What Have We Found? What's Next?

Takeaways from AAA Foundation's Research

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5th SIP-adus Workshop on Connected and Automated Driving Systems

Tokyo, Japan
November 14, 2018

Introduction Video

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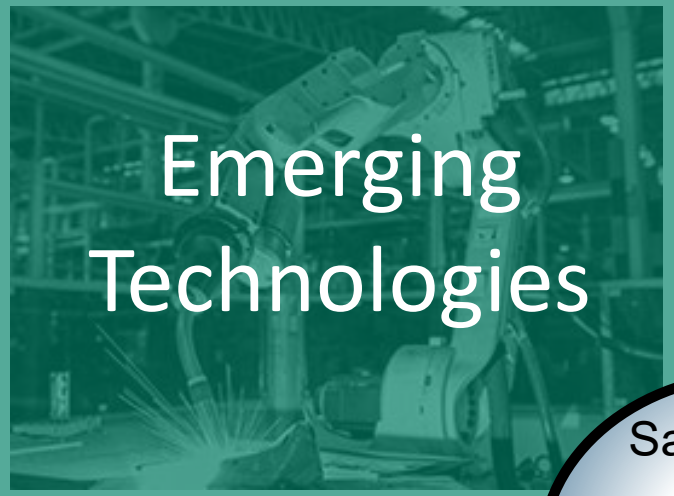
Research Focus Areas



Saving lives through research and education

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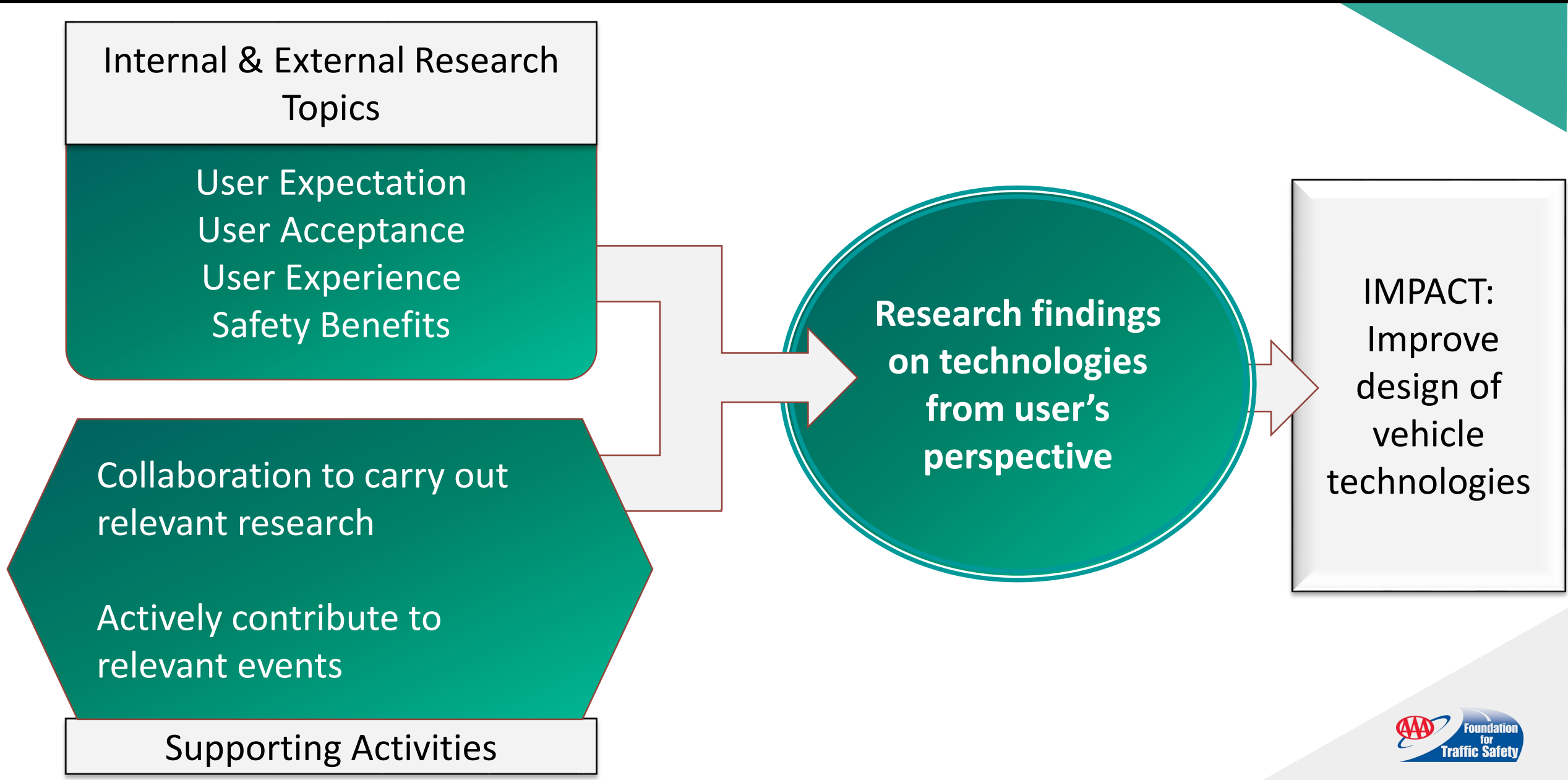
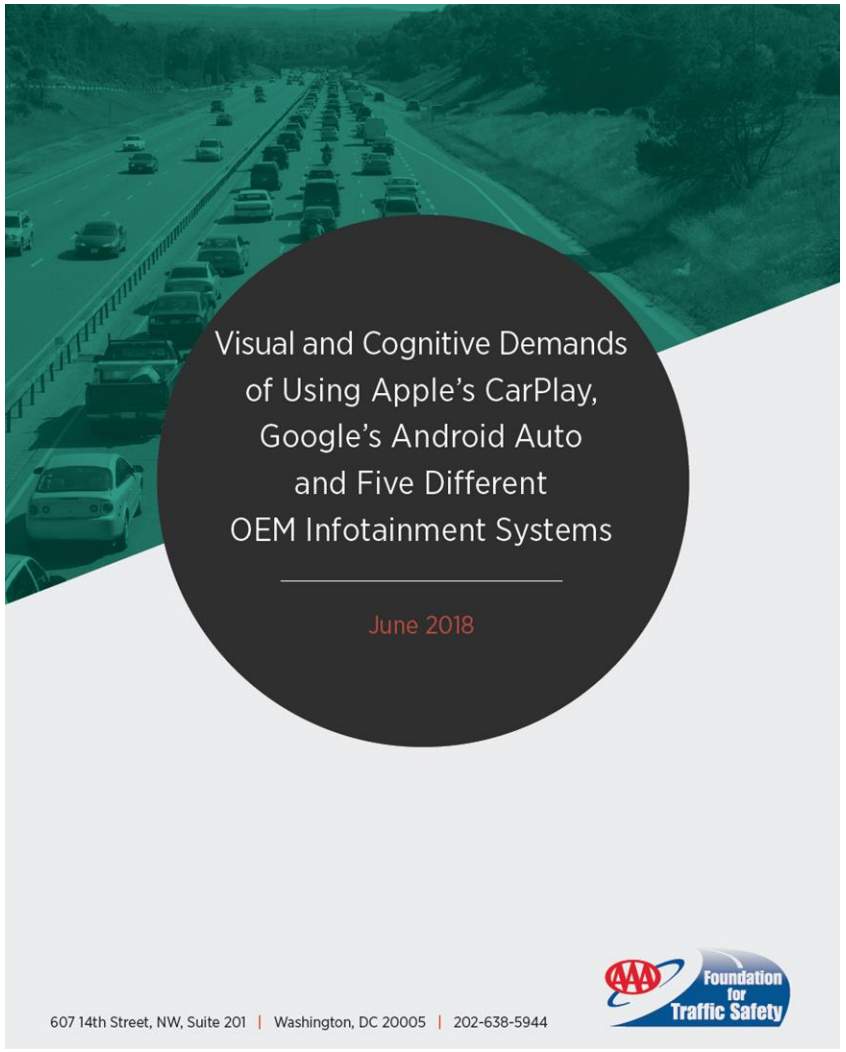
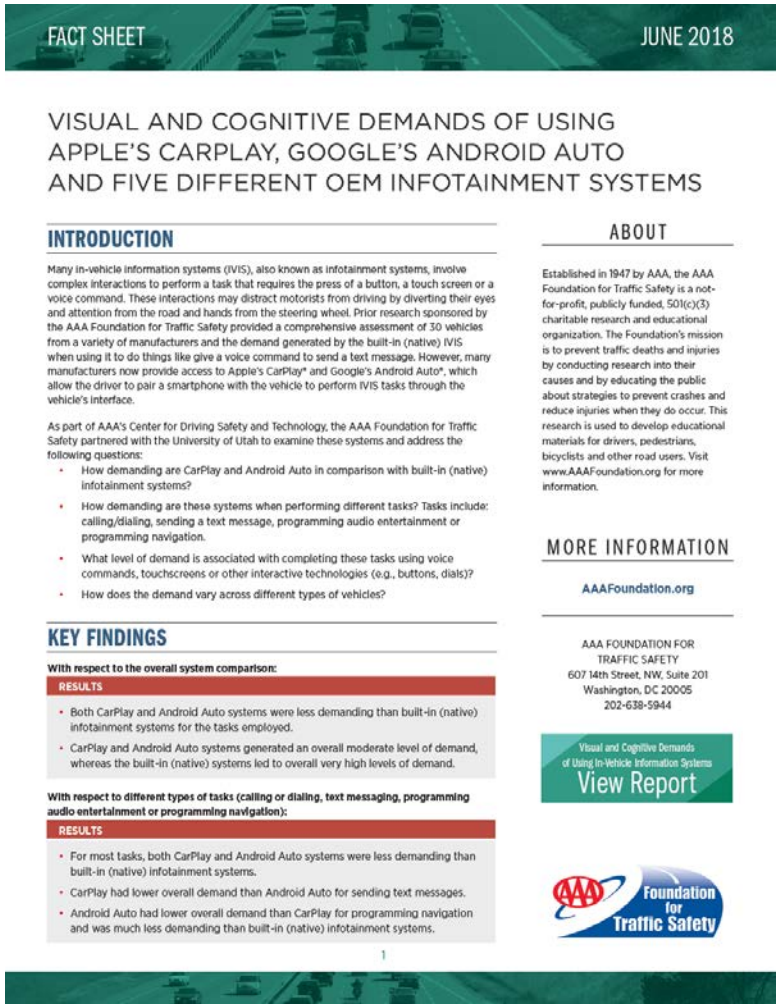
EMERGING TECHNOLOGIES



Visual & Cognitive Demand Associated with Vehicle Technologies (1 of 2)





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Visual & Cognitive Demand Associated with Vehicle Technologies (2 of 2)

- CarPlay and Android Auto systems were less demanding than built-in (native) infotainment systems for the tasks employed – moderate level of demand
- Visual demand associated with CarPlay and Android Auto was lower for both auditory/vocal and center stack interactions vs. native systems

Independent research funded by AAA Foundation → Offer suggestions to technology companies & automakers to enhance their designs, minimize demands placed on drivers

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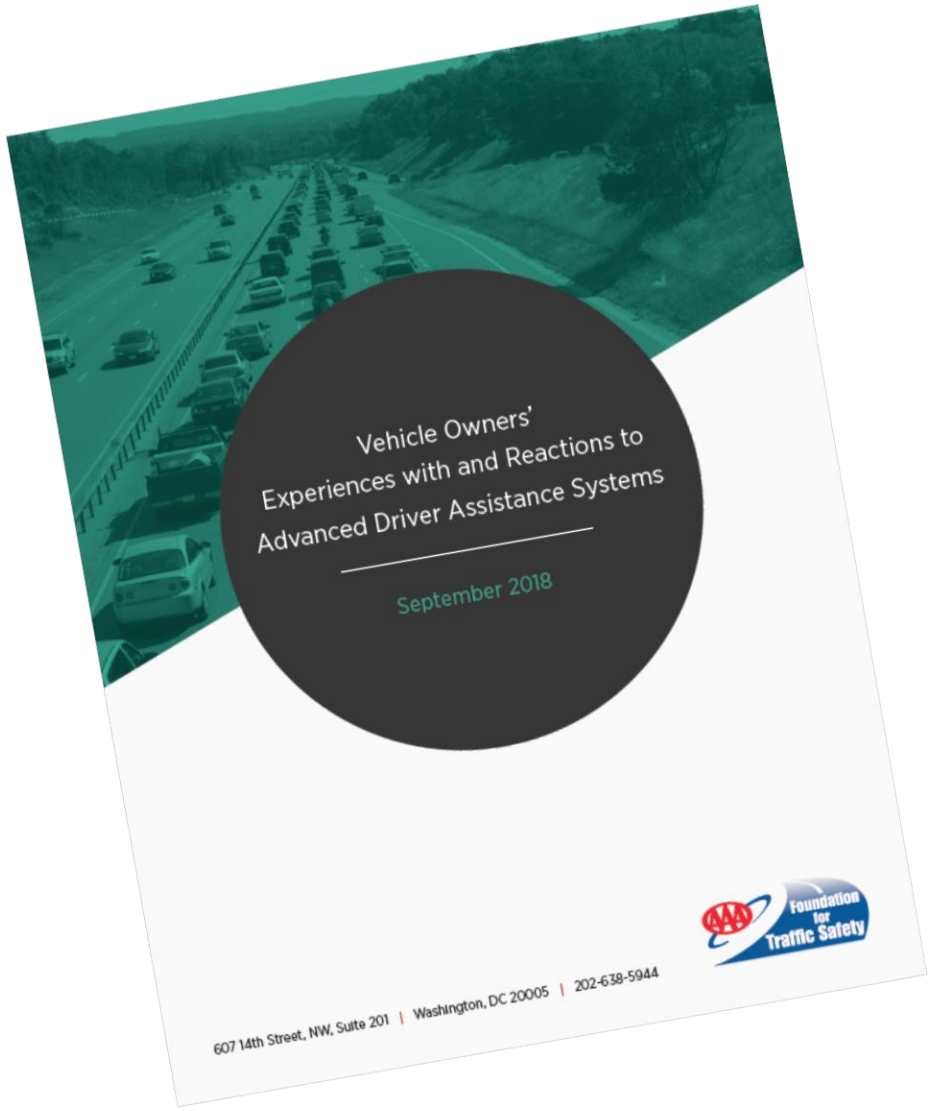
Vehicle Owners' Experiences with ADAS (1 of 2)



- Surveyed registered owners of 1,200+ 2016-2017 ADAS-equipped vehicles
- Examined attitudes, experiences, knowledge, learning, sources of info
- In collaboration with University of Iowa

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Vehicle Owners' Experiences with ADAS (2 of 2)

- Generally favorable opinions about all tech examined
  - High % trusts, finds useful, feels safer, would buy again, recommend to others
- Main sources of info = owner's manual, dealer, trial and error
  - Negligible % reported consulting other online resources
- Some concerning knowledge gaps, compensatory behaviors
  - ~30% report at least sometimes changing lanes without visual check
  - 20-30% comfortable engaging in other activities while driving with ACC, AEB

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Potential Safety Benefits from ADAS (1 of 2)

- How many crashes, injuries, and deaths could potentially be prevented if all vehicles had ADAS technologies?

- Technologies examined:

Longitudinal Systems	Lateral Systems	
Forward Collision Warning	Lane Departure Warning	Blind Spot Monitor
Automatic Emergency Braking	Lane Keeping Assist	

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Potential Safety Benefits from ADAS (2 of 2)

- Having FCW / AEB on all cars could potentially prevent
  - 1,994,000 crashes (29% of crashes – mostly rear-end)
  - 4,738 deaths (14% of all deaths – mostly pedestrians)
- LDW / LKA could potentially prevent
  - 519,000 crashes (7% of crashes – mostly road departure)
  - 4,654 deaths (14% of deaths – road departure + head-on)
- BSW could potentially prevent
  - 319,000 crashes (5%)
  - 274 deaths (<1%)

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Advanced Driver Assistance and Semi-Automated Vehicle Systems and Improper Driving Behaviors

- Investigate potential change in crash risk in relation to driver interactions with ADAS
  - Extent to which drivers may experience distraction and fatigue relative to use of ADAS
- Three existing naturalistic driving data sets
  - SHRP 2 NDS
  - Level 2 Mixed Function Automation NDS
  - VTTI Advanced-Vehicle Study

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Traffic Safety Culture Index & Emerging Transportation Technologies (1 of 2)

2018 survey included additional items pertaining to AV such as:

- Understanding of AVs
- Perceived benefits of AVs
- Perceived risks/concerns of AVs

https://www.cnet.com/roadshow/news/self-driving-car-guide-autonomous-explanation/

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Traffic Safety Culture Index & Emerging Transportation Technologies (2 of 2)

- Understand role of emerging technologies in today's traffic safety culture & future
- Characterize users' expectations & acceptance of emerging technologies in relation to other factors
- Explore relationship between traditional traffic safety and emerging technologies-related beliefs & perception
- Examine possible determinants of user acceptance

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2017 Forum

Discuss & identify research needs → impact of vehicle technologies/automation for users

Make connections and work together → shape future of vehicle technologies

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2018 Forum

Theme:

Impact of Vehicle Technologies and Automation on …

Vulnerable Road Users

Driver Behavior & Performance

Date: November 7th & 8th, 2018

Location: University of Iowa

Forum Report: January 2019

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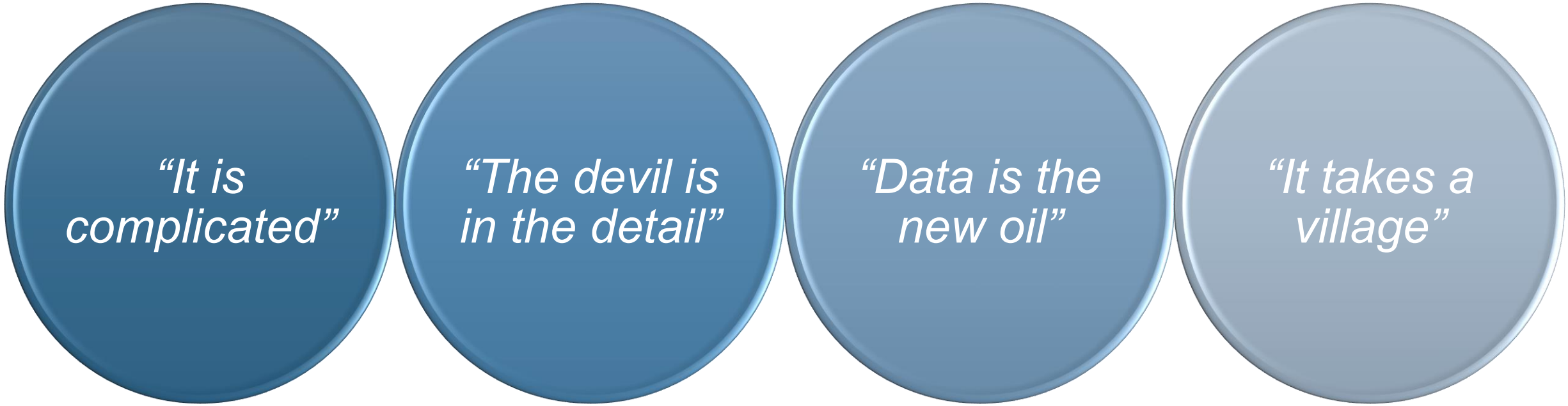

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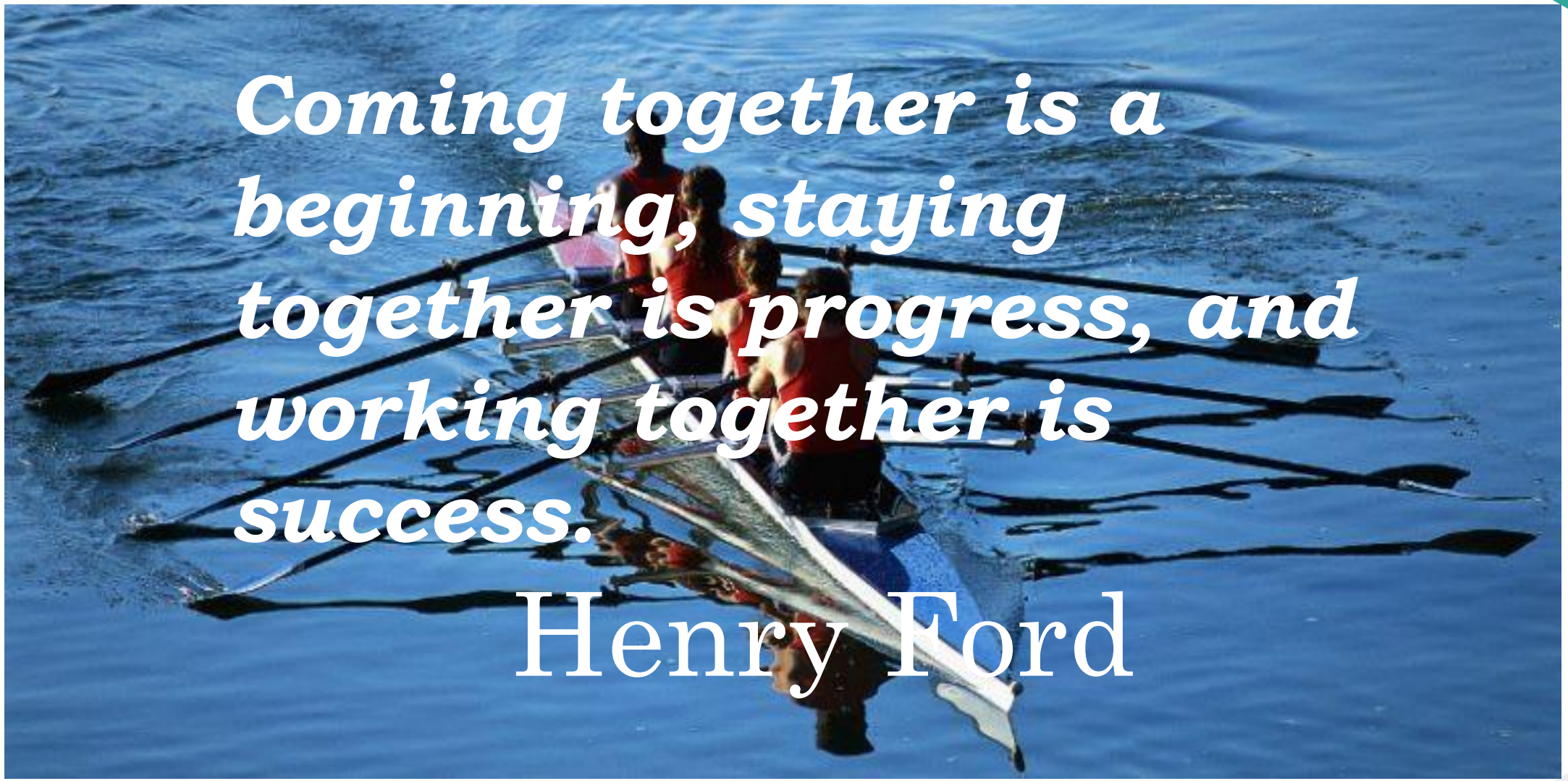

https://positivepsychologyprogram.com/psychology-teamwork/

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Learn more about AAA Foundation

https://www.aaafoundation.org