

Safety Culture in the age of the 4th Industrial Revolution

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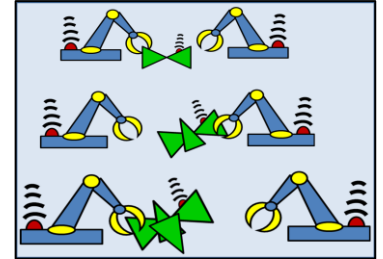
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Scope

- **Safety Culture & the 4th Industrial Revolution**
- **Safety & Security**
 - New Skills & Opportunities
- **Safety (& Security) Regulation**
 - Up-front vs Ongoing Regulation
- **Summary & Questions**

Industrial Revolutions

4th – Cyber-Physical Systems & IoT (~2016)



3rd - Electronics & IT (~1970)



2nd - Steel & Mass Production (~1850)



1st - Factories & Steam Power (~1760)



Aspects of the 4th Industrial Revolution

2020 Internet of Things

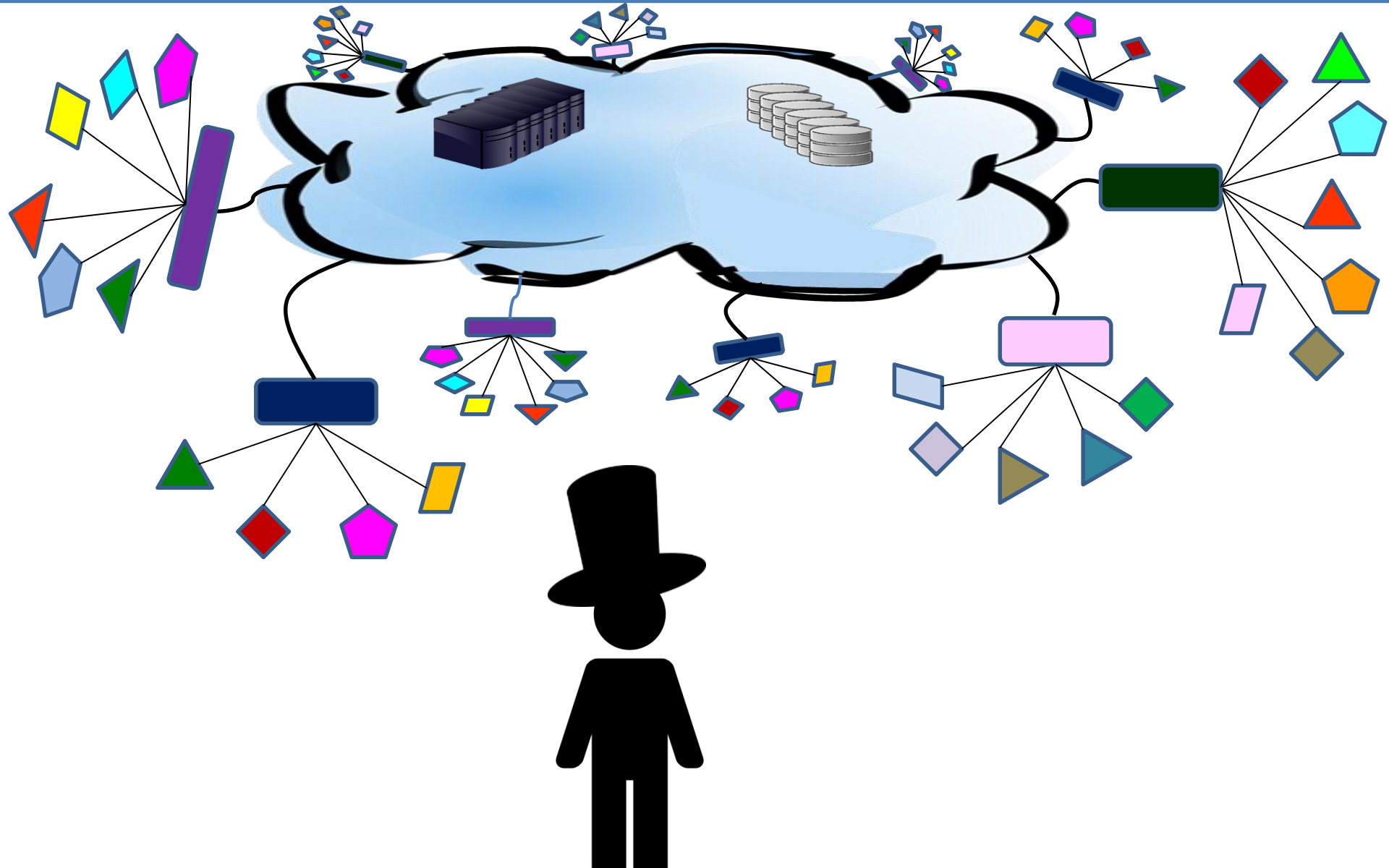


~212 Billion 'Things'
(up to US\$5 Trillion)

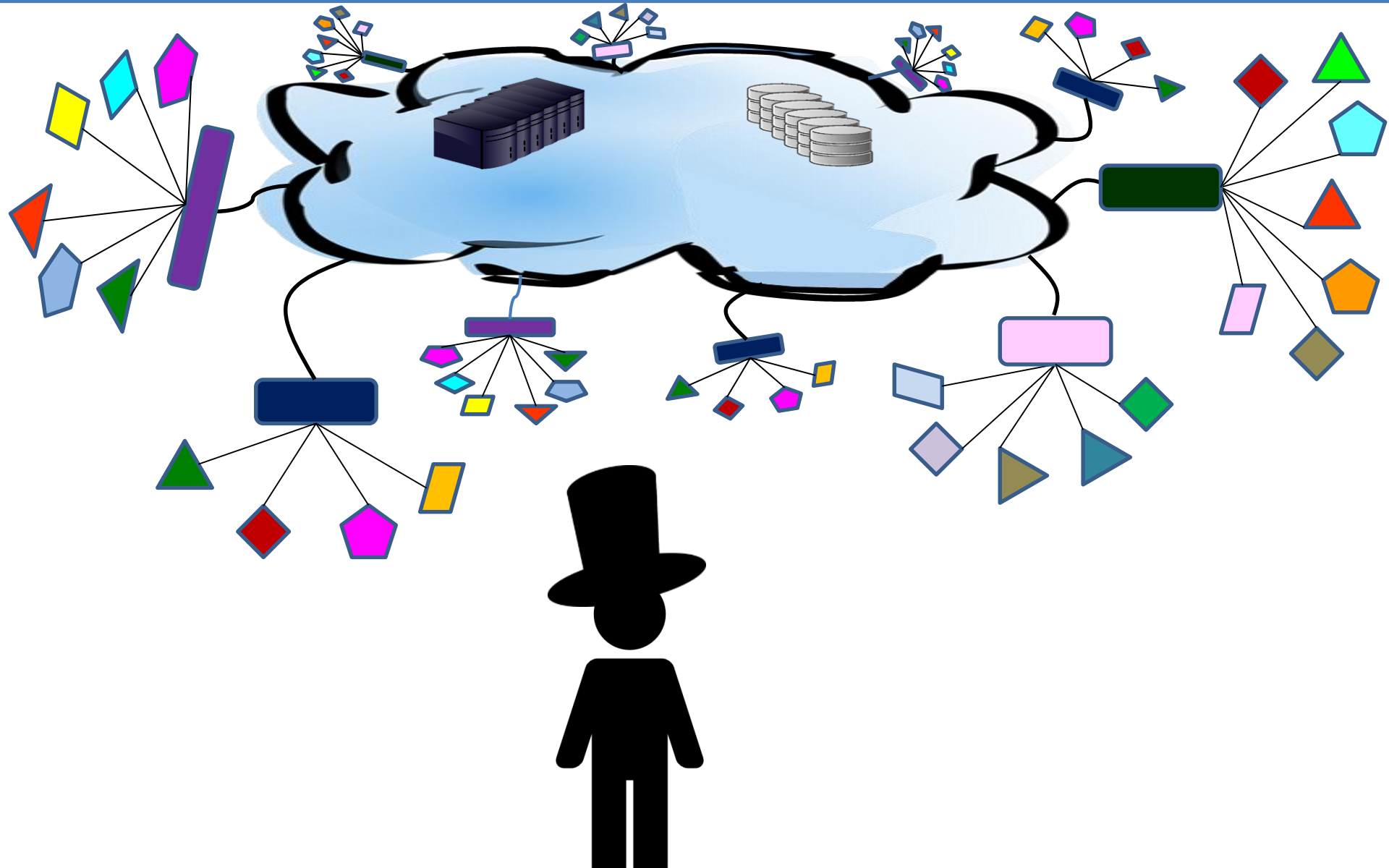
**CONNECTED
EVERYTHING!**

- Smart Factories
- Smart Cities
- Smart Buildings
- Smart Energy
- Smart Wearables
- Smart Health
- Smart Retailing
- Smart Transport
- Smart Agriculture
- :
- Smart Everything!

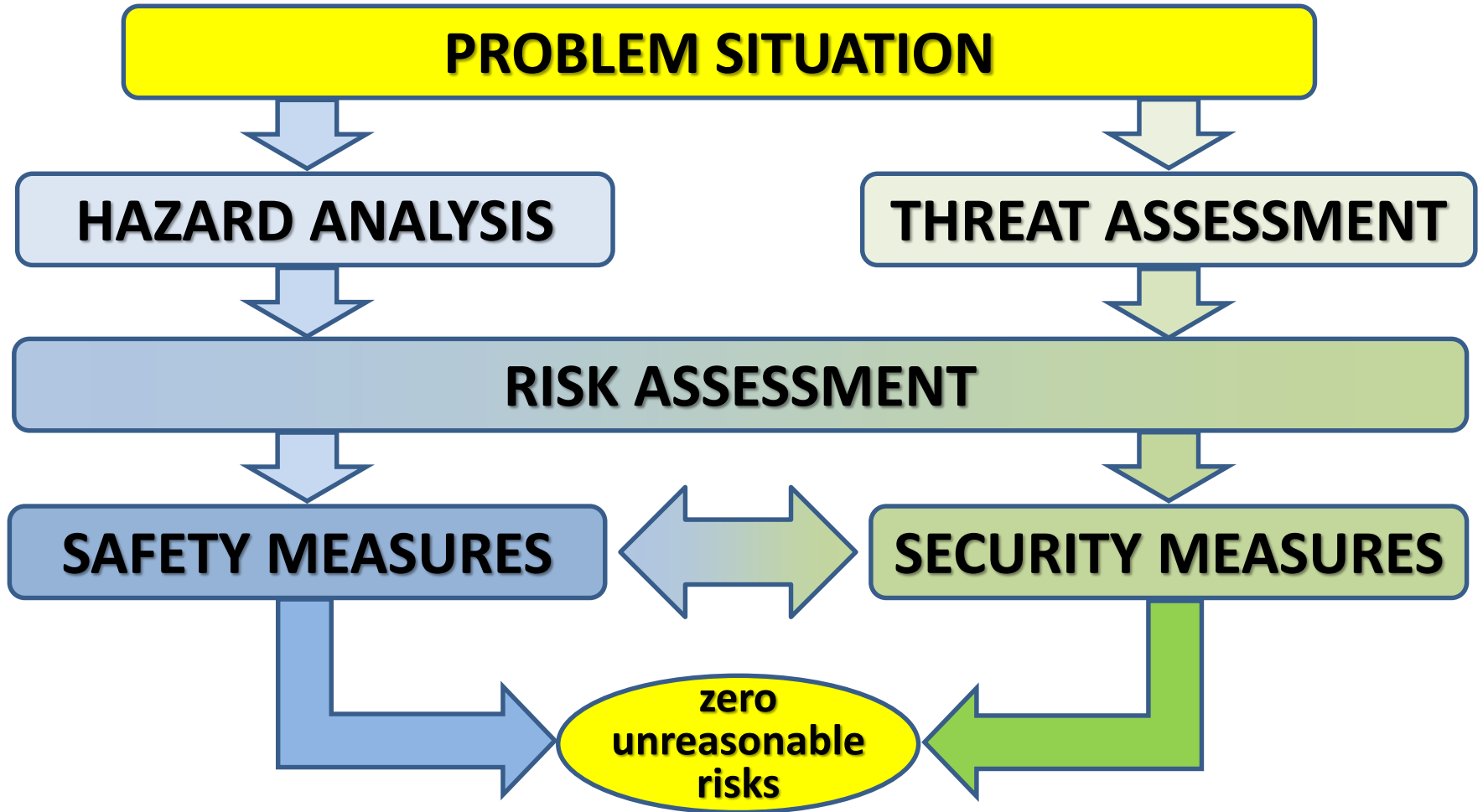
IoT – More Opportunities for Bad Guys



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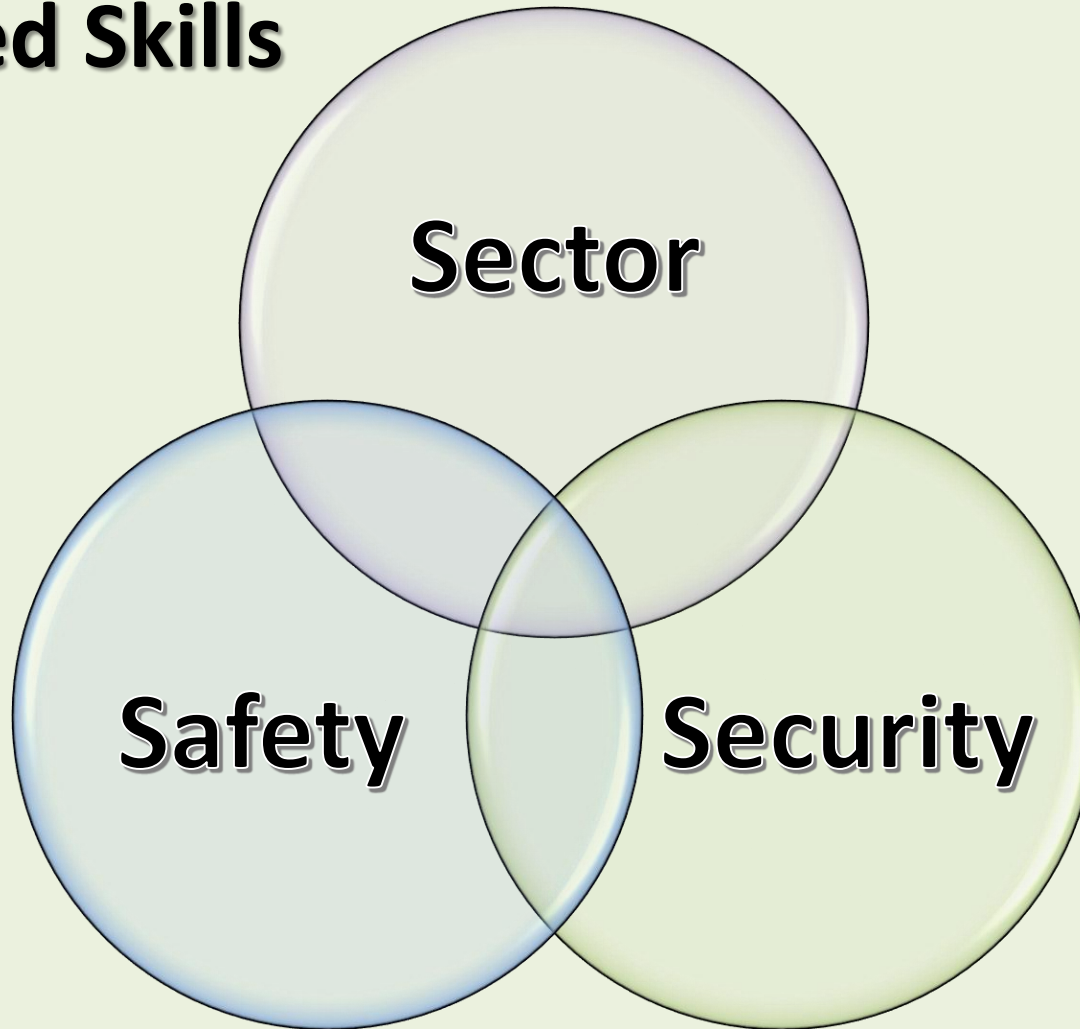


Safety ↔ Security

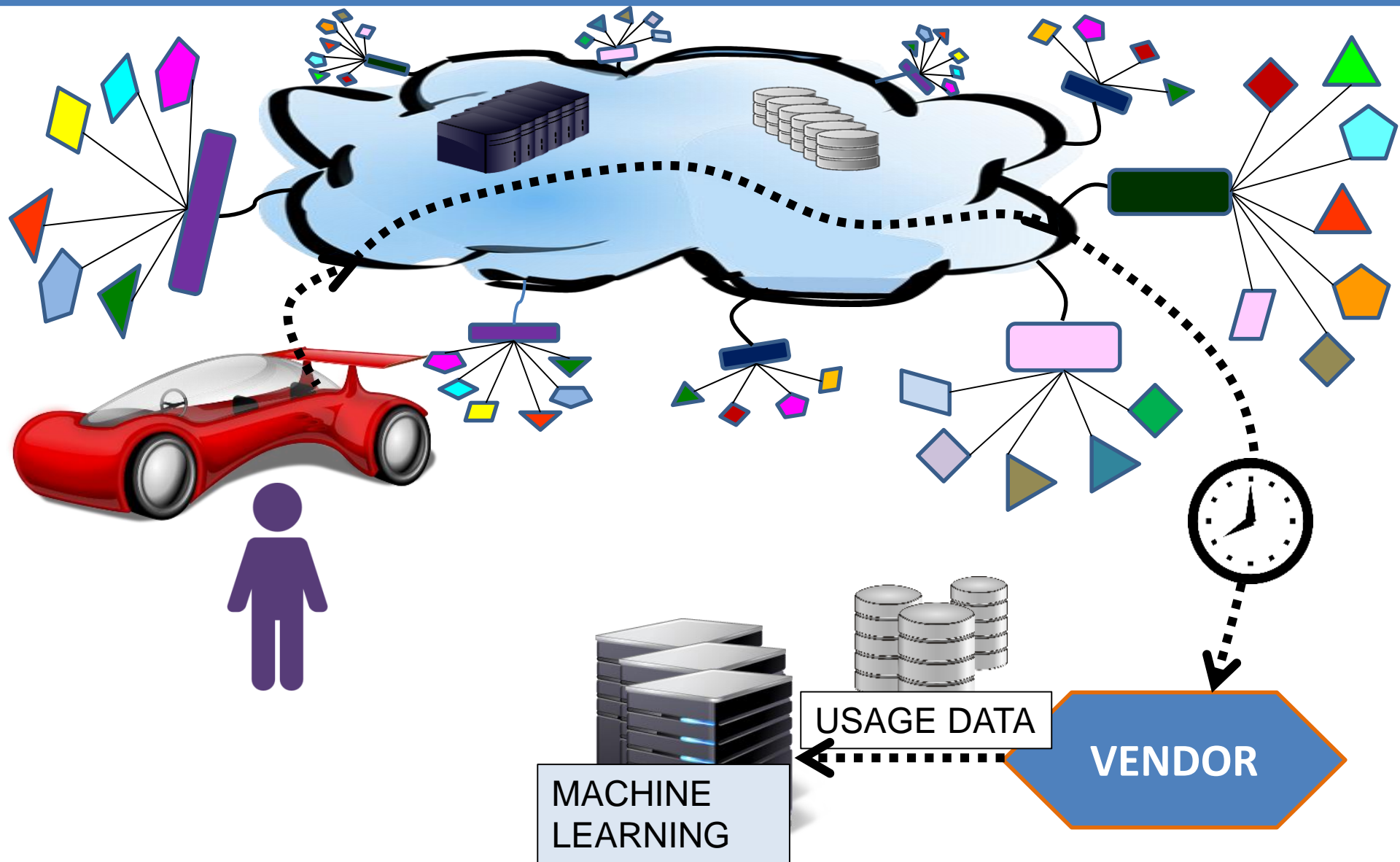


Safety, Security or Sector Skills?

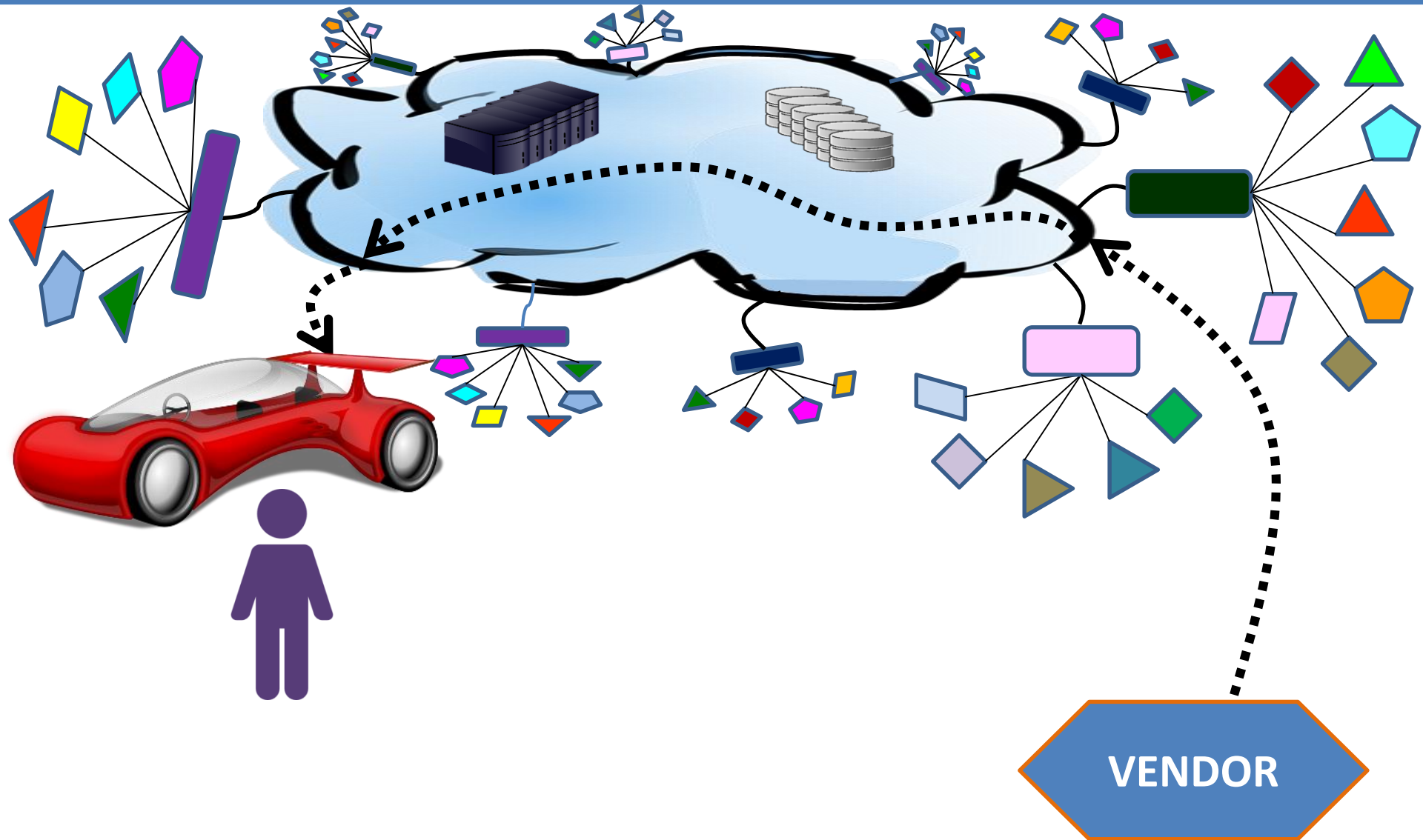
Needed Skills



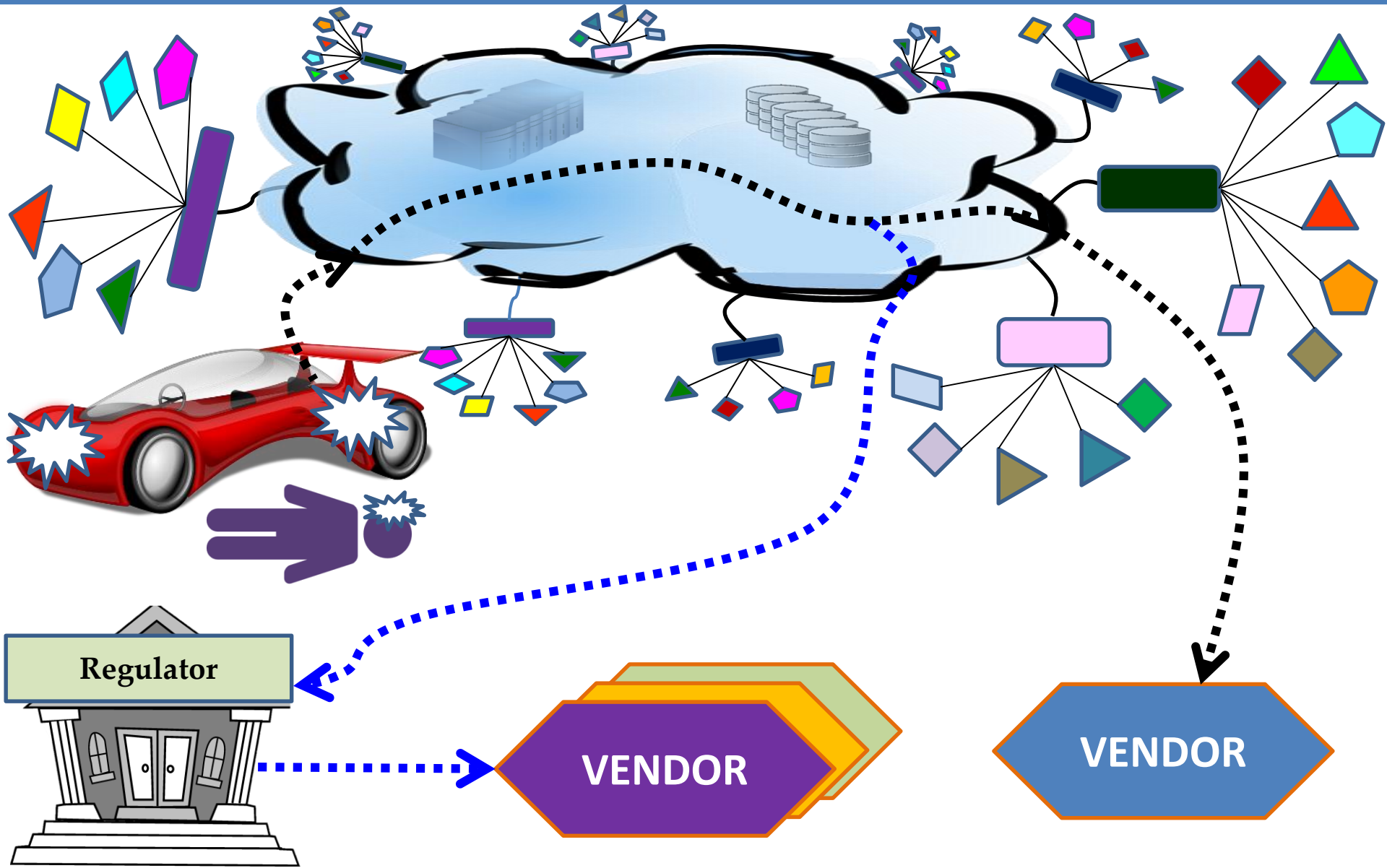
Learning – from Day-to-Day Use



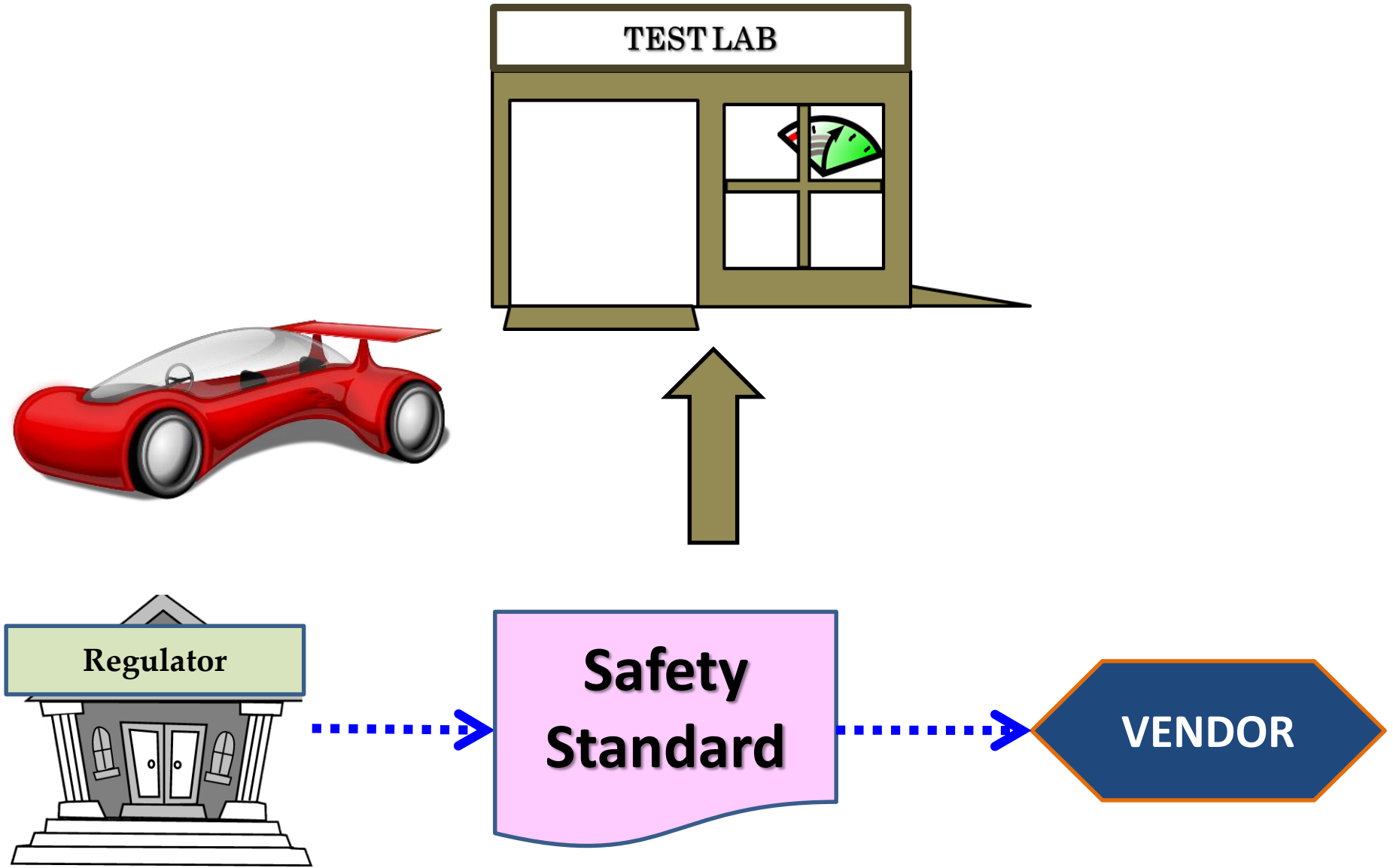
Performance - Over-The-Air (OTA) Updates



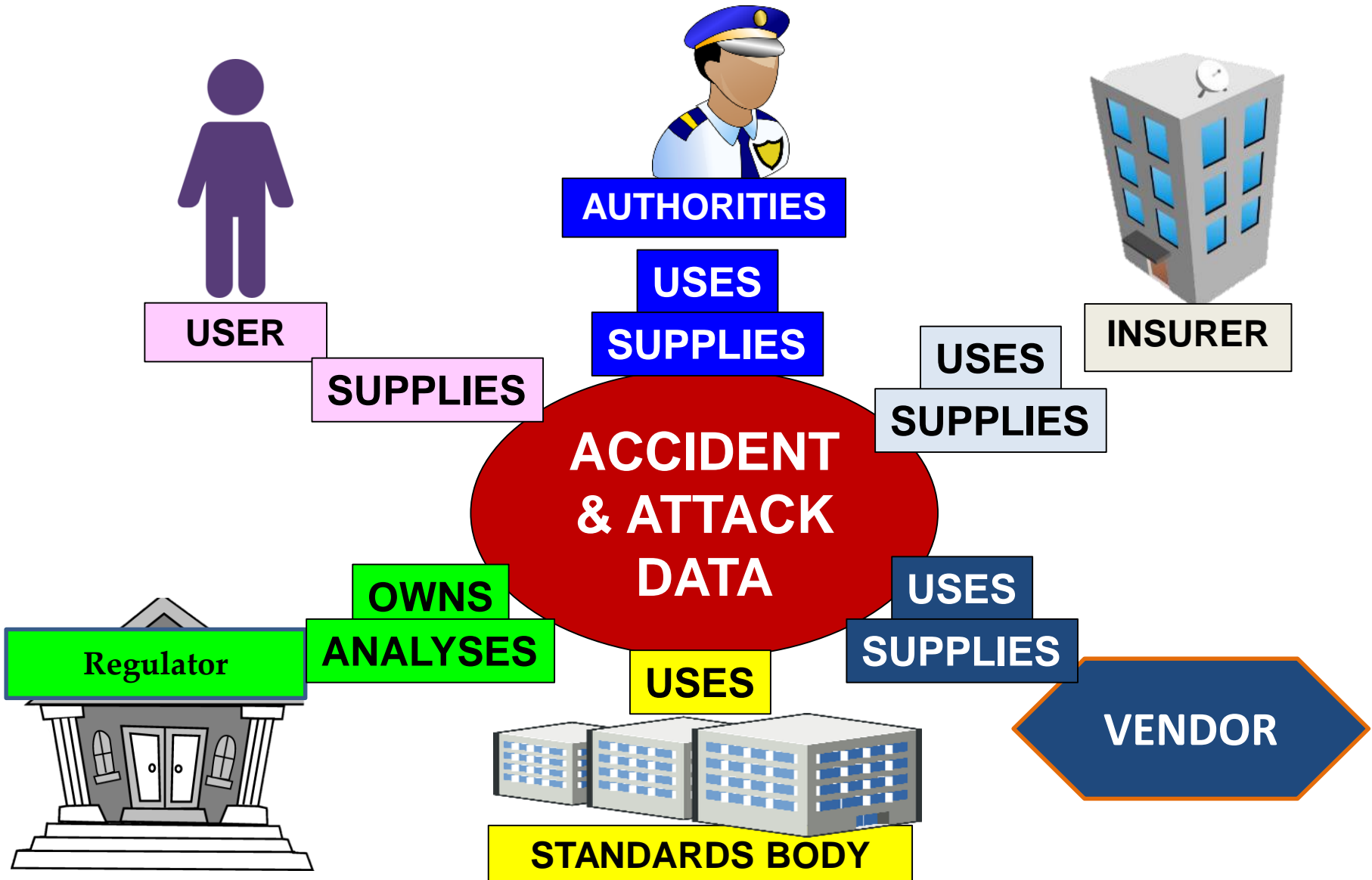
Learning – from Accidents & Attacks



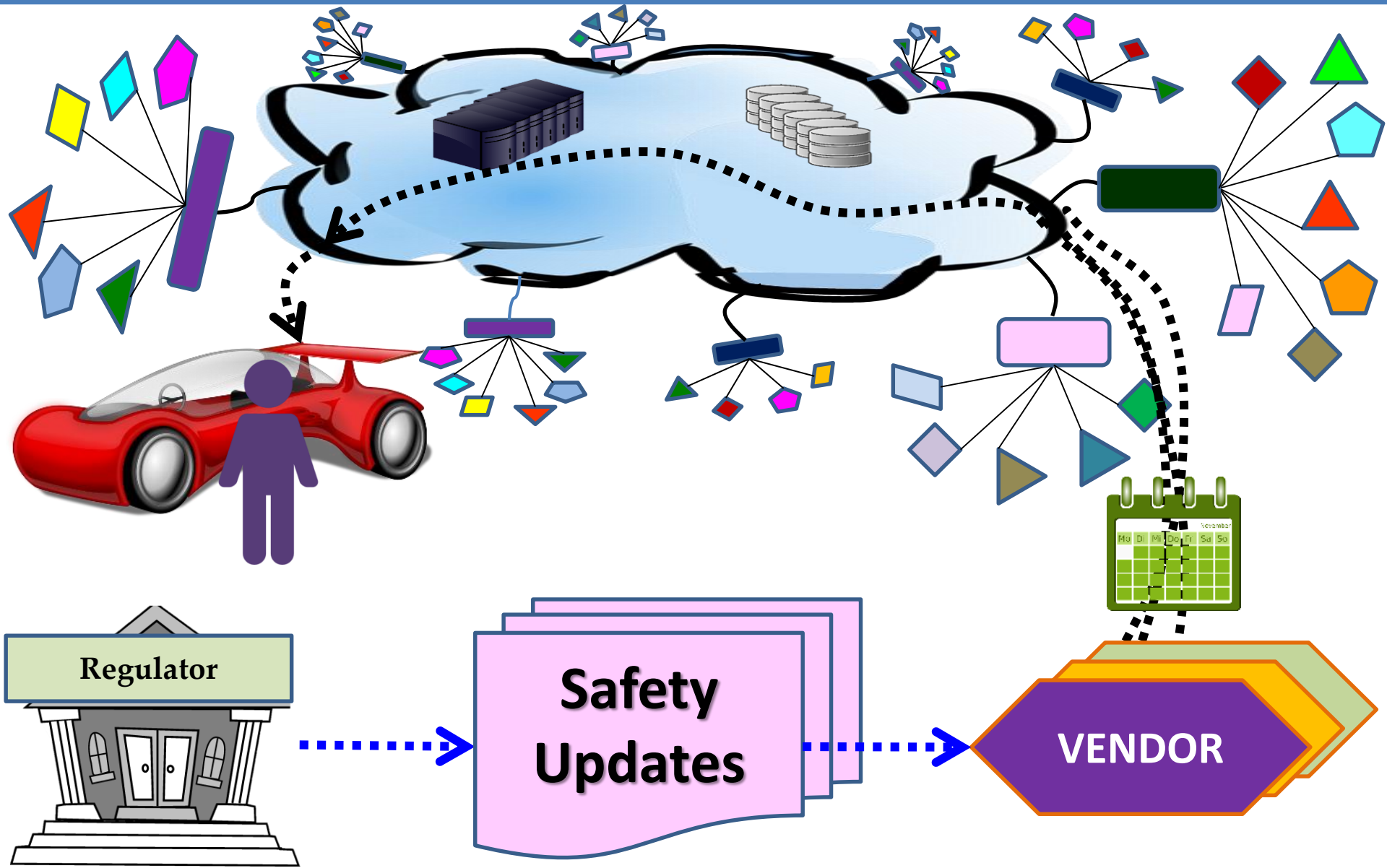
Up-front Safety Regulation



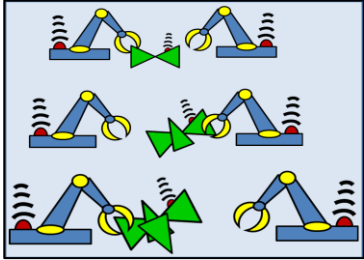
Accident & Attack Data



On-going Safety Regulation – OTA



Safety Culture & Industrial Revolutions



- **4th – Society-oriented**
 - We need a holistic approach to safety as we all interact with the technology



- **3rd – Organization-oriented**
 - ‘The way we do things around here’



- **2nd – Technology-oriented**
 - Management-imposed technical solutions



- **1st – Worker-oriented**
 - The workers looked after themselves

Summary

- **Our Safety Culture needs to become society-wide with the 4th Industrial Revolution**
- **Safety & Security both need to be considered - together**
 - so we need multi-skilled engineers
- **Regulation of connected devices needs to change from an up-front activity to also include an ongoing activity that can take account of a continuously-changing threat environment**