Retail Data Ecosystem

RETAIL DATA FLOWS

HUMAN RESOURCES MANAGEMENT PLATFORMS

PARENT COMPANY

ANALYTICS PLATFORMS

PUBLISHERS

NETWORK OPERATIONS CENTER

AD TECH PLATFORMS

DATA SERVER

CALL CENTER

FULFILLMENT PARTNERS

EMPLOYEES

FULFILLMENT PARTNERS

CUSTOMERS

Transaction data

MERCHANT

MERCHANT'S BANK

Transaction data

CUSTOMERS

Authentication

Online purchase with credit card

PAYMENT NETWORK settlement, authorization, and clearing

CALL CENTER

FULFILLMENT PARTNERS

CARDHOLDER

CRM

SUBSIDIARY

CARDHOLDER'S BANK

DATA SERVER

CUSTOMER CARE AGENTS

EMPLOYEES

Payment & reviewing statement of account
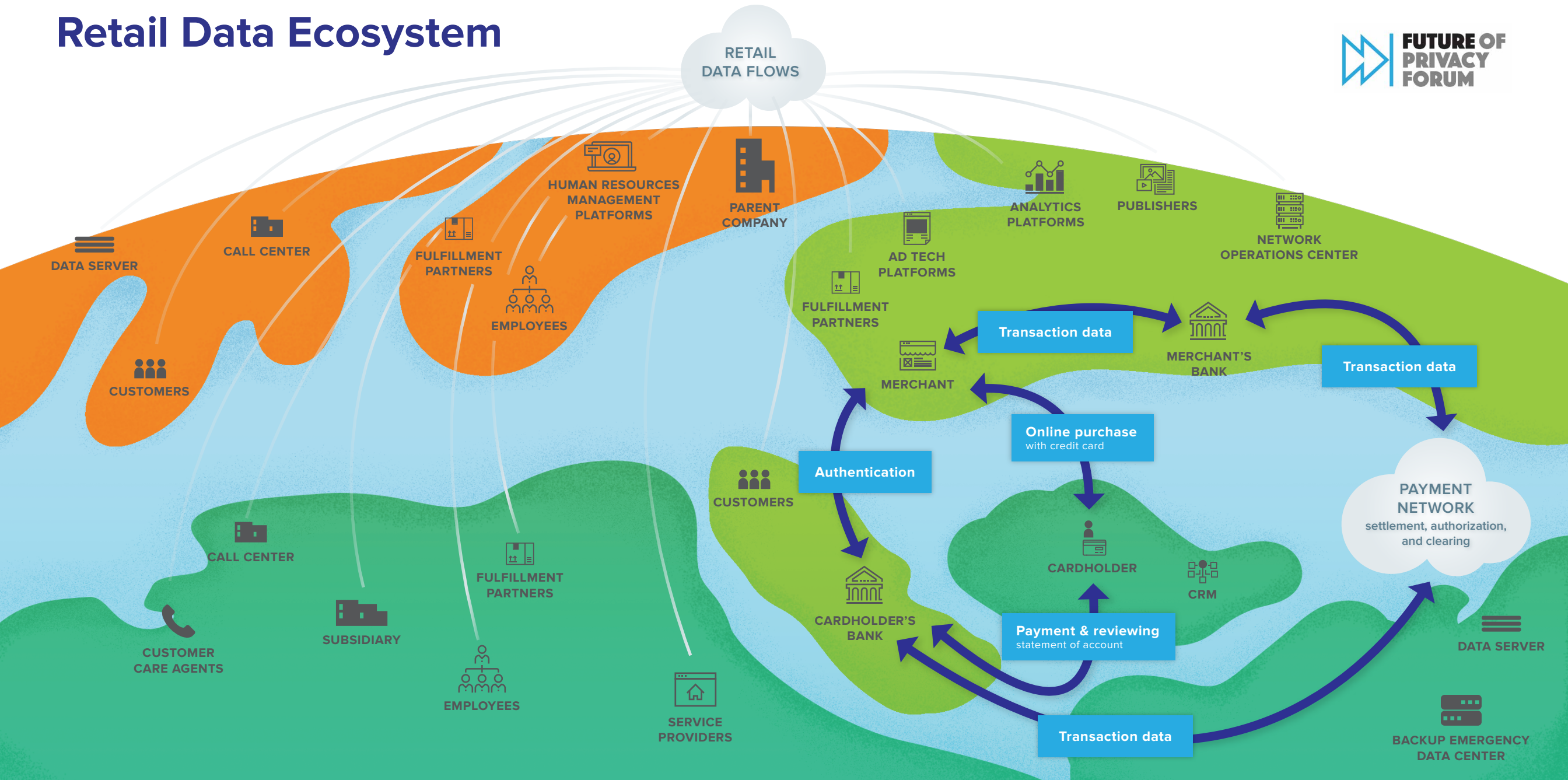
SERVICE PROVIDERS

Transaction data

BACKUP EMERGENCY DATA CENTER

This chart presents a highly simplified visual for a retailer. Data flows are complex for even small and medium size organizations, with partners and vendors commonly located in multiple jurisdictions.

Understanding Retail Data Flows

RETAILER BACKEND INFRASTRUCTURE

A retailer is likely to use a number of different service providers to support consumer transactions. Many of these service providers may only be located in a single jurisdiction, and may be geographically dispersed. These service providers often use other service providers, and who are themselves geographically distributed.

- ▶ Cloud services for the hosting of databases, application servers, data analysis/ML pipelines.

- ▶ E-commerce platforms, which are typically deployed in a public cloud.

- ▶ Platforms for serving video content.

- ▶ Storage providers for other content.

- ▶ Data analytics providers used by retailer employees for interactive dashboards, data mining, visualizations.

- ▶ Machine learning tasks outsourced to other service providers.

- ▶ Human Resource Management (HRM) platforms for managing employee data.

- ▶ Customer Relationship Management (CRM) platforms.

- ▶ Collaborative office applications for internal usage (documents, sheets, mail, etc.).

- ▶ Data Subject Request service providers for handling optout requests from consumers or requests to access or delete personal data.

- ▶ A Single Sign On (SSO) Provider for internal employees and external users.

- ▶ Warehousing or fulfillment services for the delivery of orders of physical goods.

- ▶ Backups in geographically distributed locations for disaster recovery.

- ▶ Ad Tech platforms.

- ▶ Platforms for emails and text messages.

- ▶ Software as a service (SAAS) platforms to analyze logs and assess system performance.

One of the essential services provided to a retailer is payment processing which will involve:

- ▶ An individual makes an online purchase with a credit card at a merchant via its online shop.

- ▶ Authentication checking before a payment is authorized.

- ▶ Payment of the bill by the cardholder's bank.

- ▶ Facilitating the routing of the payment authorizations and the transaction, clearing, and settlement of funds between banks.

- ▶ Settlement of a transaction through a network that includes the merchant's bank, the cardholder's bank, and the payment network.

- ▶ Monitoring network, database, application, and other critical services from a Network Operations Center (NOC) in a centralized location.

- ▶ Global fraud detection and cybersecurity monitoring which consolidate both domestic and cross-border fraud data to identify patterns of fraud and to create and improve global fraud models.

EdTech Data Flows

EDTECH DATA FLOWS

SCHOOL/UNIVERSITY

STUDENTS

EDTECH SUBSIDIARY

SCHOOL/UNIVERSITY

STUDENTS

DATA SERVER

AUTHENTICATION

EDTECH PARENT COMPANY

SCHOOL/UNIVERSITY

STUDENTS

SCHOOL/UNIVERSITY

STUDENTS

CLOUD SERVICES

VENDOR

AFFILIATE

CORPORATE IT SYSTEMS

SPECIALIST VENDORS
(TEXT/SMS, REPORTING, APPLICATIONS PERFORMANCE, SECURITY OPERATIONS)

CLIENT SUPPORT APPLICATIONS

Remote access as required for 24/7 client support to maintain product
e.g., updates, fixing issues

Remote access as required for 24/7 client support to maintain product
e.g., updates, fixing issues

Remote access as required for services provided by vendor
e.g., additional product functionalities like file format conversion or sms/txt notification functionalities, authentication provider, product stability monitoring

DATA SERVER

AFFILIATE

SCHOOL/UNIVERSITY

STUDENTS

SCHOOL/UNIVERSITY

STUDENTS

SCHOOL/UNIVERSITY

BACKUP EMERGENCY DATA CENTER

THIRD PARTY APPLICATION/DATA SERVER HOSTING

Uploading/downloading data
e.g., submitting assignments

STUDENTS

CONTENT DELIVERY NETWORKS

SCHOOL/UNIVERSITY

STUDENTS

The provider provides the EdTech service to the school

Hosting

Uploading/downloading data
e.g., viewing and commenting on assignments

SCHOOL/UNIVERSITY

STUDENTS

STUDENTS

SCHOOL/UNIVERSITY

EDTECH SUBSIDIARY

CUSTOMER RELATIONSHIP MANAGEMENT TOOLS

This map presents a highly simplified visual of the data flows for education technology for schools and universities.
Cloud based services support a wide range of programs used by teachers, students and administrators in this sector.

Understanding EdTech Data Flows

EDTECH INFRASTRUCTURE

Schools and universities increasingly rely on education technology (EdTech) applications to help educate their students. This includes online classroom/video call collaboration tools, applications to inform parents and students about important developments, learning management systems and learning content providers. Most of these providers rely on a global network of subsidiaries to support, maintain and secure their product 24/7 as well as on other service providers that deliver hosting and other specialist services. While applications and personal data of students are often hosted regionally, these subsidiaries and vendors will require access to the data for the delivery of the service.

▶ Customer relationship management tools and client support applications (e.g., for handling client support tickets).

▶ Specialist vendors for additional product functionalities (e.g., text/SMS notifications, file format conversion, reporting).

▶ Companies providing specialist expertise for supporting the stability and security of applications (e.g., application performance monitoring, outsourced security operations centers).

▶ Vendors providing outsourced client support (e.g., to assist with local language).

▶ Authentication/Single Sign On providers to support secure access to client-facing applications and internal systems.

▶ Applications for managing privacy, security and compliance programs provided by third parties (often cloud-based).

▶ Content delivery network providers allowing faster and more reliable access to content for users.

▶ Cloud-based IT systems for email, office applications, storage, HR, travel & expenses, finance and tax. These are typically hosted in the region of the company headquarters.

In addition to the above, universities and schools will also often rely on (cloud-based) vendors to fulfill their tasks.

▶ Messaging and communications tools to stay in contact with their students, parents, and the wider community as well as promoting their activities.

▶ Specialist applications for conducting and facilitating research with international collaborators.

▶ Online collaboration tools (e.g., video conferencing) to collaborate with other schools and universities.