

MISSING CONSIDERATIONS ON 802.3DM.

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MOTIVATION

- Like everyone else, 802.3dm makes a product for customers...are we?
- This presentation takes us to the following journey, from the point of view of someone affiliated with a car manufacturer (OEM) and with the associated experience.
 - What do we burden on the customers (namely OEMs)?
 - How do they think and what do they want?
 - What can they win and what can they lose?
 - How to achieve a product customers look for instead of the opposite?

INTRODUCTION

- Assuming that the outcome of this standardization is aimed to suit OEMs, almost all are already using one or the other asymmetric high-speed technology to connect their cameras.
- Up to now, at least two major proposals are proposed as the IEEE alternative to existing proprietary technologies.
 - Each one has pros and cons.
 - For one related silicon is already available, the other is being proposed as a concept for .dm
 - Each solution assumes different IVN configurations and zonalization scales.
- And like buying a new car, the customer first of all asks:
 - Do I really need to replace my old one?
 - Will the new one “eat me up” me financially/effort-wise?
 - Does it even fit my lifestyle?
- 802.3dm is not a car, but the main worries behind these questions remain the same.

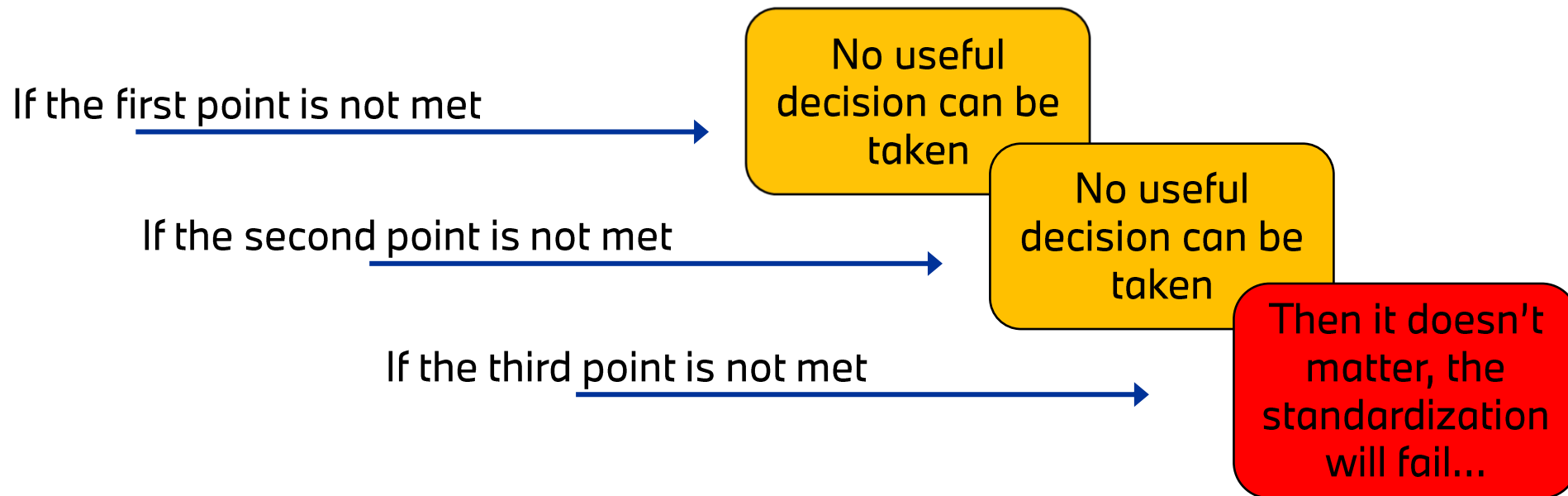
INTRODUCTION

- “Do I really need to replace my old one?” -> What is not working currently? What will I gain?
- “Will the new one *eat me up* me financially/effort-wise?” -> Do I have to invest more overall costs than I can save or compensate for with additional benefits?
- “Does it even fits my lifestyle?” -> Does it fulfills my IVN needs? Does it fit into my current and planned architecture?

- For OEMs, more questions raise like:
 - Can I already test it? See it? Integrate it?
 - What does the supplier landscape looks like?
 - Is the additional cost and effort worth it?
 - Will it be interoperable?
 - What is the impact on existing SW/HW landscapes?

WHAT IS BURDENED ON THE OEMS?

- A lot of questions whose answers require three things:
 - All of the necessary data is available -> Especially **Requirements** and **Validation Results**.
 - All of the data is comparable -> Make sure that all data refer to the **same** validations.
 - All of the data reflects real requirements -> Make sure all validations are made against requirements.



- Currently only a small number of individuals affiliated with car manufacturers have voiced their opinions.

WHAT IS THE THOUGHT PROCESS AT A CAR MANUFACTURER?

- Previous presentations emphasized the fact that “Automotive aims for the most cost efficient solution fulfilling its requirements”.
- This is normally solved with standards: Consensus helps to generate more providers, more competition, better cost-to-performance.
- Here comes the first difference observed:
 - Semiconductor vendors seek solutions that optimize; OEMs just those that satisfy (needs).
- Another observation:
 - OEMs will stay with the same solution throughout several years.
 - Semiconductor vendors plan and release products on much shorter timeframes
 - Basically this means that once an OEM integrates a technology in it's cars, it will not leave it until, probably, 10 years.
- Yes, OEMs share the same “wants” as Semiconductor vendors but rather adhere to **their** “needs”.

WHAT DOES AN OEM WIN?

- An OEM can only win a useful new standard if:
 - Requirements satisfy real needs.
 - Solutions show how they can meet the requirements.
 - Solutions can be planned with over a long time.
- Only if all this is clear, an OEM can actually invest and gain an advantage with a standard.
 - Otherwise an OEM “wins” staying with what they already have and everyone else “wins” a dead standard.
- Currently we are rushing to adopt a baseline while having different opinions on the requirements.
- In other words: The market will not accept a premature standard but reward the additional time invested.

AN EXAMPLE ON DEEPER OEM UNDERSTANDING

- OEMs generally try to satisfy their needs in the most cost-efficient way
- Example: BMW considers the following before accepting a new standard:



– Resilience -> Technology must be future proof, ideally serve to more than one use case (e.g.: Switch from cameras to displays).



– Suitability -> The solution must fit into the current and planned IVNs (IVN architectures are planned way ahead and live for several years).



– (Overall) cost -> Direct monetary costs but also costs for tools, processes and more (Do I need to train my whole staff, buy new measurement equipment, define a fully new test strategy...).



– Security -> Does the solution supports specific security levels? (Only external ones/lower layers, it has his own...)



– Provider landscape -> How many companies can provide this solution?

WHAT ELSE DOES AN OEM NEEDS? (AND MAYBE 802.3DM AS WELL?)

- Any solution-results shown need to be tested and reproducible, meaning:
 - No “assumed” factors unless **fully detailed** and **realistic (again, represent something an OEM wants to see)**.
 - Assumptions need to be detailed and comprehensive.
 - In general, factors need to be **agreed among all participants**, hence allowing for direct comparisons.
 - Any unilateral tests are welcome but need to adhere to at least the first point.
- (Simulated) improvements require (real-world) test results.
 - Between different companies -> **Interoperability**.
 - Solution is implemented and tested between more than one provider.
 - Specification by multiple stakeholders -> **Reproducibility + Realism + Comprehensiveness**.
 - Solution provides a detailed specification on physical medium, connector, modulation, channel, ...

JUST AN EXAMPLE

- Latency and delays.
- The presentations below (and more) sparked a variety of additional presentations and mailing-list entries.
- At the end it was not clear how any proposal was comparable or even reflecting what 802.3dm needs to solve.
 - ADAS loops and dependencies are introduced without consensus.
 - Amount of GPIO and I2C commands and related transfer times without consensus.
 - A Tesla recall was used as an “example” why a given parameter needs to be X or Y but only assuming potential relations and reasons.
- 802.3dm should not cause confusion.
 - Confusion leads to fear and a market driven by fear does not invest in any technology at all.

https://www.ieee802.org/3/dm/public/0724/matheus_dm_02b_latency_07152024.pdf

https://www.ieee802.org/3/dm/public/0724/houck_fuller_3dm_01_0724.pdf

https://www.ieee802.org/3/dm/public/0924/Houck_Fuller_3dm_03_0917.pdf

WHAT DOES AN OEM HAVE TO LOOSE?

- The end-user needs are important.
- (At least part of) Requirements, a roadmap and even evaluation criteria need to come from them.
- The group either needs to consider the opinions of the individuals from end-users, or try to bind more such individuals (for active participation).

- “Don't find customers for your product. Find products for your customers”.

SUMMARY AND CONCLUSION

- To find a solution, you first need to understand the problem.
- Choosing among solutions to a problem means comparing under clear and reproducible requirements and assumptions.
- All of these need to come from the use cases, mainly provided by the end-users, as only realistic source.
- Any standardization effort that does not consider this, is not understanding the problem to be solved and hence no solution will be actually valid.
- Call to the group: Identify and **agree** on the market needs. Identify and agree on the solution criteria (not only purely technical ones).

Thank You!

BACKUP

