

Context- Aware Smart Bus



CSE2049

Context Aware Computing

VIT

2021



**Thank you
for being
here**

PROGRAMMING LANGUAGE

DATASET

Java

{:}

JSON



Team Members

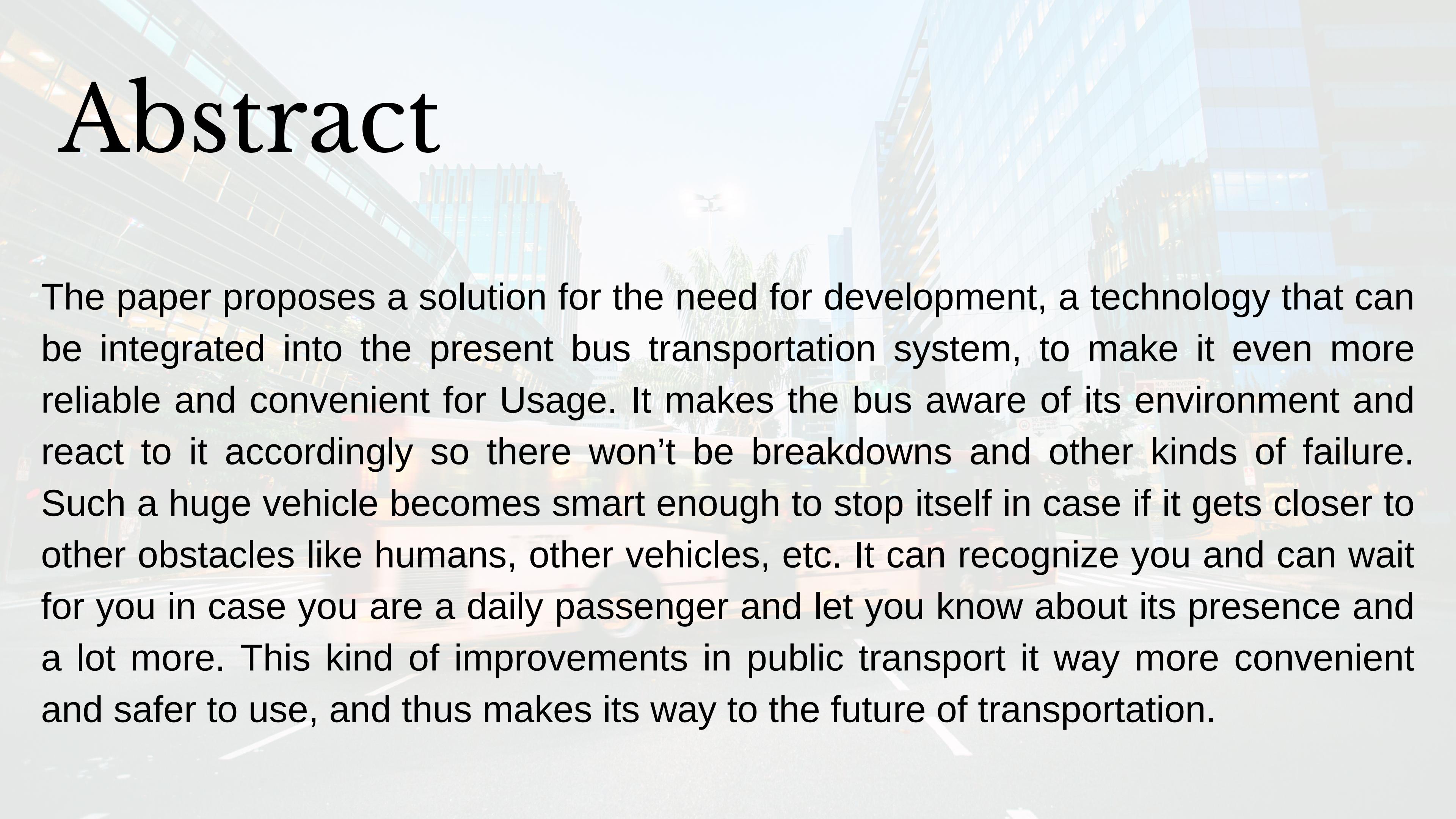
Alapati Lakshmi
Viswanath

19BPS1014

Dharaneesh
Anthikapalli

19BPS1031

Abstract



The paper proposes a solution for the need for development, a technology that can be integrated into the present bus transportation system, to make it even more reliable and convenient for Usage. It makes the bus aware of its environment and react to it accordingly so there won't be breakdowns and other kinds of failure. Such a huge vehicle becomes smart enough to stop itself in case if it gets closer to other obstacles like humans, other vehicles, etc. It can recognize you and can wait for you in case you are a daily passenger and let you know about its presence and a lot more. This kind of improvements in public transport it way more convenient and safer to use, and thus makes its way to the future of transportation.

Detailed Description



The project is another approach to develop technology in public transport, which enables multiple features to the already existing system. To execute this, we deployed various sensors to detect the presence of people both inside and outside the bus, the bus will know you are a regular passenger so it cares your presence, sends you notifications and waits for you if it knows you are near. It is really safe to travel in it as there are cameras deployed and connected to the internet all the time, it knows the weight it can carry so no mid-road breakdown again. It is always being watched so in case of any failure support will immediately know it. Those are some of the abilities which the program adds to the existing bus system

Challenges to be addressed

The major ones are to improve the security, fault tolerance and reliability of the system. Specifically, the system has to be capable of detecting an accident and react to it accordingly, which is addressed in the program where the system intelligently recognises an accident. In order to avoid damage to the bus, to increase the reliability, we need keep a check on the weight inside the bus, and shouldn't let excess weight to enter as it can damage both structure and engine of the vehicle. A constant monitoring of the structure of the bus is required to ensure the structural strength of the vehicle especially the tourist ones, as structure failure can be catastrophic at times and it can happen due to numerous reasons. Engine Diagnosis and Maintenance remainder this is self-explanatory as the bus is all about its engine and its condition has to be good at all times. Obstacle detection, this is one the important challenges to ensure that the bus can't harm other people and properties as the vehicle being huge, the driver can sometimes miss the areas which needs the attention. Coming to the reliable working of the software it shouldn't crash in any uncertain situations, so all the required fault tolerances are coded like situations where it can't find the required file, or the file format mismatches which can happen due to connectivity issues.

The software has to be intelligent enough to detect faulty sensors, reporting wrong values so that we don't run into unwanted hustles, especially in situation like some Debre getting stuck on the proximity sensors, weight sensor damage due to wear and tear of the components, and other technical failures.

Context- Aware Behaviours



- 
- 1 Accident Detection and Help call
 - 2 Weight detection, and warning sys
 - 3 Structure health detection, and maintenance call
 - 4 Engine Diagnosis and Maintenance remainder
 - 5 Obstacle detection and Avoidance

- 
- ⑥ Passenger ping, and wait determination
 - ⑦ Person detection and Profile updation
 - ⑧ Bus Station detection and Passenger determination
 - ⑨ Fire Safety Mechanism



Failure Tolerance

Hardware failure

- If GPS fails then the RFID tag of last station is stored to know location
- If vibration sensor fail to provide the threshold rhythmic action then

Software failure

- Raise of alarm issue if person unidentified in case of loss of data retrieval
- Unpredictable response of PIR sensors cause system failure

Conflicting rules

- Passing each context one at a time to context aware system.
- Raise of alarm in accident or even if close by situation
- Raise of fire extinguisher in case of fire and smoke

Erratic behaviour

- Wrong output due to the above 3 failures



Optimizations based on

Non deterministic fault

- Like erratic behavior
- fails to activate the correct action

this situation is taken care, no erratic behavior is evidenced

Dead Context fault

- You identified a context, but there are no rules fired for this context, In such cases what will the system do (all the code blocks worked in one situation at least)

Dead Decision Fault

- There are rules which are defined for a situation which never occurs, so make sure they are not there (no such context ever arrived, in our case)

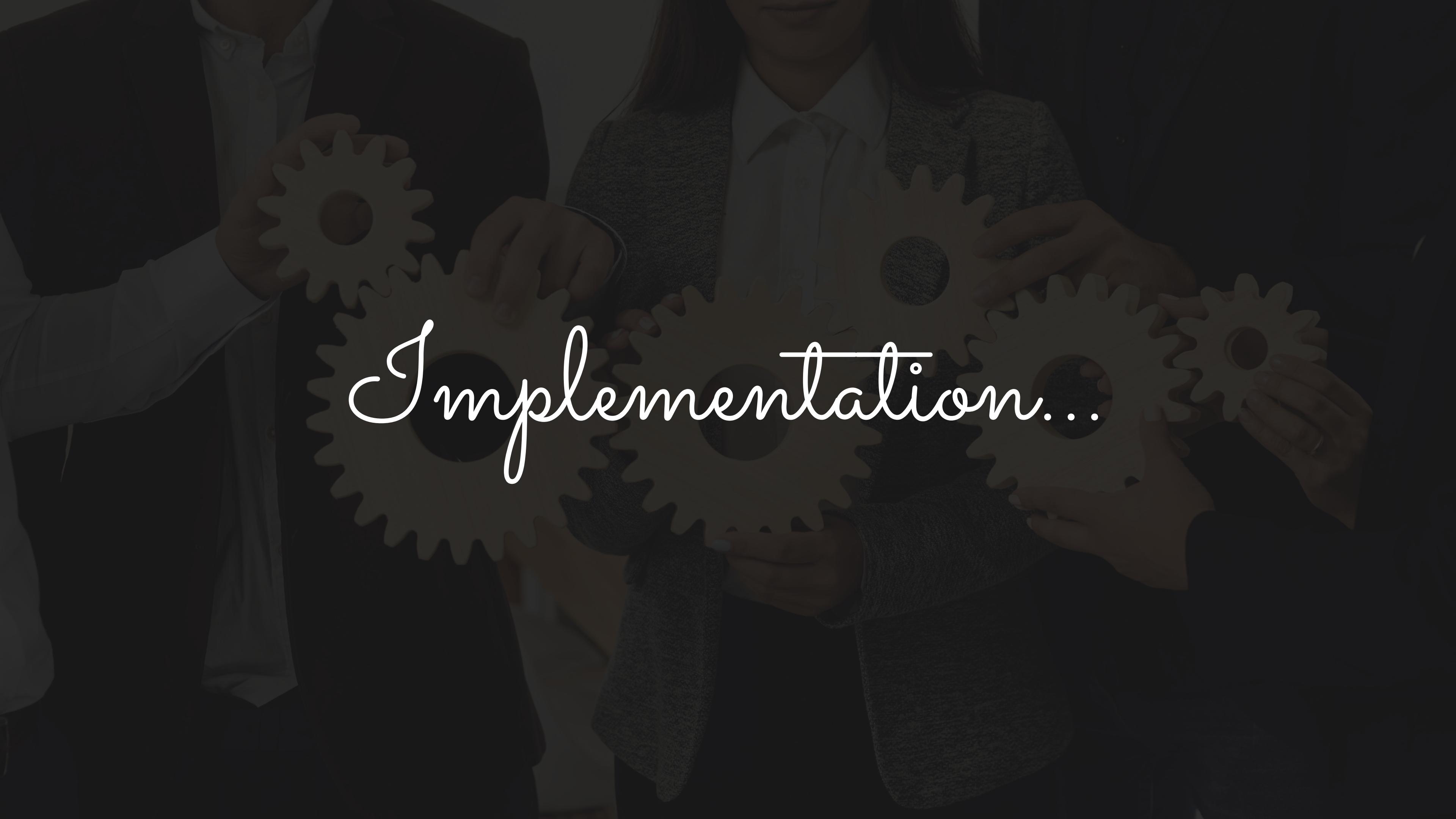
Adaptation Race Fault

- Due to some situation, a rule is fired, and because of that another rule is fired, and because of the another rule and this goes on 1(this never happens)

Adaptation Cycle fault

- The firing of a rule becomes the cause of firing of some other rule and then because of this the previous rule is fired again (this never happened)

DataSet



Implementation...

Thank
you

