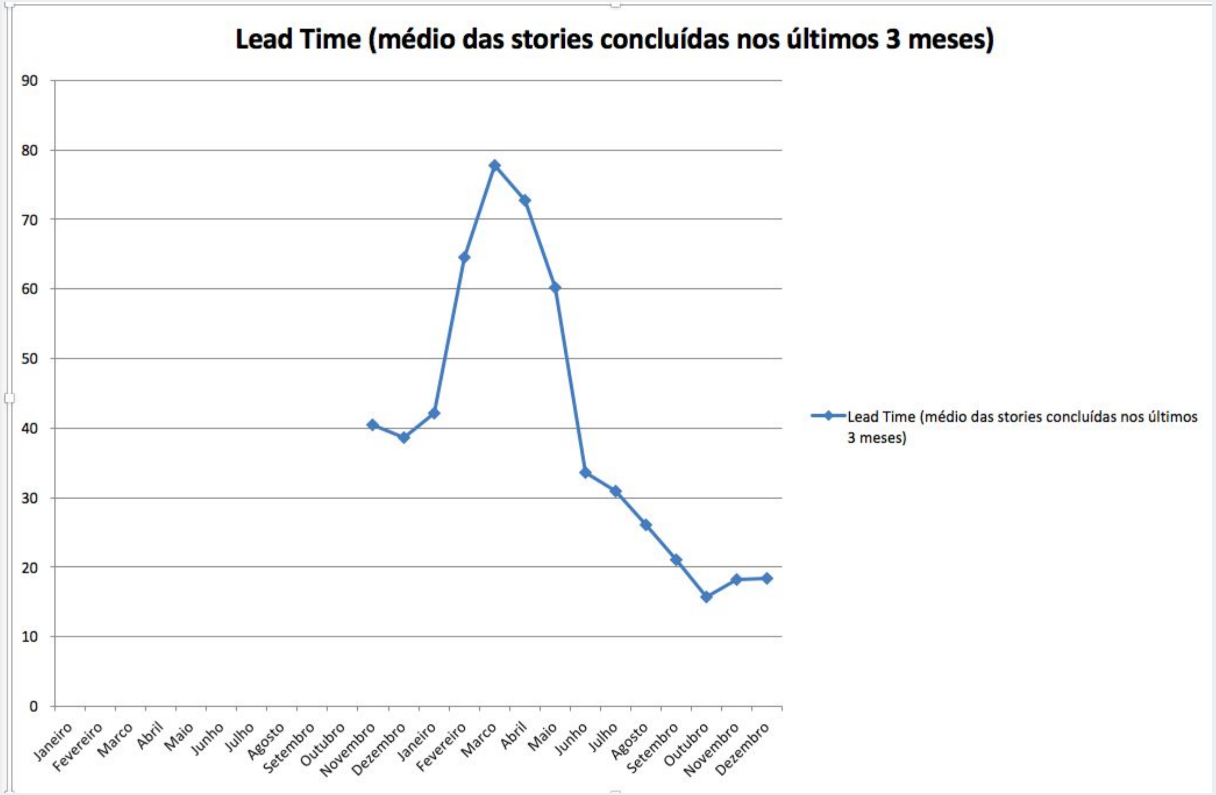
MANAGE FLOW

Defect Rate

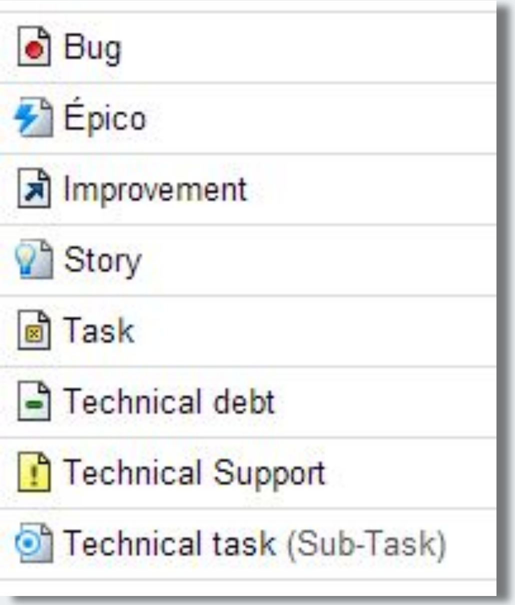


MANAGE FLOW

Average Lead Time

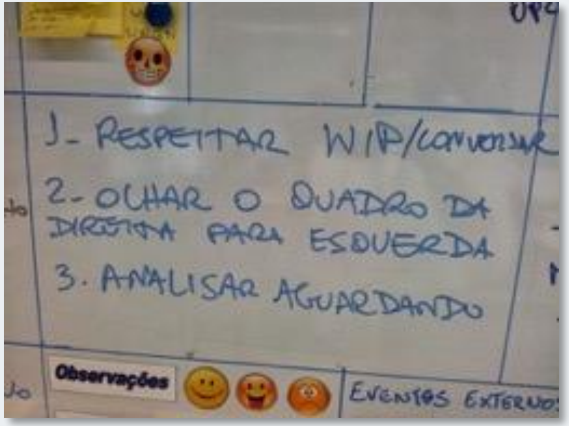


MAKE POLICIES EXPLICIT

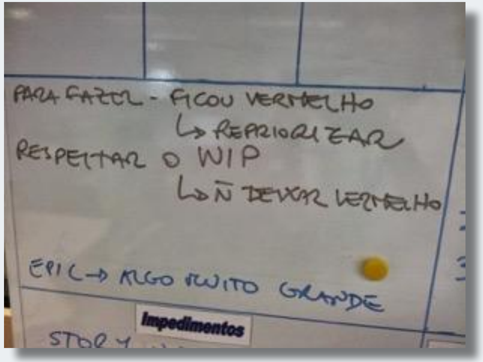


MAKE POLICIES EXPLICIT

Visible policies in the team area

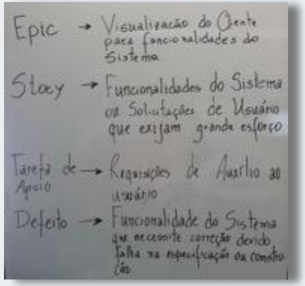

1. RESPEITAR WIP/CONVERSAR
2. OLHAR O QUADRO DA DIREITA PARA ESQUERDA
3. ANALISAR AGUARDANDO

Stand-up policies


PARA FAZER - FICOU VERMELHO
↳ REPRIORIZAR
RESPEITAR O WIP
↳ Ñ DEIXAR VERMELHO

EPIC → ALGO MUITO GRANDE

WIP policies

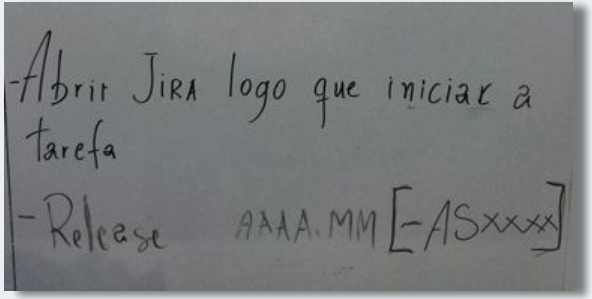

Epic → Visualização do Cliente para funcionalidades do Sistema

Story → Funcionalidades do Sistema ou Solicitações de Usuário que exijam grande esforço

Tarefa de Apoio → Requisições de Auxílio ao usuário

Defeito → Funcionalidade do Sistema que necessite correção devido falha na especificação ou construção

Work Item Types Definitions

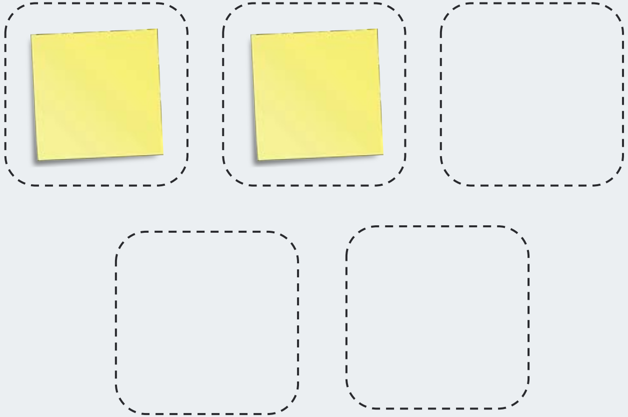

-Abrir Jira logo que iniciar a tarefa

-Release AAAA.MM [-ASxxxx]

Jira Policies

IMPLEMENT FEEDBACK LOOPS

Weekly Replenishment Meetings with the Customer



IMPLEMENT FEEDBACK LOOPS

Monthly Service Delivery Review

Team + Delivery Manager

Data Analysis, what happened

and opportunities for improvement

Service Delivery Review

The Best Management Tool to not mess up with Data!!!

The teams were very comfortable with the meetings, and they were seeing value in analysing good metrics for teams and managers. Until now, I have never seen such a thing!

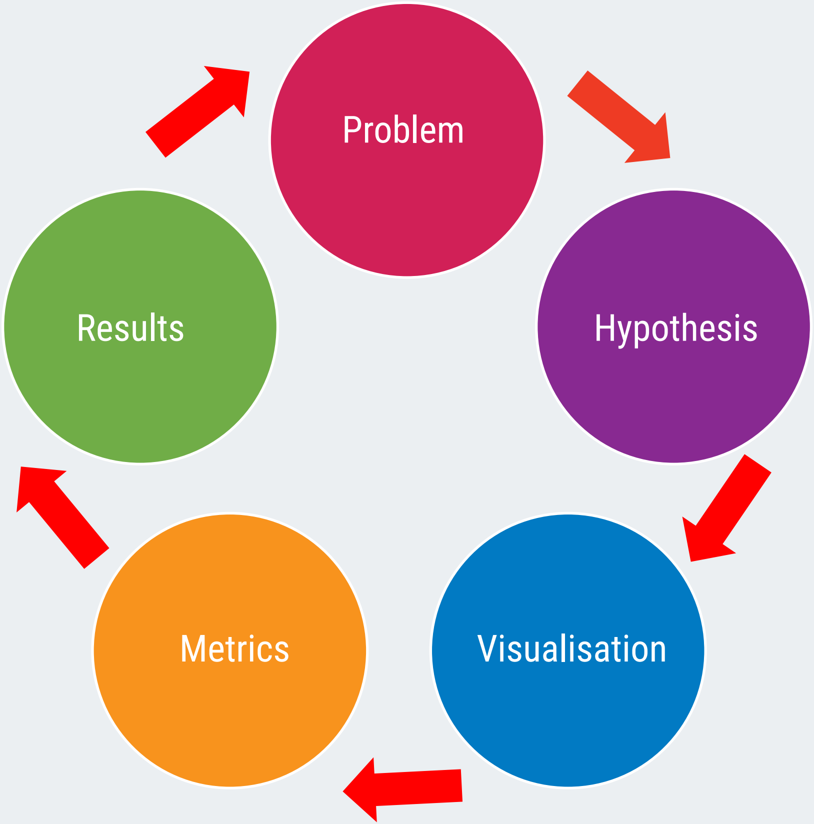
Stand-up meetings

We started doing stand ups with the 3 teams
Some of them decided to keep, others not

As they were working together for many time, communication was not a issue

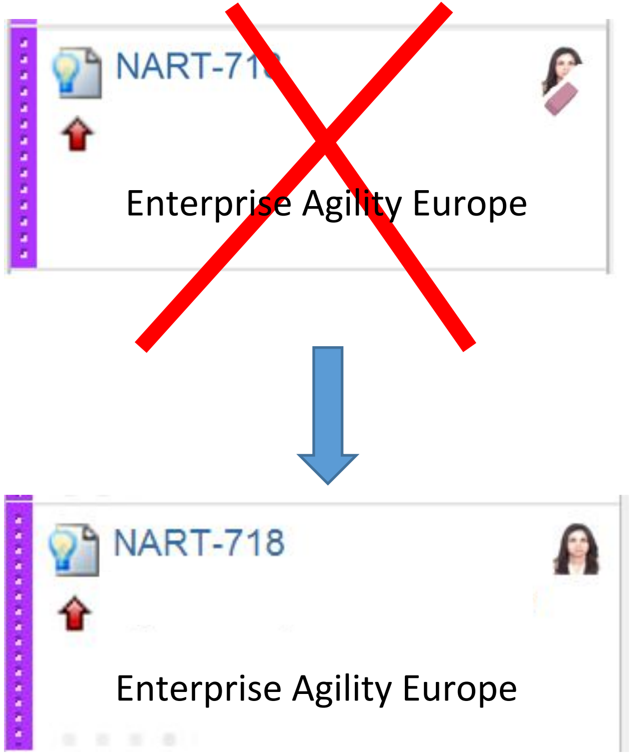
Also, the new boards helped a lot to represent current reality

IMPROVE COLLABORATIVELY
EVOLVE EXPERIMENTALLY



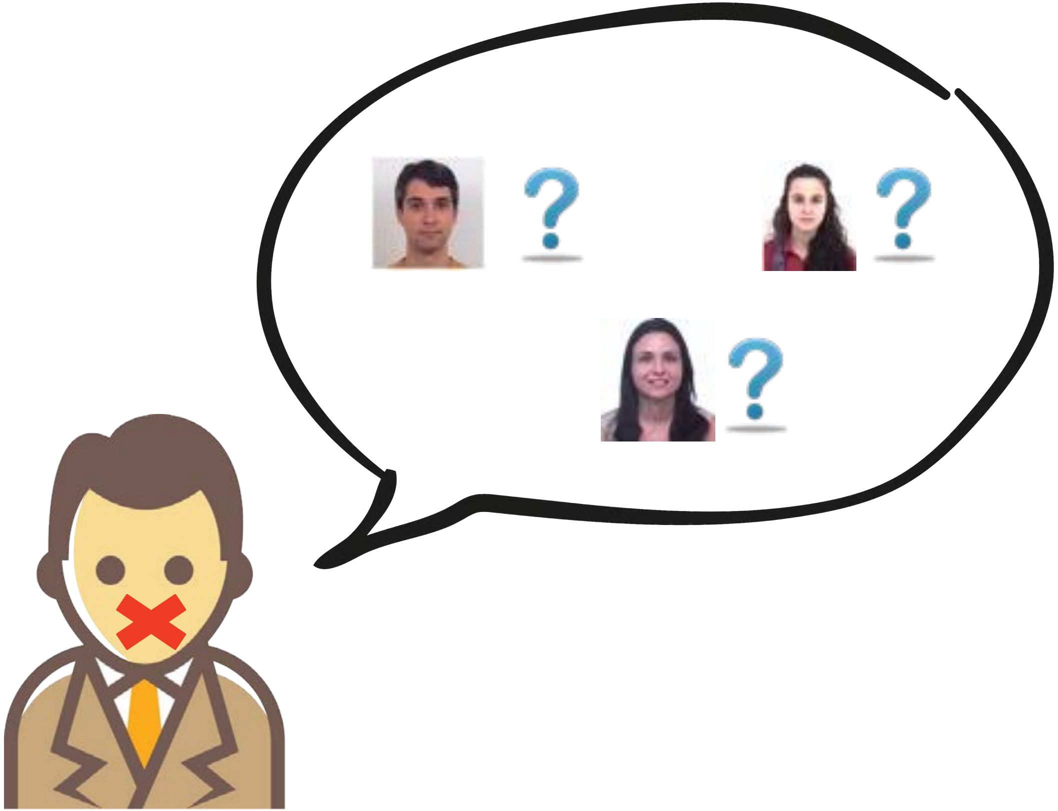
We entered into a virtuous cycle of instead of jumping into a solution of a problem, we first built some visualisation or chart that would help us understand better the nature of the problem

Many of them were solved without us taking any action!



There was no need to hide from the customer who was doing what

Results



Customer stopped asking about it

There were still some minor attempts of task assignment, but the Delivery Manager handled the naughty behavior

Results

Teams got more visibility of their own activities

They've achieved a structured software development process (it became a benchmark in the company in terms of SOX compliance)

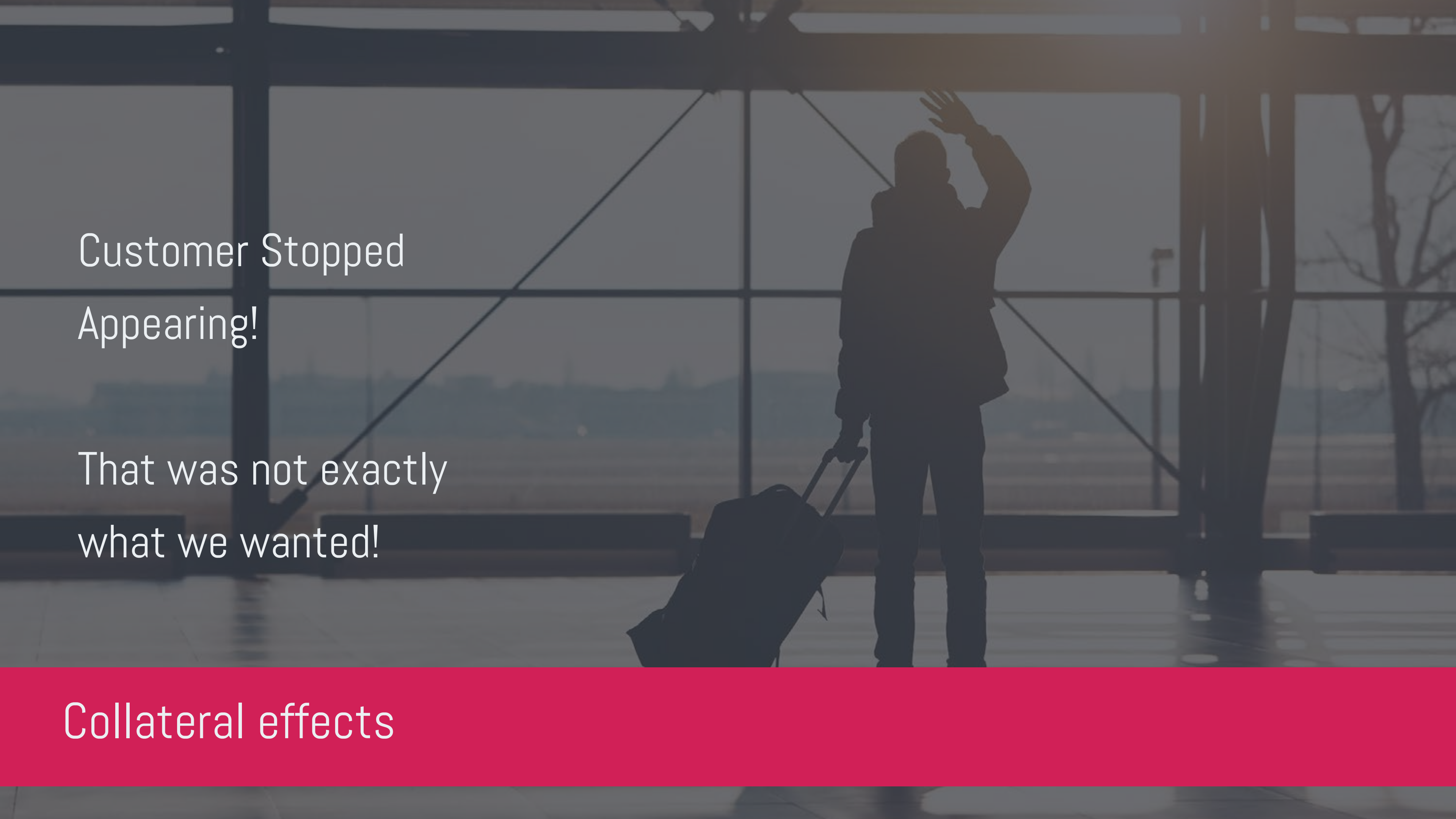
Results

The frequency of replenish meetings started to decrease

The customer started to prioritise the work directly in Jira, and doing on-demand replenishment.

He knew exactly what was happening during the development.

Collateral effects



Customer Stopped Appearing!

That was not exactly what we wanted!

Collateral effects

Observable Behaviours

Consistency of processes

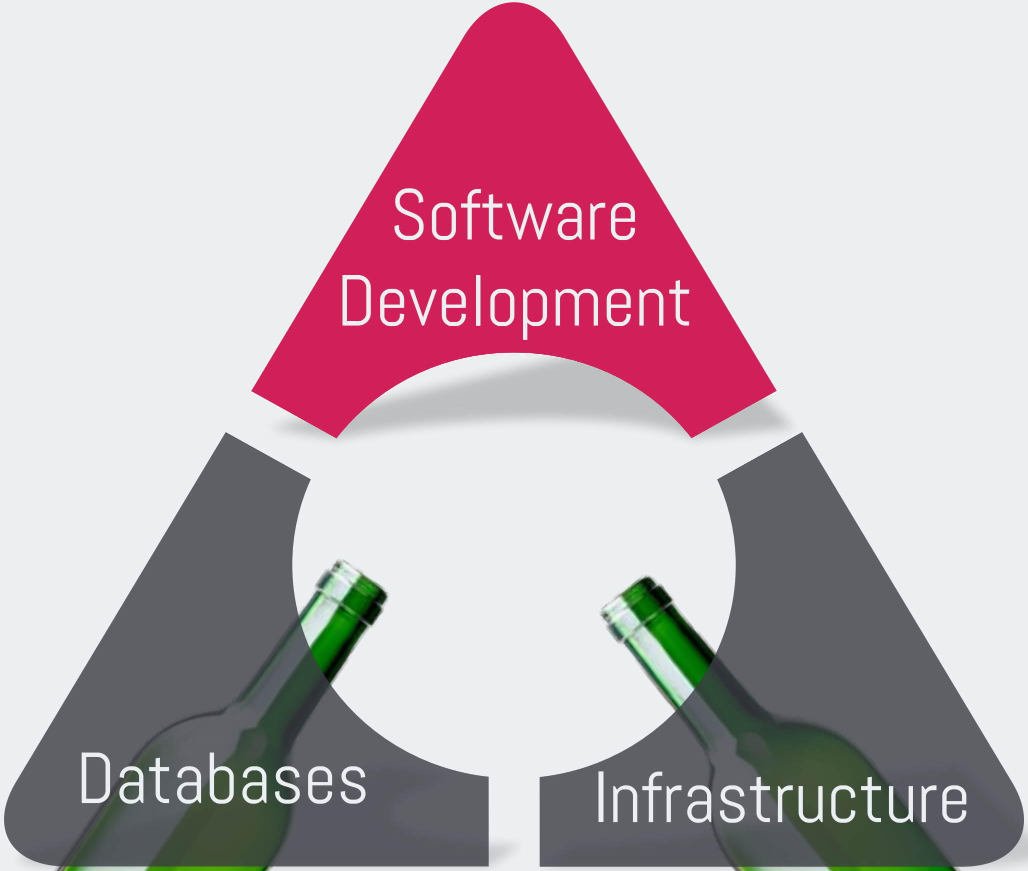
Customer expectations being met

He trusts the work is done consistently

Demand balanced against capacity

Metrics and reporting strategy

Fit for purpose



Did you remember the Databases and Infrastructure areas?

We've put a lot of effort in our interactions with them.

Inspired by our achievements, they've also started to use a lot of Kanban practices and improving their service delivery to us.

Results

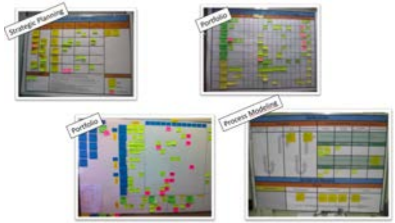
Kai Zen

改善

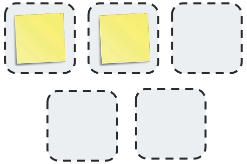
After these 3 teams, 5 more teams adopted this same approach of Service Delivery reviews

After-effects

Transparency

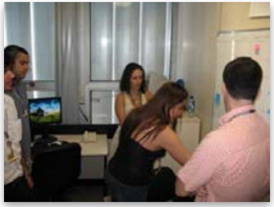


Balance



Customer Focus

Collaboration

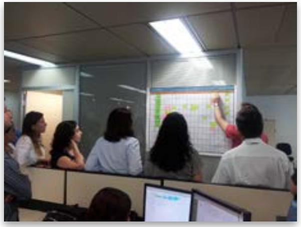


Leadership

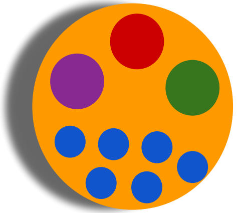
Flow

Understanding

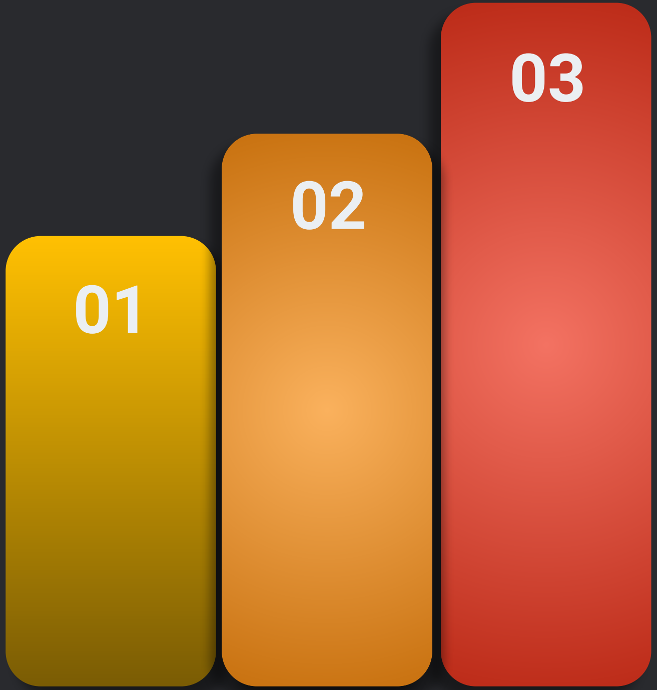
Agreement



Respect



Thank you!



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