



Case Study

Integration of Data Flow Application for a Multi-Vendor Automotive Marketplace

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About Client

WheelerShip is a leading automotive parts and accessories provider, such as original equipment, replicas, and aftermarket.

The company's offerings include wheels, EV chargers, mirrors, and lighting parts from multiple worldwide-recognized automotive brands, including Honda, Tesla, Mercedes, Lexus, Toyota, Audi, Chrysler, BMW, and Volvo. WheelerShip's competitive advantage is supplying customers with auto parts at reasonable prices as fast as possible.

To expand the product range, WheelerShip started connecting more vendors to their ecommerce platform. Thus, their online store turned into a multi-vendor marketplace.

Brand:

WheelerShip

Region:

USA

Industry:

Automotive parts & accessories

Site:

wheeler-ship.com

Client in numbers:

12 years
in the market

7K+
product items

30K+
customers



Challenges

Once WheelerShip started adding new vendors to their marketplace, the company faced new challenges connected to data processing on its website.

The client already had several systems exchanging data with one another. Adding more components would make the existing infrastructure more complex. It would be more difficult to maintain internal processes as well as collect and synchronize data among all the system components. Plus, the product information from vendors needed to be fetched, processed and converted into a unified format for the correct display on the website.

The major problem was that the WheelerShip website was initially developed as a smaller online store, and processes within the website were supposed to work differently than a bigger marketplace required. So the client asked us to streamline the website's existing workflow and harmonize vendors' data processing without recreating the whole website infrastructure from scratch. In the long run, this should also facilitate adding more vendors to the marketplace and connecting other systems.

Discovery Stage

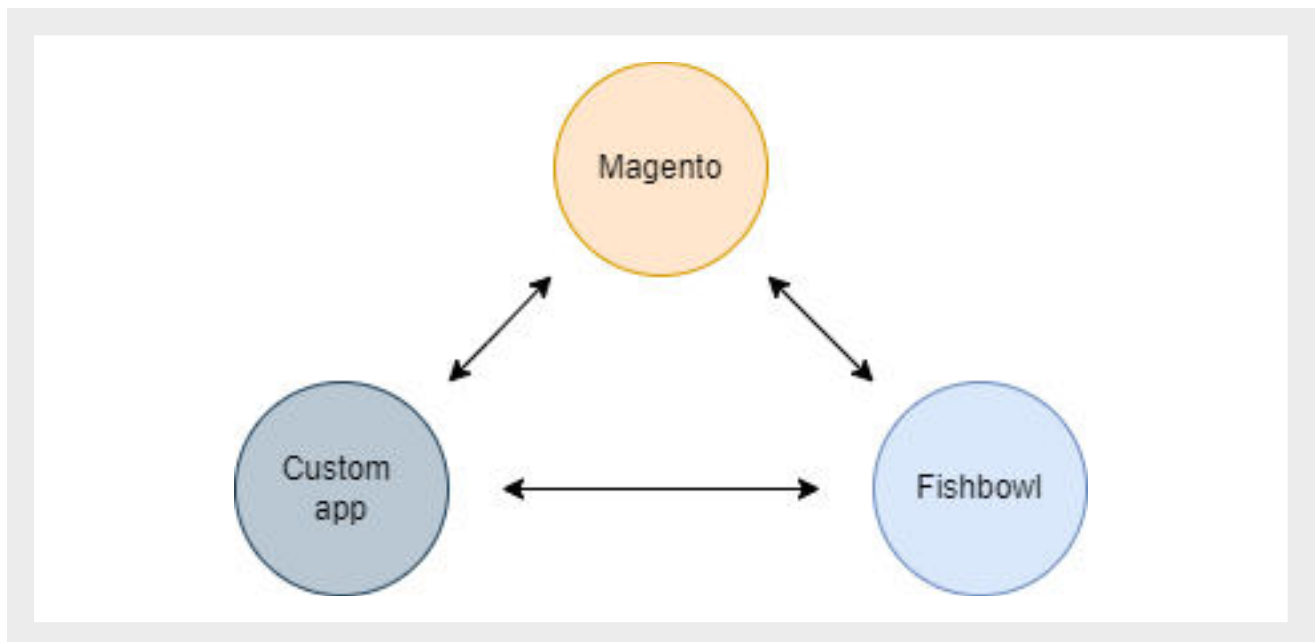
We started the project by exploring the existing setup and discovering how the client received the data from vendors.

Different teams had already been supporting systems within the WheelerShip infrastructure before the client reached out to us.

These systems were exchanging data directly with one another:

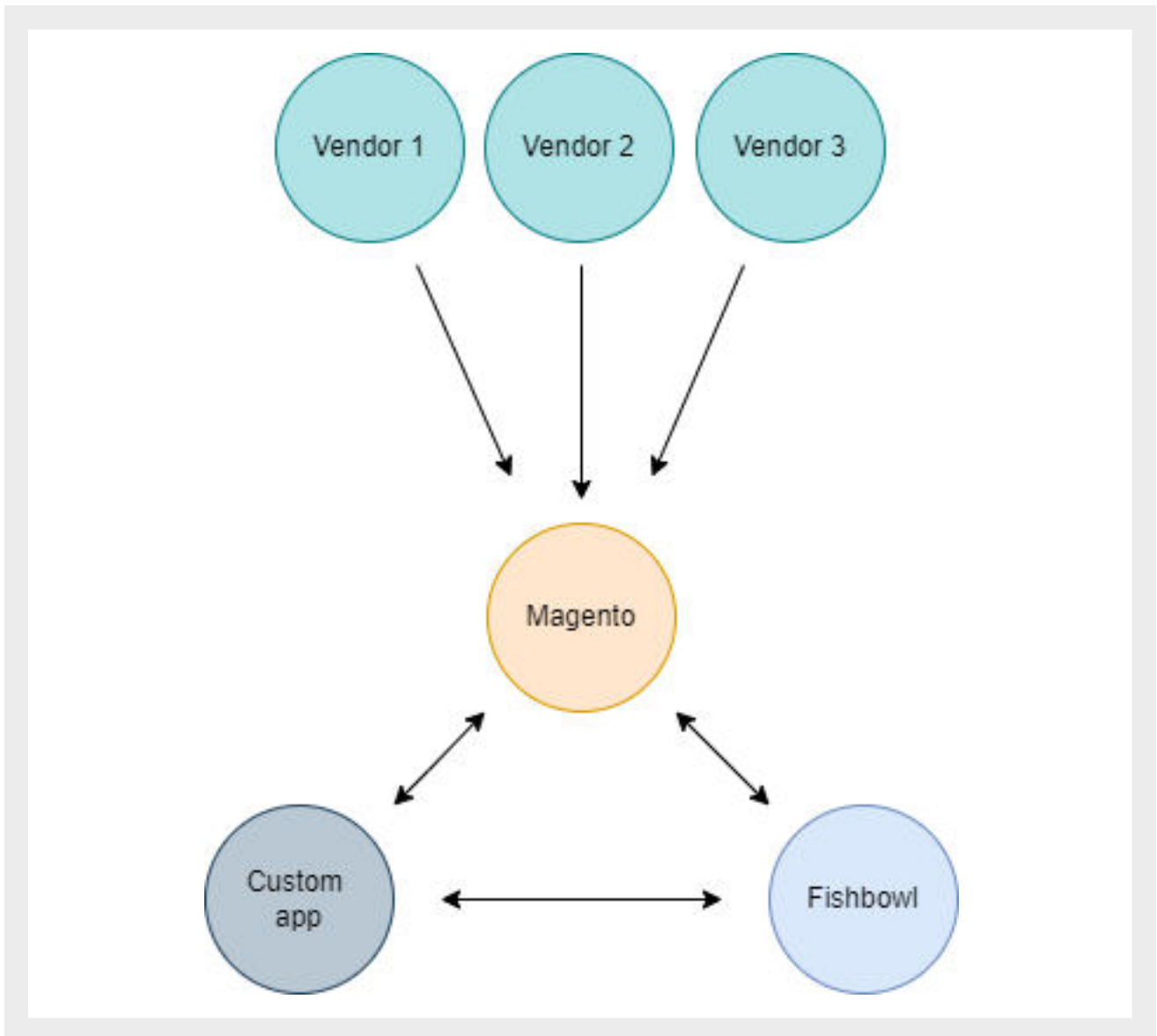
1. **Magento**, the platform on which the website was developed.
2. **Fishbowl ERP***, where the client managed products and product descriptions.
3. A **custom application** responsible for reporting, custom logic, and competitors' price monitoring.

All three systems communicated like that:



**FishBowl ERP* is an enterprise resource planning for managing day-to-day business activities such as accounting, inventory tracking, wholesale distribution, manufacturing tools, picking and packing, shipment solutions, customer relationship management, etc.

Also, WheelerShip received vendors' product data in different formats and files, for example, an Excel sheet or text document. Each time WheelerShip got it, the product data had a different number of attributes. So, connecting each vendor directly to Magento (as shown at the diagram below) would require a high level of customization, which is time-consuming and, respectively, expensive.



But even after the customization, the system would be hard to maintain. Plus, adding more vendors in the future would require the same amount of effort, time, and costs. With too many vendors the system would also be overloaded, resulting in poor performance.

To summarize, the system WheelerShip had at the time could not support several vendors and properly extract, synchronize and send different data formats to Magento and Fishbowl ERP. Our task was to make all of the existing systems communicate smoothly between each other and with new vendors added to Magento. In such a way, our work could be done with minimum efforts for customization, which would cost less than adding vendors directly to Magento, and at the same time, the website remained easy-to-maintain.



Solution

Team	1 Project Manager	1 QA Engineer
	3 Back-End Developers	1 DevOps

Analyzing existing processes within WheelerShip infrastructure allowed us to arrive at the decision that an intermediary file processing application connecting vendors' data to Magento and Fishbowl ERP is the best solution. This file processing app could extract the data and convert it to the formats required for these two systems.

Since we needed to ensure a high level of customization for the client's online store, we decided to offer them our internal solution, which was already developed for similar requirements. We still had to customize part of this solution. Yet, it would take less time and, consequently, less money than buying data flow technologies available on the market and customizing them from scratch. To introduce it, we collaborated with external teams supporting our client's Magento and Fishbowl ERP.

This solution is called **Data Flow Application (DFA)** based on the MACH architecture*. And it is a part of our R&D activities. DFA serves as middleware between external systems, in this case, Fishbowl ERP and Magento, and vendors.

**MACH architecture* is an infrastructure based on the principle that every component of the system is pluggable, scalable, and replaceable. MACH stands for Microservices-based, API-first, Cloud-native, and Headless.

Custom ERP and eCom adapter connect Magento and Fishbowl to DFA via APIs*. Adapters identify data transfer formats and convert heterogeneous data into a unified language. Then adapters send the information to the core of the DFA, called the brain of the application, which routes requests among different systems. The brain of the application knows what kind of data and where to send it from one system to another, and how often.

An **application programming interface (API) is a way for two or more computer programs to communicate with each other.*

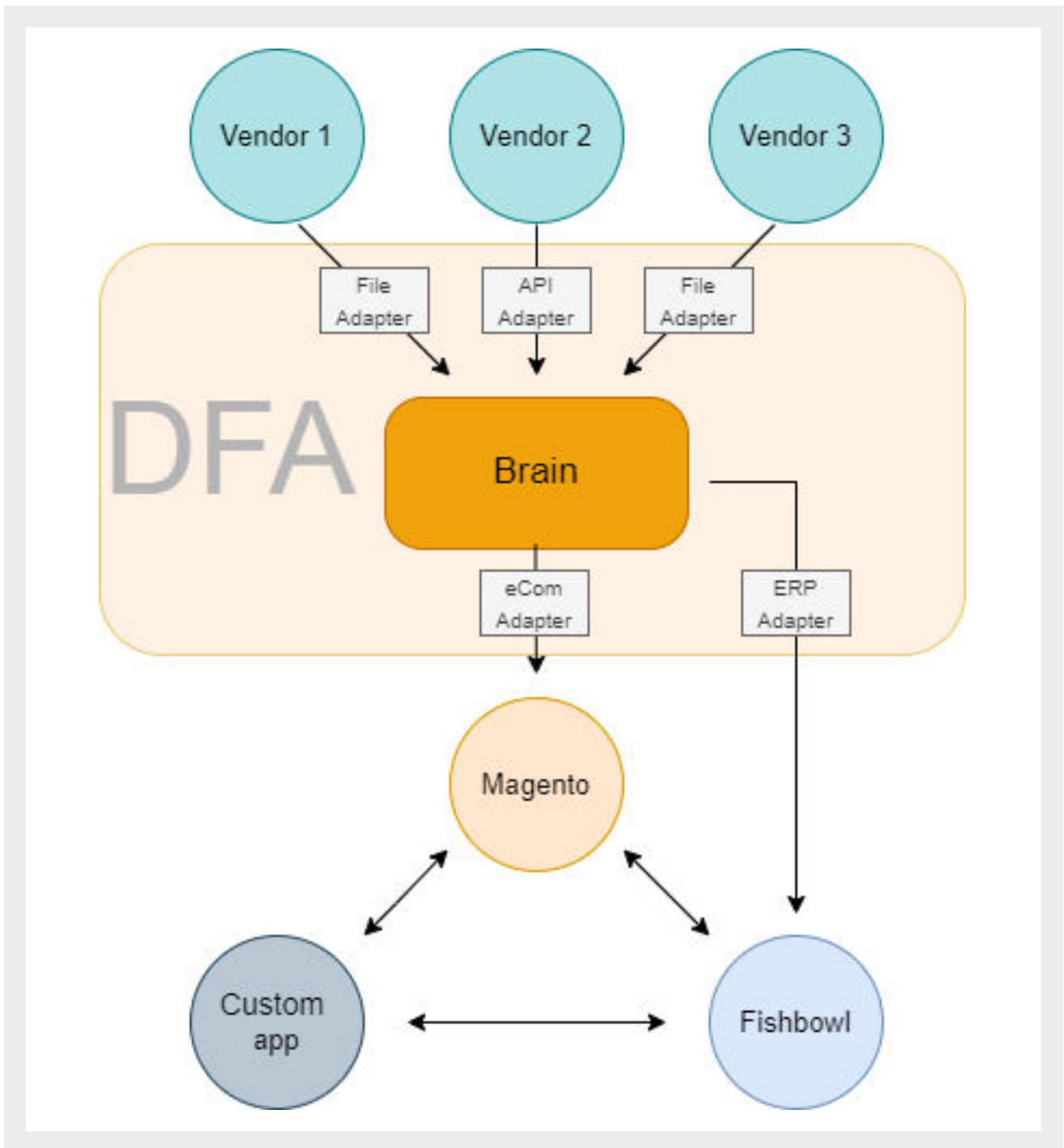
DFA lets vendors send their data to Magento also via custom adapter. We needed to deal with different data formats each time we added a new vendor to the system, so we developed adapters for each particular vendor.

The first vendor would send WheelerShip data in Excel sheets via SFTP**. So we needed to create a custom adapter that could take data from the original files from this vendor, transform it into a specific format, and send it to the 'brain' . After the 'brain' analyzes the data and adjusts mapping attributes to the rules of Magento, the data finally goes to Magento.

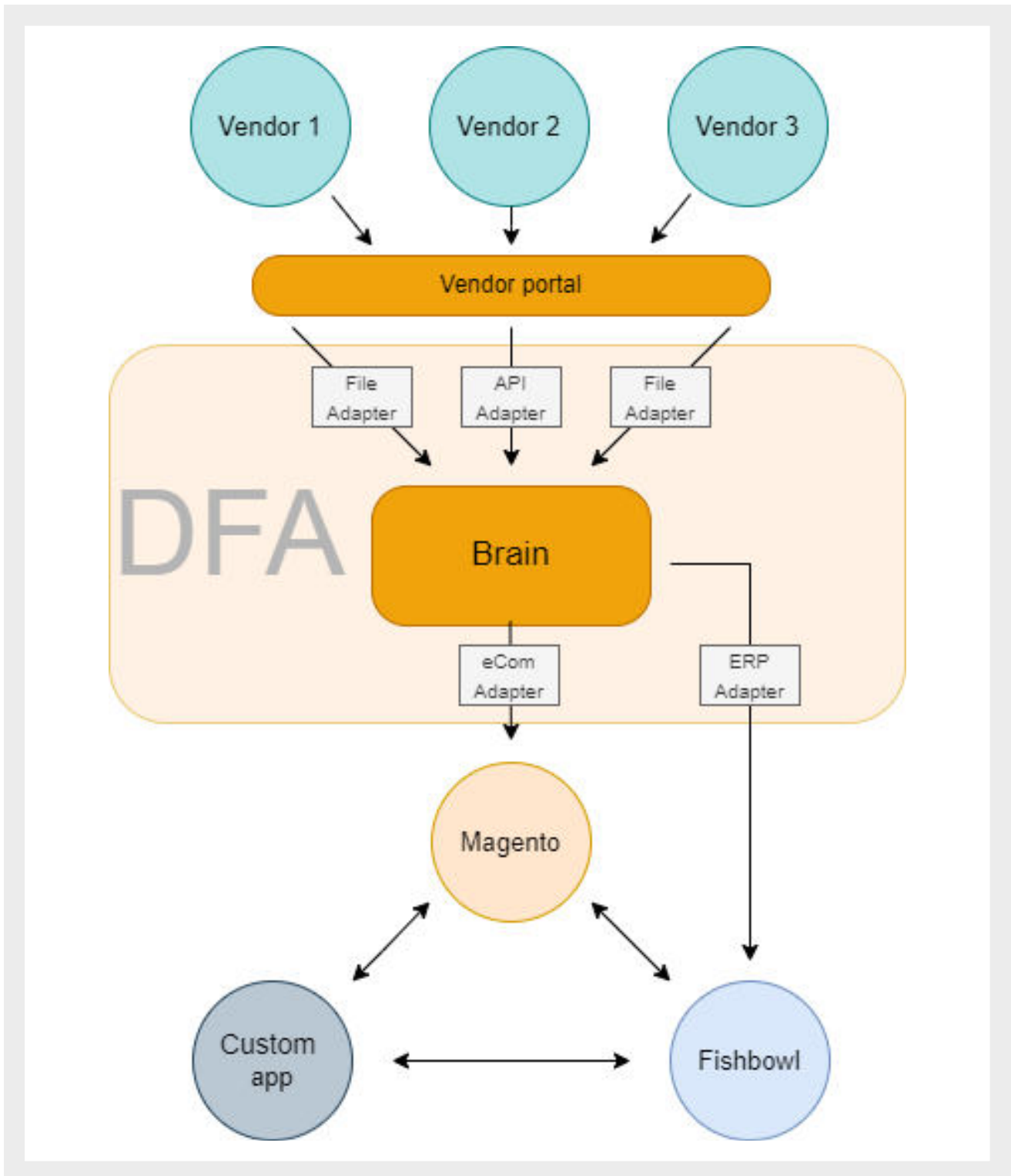
*****Secure File Transfer Protocol** (SFTP) is a network protocol for securely accessing, transferring and managing large files and sensitive data over a network.*

The second vendor offered their data via API. To link their data to the system, we needed to create another custom adapter to transform data from API into a universal format and send it to the 'brain' and then to Magento.

The following diagram shows how DFA works:



Currently, we are also working on creating a vendor portal where vendors can specify the way they communicate with WheelerShip, make the necessary configurations and settings (such as price margin, shipping options, cut-off time etc), track the progress of the information exchange, and solve any issues with products without involving WheelerShip.



Results

WheelerShip has set its strategic business course to growth by providing customers with more products and better services.

And to help our client with that, we improved the data flow for their current setup with minimum customization of Magento and made the system easy to maintain. Now, DFA allows adding an unlimited number of vendors with external product sets, and the current infrastructure makes it easy. As a result, our client can work with a larger product range and increase their revenue.

We proceed working on a deeper integration with vendors to improve customer experience and introduce an automated data flow from WheelerShip to vendors (invoices, orders, etc.).

Contact us

Choose the most convenient way of communication for you – write an email or contact us in one of the messengers.

We'll discuss your project – provide individual calculations and offer our suggestions on how to upgrade your business.

Let's have a chat:



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