



DISRUPTIVE INNOVATIONS CHANGE BUSINESS MODELS. THEY CREATE NEW MARKETS



AND VALUE NETWORKS. OVER TIME, THEY HAVE BEEN KNOWN TO IMPROVE, ALTER OR



ELIMINATE EXISTING MARKETS, ESTABLISHED FIRMS, PRODUCTS AND ALLIANCES.



THINK ABOUT

how online streaming services like Netflix have all but eliminated brick and mortar video rental companies like Blockbuster. More and more retail chains are filing bankruptcy or closing altogether due to the convenience of online shopping. The advent of digital photography thwarted the need to develop film. Travel booking websites have reduced the number of travel agents by two-thirds. Ultimately, disruptions force companies to alter the way that they approach their business — or else risk losing market share or becoming irrelevant. In the world of trucking, disruptors are aplenty.

A growing number of existing and start-up companies are developing technology-enabled services and products focused on the transportation industry, including marketplace platforms, fleet management solutions, onboard monitoring and tracking systems and trucking-focused ERP systems. Trucking is moving from pen and paper to fully digital. It's faster, more accurate and saves money.

"Technology has been rapidly changing society, the economy and the way people live, work and interact with each other. Driven in part by smart phones, a substantial increase in inexpensive computing power and the Internet of things, technologies are fundamentally changing access to information and services," said Ruan's Chief Information Officer Dan Greteman. "Within the transportation sector, the implications of new technologies and models of transportation service delivery are broad and are likely to transform the way people and goods move over the coming decades."

According to CB Insights data, trucking tech start ups generated a total of \$750 million in 2016 — and funding was expected to top \$1 billion in 2017. Auto tech funding — think autonomous trucks, fleet telematics, driver safety tools — skyrocketed to more than \$4 billion in 2017, up from \$1.5 billion in 2016. No wonder these tech ventures are attracted to trucking: In an industry that hauls more than \$700 billion in freight annually but uses relatively outdated and labor-intensive systems and processes, opportunities abound for innovation.

These ventures are creating everything from freight quote marketplaces and self-driving trucks to fleet management solutions and mobile technology systems that can wholly transform — or disrupt — the way business has been done. They're revolutionizing the ways trucks operate and interact with the central office, as well as how shipments are booked, paid for and tracked. Some of the key disruptive innovations currently or soon-to-be upending the transportation industry are highlighted in this article.

LEGACY MODERNIZATION



To start, one of the key issues facing the industry is the need for legacy modernization. To adapt and take advantage of the disruptive innovations in the pipeline, many trucking companies must update their legacy platforms and operating systems that are no longer in widespread use and can be replaced by newer systems. Once a company is accustomed to using these systems, however, change can be difficult. There's pain in not updating as well since new applications a company might want to adopt may not run on legacy platforms.

THE RUAN APPROACH

Ruan has spent the last several years updating our largest legacy revenue-generating programs to stable, supported systems in order to accomplish business proficiencies and improvements. This includes the upgrade to R2.0, our best-of-breed transportation management platform; our accounting and financial software; and our HRIS tool.

MOBILE TECHNOLOGY



Mobile technology systems are a prime alternative for or interaction point with many legacy applications. There's no question that mobile technology has permeated every facet of our lives, from how we communicate to how we shop — and now how we work. According to statista.com, 1.1 billion tablets were sold in the last five years, and annual smart phone sales top 1.5 billion. A poll by the Interactive Advertising Bureau revealed that some 75 percent of smart phone and tablet users have purchased a product or service on their mobile device in the past six months, with nearly a quarter buying goods via mobile devices on a weekly basis.

Thanks to the consumerization of IT, both workers and customers now expect their business interactions to function like their personal interactions. Like workers in other industries, truck drivers — particularly young drivers the industry is desperately trying to attract — are fluent in mobile tech use and expect high functioning technology in the workplace. And shipper customers demand it. To remain competitive, transportation companies must adopt mobile technologies, which can describe systems with mobile capabilities or that can push information to and from a mobile device.

While many trucking companies were early adopters of “mobile technology,” these legacy systems have become almost archaic after the rapid advancements in recent years. Unfortunately, many are strapped with “technical debt” from adopting early systems and have limited financial ability to move to the more advanced systems available.

The 2017 electronic logging device (ELD) mandate will help — or force — carriers to update technologies. Many platforms that met the ELD mandate requirements are available on smart phones or tablets instead of the dash-mounted computers that some carriers adopted for logging and compliance prior to the mandate. For a population that's accustomed to the ease of use

offered by mobile technology for personal needs, dash-mounted computers with chunky keyboards or touch screens that require large buttons or styluses are a hassle.

What's more, drivers and office workers are often tasked with completing jobs or entering data in multiple and separate apps and programs. This context shifting is time consuming, inefficient and downright frustrating. Modern mobile technology allows work to be completed within a single unified, workflow-centric app that runs on common tablets and smart phones. The dynamic workflow capabilities within mobile technologies ensure that data is captured in a uniform way, enforcing consistent and common practices across the company. This results in clean back end data and, therefore, valuable business insights. Plus, workflow and accurate data can eliminate major driver headaches — like delays from handling paperwork, inefficient scheduling, confusing procedures and recording detention time, to name a few. Making the job easier for truck drivers is crucial in the midst of a ballooning driver shortage.

THE RUAN APPROACH

One of Ruan's top priorities is to leverage our mobility platform to increase driver productivity and ensure regulatory compliance across the business. Ruan has been in the mobile space for more than a decade with java phones and our proprietary RedTrak routing system used in our dairy operations, and for the last year, our IT team has been focused on next generation mobility — updating our legacy systems and creating a new app currently being piloted to one day be used across all operations. The Android app integrates with XRS (a logging device used on our dairy operations) and R2.0, our transportation management platform. Drivers input load information to the app throughout their day, and the data is instantly available to our office team members and customers.

Our main objectives when developing mobile apps include to:

1. Provide flexibility and agility;
2. Improve the driver experience with better response times, enhanced device usability and stronger stability;
3. Support the demands of our customers with an increased ability to capture and store real-time freight data;
4. Lower the cost of ownership with more responsiveness to change; and
5. Continue our focus on compliance and safety.

“Our customers want a portal to track their products as easily as they can today with FedEx or Amazon. Our drivers want a device that is easy to handle, a platform that is easy to interact with and the commitment that the device always works as it should,” Greteman said. “I think we've achieved that with our new RedTrak app. In the future, opportunity exists for us to provide innovative and differentiating mobile solutions for multiple user groups across business areas at Ruan.”

AUTONOMOUS TRUCKS



Innovations to trucks themselves have major potential to disrupt the trucking industry as we know it. Start ups and the largest truck builders alike are investing billions of dollars to develop trucks capable of driving themselves down America's freeways. A number of companies are already testing self-driving trucks — with a safety driver in the cab — to work out kinks.

THE REALITY OF WORKERS COMPETING WITH AUTOMATION IS ONE THAT ALL INDUSTRIES WILL FACE, NOT JUST TRANSPORTATION; SOME ANALYSTS PREDICT THAT BY 2030 SOME 75 MILLION TO 375 MILLION WORKERS (3 TO 14 PERCENT OF THE GLOBAL WORKFORCE) WILL NEED TO SWITCH OCCUPATIONAL CATEGORIES, AND ALL WORKERS WILL NEED TO ADAPT.

self-driving tech developers are positioning the technology as a partner to drivers rather than a job killer — productivity increases, but the job becomes more attractive to drivers; from exit to exit, drivers can shift to perform other tasks, like ensuring data is captured accurately, while the truck runs on autopilot. The job of professional driver will change and adapt, but it will never go away. Truck drivers will remain the backbone of the American economy.

Noël Perry, a transportation economist, has said on record that the shift to autonomous trucking is “the most powerful thing to hit us [the trucking industry] since the building of the superhighways in the 1950s.” The reality of workers competing with automation is one that all industries will face, not just transportation; the consulting firm McKinsey & Company forecasts that by 2030 some 75 million to 375 million workers (3 to 14 percent of the global workforce) will need to switch occupational categories, and all workers will need to adapt. Jobs will need to change, but not necessarily be lost.

Self-driving trucks could help companies reduce labor costs by extending the number of hours trucks are in operation and potentially cut the number of drivers needed, at least to drive on interstates. Plus, some believe autonomous trucks have the potential to be safer — and could therefore reduce insurance premiums — as accidents are largely caused by human error.

The industry agrees, however, that drivers will still be necessary to navigate city streets for the first and last miles of trips. In fact,

While the autonomous technology could soon be in place, the challenge is to get autonomous trucks on the road and making money. Several technical and regulatory hurdles to that future currently exist, but a growing number of trucks are already equipped with autonomous braking and collision mitigation systems that step in to assist when drivers are slow to react. Still, the prospect of seeing a truck moving down the interstate at 65 mph without a driver operating the wheel is several years down the road.

ELECTRIC TRUCKS



One of a trucking company's largest — and often most volatile — operating expenses is fuel, so Tesla's recent announcement about the launch of its wholly electrically-powered tractor-trailer could be a game changer. A number of major carriers have already reserved Tesla semis, which cost \$150,000 for a model with a 300-mile range per charge and \$180,000 with a 500-mile range. Most diesel-powered tractors cost around \$100,000, but Tesla predicts that the electric vehicle will pay for itself within two years thanks to savings in aerodynamics, reliability and, of course, fuel. The vehicle boasts additional safety features as well, including wrap-around windshields, cameras instead of rearview mirrors and autonomous systems like automatic emergency braking, automatic lane keeping and forward collision warning, according to Tesla. The widespread adoption of electric trucks will depend on how they perform in real-world situations, the availability of battery-recharging facilities and the training of workers to service electric vehicles.

THE RUAN APPROACH

Ruan has reserved five Tesla electric trucks to begin testing in 2019.



DRIVER MONITORING



Heavy-duty trucks are involved in more than 4,000 fatal accidents annually. That's too many. One way the industry is moving to combat accidents caused by human error and fatigue is the use of driver monitoring tools. The newly required electronic logging devices are a type of monitoring system, as they track and report speed, location and driving status, in addition to where drivers stand within federal hours-of-service requirements. Trucks now widely come equipped with advanced driver assistance systems that use a combination of radar- and camera-based components, like following distance alerts and active braking, to intercede on the driver's behalf to eliminate or greatly decrease a collision's severity. Any event triggered by the technology is reported to employers.

But more intrusive technologies are entering the marketplace and being adopted by trucking companies. Ballcaps can measure brainwaves and give a fatigue rating, a critical factor for drivers as a majority of accidents are caused in one way or another by the effects of fatigue. One company is developing a vest that can detect a driver's heart attack and stop the truck as a result. Trucking executives can use these and other biometrics tools to recommend changes to improve the safety, health and efficiency of workers.

More common, road- and driver-facing dashboard cameras are used to record actions that can negatively affect safety—but also monitor slacking behavior or unauthorized stops, according to *Forbes*. Onboard video event

recorder systems link into a truck's engine to record video clips before and after exception-based events such as speeding, forward collision warnings, harsh braking, lane departure alerts and collisions themselves. Those videos may then be accessed for driver coaching or for litigation in the case of an accident. Some driver-facing cameras even monitor drivers' eyelids for signs of fatigue.

Drivers, who already feel closely monitored by regulators, employers and their customers (who are demanding real-time

“MONITORING TECHNOLOGIES NOT ONLY PROTECT OUR DRIVERS, BUT ALSO THE MOTORING PUBLIC AROUND US. THESE TECHNOLOGIES HELP KEEP DRIVERS ALERT AND VIGILANT IN THEIR DAY-TO-DAY ACTIVITIES, AND WE’RE ABLE TO COACH AND EDUCATE IN AREAS LIKE SPEEDING, SAFE FOLLOWING DISTANCE AND HARD BRAKING.”

— ALLISON MEINERS
MANAGER OF SAFETY TRAINING AND COMPLIANCE

data on loads to appease their own customers), are often bothered by the use of these additional monitoring technologies because their trucks serve as their offices—and homes for over-the-road drivers. Some feel mistrusted and are stressed out by the idea of constantly being monitored while they go about their normal workplace activities. Others like the idea of working for companies that value providing drivers the resources to stay safe and improve their skills. If the technology can help prevent accidents, provide coaching opportunities after near-misses and save carriers money, more carriers will likely conclude that the intrusion is warranted. But like it or not, the job of professional truck driver can no longer be considered fully independent or autonomous, which has long been one of the main attractions for the position.

THE RUAN APPROACH

Ruan's top Guiding Principle is Safety Focus, so we invest heavily in tools that can help ensure our drivers get home safely to their families.

- + *Ruan is currently testing 100 road- and driver-facing dash cameras in one of our business units, and we have seen great results, particularly in correcting driver behaviors.*
- + *Ruan uses SpeedGauge, a program that takes the GPS location breadcrumbs from our automatic onboard recording device and compares that information to the database of all posted speed limits within the United States. This then generates a report of the fleet's percentage of speeding, along with individual speeding events. Our on-site managers use this report to coach drivers and promote safe driving habits.*
- + *More than 57 percent of our trucks are equipped with advanced driver assistance systems that monitor events like hard braking, following distance alerts, lane departure warnings and speeding. All new trucks added to our fleet have these systems. Those units equipped with a collision safety system have fewer rear-end, merging and lane change accidents than those not equipped with the systems. Ruan utilizes the provided data on driver performance to coach drivers to improve safety and key performance indicators (KPI) like mpg.*

“Monitoring technologies not only protect our drivers, but also the motoring public around us. These technologies help keep drivers alert and vigilant in their day-to-day activities, and we’re able to coach and educate in areas like speeding, safe following distance and hard braking,” said Manager of Safety Training and Compliance Allison Meiners. “All of these investments are in the name of safety, and we will do anything to keep our drivers and our families safe out on the busy roads and get them home every night.”

MOVING FORWARD

It's clear the world of trucking looks wildly different than it did 10 years ago, and the next 10 years will be marked by even more change—the drivers, the transportation management systems, the data and the trucks themselves.

“For forward looking companies, there's a lot of opportunity to take advantage of these innovations to reduce costs, generate sales and improve safety,” Greteman said. “Now we just need to take a step back and determine what the application is, then prioritize what to implement.”

