NCS

Pioneering Carwash Excellence with Carwash 4.0™

Retail Carwash Operations Reinvented for Maximizing Uptime and Scalability

Imagine receiving a notification on your phone, alerting you that your top brush motor is at risk of failure within 30 days. Immediately, you're offered the option to schedule maintenance, and with a simple 'yes,' the service call is added to your calendar. On the chosen day, the service person arrives, replaces the part; zero panic, zero downtime. This scenario requires a complex network of connected systems to work together to provide this unprecedented efficiency and convenience to you.

Now, imagine your entire carwash was connected. From an app on your phone you can have insight to all areas of your carwash; from your chemical dosing to your reclaim system fresh water bypass, what would you do with that amount of information and real-time data – without needing to be onsite?

We'd like to welcome you to a streamlined, effortless, and truly transformative carwash experience.

This isn't just progress. *This is Carwash 4.0™.*

Predicting failures using advanced analytics can increase equipment uptime by up to 20% [1]

[1] Predictive Maintenance Taking pro-active measures based on advanced data analytics to predict and avoid machine failure. (n.d.). https://www2.deloitte.com/content/dam/Deloitte/de/Documents/deloitte-analytics/Deloitte_Predictive-Maintenance_PositionPaper.pdf

Just as Industry 4.0™ transformed manufacturing with advancements such as interconnected assembly lines and predictive maintenance, Carwash 4.0™ brings these realities to carwashing. Industry 4.0—coined by the German government in 2011—describes elements of the fourth industrial revolution. Carwash 4.0™ demonstrates the same groundbreaking framework in the retail carwash space.

Carwash 4.0™ integrates cutting-edge technologies like connected equipment, remote monitoring, Internet of Things (IoT), robotics, artificial intelligence (AI), and cloud computing. This blend is driving improvements in operational efficiency, cost savings, and the elevation of customer experience. Carwash 4.0™ is not simply aiming to set a new industry standard for consistent product quality and unrivaled troubleshooting - but transforming how operators cater to their customers, revolutionizing carwash operations. Ultimately, Carwash 4.0™ is redrawing the boundaries of operational excellence and uptime in the industry. The benefits are vast, and not only does this framework improve uptime and customer experience but it is also having a positive impact on the lives of business owners and their employees.

Airbus implemented 4.0 technology to simplify their cabin seat assembly process. The results were a productivity increase of 500% and enhanced employee satisfaction [2]

Re-imagining Differentiation: Operational Excellence as the Ultimate Competitive Advantage

In a market characterized by relative "sameness," Carwash 4.0™ can help operators realize the all-important goal of brand differentiation and consistency. Typically differentiation is achieved through

- **Density of stores in geographic locations**
- **Brand stacking with powerful brands recognized and trusted by consumers**
- **Operational excellence**

The blueprint for a de novo site (new build) for express car washes has been established and adopted. Thus, such sites are being replicated at a faster pace than at any other time in the carwash industry. This is creating hundreds of well-conceived, well executed retail car wash clusters aggregated as local, regional, and national chains across North America. It is also creating massive operational challenges to achieve a consistent customer experience from store to store. With its capacity to manage multiple sites to a near exact standard, and its ability to automate equipment such as chemical dispensing for consistency, Carwash 4.0™ technology delivers a powerful advantage.

[2] Industry 4.0 | Airbus. (n.d.). www.airbus.com. https://www.airbus.com/en/innovation/industry-4-0

Data-Driven Excellence

Operational excellence is driven by data. In the words of Peter Drucker, "What gets measured gets managed, and what gets managed improves." At the core of Carwash 4.0™ is connectivity, with technology integrating all aspects of the business to boost efficiency. Carwash 4.0, unlike any other era of carwashing, offers operational teams remote access to aggregate and analyze large amounts of valuable data, empowering them to make informed decisions, streamline processes, maximize uptime and exceed customer expectations. When good operators have this level of insight into their operations – their ability to serve the customer is exponential.

The carwash industry has come a long way, and if Carwash 4.0™ is anything like the previous eras, at the center of this revolution will be carwash operators and service teams, the unsung heroes, constantly refining processes and methods.

But, to better understand where the industry is going, and why Carwash 4.0™ is so revolutionary, we must understand where it's been. Starting with Carwash 1.0.

Carwash 1.0	Carwash 2.0	Carwash 3.0	Carwash 4.0
Manual to Mechanized	Mechanized to Automatic	Streamlining Volume & Revenue	Harnessing Data to Elevate Operations, Improve Customer Experience & Scale
1959-2000	1980-2010	2000-2020	2020 onwards

Carwash 1.0 (1959-2000): Manual to Mechanized

The progress of the carwash industry is best understood in three main stages: Carwash 1.0, Carwash 2.0, and Carwash 3.0, each building upon the developments of the previous era and offering a fresh paradigm for operational excellence. Two key consumer segments that benefited from these advancements were independent investors and gas station owners backed by petroleum companies.

The origins of the semi-automatic carwash date back to the mid-40s, involving a combination of manual labor and rudimentary mechanization. In 1959 a groundbreaking shift occurred when Dan Hanna, the founder of Hanna Industries, introduced the first fully mechanized carwash system. Over the next four decades, a multitude of inventive small companies worked tirelessly to advance this mechanization, paving the way for significant inflection points that profoundly transformed the industry.

Key Advancements During Carwash 1.0

Investor Carwash Operators (Tunnel)

- Full mechanized conveyor car washes with polypropylene brush washing media - Hanna

- Full mechanized conveyor car washes with non-woven cloth washing media - Belanger

- Full mechanized conveyor car washes with closed cell foam washing media featuring top wheels - MacNeil

Gas Station Carwash Operators (In Bay)

- Full mechanized in place robotic car wash typically using only soap and water - ROBO Wash

- Self-contained in-bay automatic (IBA) car washes using polypropylene brush washing media - Ryko & Slant Brush

- Self contained IBA car washes using a combination of chemical activated cleaning and high pressure rinsing - PDQ

- In Bay mini-express wash conveyorized car washes with mitter curtains and cloth wash media - Belanger

- In Bay mini express wash conveyorized car washes using top wheels and foam washing media - MacNeil

Carwash 2.0 (1980-2010): Mechanized to Automatic

The rise of Carwash 2.0 corresponded with the advent of the computer age. While carwashes had been mechanized, automation was still in its infancy. The computer revolution enabled automation of sequencing, linking conveyors with computers, and the initiation of automated commands to control the carwash machines. The advent of express car washes in 2001 marked a significant shift in the industry landscape, challenging the dominance of gas station carwash operations.

Key Advancements During Carwash 2.0

Investor Carwash Operators (Tunnel)

- Computer control of the car wash sequence - DRB & Compuwash

- Automatic payment terminals with high speed credit card processing and cash transactions - Innovative Control Solutions

- Concentrated chemicals from 55 gallon drums to 5 gallon pails - Turtle Wax

- Online automatic application of tire dressing - Simoniz

- Central vacuums for the express wash format - Vacutech

- Car wash membership clubs w/RFID tags - Innovative Control Solutions

- Professional marketing and signage - The Sign Studio - TSS

Gas Station Carwash Operators (In Bay)

- Computer control of the car wash sequence - Ryko

- Automatic payment terminals with credit card processing and cash transactions - Ryko

- Car wash purchase at the gas pump - Ryko

- Remote diagnostic codes sent to pagers - Ryko

- Fragmented sales and service to national direct to retailer sales and service channel - Ryko

- Chemical distribution through centralized professional logistics management - Mondo

Carwash 3.0 (2000 to 2020): Streamlining Volume and Revenue

The turn of the millennium saw the express wash model gaining traction nationwide due to its simplicity and high volume output. Investors saw a predictable path to scale and profit with unreal unit level economics with express delivering much higher volume than IBAs and self service washes and more simplicity than full service and flex service washes.

Memberships were launched to meet consumers' growing desire for convenience and value, stabilizing revenues by shielding the industry from weather-related risks, economic downturns, and competition. Express washes, requiring fewer employees and less inventory management, emerged as the preferred scalable model for the industry. In the quest to scale and optimize revenue, several key advancements occurred.

Key Advancements During Carwash 3.0

Investor Carwash Operators (Tunnel)

- On-line Hot Wax and Shine - Simoniz

- Ultra concentrated chemicals from 5 gallon pails to 1 gallon engineered containers - Cleaning Systems Inc - CSI

- Single store to multi store club plan management DRB Systems & Innovative Control Systems

- License plate recognition - Micrologics

- Data optimized strategies around pricing models, club plan expansion and retention - SUDS Creative

- Static menu messaging to dynamic digital, remotely controlled menu messaging - The Sign Studio - TSS

- Fragmented sales and service to national direct to retailer sales and service channel - National Carwash Solutions - NCS

Gas Station Carwash Operators (In Bay)

- Consistent chemical dosing using consistent pressure, injectors and tips - PDQ

- Remote machine programming - PDQ

- Single store to multi store payment terminal access for marketing, pricing and aggregated accounting - Kesseltronics

- LED backlit foam curtains - PDQ

- In-Bay LED light shows - TSS

Carwash 4.0™ (2020 onwards): Harnessing Data to Elevate Operations, Improve Customer Experience, and Scale

Carwash 4.0™ is the revolution that will shape the course of operations for the next decade. This era is underpinned by four groundbreaking technologies integrated across the entire value chain:

- **Connectivity**
- **Analytics**
- **Human-machine interface (HMI)**
- **Advanced automation**

Connectivity refers to the ability of machines and humans to interact seamlessly. Analytics harnesses the raw data generated by this connectivity, turning it into actionable insights. The HMI, or user interface, forms the bridge between human operators and machines. Lastly, advanced automation employs robotics to streamline processes and reduce the need for manual labor.

Carwash 4.0™ fuses technology and data with the experience of the owner/operator setting a new standard for operational excellence, maximized uptime and consistent high-quality customer experience.

Connectivity
Interconnected systems for real-time data collection and remote monitoring.

Analytics and Intelligence
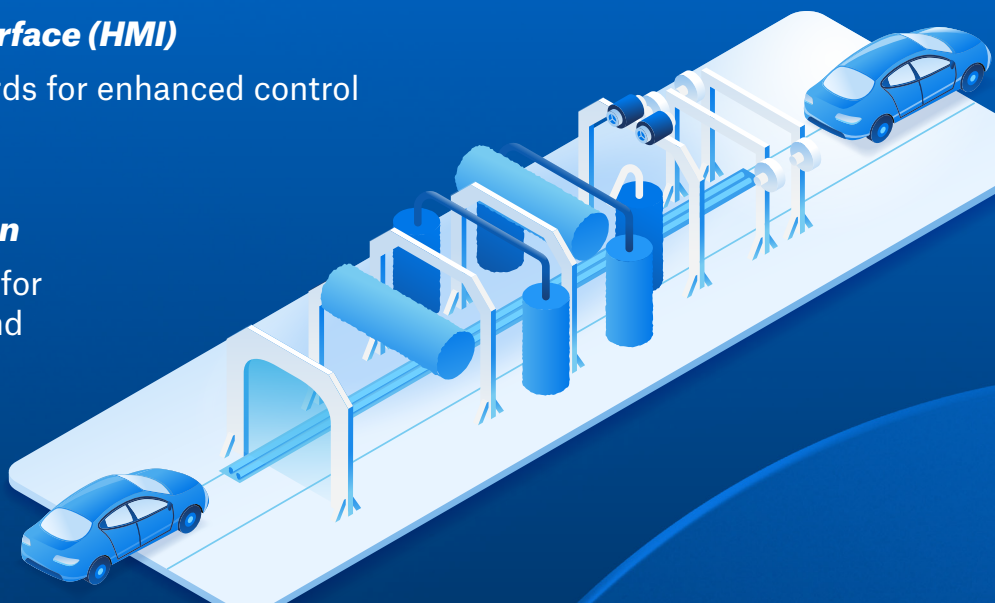Data-driven insights for process optimization and predictive maintenance.

Human-Machine Interface (HMI)
User-friendly dashboards for enhanced control and monitoring.

Advanced Automation
Use of robotics and AI for increased efficiency and consistency.

Growing (and growing fast) is the goal. As the 'sea of sameness' underpins the landscape, Carwash 4.0™ offers numerous ways for carwash operators to scale their businesses while providing the operational excellence that will differentiate them from the crowd.

Here are some key benefits and opportunities that Carwash 4.0™ brings to the table:

- Business scalability
- Increased efficiency & productivity
- Increased uptime
- Data-driven decision making
- Operational excellence
- Cost savings
- Remote monitoring & control
- Improved sustainability
- Consistent customer experience
- Increased profitability

Bosch, a global supplier of technology and services began their 4.0 journey 10 years ago. Now, with 120,000 machines and over 250,000 connected devices, they have increased productivity by as much as 25% [3]

Enhanced Efficiency

Carwash 4.0™ leverages advanced technologies like connectivity, analytics, and automation to streamline operations. This results in increased throughput, reduced cycle times, and improved resource utilization, allowing operators to serve more customers within a given timeframe.

How it works

Interconnected systems enable real-time monitoring of all carwash stations, allowing operators to identify and address bottlenecks promptly. The analytics component provides insights into peak hours and usage patterns, enabling optimal scheduling and resource allocation. The automation aspect comes into play in the actual carwashing process. From pre-wash to drying, robotics and AI ensure a swift and consistent wash every time, significantly reducing the cycle time. Furthermore, predictive maintenance powered by data-driven insights helps prevent unexpected equipment breakdowns, ensuring uninterrupted service. All these elements work together to increase the number of cars washed in a day, thereby boosting revenue potential. With Carwash 4.0™, you can achieve more with less, enhancing efficiency like never before.

[3] Bosch. (2023, August 18). Ten years of Industry 4.0. Bosch Global. https://www.bosch.com/stories/10-years-industry-4-0-at-bosch/

Cost Savings

The integration of intelligent systems and automation in Carwash 4.0™ helps optimize resource consumption, such as water, chemicals, and power. By efficiently managing these resources, operators can minimize operational costs and maximize profitability.

How it works

The integration of intelligent systems and automation in Carwash 4.0™ revolutionizes resource management, enabling operators to achieve significant cost savings. Through advanced sensors and data analytics, Carwash 4.0™ continuously monitors resource usage, detecting inefficiencies and areas for improvement. For example, the system can precisely measure the amount of water required for each wash, preventing overuse and unnecessary waste. It can also optimize the dosing of chemicals with the connected AccuDose System by National Carwash Solutions (NCS), ensuring the right amount is applied without excess, while maintaining excellent cleaning results. Furthermore, intelligent automation reduces energy consumption by optimizing equipment usage, such as adjusting dryer settings based on vehicle size or utilizing energy-saving modes during periods of low demand. By leveraging these intelligent resource optimization capabilities, operators can minimize operational costs, conserve resources, and maximize profitability, all while maintaining exceptional service quality and customer satisfaction.

Remote Monitoring and Control

The integration of intelligent systems and automation in Carwash 4.0™ helps optimize resource consumption, such as water, chemicals, and power. By efficiently managing these resources, operators can minimize operational costs and maximize profitability.

How it works

Through interconnected systems and user-friendly interfaces, operators can access real-time data and control various aspects of their carwash facilities from a centralized location. Operators can efficiently oversee multiple sites, monitor equipment performance, adjust settings, and address any issues promptly, ensuring smooth operations and minimizing downtime. With remote monitoring and control via the Lens App, operators gain unprecedented flexibility and efficiency in managing their carwash operations, leading to enhanced productivity and improved profitability.
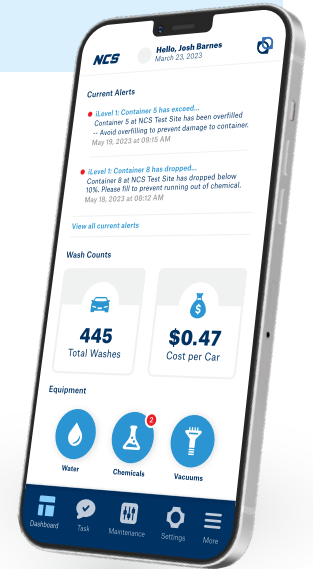
Data-Driven Decision Making

Carwash 4.0™ harnesses the power of data analytics to provide operators with valuable insights into key performance metrics, customer behavior, and operational trends. This data-driven approach enables operators to make informed decisions, optimize processes, and identify areas for improvement, ultimately driving business growth.

How it works

Both software and hardware drive insights so operators can monitor real-time KPIs, compare trends, and predict future performance. This helps identify inefficiencies, adjust processes, and make strategic decisions. Understanding customer behavior also enhances service customization, boosting satisfaction and loyalty. Thus, Carwash 4.0™ transforms data into a tool for excellence and growth.

Scalability and Replicability

Carwash 4.0™ makes possible standardized processes and technologies that facilitate scalability and replicability, allowing operators to expand their operations to new locations more efficiently.

How it works

Carwash 4.0™ leverages cutting-edge technology and automation to streamline the car-wash process, making it highly scalable and easily replicable. The standardized processes include things like precision water and chemical dispensing and predictive maintenance alerts to ensure a thorough and efficient wash. These systems are designed to be easily deployed across multiple locations, reducing the time and resources required for setup. Furthermore, the use of data analytics allows operators to monitor performance and identify areas for improvement, ensuring consistent quality and customer satisfaction across all locations. This combination of advanced technology and standardization provides a blueprint for success that can be replicated in new locations, enabling operators to expand their operations with confidence.

By leveraging the capabilities of Carwash 4.0™, operators can unlock new opportunities for growth, improve operational efficiency, and deliver exceptional experiences that drive customer satisfaction and loyalty.

Consistent Customer Experience

Carwash 4.0™ provides operators with real-time insights into the performance of their carwash, enabling them to ensure consistent service quality across all locations. By delivering a consistently exceptional customer experience, operators can build a strong reputation, foster customer loyalty, and attract new clientele.

How it works

Operators gain access to comprehensive data on key performance indicators such as wash cycle times, equipment functionality, and customer feedback. This information allows operators to proactively address any issues that may arise, ensuring smooth operations and consistent service quality.

Wash Connected
with NCS and Carwash 4.0™

Carwash 4.0™ defines the future of the carwash industry, offering a business ecosystem that combines cutting-edge technology, data analytics, and operational excellence. This revolutionary model is not just about enhancing the efficiency and profitability of carwash operations, but also about redefining the customer experience. By harnessing the power of connectivity, automation, and data-driven insights, Carwash 4.0™ empowers operators to deliver consistent, high-quality service across all locations, while also providing the scalability and replicability needed for business expansion.

The adoption of Carwash 4.0™ and the technologies that support it, will not only set a new standard for operational excellence but also reshape the competitive landscape, providing a sustainable competitive advantage for those who embrace it. At NCS, we are proud to be at the forefront of this transformation, leading the charge towards a future where technology and innovation once again drive the carwash industry to new heights.

If you're ready to go Carwash 4.0™, the Connected Chemistry System from NCS is your first step. You will see benefits quickly and connecting your chemistry will lay the foundation for the future of 4.0.

There is much more to come regarding Carwash 4.0™

Stay tuned to ncswash.com for future updates, product releases, and more.

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