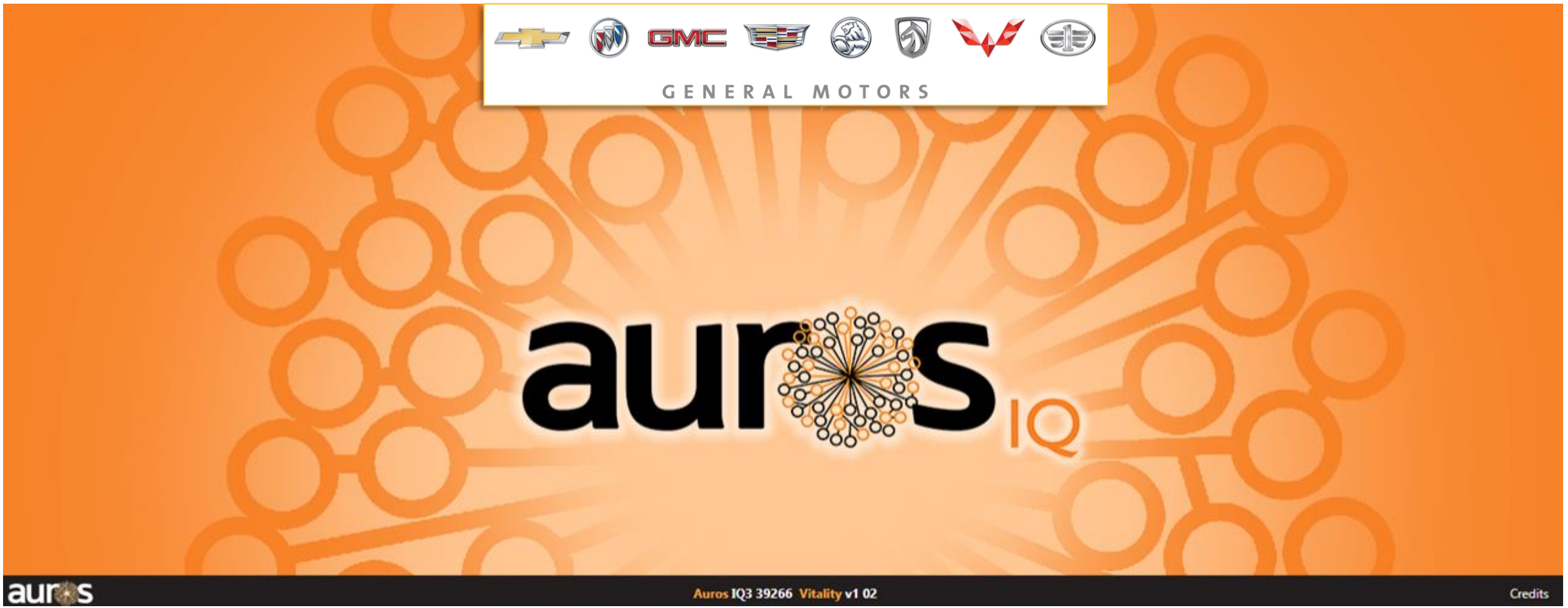
GENERAL MOTORS AND AUROS: PAST, PRESENT AND FUTURE

Nicole Nicholas

Seat Technical Lead

GM General Motors



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AGENDA

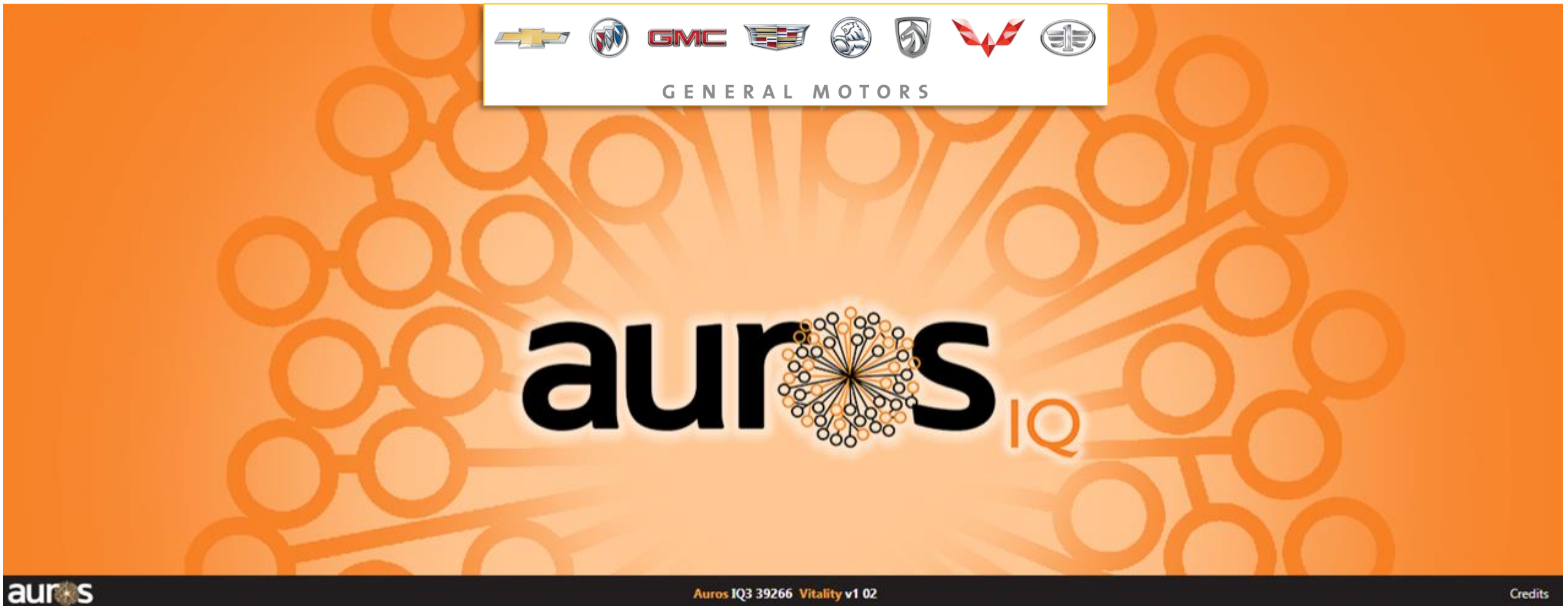
Introduction

Implementation of Auros (Past)

Case Study – Seats (Present)

Future

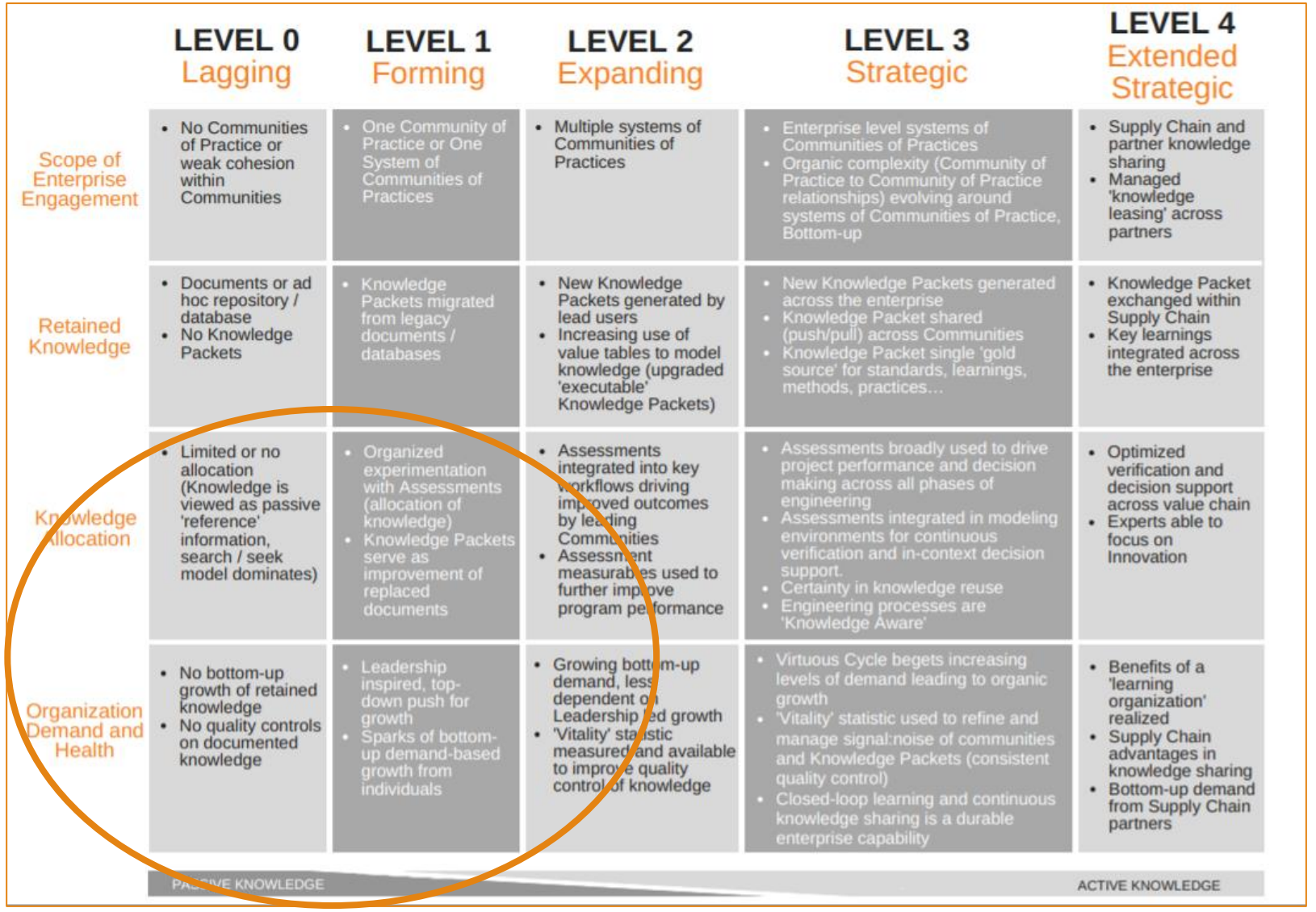
Q&A



IMPLEMENTATION OF AUROS

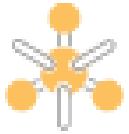
Knowledge Aware Maturity Model and Timeline (Past)

KNOWLEDGE AWARE MATURITY MODEL



	LEVEL 0 Lagging	LEVEL 1 Forming	LEVEL 2 Expanding	LEVEL 3 Strategic	LEVEL 4 Extended Strategic
Scope of Enterprise Engagement	• No Communities of Practice or weak cohesion within Communities	• One Community of Practice or One System of Communities of Practices	• Multiple systems of Communities of Practices	• Enterprise level systems of Communities of Practices • Organic complexity (Community of Practice to Community of Practice relationships) evolving around systems of Communities of Practice, Bottom-up	• Supply Chain and partner knowledge sharing • Managed 'knowledge leasing' across partners
Retained Knowledge	• Documents or ad hoc repository / database • No Knowledge Packets	• Knowledge Packets migrated from legacy documents / databases	• New Knowledge Packets generated by lead users • Increasing use of value tables to model knowledge (upgraded 'executable' Knowledge Packets)	• New Knowledge Packets generated across the enterprise • Knowledge Packet shared (push/pull) across Communities • Knowledge Packet single 'gold source' for standards, learnings, methods, practices…	• Knowledge Packet exchanged within Supply Chain • Key learnings integrated across the enterprise
Knowledge Allocation	• Limited or no allocation (Knowledge is viewed as passive 'reference' information, search / seek model dominates)	• Organized experimentation with Assessments (allocation of knowledge) • Knowledge Packets serve as improvement of replaced documents	• Assessments integrated into key workflows driving improved outcomes by leading Communities • Assessment measurables used to further improve program performance	• Assessments broadly used to drive project performance and decision making across all phases of engineering • Assessments integrated in modeling environments for continuous verification and in-context decision support. • Certainty in knowledge reuse • Engineering processes are 'Knowledge Aware'	• Optimized verification and decision support across value chain • Experts able to focus on Innovation
Organization Demand and Health	• No bottom-up growth of retained knowledge • No quality controls on documented knowledge	• Leadership inspired, top-down push for growth • Sparks of bottom-up demand-based growth from individuals	• Growing bottom-up demand, less dependent on Leadership led growth • 'Vitality' statistic measured and available to improve quality control of knowledge	• Virtuous Cycle begets increasing levels of demand leading to organic growth • 'Vitality' statistic used to refine and manage signal:noise of communities and Knowledge Packets (consistent quality control) • Closed-loop learning and continuous knowledge sharing is a durable enterprise capability	• Benefits of a 'learning organization' realized • Supply Chain advantages in knowledge sharing • Bottom-up demand from Supply Chain partners
	PASSIVE KNOWLEDGE				ACTIVE KNOWLEDGE

GENERAL MOTORS BEGINS TO USE E2KS/AUROS



2010 – Transition from Technical Memory system to E2KS to store Lessons Learned, Best Practices and Design Guidelines. KPAC value tables used to establish KBE rules within NX.

2012 – Pilot within Interior SMT using Assessments for Peer Reviews

2015 – Introduce usage of Issues within Limited Applications

2016 – Introduction of Parameter Manager/KBE (linkage between NX and Auros)

2017 – Rollout Issues for Closed Loop Learning/Manufacturing Issues and Team Boards for Peer Reviews across Vehicle Engineering

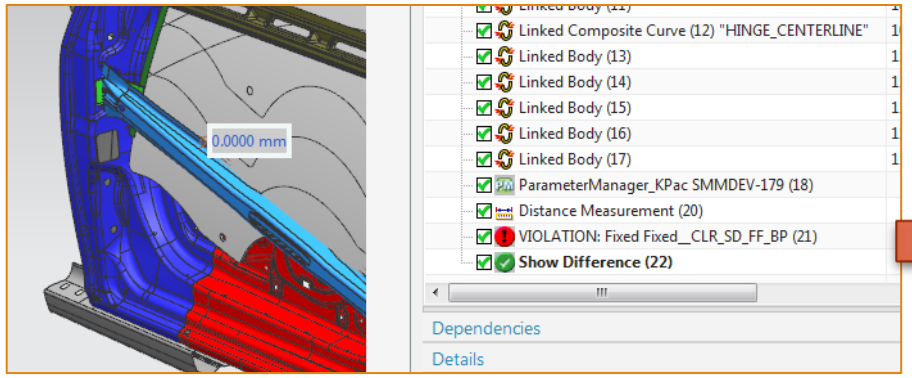
PARAMETER MANAGER

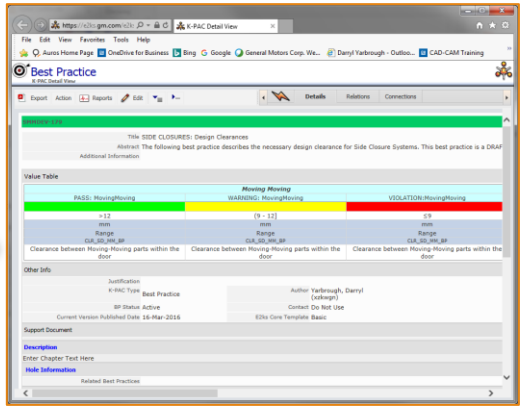
Advantages

- Create NX expressions from data in Auros
- Create Rule checks in NX which evaluate KPAC rules when model or expressions update
- Swap Auros instances and compare Auros Data
- Map and export NX Expressions
- Create NX requirement checks using NX Expressions

Application

- Link parameters to a part to control dimensions
- Link parameter to a part to control Sketch dimensions
- Link parameters to a measurement of existing bodies or components
- Dynamically rule check compliance
- Direct Access to Auros data





TRANSITION OF KNOWLEDGE MANAGEMENT TO AUROS

Interface Control Documents

InfoBook – Supplier Design Guidelines

Engineering Driven Process Controls

Manufacturing Requirements

Prevent Repeat Defect Learnings

Launch Lessons Learned

Design for Six Sigma

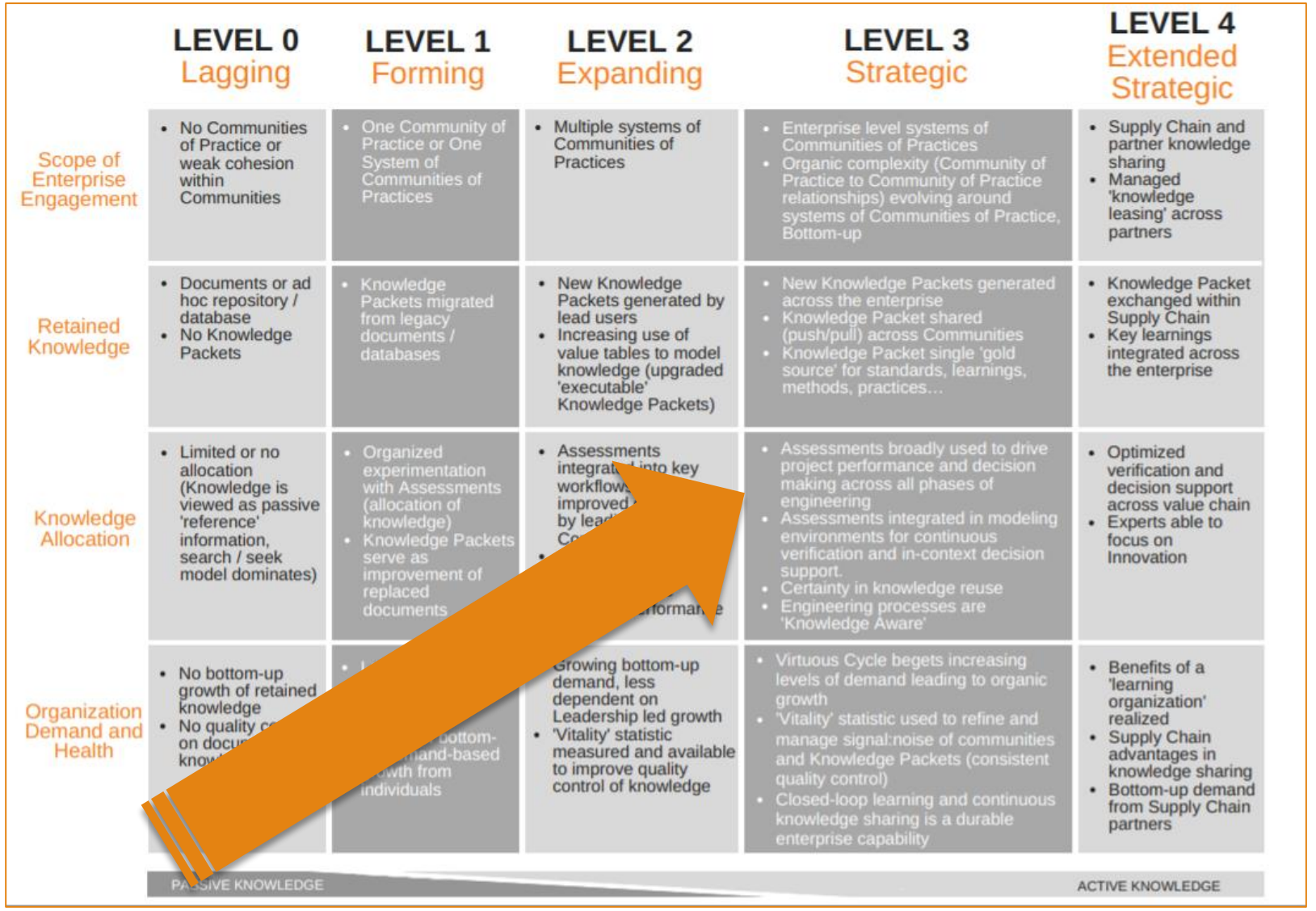
Component Readiness Reviews

Design Standard Work

Knowledge Based Engineering

just to name a few….

KNOWLEDGE AWARE MATURITY MODEL



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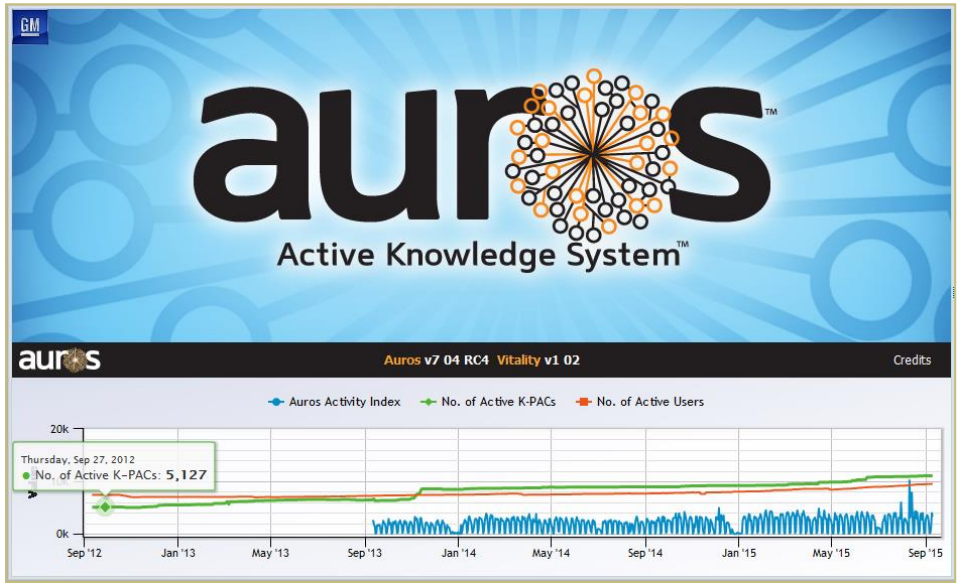
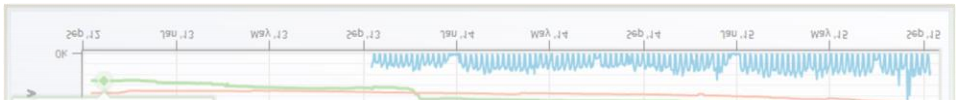
PASSIVE KNOWLEDGE — ACTIVE KNOWLEDGE

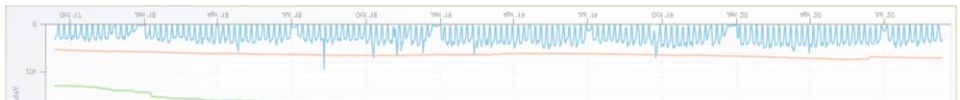
GROWTH OF AUROS

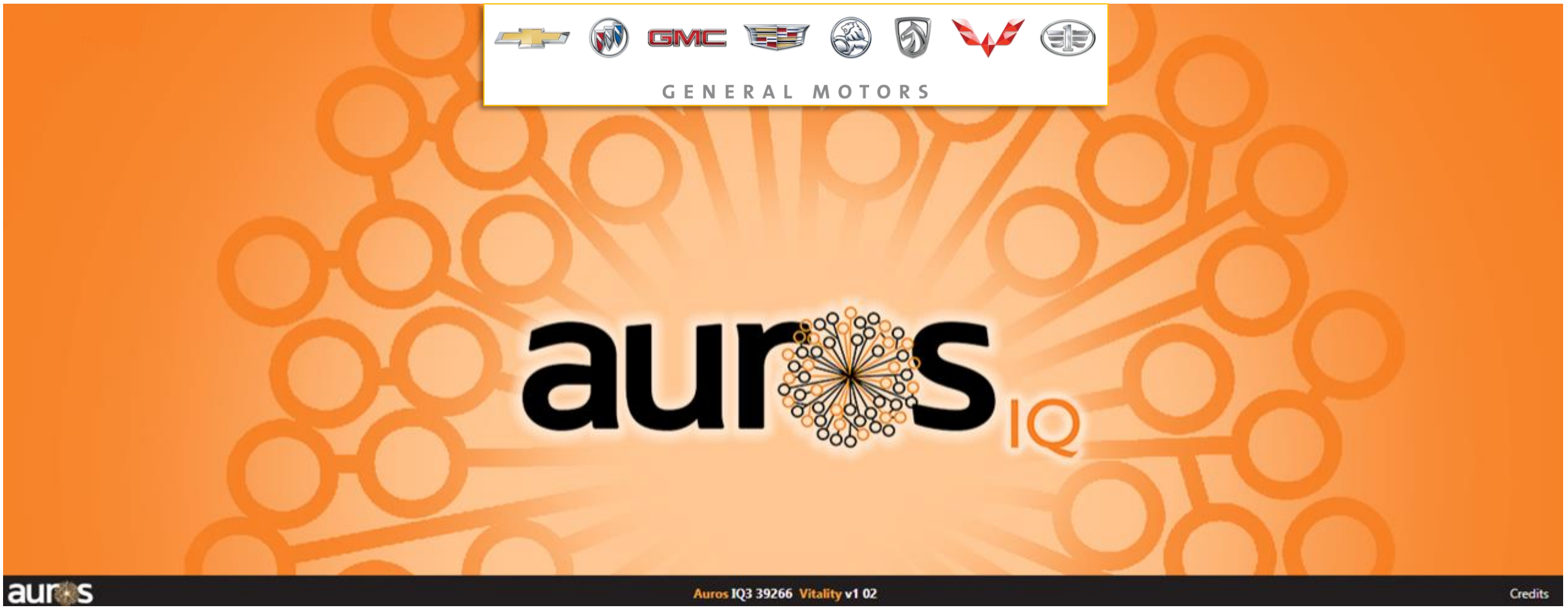
Since the introduction of Auros in 2010 (best practices) and the many applications that have transitioned to the software we have seen a substantial increase in usage

- ~800% increase in the number of KPACs
- ~230% increase of active users
- ~ 9 systems decommissioned and move to Auros (Excel, Sharepoint, etc.)
- Over 30 product and manufacturing workflows









CASE STUDY SEATS

Quality Improvements (Present)

SEATS AND AUROS

Seats was one of the first adopters of KPACs and Assessments.

2010 – Best Practices
- ~40 Best Practices

2012 – Peer Reviews (KPACs and Assessments)
- Very simple
- Collection of best practices
- ~50 Best Practices

2014 - Improved know
- Improve KPACs with
- Assessments with doc KPACs
- ~100 best practices

2016 – Reduce time for Peer Review
- Pre-Review of loaded information
- Efficient and Effective Peer Reviews
- ~150 best practices

Delivering the right knowledge to the DRE at the right time during the product/component development cycle.

2020

Seating is constantly updating knowledge. With new learnings KPACs are updated or created.

Numb

Active, ~75 WIP

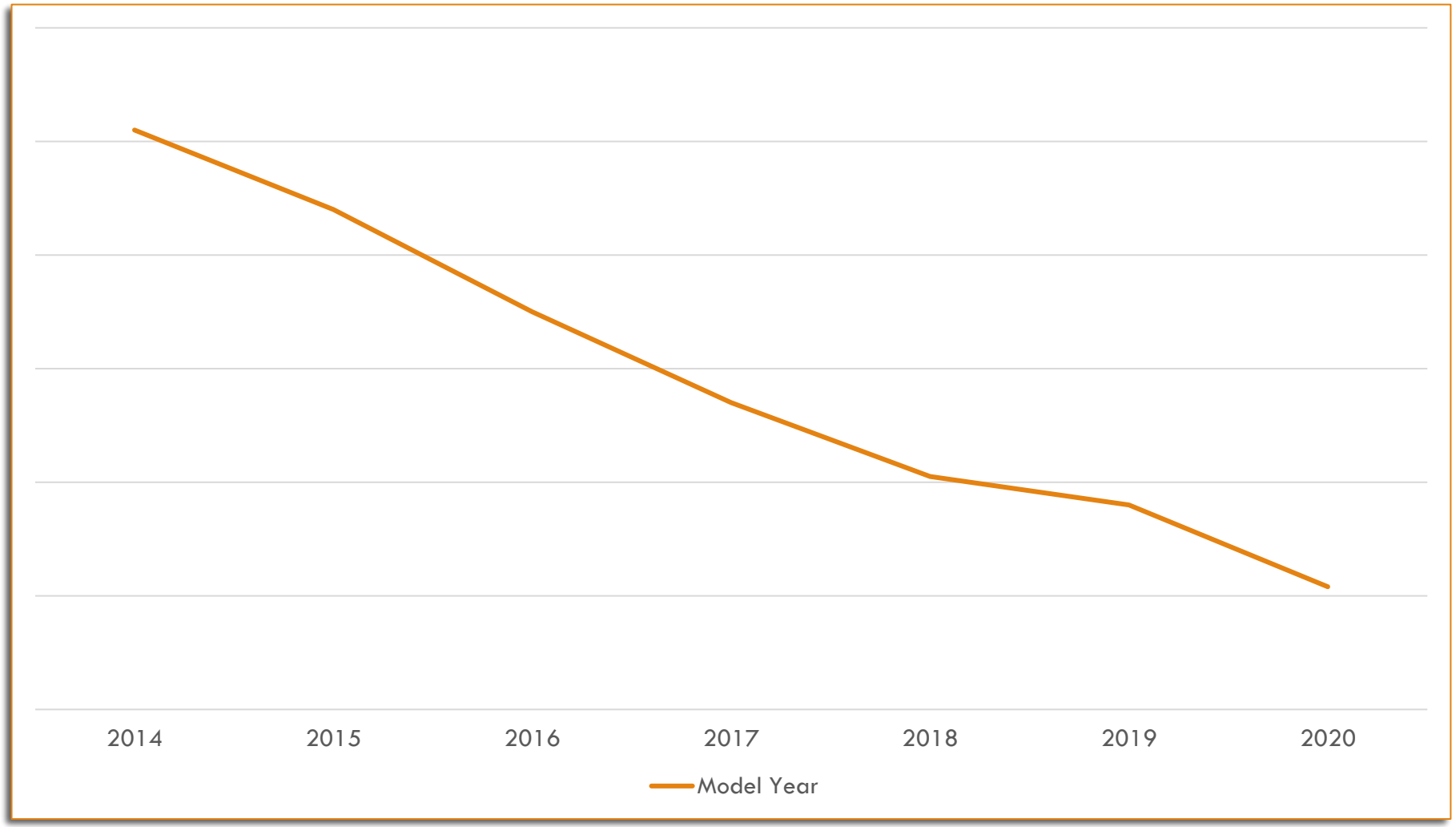
Active/Completed ~400

Issues for CLL ~80

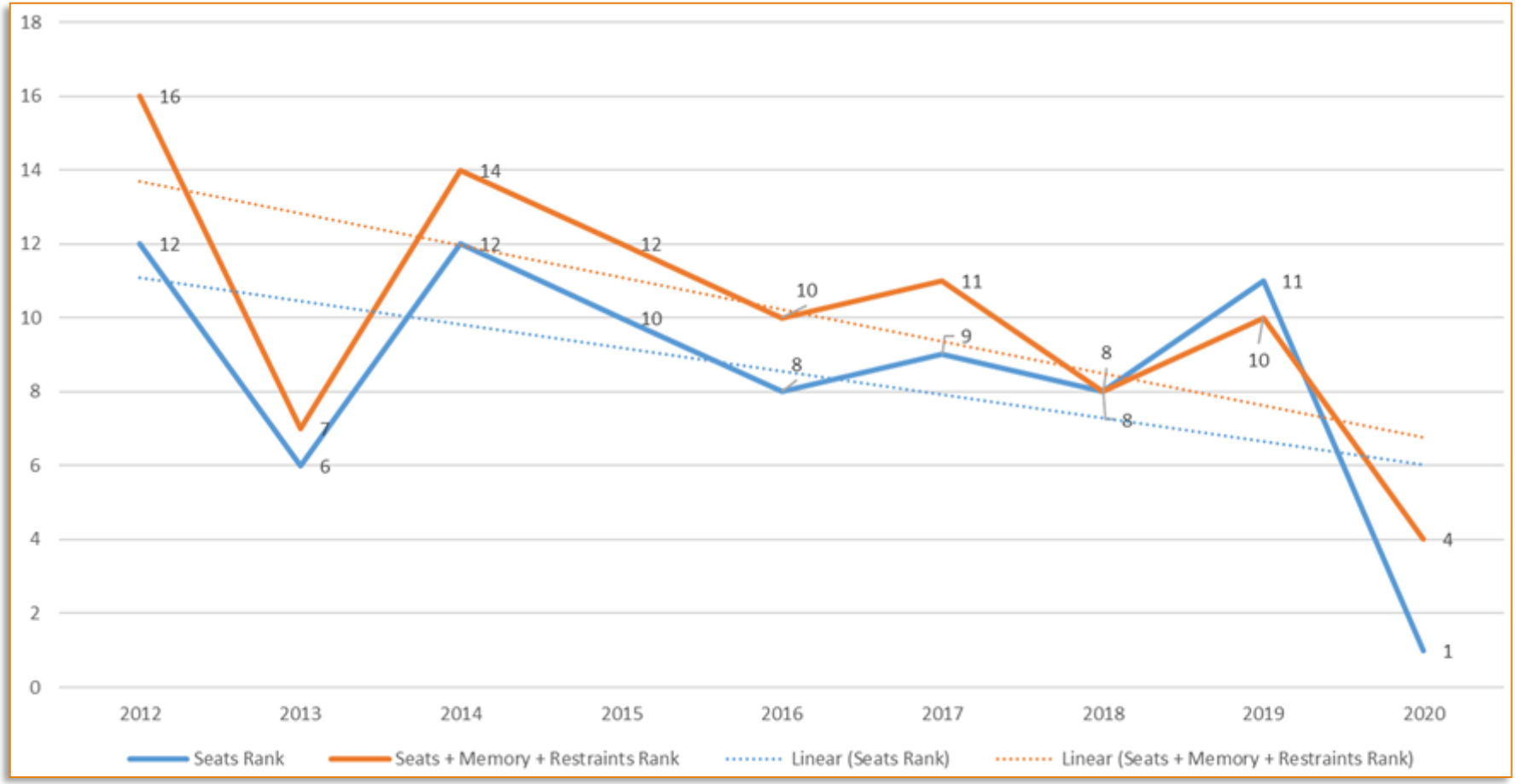
Active Team Boards ~30

Supplier Assigned to Assessments to Complete Thru Auros Portal

SEATS WARRANTY TRENDS



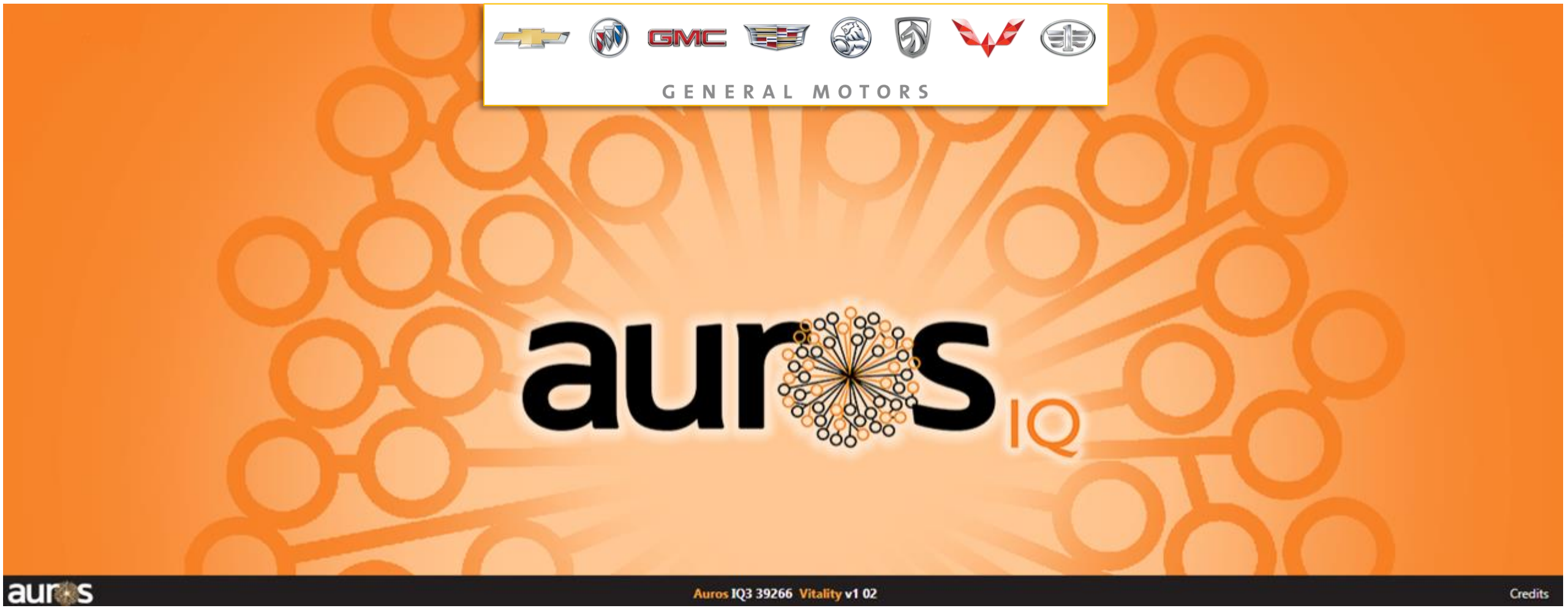
SEAT IQS JD POWER SCORES



SEAT QUALITY IMPROVEMENTS

Though Auros is not the only initiative that Seats has had since 2010, it has been a major contributor to:

- Reducing warranty
- Reduce repeat defects
- Minimizing Customer facing issues

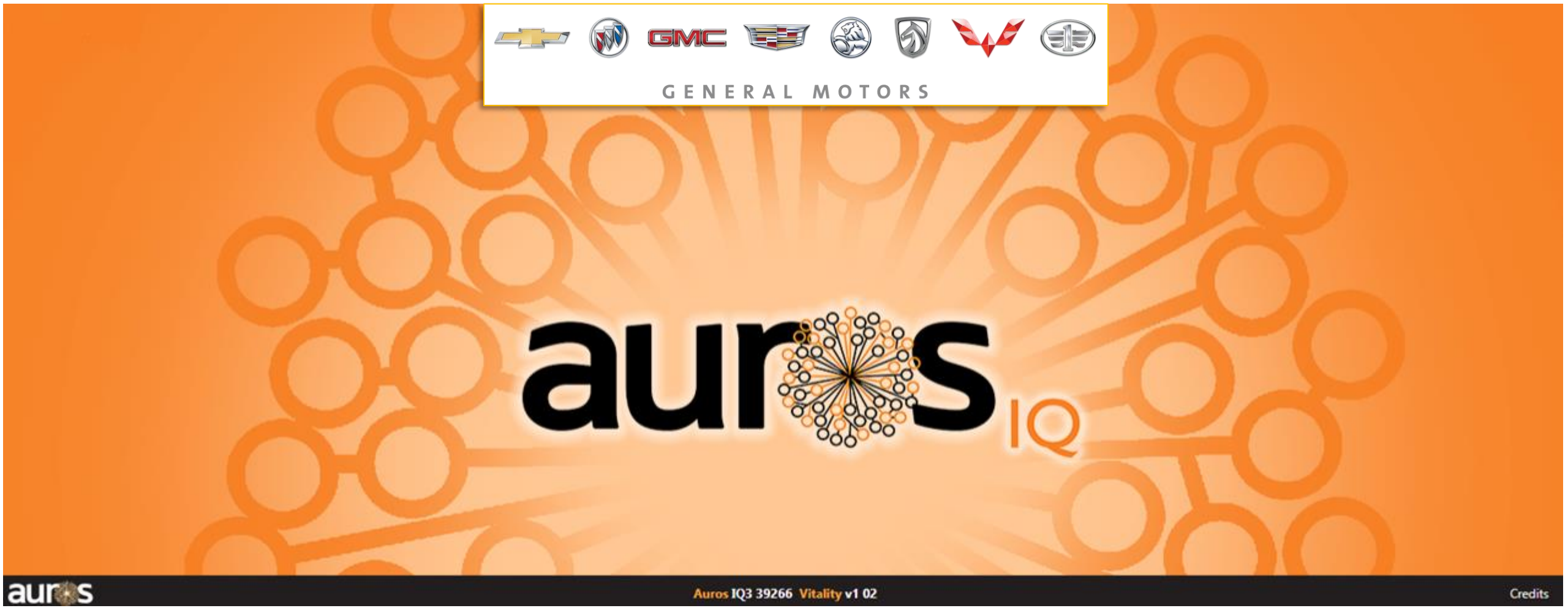


FUTURE

More Knowledge Management
Transitioning and Reporting

FUTURE APPLICATIONS

- Component Readiness Reviews
- Functional Readiness Reviews
- Reporting on Workflows thru Power BI
- Supplier Readiness Reviews
- Supplier Remote Involvement in Assessment and/or Issues


GENERAL MOTORS
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Credits

Q&A | Thank You!!!