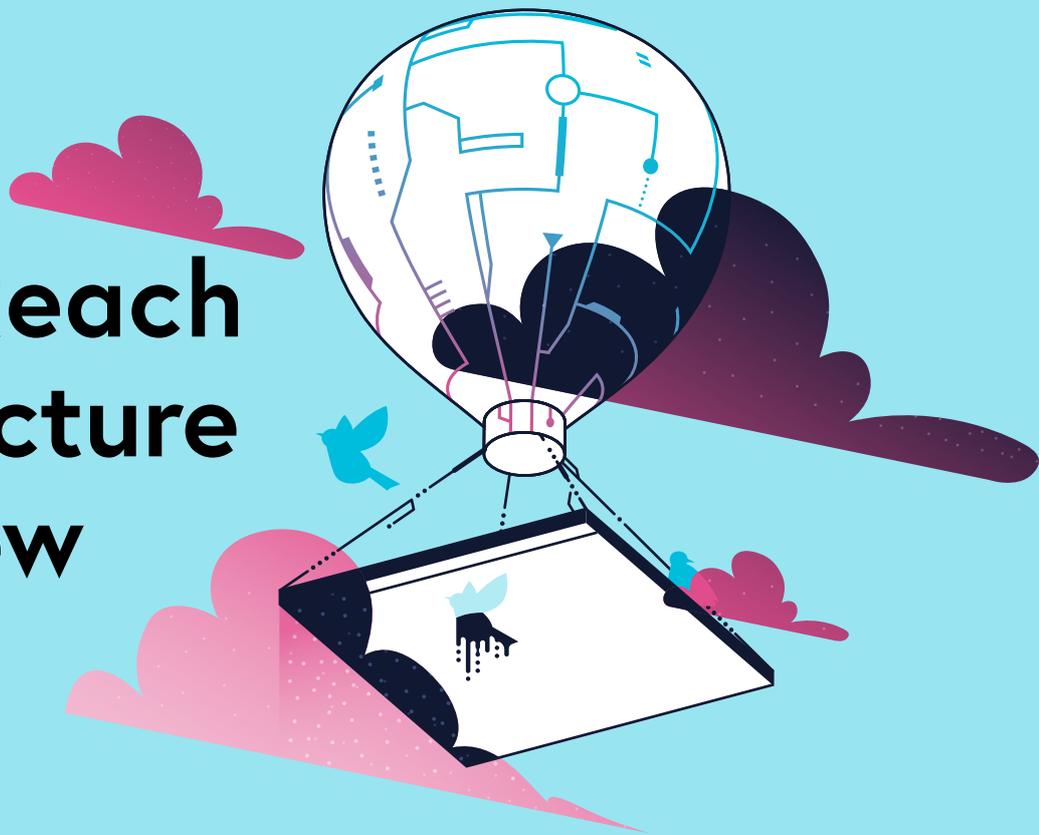# BloomReach Architecture Overview

A Flexibile and Open CMS for the Digital Experience Ecosystem

This document describes BloomReach's philosophy on open integration. It articulates how the open standards product architecture contributes to a more lightweight integration approach to all integration levels. This makes digital experience integrations faster, introduces less risk to core business applications and creates a solution architecture that remains flexible enough to cater continuous change with an overall lower Total Cost of Ownership.

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BEST OF BREED VERSUS MARKETING SUITE APPROACH

The Content Management System vendors follow one of two distinct philosophies to Digital Experience Solutions: Best of Breed or Marketing Suite.

Marketing Suite players believe in creating one unified software stack to cover all aspects of the digital experience ecosystem. Depending on the strategy, they either build or acquire. Vendors who focus on building complementary solutions internally face the challenge of keeping up with developments of this adjacent functionality compared to the respective best of breed players in that space. It is virtually impossible to build new competitive solutions in the areas of analytics, campaign management and marketing automation which have been domains in their own right.

Vendors trying to cover the entire digital experience landscape through acquisition of multiple closed technologies find themselves in years-long integration projects. In some cases, acquired solutions follow fundamentally different product architectures with the result that much R&D effort flows into making the siloed solutions appear to be working as one.

Forrester's Stephen Powers and David Aponovich summarize:

> **WCM isn't a suite story, it's an integration story.[1]**

Vendors following the best of breed philosophy like BloomReach, have concentrated their R&D efforts on creating an open product architecture that allows for more lightweight, faster and more flexible integration with other solutions in the digital experience landscape. The focus of suite players on building or bringing together technologies and locking their customer base into that offering, means they are losing valuable resources on advancing the individual products. In the meantime, best of breed vendors overtake on core competencies, leaving suite solutions with an outdated functionality set, with complex and often disjointed integrations.

In summary, the disruptive nature of today's digital experience landscape requires solutions that are easily and quickly integrated with other best of breed solutions. Moving forward, this approach is the only way in which organizations can benefit from the latest digital experience innovation and secure short time to market as well as consistently low TCO.

THE NATURE OF DIGITAL EXPERIENCE INTEGRATIONS HAS CHANGED

No other domain of IT has undergone as radical a change in philosophy over the past decade as the digital experience space. Traditional back end technology undergoes slow, deliberate change cycles and is by nature risk-averse. Contrary to this, next generation digital experience technology demands fast, agile delivery cycles and continuous innovation capabilities. This fundamentally changes the approaches in which Application Development and Delivery (AD&D) teams tackle digital experience integrations.

> **Enterprises deliver digital customer experiences through the design, development, and delivery of applications using information technology and people skilled in software development and delivery. Today, most AD&D pros do their work within an application life cycle oriented toward core business systems; this life cycle doesn't take into account what customers experience as a result of these processes. Projects that support digital customer experiences require a different life cycle. The two life cycles have fundamental differences in the information they manage, the speed at which they evolve, and the pace at which they must embrace new technologies.[2]**

**DIGITAL EXPERIENCE
SYSTEMS**
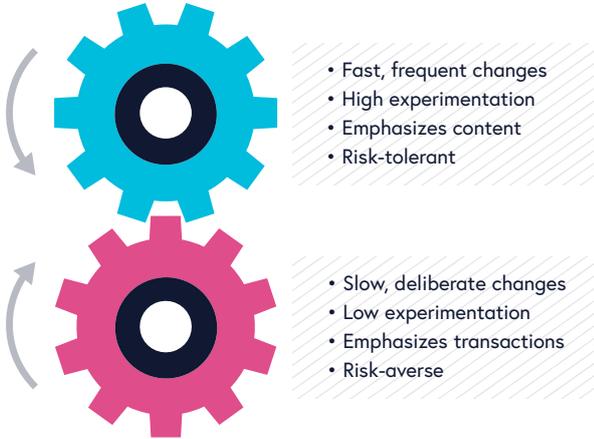
- Fast, frequent changes
- High experimentation
- Emphasizes content
- Risk-tolerant

- Slow, deliberate changes
- Low experimentation
- Emphasizes transactions
- Risk-averse

**CORE BUSINESS
SYSTEMS**

Web Content Management solutions play a core role in this new integration landscape and to succeed, vendors must support a diverse range of integration levels, in particular the integration of content, data and front-end functionality.

3 TIER ARCHITECTURE

Our CMS consists of 3 applications working together to achieve this goal:

The Repository, The CMS User Interface (CMS) and the Delivery tier (HST). This architecture holds big advantages for integration with other applications. Since the application tiers themselves communicate over well-defined API's and are individually accessible by external applications.

CONTENT INTEGRATIONS

Today, content typically resides in multiple repositories. This can be due to organizational silos, legacy technology or the different nature of content, such as structured content, product data, documents, multimedia assets, etc. Modern content management systems must be able to span across these repositories to provide digital experience team with one ubiquitous view on organizational content. In addition to that, CMS solutions have to allow the enrichment of content and metadata to facilitate the harmonized delivery of content to all digital properties and leverage technologies such as targeting and personalization.

**FRONT END
INTEGRATIONS**

- Fast, frequent changes
- Web Mash-Up
- Content Marketing & Business Applications
- Spring Application
- Mobile content delivery (REST)

**DATA
INTEGRATIONS**

- Visiter Profile
- Pivotal visitor tracking
- Pivotal analytics
- Marketing Automation
- CRM, ERP, Call Center Apps

**CONTENT
INTEGRATIONS**

- Document Management
- Documentum (CMIS)
- Syncplicity
- Digital Asset Management
- Other Back Office Systems
- eCommerce product catalog
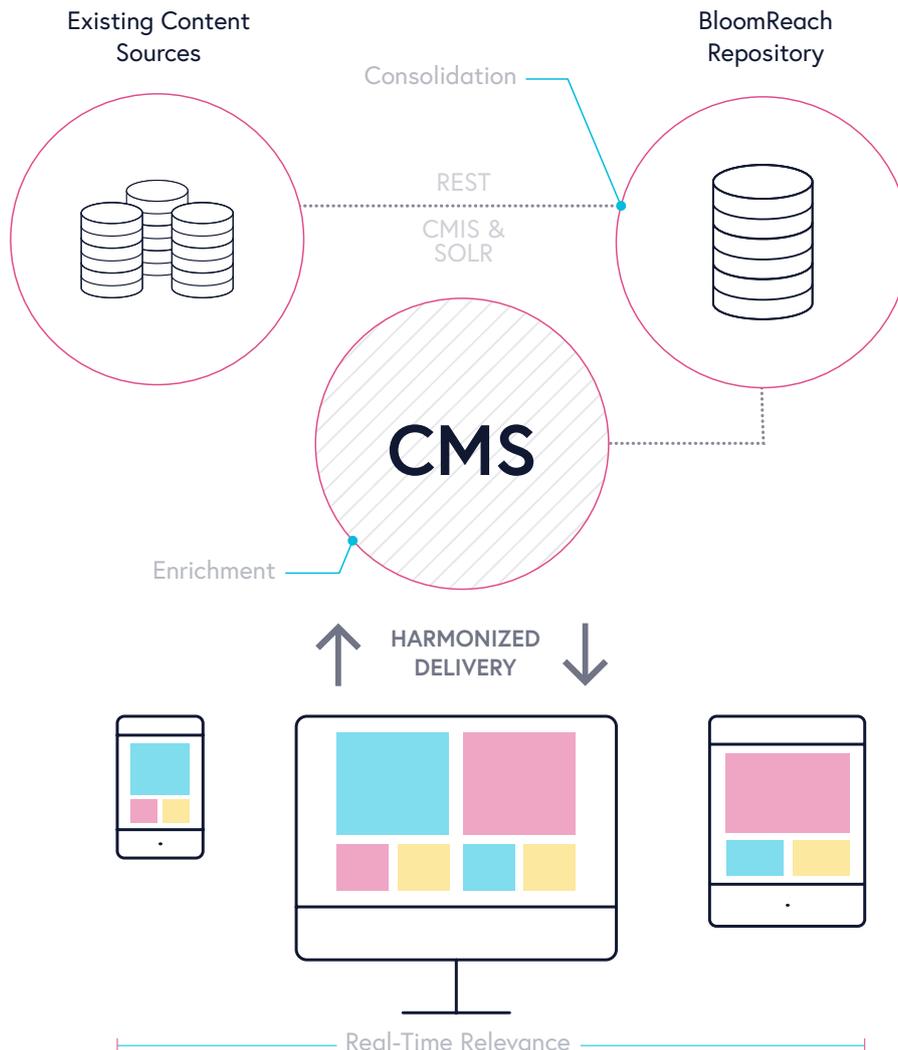- Product Information Systems

Our products have traditionally been very strong in the area of content integrations. The foundation of the Repository is Apache Jackrabbit, the reference implementation of JCR specifications JSR-170 and JSR-283. All content and CMS functionality is exposed through a standard set of API interfaces. This allows any application or process to integrate with the CMS for automatic creation, import, export and publication of content, next to the web based CMS User Interface.

Many leading CMS platforms are web-page oriented and don't allow external systems to operate directly on the structured content in their repositories. They may have their content stored as web pages or parts of web pages including presentation, whereas BloomReach stores content in a structured way with no presentation applied. The Repository allows for the creation of domain-specific content types, enforcing data integrity when external systems push content into the repository.

The HST delivery framework has built-in support to serve REST endpoints. Domain specific content can be exposed using these REST APIs to external applications that are web connected. Examples are external eCommerce platforms pulling content from the Repository, or a native mobile app getting the latest content from it over the web. (Also see: Front-End Integrations)

Next to providing a storage layer, the Repository is also responsible for the base CMS services such as metadata and workflow driven content management, content searching, versioning, processing, scheduling, transformation and aggregation.

BloomReach's plug-in architecture in the CMS allows customers to create plug-ins to access 3rd party systems from within the context of the BloomReach User Interface. This plug-in architecture defines clear extension points to the CMS layer. Programming against these well-defined end points makes future upgrades easier to control and execute.

Existing Content Sources

BloomReach Repository

Consolidation

REST

CMIS & SOLR

CMS

Enrichment

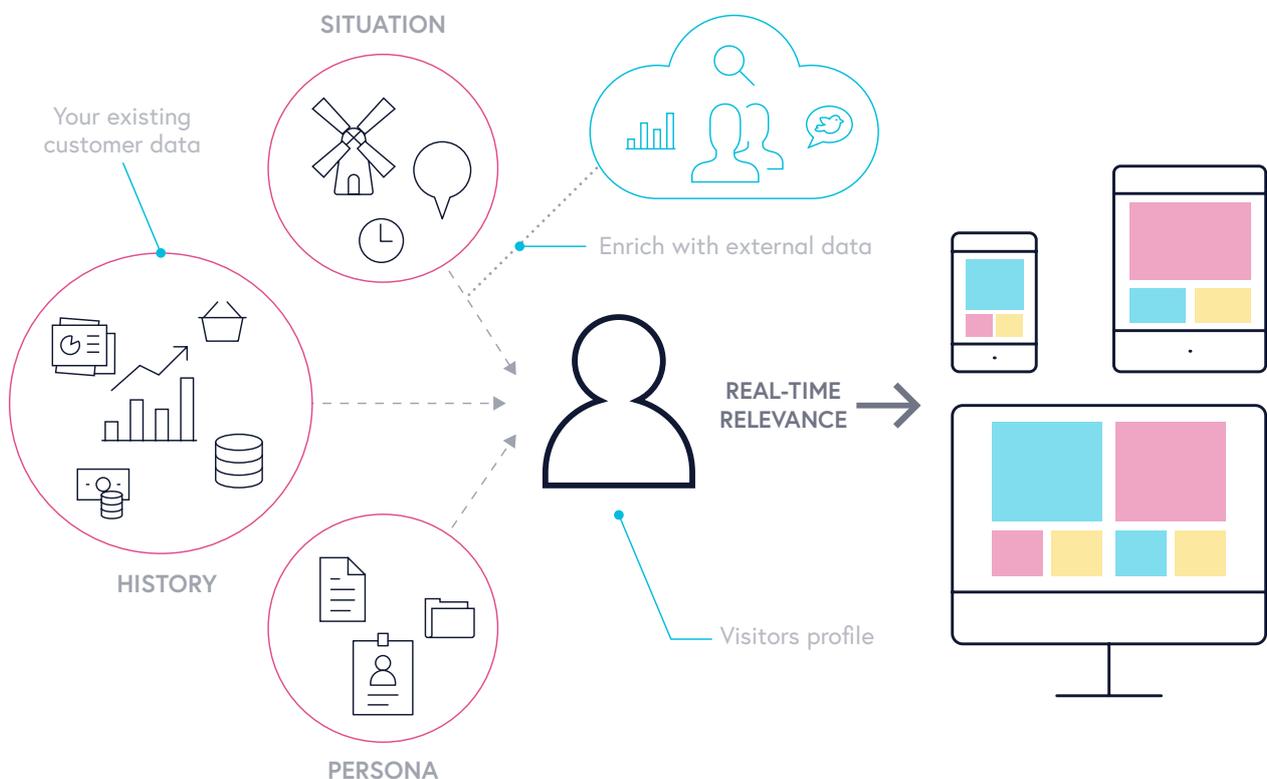HARMONIZED DELIVERY

Real-Time Relevance
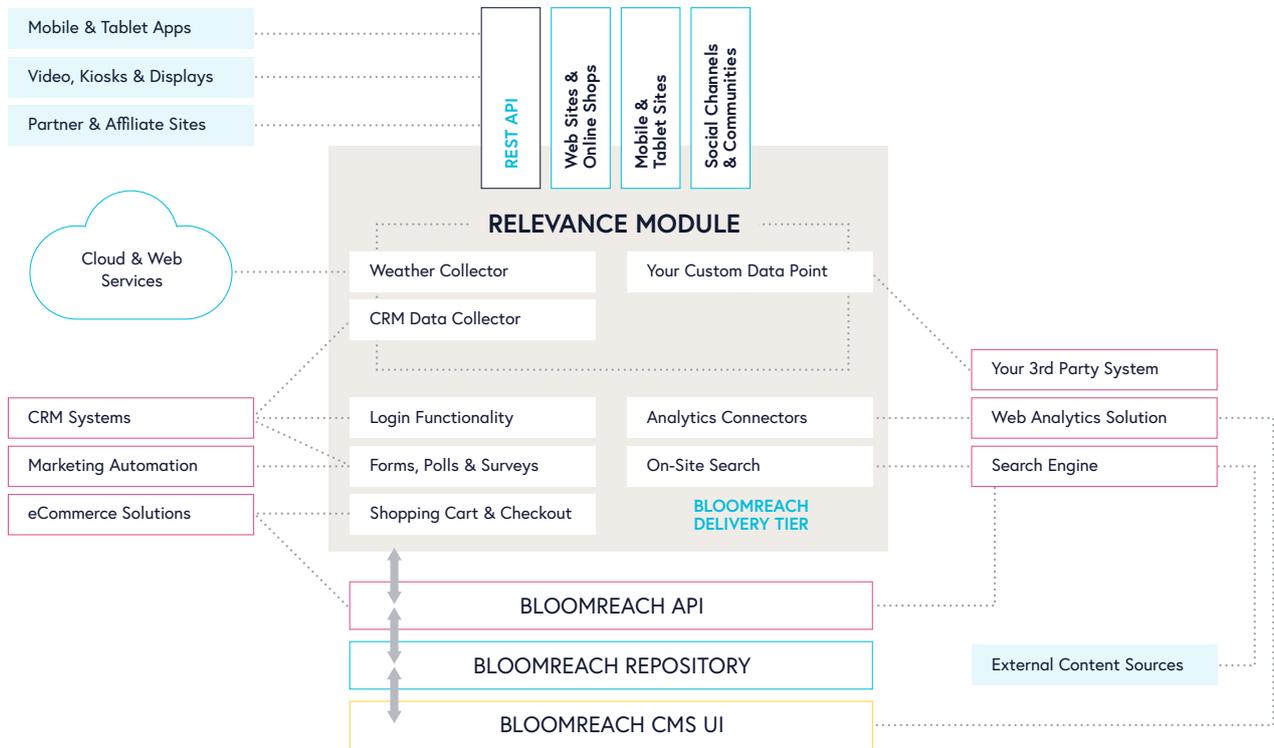
DATA INTEGRATIONS

Being flooded with content and information, online visitors expect interactions with a brand to be relevant and to the point of solving the very problem they have. The need for more dynamic and tailored information is the driver for the rise of targeting and personalization functionality. For digital marketing teams, data on and around the customer has never been more important and connecting the data dots between different customer data stores inside and outside the organization has become crucial.

BloomReach Relevance maintains a live visitor profile for every unique visitor on an online property. The visitor's profile is initially stored in-memory but persisted into a back end NoSQL database. Whenever the visitor returns and is recognized, their previous profile is picked up and progressively enriched with new data points.

The visitor profile data can be used offline for data analysis by Big Data systems like Pivotal, as well as online to tailor the visitor's web experience in real time. With every page view, HST triggers a set of configurable data providers that receive the visitor profile and current request information, after which the providers get an opportunity to process the data and add information back to the profile. The system has been designed to work with external data systems like CRM and web-services to look up extra data about the visitor based on their history.

BloomReach's core strength is the ability to serve out truly dynamic, personalized pages. With every request, the visitor profile is matched against a set of characteristics and personas configured in the CMS to represent an audience segment. The components that make up the portions of the page have access to the visitor profile, allowing them to use that information as part of search queries and external database lookups.

SITUATION

Your existing customer data

Enrich with external data

HISTORY

PERSONA

REAL-TIME RELEVANCE

Visitors profile

Diagram

Mobile & Tablet Apps

Video, Kiosks & Displays

Partner & Affiliate Sites

REST API | Web Sites & Online Shops | Mobile & Tablet Sites | Social Channels & Communities

Cloud & Web Services

RELEVANCE MODULE

Weather Collector | Your Custom Data Point

CRM Data Collector

Your 3rd Party System

CRM Systems

Marketing Automation

eCommerce Solutions

Login Functionality | Analytics Connectors | Web Analytics Solution

Forms, Polls & Surveys | On-Site Search | Search Engine

Shopping Cart & Checkout | **BLOOMREACH DELIVERY TIER**

BLOOMREACH API

BLOOMREACH REPOSITORY | External Content Sources

BLOOMREACH CMS UI

FRONT-END INTEGRATIONS

Many of the integrations that contribute to digital experience properties and modern online business applications do not necessarily require an integration with the back-end CMS. Rather, they require a contextual integration depending on the visitor situation, thus needing an integration on data level and the ability to mash-up content and applications in real-time.

BloomReach's strength in front-end integrations can be brought back to two core concepts: The strict separation of content, layout and logic as well as a strong background in portal technology.

Separation of content, layout and logic

Our CMS stands out through the clean separation of content content management from the context of its usage and its presentation. The CMS does not maintain content in a page oriented way, rather content is stored in a generic structured format, allowing it to be reused and enrich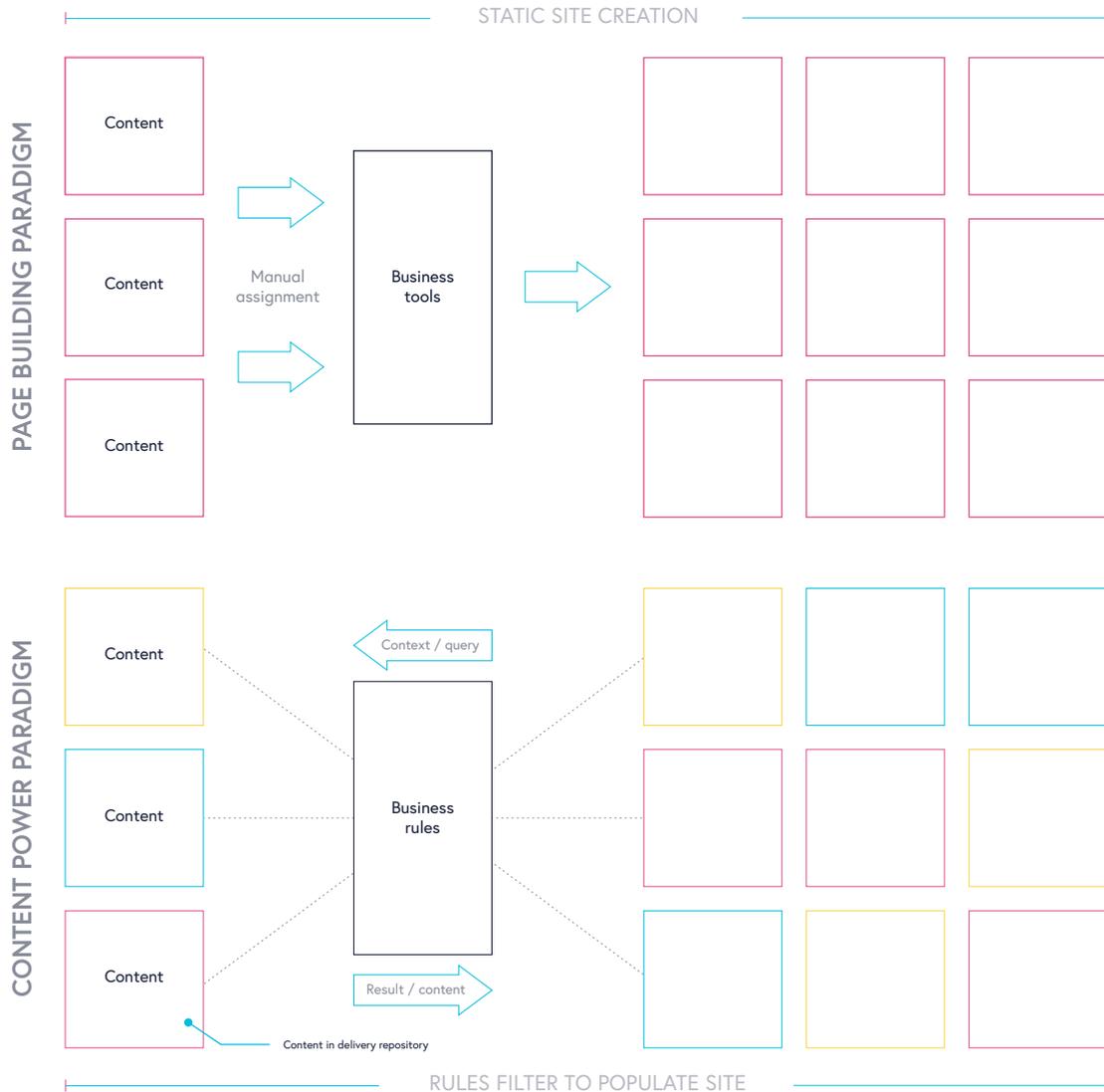ed. The content can be reused across multiple pages, but more importantly, the content can be shared across multiple channels and devices.

This allows business users to create a new digital outlet (website, mobile site, apps etc.) and repurpose all existing content for that new channel. This saves time setting up additional channels and reduces maintenance overhead in subsequent changes. CMS users can further enrich the content by adding metadata, which is used to further personalize the experience of site visitors based on their context.

Dynamic digital estates and online business applications can access and manipulate the content stored in the CMS repository. Equally, CMS users can access this and 3rd party information from within the CMS user interface. (See: Content Integrations)

All content and CMS functionality are exposed through a standard set of Java APIs. This provides full control over content and means any external application can – with the appropriate permissions – create, import, export, search, manage, structure, manipulate and publish content just by using BloomReach's open APIs.

The REST interface opens up content also to non-Java applications as well as partner applications and affiliates. Furthermore, it allows customers to choose a custom delivery tier.

STATIC SITE CREATION

PAGE BUILDING PARADIGM

Content

Content

Manual assignment

Business tools

Content

CONTENT POWER PARADIGM

Content

Context / query

Content

Business rules

Content

Result / content

Content in delivery repository

RULES FILTER TO POPULATE SITE

From Portal to Mash-Up

Until 2011, we shipped a Java Portal product based on open source technologies and the Java standard for portals (JSR-168 and 286).

However, portals became increasingly sluggish in adopting new functionalities, particularly in the areas of layout and design and were cumbersome to manage for digital marketing teams that need small and quick iterations in their continuous online channel optimization.

For that reason, we stepped out of the classic portal technology space in 2011 and developed a lightweight delivery framework (HST) that provided both the mash-up technology of the classic portal solutions and at the same time brought business users in control of look & feel. A further advantage of this new approach is that

the ability to deliver personalized experiences both to anonymous visitors and known, logged in users from one single solution.

Merging the development teams for the portal and the delivery tier meant that we adopted best practices from the portal world in the HST, allowing for easy integration of external business applications into HST-driven pages.

This focus on integration allows for easy adoption of the latest technologies, and also provides our product with a fresh and clean overall architecture. The HST fully leverages Spring technologies, supports both server side solutions (Edge Side Includes, Container Level Integration, Spring Bridge) as well as client side solutions to facilitate visual integrations.

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References:

1   Stephen Powers & David Aponovich, The Forrester Wave™: Web Content Management For Digital Customer Experience, Q2 2013, Forrester Inc.

2   Stephen Powers, Drive Business Transformation With Digital Customer Experiences, Nov 2012, Forrester Research Inc.

About BloomReach

BloomReach software enables highly personalized digital experiences for enterprises across the world. Our digital experience platform, BloomReach Experience (brXperience) is powered by a next-gen content management system (CMS), digital merchandising tools, intelligent site search, and search engine optimization (SEO).

BloomReach Experience combines machine learning with tools that keep human creativity at the helm of the customer experience. Retailers, brands, distributors, manufacturers and other enterprises use BloomReach software to deliver seamless experiences at scale, accelerate conversion, increase revenue, and promote customer loyalty.

Recognized by leading analyst firms, BloomReach is named a Leader in the Gartner Magic Quadrant for Web Content Management (WCM), a Strong Performer in the Forrester Wave for WCM, and a Visionary in the Gartner Magic Quadrant for DXP.

With a global network of certified partners, BloomReach serves hundreds of large and medium enterprise customers such as Neiman Marcus, Staples, REI, Mailchimp, FC Bayern München, and the UK's NHS Digital. Founded in 2009, BloomReach is headquartered in Silicon Valley and Amsterdam, with offices worldwide.

For more information visit **bloomreach.com**